PUBLIC CIRCULATION DRAFT
Initial Study /Proposed Mitigated Negative Declaration

FOR THE

GULLIKSEN RESIDENTIAL SUBDIVISION
Fortuna, CA

October 2026

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City of Fortuna
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1 Table of Contents

ACRONYMS AND ABBREVIATIONS 10
PROJECT SUMMARY 13
1.1 CEQA REQUIREMENTS 14
1.1.1 LEAD AGENCY NAME AND ADDRESS 14
1.1.2 CONTACT PERSON(S) AND PHONE NUMBER 14
2 PROJECT DESCRIPTION 14
2.1 PROJECT LOCATION AND SETTING 15
2.2 APPLICANT 15
2.3 GENERAL PLAN DESIGNATION 15
2.4 ZONING 16
PROJECT PHASING 16
2.5 16
2.6 UTILITIES 16
2.7 ROADWAY 17
2.8 DRAINAGE 17
2.9 RESIDENTIAL 18
2.10 SURROUNDING LAND USE 18
3 PUBLIC AGENCIES REQUIRING APPROVAL 18
4 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED 22
4.1 DETERMINATION 2
4.2 EVALUATION OF ENVIRONMENTAL IMPACTS 3
4.3 AESTHETICS 5
4.3.1 THRESHOLDS OF SIGNIFICANCE 5
4.3.2 DISCUSSION 5
4.3.3 MITIGATION MEASURES 6
4.3.4 FINDINGS 6
4.4 AGRICULTURE AND FOREST RESOURCES 7
4.4.1 THRESHOLDS OF SIGNIFICANCE 8
4.4.2 DISCUSSION 8

4.4.3 MITIGATION MEASURES 11
4.4.4 FINDINGS 11
4.5 AIR QUALITY 12
4.5.1 THRESHOLDS OF SIGNIFICANCE 12
4.5.2 DISCUSSION 12
4.5.3 MITIGATION MEASURES 18
4.5.4 FINDINGS 19
4.6 BIOLOGICAL RESOURCES 20
4.6.1 THRESHOLDS OF SIGNIFICANCE 20
4.6.2 DISCUSSION 21
4.6.3 MITIGATION MEASURES 27
4.6.4 FINDINGS 28
4.7 CULTURAL RESOURCES 28
4.7.1 THRESHOLDS OF SIGNIFICANCE 28
4.7.2 DISCUSSION: 29
4.7.3 MITIGATION MEASURES 29
4.7.4 FINDINGS 30
4.8 ENERGY 30
4.8.1 THRESHOLDS OF SIGNIFICANCE 30
4.8.2 DISCUSSION 30
4.8.3 MITIGATION MEASURES 32
4.8.4 FINDINGS 32
4.9 GEOLOGY AND SOILS 33
4.9.1 THRESHOLDS OF SIGNIFICANCE 33
4.9.2 DISCUSSION 34
4.9.3 MITIGATION MEASURES 38
4.9.4 FINDINGS 39
4.10 GREENHOUSE GAS EMISSIONS 39
4.10.1 THRESHOLDS OF SIGNIFICANCE 39
4.10.2 DISCUSSION 39

4.10.3 MITIGATION MEASURES 45
4.10.4 FINDINGS 45
4.11 HAZARDS AND HAZARDOUS MATERIALS 46
4.11.1 THRESHOLDS OF SIGNIFICANCE 46
4.11.2 DISCUSSION 47
4.11.3 MITIGATION MEASURES 49
4.11.4 FINDINGS 49
4.12 HYDROLOGY AND WATER QUALITY 50
4.12.1 THRESHOLDS OF SIGNIFICANCE 50
4.12.2 DISCUSSION 51
4.12.3 MITIGATION MEASURES 58
4.12.4 FINDINGS 61
4.13 LAND USE AND PLANNING 61
4.13.1 THRESHOLDS OF SIGNIFICANCE 61
4.13.2 DISCUSSION 62
4.13.3 MITIGATION MEASURES 62
4.13.4 FINDINGS 62
4.14 MINERAL RESOURCES 63
4.14.1 THRESHOLDS OF SIGNIFICANCE 63
4.14.2 DISCUSSION 63
4.14.3 MITIGATION MEASURES 63
4.14.4 FINDINGS: 63
4.15 NOISE 64
4.15.1 THRESHOLDS OF SIGNIFICANCE 64
4.15.2 DISCUSSION 64
4.15.3 MITIGATION MEASURES 66
4.15.4 FINDINGS 66
4.16 POPULATION AND HOUSING 67
4.16.1 THRESHOLDS OF SIGNIFICANCE 67
4.16.2 DISCUSSION 67

4.16.3 MITIGATION MEASURES 68
4.16.4 FINDINGS 68
4.17 PUBLIC SERVICES 68
4.17.1 THRESHOLDS OF SIGNIFICANCE 68
4.17.2 DISCUSSION 68
4.17.3 MITIGATION MEASURES 70
4.17.4 FINDINGS 70
4.18 RECREATION 70
4.18.1 THRESHOLDS OF SIGNIFICANCE 70
4.18.2 DISCUSSION 70
4.18.3 MITIGATION MEASURES 71
4.18.4 FINDINGS 71
4.19 TRANSPORTATION/TRAFFIC 71
4.19.1 THRESHOLDS OF SIGNIFICANCE 71
4.19.2 DISCUSSION: 71
4.19.3 MITIGATION MEASURES 78
4.19.4 FINDINGS 79
4.20 TRIBAL CULTURAL RESOURCES 79
4.20.1 THRESHOLDS OF SIGNIFICANCE 79
4.20.2 DISCUSSION: 80
4.20.3 MITIGATION MEASURES 81
4.20.4 FINDINGS 81
4.21 UTILITIES AND SERVICE SYSTEMS 81
4.21.1 THRESHOLDS OF SIGNIFICANCE 81
4.21.2 DISCUSSION 82
4.21.3 MITIGATION MEASURES 85
4.21.4 FINDINGS 85
4.22 WILDFIRE 86
4.22.1 THRESHOLDS OF SIGNIFICANCE 86
4.22.2 DISCUSSION: 86

4.22.3 MITIGATION MEASURES 87
4.22.4 FINDINGS 87
4.23 MANDATORY FINDINGS OF SIGNIFICANCE 88
4.23.1 DISCUSSION 88
4.24 Determination 89
5 MITIGATION SUMMARY 90
References 92
Attachment A: Proposed Site Plan Sheets ..... A
Attachment B: September 2022 – Aquatic Resources Delineation Report- Gulliksen Drive Development Project ii
Attachment C: Cultural Resources Survey iii
Attachment D: Final Drainage Analysis- A.M. Baird Engineering & Surveying iv
Attachment E: Engineering Geologic Soils Report- A.M. Baird Engineering & Surveying v
Attachment F: Technical Advisory on Evaluating Transportation Impacts in CEQA vi
Attachment G: EPANET Model Results vii
Attachment H: EPANET Water Service Report and Performance viii
Attachment I: CalEEMod Results ix

TABLE OF TABLES

TABLE 1: AESTHETIC IMPACT EVALUATION 5

TABLE 2: AGRICULTURE AND FOREST RESOURCES IMPACT EVALUATION 7

TABLE 3: AIR QUALITY IMPACT EVALUATION 12

TABLE 4: CONSTRUCTION POLLUTANT EMISSIONS IN 2025 16

TABLE 5: CONSTRUCTION POLLUTANT EMISSIONS IN 2026 16

TABLE 6: OPERATIONAL POLLUTANT EMISSIONS 17

TABLE 7: BIOLOGICAL RESOURCES IMPACT EVALUATION 20

TABLE 8: CULTURAL RESOURCES IMPACT EVALUATION 28

TABLE 9: ENERGY IMPACT EVALUATION 30

TABLE 10: GEOLOGY AND SOILS IMPACT EVALUATION 33

TABLE 11: GREENHOUSE GAS EMISSIONS IMPACT EVALUATION 39

TABLE 12: MODELLED CONSTRUCTION EMISSIONS TOTALS GENERATED THROUGH THE CALEEMOD APPLICATION 41

TABLE 13: FULL BUILDOUT GREENHOUSE GAS EMISSIONS MODELLED USING THE CALEEMOD MODEL 41

TABLE 14: GHG EMISSIONS FOR 2025 (SOURCE: CALEEMOD) 42

TABLE 15: GHG EMISSIONS FOR 2026 (SOURCE: CALEEMOD) 42

TABLE 16: HAZARD AND HAZARDOUS MATERIALS IMPACT EVALUATION 46

TABLE 17: HYDROLOGY AND WATER QUALITY IMPACT EVALUATION 50

TABLE 18: LAND USE AND PLANNING IMPACT EVALUATION 61

TABLE 19: MINERAL RESOURCES IMPACT EVALUATION 63

TABLE 20: NOISE IMPACT EVALUATION 64

TABLE 21: POPULATION AND HOUSING IMPACT EVALUATION 67

TABLE 22: PUBLIC SERVICES IMPACT EVALUATION 68

TABLE 23: RECREATION IMPACT EVALUATION 70

TABLE 24: TRANSPORTATION/TRAFFIC IMPACT EVALUATION 71

TABLE 25: TRIBAL CULTURAL RESOURCES IMPACT EVALUATION 79

TABLE 26: UTILITIES AND SERVICE SYSTEMS IMPACT EVALUATION 81

TABLE 27: WILDFIRE IMPACT EVALUATION 86

TABLE 28: MANDATORY FINDINGS OF SIGNIFICANCE IMPACT EVALUATION 88

TABLE OF FIGURES

FIGURE 1: WENDT IMPROVEMENT PLAN LOCATION 19

FIGURE 2: WENDT IMPROVEMENT PLAN AERIAL PHOTO 20

FIGURE 3: WENDT IMPROVEMENT PLAN TENTATIVE MAP, SHEET 1. 21

FIGURE 4: MAP OF AGRICULTURE AND TIMBERLAND IN FORTUNA, CA. SITE IS MARKED WITH BLUE OUTLINE. 9

FIGURE 5: MAP OF WETLAND AND TRANSECT LOCATIONS (FROM GHD REPORT). 24

FIGURE 6: FLOOD ZONE MAP OF THE PROPOSED PROJECT AREA. 57

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
APN	Assessor Parcel Number
USACE	U.S. Army Corps of Engineers
ASCE	American Society of Civil Engineers
BAAQMD	Bay Area Quality Management District
BMPs	Best Management Practices
CAP	Climate Action Plan
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGP	Construction General Permit
CHP	California Highway Patrol
CIWMB	California Integrated Waste Management Board
dB	Decibels
DPEIR	Draft Programmatic Environmental Impact Report
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
ECOS	Environmental Conservation Online System
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
EPANET	Environmental Protection Agency Network Evaluation Tool
ERD	Eel River Disposal and Resource Recovery Inc.
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FCMP	Final Construction Management Plan
FEMA	Federal Emergency Management Agency
FFPD	Fortuna Fire Protection District

FGDC	Federal Geographic Data Committee
FMMP	Farmland Mapping and Monitoring Program
FPD	Fortuna Police Department
FVFD	Fortuna Volunteer Fire Department
FWS	U.S. Fish and Wildlife Service
G	Gravity
GHG	Greenhouse Gas
GIS	Geographic Information System
HCDEH	Humboldt County Division of Environmental Health
HCP	Habitat Conservation Plans
HMAP	Hazardous Materials Area Plan
HMRT	Regional Hazardous Materials Response Team
HOA	Homeowner's Association
HTA	Humboldt Transit Authority
HWMA	Humboldt Waste Management Authority
L_{eq}	Equivalent Continuous Sound Level
LID	Low Impact Development
LOS	Level Of Service
MGD	Million Gallons per Day
MND	Mitigated Negative Declaration
MOU	Memorandum of Understanding
MPH	Miles per Hour
MS4	Municipal Separate Storm Sewer System
MT/yr	Metric Tons per Year
ND	Negative Declaration
NAAQS	National Ambient Air Quality Standards
NCAB	North Coast Air Basin
NCRWQCB	North Coast Regional Water Quality Control Board
NCUAQMD	North Coast Unified Air Quality Management District
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NSR	New Source Review
NPDES	National Pollutant Discharge Elimination System
OBL	Obligate Wetland

ODCHC	Open Door Community Health Clinic
OSHA	Occupational Safety and Health Administration
OPR	Governor's Office of Planning and Research
PEM	Palustrine Emergent
PGA	Peak Ground Acceleration
PM	Particulate Matter
PRC	Public Resources Code
QSD	Qualified SWPPP Developer
R-L	Residential Low
RE	Residential Estates
ROW	Right of Way
RTS	Redwood Transit Service
RWQCB	Regional Water Quality Control Board
SDC	Seismic Design Category
SQFT	Square Feet
SRA	State Responsibility Area
SWMM	Storm Water Management Model
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TISR	Traffic Impact Study Report
TMDL	Total Maximum Daily Load
UBC	Uniform Building Code
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

PROJECT SUMMARY

Date:	August 17, 2026
Project Title:	Gulliksen Residential Subdivision
Project Summary	Subdivision of 33.5 acres across three parcels into 29 residential lots and associated improvements including improving and extending existing roads with additional drainage routing and utilities, and creating a new road to connect existing roads.
Lead Agency:	City of Fortuna
Lead Agency Contact:	Brendan Byrd, Community Development Director
Report Authors:	Whitchurch Engineering
Author Contact:	Whitchurch Engineering 610 9th Street, Fortuna CA, 95540 (707)725-6926
Project Location:	Gulliksen Drive, Fortuna CA, 95540
Coastal Zone:	Site is not located within the Coastal Zone
Assessor Parcel Numbers:	202-093-060, 202-041-005, and 202-092-018
General Plan Designation:	Residential Very Low (RVL)
Zoning:	Residential Estates (RE 20 and RE 43)
Additional public agencies whose approval is required. Note this list is not exhaustive, and additional approvals may be required.	Fortuna Fire Protection District Tribal Communities US Army Corps of Engineers California Northcoast Regional Water Quality Board State Water Resources Control Board - Water Quality California Department of Fish and Wildlife North Coast Unified Air Quality Management District U. S. Fish and Wildlife Service (FWS) Fortuna Union High School District Fortuna Elementary School District
Anticipated City of Fortuna Permits and Approvals. Note this list is not exhaustive, and additional permits may be required.	1) Planned Development/Tentative Map 2) Utility Improvement Plans 3) Grading, Building, and Encroachment permits

1.1 CEQA REQUIREMENTS

The project is subject to the requirements of the California Environmental Quality Act (CEQA). CEQA encourages lead agencies and applicants to modify their projects to avoid potentially significant adverse impacts (CEQA Section 21080 [C][2] and State CEQA Guidelines Section 15070[b][2]). The purpose of this Initial Study (IS) is to provide a basis for determining whether to prepare an Environmental Impact Report (EIR), Negative Declaration (ND), or Mitigated Negative Declaration (MND). This is intended to satisfy the requirements of CEQA (Public Resources Code, Div 13, Sec 21000-21177) and the State CEQA Guidelines (California Code of Regulations, Title 14, Sec 15000-15387).

Section 15063(d) of the State CEQA Guidelines states that an IS shall contain the following information in brief form:

1) A description of the project including the location of the project.
2) An identification of the environmental setting.
3) An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to provide evidence to support the entries.
4) Discussion of means to mitigate identified significant effects, if any.
5) An examination of whether the project would be consistent with existing zoning, plans, and other applicable land use controls.
6) The name of the person or persons who prepared and/or participated in the Initial Study.

The environmental checklist form contained in this document is based on Appendix G of the CEQA Guidelines (2018).

1.1.1 LEAD AGENCY NAME AND ADDRESS

Fortuna City Council
621 11th St

Fortuna, CA 95540

The Lead Agency for the proposed development is the City of Fortuna hereinafter referred to as 'The City,' per CEQA guidelines Section 21067.

1.1.2 CONTACT PERSON(S) AND PHONE NUMBER

Lead Agency Contact: Brendan Byrd, Community Development Director

2 PROJECT DESCRIPTION

The Project proposes to subdivide a 33.5-acre site for 29 single-family residential lots and infrastructure improvements including site grading, public streets, utilities (water, sewer, power, and data), and drainage improvements for the project area and future residences. Improvements would be completed so that the only remaining project work to be completed at the close of the subdivision are the building permits and improvements associated with the construction of individual residences. The proposed residential development would provide

much-needed housing and complement the existing residential neighborhood by offering street interconnectivity that would complete previous phases of this subdivision.

This site also includes wetlands measuring 0.37 acres and 0.12 acres in area, which will be preserved and protected by a 50-ft fenced wetland setback/buffer area.

2.1 PROJECT LOCATION AND SETTING

The site is located on Gulliksen Drive in Fortuna CA, 95540, east of Rohnerville Road. The site is on the easternmost edge of Fortuna, generally between Rohnerville Road to the east, Gulliksen Drive and Towhee Street to the North, Loop Road to the South, and Pampas Lane to the West. The project parcels (APN: 202-093-060, 202-041-005, and 202-092-018) are approximately 33.5 acres in size. Most of the site consists of gently sloping open grass fields with timberland to the north. Surrounding land uses include residential, commercial, and rural residential development to the west, and a small area of residential development to the east, bordered by extensive forested land comprised of privately owned timberlands. The existing area with the two roads has houses, utility lines, and areas with open field on site. The Project is 0.12 miles south of a small tributary to Strongs Creek and 0.38 miles north of Jameson Creek, therefore there are no Streamside Management Areas, although the project area generally drains to these streams though either natural topography or existing City-owned storm drain infrastructure. The parcel is located within the California Township and section S1 T2N R1W. The parcel is not located in a Coastal zone or the FEMA 100-year and 500-year floodplain.

2.2 APPLICANT

Wendt Construction
3651 Rohnerville Road
Fortuna, CA 95540

2.3 GENERAL PLAN DESIGNATION

The City General Plan land use designation for the project site is Residential Very Low (RVL). This designation provides for very low-density residential development and allows single-family residences, mobile homes, accessory dwelling units, public and quasi-public uses, limited neighborhood-serving commercial uses, and other similar and compatible uses. Residential densities within the RVL designation shall be in the range of 1.1 to 2.9 dwelling units per gross acre. Based solely on the gross acreage of the project site, this density range would allow approximately 37 to 97 dwelling units. However, these figures represent theoretical gross-density calculations only and do not reflect the site's actual development capacity. Actual residential yield is governed by the underlying zoning regulations, minimum lot size and subdivision requirements, roadway and access standards, infrastructure and utility availability, environmental constraints including wetlands and required buffers, topography, drainage requirements, and other applicable development standards. The proposed 29-lot subdivision will provide for single-family residential development consistent with the range of uses envisioned by the RVL designation and is compatible with the surrounding pattern of low-density residential development. Therefore, the project is consistent with the Residential Very Low General Plan land use designation.

2.4 ZONING

The project site is zoned Residential Estates (RE), which permits one single-family residence per lot pursuant to FMC 17.03.011. The proposed subdivision and residential development are consistent with this requirement, as each proposed dwelling will be located on a separate lot. In addition, the proposed lots have been reviewed for consistency with the applicable development standards of the RE zoning district, including the minimum lot area requirements of the RE-20 and RE-43 districts, minimum lot frontage, access requirements, yard setback standards, and applicable infrastructure and utility requirements. As conditioned, the proposed lots meet or exceed the minimum lot size and dimensional standards of the underlying zoning district, each lot will have legal frontage and access, and future development will be required to comply with all applicable setback, utility, drainage, and public improvement standards of the Fortuna Municipal Code. For proposed lots that are split-zoned between RE-20 and RE-43, compliance with minimum lot area and other applicable development standards shall be determined based on the zoning designation encompassing the greatest percentage of the lot. As proposed, each split-zoned lot meets or exceeds the standards of the zoning district constituting the majority of the lot area. Therefore, the project is consistent with the density, lot configuration, and development standards of the Residential Estates zoning designation.

2.5 PROJECT PHASING

The tentative map for the project is divided into two phases, both of which are evaluated in this document. Phase 1 is generally located on the southern portion of the subdivision and includes 19 lots. Phase 2 includes the remaining 10 lots. The project is phased to support orderly development and provide flexibility in construction timing. However, some Phase 2 infrastructure may be constructed as part of the initial phase, or the project may be constructed in a single phase.

The subdivision is part of the larger Gulliksen subdivision, which has included three previous phases involving the creation of residential and commercial parcels. Most of the infrastructure for the currently proposed phase of work will connect to termination points from prior development phases.

2.6 UTILITIES

There are existing utilities including water, sewer, power, data, and storm drainage that serve the existing residences on Gulliksen Drive and Towhee Street and will be extended from their existing arrangement to serve the new subdivision. Installation of utilities includes water, sewer, gas, and power lines to service each new parcel. The sewer system will consist of new sewer mains with standard and junction manholes to new lateral connections. There will be lateral connections to existing mains as well. On the new road shoulders and lots there will be sewer easements with pressure sewer laterals underneath. The water system will have new lines, mains, fire hydrants and meters.

2.7 ROADWAY

The main access to the subdivision will be from Gulliksen Drive and Towhee Street. A new road will be installed to connect the subdivision from Towhee Street to Gulliksen Drive, this road will be called Allen Way. The road will be developed to a 32-foot width, 5-foot sidewalk, 5-foot of open space within the right of way for future sidewalk. The development in the central area of these three streets will include three cul-de-sacs at the end of Gulliksen Drive, Towhee Street, and Allen Way. An additional 20-foot gravel road will be provided from Towhee Street to Gulliksen Drive for emergency access by the fire-department and other emergency providers. A compliant number of parking spaces will be provided within driveways and garages with additional parking within parking lanes of new and existing roadways. Parking will be on one side of the road and the other side will have no parking signs.

2.8 DRAINAGE

A storm drain system will be installed that will route stormwater via surface and subsurface structures. There are two existing anthropogenic drainage ponds at the site that are in series with vegetation around them and they drain naturally via topography to the City of Fortuna inlet located along Rohnerville Road. These ponds currently receive drainage from previous phases of this subdivision. These ponds are currently outfitted with existing piping that will be upgraded as part of the project to ensure that site runoff and stormwater design criteria are met. There is a rocked drainage swale that is connected to the second pond. There will be a culvert placed underneath to connect the extending roads for drainage to go to both sides. The site will be developed for a stormwater retention basin using the existing pond and flow path. Pond 1 is identified approximately 325 feet north-northwest of the terminus of Gulliksen Drive and Pond 2 is approximately 180 feet west-northwest of Pond 1. Although man-made, both ponds have areas that have been recently mapped as wetlands largely due to the fact that through previous land uses, they have been made to retain water. In developing the project no major grading or vegetation removal is proposed within the pond area, outside of the establishment or modification of new inlet/outlet structure that route stormwater throughout the site. Standard City setbacks of 50-feet will be applied around the mapped wetland areas.

The current surface drainage generally flows southeast to northwest through the existing site, drainage improvements with high ridges along the borders of the site. An existing pond on APN 202-093-060 overflows and runs in the Northwest direction off site and surface flows to a drainage inlet located on Rohnerville Road. Strongs Creek runs along the Northern line of the development but is over 700 feet from the extents of the Gulliksen Subdivision development footprint and is physically separated by the northern high ridge.

The majority of storm water runoff from the subdivision will be routed through a new storm drainage subsurface system that will make use of existing retention ponds with a metered outflow connected to the existing natural drainage course that ends on a drainage inlet on Rohnerville Road west of the development. The basin and flow concentration point will be in a new drainage easement located in the northwest area of development on parcel APN: 202-041-005.

Drainage for the project will adhere to requirements defined by the Municipal Separate Storm Sewer System (MS4) permit effective in the project area. Design of stormwater routing and both wetlands maintain a water stage height, retention will be in conformance with Humboldt County Low Impact Development (LID) Manual requirements. Additionally, the drainage system will be designed to conform with the City of Fortuna design standards, which includes no increased runoff from the site during the 25-year, 24-hour design storm. The use of the areas is to retain and infiltrate drainage water which will be utilized in open space areas associated with the development.

2.9 RESIDENTIAL

The purpose of this proposed project is to extend roads and utility services for the future development of a 29-unit subdivision that will house single-family residents in Fortuna. The residences will be developed by the future home owners that will need to obtain building permits for construction from the City. Each unit will have access to the roads. The proposed development site plan sheets are included as attachments at the end of this document (Attachment A).

2.10 SURROUNDING LAND USE

The parcel is surrounded by existing streets and single-family residences to the south, open and forested land to the north, east, and west, open land and a few single-family residences to the west and east.

3 PUBLIC AGENCIES REQUIRING APPROVAL

The City of Fortuna Planning Commission and City Council are the approving bodies for the planned development subdivision. The City of Fortuna Public Works, Engineering, and Community Development Departments will approve the public utility infrastructure plans. The City of Fortuna Building Division will permit the construction of the residential units. The City of Fortuna Volunteer Fire Department will also review and approve of project components during the subdivision phase of work. Work within the mapped wetland areas to modify the inlet and outlet structures of the existing stormwater ponds may require regulatory approvals from the Water Board, Army Corp of Engineers, or California Department of Fish and Wildlife. These agencies will be consulted to determine if any permits are necessary to complete the project.



Figure 1: Wendt Improvement Plan Location



Figure 2: Wendt Improvement Plan Aerial Photo

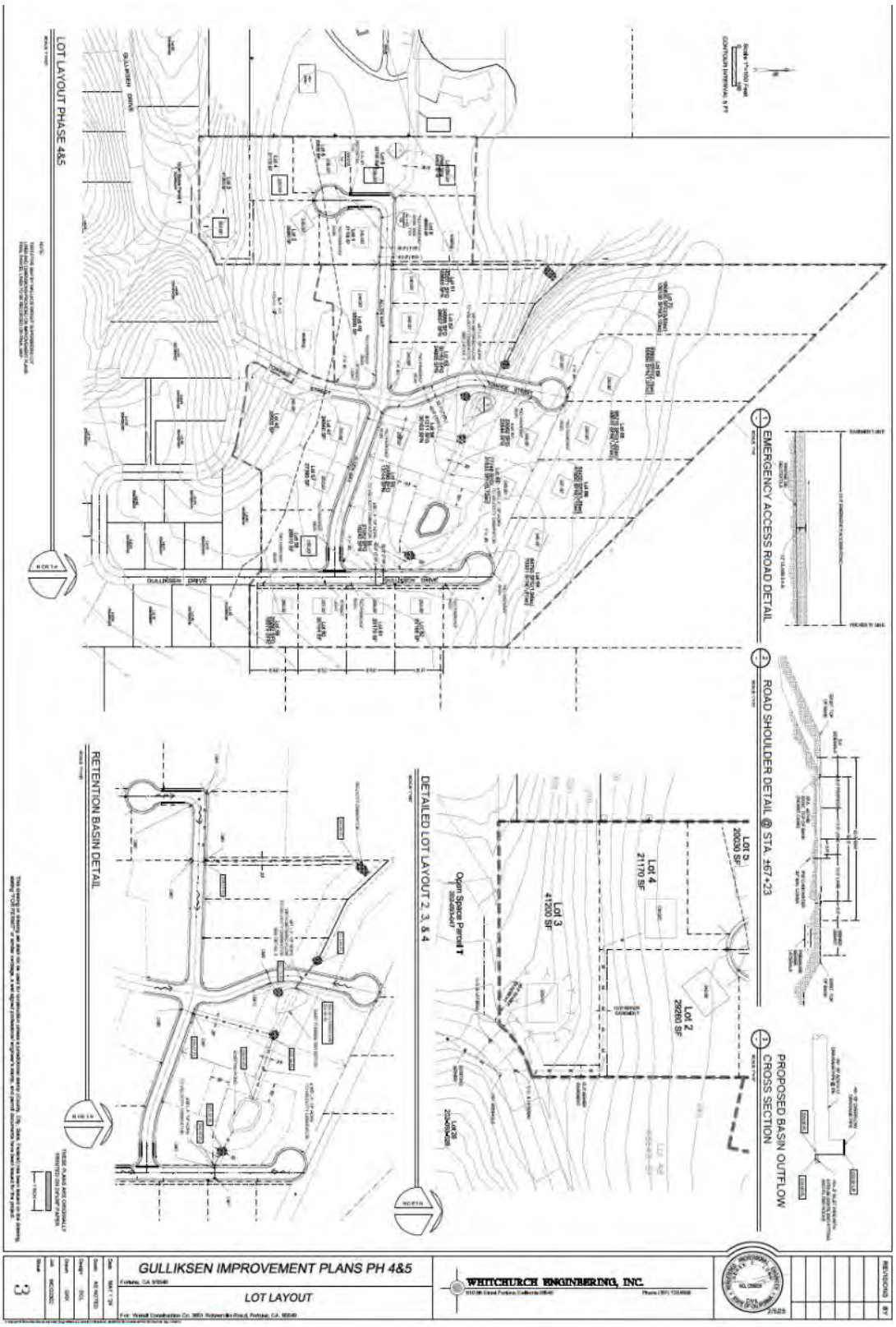


Figure 3: Wendt Improvement Plan Tentative Map, Sheet 1.

4 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors marked below have been determined to have a possible effect experienced due to the implementation of this project. Factors that involve at least one impact determined to be a "Potentially Significant Impact" include:

☐ Aesthetics	☐ Agriculture and Forest Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology/Soils	☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials
☐ Hydrology/Water Quality	☐ Land Use/Planning	☐ Mineral Resources
☐ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

A detailed explanation of all responses follows in Section 4 of this report. All answers consider the whole action involved, including off-site as well as on-site; cumulative as well as project-level; indirect as well as direct; and construction as well as operational impacts. The explanation of each issue identifies: (a) the significance criteria or threshold, if any, used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to a less than significant level.

4.1 DETERMINATION

(To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared
☐	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Director of Community Development

Date

4.2 EVALUATION OF ENVIRONMENTAL IMPACTS

A detailed explanation of all responses follows in Section 10 of this report. All answers take into account the whole action involved, including off-site as well as on-site; cumulative as well as project-level; indirect as well as direct; and construction as well as operational impacts. The explanation of each issue identifies: (a) the significance criteria or threshold, if any, used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to a less than significant level.

In the checklist the following definitions are used:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2) All answers must take account of the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.
4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).
5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
    a) Earlier Analysis Used. Identify and state where they are available for review.

b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
c) Mitigation Measures. For effects that are "Less Than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
9) The analysis of each issue should identify:
    a) the significance criteria or threshold used to evaluate each question; and
    b) the mitigation measure identified, if any, to reduce the impact to less than significant

4.3 AESTHETICS

Table 1: Aesthetic Impact Evaluation

I. AESTHETICS. *Except as provided in Public Resources Code Section 21099, would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

4.3.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant effect on aesthetic resources if it would have a substantial adverse effect on a scenic vista; substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway; in non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings and if the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

4.3.2 DISCUSSION

Views within the project site include the residential area looking south and west, open and forested land facing north, and residential houses and open land looking east (however dense vegetation will limit the residential houses from viewing the land). Thus, the viewshed consists of mostly rural areas.

a) Adverse Effect on a Scenic Vista – Less Than Significant Impact

The project area is substantially surrounded by suburban development including single family residential neighborhoods and rural area. The project area may be temporarily altered by equipment, construction materials, and workers during active construction. The changes to these views will be minor, temporary, and will generally be visible only to the public in the immediate vicinity of the active portion of construction.

Post construction, the new residences will be surrounding Gulliksen Drive, Towhee Street, and Allen Way including the streets extensions and new road being built. Upon completion of the project, there will not be any substantial discernible alterations to the visual nature of the area

as native landscape plantings and trees are part of the project development and most adjacent properties are also developed to typical urban or suburban densities. The zoning of the site is Residential Estates (RE 20 and RE 43). The proposed development is suitable for this zoning, and single-family residences are not considered to be a visual nuisance, thus resulting in a less than significant impact.

b) Damage Scenic Resources within a State Scenic Highway – No Impact

Based on California Scenic Highway Mapping System information, no designated state scenic highways are found adjacent to or within view of the project site (California Department of Transportation, 2015). There are no officially designated State Scenic Highways within Humboldt County, although Highway 101 has been identified by the State Scenic Highway Mapping System as eligible for state listing for its entire length in Humboldt County. The project site is not visible from Highway 101, resulting in no impact.

c) Degrade Existing Visual Character and Conflict with Applicable Zoning– Less than Significant Impact

Construction activities associated with the project will result in minor temporary aesthetic impacts that will not substantially alter/degrade the existing visual character of the project area. Site work will include installation of a roadway, road extensions, emergency access road, driveways, parking, and sidewalks. The project will not substantially degrade the existing visual character, or the visual quality of the project site and its surroundings. The riparian areas surrounding both Jameson and Strongs Creek will be substantially unaltered. Therefore, the project will not substantially alter the existing visual character of the project site or its surroundings. The impact is less than significant.

d) New Source of Light or Glare – Less than Significant Impact

Construction of the project will occur during daylight hours and will not produce a noticeable amount of light or glare. For public safety reasons, street lights will be installed in the roadways or sidewalks. Street lighting will consist of low-pressure sodium lighting on light standards pursuant to City policy.

The City of Fortuna General Plan policy requires that all new development provide on-sight lighting to be shielded and downward facing to limit night sky illumination and to prevent direct views of lighting elements from neighboring streets and properties. The impact is less than significant.

4.3.3 MITIGATION MEASURES

No mitigation required.

4.3.4 FINDINGS

The Proposed Project will not have a substantial adverse effect on scenic resources or visual character. For the reasons stated above, the project will have Less than Significant Effect.

4.4 AGRICULTURE AND FOREST RESOURCES

Table 2: Agriculture and Forest Resources Impact Evaluation

II. AGRICULTURE AND FOREST RESOURCES. *In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional mode; to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information complied by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g), timberland (as defined by PRC section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forestland to non-forest use?	☐	☐	☐	☒

4.4.1 THRESHOLDS OF SIGNIFICANCE

Agriculture and Forestry Resources would be significantly affected by the proposed project if the project were to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (hereafter "farmland"), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program (FMMP) of the California Resources Agency, to non-agricultural uses. Significant impacts to Agricultural and Forestry Resources would also occur if the project conflicted with existing zoning for agricultural use or a Williamson Act contract; conflicted with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g), timberland (as defined by PRC section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)); result in the loss of forest land or conversion of forest land to non-forest use; or involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forestland to non-forest use.

4.4.2 DISCUSSION

The California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) identifies and tracks Important Farmland throughout much of California for regional planning purposes. However, Humboldt County is not currently mapped under the FMMP program and, therefore, the project site does not have an FMMP Important Farmland designation. FMMP data are intended for broad planning purposes and are not designed for parcel-specific land use determinations or development entitlement decisions.

Although the site is not designated as Important Farmland by FMMP, local planning documents identify the property as containing soils with agricultural potential. The City of Fortuna General Plan Update Draft Program Environmental Impact Report (DPEIR) and Humboldt County WebGIS mapping indicate that portions of the project site contain soils classified as Prime Farmland based on Storie Index ratings and soil characteristics. These classifications reflect soil suitability for agricultural production but do not establish land use designations or determine allowable development of the property.

The project site is designated Residential Very Low (RVL) in the City of Fortuna General Plan and zoned Residential Estates (RE-20 and RE-43). Through the City's adopted land use planning process, the property has been designated and zoned for low-density residential development. The proposed subdivision is consistent with the permitted residential uses, density range, and development standards established by the General Plan and Zoning Ordinance. While the presence of soils with agricultural capability is a relevant consideration, soil suitability alone does not determine the land use of a property. Rather, future development is guided by the City's adopted land use policies, zoning regulations, infrastructure planning, environmental constraints, and subdivision standards.

Accordingly, the project represents development that is consistent with the City's long-range planning framework for residential growth. The proposed subdivision would implement the existing Residential Very Low General Plan designation and Residential Estates zoning and would not conflict with adopted local land use plans governing the future use of the site

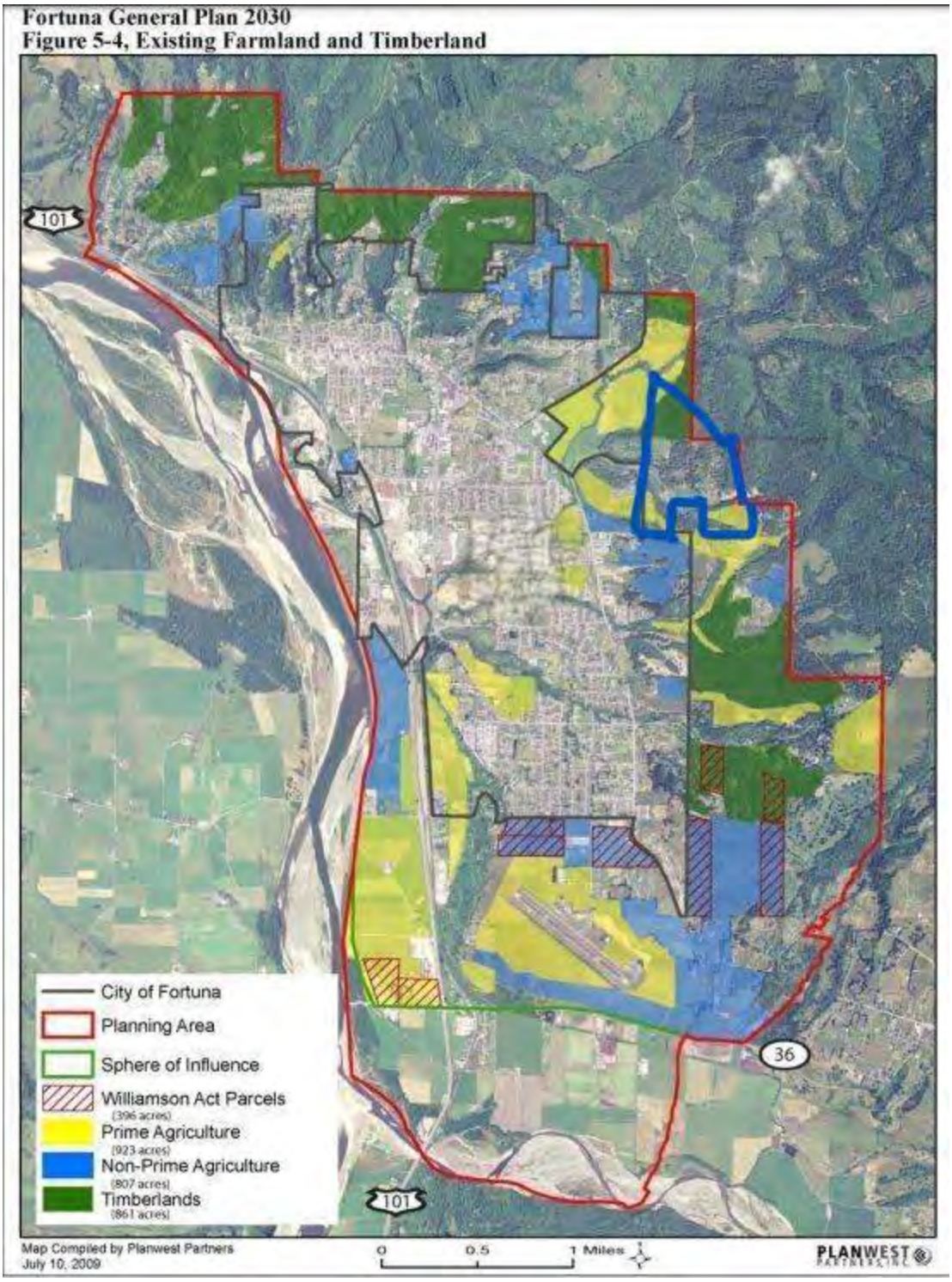


Figure 4: Map of Agriculture and Timberland in Fortuna, CA. Site is Marked with Blue Outline.

a) Convert Farmland – Less Than Significant Impact

Although the project would convert locally identified prime farmland to residential use, the impact would be less than significant because the project site is designated Residential Very Low (RVL) in the City's General Plan and zoned Residential Estates (RE-20 and RE-43) for low-density residential development. The proposed subdivision is consistent with the City's adopted land use designations, Housing Element, zoning regulations, and long-range planning framework for residential growth

Because Humboldt County is not mapped by the California Department of Conservation Farmland Mapping and Monitoring Program (FMMP), the project site is not shown on FMMP maps as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. FMMP mapping is prepared for broad regional planning purposes and is not intended for parcel-specific land use determinations.

While the project site is not designated as Important Farmland by the FMMP, local planning documents, including the City's General Plan Update DPEIR and Humboldt County WebGIS mapping, identify portions of the site as containing soils with prime agricultural characteristics based on Storie Index ratings and soil suitability. Figure 4, "Map of Agriculture and Timberland in Fortuna, CA," illustrates the location of agricultural and timberland resources within the City and identifies the project site's relationship to locally mapped agricultural lands. However, soil suitability alone does not determine the appropriate land use of a property. Through the City's adopted planning process, the site has been designated and zoned for residential development, and future development is governed by applicable General Plan policies, zoning regulations, subdivision standards, infrastructure requirements, environmental constraints, and access considerations. Accordingly, the proposed subdivision implements the City's adopted land use planning framework and does not result in a significant impact related to the conversion of farmland.

4.4.2(b) Conflict with Agricultural Zoning or Williamson Act Contract-No Impact

The project site is zoned Residential Estates (RE-20 and RE-43) and is not designated for agricultural use. The site is not subject to a Williamson Act contract and is not located on land under an agricultural preserve. As the project would not conflict with existing agricultural zoning or a Williamson Act contract, no impact would occur.

4.4.2(c) Conflict with Forest Land or Timberland Zoning – No Impact

The project site is zoned Residential Estates (RE-20 and RE-43) and is not designated as forest land, timberland, or Timberland Preserve Zone (TPZ) land. The site is located within an area planned and zoned for low-density residential development under the City's General Plan and Zoning Ordinance. The project would not conflict with existing forest land or timberland zoning and would not interfere with the management of forest resources. Therefore, no impact would occur.

4.4.2(d) Loss or Conversion of Forest Land – No Impact

The project site does not contain land designated as forest land, timberland, or Timberland Production Zone land, nor is it utilized for commercial timber production. While the site contains vegetation typical of undeveloped residential estate properties, the project footprint would not require the conversion of forest land or timberland to a non-forest use. No land designated or zoned for forestry purposes would be removed or converted as a result of project implementation. Therefore, the project would not result in the loss or conversion of forest land and no impact would occur.

d) Convert Forest Land or Farmland – No Impact

The subject site is majorly surrounded by properties developed by suburban uses and open fields with no adjacent forest land or intensive agricultural uses. Therefore, development of the subject site does not have the potential to cause the conversion of other farmland to non-agricultural use or conversion of forest land to non-forest use. No impact has been identified.

e) Convert Forest Land or Farmland – No Impact

The Project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. No impact has been identified.

4.4.3 MITIGATION MEASURES

No mitigation is required. The project site is designated and zoned for residential development, is not subject to a Williamson Act contract, and is not zoned for agricultural use, forest land, timberland, or Timberland Production. The project would not conflict with applicable agricultural or forest resource zoning and would not result in a significant impact requiring mitigation.

4.4.4 FINDINGS

The project would result in a less-than-significant impact to agricultural and forestry resources. Although the site is locally identified as prime farmland, the project site is designated Residential Very Low and zoned Residential Estates for residential development, is not subject to a Williamson Act contract, and is not zoned for agricultural use, forest land, timberland, or Timberland Production. The proposed subdivision is consistent with the City's adopted General Plan, Housing Element, zoning regulations, and long-range planning framework for residential growth. No mitigation is required.

4.5 AIR QUALITY

Table 3: Air quality Impact Evaluation

III. AIR QUALITY. *Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

4.5.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant effect on Air Quality if it (a) conflicts with or obstructs implementation of the applicable air quality plan; (b) results 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; (c) exposes 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.

4.5.2 DISCUSSION

The climate in Fortuna is moderate, with the predominant weather being moist air masses moving in a westerly direction from the ocean. Average annual rainfall is approximately 40 inches with the majority falling between October and April. The Draft Environmental Impact Report for the City of Fortuna General Plan Update concludes that: “The City of Fortuna benefits from generally good airflow and quality. Its primary sources of air emissions include smoke from residential wood stoves, vehicular exhaust particulates, and dust from unpaved roads.”

The Proposed Project is located within the North Coast Air Basin (NCAB) and is subject to North Coast Unified Air Quality Management District (NCUAQMD) requirements. The NCUAQMD is responsible for monitoring and enforcing local, state, and federal air quality standards in the County of Humboldt. Air quality standards are set for emissions that may include, but are not limited to, visible emission, particulate matter, and fugitive dust. The NCUAQMD is listed as “attainment” or “unclassified” for all the federal and state ambient air quality standards except for the state 24-hour particulate (PM10) standard in Humboldt County, which relates to concentrations of suspended airborne particles that are 10 micrometers or less in size. The entire NCAB is currently designated as “non-attainment,” or in excess of allowable limits, for

the State 24-hour PM10 standard for breathable particulate matter of 10 microns or less (PM10), and as "attainment," or within allowable limits, with respect to the balance of the criteria pollutants (http://www.ncuaqmd.org/index.php?page=aqplanning.ceqa).

a) Conflict with or Obstruct Applicable Air Quality Plan – Less Than Significant with Mitigation Incorporation

This impact is related to consistency with the applicable air quality management or attainment plan. A potentially significant impact to air quality would occur if the Project would conflict with or obstruct the implementation of the applicable air quality management or attainment plan. Although the Project would represent an incremental increase in air emissions within the proposed subdivision, of primary concern is that Project-related impacts have been properly anticipated in the regional air quality planning process and reduced whenever feasible. Therefore, it is necessary to assess the Project's consistency with the applicable district air quality management or attainment plan(s).

The Health and Safety Element of the Fortuna General Plan (October 2010) includes policies to maintain compliance with National Ambient Air Quality Standards (NAAQS) for PM10 (Policy HS-3.2 Particulate Matter); to reduce Greenhouse Gas emissions (Policy HS-3.6 Greenhouse Gas Emissions Reduction from Transportation); and require that new development incorporate air pollutant emission reduction measures during construction and operation (Policy HS-3.7 Air Pollutant Emission Reduction Construction and Operation Measures). The Health and Safety Element also include programs to work with the NCUAQMD to develop and implement an Air Quality Management Plan for controlling PM10 (Program HS-4); and to require proposed new subdivisions, PDs, and other large development projects to implement air emission reduction measures (Program HS-5).

The California Clean Air Act (CCAA) requires the NCUAQMD achieve and maintain State ambient air quality standards for PM10 by the earliest practicable date. The NCUAQMD prepared the Particulate Matter Attainment Plan, Draft Report, in May 1995 (Attainment Plan). This report includes a description of the planning area (NCUAQMD), an emissions inventory, general attainment goals, and a listing of cost-effective control strategies. The NCUAQMD's attainment plan established countywide goals to reduce PM10 emissions and eliminate the number of days in which standards are exceeded. The plan does not include Project specific related requirements. However, NCUAQMD Rule 104, Section D- Fugitive Dust Emissions is used to address non-attainment for PM10 by prohibiting specific activities and providing reasonable precautions to prevent particulate matter from becoming airborne. Under Rule 104, Section D "no person shall allow handling, transporting, or open storage of materials in such a manner which allows or may allow unnecessary amounts of particulate matter to become airborne." Rule 104, Section D provides the following reasonable precautions that shall be taken to prevent particulate matter from becoming airborne, including, but not limited to, the following provisions:

1) Covering open bodied trucks when used for transporting materials likely to give rise to airborne dust.

2) Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials. Containment methods can be employed during sandblasting and other similar operations.
3) The use of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.
4) The application of asphalt, oil, water or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which can give rise to airborne dusts.
5) The paving of roadways and their maintenance in a clean condition.
6) The prompt removal of earth or other track out material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means.

The project will generate a minor number of particulate emissions over the duration of construction in the form of dust, and vehicle and equipment emissions because of earthwork, trenching, clearing, grading, and other construction activities. The amount of fugitive dust generation would be variable and dependent on the disturbed area, amount of construction activity, soil, and meteorological conditions. Fugitive dust emissions generated during construction of the Project would be mitigated to less than significant with the incorporation of Mitigation **Measure AQ-1**, which is incorporated to comply with NCUAQMD Rule 14, Section D. To reduce potential impacts to air quality, the City of Fortuna General Plan includes construction emission reduction measures that are required for development projects. Those are incorporated into the project. While the NCAB is in non-attainment for PM10, the temporary nature of construction activities combined with project implementation of standard dust and CO_2 emission reduction actions during construction will avoid significant impacts.

Operation of the Project would not include the handling, transporting, or open storage of materials in which particulate matter may become airborne. Therefore, the operation would not conflict with NCUAQMD's Rule 104, Section D and there would be no impact due to operation.

In the long term, the project will not substantially add to the level of PM10 or other emissions such that it will cause a cumulatively considerable net increase of pollutant emissions in the area. With implementation of Best Management Practices (BMPs) and the City's Construction Emission Reduction Measures, which are incorporated into the project, the project will not obstruct implementation of the NCUAQMD particulate matter attainment plan. The project will also be consistent with applicable General Plan policies related to air resources and a less than significant impact will occur with **Mitigation Measure AQ-1** incorporated.

b) Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Region is in Non-Attainment – Less Than Significant with Mitigation Incorporation

As described above, the NCAB is in non-attainment for the criteria air pollutant PM10; however, as discussed above, with incorporation of construction emission reduction measures that are required for development projects (Environmental Protection Action 1) in the City of Fortuna, project construction will cause only minor and short-term production of PM10 and will not

significantly increase the background levels. Project operation will result in negligible additional PM10 emissions; therefore, the project will result in a less than significant cumulative impact to air quality from criteria air pollutant and precursor emissions.

Construction: The Project would generate short term PM 10 emissions from construction activities which include clearing and grubbing, grading, excavating, asphalt paving, building construction, landscaping, and vehicle traffic.

The NCUAQMD has advised that, generally, an activity that individually complies with the state and local standards for air quality emissions would not result in a cumulatively considerable increase in the countywide PM10 air quality violation. Potential particulate matter could be generated during construction activities and build-out of the site, however, in general, construction activities that last for less than one year, and use standard quantities and types of construction equipment, are not required to be quantified, and are assumed to have a less than significant impact. In addition, the Project design incorporates control measures identified in the PM10 appropriate to this type of Project to reduce fugitive emissions. These measures are included in **Mitigation Measure AQ-1**.

The NCUAQMD and the City have not adopted thresholds of significance for construction generated PM10. However, the Bay Area Quality Management District (BAAQMD) has established thresholds that can be used for significance determinations. The BAAQMD bases the determination of significance for fugitive dust on a consideration of the control measures to be implemented. If all appropriate emissions control measures recommended by BAAQMD are implemented for a Project, then fugitive dust emissions during construction are not considered significant. BAAQMD recommends a specific set of Basic Construction Measures to reduce emissions of construction-generated PM10 to less than significant. The BAAQMD Basic Construction Measures are consistent with NCUAQMD Rule 104, Section D, provide supplemental additional measures to control fugitive dust, and have been incorporated into **Mitigation Measure AQ-1**. Therefore, with incorporation of **Mitigation Measure AQ-1**, the construction related Project impacts would be less than significant.

As discussed above, the NCUAQMD and the City do not have significance criteria to determine impacts that may result from a Project; however, the NCUAQMD has indicated that it is appropriate for lead agencies to compare proposed construction emissions that last more than one year to its stationary source significance thresholds which are provided in Table 4 and Table 5 below. If the Project's construction emissions are below these thresholds, the Project's impacts are less than significant.

The California Emission Estimator Model (CalEEMod®) Version 2020.4.0 was used to estimate emissions from Project related construction activities (Attachment I). Most of the construction activities involving clearing and grubbing, grading, excavating, utility installation and concrete and asphalt placing activities would occur over a 10- to 14- week period. For estimation purposes, and to be conservative, it was assumed that construction would occur begin in the Spring of2027 for a 12-month duration. Two different types of residential estates were used to perform an analysis for the proposed subdivision of Residential Estates: 43,560 square feet (sq.

ft.) for RE-43 and 20,000 sq. ft. for RE-20. These Residential Estates were chosen as the most consistent to the proposed Project. Information for the CalEEMod Analysis was derived from applicant information and correspondence, and default parameters were used where appropriate (e.g., construction equipment list). The estimated emissions along with the NCUAQMD significance thresholds are summarized in Table 4 and Table 5 . As shown in the table, all construction-related emissions are less than the significance thresholds and therefore, the Project's operational emissions are considered to have a less than significant impact rating.

Table 4: Construction Pollutant Emissions in 2025

Pollutant	Project Emissions-Unmitigated		Significance Thresholds		Exceeds Threshold?
	Tons/year	Lbs./day	Tons/year	Lbs./day	
ROG	0.1584	0.8679	40	50	No
NO_x	1.4389	7.8843	40	50	No
CO	1.4635	8.0194	100	500	No
SO_2	0.0026	0.0143	40	80	No
PM_{10}	0.6747	3.6972	15	80	No
$PM_{2.5}$	0.3448	1.8891	10	50	No

Table 5: Construction Pollutant Emissions in 2026

Pollutant	Project Emissions-Unmitigated		Significance Thresholds		Exceeds Threshold?
	Tons/year	Lbs./day	Tons/year	Lbs./day	
ROG	0.0214	0.1172	40	50	No
NO_x	0.1854	1.0157	40	50	No
CO	0.1936	1.0607	100	500	No
SO_2	0.0004	0.0023	40	80	No
PM_{10}	0.0709	0.3887	15	80	No
$PM_{2.5}$	0.0320	0.1753	10	50	No

Operation: During operation of the Project, the primary activities that would generate pollutant emissions would be daily vehicle traffic and the use of a back-up fuel-powered generator during

power outages. Although the use of the generator would be infrequent, generator use was considered as part of the operational impact analysis. Since the Project would result in an increase in operational trips during construction (employees and delivery trucks), operational analysis includes emissions from these mobile sources. Project Operational emissions were estimated using CalEEMod. Daily trips were obtained from referencing the Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR 2018) and Vehicle Miles Traveled (VMT) model with hand calculations/assumptions. The subdivision is expected to generate an average of 320 trips per day. The estimated emissions along with the NCUAQMD significance thresholds are summarized in Table 6. As shown in the table, all operational-related emissions are less than the significance thresholds and therefore, the Project's operational emissions are considered to have a less than significant impact rating.

The Project impacts are less than significant with **Mitigation Measure AQ-1** incorporated.

Table 6: Operational Pollutant Emissions

Pollutant	Project Emissions-Unmitigated		Significance Thresholds		Exceeds Threshold?
	Tons/year	Lbs./day	Tons/year	Lbs./day	
ROG	2.6105	14.304	40	50	No
NO_x	0.1636	0.8964	40	50	No
CO	3.2849	17.999	100	500	No
SO_2	0.0050	0.0273	40	80	No
PM_{10}	0.3485	1.9097	15	80	No
$PM_{2.5}$	0.3453	1.8921	10	50	No

c) Expose Sensitive Receptors to Substantial Pollutant Concentrations – Less Than Significant Impact

Construction of the project will create temporary emissions of toxic air contaminants, primarily as a component of diesel emissions. Due to the variable nature of construction activity, the generation of toxic air contaminant emissions in most cases will be temporary, particularly considering the short amount of time such equipment is typically within an influential distance of sensitive receptors. Sensitive receptors in the project area include residences, churches, schools, a hospital, and areas adjacent to roadways where the general public will have access. Concentrations of mobile-source diesel PM emissions are typically reduced by 70 percent at approximately 500 feet. In addition, current models, and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and variable nature of construction activities associated with this project.

Construction will occur Monday through Saturday between the hours of 8:00 a.m. and 6:00 p.m. Construction outside of these hours including Sundays and holidays will require prior City approval. As discussed above, the project will result in only minor, short-term construction-related air emissions. Additionally, the implementation of the City's construction emission reduction measures that are required for development projects (Environmental Protection Action 1), will keep diesel PM10 exhaust emissions at lower levels. As these emissions are temporary in nature, health risks from project construction are not anticipated. Construction impacts are less than significant.

Project operation will not expose sensitive receptors to substantial pollutant concentrations as the project does not include any significant stationary source emissions, as the project components are those typical for a subdivision. Source emissions will be constrained to resident vehicles, and intermittent gardening equipment. Therefore, operational impacts will be less than significant.

d) Result in Other Emissions Affecting a Substantial Number of People – Less Than Significant Impact

During construction the various diesel-powered vehicles and equipment could create localized odors. Additionally, some materials used in construction or substrates encountered in sub-surface construction may create objectionable localized odors. These odors will be temporary and not likely to be noticeable for extended periods of time beyond the construction zone due to atmospheric dissipation. The impact will be less than significant.

The project will comply with City of Fortuna new Planned Development/Subdivision and other large development projects air emission reduction measures (City of Fortuna; General Plan - HS-5, 2010) through the application of the following control measures;

1) Use watering to control dust during tree clearing activities
2) Spray exposed soils and dirt roads as needed during clearing, grading, and trenching;
3) Sweep paved streets used by earth-moving equipment at least once a day;
4) Apply soil stabilizers to areas where development or landscaping will not occur within three (3) days of grading;
5) Plant ground cover in disturbed areas immediately after grading;
6) Cover haul truck loads;
7) Use only low Volatile Organic Compounds (VOC) and low formaldehyde coatings, paints, and insulation in buildings;
8) Fit construction equipment with EPA and/or NCUAQMD-approved exhaust systems, and keep these vehicles tuned and in good working order;
9) Limit diesel-powered construction equipment idling time to 10 minutes maximum; and
10) Stage diesel-powered construction equipment as far away from residences as possible.

4.5.3 MITIGATION MEASURES

AQ-1. During construction activities the following minimum dust control measures shall be implemented:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, active graded areas, excavations, and unpaved access roads) shall be watered two times per day in areas of active construction.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph, unless the unpaved road surface has been treated for dust suppression with water, rock, wood chip mulch, or other dust prevention measures.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes. Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications.
- Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The NCUAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

4.5.4 FINDINGS

The Project will have a Less than Significant Impact on Air Quality with mitigation measures incorporated.

4.6 BIOLOGICAL RESOURCES

Table 7: Biological Resources Impact Evaluation

IV. BIOLOGICAL RESOURCES. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or NOAA Fisheries?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife 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 wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
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?	☐	☐	☒	☐

4.6.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant impact to Biological Resources if it were to (a) have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or National Oceanic and Atmospheric Administration (NOAA) Fisheries; (b) have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (FWS); (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 wildlife nursery sites; (e) conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; (f) or conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.6.2 DISCUSSION

Zoning of the site is Residential Estates (RE 20 and RE 43). The Site's surrounding land uses include residential, commercial, and rural residential development to the west (City of Fortuna proper), and a small area of residential development to the east, bordered by extensive forested land comprised of privately owned timberlands. The undeveloped Site consists of open land. The northernmost boundary of the subdivision is approximately 0.12 miles south of a small tributary to Strongs Creek, and the southernmost boundary of the subdivision is approximately 0.38 miles north of Jameson Creek. There are 2 stormwater pond/Wetlands on Site, Wetland 1 is 0.37 acres in size and Wetland 2 is 0.12 acres in size, rough location can be seen in Figure 5 below.

Wetland 1 consisted of a vegetated three-parameter wetland depression and can be classified according to the Cowardin system as a Palustrine Emergent wetland (PEM) (FGDC, 2013). It was observed to retain water, as the soils were saturated and there is a constructed earthen embankment on the downstream side; however, it did not appear hydrologically connected to a receiving waterway under typical conditions. The vegetation was characterized by only herbaceous groundcover including dotted smartweed (*Persicaria punctata*, OBL), Kentucky bluegrass *(Poa pratensis*, FAC), and creeping bentgrass (*Agrostis stolonifera*, FAC), with lesser amount of buttercup (*Ranunculus muricatus*, FACW). Wetland 1 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydrophytic vegetation.

Wetland 2 exhibits swale characteristics and consists of a vegetated three-parameter wetland and can be classified according to the Cowardin system as a Palustrine Forested wetland (FGDC, 2013). It was observed to exhibit all three parameters to be considered a wetland. Wetland 2 was observed to be surficially hydrologically connected to a receiving waterway via the drainage swale that runs through and west of Wetland 2 and eventually drains into Strongs Creek. Therefore Wetland 2 is anticipated to be jurisdictional under the US Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB).

Wetland 2 was observed for Site Conditions at Transect W2T1-W and W2T2-W, which can be seen in Figure 5 below. The eastern extent of Wetland 2 is W2T1-W and was observed within a concavity in the central portion. The vegetation at this Site was a combination of herbaceous cover, woody vines, and some small diameter trees. Herbaceous vegetation at this site was dominated by lady fern (*Athyrium felix femina var. femina*, FAC), creeping bentgrass (FAC), and creeping buttercup (*Ranunculus repens*, FAC), with a minor presence of other herbs. The woody vine stratum was dominated by California blackberry (*Rubus ursinus*, FACU). The tree layer was dominated by red alder (*Alnus rubra*, FAC). The vegetation at Transect 1 for Wetland 2 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydrophytic vegetation. The western extent of Wetland 2 is W2T2-W was observed within a

swale feature near the western edge. The vegetation at this site was a combination of herbaceous cover, shrubs, and woody vines. Herbaceous vegetation at this site was dominated by skunk cabbage (*Lysichiton americanus*, OBL), and lady fern (FAC), with lesser amounts of sword fern (*Polystichum munitum*, FACU) and stinking hedge nettle (*Stachys ajugoides*, OBL). The woody vine stratum was dominated by California blackberry (FACU). The shrub layer was dominated by thimbleberry (*Rubus parviflorus*, FAC). The vegetation at Transect 2 for Wetland 2 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydrophytic vegetation.

Upland 1 was located between Wetland 1 and Wetland 2. The site was dominated by velvet grass (*Holcus lanatus*, FAC) and rush (*Juncus patens*, FACW), with lesser amounts of bracken fern (*Pteridium aquilinum*, FACU) and bird's foot trefoil (*Hosackia gracilis*, FACW). Vegetation at the site did pass the dominance test for hydrophytic vegetation. The soil was a dark, friable silt loam that lacked redoximorphic features.

The Strongs Creek and Jameson Creek riparian forest is dominated by red alder (*Alnus rubra*) with scattered Pacific willow (*Salix lasiandra*), Scouler's willow (*Salix scoulerii*), California bay (*Umbellularia californica*), and bigleaf maple (*Acer macrophyllum),* with an understory of salmon berry (*Rubus spectabilis*), cascara (*Rhamnus purshiana*), thimbleberry (*Rubus parviflorus*), and ground cover including colt's foot (*Petasites frigidus var. palmatus*), lady fern (*Athyrium felix-femina*), and creeping buttercup (*Ranunculus repens*).

Currently, the open space on the site provides wildlife habitat for mammals, reptiles, amphibians, and avian species. The residential development will eliminate orange, cover, nesting habitat, and habitat connectivity. The forested land at the northern portion of the subdivision or the Strongs Creek riparian area would be the most suitable habitat on site for wildlife cover and breeding bird use. No development will occur within 50 feet of the Strongs Creek bank and riparian area, and it will continue to function as a wildlife corridor and county streamside management area.

Development activities will not have a significant effect on sensitive wildlife because all development activities will take place within the existing Project Site area and outside of the streamside management area and wildlife corridor. Grading will occur outside of the 50-foot creek setback from the high flow channel and the 50-foot wetland setback. This project will have a less than significant impact to special-status species, riparian habitat, or sensitive natural community. Wetland 1 is not anticipated to be under the jurisdiction of USACE due to the absence of surface level hydrologic connectivity with a receiving waterway. Wetland 1 can be considered isolated. It may still be under the jurisdiction of the RWQCB though due to it being an artificial wetland that is not subject to ongoing maintenance. However, Wetland 2 is anticipated to be USACE and RWQCB jurisdictional due to surficial hydrologic connectivity within a receiving navigable waterway (i.e. the Eel River via Strongs Creek and the drainage swale to Strongs Creek). Additionally, the City of Fortuna General Plan requires 50-foot buffers around jurisdictional wetlands, therefore both Wetland 1 and Wetland 2 are anticipated to require a wetland buffer under City of Fortuna General Plan policies.

An Aquatic Resources Delineation Report was conducted for the subject property by GHD on September 09, 2022 and there was a revision on May 26, 2023 for APN(s): 202-093-060 and 202-041-005 (Attachment B). The Project is located outside of the Coastal Zone, and therefore only Waters of the U.S. including United States Army Corps of Engineers (USACE) three-parameter wetlands based on wetland indicative vegetation, hydric soils, and wetland hydrology, and Waters of the State (such a riparian habitat) were mapped. Two three-parameter wetlands were observed.

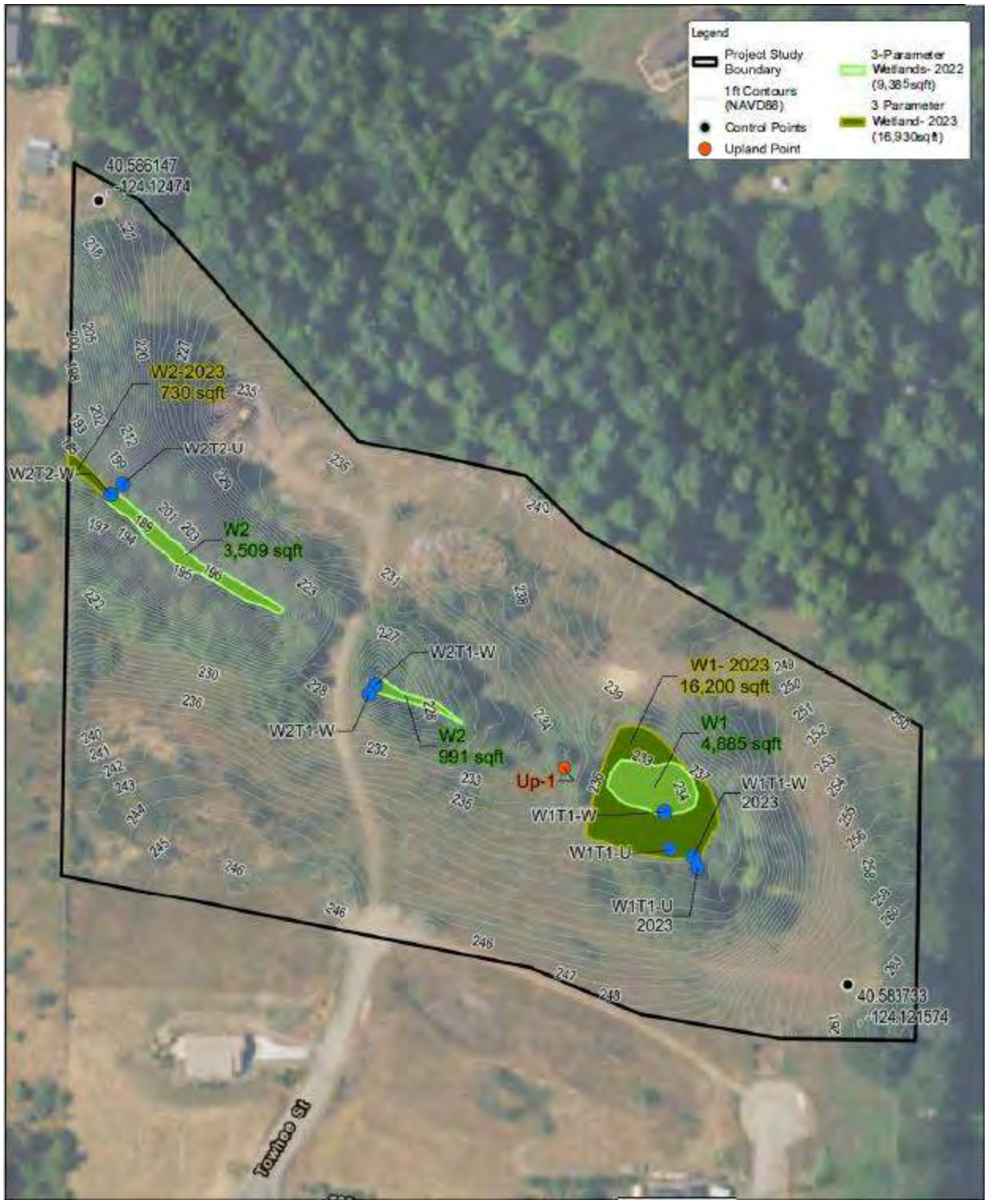


Figure 5: Map of Wetland and Transect Locations (From GHD Report).

a) Impacts to Special-Status Species, Riparian or Sensitive Natural Community – Less Than Significant Impact with Mitigation Incorporation

The project will be constructed in the vicinity of Strongs and Jameson Creeks, but development will not encroach on the 50-foot streamside management area. Wetlands are recommended in the Fortuna General Plan to have a 50-foot setback; however, the Fortuna General Plan Policy NCR-15 allows for a reduced setback up to 25 feet when a biological report indicates that such wetland buffer areas are not required. Site review by GHD indicates that the wetland setback will be 50-feet for the two jurisdictional wetlands.

The Aquatic Resources Delineation Report by GHD describes the features at both wetlands. One of these features (Wetland 1) appeared to be isolated (i.e. not surficial hydrologically connected to a receiving waterway) and is therefore not anticipated to be under the jurisdiction of the US Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB). Wetland 2 appeared to be hydrologically connected to a receiving navigable waterway via a drainage swale to the west of the subdivision (which drains to Strongs Creek and thus the Eel River), and is therefore anticipated to be under the jurisdiction of the USACE and RWQCB. No riparian habitat was observed.

Vegetation at the sites has been altered and modified by past land use and development. These activities have altered the environmental conditions at the sites so that common, non-native plant species dominate the sites. The ongoing disturbed nature of the sites and regular impacts from human intrusion are factors that likely contribute to the absence of rare plants or their ability to colonize the site over time, except for species that can tolerate a high disturbance regime. Through the USACE wetland delineation process, database information concluded that there are no previously known rare plant populations within the project parcels.

Given the above information and that no special status plant species were observed during the GHD wetland delineation, the proposed project is not anticipated to directly or indirectly impact any listed or special status plant species; thus, anticipated impacts are less than significant with mitigation incorporated.

b) Interfere with Movement of Fish or Wildlife Species – Less Than Significant Impact

Development activities will not have a significant effect on fish or wildlife because all development activities will take place within the existing disturbed open field area and outside of the streamside management areas. Grading will occur outside of the 50-foot creek setback from the high flow. The Contractor shall maintain Wetland Buffer Areas of at least 50 feet around jurisdictional wetlands and this is a City requirement. This project will have a less than significant impact to special-status species, riparian habitat, or sensitive natural community. Implementation of the project will not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors. Less than significant impact will occur.

c) Effect on Wetlands – Less Than Significant Impact with Mitigation Incorporation

The GHD Aquatic Resources Delineation Report on September 09, 2022 revealed that both wetlands on site could be potential jurisdictional wetlands. Wetland 1 did not appear to contain a surface-level hydrologic connection with a receiving navigable waterway, and is therefore considered isolated and likely non-jurisdictional under the USACE. Wetland 1 may be jurisdictional by the RWQCB under water of the state definition 3c. Wetland 2 appeared to be hydrologically connected to a receiving waterway (navigable water [i.e. the Eel River via Strongs Creek]) via a drainage swale, located west of the subdivision. Both wetlands should have the 50-foot buffer given their potential jurisdictional status (Attachment B).

The revision of the report on May 26, 2023 stated that Wetland 1 was not observed to be surficial hydrologically connected to a receiving navigable waterway, and therefore is not anticipated to be USACE- or RWQCB-jurisdictional. Wetland 2 was observed to be surficial hydrologically connected to a receiving waterway via the drainage swale that runs through and west of Wetland 2 and eventually drains into Strongs Creek. Therefore Wetland 2 is anticipated to be jurisdictional under the USACE and RWQCB (Attachment B).

Every unit will be at least 50 feet from the riparian zone as to not disrupt the surrounding environment. Jurisdictional wetlands are recommended to have a 50-foot setback for any development. The setback will be 50 feet around the wetland areas without impact to the wetlands. Resulting in a less than significant impact with mitigation incorporated.

d) Interfere with Movement of Fish or Wildlife Species, Migratory Wildlife Corridors or Native Wildlife Nursery Sites –Less Than Significant Impact with Mitigation Incorporation

This project is not anticipated to impede the use of native wildlife nursery sites. However, suitable Strongs Creek and Jameson Creek riparian habitat exists on site for wildlife cover and breeding bird use. Development will not occur within the 50-foot riparian buffer and will not occur during the breeding season before a nesting survey is completed (BR-3 Mitigation). No work will be performed within Strongs or Jameson Creek or associated streamside management areas, therefore potential migratory fish within the channel will not be affected.

The Fortuna General Plan includes Policy NCR-2.1 (Riparian Corridor Protection), to address fish and terrestrial wildlife habitat protection, enhancement, and movement along riparian corridors. The Strongs and Jameson creeks riparian area will remain as a buffer. No other development will occur within 50 feet of the riparian corridor.

This project will have a less than significant effect on the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors. With the incorporation of BR-3 Mitigation, this project will have a less than significant effect on native wildlife nursery sites.

e) Conflict with Local ordinances or policies Protecting Resources – Less Than Significant Impact

The City of Fortuna does not have an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved conservation plan within which the project will conflict.

Furthermore, according to the Fortuna General Plan Background Report (City of Fortuna 2007), the Fortuna General Plan Planning Area (which encompasses both incorporated territory and unincorporated areas that may directly or indirectly affect the City's future development) is not subject to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Less than significant impact will occur.

f) Conflict with the Provisions of an Adopted Habitat Conservation Plan – Less Than Significant Impact

According to the U.S. Fish & Wildlife Service Environmental Conservation Online System (ECOS), the Project Site is not located within the boundaries of a Habitat Conservation Plan. Habitat Conservation Plans (HCP) in Humboldt County include the following: 1) Green Diamond Resource Company California Timberlands & Northern Spotted Owl (formerly Simpson Timber Company); 2) Humboldt Redwood Company (formerly Pacific Lumber, Headwaters); 3) Regli Estates; and 4) Humboldt Bay Municipal Water District Habitat Conservation Plan. These Habitat Conservation Plans primarily apply to forest lands in the County. According to the CDFW website, the Project Site is not located in the boundaries of a Natural Community Conservation Plan (CDFW, 2023). The conservation plan for Humboldt County, listed on the California Regional Conservation Plans Map on the CDFW website, includes the Green Diamond and Humboldt Redwoods Company (previously Pacific Lumber Company) Habitat Conservation Plans.

There are no adopted Habitat Conservation, Community Conservation, or approval local, regional, or state habitat conservation plans that apply to the Project. Less than significant impact would result.

4.6.3 MITIGATION MEASURES

BR-1: Compliance with Army Corps Nationwide Permit.

Timing for Implementation/Compliance: City plan review of improvement plans and building permit plans.

Person/Agency Responsible for Monitoring: City Community Development and Engineering Departments.

Monitoring Frequency: Plan review and pre-construction site review.

Evidence of Compliance: Final development plans depict creek banks and wetland areas, and identify the appropriate 50-foot setbacks from Strongs and Jameson Creeks, as well as 50-foot setbacks from identified wetlands.

BR-2: Maintain the 50-ft setback from Strongs and Jameson Creeks' top of bank. Maintain a 50-ft buffer around delineated wetlands.

Timing for Implementation/Compliance: City plan review of improvement plans and building permit plans.

Person/Agency Responsible for Monitoring: City Community Development and Engineering Departments.

Monitoring Frequency: Plan review and pre-construction site review.

Evidence of Compliance: Plans depict 50-foot setback from Strongs and Jameson Creeks, and 50-foot setbacks from wetlands.

BR-3: Migratory Bird Protection

There are potential direct impacts to migratory bird species if construction or vegetation removal occurs during the breeding season (March 1- August 15). Therefore, preconstruction nesting surveys will be performed if construction will occur during that time to mitigate these potential impacts.

If breeding birds are found in the vicinity, construction will be delayed until after the breeding season or proper setbacks should be established in cooperation with the California Department of Fish and Wildlife prior to proceeding with construction.

Timing for Implementation/Compliance: March - August

Person/Agency Responsible for Monitoring: Owner

Monitoring Frequency: Once, pre-construction and at any point construction is delayed for more than seven days.

Evidence of Compliance: Visual inspection and written verification that no breeding birds are present.

4.6.4 FINDINGS

The Project will have Less than Significant Effect on Biological Resources with Mitigation Incorporation.

4.7 CULTURAL RESOURCES

Table 8: Cultural Resources Impact Evaluation

V. CULTURAL RESOURCES. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of a historical resource pursuant to 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 dedicated cemeteries?	☐	☐	☒	☐

4.7.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant effect on Cultural Resources if it would (a) cause a substantial adverse change in the significance of a historical resource pursuant to in 15064.5;

(b) cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5; or (c) disturb any human remains, including those interred outside of formal cemeteries.

4.7.2 DISCUSSION:

In November 2025, Archaeological Research and Supply Company (ARSC) compiled a report for the three parcels that comprise the project site. The study included records research, tribal coordination, and intensive field survey. ARSC reported that no significant historic or prehistoric cultural resources were identified within the project area. One isolated piece of chert debitage was observed and recorded. The records search identified four previous surveys and one previously recorded resource within one-half mile of the property; that resource is outside the current Are of Potential Effect (APE) and was determined to be unaffected be project activities. The report also documents coordination with the Bear River Band of the Rohnerville Rancheria and the Wiyot Tribe; neither identified a known archaeological or cultural site on the subject property, and both recommended proceeding with the survey because of the sensitivity of the area.

a) Historical Resources – Less Than Significant Impact

ARSC concluded that the project would not affect significant historic resources and identified no significant historic-era resources within the project area. Therefore, the project is not expected to cause a substantial adverse change in the significance of a historical resource.

b) Archaeological Resources – Less Than Significant Impact with Mitigation Incorporation

The field survey identified no significant prehistoric archaeological resources. The isolated chert flake was recorded, and ARSC concluded that the available information from the isolate had been documented. Although no significant deposit was identified, the report notes that buried archaeological resources could be encountered during ground-disturbing activities. Implementation of mitigation measures would reduce potential impacts associated with an inadvertent discovery to a less than significant level.

c) Human Remains – Less Than Significant Impact with Mitigation Incorporation

No human remains were identified during the investigation. Nonetheless, ground-disturbing activities could inadvertently encounter human remains. Mitigation measures establish stop-work and notification procedures.

4.7.3 MITIGATION MEASURES

ARSC recommends no further archaeological study for the project; however, the report states that there remains a potential for buried archaeological deposits to be encountered during ground-disturbing activities. The following inadvertent discovery protocols shall be implemented:

a) Archaeological Resources

If suspected archaeological or cultural resources are encountered during project construction, all work shall stop within 100 feet of the discovery. A qualified professional archaeologist and

appropriate tribal representative(s), including representatives of the Bear River Band of the Rohnerville Rancheria and the Wiyot Tribe, shall be contacted to evaluate the find and recommend appropriate next steps. Work within the stop-work area shall not resume until the discovery has been evaluated and the City has authorized work to proceed based on the recommendations of the qualified professional and applicable tribal representatives.

b) Human Remains

If human remains are encountered, work in the vicinity shall stop immediately and the permitting agency shall contact the Humboldt County Coroner. The Coroner will determine the appropriate course of action. If the remains are determined to be Native American, the Coroner shall contact the Native American Heritage Commission in accordance with the procedures identified in the 2025 report, and the most likely descendant process shall be followed before work resumes in the affected area.

4.7.4 FINDINGS

The Project will have Less Than Significant Impact on Cultural Resources.

4.8 ENERGY

Table 9: Energy Impact Evaluation

VI. ENERGY. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	☐	☐	☒	☐

4.8.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant effect on energy if it (a) results in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operations; or (b) conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.8.2 DISCUSSION

The project site has electricity that is currently provided by PG&E and it would continue to use the existing electrical service. Proposed electrical upgrade from PG&E to power subdivision.

The state of California Building Energy Efficiency Standards, known widely as Title 24, outline requirements for all new commercial and residential construction projects. Title 24 is part of California's wider strategy to require all new commercial construction projects to be zero net energy by 2030 (California Energy Efficiency Strategic Plan, 2011).

The 2019 California Green Building Standards Code (24 CCR, Part 11), also known as the CALGreen code, contains mandatory requirements and voluntary measures for new residential and nonresidential buildings (including buildings for hotel, retail, office, public schools, and

hospitals) throughout California (CBSC, 2019). The development of the CALGreen Code is intended to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the following construction practices: (1) planning and design; (2) energy efficiency; (3) water efficiency and conservation; (4) material conservation and resource efficiency; and (5) environmental quality (CBSC, 2019). In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

The City's General Plan 2030 includes an Energy Conservation Goal, NCR-6, to "reduce consumption and reliance upon non-renewable energy sources and promote energy conservation, energy efficiency, and the use of alternative energy sources in new and existing development."

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation—Less Than Significant Impact

During construction, the Project would result in energy usage through the use of fuel powered vehicles and equipment. The construction equipment, use of electricity, and fuel for the Project would be temporary in nature. In addition, all construction equipment would conform to applicable California Air Resources Board (CARB) emissions standards, which promote equipment fuel efficiencies. Construction contractors would be required to comply with the provisions of California Code of Regulations Title 13 Sections 2485, which prohibit diesel-fueled commercial motor vehicles and off-road diesel vehicles from idling for more than five minutes and would minimize unnecessary fuel consumption. Gasoline and diesel fuel would be supplied by local and regional commercial vendors. It should be noted that fuel efficiencies are improving for on- and off-road vehicle engines due to more stringent government requirements. Construction energy consumption would represent a "single-event" demand and would not require ongoing or permanent commitment of energy resources. The project would also not necessitate the use of construction equipment or processes that are less energy efficient than at comparable construction sites. Thus, construction energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

During operation, the Project would use on-grid electricity from PG&E for all operations with back-up fuel-generator used only during power outage events. The Project would comply with Title 24 standards of the California Energy Code including requirements surrounding energy efficiency. The City would review and verify that the Project would be in compliance with the most current version of the Building and Energy Efficiency Standards. The Project would also be required to adhere to the CALGreen Code, which establishes planning and design standards for sustainable developments and energy efficiency. Additionally, the Project building would use electricity from PG&E, which complies California's Renewable Portfolio Standard and requires an increasing percentage of the utility's energy to come from renewable energy sources. Therefore, the Project operations would not result in wasteful, inefficient, or unnecessary consumption of energy.

No aspect of the Project would result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources. Less than significant impact.

b) Conflict with state or local plan for renewable energy or energy efficiency—Less Than Significant Impact

The Project would be required to comply with the State of California's Title 24 Building Energy Efficiency Standards. The Project was reviewed for consistency with applicable goals and policies of the City. The Project is consistent with the following energy-related policies:

- *Policy NCR-6.1: Site Design Standards:* The Project would incorporate energy-efficient construction techniques and materials and is consistent with this policy.
- *Policy NCR*-6.2: *New Development Requirements; Policy PFS-7.2. Renewable Energy:* The Project is located on an open field. Power for the Project would be sourced from PG&E, which currently sources approximately 33% of their power from renewable energy (PG&E website, 2025).
- *Policy PROS*-1.26: *Construction Materials:* The Project would utilize non-toxic materials, and low-energy requiring technologies to the greatest extent feasible, including low-flow showers, toilets, faucets, and landscaping equipment, as well as lighting and other building features. The Project would comply with Title 24 requirements and is thus consistent with this City's policy.
- *Policy PFS*-7.1 *Energy Conservation:* The Project is consistent with this policy, as it would utilize energy conservation techniques in compliance with Title 24 requirements.

The Project would not conflict with the City of Fortuna General Plan Energy Element. The Project would only use the amount of electricity required for its operations and not in a wasteful manner. A less than significant impact would occur.

4.8.3 MITIGATION MEASURES

No mitigation required.

4.8.4 FINDINGS

The project will have Less Than Significant Impact on Energy.

4.9 GEOLOGY AND SOILS

Table 10: Geology and Soils Impact Evaluation

VI. GEOLOGY AND SOILS. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) 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 the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

4.9.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant effect on geology and soils if it would (a) directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault, ii) strong seismic ground shaking, iii) seismic-related ground failure, including liquefaction, or iv) 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 the disposal of wastewater; or (f) directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

4.9.2 DISCUSSION

The City of Fortuna is located within a complex geological environment characterized by high rates of tectonic activity. The area is known for a high amount of seismicity, with more than 60 earthquakes producing discernible damage since the mid-1800s. The project area lies north of the Mendocino Triple Junction, where the North American, Pacific and Gorda plates meet. The local geologic setting of Fortuna is characterized by the Little Salmon fault and the Eel River. The City lies east of the Eel River and is built on alluvium derived from the Eel and Van Duzen rivers and from streams draining the hills east of town.

The Project Site is located within Northern California's Coast Ranges Geomorphic Province, which is a geologically active region at risk for strong ground shaking. Humboldt County is located within the two highest of five seismic risk zones specified by the Uniform Building Code. The Cascadia Subduction Zone runs north offshore of Humboldt, Del Norte, Oregon, and Washington. Landslides and soil slips are common due to the combination of sheared rocks, shallow soil profile development, steep slopes, and heavy seasonal precipitation (Humboldt County 2025 General Plan Update. Natural Resources and Hazards Report; Pg.10-9). The Project Site is situated in an active earthquake zone, as is all of Humboldt County, and is within an area of Relatively Stable Seismic Safety (Humboldt County Web GIS, 2025). Numerous potential sources of large magnitude earthquakes that could affect this Project Site include the San Andreas Fault, the Russ Fault Zone, the Garberville-Briceland Fault Zone, the Little Salmon Fault (onshore), and the Cascadia Subduction zone. Although the subject parcel is located near numerous earthquake fault zones, there are no fault zones within the Project Site, per the California Geological Survey (2010) and the Humboldt County Web GIS (2025) and the property is within an area of Relatively Stable Seismic Safety (Humboldt County Web GIS, 2025).

The Humboldt County GIS website and the EIR for the Fortuna General Plan do not identify any earthquake faults, or earthquake fault hazard zones within the project area. According to the Humboldt County GIS, the project site is relatively stable, is not within a liquefaction zone, and is not within an Alquist Priolo Fault Zone. Soil types have not been mapped by the Natural Resources Conservation Service. However, geologic maps of the region indicate the material underlying the project area and surrounding slopes is associated with the Middle to Late Pleistocene aged Hookton Formation (Kilbourne, 1985). The Hookton Formation is composed principally of non-marine gravel, sand, silt, and clay; however, some of the sediments along the western limits of this formation appear to have been deposited in shallow marine or marginal environments (Ogle, 1953). The Wildcat series of the Hookton formation are the predominate soils in the area.

a.i) Fault Rupture – Less Than Significant Impact

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults or even along different strands of the same fault. Surface rupture can damage or collapse buildings, cause severe damage to roads and pavement structures, and cause failure of overhead as well as underground utilities.

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This act prohibits the location of structures designed for human occupancy across active faults and regulates construction within fault zones. The project site is not within, but is adjacent to an Alquist–Priolo Earthquake Fault Zone (CGS 1991). The nearest active fault classified as an Alquist–Priolo Earthquake Fault Zone is the Type A Little Salmon Fault (onshore) located within 5 kilometers, within 10 kilometers of the Type B Fickle Hill Fault and Table Bluff Fault, within 30 kilometers of the Type B Mad River Fault and Little Salmon Fault (offshore), and within 40 kilometers of the Type A Cascadia Subduction Zone. Based on published mapping, the possibility of ground ruptures and/or fault creep at the project site is low.

There is no earthquake faults delineated on Alquist Priolo Fault Zone maps within the Project Area (California Geological Survey, 2010 and Humboldt County Web GIS, 2025). Since the Project Area is not traversed by a known active fault and is not within 200 feet of an active fault trace, surface fault rupture is not considered to be a significant hazard for the Project Site. Therefore, the Project would not expose people or structures to substantial adverse effects from a fault rupture and the impact would be less than significant.

a.ii) Ground Shaking – Less Than Significant Impact

All of coastal Northern California is subject to potentially strong seismic ground shaking and multiple earthquake sources capable of generating moderate to strong earthquakes are in close proximity to the project site. Strong seismic shaking is a regional hazard that could cause major damage to the project area. The extent of ground-shaking during an earthquake is controlled by the earthquake magnitude and intensity, distance to the epicenter, and the geologic conditions in the area. There is no earthquake faults delineated on Alquist Priolo Fault Zone maps within the Project Area.

Earthquakes on active faults in the region have the capacity to produce a range of ground shaking intensities in the Project Area. Ground shaking may affect areas hundreds of miles distant from an earthquake's epicenter. Ground motion during an earthquake is described by the parameters of acceleration and velocity as well as the duration of the shaking. A common measure of ground motion is peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g). Moderate earthquake hazard areas are defined as areas with ground accelerations of less than .092g and violent earthquake hazard areas have ground accelerations of 0.65g to 1.24g. The California Geological Survey, Probabilistic Seismic Hazards Mapping Ground Motion Page (California Department of

Conservation, 2020) indicates a maximum PGA on the order of 0.61g for a seismic event with a 10 percent probability of exceedance in 50 years (design basis earthquake).

The San Andreas Fault has produced major earthquakes in this area at intervals of approximately 75-150 years. Earthquakes with average magnitudes of 5.8 occur on average every 2 years at varying locations in or near Humboldt County, and geological evidence suggests that the San Andreas Fault can generate magnitudes much higher (7+). This high to very high level of risk of seismic hazard is typical for Northern California and this risk is assumed when developing in this area. Earthquakes capable of causing intense ground shaking and structural damage can be expected to occur within the design life of the proposed structure (50+ years). Developers and residents should be aware these natural hazards cannot be fully eliminated with engineered design. As required, all structural design should be in conformance with the 2022 California Building Code (CBC) Seismic Design Category (SDC) "E".

The State of California provides minimum standards for building design through the California Building Code (CBC). Where no other building codes apply, CBC Chapter 29 regulates excavation, foundations, and retaining walls. The CBC applies to building design and construction in the State and is based on the federal Uniform Building Code (UBC) used widely throughout the country. The CBC has been modified for California conditions with numerous more detailed and/or more stringent regulations. Specific minimum seismic safety and structural design requirements are set forth in CBC Chapter 16. The Code identifies seismic factors that must be considered in structural design. The structures proposed in the Project would be required to follow all requirements outlined in the CBC. Therefore, the Project would not expose people or structures to substantial adverse effects involving strong seismic ground shaking and a less than significant impact would occur.

a.iii) Liquefaction – Less Than Significant Impact

Liquefaction is the transformation of saturated, loose, fine-grained sediment to a fluid-like state because of earthquake shaking or other rapid loading. Liquefaction is known to occur in loose or moderately saturated granular soils with poor drainage.

An engineering soils report was completed for the project site by A.M. Baird Engineering and Surveying (Attachment E). The report found that "Slope instability, liquefication, and surface rupture due exclusively to faulting or lateral spreading are not considered consequential as to require specific analysis." Further, the report concluded "Dynamic seismic loading for retaining walls if required shall be based upon peak ground acceleration for design purposes with a value of SS/2.5 using ASCE 7-22, unless additional site-specific analysis or alternate method is employed per code and shown for design." The impact is less than significant.

a.iv) Landslides – Less Than Significant Impact

Landslides are gravity-driven downslope movements of earth materials, typically triggered by earthquakes, or elevated pore pressures, resulting from peak rainfall events. Factors that influence the susceptibility of an area to landslides, or mudflows, include slope gradient, the nature of earth materials, vegetative cover, and groundwater levels (City of Fortuna 2010a). Earthquake motions can induce significant horizontal and vertical dynamic stresses in slopes

that can trigger failure. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake, the youthful and steep topography of the coast range is known for its potential for landslides.

The project site is not within a landslide zone and is on relatively flat ground. Representatives from A.M. Baird Engineering and Surveying prepared a soils report for the site and deemed "the vast majority of the subdivision area in question slopes at less than 20% and all lots have significant available flat areas of approximately 10% or less for placement of residential structures." The project will not expose people or structures to substantial risk of landslides for the reasons stated above. The impact is less than significant.

b) Loss of Topsoil – Less Than Significant with Mitigation Incorporation

Grading, ground disturbance, and the removal of on-site groundcover and vegetation within the Project footprint would occur during construction and have the potential to cause erosion. Erosion and sediment control provisions are required by the California Building Code and the City Municipal Code would be adhered to during construction as part of the Building Permit.

Construction activities, including trenching, excavation, trimming/removal of vegetation, shrubs and trees, and operation of heavy equipment will disturb soil and, therefore, have the potential to cause erosion. Subject to regulatory approval, erosion control actions and a Storm water Pollution Protection Plan (SWPPP) will be prepared for the project prior to the start of construction and soil disturbance. The erosion control actions will include Best Management Practices (BMPs) designed to reduce erosion of exposed soil and minimize the sediment entrained in runoff from the site during construction. BMPs may include: plastic tarps, geo-fabric, woven coconut fronds, silt fences, coir rolls/straw wattles, erosion control matting, site watering for controlling dust, or other suitable materials. With the implementation of these mitigation measures, potential impacts to soil erosion or the loss of topsoil will be less than significant.

c) Unstable Soil – Less than Significant Impact

According to the City of Fortuna General Plan Program EIR (City of Fortuna 2010a), the Planning Area is underlain by sedimentary materials and the potential for unstable soils (e.g., soils subject to liquefaction, lateral spreading, subsidence, or expansion). According to the Soils Report prepared for the Project Site, the liquefication potential is not considered consequential. The Project Site is relatively flat where residential structures will be placed. Design and construction of the Project would incorporate appropriate engineering practices to ensure seismic stability as required by the California Building Code and City standards. Therefore, the Project would not 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, liquefication or collapse, liquefication and a less than significant impact would occur.

d) Expansive Soils – No Impact

Expansive soils are generally high in certain clay types and are prone to large volume changes upon wetting and drying. According to the Fortuna General Plan Program EIR (City of Fortuna 2010a), the Eel River Valley is underlain by the Hookton Formation that includes coastal plain and fluvial deposits. The western two-thirds of the Fortuna Planning Area overlays this formation. Given the unconsolidated nature of this formation and its proximity to the Eel and Van Duzen rivers this portion of the Fortuna Planning Area is subject to varying levels of expansive soils. The soils report conducted by A.M. Baird Engineering and Surveying indicate low amounts of clayey soils, meaning there are little to no expansive soils in the project site. Out of five test holes only one had clay soils found, which had a coarse content of approximately 4.3% (by weight) consisting of small gravels. This soils report can be found in the attached documentation (Attachment E). The project impact from expansive soils will have no impact.

e) Septic Tanks – No Impact

The Project would generate wastewater that would be connected to the City of Fortuna's municipal sewer utility system. The wastewater generated by the Project would be within the capacity of existing wastewater treatment operations and would not require an expansion of service. Because the project does not include septic tanks or alternative wastewater disposal systems, and because construction of the berms and treated effluent pump station will not be impacted or be located on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems, no impact will occur.

f) Destroy Unique Geologic Feature—Less Than Significant with Mitigation Incorporation

There are no known unique paleontological resources, or unique geological features on or near the site. Regional uplifting and other seismic activity in the area have limited the potential for discovery of paleontological resources. However, there is a potential for fossils to be discovered and inadvertently damaged during Project construction even in an area with a low likelihood of occurrence. As such an inadvertent discovery protocol for paleontological resources has been included as **Mitigation Measure CUL-2.** With the proposed **Mitigation Measure CUL-2,** the Project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Less than significant impact with mitigation incorporated.

4.9.3 MITIGATION MEASURES

GS-1: Implement standard construction BMPs in accordance with a standard Caltrans SWPPP. The erosion control actions will include BMPs designed to reduce erosion of exposed soil and minimize the sediment entrained in runoff from the site during construction. BMPs may include: plastic tarps, geo-fabric, woven coconut fronds, silt fences, coir rolls/straw wattles, erosion control matting, site watering for controlling dust, or other suitable materials. With the implementation of these mitigation measures, potential impacts to soil erosion or the loss of topsoil will be less than significant.

Timing for Implementation/Compliance: During construction of project.

Person/Agency Responsible for Monitoring: Licensed Qualified SWPP Developer (QSD) or designated Construction Observer.

Monitoring Frequency: Before, during, and after rain events resulting in 0.1 inches of rainfall depth within a 24-hour period.

Evidence of Compliance: Visual site inspection by QSD or designated Construction Observer.

4.9.4 FINDINGS

The Project will have Less Than Significant impact on Geology and Soils within limited mitigation.

4.10 GREENHOUSE GAS EMISSIONS

Table 11: Greenhouse Gas Emissions Impact Evaluation

VII. GREENHOUSE GAS EMISSIONS. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Generate greenhouse gas emissions (GHG), either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

4.10.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant impact on Greenhouse Gas Emissions if it would (a) generate greenhouse gas emissions (GHG), either directly or indirectly, that may have a significant impact on the environment; or (b) conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

4.10.2 DISCUSSION

The proposed project is to create a 29-unit residential subdivision for future housing. The site is currently vacant. Vegetation consists of significant riparian vegetation associated with the Streamside Management Areas of Strongs Creek and Jameson Creek. In addition, 0.49 acres of wetlands have been delineated, and will be preserved on the site.

The California Global Warming Solutions Act of 2006 (Assembly Bill 32) definitively established the state's climate change policy and sets GHG reduction targets (Health & Safety Code §38500 et seq.). The state set its target at reducing greenhouse gases to 1990 levels by 2020.

CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use.

The primary GHGs that are of concern for development Projects include Carbon Dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). CO_2, CH_4, and N_2O occur naturally, and through human activity. Emissions of CO_2 are largely by-products of fossil fuel combustion and CH_4 results from off-gassing associated with agricultural practices and landfills. CO_2 is the most common GHG emitted by human activities. As a result, CO_2 is sometimes used as a shorthand expression for all greenhouse gases, however, this can cause confusion, and a more accurate way of referring to a number of GHGs collectively is to use the term "carbon dioxide equivalent" or "CO_2e". The Assembly Bill (AB) 32 Scoping Plan contains the main strategies California will use to reduce GHG emissions. Humboldt County coordinated with other local agencies to draft a regional Climate Action Plan (CAP) to reduce greenhouse gas emissions (GHG) throughout Humboldt County. The City of Fortuna adopted the final Regional CAP in early 2026. These can be found on the County's Climate Action Plan Website.

The model is an accurate and comprehensive tool for quantifying air quality impacts from land use projects throughout California. The model can be used for a variety of situations where an air quality analysis is necessary or desirable such as California Environmental Quality Act (CEQA) documents, National Environmental Policy Act (NEPA) documents, pre-project planning, compliance with local air quality rules and regulations, etc.

Sources of greenhouse gas emissions from the Project would occur during short-term construction activities (e.g. vehicle/truck traffic, equipment).

In an attempt to quantify this impact, project staff evaluated GHG impacts projected from the project using the CalEEMod model.

Project-related air quality impacts fall into two categories: short-term construction-related impacts and long-term operations-related impacts. Emissions for the project were calculated using the CalEEMod model Construction equipment types and numbers specified in the CalEEMod modeling effort are based on the applicant's guidance and the consultant's experience. Construction emissions estimated for the proposed project were modeled over a period of six months. This modeling of project-level emissions is considered conservative because it condensed the same level of emissions into a shorter time period, thus inflating the project's average annual emissions estimates. Long-term operational emissions for the proposed project are based on the land uses and trip generation rates.

a) Generation of Greenhouse Gas Emissions – Less Than Significant Impact

The project would significantly impact greenhouse gas (GHG) emissions if it were to generate substantial GHG emissions exceeding the CEQA thresholds of significance adopted by the NCUAQMD and Humboldt County. NCUAQMD and City have not adopted thresholds of significance for GHG emissions from non-stationary sources. However, the Bay Area Quality Management District (BAAQMD) has established GHG thresholds that can be used in for significance determination. These thresholds are used by other counties in northern California without adopted thresholds of significance. Thus, for the analysis of GHG emissions, BAAQMD's GHG thresholds are used to evaluate the significance of the Project's GHG emissions. For land

use development Projects, the BAAQMD GHG threshold is “annual emissions less than 1,100 metric tons per year (MT/yr) of CO2e.” (BAAQMD, 2017).

Mobile sources of greenhouse gases from the Project would include equipment used during short-term construction and vehicle/truck traffic and light-duty equipment from long-term operation. All construction equipment and commercial trucks would be maintained to meet current emissions standards as required by the California Air Resources Board (CARB).

According to the CalEEMod Model, the mitigated construction emissions are as follows in Table 12 and Table 13 below:

Table 12: Modelled Construction Emissions Totals Generated Through the CalEEMod Application

	ROG	NO_X	CO	SO_2	Fugitive PM_{10}	Exhaust PM_{10}	PM_{10} Total	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$	$PM_{2.5}$ Total
Year	**lbs/day**									
2025	0.87	7.88	8.02	0.01	0.34	1.34	1.67	0.31	0.62	0.93
2026	0.12	1.02	1.06	0.01	0.04	0.14	0.18	0.04	0.05	0.09

The construction of the proposed project will contribute a temporary, short-term increase in air pollution from vehicles and equipment during construction. The proposed project will result in emissions of GHGs, which contribute to global climate change. Given the scope of global climate change, however, it is not anticipated that the project will have an individually discernible effect on global climate change (i.e., increase global temperature as a result of emissions from the project).

Operational GHG’s were calculated once the planned development has undergone all construction phases, and including full residency on site utilizing the CalEEMod model.

Table 13: Full Buildout Greenhouse Gas Emissions Modelled Using the CalEEMod Model

	ROG	NO_X	CO	SO_2	Fugitive PM_{10}	Exhaust PM_{10}	PM_{10} Total	Fugitive $PM_{2.5}$	Exhaust $PM_{2.5}$	$PM_{2.5}$ Total
Category	**lbs/day**									
Mobile	1.34	0.37	3.40	0.01	0.01	0.01	0.01	0.01	0.01	0.001
Area	12.95	0.22	14.47	0.02	1.87	-	1.87	1.86	-	1.86
Energy	0.02	0.30	0.13	0.01	0.02	-	0.02	0.02	-	0.02
Total	14.30	0.90	17.99	0.03	1.90	0.01	1.91	1.90	0.01	1.89

Given the scope of global climate change, it is not anticipated that the project will have an individually discernable effect on global climate change and the impacts are less than significant.

Construction and operation GHG emissions were estimated using the California Emission Estimator Model (CalEEMod). The GHG emission results are summarized in Table 14 and Table 15 below. One type of land use was utilized to perform the analysis for the proposed subdivision: 62,400 sq. ft. of "Residential Single-Family Housing". Information for the CalEEMod Analysis was derived from applicant information and correspondence, and default parameters were used where appropriate (e.g., construction equipment list). The results are summarized in Table 14 and Table 15 below.

Table 14: GHG Emissions for 2025 (Source: CalEEMod)

Emission Source	CO_2e (MT/yr)	BAAQMD Threshold (MT/yr)	Exceeds Threshold?
Construction-Unmitigated	263.25	1,100	No
Construction-Mitigated	263.25	1,100	No
Operation-Unmitigated	155.24	1,100	No
Operation-Mitigated	155.24	1,100	No

Table 15: GHG Emissions for 2026 (Source: CalEEMod)

Emission Source	CO_2e (MT/yr)	BAAQMD Threshold (MT/yr)	Exceeds Threshold?
Construction-Unmitigated	41.63	1,100	No
Construction-Mitigated	41.63	1,100	No
Operation-Unmitigated	155.24	1,100	No
Operation-Mitigated	155.24	1,100	No

As can be seen in Table 14 and Table 15 above, GHG emissions related to construction fall well below the BAAQMD CEQA threshold and are therefore unlikely to cause significant or cumulative impacts to the environment. The primary source of operation GHG emissions is vehicle trips.

Project-related Reduction in Greenhouse Gas Emissions

The project includes a few design features that will result in a reduction in greenhouse gas emissions:

1) Transit Proximity. The project is near two bus stops operated by the Humboldt Transit Authority (Redwood Transit System). The first bus stop is located on Rohnerville Road approximately 0.42 miles to the west of the proposed subdivision. The second bus stop is also located on Rohnerville Road approximately 0.41 miles to the southwest of the proposed subdivision. Additionally, the City of Fortuna already operates a senior and paratransit curb-to-curb service, and in late 2026 will be launching this service to the general public. Therefore, transit access through the entire project site will effectively be to the residence.
2) Proximity to Services. The project is an in-fill development, and is in the vicinity of medical, shopping, and other services. Redwood Memorial Hospital, Open Door Health Clinic, and other medical offices are located to the west of the project site, many of which are located less than 1-mile away. Redwood Shopping Center is located on Fortuna Boulevard approximately 1.15 mile to the west, reached by car, bus, bike, or foot on Redwood Way. Other services are also available on Fortuna Boulevard.
3) Vegetation. The project includes mostly open space until the 29 units are built and then there will be open space between each unit, riparian vegetation along Strongs and Jameson Creeks, and preserved wetlands. The common open space will be the vegetation that currently exists on the site.
4) Transportation. A bus stop could be implemented closer to the subdivision, which would encourage more people to use it. A half-mile walk is potentially too long for some people which makes them use their vehicles instead. However as noted above, the City of Fortuna will be implementing a curb-to-curb microtransit system within the City will which increase access to transit throughout the subdivision. More bike lanes could also be added which would increase bike traffic and produce less GHG emissions. Family carpooling is another option that would also reduce GHGs.

All these listed design reduction measures will result in reduction in greenhouse gas emissions when levels are compared to the standard residential development measurements calculated in the CalEEModel prepared for the project, and compared to the modeling that was done for the Fortuna General Plan EIR that considered standard residential development in the RE 20 and RE 43 land use designation. Therefore, the project will result in a reduction in greenhouse gases when compared to a standard residential development allowed under the Fortuna General Plan.

b) Conflict with an Applicable Plan, Policy, or Regulation - Less Than Significant Impact

The Project proposes a Residential Estates Subdivision. For the purposes of this analysis, the Project was evaluated against the following applicable plans, policies, and regulations:

1) Humboldt County Climate Action Plan
2) City of Fortuna General Plan

3) California Air Resources Board 2017 Climate Change Scoping Plan
4) NCUAQMD Particulate Matter Attainment Plan

Humboldt County Regional Climate Action Plan and EIR

Humboldt County, in coordination with the incorporated cities and regional partners, prepared the Humboldt Regional Climate Action Plan (RCAP) to establish a regional framework for reducing greenhouse gas emissions from transportation, building energy use, waste, water and wastewater, carbon sequestration, and other sources. Although adoption of the RCAP and its Environmental Impact Report was previously anticipated for Summer 2025, final adoption occurred later in the year. On December 16, 2025, the Humboldt County Board of Supervisors certified the Final Programmatic Environmental Impact Report and adopted RCAP.

The City of Fortuna subsequently adopted Resolution 2026-17 on May 18, 2026, adopting the Humboldt Regional Climate Action Plan as the City's regional climate action framework and making the applicable CEQA findings as a Responsible Agency. The City's action adopted the RCAP for City planning and implementation purposes but did not separately adopt Humboldt County's CEQA greenhouse gas emissions thresholds.

The proposed Project would not conflict with implementation of the adopted RCAP. Future residential development within the subdivision would be required to comply with applicable California Building Code and Title 24 energy-efficiency requirements in effect at the time of building permit issuance, and the Project incorporates greenhouse gas reduction measures and development standards described herein. Therefore, the Project would be consistent with the adopted RCAP and would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emissions.

City of Fortuna General Plan

The Fortuna General Plan includes two policies specific to GHGs. Policy HS-3.5 (Restoration for Greenhouse Gases Absorption) states, "foster and restore forests and other terrestrial ecosystems that offer significant carbon mitigation potential." Policy HS-3.6 (Greenhouse Gas Emissions Reduction from Transportation) states, "Increase clean-fuel use, promote transit-oriented development and alternative modes of transportation, and reduce travel demand."

California Air Resources Board Climate Change Scoping Plan

The 2022 Climate Change Scoping Plan developed by the California Air Resources Board (CARB) provides context and strategies to help achieve statewide greenhouse gas emission reduction goals. Appendix D of the Scoping Plan includes suggested actions that local governments can take to support the State's climate goals. The Project is consistent with the following applicable GHG reduction measures identified in the Scoping Plan:

- *Energy Efficiency / Green Building Strategy*: The proposed subdivision would comply with the California Building Code and California Energy Code and thus would include the required energy features to be consistent with this measure.
- *Renewable Portfolio Standard to achieve 60% renewable energy mix statewide by 2030:* The Project would source energy from PG&E. PG&E currently obtains 33% of its power supply

from renewable energy sources, which is on track to meet the 60% renewable energy mix by 2030 (PG&E website, Accessed May 2025).

- *Million Solar Roofs Program*: The Project would comply with Title 24 energy requirements, which requires new buildings to be "solar ready".
- *California Cap-and-Trade Program – Western Climate Initiative*: The Project would utilize PG&E power. This is a statewide measure, not implementable by the applicant or local agencies. The Project would utilize PG&E power, which is on track to meet statewide renewable energy goals by 2030.
- *Recycling & Waste*: The Project would include a recycling program for home owners with curbside collection using the City's designated bins which would divert recyclable waste from landfills, thus reducing GHGs released from landfills. The Project does not include construction of a new landfill.

NCUAQMD Particulate Matter Attainment Plan

The NCUAQMD prepared a Particulate Attainment Plan, Draft Report, in May 1995 with the goal of achieving and maintaining state ambient air quality standards for PM10. This report includes a description of the planning area (North Coast Unified Air District), and emissions inventory, general attainment goals, and a listing of cost-effective control strategies. The NCUAQMD's attainment plan established goals to reduce PM10 emissions and eliminate the number of days in which standards are exceeded. The plan includes three areas of recommended control strategies to meet these goals – transportation, land use, and burning. Control measures for these areas are included in the Attainment Plan. Compliance with the control measures in the Particulate Matter Attainment Plan would not only result in a reduction of PM10 emissions but would also result in a reduction of GHG emissions. The proposed subdivision would be designed to meet all California Building Code and Title 24 Standards.

The NCUAQMD does not have rules, regulations, or thresholds of significance for non-stationary or construction-related GHG emissions. In 2011, the NCUAQMD adopted Rule 111 - Federal Permitting Requirements for Sources of Greenhouse Gases to establish a threshold above which New Source Review (NSR) and federal Title V permitting applies and to establish federally enforceable limits on potential to emit greenhouse gases for stationary sources. These are considered requirements for stationary sources and should not be used as a threshold of significance for non-stationary source projects.

Therefore, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Less than significant impact.

4.10.3 MITIGATION MEASURES

No Mitigation Required

4.10.4 FINDINGS

The Project will have a Less than Significant Impact on Global Greenhouse Gases.

4.11 HAZARDS AND HAZARDOUS MATERIALS

Table 16: Hazard and Hazardous Materials Impact Evaluation

VIII. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
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 complied 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?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

4.11.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant impact on hazards and hazardous materials if it were to (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) or be located on a site which is included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment. In addition, (e) for projects 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. Finally, the project would have a significant impact to hazards and hazardous materials if it would (f) impair the implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan; (g) or expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized area or where residences are intermixed with wildlands.

4.11.2 DISCUSSION

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous. Factors that influence the health effects of exposure to hazardous material include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

The California Code of Regulations (CCR) defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10).

Hazardous wastes are defined in the same manner. Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. Hazardous materials and hazardous wastes are classified according to four properties: toxicity, ignitability, corrosivity, and reactivity (CCR, Title 22, Chapter 11, Article 3).

a) Transport, Use, and Disposal of Hazardous Materials – Less Than Significant Impact

Project construction will require the use of hazardous materials such as fuels, lubricants, paints, and solvents. Construction activities for the project will be short-term and one-time in nature, and will involve the limited transport, storage, use, or disposal of hazardous materials. Some examples of hazardous materials handling include fueling and servicing construction equipment on-site, and the transport of fuels, lubricating fluids, and solvents. These types of materials; however, are not acutely hazardous, and all storage, handling, and disposal of these materials are regulated by the Department of Toxic Substances Control (DTSC), the U.S. EPA, the Occupational Safety & Health Administration (OSHA), and the Fortuna Fire Protection District.

Because the City, contractors, and other construction service providers will be required to comply with existing hazardous materials laws and regulations for the transport, use, and disposal of hazardous materials, the impacts associated with the project having the potential to create a significant hazard to the public or the environment will be less than significant.

b) Upset or Accidents Involving Hazardous Materials – Less Than Significant Impact

During construction, routine transport of hazardous materials to and from the project site could indirectly result in an incremental increase in the potential for accidents. Caltrans, the Federal

Department of Transportation, and the California Highway Patrol (CHP) regulate the transportation of hazardous materials and wastes, including container types and packaging requirements, as well as licensing and training for truck operators, chemical handlers, and hazardous waste haulers. Because the City, contractors, and other construction service providers will be required to comply with existing hazardous materials laws and regulations for the transport and use of hazardous materials, the impacts associated with the potential to create a significant hazard to the public or the environment will be less than significant.

c) Emit Hazardous Materials within 0.25 Mile of a School – Less Than Significant Impact

There is a potential impact related for the project to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school, as the project is southwest of the Norman G. Ambrosini Elementary School. However, as stated above in Sections a) and b) above, the impacts associated with the project having the potential to create a significant hazard will be less than significant.

d) Included on a List of Hazardous Materials Sites – Less Than Significant Impact

There is not a hazardous material site compiled pursuant to Government Code Section 65962.5 (Hazardous Waste and Substances Site List or "Cortese" list) within the project area. The Redwood Memorial Hospital is the closest one on the list to the site and it is approximately 0.7 miles west of the site. The Redwood Memorial Hospital is an institutional user of hazardous materials. Hospitals abide to the California Code of Regulations, Title 8, Section 5193, when discerning the proper disposal of hazardous waste and thus provide a less than significant impact on the site.

e) Safety Hazard for People Residing or Working Within Two Miles of an Airport – Less Than Significant Impact

The nearest public airport, the Rohnerville Airport, is located approximately 2 miles south of the project site. The project will not result in airport-related safety hazards for people residing or working in the project area. Less than significant impact will occur.

f) Impair or Interfere with an Adopted Emergency Response/Evacuation Plan – No Impact

The Humboldt County Department of Health & Human Services Division of Environmental Health (HCDEH) has a Hazardous Materials Area Plan (HMAP) that covers the County, including the City of Fortuna and its surroundings. The HMAP establishes the following:

- Policies, responsibilities, and procedures required for protecting the health and safety of Humboldt County's population, the environment, and the public and private property from the effects of hazardous materials incidents;
- Emergency response organization for hazardous materials incidents occurring within Humboldt County;
- Operational concepts and procedures associated with the Eureka Fire Departments Regional Hazardous Materials Response Team (EFD HMRT).

The City of Fortuna also has hazardous material response plans associated with the regulatory requirements for their wastewater treatment, water treatment plant facilities and operations,

and an emergency response plan that establishes chain-of-command and response procedures between the police, fire, public works, City staff and board, and other essential departments and outside organizations. Response plans are also included in hazardous materials business plans, for those businesses that are required by the HCDEH to prepare and maintain them.

The project will not impair or interfere with any emergency response and evacuation plans, and does not include development that will significantly increase the number of people exposed to potential emergencies. Furthermore, no roads will be closed because of project activities. No impact will occur.

g) Exposure to Wildland Fires – Less than Significant Impact

The project will not expose people or structures to a risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Construction involving heavy equipment, vehicles, power tools, and personnel smoking in and around the project site could cause the ignition of a wildfire; however, the project site is within the suburbanized area of Fortuna so the possibility of a wildfire is remote. The impact is less than significant.

4.11.3 MITIGATION MEASURES

No mitigation required.

4.11.4 FINDINGS

The Project will have Less Than Significant impact on Hazards and Hazardous Materials.

4.12 HYDROLOGY AND WATER QUALITY

Table 17: Hydrology and Water Quality Impact Evaluation

IX.HYDROLOGY AND WATER QUALITY. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
i) result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☒	☐	☐
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; or	☐	☒	☐	☐
iv) impede or redirect flood flows?	☐	☒	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

4.12.1 THRESHOLDS OF SIGNIFICANCE

The project would have a significant effect on hydrology and water quality if it would (a) violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality; (b) substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin; (c) substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) result in substantial erosion or siltation on- or off-site, ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite, 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, or iv) impede or redirect flood flows. Significant impacts would also occur if in (d) flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or (e) conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

4.12.2 DISCUSSION

According to EPA, the proposed project is located within the Eel River watershed, which drains approximately 3,684 square miles and extends from the headwaters in the mountains to the east to the river's mouth at the Pacific Ocean. The Eel River is located approximately 1.8 miles west of the subject property. The Eel River is approximately 200-miles long and the basin receives an average of approximately 57 inches per year, occurring primarily from October through April, including a small fraction of snow. More specifically, the project site is located within the Strongs Creek watershed, which encompasses approximately 10,700 acres and drains a mix of developed and undeveloped areas.

The Strongs Creek Drainage Area is in the central area of the City of Fortuna, bordered by the Rohner Creek and Hillside Creek Drainage Areas to the north and the Jameson Creek Drainage Area to the south. The Strongs Creek watershed is the largest watershed in the general Fortuna area, encompassing approximately 5,200 acres not including tributaries, and approximately 10,700 acres when tributaries are included. Tributaries to Strongs Creek include Rohner Creek, Jameson Creek, and Mill Creek. Jameson Creek is South of the project site. Jameson Creek is at approximately 115 feet in elevation. EPA temperature analysis of the Strongs Creek drainage has been designated as marginal for the purposes of Total Maximum Daily Loads (TMDL) and sediment is not a concern.

The Eel River is state and federally designated under the Wild and Scenic Rivers Act, with 97 miles of river designated as Wild, 28 miles designated as Scenic, and 273 miles designated as Recreational. (National Wild and Scenic Rivers System, 2025). The section of river closest to the Project Site is designated as Recreational.

The Lower Eel River Delta and its tributaries are listed as an "Impaired" waterbody per section 303(d) of the Clean Water Act, for sediment and temperature. Listing a waterbody as impaired for a particular constituent or stressor requires the development of a Total Maximum Daily Load (TMDL), which is a pollution control plan for the waterbody and the associated constituent or stressor. The TMDL identifies the quantity of the constituent that can be safely assimilated by a waterbody without violating water quality standards. A TMDL for sediment and temperature in the Lower Eel River was adopted by the U.S. Environmental Protection Agency (EPA) on December 18, 2007. The TMDL includes numeric targets, source analysis, and sediment loading rates within the watershed (EPA, 2016). The primary purpose of the TMDLs for the Lower Eel River is to ensure that beneficial uses of freshwater habitat (such as salmonid habitat) are protected from elevated sediment and temperature levels.

As part of the Sustainable Groundwater Management Act, the California Department of Water Resources (DWR) prioritized 517 groundwater basins and subbasins in California as either high, medium, low, or very low based on eight components to determine which basins are in

overdraft and/or require groundwater management. The Project Site is located within the Eel River Valley Groundwater Basin, Basin #1-010, a medium priority basin (DWR, 2025). This basin covers approximately 73,000 acres and nearly 22,000 residents, primarily residing in and around Fortuna, Loleta, Ferndale, Scotia, and Rio Dell (Humboldt County Department of Public Works, 2025). Just under 500 permitted wells are recorded in the basin (DWR, 2025), with uses including private domestic and agricultural wells, public water systems, and municipal wells. Approximately 13,500 acres of agricultural lands in the basin are irrigated with groundwater, with grazed pastureland and livestock crop production compromising approximately 85% of the use.

The Sustainable Groundwater Management Act applies to groundwater basins ranked as high or medium priorities. The Eel River Valley Groundwater Basin was designated as medium priority in 2015 and 2018. A Groundwater Sustainability Plan Alternative was developed and submitted to DWR in 2016, however DWR disapproved the alternative in 2019. As such, Humboldt County is now mandated to form a Groundwater Sustainability Agency and develop a full Groundwater Sustainability Plan. On February 9, 2021, the Humboldt County Department of Public Works released an Initial Notification to form the Eel River Valley Groundwater Basin. A final Groundwater Sustainability Plan will be developed and adopted by January 31st, 2022. On January 25, 2022 the Humboldt County Board of Supervisors adopted the Eel River Valley Groundwater Sustainability Plan. The Eel River Valley Groundwater Sustainability Plan with all its attachments was finalized on January 29, 2022 and submitted to the California Department of Water Resources on January 31, 2022(Department of Public Works, 2025).

Since, during construction, the Project would disturb more than one acre of the site, the Project would be subject to the requirements State Water Resources Control Board (SWRCB) Construction General Permit (CGP). The SWRCB CGP would require the preparation of a SWPPP which documents the stormwater dynamics at the site, the Best Management Practices (BMPs), and water quality protection measures that are used, and the frequency of inspections. BMPs are activities or measures determined to be practicable, acceptable to the public, and cost effective in preventing water pollution or reducing the amount of pollution generated by non-point sources.

The Project would be designed to meet the City's stormwater design standards. The City requires that the Project be designed to limit post Project runoff flow rate and volume to the pre-Project runoff flow rate and volume for the 25-year, 24-hour storm.

The current surface drainage generally flows southeast to northwest through the existing site, drainage improvements with high ridges along the borders of the site. An existing pond on APN 202-093-060 overflows and runs in the Northwest direction off site and surface flows to a drainage inlet located on Rohnerville Road. Strongs Creek runs along the Northern line of the development but is over 700 feet from the extents of the Gulliksen Subdivision development footprint and is physically separated by the northern high ridge.

The majority of storm water runoff from the subdivision will be routed through a new storm drainage subsurface arrangement that will make use of existing retention areas with a metered

outflow connected to the existing natural drainage course that ends on a drainage inlet on Rohnerville Road west of the development. The basin and flow concentration point will be in a new drainage easement located in the northwest area of development on parcel APN: 202-041-005.

a) Violate Water Quality Standards or Degrade Water Quality–Less Than Significant with Mitigation Incorporation

Construction activities can introduce pollutants to Stormwater runoff, including sediment, paint, solvent, pavement, construction debris and trash, as well as hydrocarbons and other fluids from construction vehicles. The most likely pollutant from the proposed project will be sediments created by soil disturbance during or immediately after construction from rainfall events. These potential pollutants are regulated under the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities. This construction general permit offers NPDES coverage for Stormwater discharges with construction activities of more than 1.0 acre and will apply if the project disturbs over one acre of ground. Ground disturbance will be more than one acre; therefore, the project will trigger the requirement for a SWPPP.

A SWPPP must contain site plans that show the construction area, roadways, Stormwater collection/discharge points, general existing and proposed topography, and drainage patterns across the project. As described in section A of the construction general permit, a SWPPP must include: BMPs the discharger will use to protect Stormwater runoff; a visual monitoring program; a chemical monitoring program for non-visible pollutants to be implemented in the event of a BMP failure; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303 (d) list for sediment.

Jameson Creek and Strongs Creek, both located by or in the subject site, are tributaries of the Eel River, which is on the 303 (d) list. Project activities will not take place along the Eel River or immediately adjacent to its tributaries; however, since the Eel River is downstream from the project site, the Eel River could be potentially affected by project activities in the absence of adequate controls. The project is within an MS4 permit area. MS4 permit areas require the incorporation of an Erosion Control Plan and implementation of a SWPPP to protect nearby waterbodies from uncontrolled erosion and stormwater runoff. The project will not violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality with the implementation of these plans.

Construction of the project will also require the use of gasoline and diesel-powered equipment, such as trucks, excavators, graders, bulldozers, backhoes, compactors, and generators. Chemicals such as diesel, gasoline, lubricants, hydraulic fluid, transmission fluid, paints, solvents, glues, and other substances will be utilized during construction. An accidental release of any of these substances could degrade surface or groundwater and cause a significant impact. Therefore, the following mitigation is included in section 11.9.3.

With implementation of these mitigation measures, project impacts to water quality will be less than significant after mitigation.

b) Substantially Decrease Groundwater Supplies or Interfere with Groundwater Recharge–Less Than Significant Impact

The Project is located in groundwater basin 1-010 (Eel River Valley) and is not listed as a basin in Critical Conditions of Overdraft (DWR, 2025). DWR classified Basin 1-010 is a medium priority basin (DWR, 2025). However, recent studies as part of the Eel River Groundwater Sustainability Plan (Humbolt County, 2025) and City of Fortuna 2020 Urban Water Management Plan (City of Fortuna, 2021), that groundwater supply is robust and productive, and the basin is not over-drafted (recharge exceeds long-term withdrawal).

Water for the Project would be provided by the City via the City's existing drinking water system. The City's water source is from groundwater wells in the Eel River Valley Groundwater Basin. According to the City's Urban Water Management Plan, the City's water supply is reliable and consistent and demand projections will be met, even during drought scenarios (City of Fortuna, 2026).

Therefore, the Project would not decrease groundwater supplies or interfere with groundwater management. Less than significant impact would result.

c) Alter Drainage Patterns–Less Than Significant Impact

The project will slightly alter the existing drainage patterns of the project site in the area and alter any waterway because a culvert will be added in which will change the route between the ponds. Otherwise, drainage patterns will follow the same general route as currently provided by site and overall topography, and areas will continue to drain to the existing ponds as they do currently. The impact is less than significant.

i. Substantial Erosion or Siltation–Less Than Significant Impact with Mitigation Incorporation

The project will slightly alter the existing drainage patterns of the project site in the area and alter any waterway because a culvert will be added in which will change the route between the ponds to improve drainage.. The ponds themselves will be designed to retain/detail more of the stormwater then they currently do, and with the expanded drainage and ponding potential any additional sediments or other runoff particles will be captured in the pond. The impact is less than significant with Mitigation Incorporation.

ii. Increase Surface Runoff –Less Than Significant with Mitigation Incorporation

The project will result in an increase in impervious surfaces, which without mitigation would increase surface stormwater runoff. The existing ponds on the site, which based on the Preliminary Hydrology Analysis developed for the project currently have enough existing available volume to store the increase in runoff, will be improved such that the existing outfall will act as overflow features (not flow through features as they currently are). As part of the final improvement plan process, a final hydrology report will be developed that shows how the proposed design functions, while specifically showing how the increased runoff from the site will be managed by the engineered pond system. The design of the ponds will be subject to the requirements of the Humboldt County LID manual, and the City of Fortuna 25-year 24-hour

design storm requirement for hydro modification. The impact is less than significant with mitigation incorporation.

iii. Contribute Runoff Water That Would Exceed Capacity of Drainage Systems—Less Than Significant with Mitigation Incorporation

The proposed project is attenuating increased runoff via the existing ponds and infiltrating in place, with only overflow leaving the ponds during larger storms. There is an effect on the existing drainage system but with mitigation capacity and through engineering design it will not be exceeded. Because the City's drainage design requirement is no increase in peak runoff volumes during the design storms, there is no anticipated impact to downstream stormwater conveyance capacity. impact is less than significant with mitigation incorporation.

iv. Impede or Redirect Flood Flows—Less Than Significant with Mitigation Incorporation

The Project is not located in a FEMA Flood Zone (Humboldt County, 2025). There are two surface waters in the Project Area that would contribute to flooding, these surface waters are wetlands. During the construction of the project, certain areas will be graded to ensure the flow of the water to the wetlands, as well as building the residences in areas of higher elevation. This will help to keep flooding of the residences to a minimal and therefore it less than significant impact with mitigation.

d) Risk Release of Pollutants due to Project Inundation–Less than Significant Impact

The project is not in an area that is at risk from flood hazard, seiche, or tsunami. The Project is not located near a large body of water capable of producing a seiche and is not located near the coast in a tsunami inundation area. Therefore, the Project would not result in inundation by flood hazard, seiche, or tsunami and less than significant impact would occur.

No levee or dam construction is associated with the Project Area. As noted previously, the Project would not be located within a 100-year flood zone and would not expose people or structures to any other kind of flooding event. The Project Site is not located within a dam failure inundation area according to the (Humboldt County, 2025). Therefore, the Project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam and less than significant impact would occur.

e) Conflict With or Obstruct Implementation of a Plan–Less Than Significant Impact

The relevant water quality control plan is the California North Coast Regional Water Quality Control Board (NCRWQCB) Basin Plan, which establishes thresholds for key water resource protection objectives for both surface waters and groundwater. Waters on the Project Site are limited to the two on-site wetlands, which would not be impacted during construction or operation of the Project. The Project would not utilize or otherwise impact any groundwater resources. A conflict with the Basin Plan would therefore not occur. A Sustainable Groundwater Management Plan has been finalized for the Eel River Valley Groundwater Basin. There are no conditions associated with the Project that would result in a conflict with or obstruct

implementation of a water quality control plan or sustainable groundwater management plan beyond what is described in the responses to subsections a) – d) above. The Project includes compliance with the State Water Resources Control Board (SWRCB) Construction General Permit (CGP) and Humboldt County LID program. Therefore, the Project would not otherwise substantially degrade water quality or conflict with or obstruct a water quality control plan or sustainable groundwater management plan, and a less than significant impact would occur.

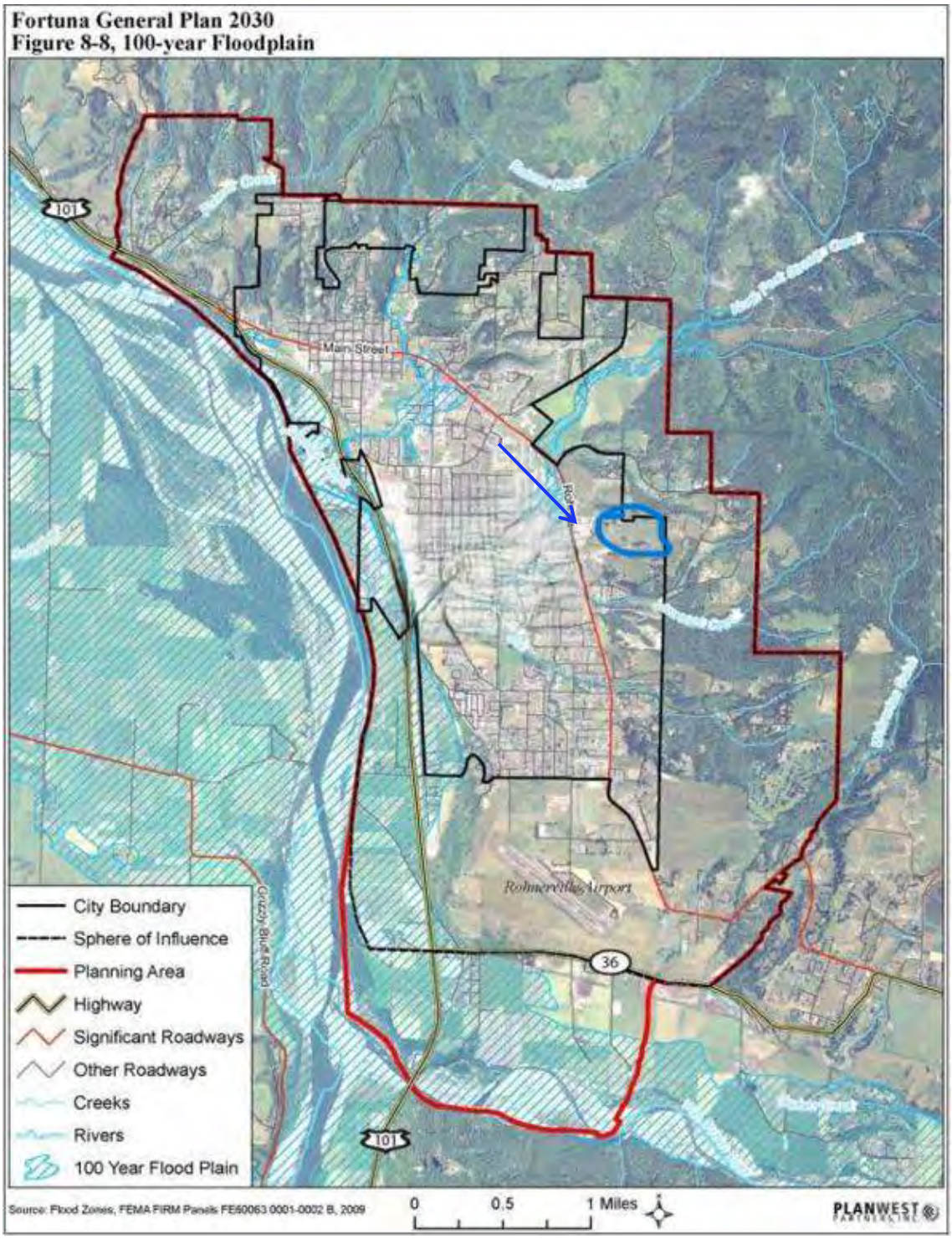


Figure 6: Flood Zone Map of the Proposed Project Area.

4.12.3 MITIGATION MEASURES

HWQ-1: Prepare and Implement SWPPP and BMPs

The City shall ensure that a SWPPP is prepared and implemented for the project and includes BMPs. The SWPPP shall be prepared prior to any construction on any portion of the project and implemented prior to and during construction. At a minimum the contractor shall implement the following, or the equivalent as described in the approved SWPPP:

4.12.3.1 Materials Management

- The Contractor shall provide protected (covered) storage areas for any potentially toxic materials (concrete, herbicides, pesticides, fertilizer, grease, oils, fuel, paints, stains, solvents, wood preservatives, etc.). Ensure that these materials are protected from vandalism, and that all lids and covers are securely fastened. Clearly mark all hazardous material containers.
- Bags of mortar, concrete, or other supplies shall be placed on pallets and covered with tarps so that if precipitation does occur these materials will not be exposed to Stormwater and become a Stormwater pollutant.
- Minimize the production or generation of hazardous materials and wastes at the site. Do not allow them to accumulate on the ground. Schedule regular pickup of used materials by licensed waste haulers and ensure proper disposal.
- All hazardous material containers shall be placed in secondary containment. Ensure that adequate secondary containment volume is provided for hazardous materials and that they are located in areas on the site away from stormwater drains or water courses. Segregate potentially hazardous waste from non-hazardous construction debris. Provide berms, if necessary, to prevent Stormwater run-on from contacting the storage area. Also, use containment berms in fueling and maintenance areas and where the potential for spills is high.

4.12.3.2 Waste Disposal

- The Contractor shall provide waste receptacles for common solid wastes at convenient locations on the job site and provide regular collection of wastes, including building materials. Provide cover for receptacles or piles of waste prior to rain events. Do not allow crew to discard miscellaneous trash on the project site.

4.12.3.3 Spill Prevention and Response

- The Contractor shall make adequate preparations, including training personnel and providing equipment, to contain and/or cleanup spills of oil and other hazardous materials. Ensure that adequate materials such as absorbents, berms, dry sweep shovels, brooms, and absorbent pads are on hand to clean up any accidental spill that may occur. Spills of hazardous materials can originate from fueling, equipment breaking down (such as hydraulic lines), material transfer operations, and other sources. Cleanup such spills immediately and properly dispose of all wastes and used spill control materials.

4.12.3.4 Available Erosion Control Supplies

- The Contractor shall ensure that sufficient erosion control supplies shall always be available on site to deal with areas susceptible to erosion during rain events. Materials should include plastic tarps, geo-fabric, woven coconut fronds, coir rolls/straw wattles, jute netting, erosion control matting, silt fencing, straw mulch, or other suitable materials.

4.12.3.5 Non-Stormwater Discharges

- Activities such as vehicle washing, bucket rinsing, paint brush cleaning, etc. shall be carried out at an approved facility (i.e. carwash or interior sink), wherein the water is discharged into a sanitary sewer. Non-stormwater discharges should be eliminated or reduced to the extent feasible. The Contractor shall designate a qualified person with the responsibility for ensuring that no materials other than stormwater are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems.

4.12.3.6 Sanitary Waste Management

- The Contractor shall provide sanitary facilities of sufficient number and size to accommodate construction crews. Locate the sanitary facilities in a convenient location, but away from storm drain inlets and drainage facilities. Anchor the facilities sufficiently to prevent them from being blown over or tipped by vandals. Ensure that the facilities are maintained in good working order and emptied at regular intervals by a licensed sanitary waste hauler.

4.12.3.7 Vehicle and Equipment Fueling

- On-site vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. The Contractor shall designate an area for equipment fueling and maintenance away from storm drain inlets or drainage channels. The fueling area shall be located on a paved surface (if practical) and shall be protected with berms to prevent run-on and run-off and contain spills. Secondary containment techniques such as drip pans or drop cloths shall be used when fueling to catch drips or leaks.

4.12.3.8 Vehicle and Equipment Cleaning

- Off-site commercial washing businesses are equipped to handle and dispose of wash water properly and are to be used for vehicle and equipment cleaning as much as possible. If vehicle and equipment washing and cleaning must occur on site and cannot be performed in a building equipped with sanitary sewer facilities, the outside cleaning area shall be located away from storm drain inlets and drainage facilities. The wash area shall be stabilized with aggregate base, and bermed to prevent run-off and run-on. The drainage area shall be outfitted with a sump to allow for the collection and disposal of wash water. Wash water is not to be disposed of into storm drains or water courses.
- The wash area shall be used as little as possible, while using the minimum amount of wash water and soaps necessary. Power washers tend to use less water and should be considered. Steam cleaning is not to be performed at any time. Cleaning solvents shall never to be used on-site.

4.12.3.9 Vehicle and Equipment Maintenance

- Perform vehicle maintenance off site whenever practical. The Contractor shall coordinate with the City and designate the on-site vehicle and equipment maintenance areas away from storm drain inlets and water courses. Locate the maintenance areas on paved surfaces if practical and protect the maintenance area from stormwater run-on and run-off.
- Properly dispose of used oils, fuels, and lubricants. Do not dump fuels or lubricants on the ground, place in dumpsters, or pour into storm drains or water courses. Properly dispose of or recycle batteries and other waste products.
- Repair leaks of fluids and oil immediately. Place drip pans under vehicles with leaks while they are waiting repair and promptly empty drip pans into proper waste containers.
- Regularly inspect vehicles and equipment for leaks or potential leaks. Perform regularly scheduled preventative maintenance, preferably offsite. Inspect the maintenance area regularly and cleanup any spills or leaks immediately. Always maintain an adequate supply of spill cleanup materials in the maintenance area.

4.12.3.10 Erosion Control BMPs

- Scheduling Work

-Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of the construction project especially during the rainy season. This project is scheduled to be constructed in the summer season with all grading and major excavations completed prior to the onset of the rainy season, which begins on October 15th. When rainfall is forecast, the construction schedule is to be adjusted to allow the implementation of erosion and sediment controls on all disturbed areas prior to the onset of rains.

- Minimize Earth moving and Vegetation Removal

-Vegetation removal, grading, and other construction activities shall be restricted to the minimum area necessary to complete the project.

- Site Stabilization and Seeding

-All soil disturbances shall be stabilized by native seeding. All soil disturbances shall be stabilized with a pasture seed mix or similar seed mix. The contractor should hand broadcast seed and rice straw in access areas where bare ground exists after construction. Seeding should be done at an adequate time to develop a uniform vegetative cover (70% or greater) before the seasonal rains begin. If this is not possible at the site due to the construction schedule of the project, the Contractor shall implement temporary soil stabilization measures until the vegetative cover develops. The Contractor shall consider measures such as: covering with mulch, temporary seeding/vegetation, soil stabilizers, binders, fiber rolls, blankets, or permanent seeding.

- Seeding and mulching should be done as soon as grading operations are completed.

-Proper and timely attention shall be taken to avoid erosion. Erosion control and seed establishment can be enhanced with the use of surface roughening followed by seeding and mulching.

- Exposed Area Limitations

-The occurrence of windy days may also require water to be sprayed onto exposed surface areas for dust control. These areas could include dirt roads, soil disposal areas, or other graded surfaces. Care should be taken not to create run-off from the application of excessive quantities of water, or to increase vehicle track-out of sediment from this activity.

- Stockpiled Soils

–The Contractor shall work with the Owner to designate an area to be used for stockpiled soils. Trench spoils generated during utility installation and other activities must be securely stockpiled at the site. In the event of rain, care shall be taken to prevent erosion and sediment transport from stockpiled areas. Stockpiles should be securely covered and placed away from drainage channels, preferably in areas with some natural vegetation in place. Silt fences shall be installed around the soil stockpile areas in the event of extended heavy rainfall. Silt fence construction and maintenance is further discussed in the Sediment Control section of this SWPPP. Uncovered soil stockpiles are to be wetted as needed during windy days to prevent wind erosion.

Timing for Implementation/Compliance: During construction of project.

Person/Agency Responsible for Monitoring: Building Department site inspector or designated Construction Observer.

Monitoring Frequency: Daily, for duration of project.

Evidence of Compliance: Visual site inspection by Building Department Staff.

4.12.4 FINDINGS

The Project will have Less than Significant Impact with Mitigation Incorporation on Hydrology and Water Quality with Mitigation Incorporation.

4.13 LAND USE AND PLANNING

Table 18: Land Use and Planning Impact Evaluation

X. LAND USE AND PLANNING. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

4.13.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) physically divide an established community; or (b) cause a significant environmental impact due to a

conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

4.13.2 DISCUSSION

The City of Fortuna's General Plan was adopted in October, 2010. The Fortuna General Plan formalizes the long-term vision for the City's physical evolution. It outlines policies, standards, and programs to guide day-to-day decisions concerning future development.

The subject property is zoned Residential Estates– single family (RE 20 and RE 43) by the City of Fortuna. Parcels which fall under this zoning definition are meant to encourage the growth of single-family dwelling developments. Each proposed residence will be within its own parcel, this new development being implemented as a subdivision affects the setback requirements between each parcel, and the size of the lots. This development falls under the principal permitted use of RE of one, single-family residences per lot.

a) Physically Divide an Established Community–No Impact

No aspect of the project will physically divide an existing residential community; therefore, no impact will occur.

b) Conflict with Applicable Land Use Plans, Policies or Regulations–No Impact

The project site is within the city limits of Fortuna and includes the General Plan Land Use designation of Residential Estates zoning (RE 20 and RE 43). The proposed project is consistent with General Plan Land Use and Zoning and will not require a General Plan Land Use designation or zoning change, is not within the California Coastal Commission's jurisdiction, and will not conflict with any other applicable plan, policy, or regulation with jurisdiction over the project area. Therefore, no impact has been identified.

4.13.3 MITIGATION MEASURES

No mitigations measures are required for this Land use and Planning.

4.13.4 FINDINGS

The Project will have No Impact on Land Use and Planning.

4.14 MINERAL RESOURCES

Table 19: Mineral Resources Impact Evaluation

XI. MINERAL RESOURCES. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☒	☐

4.14.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state, or (b) result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

4.14.2 DISCUSSION

According to the Fortuna General Plan Background Report (Natural & Cultural Resources, Section 6.5 Mineral/Soils and Energy Resources) (City of Fortuna 2007), there are seven gravel extraction operations in the Eel River adjacent to the City's Planning Area.

a,b) Result in the Loss of Availability of a Known Mineral Resource of Value to the Region or Delineated by a General Plan, Specific Plan, or other Land Use Plan – Less Than Significant Impact

Gravel mining operations are located to the north and south of the project area. The project, will require use of mined rock material but will not require the use of a substantial amount of any mineral resource, and will not result in the loss of availability of known mineral resources of value to the state, region or locally; therefore, the impact will be less than significant.

4.14.3 MITIGATION MEASURES

None required.

4.14.4 FINDINGS:

The Project will have Less Than Significant Impact on Mineral Resources.

4.15 NOISE

Table 20: Noise Impact Evaluation

XII. NOISE. *Would the project result in:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Generation of a 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 ground borne vibration or ground borne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

4.15.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed 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 ground borne vibration or ground borne noise levels; or (c) be located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

4.15.2 DISCUSSION

Noise levels are measured in decibels (dB), but community noise levels are measured in terms of A-weighted sound level (dBA). The A-weighted scale of frequency sensitivity accounts for the sensitivity of the human ear and is cited in most noise criteria.

The City of Fortuna General Plan 2030 Chapter 8 Health and Safety, Subsection HS-4 Noise provides noise guidelines. The General Plan allows for different levels of noise during the construction phase of the project and during the operational phase of the project. During the construction phase, there are two standards; daytime exterior noise and nighttime exterior noise. During the operational phase of the project (post-construction), the General Plan allows for levels of noise using interior and exterior compatibility standards for residential land uses, with standards of 45 dBA interior and 60 dBA exterior.

The City's General Plan standards for exterior construction noise level impacts to residential land uses are not to exceed 65-dBA during the daytime, and not to exceed 60-dBA during nighttime. Construction noise standards per the General Plan are that construction activities

are to be limited to the hours between 7:00 a.m. to 8:00 p.m., Monday through Saturday, except for emergencies and other special permitted circumstances.

Noise from construction activities on this project will be a function of the noise generated by individual construction equipment items ("Construction Equipment" section of the standards of the Construction Management Plan), the equipment location, and the timing and duration of noise-generated activities. It is important to note that generally all equipment is not operated continuously or used simultaneously. The number, type, distribution, and usage of construction equipment will differ from phase to phase. The noise generated is both temporary in nature and limited in duration by the phase of construction and permitted hours of operation.

Based on this analysis, the project sites will experience noise levels above the 65 dB, "Acceptable" level. This increase will be short-term and temporary and will cease upon completion of construction. To mitigate temporary increases in noise, the following mitigation measure **NOI-1** is recommended.

a) Exposure to Noise in Excess of Established Standards or Substantially Increase Existing Levels – Less Than Significant with Mitigation Incorporation

Construction of the proposed subdivision would temporarily increase ambient noise levels in the project vicinity through the operation of construction equipment associated with grading, roadway and utility installation, and other site improvements. Construction noise would be temporary and would vary depending on the type, location, and duration of equipment operating during each phase of construction.

Sensitive receptors in the vicinity of the project include existing residences to the west, east, and south of the project site. The Norman G. Ambrosini Elementary School is approximately 2,100 feet west of the project site. Construction equipment may generate temporary noise levels exceeding the City's normally acceptable residential noise levels when operating near adjacent residences. However, these increases would be temporary and would cease following completion of construction. To prevent noise disturbance to the community, construction will be limited to 7:30 a.m. to 7 p.m. on weekdays and 9 a.m. to 6 p.m. on weekends and holidays with the permission of the city.

Sound from a point source is known to attenuate at a rate of approximately -6 dB for each doubling of distance under typical urban/suburban conditions (HUD Noise Guidelines). For example, a noise level of 84 dB L_{eq} as measured at 50 feet from the noise source will attenuate to 78 dB L_{eq} at 100 feet from the source and to 72 dB L_{eq} at 200 feet from the source to the receptor. Based on the reference noise levels in Table 3.12-1, the noise levels generated by construction equipment at the project site may reach a maximum of approximately 85 dB L_{eq} at 50 feet during site excavation, vegetation trimming/removal and construction.

Based on these assumptions, the residential areas will experience noise levels above the 65 dB, "Acceptable" level. With implementation of NOI-1, temporary construction noise impacts would be less than significant with mitigation incorporated.

b) Exposure to Ground Borne Vibration or Noise–Less than Significant Impact

Construction will cause temporary vibration in the immediate vicinity of the active portion of the construction site. Vibration will predominantly be caused by trenching equipment, excavation equipment, and compaction equipment. Vibration from on-site construction activities will typically be intermittent and for short durations.

Based upon the types of anticipated construction equipment, and because no pile driving or blasting is needed, ground borne vibration levels produced during project construction are not expected to have a significant impact at neighboring sensitive receptor locations. The restriction of working hours under the mitigation requirements will limit exposure to the impact of equipment-generated vibration during night-time, early morning, and evening hours when people are generally more sensitive to noise and vibration. Therefore, a less than significant impact will occur related to ground borne vibration or ground borne noise levels.

c) Exposure of People Residing or Working Near a Private or Public Airport to Excessive Noise Levels – No Impact

The nearest public airport, the Rohnerville Airport, is located approximately two miles south of the project site. The project will not result in any changes to the noise levels related to an airport or private airstrip. No impact will occur.

4.15.3 MITIGATION MEASURES

NOI-1: Construction Noise Mitigation Procedures

- Construction activities shall be conducted in accordance with the city of Fortuna's applicable construction noise standards and permitted hours. Construction equipment shall be properly maintained and equipped with manufacturer-recommended mufflers or other noise-control devices. Stationary noise-generating equipment shall be located as far as practicable from adjacent residences. Unnecessary idling of construction equipment shall be prohibited. If construction noise complaints are received, the contractor shall identify the source of the complaint and implement reasonable measures, as necessary, to reduce the noise disturbance.

Timing for Implementation/Compliance: During construction of project.

Person/Agency Responsible for Implementation: Developer and construction contractor.

Person/Agency Responsible for Monitoring: Community Development Department staff or designated Construction Observer.

Monitoring Frequency: Daily, for duration of project.

Evidence of Compliance: City inspection and response to substantiated noise complaints, if any.

4.15.4 FINDINGS

The Project will have Less than Significant with Mitigation Incorporation Impact on Noise.

4.16 POPULATION AND HOUSING

Table 21: Population and Housing Impact Evaluation

XIII.POPULATION AND HOUSING. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

4.16.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or (b) displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

4.16.2 DISCUSSION

The project includes a new 29 lot subdivision for future housing, new road including a fire lane, extension of two existing roads, new emergency road access, and the implementation of new utility services. Each lot is designed to house one single-family residence, and provide a frontage dedication for the construction of a sidewalk.

a) Induce Substantial Population Growth – Less Than Significant Impact

The primary objective of the project is to provide a 29-lot subdivision to the city of Fortuna. These lots are intended for single-family residences. With the average number of persons per single-family residences in the United States being 2.5, there could be as many as, if not more than 80 people living in this subdivision. This represents an approximate 0.7% increase in reference to the total population of Fortuna, CA. This does not represent a large increase in the population, thus, less than significant impact is expected. The Fortuna General Plan and Program EIR analyzed the population growth of the City, including the density of the project site at the density in which it is proposed to be developed. The project will not increase the density to a level greater than that analyzed in the General Plan and Program EIR. Additionally, the City is regularly assigned new housing unit allocations through the California Regional Housing Needs Allocation process, and for Cycle 7 the City was allocated over 480 new housing units. These new units will actually serve to help the City meet their RHNA allocation requirements.

b) Displace Housing or People – No Impact

The project will not result in the displacement of any housing or people. No impact will occur.

4.16.3 MITIGATION MEASURES

No mitigation measures are necessary in regards to population and housing.

4.16.4 FINDINGS

The Project will have less than significant impact. Population increase will be minor in reference to the current population in Fortuna, CA. The project purpose is to provide new housing for single-family residence, meaning that displacement of people or housing will not occur.

4.17 PUBLIC SERVICES

Table 22: Public Services Impact Evaluation

XIV. PUBLIC SERVICES. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Fire protection?	☐	☐	☒	☐
b) Police protection?	☐	☐	☒	☐
c) Schools?	☐	☐	☒	☐
d) Parks?	☐	☐	☒	☐
e) Other public facilities?	☐	☐	☒	☐

4.17.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or result in the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for (a) fire protection, (b) police protection, (c) schools, (d) parks, or (e) other public facilities.

4.17.2 DISCUSSION

For fire protection services, the project area is protected by the Fortuna Fire Protection District (FFPD). The FFPD provides structural fire protection and emergency services to the City of Fortuna as well as most of the Planning Area. The FFPD is staffed by the Fortuna Volunteer Fire Department (FVFD), which is comprised of all-volunteer firefighters. The FVFD operates out of three fire stations. The largest station is centrally located on South Fortuna Boulevard, with the two smaller stations located in Hydesville and Campton Heights. CAL FIRE provides wildland fire protection to the forest area within the Planning Area north and east of the City limits that is designated as a State Responsibility Area (SRA). Several mutual aid agreements exist between

the FFPD and other local emergency response agencies in Carlotta, Ferndale, Loleta, Rio Dell, and Scotia.

Police protection services and traffic patrol for the project area and Fortuna City limits are provided by the Fortuna Police Department (FPD). The FPD responded to approximately 14,721 calls in 2008, with an average response time of less than three minutes. The Humboldt County Sheriff Department provides police protection within the Planning Area and along Highway 101 in the City limits.

The school districts serving the project area include the Fortuna Union High School District and Fortuna Union Elementary School District. Fortuna Union High is located on 12th Street. Fortuna Middle School is located on L Street. Norman G. Ambrosini Elementary School is located near the site.

Parks and recreation facilities in the project area include landscaped areas and recreational facilities and equipment at Fortuna Union High School. The Parks and Recreation Department have a shared agreement with Fortuna high school to use gym and school field facilities for community soccer, basketball, and football programs. This partnership allows the community to maximize use of available parks and facilities. Other parks in the vicinity include Chamber Park, Rohner Park, and Newburg Park.

The City of Fortuna library provides information, reading, audio, and visual materials. The present library has reached capacity at 18,000 books and has a monthly circulation around 9,000 books per month. The city has signed a memorandum of understanding between the City of Fortuna and the Humboldt County Library. A Memorandum of Understanding (MOU) transfers all library equipment owned by the City of Fortuna to the County. The Humboldt County Library is responsible for maintenance, supplies, and property insurance of the equipment, whereas the City owns the building and pay for repairs and maintenance.

The City of Fortuna provides public transit to all Fortuna residents through sponsorship of the Humboldt Transit Authority. The City's Parks and Recreation Department operate the "Dial-a-Ride" service for seniors over the age of fifty and disabled persons regardless of age. Two buses are in operation Monday through Friday from 8:30 a.m. to 4:30 p.m. One bus operates on Saturday from 9:00 a.m. to 3:30 p.m.

a, b, c, d, e) Substantial Adverse Physical Impacts Associated with New or Altered Fire or Police Protection, Schools, Parks, or other public facilities – Less Than Significant Impact

As discussed in Section XIII, the project will directly induce population growth and create new demand for services. There are bus stops outside of the subdivision on Rohnerville Road, this impacts the service since they will be expecting more riders. Therefore, the project will have an impact on the service ratios, response times, or other performance objectives of schools, parks, and other public facilities and services that are based on population growth, but the impact will be less than significant. The project will not require new or physically altered government facilities to serve the project site.

4.17.3 MITIGATION MEASURES

No mitigation required.

4.17.4 FINDINGS

The Project will have Less than Significant Impact on Public Services.

4.18 RECREATION

Table 23: Recreation Impact Evaluation

XV. RECREATION. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) 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?	☐	☐	☒	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

4.18.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) 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 (b) include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

4.18.2 DISCUSSION

The City of Fortuna owns and maintains public parks, open spaces, and recreation facilities under the Parks and Recreation Department. The responsibilities of the Parks and Recreation Department include managing and maintaining City parks and recreational facilities, coordinating recreation programs and service club activities that take place at City parks and facilities, and planning for park and recreational facilities demand. The City of Fortuna has 75 acres of community parkland in Rohner, Newburg and 2 mini/pocket parks.

a) Increase in the Use of Existing Facilities Resulting in Substantial Physical Deterioration – Less Than Significant Impact

This project will indirectly influence recreation use as this project is constructing 29 permanent units for people to live in. As many as if not more than, 80 people could live in the proposed unit development. As these homes are specifically for single-family residences, usage of parks will most likely include some significant wear and tear on facilities depending on the increase of children in this new subdivision. Less than significant impact will occur.

b) Development of Recreation Facilities that Could Result in Adverse Physical Effects on the Environment – Less Than Significant Impact

The Project includes a new 29 lot subdivision for single family residences, this will more than likely increase the number of children in the area and the amount of people attending these recreation facilities, resulting in a less than significant impact. Thus, no adverse physical effects are anticipated.

4.18.3 MITIGATION MEASURES

No mitigation required.

4.18.4 FINDINGS

The Project will have Less Than Significant Impact on Recreation.

4.19 TRANSPORTATION/TRAFFIC

Table 24: Transportation/Traffic Impact Evaluation

XVI. TRANSPORTATION / TRAFFIC. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☒	☐	☐
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

4.19.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities; (b) conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b); (c) substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or (d) result in inadequate emergency access.

4.19.2 DISCUSSION:

As proposed, the project site access will be via Rohnerville Road which leads to the side streets of Towhee Street and Gulliksen Drive. Rohnerville Road is also identified as providing primary access throughout the community. The City also conducted surveys of critical intersections and the Rohnerville Road/Redwood Way (a two-way stop controlled) intersection is one the 26 critical intersections analyzed by the City.

Level of Service (LOS) is a quantitative measure that characterizes operation of transportation facilities. Using data relative to volumes, right-of-way (ROW) controls, and lane configurations, the relative experience of drivers using the transportations system can be evaluated. It “grades” the operation of the facility similar to a report card; a LOS of "A" is representative of generally

free-flowing conditions while a LOS of “F” is representative of long delays. The City’s standard is LOS “C” for all City streets, except Main Street where LOS “D” is the minimum.

A Vehicle Miles Traveled (VMT) analysis was prepared for the project by Whitchurch Engineering in May, 2025 This analysis was completed by following the Technical Advisory on Evaluating Transportation Impacts in CEQA which can be found in the attached document (Attachment F). This Advisory identifies that vehicle miles traveled (VMT) is the most appropriate metric to evaluate the transportation impacts on a project. This document states, “The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel” (Reference). In addition, “Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses” (OPR 2018).

VMT and Other Impacts to Health and Environment: Beyond GHG emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel led to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affect other roads users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development that leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways (OPR 2018).

It was determined by CARB that it will not be possible to achieve the State’s 2030 and post-2030 emission goals without reducing VMT growth. In order to meet the long-term climate goals, single-occupancy vehicle activity needs to be reduced. In order to achieve the State’s long-term goals, California needs to reduce per capita VMT and this can occur under CEQA through VMT mitigation. As stated in CARB’s 2017 Scoping Plan: “California’s future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches.” (Id. At p.102, CARB 2017).

“Achieving California’s long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emissions technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into marketplace, (3) plan and build communities to reduce vehicular GHG emissions and provide more transportation options, (4) improve the efficiency and throughput of existing transportation systems.” (OPR 2018).

The purpose of the VMT analysis is to provide City staff and policy makers such as Planning Commissioners and Council members with data that they can use to make an informed decision regarding the potential traffic impacts of the proposed project, and any associated improvements that will be required in order to mitigate these impacts to a level of insignificance as defined by the Fortuna General Plan 2030, or other applicable policies.

The Humboldt Transit Authority (HTA) have two transit services operating within the City of Fortuna. The primary transit services within the study area are the Redwood Transit Service (RTS) mainline, with the RTS Southern Humboldt Intercity transit line operating in the southbound direction from the study area. The RTS main lines provides fixed route services between Scotia, Fortuna, Loleta, Fields Landing, Eureka, Arcata, McKinleyville, Westhaven, and Trinidad seven days per week. Services travel along South Fortuna Boulevard, Redwood Way, Rohnerville Road, and Kenmar Road. Transit stops are currently placed adjacent to Redwood Village Shopping Center along both South Fortuna Boulevard and Redwood Way, and adjacent to the St. Joseph's Drive and Redwood Memorial Hospital.

In addition to the HTA system, the City of Fortuna operates Fortuna Transit, which provides curb-to-curb microtransit to seniors and people with disabilities. In late 2026, before this project will be complete, Fortuna Transit will be launching service to the general public within Fortuna City limits, including each parcel included in this subdivision.

Pedestrian facilities (sidewalks on public streets) are provided in varying coverage throughout Fortuna and already exist on these streets. Of particular note, there are full pedestrian facilities within the proposed subdivision, and full facilities exist within approximately 1.15 miles to access a school, the hospital, a community health clinic, a pharmacy, and a grocery store, among other services. The extended roads will have sidewalk placed on one side, but the opposite side will be up to the owners during development to have sidewalks placed in front of their homes.

a) Conflict with an Applicable Program, Plan, Ordinance, or Policy Establishing Measures of Effectiveness for the Performance of the Circulation System – Less Than Significant with Mitigation Incorporation

Increases in traffic will occur during project construction. The proposed project will generate short-term traffic during construction from transport of heavy construction equipment to and from the project site, truck traffic associated with hauling construction components and materials to the site and removal of debris, and construction workers commuting to and from the site. The temporary increase in traffic will be localized and temporary.

During project construction, truck trips associated with delivery of materials and hauling away of soil and other construction debris will occur. The trips will create a minor impact within the neighborhood immediately surrounding the project site. However, the impact will be short-term, and once construction is completed, all short-term impacts associated with the proposed project will cease. Thus, the impact is less than significant with mitigation measure **TRT-1** incorporated.

Based on the calculated VMT by Whitchurch Engineering, Inc. the Project itself will not generate a significant impact on the LOS of the surrounding road network.

b) Conflict with CEQA Guidelines section 15064.3, Subdivision (b) – Less Than Significant Impact

A project would have potential to have impact on VMT if due to the nature of the project, implementation would otherwise provide no reasonable options for non-motorized transportation. While the City of Fortuna does not have specifically adopted VMT guidance and thresholds for new development or housing projects, there are several relevant standard methods, data sources, and regional policies which collectively can be used to determine the VMT impacts for a project. The methods and policies used in this analysis include:

- Census Block VMT Screening
- Access to Transit Services
- Humboldt County Regional Transportation Plan Policies
- Distance to Key Destinations

Census Block VMT

One common screening method for projects is to review the VMT at the census block level. To perform this screening a review of the data available on the VMTIndex Tool (Fehr & Peers) was used. The project is located within Block Group 06023019023, which is a large block mostly within the County. Per the figure below, the project within the City, at the very edge of the census block.

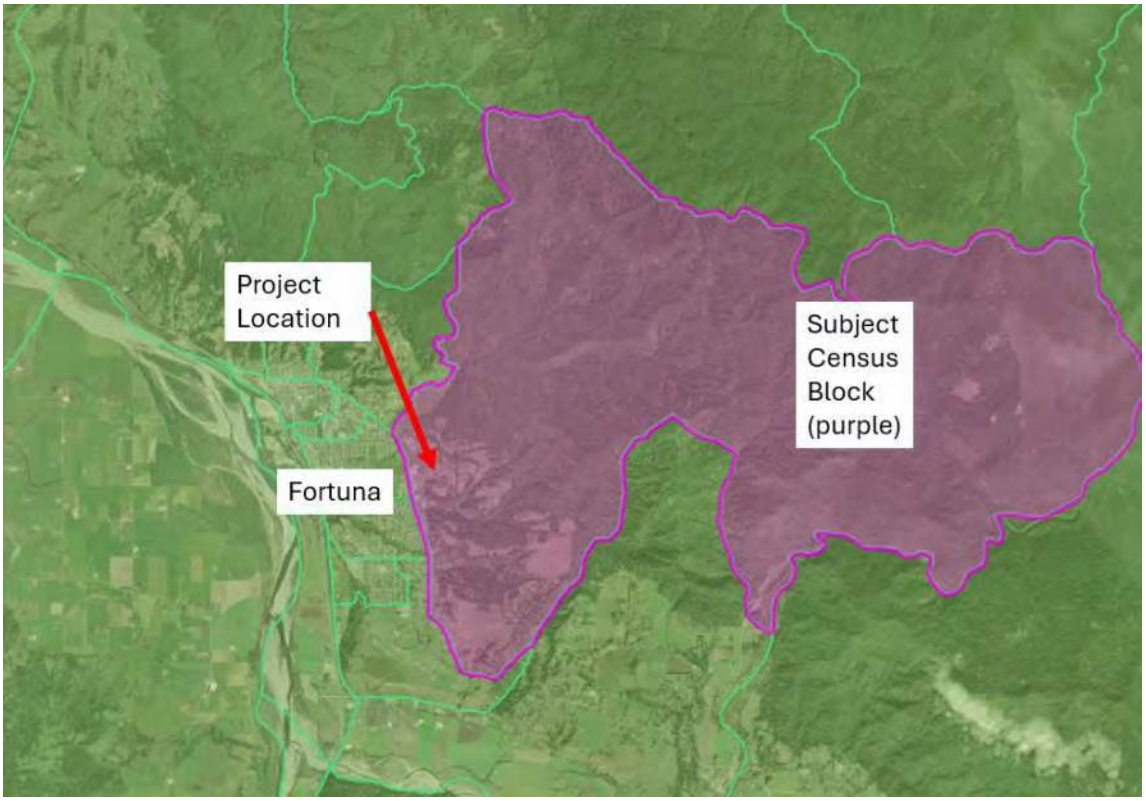


Figure 7: Project location within Subject Census Block Used for VMT Screening.

Using the VMTIndex Tool, the following table summarizes the VMT for the census block and compares it to the City and County (regional) VMT values. These values are then compared to the 15% threshold which is generally accepted as that which results in no significant impacts. Due to the fact that significant majority of the subject census block is within the County and is accessed via other roadways outside of the City, adjacent census block 06023019011 is also included for concept verification/validation. This census block is directly located to the northwest, is composed of residential land use of the same pattern as proposed, and is generally fully within the City limits and access from City roadways.

Table 25: VMT Comparison for Project and Reference Census Blocks.

Location	Total VMT (miles/capita/day)	Work-Based VMT (miles/capita/day)	% Reduction from City Average (Total VMT/Work-Base VMT)	% Reduction form Regional Average (Total VMT/Work-Based VMT)
Census Block 060230109023 (Project Block)	22.5	4.8	-14%/67%	-12%/64%
Census Block 06023019011 (Comparison Block)	16.3	10.9	17%/26%	19%/17%
City Average	19.7	14.7	N/A	N/A
County Average	10.5	13.2	N/A	N/A

As shown in the table above, based on the data from VMTIndex the census block group which the project is located in exhibits work-based VMT values significantly lower than the City or County average, with reductions ranging from 64%-67%. This indicates that residents living in housing units in this census block that have jobs are typically employed locally in Fortuna. The data for total VMT exhibits values higher than the City and County average. It is unclear why these values are higher, and how much the larger nature of the block group may be influencing this result (again, this block group is over 90% in the County). The table above also shows data for census block 06023019011 (the comparison block), which indicates that based on both total- and work-based VMT, residents living within this block typically exhibit VMT's between 17%-20% lower than City and County averages.

Based on the findings from the data and the comparable census block that may more accurately represent vehicular transportation needs in Fortuna, the location of the project appears to be located such that overall per capita reductions to VMT (both work-based and total) could be expected to reduce by 15% or greater.

In addition to the 15% threshold, the project can be compared to the goals outlined in the safe and sustainable transportation targets (Section 2, Table 3) listed in Humboldt's Regional Transportation Plan, VROOM 2026, specifically:

- **Efficiency & Practicality in Locating New Housing iii):** Starting by 2022, new housing development patterns contribute to a countywide reduction in per capita VMT from cars.

The findings of the available VMT data support the policy that this project should be expected to reduce overall regional VMT, by providing for more housing opportunity within existing urbanized areas.

Transit Access

The Project Site is within ½ mile of a transit stop along Rohnerville Road, and most houses would be located within 0.25 – 0.5 miles of the stop. As discussed above, the Redwood Transit System which connects McKinleyville in the north to Benbow in the south. By the time of project completion, Fortuna Transit will also be providing microtransit services within City limits, and therefore each residence within the proposed development will have direct access to the local and regional transit system.

Distance to Critical Destinations and Non-Motorized Infrastructure

In addition to the VMT data and the access to transit, a desktop evaluation was performed highlighting the distance from the project area to key destinations within the City of Fortuna. The table below shows the total distances to each destination, and the type of non-motorized access currently provided.

Table 26: Distance and Non-Motorized Access to Key Destinations from the Project Site.

Destination	Distance from Project Type (Miles)	Fully Connected Pedestrian Facility? (Y/N) and What Type(s)	Fully Connected Bike Facility? (Y/N) and What Type(s)
Hospital, Open Door Community Health and Medical Services	0.60	Yes. Sidewalk enhanced pedestrian crossing, Class 1 Trail	Yes. Class II and III Bike Lanes and Class 1 Trail
Fortuna Senior Center	0.40	Yes. Sidewalk	Yes. Class III Bike Lanes
Newburg Park	1.1	No. Sidewalk for about 50% of the route	Yes. Class II and III Bike Lanes
Grocery Store	1.2	Yes. Sidewalk enhanced pedestrian crossing, Class 1 Trail	Yes. Class II and III Bike Lanes
Pharmacy	1.2	Yes. Sidewalk, enhanced pedestrian crossing, Class 1 Trail	Yes. Class II and III Bike Lanes
Elementary School	0.6	Yes. Sidewalk, enhanced pedestrian crossing	Yes. Class II and III Bike Lanes

As shown in the table above, most services essential to residential housing are located within or just beyond one-mile from the project site. Full pedestrian infrastructure is provided for destinations within one-mile, with the exception of the route to Newburg Park. The City of Fortuna is currently working on an independent project to close that gap along this particular route. There are full existing bike facilities between the project site and the key destinations.

Summary

In summary, the analysis of the project site using publicly available VMT data, the existing transit systems, and the distance and infrastructure between the project site and key

destinations show that the project location provides suitable non-vehicular access to key destinations, and that a housing project at this site would reasonably be assumed to lower City and Countywide VMT.

c) Substantially Increase Hazards due to a Design Feature or Incompatible Use – Less Than Significant Impact

The two main roads in this residential subdivision will both be extended, and a new road will be placed connecting these extended roads. The 2 extended roads and the new road will all have a cul-de-sac at one end of them. The cul-de-sacs will make it more convenient and accessible for drivers to be able to turn around or for any delivery trucks and emergency response vehicles to be able to navigate their way around the subdivision. Gulliksen Drive is a side road off the main road Rohnerville Road, Towhee Street is a side street off Gulliksen Drive, and the proposed new road connecting these two roads is Allen Way.

As discussed above, the presence of construction vehicles and equipment on nearby roadways could increase the normal traffic hazard in the project area. The project will only require traffic safety control procedures onsite to accommodate traffic during construction. Work hours will be confined to 7:00 a.m. to 7:00 p.m. on weekdays, and 9:00 a.m. to 6:00 p.m. on weekends and holidays (if work on weekends and/or holidays is permitted by the City). The impact will be less than significant.

d) Result in Inadequate Emergency Access – Less Than Significant Impact

This proposed subdivision will provide the entire development a secondary emergency access road which will be going West off Allen Way, which is a condition of approval for the subdivision from the Fortuna Volunteer Fire DepartmentThis will allow for residents and emergency response vehicles to have two emergency access roads, Gulliksen Drive and the extension of Allen Way. Thus, a less than significant impact will occur.

4.19.3 MITIGATION MEASURES

TRT-1: Traffic Planning

The Developer and their contractors will be responsible for implementing the following measures to minimize the potential short-term impacts to transportation in the project area during construction:

1. No public traffic routes shall be fully blocked at any time.
2. Workers shall park their privately-owned vehicles at designated locations at the project site to reduce traffic impacts.
3. Temporary parking advisory signs shall be posted at least 24 hours, but no more than 48 hours, in advance of construction.
4. Haul routes shall be utilized by construction trucks to minimize truck traffic on local roadways to the extent possible. When necessary, flaggers and/or signage to guide vehicles through and/or around the construction zone shall be utilized.

5. Truck trips shall be scheduled outside of peak morning and afternoon commute periods to the extent possible.
6. The Developer and their contractorsshall be responsible for ensuring that any affected residents are notified well in advance of any disruption to the transportation infrastructure.

Timing for Implementation/Compliance: During construction.

Person/Agency Responsible for Monitoring: Building Official.

Monitoring Frequency: During construction activities.

Evidence of Compliance: Visual observance by Building Official.

With implementation of the above mitigation measures, potential impacts on traffic, bicycle, and pedestrian circulation attributable to the project will be reduced to a less than significant level.

4.19.4 FINDINGS

The Project will have Less than Significant Impact on Transportation and Traffic with Mitigation Incorporation.

4.20 TRIBAL CULTURAL RESOURCES

Table 27: Tribal Cultural Resources Impact Evaluation

X. TRIBAL CULTURAL RESOURCES. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

4.20.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would be (a) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or (b) a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be

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

4.20.2 DISCUSSION:

A historic resource evaluation of significance was prepared for the Proposed Project area by Archaeological Research and Supply Company. The evaluation included background and archival research, review of previous cultural resource studies, coordination with local tribal representatives, and an archeological field survey of the Project Site. The investigation was conducted to identify historic or prehistoric cultural resources that could potentially be affected by the development of the Proposed Project. The full report can be found in Attachment D.

Background research included consultation with the Bear River Band of the Rohnerville Rancheria and the Wiyot Tribe. No known archaeological or cultural sites within the Project Site were identified through this coordination. Tribal representatives recommended proceeding with the survey due to the cultural sensitivity of the surrounding area and requested an opportunity to review the archaeological report. Records research also identified four previous surveys and one previously recorded historic resource within one-half mile of the Project Site; however, no previously recorded archaeological resources were identified within the Project Site.

The archaeological field survey included areas of existing disturbance as well as approximately 600-foot buffers and slopes of less than 35 percent. Ground visibility was generally limited, ranging from approximately 25 to 50 percent. Where vegetation obscured the ground surface, shovel probes and surface scrapes were conducted at approximately 15-meter intervals to supplement the pedestrian survey.

No significant historic or prehistoric cultural resources were identified during the field investigation. One isolated piece of chert debitage was observed and recorded. The isolated artifact was documented to contribute to the broader understanding of prehistoric land-use patterns; however, it was not determined to represent a significant archaeological resource. The investigation therefore concluded that no significant archaeological deposits or cultural resources were identified within the Project Site.

The Project Site has been subject to previous land-use activities that may have disturbed or altered evidence of prehistoric occupation. Although it is possible that archeological materials could have been affected by these previous disturbances, the professional archaeological survey did not identify evidence of a significant archaeological deposit. Based on the records search, tribal coordination, filed investigation, and evaluation of the isolated chert flake, the archaeological report concluded that the proposed Project would not adversely affect known significant historic or prehistoric cultural resources.

4.20.3 MITIGATION MEASURES

No additional archaeological investigation is recommended prior to Project development. However, because previously unidentified subsurface cultural resources may be encountered during ground-disturbing activities, the inadvertent discovery procedures identified in the archaeological report shall be implemented during construction. If buried archaeological resources are encountered, work shall cease within 100 feet of the discovery and a qualified professional archaeologist and appropriate tribal representative(s) shall be contacted to evaluate the resource and determine the appropriate course of action. If human remains are encountered, work shall cease in the vicinity of the discovery and Humboldt County and the County Coroner shall be contacted in accordance with applicable requirements. For a full breakdown and guidance on each scenario refer to the full report in Attachment D.

4.20.4 FINDINGS

The project will have Less Than Significant Impact on Tribal Cultural Resources.

4.21 UTILITIES AND SERVICE SYSTEMS

Table 28: Utilities and Service Systems Impact Evaluation

XVII.UTILITIES AND SERVICE SYSTEMS. *Would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management, and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

4.21.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the

construction of relocation which could cause significant environmental effects; (b) have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years; (c) result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments; (d) generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; or (e) comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

4.21.2 DISCUSSION

The City has prepared master plans for the infrastructure in the project area, including water and sewer and roadways through the General Plan, zoning ordinance, Capital Improvement Plan, and Storm Drainage Master Plan. In addition, Whitchurch Engineering has made a water model using Environmental Protection Agency Network Evaluation Tool (EPANET2) to determine the effects of the Project on the water and wastewater facilities of the City.

The storage of existing water sources, connection of pressure zones and improvement of existing fire suppression services will not conflict with applicable plans, policies, or regulations. City of Fortuna service providers have been contacted regarding the project and have indicated the ability to provide services. Additionally, Whitchurch Engineering has found through EPANET model that the existing wastewater and potable water systems are adequately sized to service the proposed project. Therefore, the existing water system also has adequate capacity to meet the domestic and irrigation demands of the proposed development.

The General Plan encourages in-filling where existing facilities and services are already available.

The City Wastewater Treatment Plant (WWTP) currently treats 1.0 million Gallons per Day (MGD) during the dry weather season (June through September), and an average of 1.9 MGD annually (wet and dry weather flows). The recently upgraded WWTP has an average dry weather capacity of 1.5 MGD, and a wet weather capacity of up to 7 MGD. The WWTP can accommodate services for approximately 18,000 – 20,000 people, based on recent design projections from the City's wastewater treatment plant upgrade project.

Additionally, Whitchurch Engineering EPANET modeling indicated that the City's existing water conveyance system has adequate capacity to meet the demands of the proposed development. Based upon this analysis, the provided water storage is sufficient for 1 hour of flow the proposed subdivision infrastructure will be sufficient to provide adequate water to serve domestic and fire needs (Attachments H and I)

The overall current storage capacity of the City's water system is approximately 7.5 MG. The city's water supply is limited by water rights. According to the Humboldt County Capital Facilities Technical Report, the city is extracting approximately 75 percent of its groundwater allocation under current rights. The city has approximately 1,489 connections available before it will need to apply for additional water rights

The waste stream generated in the City of Fortuna totals approximately 7,000 tons per year, and includes household, commercial, construction, and garden refuse material, as well as recycling.

The City of Fortuna contracts with Eel River Disposal and Resource Recovery Inc. (ERD) for municipal solid waste collection services. ERD has been in operation for more than 20 years and offers Fortuna residents weekly garbage pickup and bi-weekly curbside recycling of paper, cardboard, plastic, glass, and metal. Solid waste from the ERD transfer station is transported out of Humboldt County to the Dry Creek Landfill in Medford, Oregon or Anderson Landfill in Anderson, California.

Electricity at the Project Site is currently provided by PG&E, however new services will be needed for the subdivision and road extensions. The Project would use existing electrical service and a proposed electrical upgrade from PG&E to power the new subdivision.

Water and Sewer would be provided by the City of Fortuna. Internet and communication services would be provided the choice of the owner.

a) Require Construction or Expansion of New Water, Wastewater Facilities and New Stormwater Facilities – Less Than Significant Impact

Based on the preliminary analysis of the current City of Fortuna infrastructure through the analysis of the provided EPANET model (included in the Appendix), the project water system design is anticipated to provide adequate residential and fire flow consistent with the pressures and flows found at existing portions of the site. As part of the final design and improvement plans for the project, the developer will be required to demonstrate that the water supply and pressure to the entire system will be adequate and approval from the City's Engineering Department and the Fortuna Volunteer Fire Department will be a condition of approval.

For the sewer conveyance system, based on the City's 2024 Sewer System Master Plan this project is located in a sewer shed that in the developed condition (which assumed buildout of the existing phases of the project) there is both adequate wet and dry weather capacity to serve the additional residential units. As sewer loadings from an additional 29 residences will not result in a significant increase to either dry or wet weather loading within this sewer shed, this is anticipated to be the finding for the developed condition as well. As part of the final conditions of approval for the project during the improvement plan phases, a final analysis will be required to verify that the final two phases of the project will be able to be safely conveyed by the City's existing sewer system.

As noted above there is more than adequate capacity in the wastewater treatment system to serve the project. Each new sewer connection for the project will be required to pay capital connection fees, which serves as the impact fee to help fund any improvements required to service the expanded loads.

Storm drain systems that service the project, including drainage inlets, swales, pipes, and stormwater retention/detention ponds, will be designed and constructed as needed to service

the development and meet State MS-4 and City of Fortuna design standards. New stormwater utilities long term maintenance will be funded through an assessment benefit district.

Utilities are present along roadway frontages and would be extended to the site via the access roads. Utility requirements for the Project, including electrical, telecommunication, water, and sewer are within the existing capacity of service providers. Off-site utilities would not need to be relocated or expanded as a result of the Project. The impact would be less than significant.

b) Have Sufficient Water Supplies to Serve the Project – No Impact

c) With the number of residential units being added to the City as part of the project, there is only anticipated to be an approximate increase in water use of less than 0.06%. Based on this finding, and the findings from the City's 2026 Urban Water Management Plan project will not require an increase in the capacity or result in overloading of the City's water system. No additional water supply is necessary to serve the proposed project. No impacts will occur as part of this project. Exceed Applicable Wastewater Treatment Requirements or Wastewater Treatment Capacity – Less Than Significant Impact

The project consists of development pursuant to the General Plan and Zoning Designation at a density and intensity of use which was considered in the City of Fortuna utility Master Plans. The Master Plan identifies long term capacity improvements which may be needed to accommodate anticipated development. Wastewater generated at the Project would be within the existing capacity of the Fortuna wastewater treatment plant. A need to expand wastewater facilities would not result from this project. The impact would be less than significant.

d) Have Sufficient Landfill Capacity– Less Than Significant Impact

Construction of the Project would result in a temporary increase in solid waste disposal needs associated with construction waste. Construction wastes would include, but not be limited to, excavated soils. Construction waste with no practical reuse or that cannot be salvaged or recycled would be legally disposed of at a local transfer station. Active permitted in-County transfer stations include the Humboldt Waste Management Authority (HWMA) facilities in Eureka or Samoa, California and the Recology Eel River Transfer Station in Fortuna, California. Solid waste generated by the Project would represent a small fraction of the daily permitted tonnage of these facilities. This would be a less than significant impact on landfill capacity with the implementation of federal, state, and local statutes and regulations related to solid waste. Therefore, the Project's construction-related solid waste disposal needs would be sufficiently accommodated by existing landfills, and the impact would be less than significant.

Following construction, the Project operation would not generate significant additional solid waste. No operational impact would occur.

According to the Humboldt County General Plan Update Revised Draft EIR, Eel River Disposal manages the transport of self-hauled and non-HWMA member waste, as well as waste received at the Redway Transfer Station. Solid waste is transported for disposal to the Anderson Landfill for disposal by Eel River Disposal, and Alves Inc. also hauls residual waste from its operation to Anderson. This landfill is not expected to close until 2036. Therefore, the Project would be

served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs. (Humboldt County, 2017; p.3.3-35).

e) Comply with Statutes Related to Solid Waste – Less Than Significant Impact

The project will generate a small volume of construction waste that will be hauled by the construction contractor to an approved disposal site. Waste will include construction materials remnants, replaced materials, and worker-generated trash and debris. This will be a less than a significant impact.

The California Integrated Waste Management Act of 1989 (Public Resources Code Division 30), enacted through Assembly Bill (AB) 939 and modified by subsequent legislation, required all California cities and counties to implement programs to divert waste from landfills (Public Resource Code Section 41780). Compliance with AB 939 is determined by the Department of Resources, Recycling, and Recovery (Cal Recycle), formerly known as the California Integrated Waste Management Board (CIWMB). Each county is required to prepare and submit and Integrated Waste Management Plan for expected solid waste generation within the county to the CIWMB. In 2010, the State legislature passed AB 341 (Chesbro) which set a statewide recycling goal of 75% by 2020 which is anticipated to be achieved through source reduction, recycling, and continued diversion of materials such as organic wastes. According to the Humboldt County General Plan Update Revised Draft EIR, the 2014 waste diversion rate for the unincorporated area of the county was 79 percent (Humboldt County, 2017; p.3.3-36).

The Project would comply with all federal, state, and local statutes related to solid waste, including AB 939. This would include compliance with the Humboldt Waste Management Authority's recycling, hazardous waste, and composting programs in the county to comply with AB 939. Therefore, the Project would not violate any federal, state, and local statutes and regulations related to solid waste. Additionally, the City is working to implement solid waste requirements under SB 1383, including setting up mandatory curbside pickup, and handling for organic waste as well as solid waste and recyclables. As this project is within the City, its future residences will be subject to this requirement.

4.21.3 MITIGATION MEASURES

No mitigation required.

4.21.4 FINDINGS

The Project will have Less Than Significant Impact on Utilities and Service Systems. Current infrastructure is adequately sized to service the proposed project.

4.22 WILDFIRE

Table 29: Wildfire Impact Evaluation

XVIII. WILDFIRE. *If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:*	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes	☐	☐	☒	☐

4.22.1 THRESHOLDS OF SIGNIFICANCE

This Initial Study considers to what degree, if any, the Proposed Project would (a) substantially impair an adopted emergency response plan or emergency evacuation plan; (b) due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; (c) require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or (d) expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

4.22.2 DISCUSSION:

The City of Fortuna does not have an adopted emergency response plan or evacuation plan. The project site is located within a suburban area. As of 2025 the project site is located in a Moderate fire Hazard Severity Zone by the State Fire Marshal. For fire protection services, the project area is protected by the Fortuna Fire Protection District (FFPD). The FFPD provides structural fire protection and emergency services to the City of Fortuna as well as most of the Planning Area. The FFPD is staffed by the Fortuna Volunteer Fire Department (FVFD), which is comprised of all-volunteer firefighters. The FVFD operates out of three fire stations. The largest station is centrally located on South Fortuna Boulevard. The closest station to the project site is located on 3050 School Street and that is the Fortuna Volunteer Fire Department Campton

Heights Station. The project area is not located in a wildfire severity zone, according to the map the zone is moderate for this area. (Humboldt County, 2025). The project site is not located in an area subject to flooding, landslides, slope instability, or drainage changes. The site will add an addition of a fire emergency access road to the area. The impact would be less than significant.

a) Impair an Adopted Emergency Response Plan – Less Than Significant with Mitigation Incorporation

The project will implement a second emergency road access to the site, therefore having Less than a Significant Impact with Mitigation Incorporated for substantially impairing an adopted emergency response plan or emergency evacuation plan.

b, c, d) Pollutant Concentrations from a Wildfire, Require Installation of Maintenance of Associated Infrastructure that Exacerbates Fire Risk, Expose People or Structures to Significant Risks— Less Than Significant Impact

The project would not exacerbate fire risks due to slope, prevailing winds, and other factors, and thereby expose project occupants to, pollutant concentrations from a wildfire of the uncontrolled spread of a wildfire. Would also not require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. Furthermore, the project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. This will have Less Than a Significant Impact.

4.22.3 MITIGATION MEASURES

A second emergency access road will be implemented because the number of homes and people are increasing by this new 29 lot subdivision.

4.22.4 FINDINGS

The project will have Less Than Significant Impact with Mitigation Incorporation for adopting an emergency response/evacuation plan. The project will have Less Than Significant Impact on Wildfire.

4.23 MANDATORY FINDINGS OF SIGNIFICANCE

Table 30: Mandatory Findings of Significance Impact Evaluation

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE.	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number, or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).	☐	☒	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

4.23.1 DISCUSSION

a, c) Degrade Environmental Quality or Adversely Affect Human Beings – Less Than Significant with Mitigation Incorporation

With implementation of the Mitigation Measures presented herein, the project as a whole does not have the potential to significantly degrade the quality of the environment, including air quality, fish or wildlife species or their habitat, plant or animal communities, important examples of the major periods of California history or prehistory, geologic resources, hazards, water resources, land use compatibility, noise, traffic movement, or other adverse effects, directly or indirectly, on human beings.

b) Cumulatively-Considerable Impacts – Less Than Significant Impact with Mitigation Incorporation

The project's individual impacts will not add appreciably to any existing or foreseeable future significant cumulative impact, such as visual quality, historic resources, traffic impacts, or air quality degradation. Incremental impacts, if any, will be negligible and undetectable. As reported throughout this document, cumulative impacts to which this project will contribute will be mitigated to a less than significant level.

4.24 Determination

This Initial Study has determined that in the absence of mitigation the proposed Project could have the potential to result in significant impacts associated with the factors checked below. Mitigation measures are identified in this Initial Study that will reduce all potentially significant impacts to less-than-significant levels.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology/Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☒ Hydrology/Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☒ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☒ Transportation/Traffic	☒ Tribal Cultural Resources	☐ Utilities / Service Systems
☐ Mandatory Findings of Significance		

On the basis of this Initial evaluation: There are no significant impacts which could not be mitigated to results in less-than-significant levels. The proposed Project does not fall under the requirements to result in an Environmental Impact Report.

5 MITIGATION SUMMARY

AQ-1: Dust Measure Controls. During construction activities, the minimum dust control measures identified in Section 4.4.8 shall be implemented, including watering exposed surfaces; covering trucks transporting loose materials; removing track-out from public roads; completing pavement as soon as possible; limiting equipment idling; maintaining construction equipment in accordance with manufacturer specifications; and posting contact information for dust complaints.

BR-1: Compliance with Army Corps Nationwide Permit.

BR-2: Creek and Wetland Setbacks. Maintain the 50-foot setback from Strongs and Jameson Creeks' top of bank. Maintain a 50-foot buffer around delineated wetlands.

BR-3: Migratory Bird Protection. If construction or vegetation removal occurs during the breeding season of March 1 through August 15, a preconstruction nesting survey shall be performed.

CR-1: Cultural Resource Inadvertent Discovery Protocol. If suspected archaeological or cultural resources are encountered during project construction, all work shall stop within 100 feet of the discovery. A qualified professional archaeologist and appropriate tribal representative(s), shall be contacted to evaluate the find and recommend appropriate next steps. Work within the stop-work area shall not resume until the discovery has been evaluated and authorization to proceed has been provided by the qualified professional and tribal representative(s).

If human remains are encountered work, in the vicinity shall stop immediately and the Humboldt County coroner shall be contacted. If the remains are determined to be Native American, the corner shall contact the Native American Heritage Commission, and the applicable most likely descendant procedures shall be followed before work resumes in the affected area.

CUL-2: Paleontological Resource Inadvertent Discovery Protocol. An inadvertent discovery protocol for paleontological resources shall be implemented during project construction to prevent the inadvertent damage or destruction of fossils or other unique paleontological resources that may be encountered during ground-disturbing activities.

GS-1: Construction Erosion-Control BMPs. Implement standard construction BMPs in accordance with a standard Caltrans SWPPP to reduce erosion of exposed soil and minimize sediment entrained in site runoff during construction.

HWQ-1: Prepare and Implement SWPPP and BMPs. The City shall ensure that a SWPPP is prepared and implemented for the project prior to construction and during construction. At a minimum, the contractor shall implement the materials management, waste disposal, spill prevention and response, erosion-control, non-stormwater discharge, sanitary waste, vehicle fueling, vehicle cleaning, vehicle maintenance, and other applicable BMPs identified in Section 4.11.3, or equivalent measures contained in the approved SWPPP.

NOI-1: Construction Noise Mitigation Procedures. The contractor shall prepare a final Construction Management Plan (FMCP) to minimize temporary construction noise impacts on surrounding residences. Pile driving shall not be used. Construction shall be limited to 7:30 AM to 7:00 PM on weekdays and 9:00 AM to 6:00 PM on weekends and holidays with City permission. The FMCP shall also include the complaint-response and construction-noise-reduction procedures identified in Section 4.14.3.

TRT-1: Traffic Planning. The Developer and their contractors shall be responsible for implementing measures to minimize temporary construction-related transportation impacts. Public traffic routes shall not be fully blocked; worker vehicles shall use designated parking areas; temporary parking advisory signs shall be posted in advance when necessary; construction haul routes shall be used to minimize truck traffic on local roads; truck trips shall be scheduled outside peak commute periods if possible; and the Developer and their contractors shall ensure that affected residents are notified in advance of disruptions to transportation infrastructure.

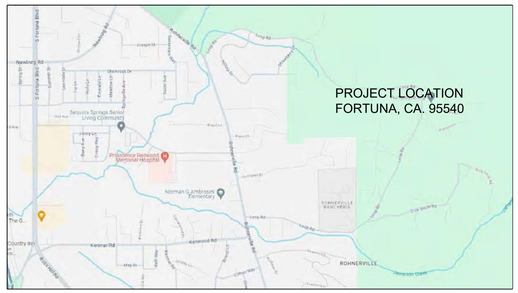
Wildfire/Emergency Access. A second emergency access road shall be implemented to provide additional emergency access for the proposed 29-lot subdivision.

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Attachment A: Proposed Site Plan Sheets



VICINITY MAP

NO SCALE

NORTH

OWNER/APPLICANT:
WENDT CONSTRUCTION
3651 ROHNERVILLE ROAD
FORTUNA, CA. 95540

PROJECT ENGINEER:

DEREK C. LONG PE, PMP
WHITCHURCH ENGINEERING
610 9th STREET
FORTUNA, CA. 95540
(707) 725-6926
dcl@whitchurchengineering.com

SOILS CONSULTANT:
A.M. BAIRD ENGINEERING &
SURVEYING
1257 MAIN STREET
FORTUNA, CA. 95540

IT IS EXPRESSLY UNDERSTOOD THAT APPROVAL OF THESE IMPROVEMENT PLANS BY THE CITY OF FORTUNA SHALL NOT RELIEVE EITHER THE ENGINEER OF RECORD FROM THE RESPONSIBILITY FOR ANY ERRORS OR OMISSIONS, OR THE CONTRACTOR OF ANY RESPONSIBILITY FOR THE SUCCESSFUL COMPLETION OF THE WORK IN CONFORMITY WITH THE REQUIREMENTS OF THESE IMPROVEMENT PLANS AND SPECIFICATIONS. APPROVAL OF THESE IMPROVEMENT PLANS BY THE CITY OF FORTUNA SHALL NOT OPERATE TO WAIVE ANY OF THE REQUIREMENTS OF THESE IMPROVEMENT PLANS AND SPECIFICATIONS, OR RELIEVE THE CONTRACTOR OF ANY OBLIGATION THEREUNDER AND DEFECTIVE WORK, MATERIALS, AND EQUIPMENT MAY BE REJECTED NOTWITHSTANDING THIS APPROVAL.

APPROVED BY:

_____ Dated _____
PG&E

_____ Dated _____
AT&T

_____ Dated _____
Optimum Communications

_____ Dated _____
Soils Consultant

_____ Dated _____
City of Fortuna Building Official

_____ Dated _____
City of Fortuna Compliance Coordinator

_____ Dated _____
City Of Fortuna Public Works Director

_____ Dated _____
City Of Fortuna City Engineer

_____ Dated _____
City Of Fortuna City Planner

_____ Dated _____
City Of Fortuna Postmaster

_____ Dated _____
Fortuna Volunteer Fire Department

SHEET INDEX

1 COVER/NOTES/ABBREVIATIONS/APPROVALS
2 CONSTRUCTION NOTES (CONTINUED)
3 OVERALL LOT LAYOUT
4 ALLEN WAY PLAN & PROFILE STA. 0+00 TO STA. 8+00
5 ALLEN WAY PLAN & PROFILE STA. 8+00 TO STA. 11+89
6 ALLEN WAY CROSS SECTIONS
7 GULLIKSEN DR. PLAN & PROFILE STA. 42+13.36 TO STA. 48+40.80
8 GULLIKSEN DR. CROSS SECTIONS
9 TOWHEE PLAN & PROFILE
10 TOWHEE CROSS SECTIONS
11 STANDARD SEWER DETAILS
12 STANDARD SEWER DETAILS
13 STANDARD WATER DETAILS
14 STANDARD WATER DETAILS
15 MISCELLANEOUS DETAILS
16 MISCELLANEOUS DETAILS
17 MISCELLANEOUS DETAILS
18 DRAINAGE STRUCTURES PRELIMINARY GRADING

A) GENERAL NOTES:

1. CONTRACTOR SHALL SECURE AN ENCROACHMENT PERMIT FROM THE CITY OF FORTUNA DEPT OF PUBLIC WORKS PRIOR TO ANY STREET IMPROVEMENT WORK OR UTILITY INSTALLATION WORK WITHIN CITY RIGHT OF WAY.

2. ALL CONSTRUCTION, MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE MOST CURRENT EDITION OF THE CALIFORNIA BUILDING CODE, MOST CURRENT EDITIONS OF THE CALIFORNIA PLUMBING AND MECHANICAL CODES, AND ALL APPENDICES THERETO, CALTRANS STANDARD PLANS & SPECIFICATIONS, 2018 EDITION & CITY OF FORTUNA STANDARDS.

3. THE CONTRACTOR SHALL PROVIDE WORKMANS COMPENSATION INSURANCE & LIABILITY INSURANCE.

4. THE CONTRACTOR SHALL GUARANTEE ALL LABOR AND MATERIAL FOR A MINIMUM OF ONE YEAR.

5. THE GENERAL CONTRACTOR SHALL COMPARE ALL PAGES OF THE PLANS, AND VERIFY ALL THE SITE CONDITIONS AND DIMENSIONS DEPICTED IN THE PLANS BEFORE STARTING WORK AND PRIOR TO ORDERING ANY MATERIALS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.

6. THE CONTRACTOR SHALL TAKE CARE WHEN EXPOSING EXISTING UTILITIES. HAND TOOLS AND PROBES SHALL BE UTILIZED WHEN WITHIN TWO FEET OF THE ANTICIPATED DEPTH OR LOCATION.

7. THE DESIGN CONSULTANTS ASSUMES NO RESPONSIBILITY FOR THE PERFORMANCE OF PRODUCTS OR MATERIALS NOT SPECIFIED IN THESE DRAWINGS.

8. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DRAWINGS. WHERE DISCREPANCIES OCCUR NOTIFY THE OWNER'S REPRESENTATIVE FOR CLARIFICATION.

9. ACCEPT NO INK OR PENCIL CORRECTIONS TO THESE DRAWINGS WITHOUT THE OWNER'S REPRESENTATIVE INITIAL OR SIGNATURE. THE DESIGN CONSULTANTS SHALL BE HELD HARMLESS FOR ALL CHANGES NOT IN CONFORMANCE WITH THIS PROVISION.

10. ALL USERS OF THESE DRAWINGS AGREE BY USING THESE DRAWINGS TO HOLD THE DESIGN CONSULTANTS HARMLESS FOR ANY AND ALL WORK THAT DOES NOT CONFORM TO THE REQUIREMENTS AND MINIMUM STANDARDS OF THE C.B.C., ORDINANCES, AND ACCEPTABLE STANDARDS.

11. THESE DRAWINGS ARE THE PROPERTY OF THE DESIGN CONSULTANTS AND ARE NOT TO BE USED IN PART FOR ANY WORK OTHER THAN THE LOCATION SHOWN HEREON.

12. THE DESIGN CONSULTANTS AND CITY OF FORTUNA SHALL HAVE NO CONTROL OR CHARGE OF AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES FOR ANY SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK.

13. THESE GENERAL CONDITIONS SHALL APPLY TO ALL SECTIONS WITHIN THESE PLANS. ALL WORK AND MATERIALS NOT SPECIFICALLY COVERED HEREIN SHALL CONFORM TO THE PROVISIONS OF CALTRANS STANDARD PLANS & SPECIFICATIONS, 2018 EDITION & CITY OF FORTUNA STANDARDS. ALL WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER. WHERE BRAND NAMES ARE USED ON THE PLANS, THEY ARE USED ONLY AS A STANDARD FOR QUALITY AND FUNCTION. PRODUCTS OR PROCESSES OF COMPARABLE QUALITY AND FUNCTION MAY BE SUBSTITUTED ONCE THEY HAVE BEEN APPROVED BY THE ENGINEER OF RECORD AND ACCEPTED BY THE CITY ENGINEER.

14. THE CONTRACTOR SHALL COMPLY WITH ALL OF THE APPLICABLE REQUIREMENTS OF THE FEDERAL WILLIAMS - STEIGER OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) OF 1970 AND ANY AMENDMENTS THERETO. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, C.O.F. AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER OR C.O.F. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SITE SAFETY REQUIREMENTS.

15. UPON COMPLETION OF THE SUBDIVISION, THE CONTRACTOR AND SUBCONTRACTORS SHALL REMOVE SURPLUS MATERIALS AND DEBRIS FROM THE SITE. CONTRACTOR SHALL REMOVE ALL DELETERIOUS MATERIAL FROM SITE INCLUDING BUT NOT LIMITED TO BROKEN CONCRETE, STUMPS, ROCKS, DEBRIS, ASPHALT RUBBLE, GARBAGE, ETC. AND LEGALLY DISPOSE OF ALL MATERIALS.

16. CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS ON OR ADJACENT TO PROJECT SITE. CONTRACTOR SHALL REPAIR OR REPLACE ALL DAMAGE TO EXISTING IMPROVEMENTS TO THE SATISFACTION OF CITY OF FORTUNA PUBLIC WORKS OR PRIVATE PROPERTY OWNER INVOLVED.

17. CONTRACTOR TO OBTAIN APPROVAL IN WRITING FROM THE ENGINEER OF RECORD PRIOR TO DEVIATING FROM THE PLANS WITH NOTICE FOWARDED TO THE CITY ENGINEER. CONTRACTOR SHALL PROVIDE MARKED UP DRAWINGS TO THE ENGINEER OF RECORD AND THE CITY OF FORTUNA ENGINEER.

18. CONTRACTOR SHALL PROVIDE (UNDER SEPARATE CONTRACT WITH A CIVIL ENGINEER OR SURVEYOR) ALL CURB AND HORIZONTAL AND VERTICAL CONTROL STAKES. CONTRACTOR SHALL SUBMIT STAKING NOTES TO THE CITY ENGINEERING DEPARTMENT FOR REVIEW AND ACCEPTANCE PRIOR TO STARTING ANY EARTHWORK OPERATIONS. CONTRACTOR SHALL VERIFY PROPERTY LINE LOCATION PRIOR TO CONSTRUCTION OF ANY IMPROVEMENTS. CONTRACTOR SHALL PROTECT ALL STAKES, ANY RE-STAKING REQUIRED DUE TO LOST OR DAMAGED STAKES WILL BE AT WILL BE AT THE EXPENSE OF THE CONTRACTOR.

19. CONTRACTOR SHALL NOTIFY CITY OF FORTUNA PUBLIC WORKS, AND ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE OF QUALITY CONTROL INSPECTION TESTING. ALL BURIED UTILITIES SHALL BE INSPECTED AND TESTED PRIOR TO BACKFILL OPERATIONS.

B) SITE PREPARATION & EARTHWORK:
ALL EARTHWORK SHALL COMPLY WITH THE PROVISIONS OF CHAPTERS 18 AND 33 OF THE CBC 2022 EDITION, AND THE COMPLETED SOILS REPORT BY A.M. BAIRD ENGINEERING DATED OCTOBER 6, 2005 AND ANY ADDENDA THERTO.

1. EXCAVATION - EXCAVATION SHALL INCLUDE ALL EXCAVATION REQUIRED FOR ROAD AND/OR SITE WORK UNLESS OTHERWISE SPECIFIED. CUT SLOPES SHALL NOT EXCEED 2 (TWO) HORIZONTAL TO 1 (ONE) VERTICAL.

2. SUBBASE- SUBBASE SHALL BE WELL GRADED RIVER RUN GRAVEL OR OTHER MATERIAL APPROVED BY THE ENGINEER. SUBBASE MATERIAL SHALL CONFORM TO THE REQUIREMENTS FOR CLASS 3 MATERIAL AS STATED IN SECTION 25-1.02A OF THE CALTRANS STANDARDS SPECIFICATIONS. FILL SHALL BE COMPACTED TO 95% RELATIVE COMPACTION. FILL SHALL BE PLACED AND COMPACTED IN 8 INCH LAYERS. ADDITIONAL TESTING MAY BE REQUIRED BY THE ENGINEER. SUCH TEST SHALL COMPLY CONFORM TO ASTM TEST METHOD D 1557. SEE AGGREGATE GRADING REQUIREMENT CHART, CLASS 3 ON SHEET 2.

3. BASE - PAVEMENT BASE AND BASE UNDER CONCRETE SHALL BE CLASS 2 AS SPECIFIED BY CALTRANS. BASE MATERIAL SHALL BE PLACED IN 6" THICK MAXIMUM UNIFORM LAYERS AND COMPACTED TO 95 PERCENT RELATIVE DENSITY.

4. STRUCTURAL BACKFILL - STRUCTURAL BACKFILL SHALL BE PLACED IN 8 INCH THICK MAXIMUM UNIFORM LAYERS. COMPACTION EQUIPMENT OR METHODS WHICH MAY CAUSE DISPLACEMENT OR DAMAGE STRUCTURES SHALL NOT BE USED. NO BACKFILL MATERIAL SHALL BE DEPOSITED AGAINST CAST-IN-PLACE CONCRETE STRUCTURES UNTIL THE CONCRETE HAS DEVELOPED A STRENGTH OF NOT LESS THAT 1500 P.S.I COMPRESSIVE STRENGTH. STRUCTURAL BACKFILL SHALL CONFORM TO THE REQUIREMENTS STATED WITHIN SECTION 19-3.06 OF THE CALTRANS STANDARD SPECIFICATIONS.

5. PERMEABLE MATERIAL (FILTER GRAVEL) - PERMEABLE MATERIAL SHALL CONFORM TO THE REQUIREMENTS FOR PERMEABLE MATERIAL AS PROVIDED FOR WITHIN 68-1.025 OF THE CALTRANS STANDARD SPECIFICATIONS. SEE CLASS 2 CHART SHEET 2.

6. THE CONTRACTOR SHOULD LOCATE ALL MONITORING AND/OR ON-SITE WATER WELLS. ALL WELLS SCHEDULED FOR DEMOLITION SHOULD BE ABANDONED PER STATE AND LOCAL REQUIREMENTS. ANY WELL (WATER OR MONITORING) THAT FALLS WITHIN THE ROADWAY SHOULD BE ABANDONED. THE CONTRACTOR SHOULD OBTAIN AN ABANDONMENT PERMIT FROM THE LOCAL ENVIRONMENTAL HEALTH DEPARTMENT, AND ISSUE CERTIFICATES OF DESTRUCTION TO THE OWNER AND THE SOILS CONSULTANT UPON COMPLETION.

7. ALL TOPSOIL, VEGETATION, ORGANICS, AND DEBRIS SHOULD BE REMOVED FROM THE PROPOSED BUILDING AND PAVEMENT AREAS. THE GENERAL DEPTH OF STRIPPING SHOULD BE SUFFICIENTLY DEEP TO REMOVE THE ROOT SYSTEMS AND ORGANIC TOPSOILS. FOR ESTIMATE PURPOSES, A MINIMUM STRIPPING DEPTH OF 6 INCHES SHOULD BE USED. THE ACTUAL DEPTH OF STRIPPING SHOULD BE REVIEWED BY THE SOILS CONSULTANT AT THE TIME OF CONSTRUCTION. DEEPER STRIPPING MAY BE REQUIRED IN LOCALIZED AREAS. STRIPPING SHOULD EXTEND LATERALLY A MINIMUM OF 10 FEET OUTSIDE THE PAVEMENT PERIMETERS. THESE MATERIALS WILL NOT BE SUITABLE FOR USE AS ENGINEERED FILL; HOWEVER, STRIPPED TOPSOIL MAY BE STOCKPILED AND REUSED IN LANDSCAPE AREAS AT THE DISCRETION OF THE OWNER.

8. ALL UTILITY LINES SHOULD BE LOCATED. THOSE UTILITY LINES NOT ANTICIPATED TO BE USED AFTER CONSTRUCTION SHOULD BE EXCAVATED AND REMOVED. UTILITY LINES SHOULD NOT BE CRUSHED AND LEFT IN PLACE. THE RESULTING EXCAVATIONS SHOULD BE CLEANED OF ALL LOOSE OR ORGANIC MATERIAL. THE EXPOSED NATIVE SOILS SHOULD BE SCARIFIED TO A DEPTH OF 6 INCHES, THEN COMPACTED AS ENGINEERED FILL AND THE EXCAVATION BACKFILLED WITH ENGINEERED FILL.

9. EXCAVATIONS BELOW GROUNDWATER CAN BE BACKFILLED USING EITHER A SAND-CEMENT SLURRY, OR GRAVEL ENCASED IN A GEOTEXTILE FILTER FABRIC OR ENGINEERED FILL MATERIAL. ONCE THE EXCAVATION IS BACKFILLED ABOVE THE GROUNDWATER TABLE, SILTY SAND SOILS SHOULD BE USED AS BACKFILL.

10. THE EXPOSED GROUND SURFACE IN AREAS TO RECEIVE ENGINEERED FILL MATERIAL, PAVEMENTS SHOULD BE SCARIFIED TO A DEPTH OF 8 INCHES, MOISTURE CONDITIONED TO WITHIN TWO PERCENT OF OPTIMUM MOISTURE CONTENT AND COMPACTED AS ENGINEERED FILL. THE ZONE OF SCARIFICATION AND COMPACTION SHOULD EXTEND LATERALLY A MINIMUM OF 10 FEET OUTSIDE THE PERIMETERS OF THE AREA TO BE PAVED. THE SCARIFICATION AND COMPACTION SHOULD BE CONDUCTED FOLLOWING STRIPPING OPERATIONS, REMOVAL OF SUBSURFACE STRUCTURES, OVER-EXCAVATION, AND REMOVAL OF ALL SOFT OR PLIANT AREAS.

C) TEMPORARY EXCAVATIONS

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE SAFE WORKING CONDITIONS WITH RESPECT TO EXCAVATION SLOPE STABILITY.

2. TEMPORARY EXCAVATIONS SHOULD BE CONSTRUCTED IN ACCORDANCE WITH CAL OSHA REQUIREMENTS. TEMPORARY CUT SLOPES SHOULD NO BE STEEPER THAN 1.5:1, HORIZONTAL TO VERTICAL, AND FLATTER IF POSSIBLE. IF EXCAVATIONS CAN NOT MEET THIS CRITERIA, THE TEMPORARY EXCAVATIONS SHOULD BE SHORED.

3. SHORING SYSTEMS, WHEN REQUIRED, SHOULD BE DESIGNED BY AN ENGINEER WITH EXPERIENCE IN DESIGNING SHORING SYSTEMS AND REGISTERED IN THE STATE OF CALIFORNIA.

D) UTILITIES

1. CONTRACTORS SHALL VERIFY EASEMENTS (PUBLIC OR PRIVATE) FOR SEWER, WATER, ELECTRICAL, TELEPHONE, CABLE T.V., AND GAS PRIOR TO STARTING CONSTRUCTION.

2. VERIFY ALL UTILITY DATA AND LOCATIONS PRIOR TO ANY WORK. ONSITE UTILITIES SHALL BE COORDINATED WITH THE APPROPRIATE AGENCY OR UTILITY COMPANY. LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN HEREON ARE FROM RECORD INFORMATION AND ARE SHOWN FOR INFORMATION ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION AND CONSTRUCTION IN ANY AREA.CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (USA) AT 1-800-642-2444 A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION. CONTRACTORS SHALL IMMEDIATELY REPORT ANY DISCREPANCIES IN RECORD INFORMATION TO ENGINEER AND DEVELOPER PRIOR TO CONSTRUCTING ANY WORK.

3. THE CONTRACTOR SHALL COORDINATE ALL WATER AND SEWER MAIN CONNECTION WORK WITH THE CITY OF FORTUNA, (707) 725-7600. THE CITY OF FORTUNA PUBLIC WORKS SHALL BE NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE OF ANY CONNECTION WORK.

4. ONLY CITY OF FORTUNA PERSONNEL SHALL OPERATE VALVES ON EXISTING WATER MAINS OR WATER SERVICES. THE CITY OF FORTUNA DEPT. OF PUBLIC WORKS SHALL BE NOTIFIED A MINIMUM OF 48 HOURS IN ADVANCE OF ANY REQUIRED WATER MAIN SHUT-OFF.

5. No. 10 COATED COPPER WIRE SHALL BE LAID ON TOP OF AND ALONG ENTIRE LENGTH OF ALL NON-METALLIC MAINS AND SHALL BE EXTENDED TO THE SURFACE AT ALL VALVE LOCATIONS, BLOW-OFFS, METER BOXES, MANHOLES AND CLEANOUTS SUFFICENTLY FOR LOCATOR EQUIPMENT TO BE ATTACHED. TRACER WIRE SHALL BE INSTALLED ON ALL SERVICES NOT PERPENDICULAR TO THE MAIN. FASTEN THE WIRE TO THE TOP OF THE PIPE SO AS NOT TO BE DISPLACED BY BACKFILLING (ONE METHOD OF ACCOMPLISHING THIS IS TO AFFIX THE WIRE TO THE TOP OF THE PIPE WITH DUCT TAPE AT APPROXIMATELY 10 FEET INTERVALS).

6. ALL METER BOXES, VAULTS AND PITS SHALL BE BEDDED ON A 3" MINIMUM THICK, 3/4" DRAIN ROCK, CL 2 AGGREGATE BASE, OR OTHER CLEAN MATERIAL WITH TYPICAL SAND EQUIVALENT OF 20 MINIMUM, UNCONTAMINATED BY NATIVE SOIL, AGAINST COMPACTED OR UNDISTURBED BASE. THE GRAVEL BED SHALL EXTEND TO A 4" MINIMUM BEYOND ALL SIDES OF THE METER BOX. BOX SHALL BE SET FLUSH WITH TOP OF CURB, SIDEWALK OR GROUND, WHICHEVER IS APPLICABLE. IN NEW SUBDIVISIONS LOT NUMBERS MUST BE NOTED ON INSIDE OF METER BOX LID WITH PERMANENT MARKING PEN.

E.) UTILITY TRENCHES

1. IT SHOULD BE ANTICIPATED THAT WATER COULD SEEP INTO EXCAVATIONS. DEWATERING OF THE EXCAVATIONS MAY BE REQUIRED. GROUND WATER WILL ALSO IMPACT THE EXCAVATION, PLACEMENT, AND BACKFILL OF UTILITY LINES. CONTRACTOR SHOULD ANTICIPATE REMOVING WATER SEEPAGE. USE OF GRANULAR MATERIALS ENCASED IN A GEOTEXTILE FABRIC OR CEMENT-SAND SLURRY BACKFILL MATERIALS SHOULD BE ANTICIPATED WHEN BACKFILLING UTILITY LINES.

2. ALL SUBSURFACE STRUCTURES WHICH COULD BE IMPACTED BY THE INFILTRATION OF MOISTURE SHOULD BE DESIGNED TO BE WATER TIGHT AND TO RESIST UPWARD BUOYANT FORCES.

3. THE TYPE OF PIPE BEDDING, THE INITIAL BACKFILL AND COMPACTION REQUIREMENTS OF BEDDING AND INITIAL BACKFILL MATERIAL SHOULD BE PER THE ATTACHED DETAIL, PER THE MANUFACTURER'S REQUIREMENTS, OR ASTM D-2321 FOR FLEXIBLE POLYVINYL CHLORIDE (PVC) PIPE, WHICHEVER IS MORE STRINGENT. FOR PIPE PLACED IN SOILS BELOW 5 FEET BSG, UNSTABLE SOIL CONDITIONS SHOULD BE ANTICIPATED.

4. WHEN UTILITY TRENCH BACKFILLS ARE DETERMINED BY THE SOILS CONSULTANT TO BE NONSTRUCTURAL BACKFILLS, THEY SHOULD BE COMPACTED TO A MINIMUM OF 90 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM TEST METHOD D1557-78.

5. TRENCH BACKFILL SHOULD BE PLACED IN 8 INCH LIFTS, MOISTURE CONDITIONED TO WITHIN 2 PERCENT OF OPTIMUM AND COMPACTED TO ACHIEVE THE MINIMUM RELATIVE COMPACTION.

6. APPROVED IMPORTED ENGINEERED FILL MAY BE USED AS STRUCTURAL BACKFILL IN TRENCHES.

7. THE IN-PLACE DENSITY OF EXISTING UTILITY TRENCH BACKFILLS WHICH ARE ANTICIPATED TO REMAIN SHOULD BE DETERMINED. EXISTING TRENCH BACKFILL WITH A RELATIVE DENSITY LESS THAN 90% PER ASTM D1557 SHOULD BE OVEREXCAVATED AND REPLACED AS ENGINEERED FILL WITH A MINIMUM RELATIVE DENSITY OF 92%.

8. ALL FILL REQUIRED TO BRING THE SITE TO FINAL GRADE SHOULD BE PLACED AS ENGINEERED FILL. IN ADDITION, ALL NATIVE SOILS OVER-EXCAVATED SHOULD BE COMPACTED AS ENGINEERED FILL.

F) UTILITY INSTALLATION

1. ALL WORK AND MATERIALS IN THE PUBLIC RIGHT OF WAY, AND WHERE INDICATED ON THE PLANS, SHALL BE IN ACCORDANCE WITH THE CITY OF FORTUNA STANDARDS AND THE STANDARD SPECIFICATIONS AND STANDARD PLANS OF THE CALIFORNIA STATE DEPARTMENT OF TRANSPORTATION (CALTRANS), 2018 EDITION.

2. NO. 10 COATED COPPER TRACER WIRE SHALL BE INSTALLED ON ALL WATER AND SEWER MAINS.

3. TRENCH SHORING SHALL BE IN ACCORDANCE WITH THE CAL-OSHA CONSTRUCTION SAFETY ORDERS, LATEST REVISION, WHERE REQUIRED.

4. TRENCH COMPACTION IN PAVED STREETS AND UNDER DRIVEWAYS SHALL BE COMPACTED TO 95% R.C. USING CALIFORNIA TEST METHOD 216 OR 231. TRENCH COMPACTION IN UNIMPROVED RIGHT OF WAY SHALL BE 90% R.C.

5. CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING FOR ALL SOILS AND COMPACTION TESTING AS REQUIRED BY THE CITY OF FORTUNA.

6. ALL UNDERGROUND UTILITIES SHALL BE INSTALLED PRIOR TO CONSTRUCTION OF PAVEMENT AND STREET STRUCTURAL SECTION.

7. DRAIN INLET GRATE SHALL BE 'BIKE PROOF' AND GRATE AND FRAME SHALL BE GALVANIZED IN ACCORDANCE WITH THE CALTRANS STANDARD PLANS AND SPECIFICATIONS, 2018 EDITION, STANDARD PLAN #D77A.

8. THE CONTRACTOR SHALL EXPOSE THE EXISTING STORM SEWER MAIN TIE-IN POINTS AND OTHER UNDERGROUND UTILITY LOCATIONS, AND VERIFY ELEVATION AND/OR LOCATION PRIOR TO STARTING WORK ON ANY PORTION OF THE STORM SEWER OR WATER SUPPLY SYSTEM. ANY DEVIATION FROM THE INFORMATION PROVIDED HEREIN DISCOVERED SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER, WHO WILL MAKE THE NECESSARY RECOMMENDATIONS.

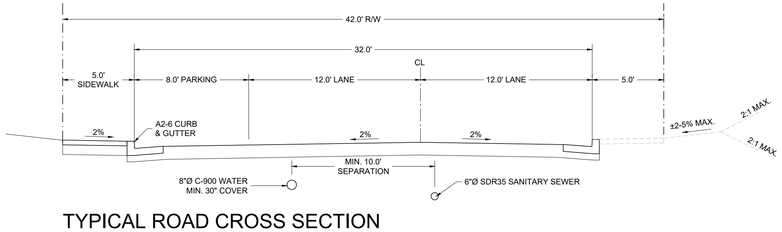
9. AFTER A STREET HAS BEEN OVERLAYED, ALL UTILITY STRUCTURES WILL BE MARKED IN WHITE PAINT OR "DIMPLED" ASPHALT BEFORE CLOSE OF THAT WORK DAY.

10. WITHIN 5 DAYS OF PAVING, ALL UTILITY STRUCTURES AND BOXES WILL BE BROUGHT TO GRADE AND INSPECTED.

G) SOILS & ENGINEERED FILL

1. NATIVE SOILS - NATIVE SOILS TO BE APPROVED BY THE SOILS ENGINEER. NATIVE SOILS TO BE COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION AS PER ASTM D1557, BEFORE PLACEMENT OF STRUCTURAL FILL.

2. ENGINEERED FILL SOIL- ENGINEERED FILL SOILS SHOULD BE PLACED IN LOOSE LIFTS APPROXIMATELY 8 INCHES THICK, MOISTURE-CONDITIONED TO WITHIN TWO PERCENT OF THE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO A DRY DENSITY OF AT LEAST 92 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM TEST METHOD D1557-78. ADDITIONAL LIFTS SHOULD NOT BE PLACED IF THE PREVIOUS LIFT DID NOT MEET THE REQUIRED DRY DENSITY OR IF SOIL CONDITIONS ARE NOT STABLE. AREAS NOT MEETING COMPACTION REQUIREMENTS SHOULD BE EITHER RECOMPACTED OR EXCAVATED AND REPLACED WITH NEW FILL MATERIAL UNTIL COMPACTION REQUIREMENTS MET.



TYPICAL ROAD CROSS SECTION

SCALE: 1"=5'

ABBREVIATIONS

AC	ASPHALT CONCRETE	P.P.	POWER POLE
AGG.	AGGREGATE	P.S.I.	POUNDS PER SQUARE INCH
APPROV.	APPROVED	PUE	PUBLIC UTILITY EASEMENT
BO	BLOW-OFF	PVC	POLYVINYL CHLORIDE
BVC	BEGIN VERTICAL CURVE	RD.	ROAD
CL	CENTERLINE	R.R.	RAILROAD
CO	CLEANOUT	R/W	RIGHT OF WAY
CONC.	CONCRETE	SCHED.	SCHEDULE
CPL'G.	COUPLING	SD	STORM DRAIN
DI	DRAINAGE INLET	S.F.	SQUARE FOOT
<E>	EXISTING	SHT.	SHEET
EC	EDGE OF CONCRETE	SQ.	SQUARE
EL	ELEVATION	SS	SANITARY SEWER
ELEC.	ELECTRICAL	STD.	STANDARD
EVC	END VERTICAL CURVE	TBR	TO BE REMOVED
EXIST.	EXISTING	TYP.	TYPICAL
FG	FINISHED GRADE	THK.	THICK
FH	FIRE HYDRANT	UTIL.	UTILITY
FL	FLOW LINE	W	WATER
FLG.	FLANGE	W/	WITH
GALV.	GALVANIZED	WM	WATER METER
G.I.	GALVANIZED IRON		
MH	MANHOLE		
MIN.	MINIMUM		

NOT FOR CONSTRUCTION

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1 INCH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * DEREK C. LONG * NO. C85655 * STATE OF CALIFORNIA

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GULLIKSEN IMPROVEMENT PLANS PH 4&5
Fortuna, CA. 95540

COVER/NOTES/ABBREVIATIONS/APPROVALS

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	1

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GENERAL NOTES CONTINUED:

H) PAVING AND SUB-SURFACING:

1. THE UPPER 8 INCHES OF SUBGRADE BENEATH AGGREGATE BASE OR SUB-BASE SHOULD BE SCARIFIED (12 INCHES IF A FULL DEPTH ASPHALTIC CONCRETE SECTION IS USED), MOISTURE- CONDITIONED AS NECESSARY AND COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM TEST METHOD D1557-78.

2. PAVED AREAS ARE NOT TO BE USED DURING CONSTRUCTION.

3. THE ASPHALTIC-CONCRETE SHOULD BE COMPACTED TO AN AVERAGE RELATIVE COMPACTION OF 97 PERCENT, WITH NO SINGLE TEST VALUE BEING BELOW A RELATIVE COMPACTION OF 95 PERCENT BASED ON A 50 BLOW MARSHALL MAXIMUM DENSITY.

4. THE ASPHALT CONCRETE SHOULD COMPLY WITH TYPE "B" ASPHALT CONCRETE AS DESCRIBED IN SECTION 39 OF THE STATE OF CALIFORNIA STANDARD SPECIFICATION REQUIREMENTS. WE RECOMMEND THAT AN ASPHALT CONCRETE MIX DESIGN BE PREPARED AND APPROVED BY THE SOILS CONSULTANT PRIOR TO CONSTRUCTION.

5. ASPHALT CONCRETE AND PLACING THEREOF SHALL CONFORM TO THE CALTRANS STANDARD SPECIFICATIONS FOR CONSTRUCTION OF LOCAL STREETS AND ROADS, 2018 ED. TYPE A AGGREGATE SHALL BE USED WITH ½" MAXIMUM SIZE. SOIL SHALL BE STERILIZED BEFORE PLACING OF ASPHALT CONCRETE.

6. AFTER THE BASEMENT MATERIAL IN THE AREA TO BE SURFACED WITH ASPHALT CONCRETE PAVING HAS BEEN LEVELED, BROUGHT TO PROPER GRADE, AND COMPACTED, THE ENTIRE AREA SHALL BE UNIFORMLY TREATED WITH A SOIL STERILANT TYPE HERBICIDE, SIMILAR AND APPROVED EQUAL TO POLY-CHLORATE, GRANULAR, AS MANUFACTURED BY THE U.S. BORAX AND CHEMICAL COMPANY. MATERIAL MAY BE APPLIED EITHER DRY OR IN A SOLUTION. APPLICATION PROCEDURES AND QUANTITY OF HERBICIDE USED PER 100 SQ. FT. SHALL CONFORM TO THE MANUFACTURER'S PRINTED RECOMMENDATIONS.

7. PAVING IN THE PUBLIC RIGHT OF WAY IS TO CONFORM TO CITY STANDARDS AND TYPICAL ROAD SECTIONS AS PROVIDED ON THESE IMPROVEMENT PLANS.

8. PROVIDE SMOOTH TRANSITION TO EXISTING ASPHALT AT ALL SAWCUT LOCATIONS.

9. FINISH GRADE CONSTRUCTION AT INTERSECTION OF REDWOOD WAY AND PRIVATE INTERIOR ROADWAY SHOULD BE CONSTRUCTED WITH SMOOTH TRANSITIONS BETWEEN SPECIFIED GRADE ELEVATIONS. AVOID ABRUPT GRADE TRANSITIONS.

I) DUST CONTROL

DURING CONSTRUCTION ACTIVITIES, THE FOLLOWING DUST CONTROL MEASURES SHALL BE TAKEN:

1. WATER ALL ACTIVE CONSTRUCTION AREAS TWICE PER DAY AND USE EROSION CONTROL MEASURES TO PREVENT WATER RUNOFF CONTAINING SILT AND DEBRIS FROM ENTERING THE STORM DRAINAGE SYSTEM.

2. COVER TRUCKS HAULING SOIL, SAND AND OTHER LOOSE MATERIAL.

3. PAVE, WATER OR APPLY NON-TOXIC SOIL STABILIZERS ON UNPAVED ACCESS ROADS AND PARKING AREAS.

4. SWEEP PAVED ACCESS ROADS AND PARKING AREAS DAILY.

5. CONTRACTOR IS REQUIRED TO PROVIDE MEASURES TO PREVENT MATERIAL FROM BEING CARRIED ONTO CITY STREETS AND ALLEYWAYS.

6. HYDRO SEED OR APPLY NON-TOXIC SOIL STABILIZERS TO INACTIVE CONSTRUCTION AREAS.

7. ENCLOSE, COVER, WATER OR APPLY NON-TOXIC SOIL BINDERS TO OPEN MATERIALS STOCKPILES.

8. LIMIT TRAFFIC SPEEDS ON UNPAVED ACCESS ROADS TO 15 MPH.

9. INSTALL EROSION CONTROL MEASURES TO PREVENT SILT RUNOFF TO PUBLIC ROADWAYS.

10. REPLANT VEGETATION IN DISTURBED AREAS WITHIN 30 DAYS OF COMPLETION OF PROJECT. THE CONSTRUCTION SITE SHALL BE MAINTAINED IN A CLEAN AND ORDERLY FASHION AND BE KEPT FREE OF DEBRIS. SOLID WASTE GENERATE DURING CONSTRUCTION SHALL BE DISPOSED OF IN AN APPROPRIATE MANNER. SUCH WASTE SHALL INCLUDE, BUT NOT BE LIMITED TO: CONCRETE FORMS, WASTE CONCRETE AND ASPHALT, EMPTY CONTAINERS OF BUILDING MATERIALS AND EXCESS BUILDING MATERIALS.

J) DAYS AND HOURS OF CONSTRUCTION AND NOISE CONTROL.

THE FOLLOWING SHALL APPLY TO CONSTRUCTION NOISE FROM TOOLS AND EQUIPMENT:

1. THE OPERATION OF TOOLS OR EQUIPMENT USED IN CONSTRUCTION, DRILLING, REPAIR, ALTERATION OR DEMOLITION SHALL BE LIMITED TO BETWEEN THE HOURS OF 7 A.M. AND 7 P.M. MONDAY THROUGH FRIDAY, AND BETWEEN 9 A.M. AND 6 P.M. ON SATURDAYS.

2. NO HEAVY EQUIPMENT RELATED CONSTRUCTION ACTIVITIES SHALL BE ALLOWED ON SUNDAYS OR HOLIDAYS.

3. CONTRACTOR SHALL SELECT STAGING AREAS AS FAR AS FEASIBLY POSSIBLE FROM SENSITIVE RECEPTORS.

4. CONTRACTOR SHALL MAINTAIN ALL CONSTRUCTION EQUIPMENT WITH MANUFACTURER'S SPECIFIED NOISE-MUFFLING DEVICES.

5. UNNECESSARY IDLING OF INTERNAL COMBUSTION ENGINES SHALL BE PROHIBITED, THIS WOULD MEAN TURNING OFF EQUIPMENT IF IT WILL NOT BE USED FOR 5 OR MORE MINUTES.

6. ALL STATIONARY NOISE-GENERATING CONSTRUCTION EQUIPMENT SUCH AS AIR COMPRESSORS SHALL BE AS FAR AS POSSIBLE FROM HOMES AND BUSINESSES.

7. CONTRACTOR SHALL SELECT QUIET CONSTRUCTION EQUIPMENT, PRIMARY AIR COMPRESSORS, WHENEVER POSSIBLE.

8. TRUCK DRIVER SHALL ADHERE TO POSTED SPEED ON LOCAL ROADS. ALTERNATE TRUCK ROUTES SHALL BE CONSIDERED IF COMPLAINTS OCCUR.

9. EACH SHIFT SHALL HAVE A DESIGNATED COORDINATOR TO RESPOND TO ANY COMPLAINTS ABOUT EQUIPMENT OR TRUCK NOISE. THE COORDINATOR SHALL DETERMINE THE CAUSE OF NOISE AND REMEDY THE SITUATION AS SOON AS POSSIBLE. IF THE COORDINATOR IS NOT ON-SITE, A CONTACT TELEPHONE NUMBER SHALL BE PROMINENTLY POSTED AT THE JOB SITE ENTRANCE, AT THE CITY PLANNING OFFICE AND IN THE CONSTRUCTION OFFICE. THE CITY POLICE DISPATCHER SHALL ALSO BE NOTIFIED OF THE NOISE COORDINATOR'S CONTACT INFORMATION.

K) SEWER INFILTRATION TESTING.

INFILTRATION TESTING IS REQUIRED FOR ALL NEW MANHOLES NEW SEWER LINES.

1. ALL NEW SEWER LINES AND MANHOLES SHALL NOT BE ACCEPTED BY THE CITY AND SHALL NOT BE OPERATED AS A PART OF THE CITY'S SANITARY SEWER SYSTEM UNTIL THE CITY'S ACCEPTANCE OF WATER INFILTRATION TESTING PER CITY STANDARDS.
2. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ALL REQUIRED TESTS AND THE TEST SHALL BE WITNESSED BY A CITY REPRESENTATIVE.

L) WATER FACILITY TESTING.

ALL NEW OR AFFECTED EXISTING WATER FACILITIES SHALL BE DISINFECTED, BACTERIA TESTED, AND PRESSURE TESTED PER CITY STANDARDS.

1. ALL NEW WATER LINES AND/OR ANY EXISTING WATER LINES THAT HAVE BEEN DRAINED OR HAVE BECOME OTHERWISE DEPRESSURIZED SHALL NOT BE ACCEPTED BY THE CITY AND SHALL NOT BE OPERATED AS A PART OF THE CITY'S WATER DISTRIBUTION SYSTEM UNTIL THE CITY'S ACCEPTANCE OF SYSTEM DISINFECTION, BACTERIOLOGICAL TESTING, AND PRESSURE TESTING.
2. WATER SAMPLES SHALL BE COLLECTED BY OR IN THE PRESENCE OF THE CITY'S UTILITY SUPERINTENDENT OR DESIGNEE.
3. ALL WATER SAMPLE TESTING AND ANALYSIS SHALL BE PERFORMED BY THE CITY (OR ITS CHOSEN SUBCONTRACTOR), AND FEES FOR SAID TESTING AND ANALYSIS WILL BE COLLECTED IN ACCORDANCE WITH CURRENT FEE ORDINANCES.

M) INSPECTIONS

1. SUBGRADE SOILS SHALL BE VERIFIED AND INSPECTED BY THE SOILS CONSULTANT.
2. ALL TRENCHING SHALL BE VERIFIED BY THE SOILS CONSULTANT.
3. ESCP MEASURES TO BE INSPECTED AS REQUIRED BY THE SWPPP.
4. BEDDING FOR ALL TRENCHES TO BE VISUALLY VERIFIED BY THE ENGINEER.
5. RIVER RUN GRAVEL COMPACTIONS SHALL BE TESTED PER ASTM D1557.
6. AGGREGATE BASE COMPACTIONS SHALL BE TESTED PER ASTM D1557.
7. PLACEMENT OF GEOTEXTILE FABRIC SHALL BE VISUALLY VERIFIED BY THE SOILS CONSULTANT.

SPECIFICATIONS:

AGGREGATE BASE MATERIAL SHALL CONFORM TO SECTION 26 OF THE CALTRANS STANDARD SPECIFICATIONS. (2018 EDITION)

A. CLASS 2 AGGREGATE BASE:
   1. CLASS 2 AGGREGATE BASE SHALL BE 1-1/2 INCH MAXIMUM AS DEFINED IN SECTION 26-1.02B OF THE CALTRANS STANDARD SPECIFICATIONS. (2018 EDITION)
B. PLACEMENT:
   1. WHERE SPECIFIED AGGREGATE BASE THICKNESS IS 0.50 FOOT OR LESS, THE AGGREGATE BASE MAY BE SPREAD AND COMPACTED IN ONE LAYER.
   2. WHERE SPECIFIED AGGREGATE BASE THICKNESS IN GREATER THAN 0.50 FOOT, SPREAD AND COMPACT IN 2 OR MORE LAYERS APPROXIMATELY EQUAL IN THICKNESS. THE COMPACTED THICKNESS OF ANY ONE LAYER MUST NOT EXCEED 0.50 FOOT.
C. COMPACTION:
   1. ALL AGGREGATE BASE SHALL BE COMPACTED TO 95% RELATIVE COMPACTION.
D. GRADE TOLERANCE:
   1. THE FINISHED SURFACE OF THE AGGREGATE BASE SHALL BE WITHIN 0.05 FOOT OF THE GRADE INDICATED ON THE PLANS.

1. ASPHALT CONCRETE:

   ASPHALT CONCRETE SHALL BE ¾" HOT MIX ASPHALT, TYPE A 0R B, CONFORMING TO CALTRANS STANDARD SPECIFICATION SECTION 39.

2. GEOTEXTILE:

   GEOTEXTILE SHALL BE WIN-FAB-200 OR APPROVED EQUAL.

3. PIPES:

   A. WATER PIPING SHALL BE CONSTRUCTED OF EITHER:

      1. C900-AWWA C900 SPECIFICATION WITH GASKETS MEETING ASTM F477 AND JOINTS CONFORMING TO ASTM3139 OR

      2. DUCTILE IRON PIPE SHALL MEET AWWA A2151. JOINTS SHALL BE IN ACCORDANCE WITH AWWA A21.11. FITTINGS SHALL CONFORM TO AWWA A21.10 OR AWWA 21.53.

   B. SANITARY SEWER PIPING SHALL BE CONSTRUCTED OF:

      1. SDR 35-SHALL MEET ASTM D3034. JOINTS SHALL MEET OR EXCEED ASTM D3212 FOR TIGHTNESS.

      2. DUCTILE IRON PIPE SHALL MEET AWWA A2151. JOINTS SHALL BE IN ACCORDANCE WITH AWWA A21.11. FITTINGS SHALL CONFORM TO AWWA A21.10 OR AWWA 21.53.

   C. DRAINAGE PIPE SHALL BE CONSTRUCTED OF EITHER:

      1. HIGH DENSITITY POLYETHELYNE (HDPE) CONFORMING TO ASTM F667.

      2. POLYVINYL CHLORIDE (PVC) CONFORMING TO ASTM 2729-11.

SUBMITTAL REQUIREMENTS:

ALL CONSTRUCTION SUBMITTALS FOR WATER AND WASTEWATER SYSTEMS FOR THE PROJECT SHALL BE APPROVED BY THE CITY ENGINEER.

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REVISIONS	BY

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610 9th Street Fortuna, California 95540

GULLIKSEN IMPROVEMENT PLANS PH 4&5

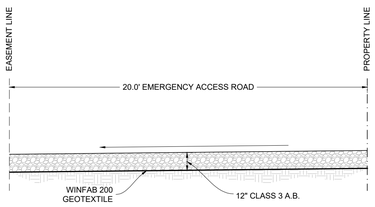
Fortuna, CA. 95540

CONSTRUCTION NOTES

For: Wendt Construction Co. 3851 Rohnerville Road, Fortuna, CA. 95540

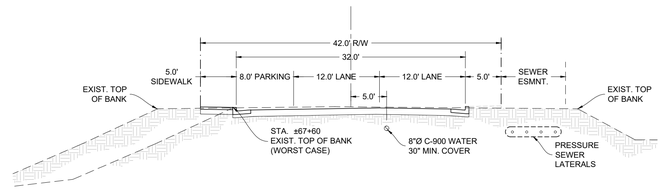
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Scale	AS NOTED
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Drawn	GKK
Job	WCO2302
Sheet	2

©WhitchurchEngineering,Inc.2024 Autocad Civil3D2024 Dwg Plot by Kelsey 2/5/2024



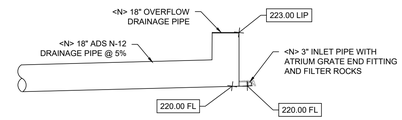
1 - EMERGENCY ACCESS ROAD DETAIL

SCALE: 1"=4'



2 - ROAD SHOULDER DETAIL @ STA. ±67+23

SCALE: 1"=10'



3 - PROPOSED BASIN OUTFLOW CROSS SECTION

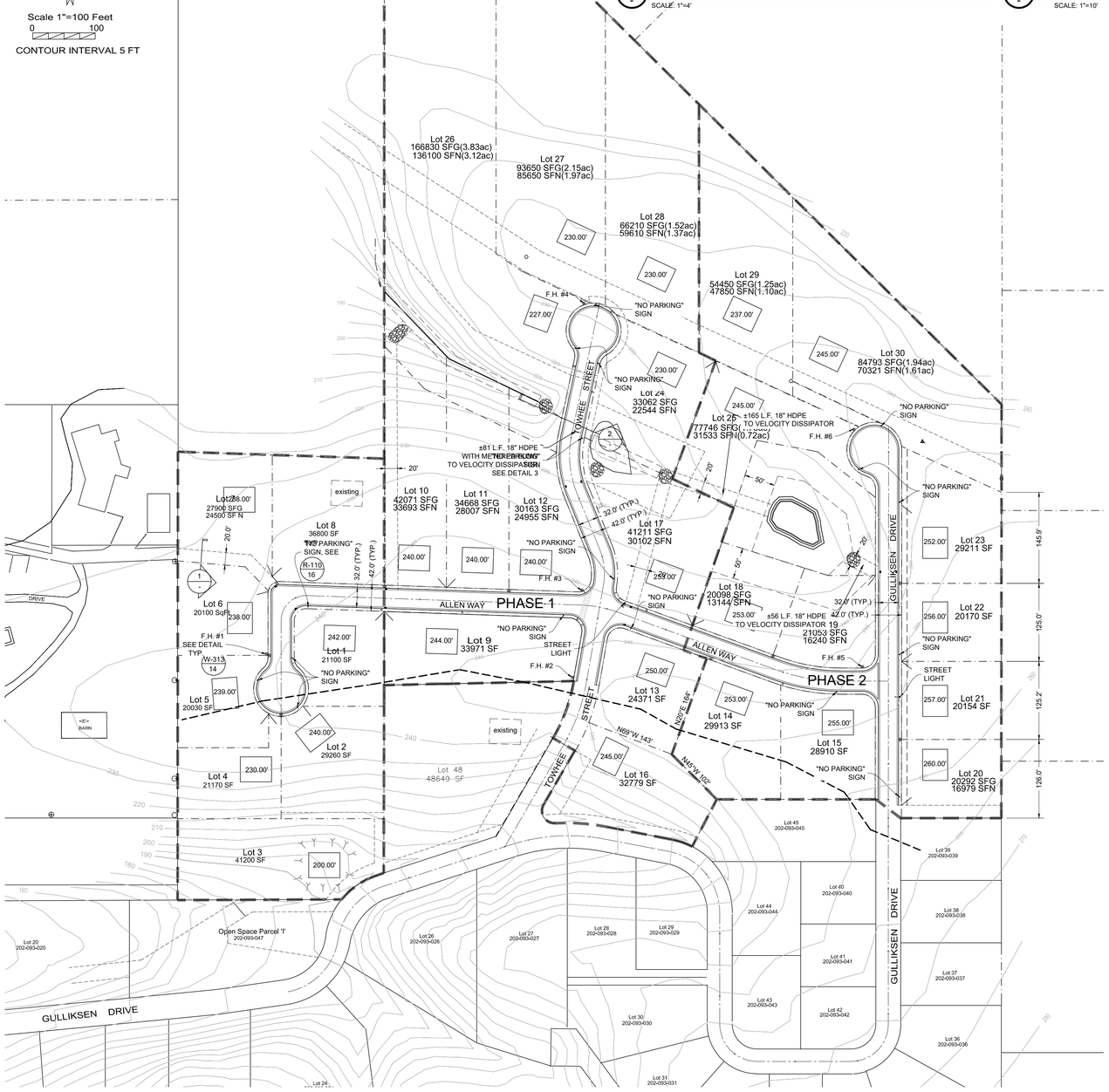
SCALE: 1"=10'

N

Scale 1"=100 Feet

0 100

CONTOUR INTERVAL 5 FT

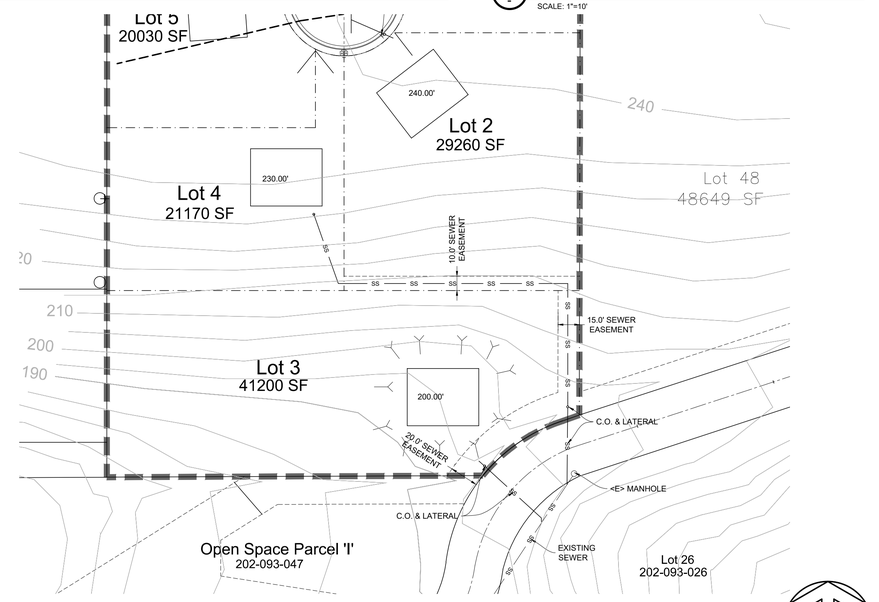


LOT LAYOUT PHASE 2&3

SCALE: 1"=100'

NOTE:

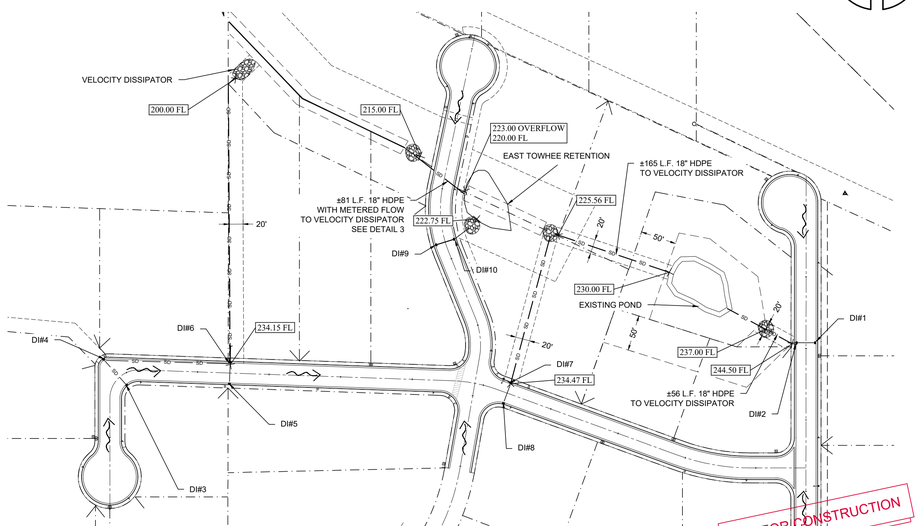
TENTATIVE MAP BY WALLACE WRIGHT SUPERSEDES LOT LINES AND DIMENSIONS PROVIDED ON IMPROVEMENT PLANS. FINAL PARCEL LINES TO BE RECORDED ON FINAL MAP.



DETAILED LOT LAYOUT 2, 3, & 4

SCALE: 1"=50'

NORTH



RETENTION BASIN DETAIL

SCALE: 1"=100'

NORTH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * DANIEL C. KING * NO. C65055 * STATE OF CALIFORNIA

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GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

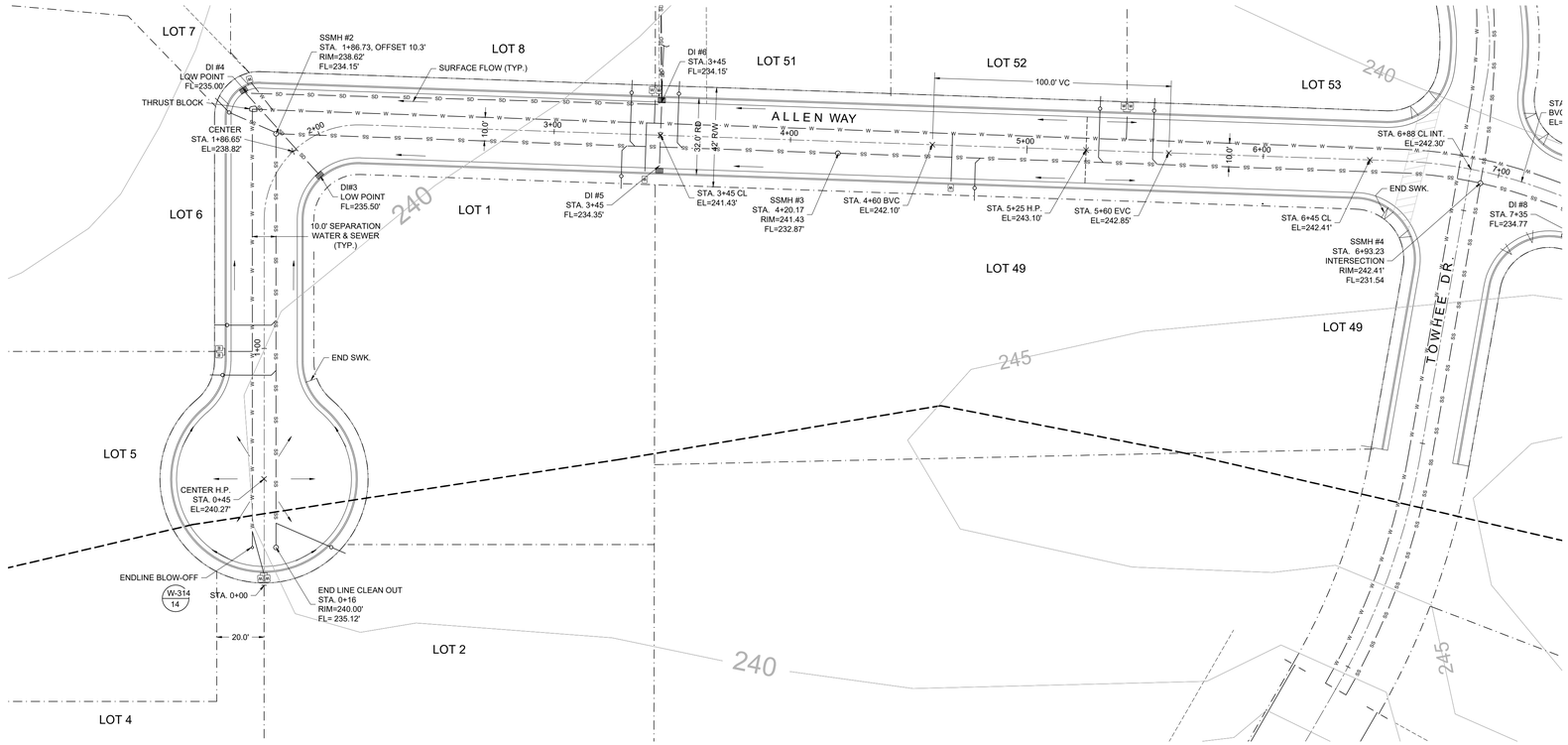
LOT LAYOUT

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
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Drawn	GKK
Job	WCO2302
Sheet	3

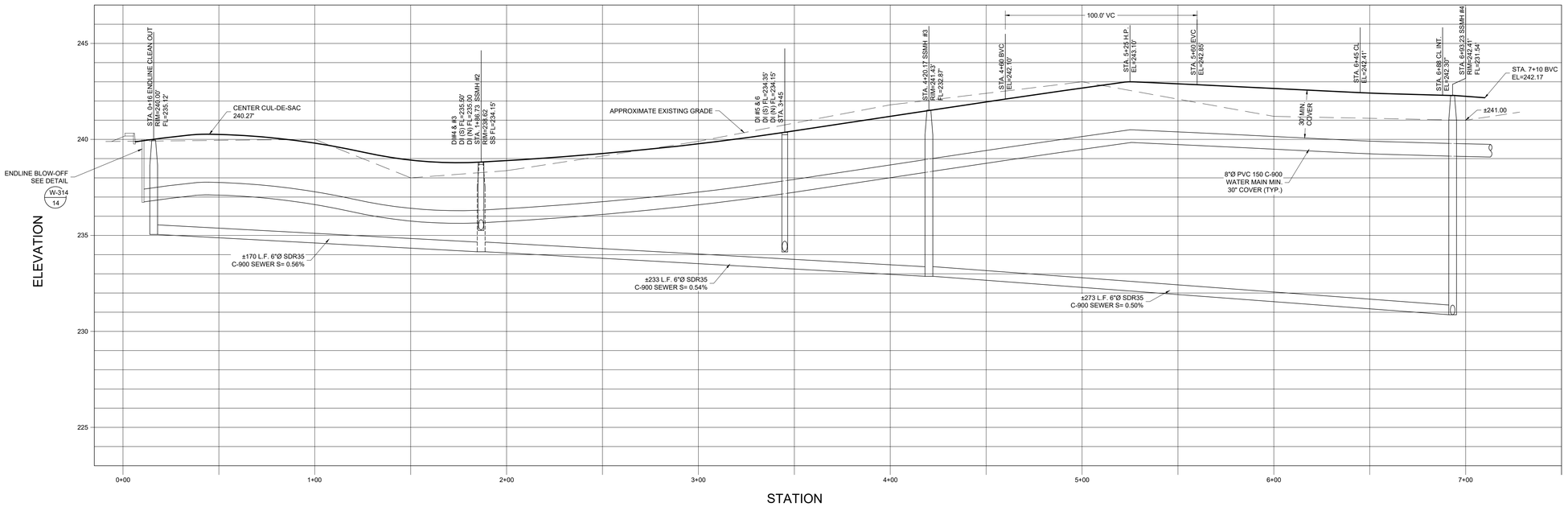
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ALLEN WAY SEWER CO & LATERAL DATA				
LOT #	SS LAT. STA.	SSCO LID	SSCO FL	WM STA.
1	3+28	240.43'	233.38'	3+38
2	0+26	240.32'	235.70'	0+05
5	0+89	239.80	235.27	0+99
6	1+09	239.71'	235.16'	0+99
7	1+82	238.70'	234.72	1+92
8	3+32	240.27'	233.36'	3+42
49	4+78	242.54'	232.75'	4+68
51	3+53.6	240.55'	233.24'	3+43.6
52	5+30.3	243.02'	232.59'	5+40.3
53	5+50.3	242.95'	233.44'	5+40.3



UTILITY PLAN STA. 0+00 TO STA. 7+00

SCALE: 1"=30'



UTILITY PROFILE STA. 0+00 TO STA. 7+00

SCALE: 1"=30' HORIZ.
1"=3' VERT.

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REGISTERED PROFESSIONAL ENGINEER * CIVIL * STATE OF CALIFORNIA * NO. C65055 * DAVID C. LEE

WHITCHURCH ENGINEERING, INC.
Phone (707) 725-6926
610 9th Street Fortuna, California 95540

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

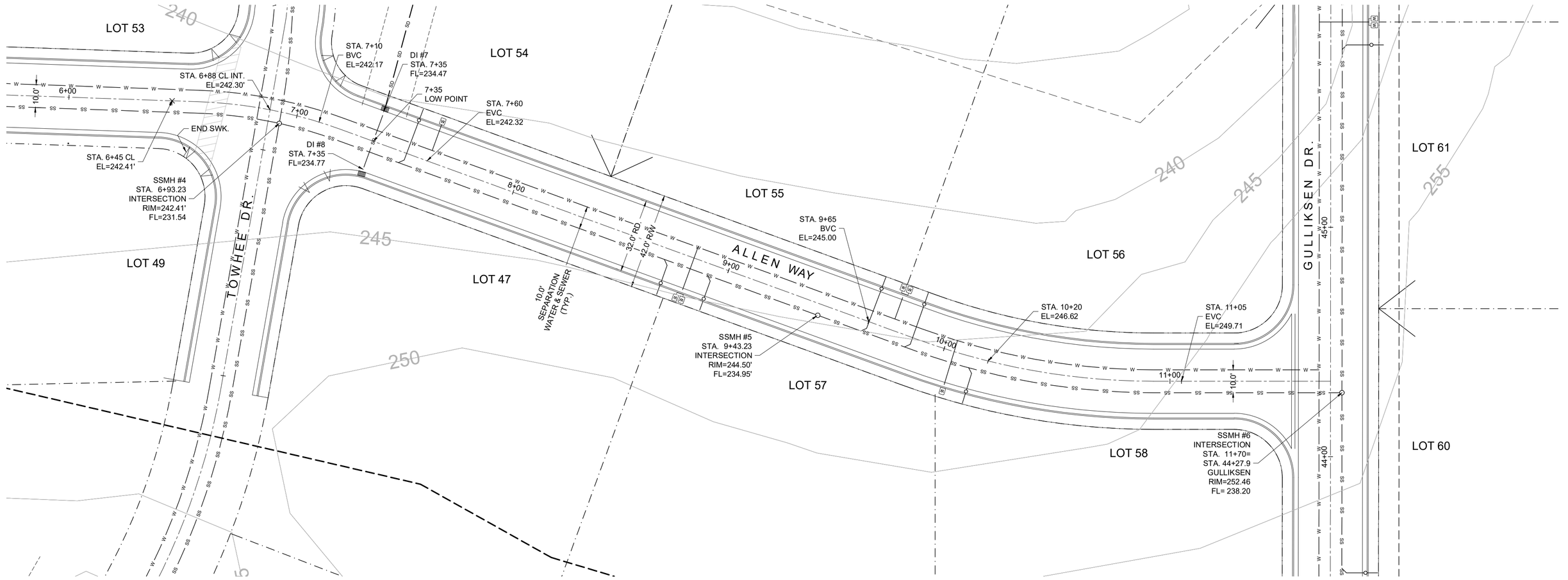
ALLEN WAY
UTILITY PLAN & PROFILE STA. 0+00 TO 7+00

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	4

C:\Whitchurch\Projects\2023\WCO2302\Civil\WCO2302 Sht 4 of 5 Plan.dwg 4/30/24

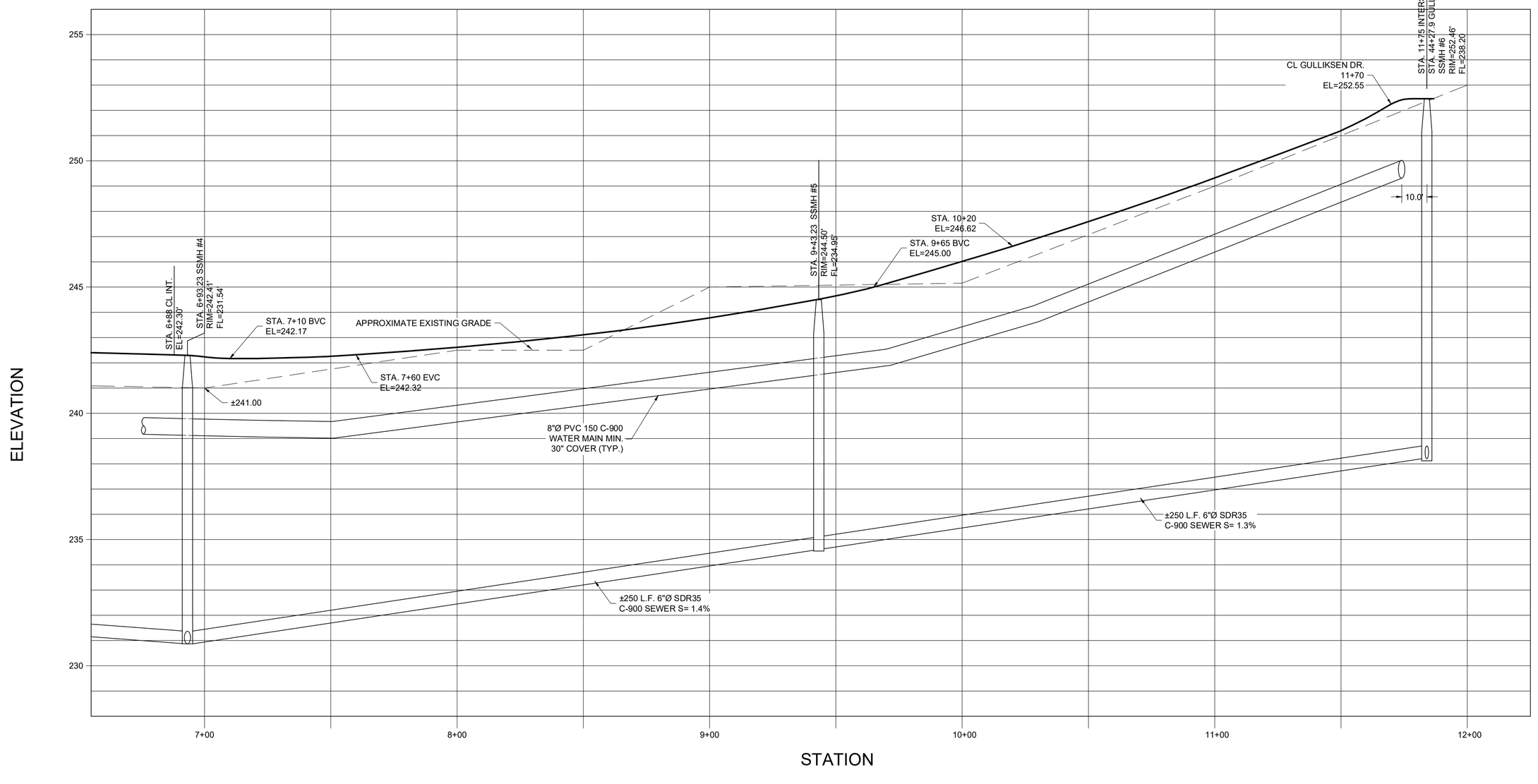
ALLEN WAY SEWER CO & LATERAL DATA				
LOT #	SS LAT. STA.	SSCO LID	SSCO FL	WM STA.
47	8+74	243.61'	234.19'	8+84
54	7+50.6	242.30'	232.80'	7+60.6
55	9+65	245.05'	235.59'	9+75
56	9+85	245.64'	235.85'	9+75
57	8+94	243.90'	234.45'	8+84
58	10+14.6	246.66'	236.01'	10+04.6



UTILITY PLAN STA. 7+00 TO STA. 11+89.85

SCALE: 1"=30'

NORTH



UTILITY PROFILE STA. 7+00 TO STA. 11+89.85

SCALE: 1"=30' HORIZ.
1"=3' VERT.

NOT FOR CONSTRUCTION

THESE PLANS ARE ORIGINALLY PRINTED ON 24"x36" PAPER.

1 INCH

This drawing or drawing set shall not be used for construction unless a jurisdictional stamp (County, City, State, Federal) has been issued on the drawing, stating "FOR PERMIT" or similar verbiage, a wet signed professional engineer's stamp, and permit documents have been issued for the project.

REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * CIVIL * STATE OF CALIFORNIA * NO. C85055 * DANIEL K. GALLAGHER

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA 95540

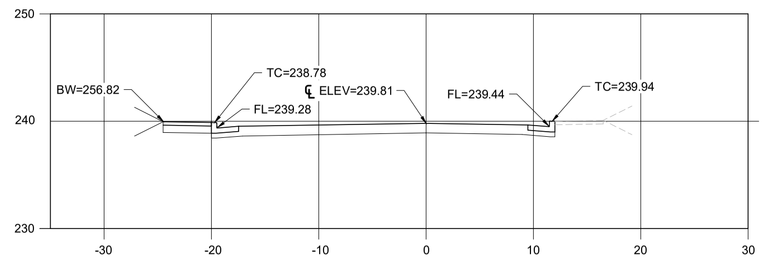
ALLEN WAY

UTILITY PLAN & PROFILE STA. 7+00 TO STA. 11+89.85

For: Wendt Construction Co. 3851 Rohnerville Road, Fortuna, CA. 95540

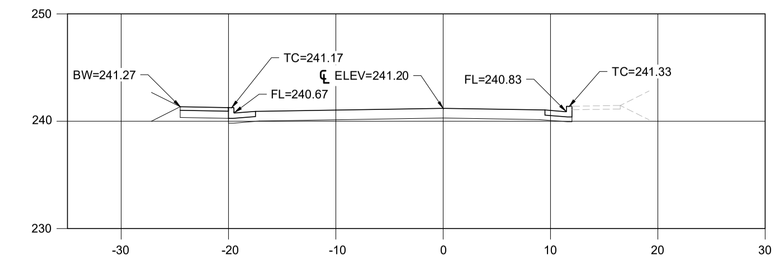
Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	5

D:\Gulliksen\Gulliksen Sheet 4-5\2302Gulliksen Ph4-5 5-01-24.dwg 2/2024



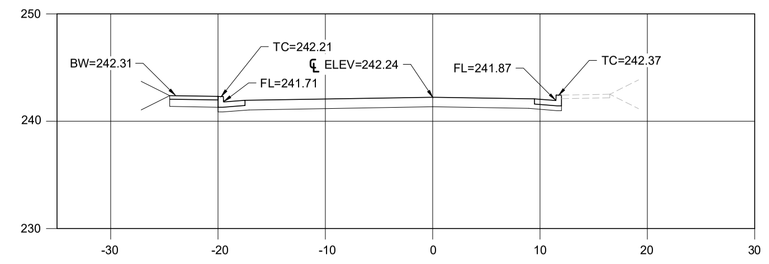
CROSS SECTION STA. 1+00

SCALE: 1"=10'



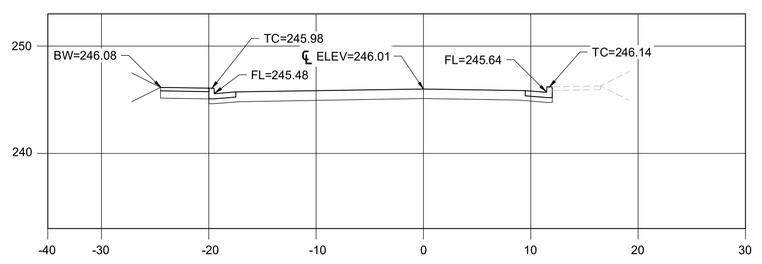
CROSS SECTION STA. 4+00

SCALE: 1"=10'



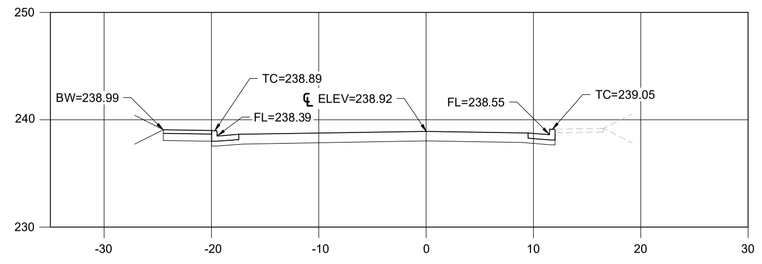
CROSS SECTION STA. 7+00

SCALE: 1"=10'



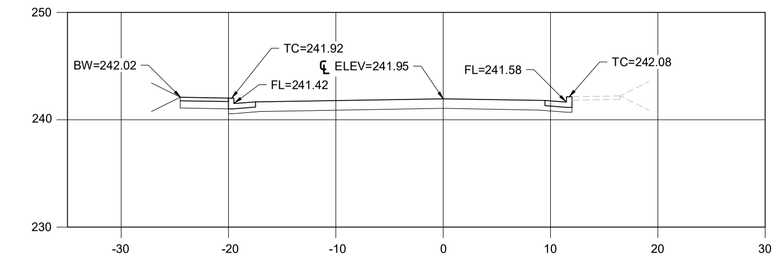
CROSS SECTION STA. 10+00

SCALE: 1"=10'



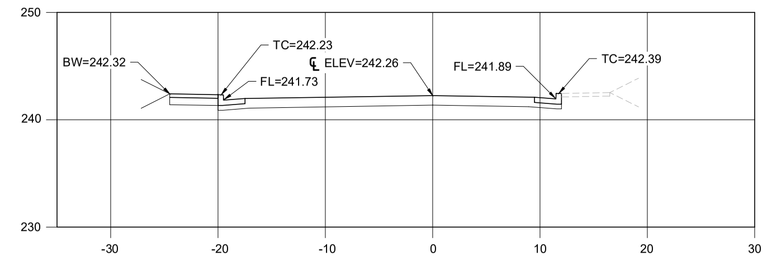
CROSS SECTION STA. 1+50

SCALE: 1"=10'



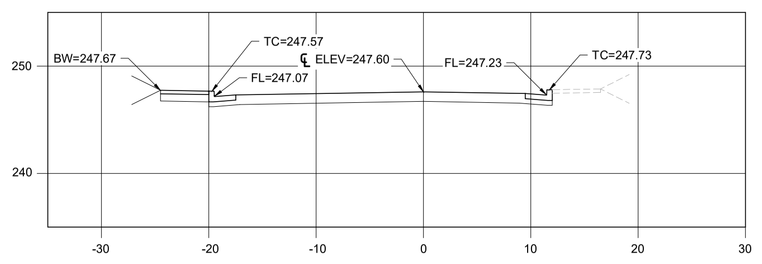
CROSS SECTION STA. 4+50

SCALE: 1"=10'



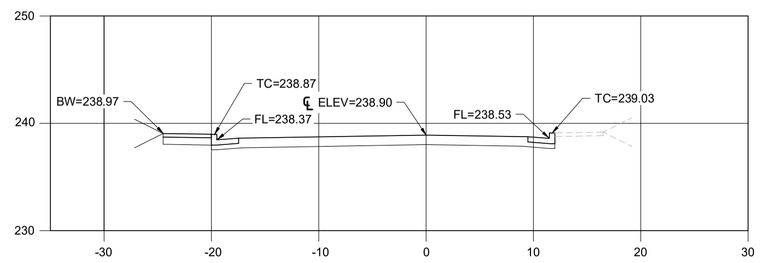
CROSS SECTION STA. 7+50

SCALE: 1"=10'



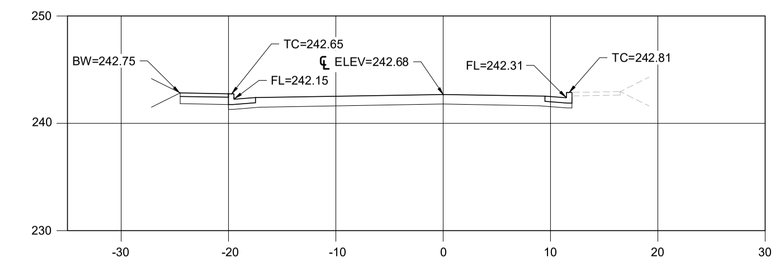
CROSS SECTION STA. 10+50

SCALE: 1"=10'



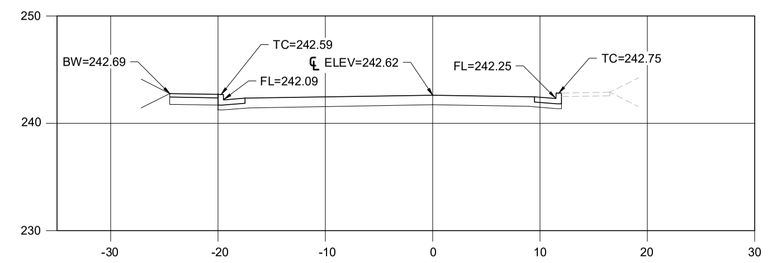
CROSS SECTION STA. 2+00

SCALE: 1"=10'



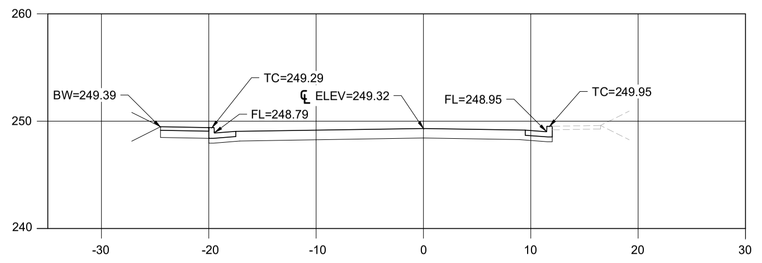
CROSS SECTION STA. 5+00

SCALE: 1"=10'



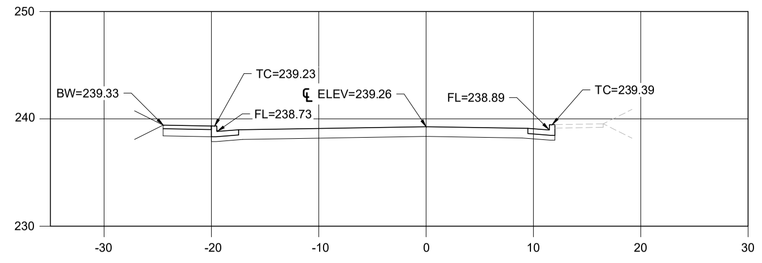
CROSS SECTION STA. 8+00

SCALE: 1"=10'



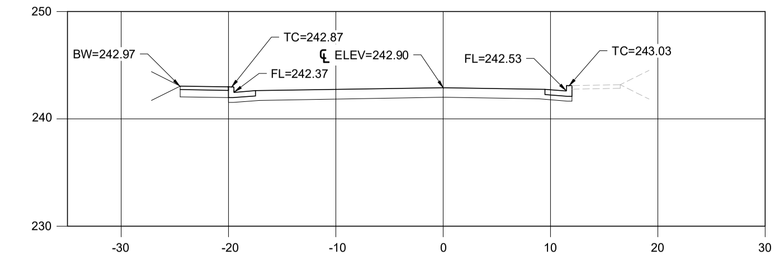
CROSS SECTION STA. 11+00

SCALE: 1"=10'



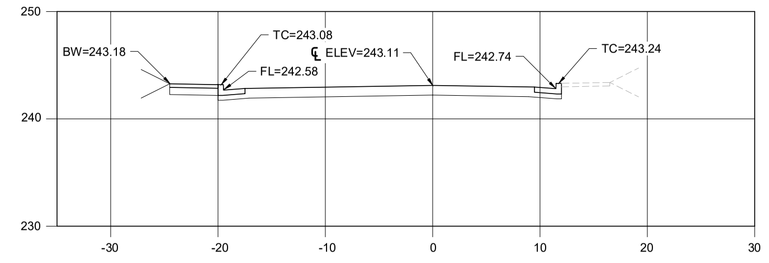
CROSS SECTION STA. 2+50

SCALE: 1"=10'



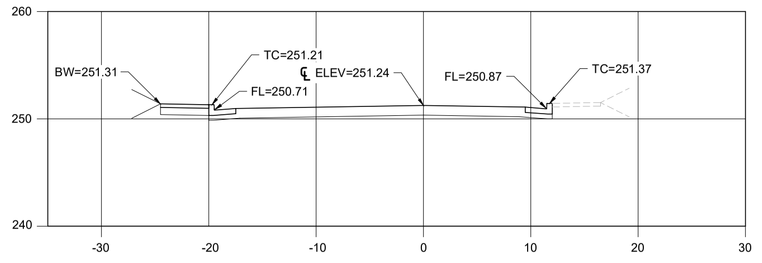
CROSS SECTION STA. 5+50

SCALE: 1"=10'



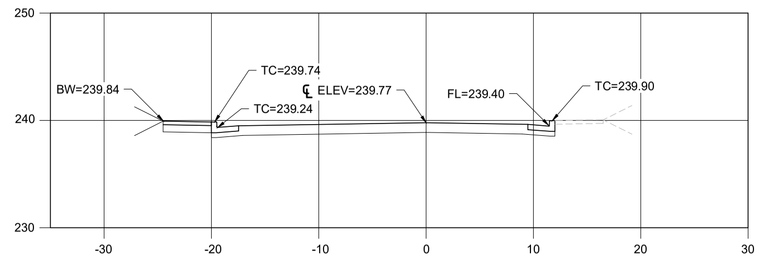
CROSS SECTION STA. 8+50

SCALE: 1"=10'



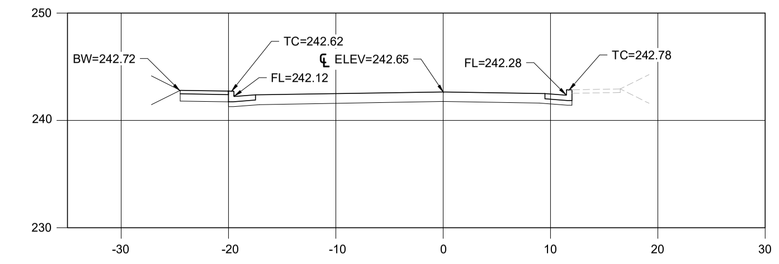
CROSS SECTION STA. 11+50

SCALE: 1"=10'



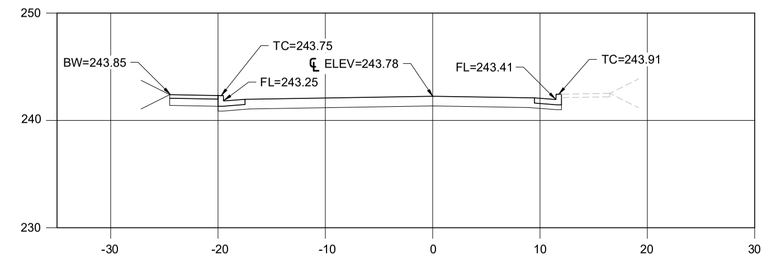
CROSS SECTION STA. 3+00

SCALE: 1"=10'



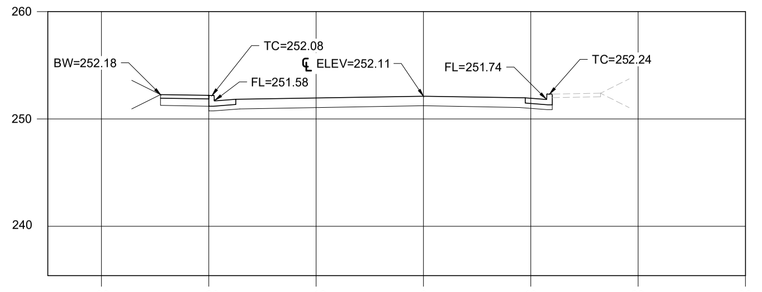
CROSS SECTION STA. 6+00

SCALE: 1"=10'



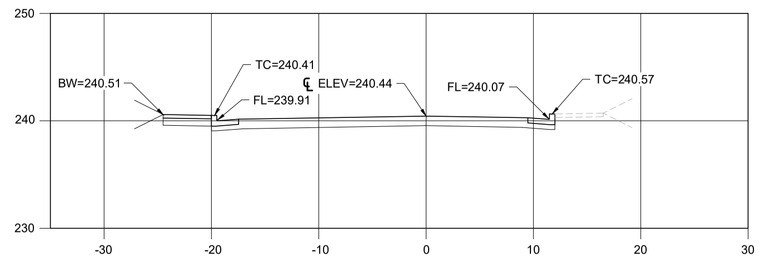
CROSS SECTION STA. 9+00

SCALE: 1"=10'



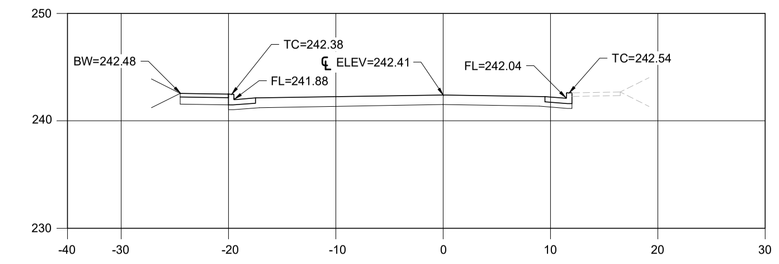
CROSS SECTION STA. 11+70

SCALE: 1"=10'



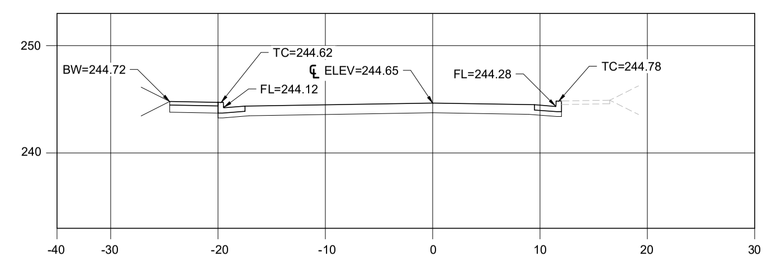
CROSS SECTION STA. 3+50

SCALE: 1"=10'



CROSS SECTION STA. 6+50

SCALE: 1"=10'



CROSS SECTION STA. 9+50

SCALE: 1"=10'

NOT FOR CONSTRUCTION

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1 INCH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * DANIEL C. WHITCHURCH * NO. C85055 * STATE OF CALIFORNIA * CIVIL

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

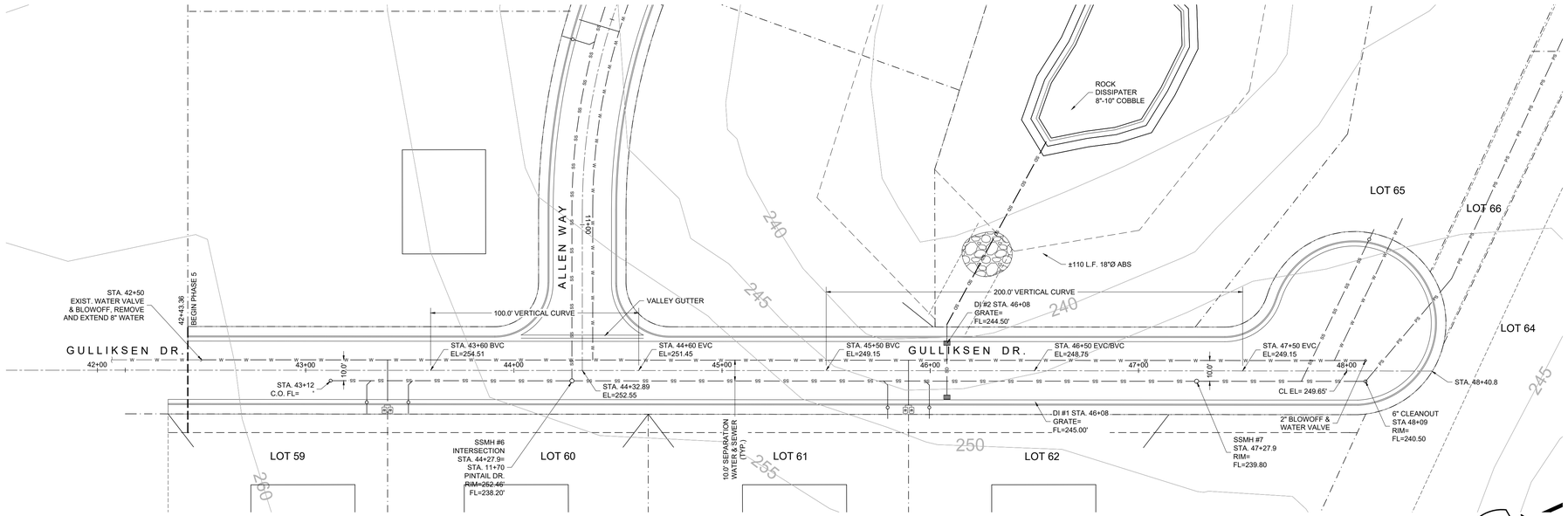
ALLEN WAY CROSS SECTIONS

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	6

C:\Data\Gullikseneandis\2023 plans\Civil\Sheets\Allen Way Cross Sections.dwg, 4/30/2024

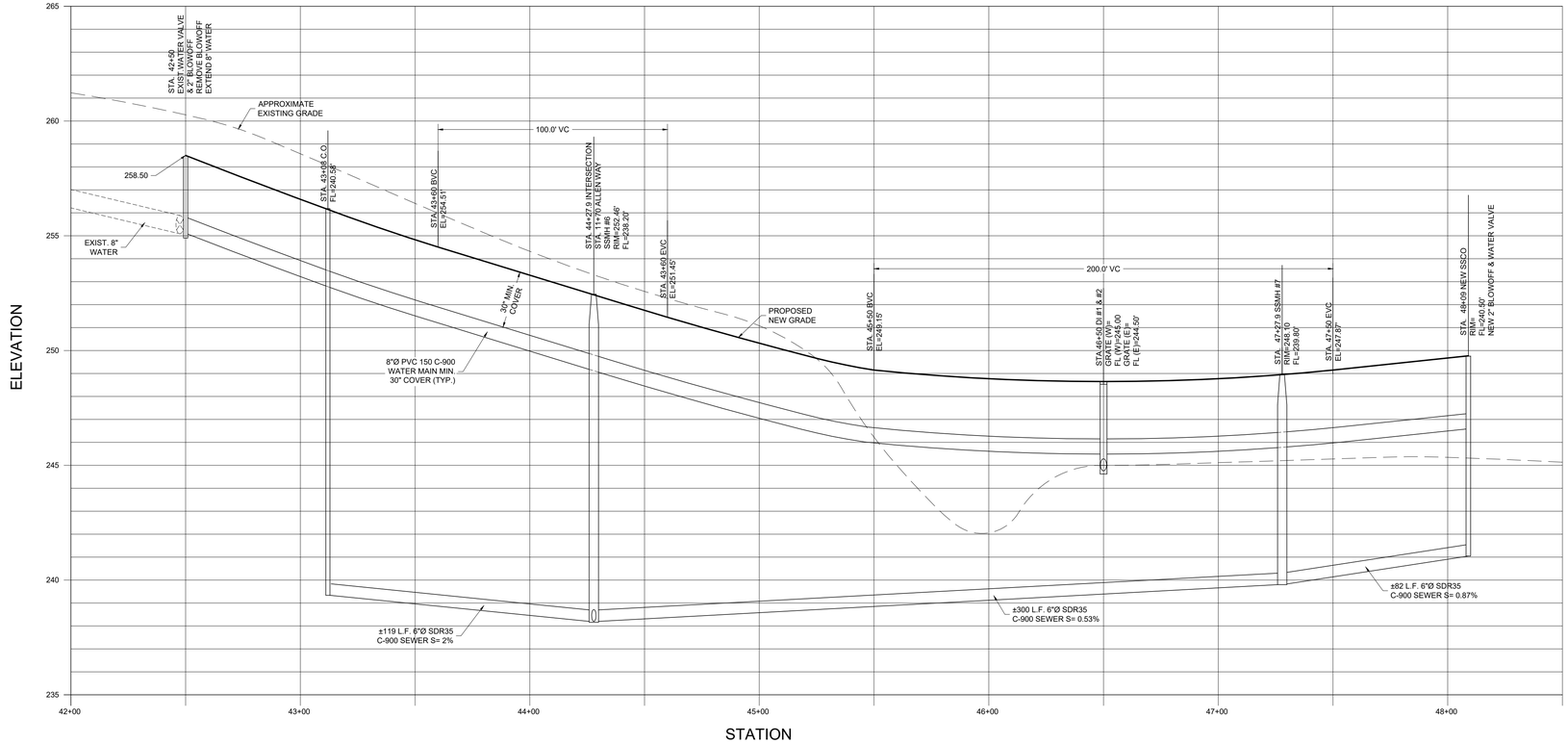
GULLIKSEN DR. SEWER CO & WATER LATERAL DATA				
LOT #	SSCO STA.	SSCO LID	SSCO FL	WM STA.
59	43+29.3			43+39.3
60	43+49.3			43+39.3
61	45+79.5			45+89.5
62	45+99.5			45+89.5



UTILITY PLAN STA. 41+00 TO STA. 48+40.0

SCALE: 1"=30'

NORTH



UTILITY PROFILE STA. 42+13.36 TO STA. 48+40.0

SCALE: 1"=30' HORIZ.
1"=3' VERT.

NOT FOR CONSTRUCTION

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * DAVID C. GNG * NO. C85055 * STATE OF CALIFORNIA * CIVIL

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

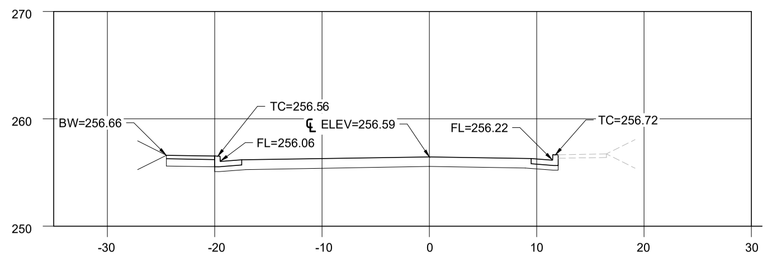
GULLIKSEN DR.

UTILITY PLAN & PROFILE STA.42+13.36 TO STA. 48+40.0

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

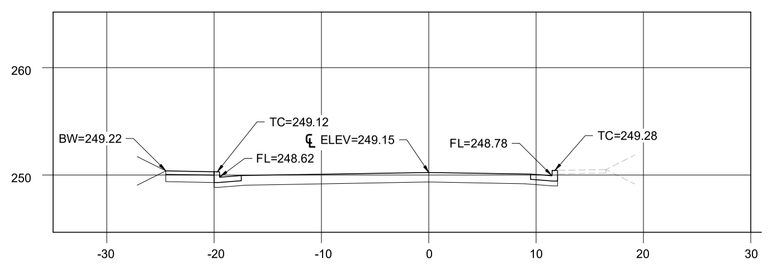
Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	7

E:\Gulliksen\Improv\2024 sheet 6 GULLIKSENDR2024.dwg Plotted: 30 Apr 2024 By: Dave Gng



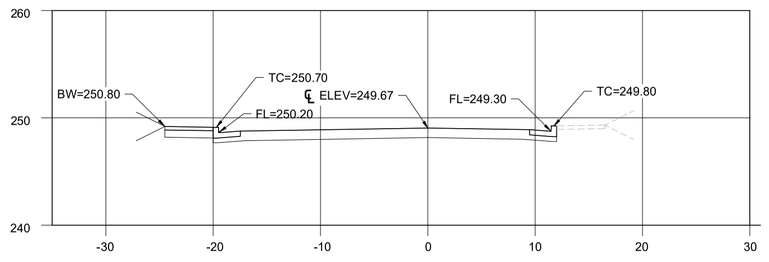
CROSS SECTION STA. 43+00

SCALE: 1"=10'



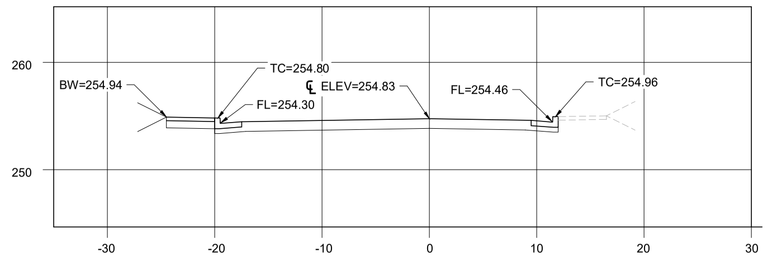
CROSS SECTION STA. 45+50

SCALE: 1"=10'



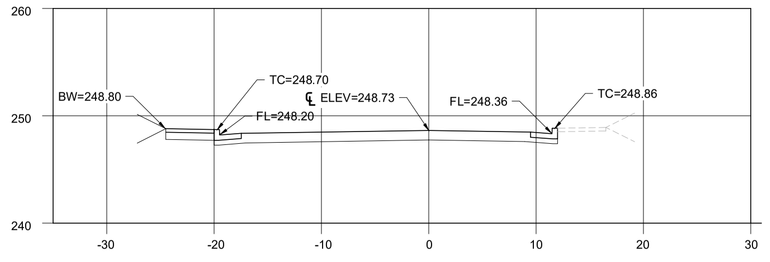
CROSS SECTION STA. 48+00

SCALE: 1"=10'



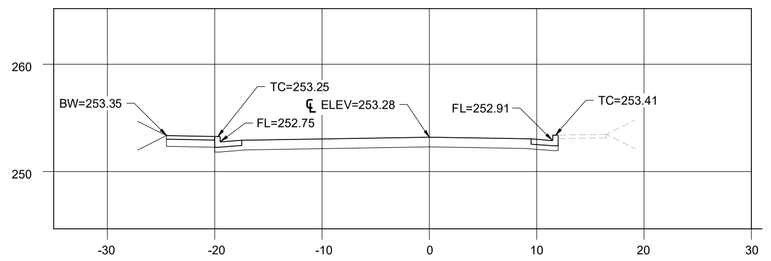
CROSS SECTION STA. 43+50

SCALE: 1"=10'



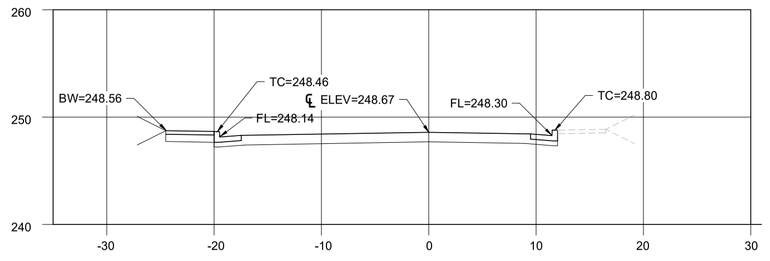
CROSS SECTION STA. 46+00

SCALE: 1"=10'



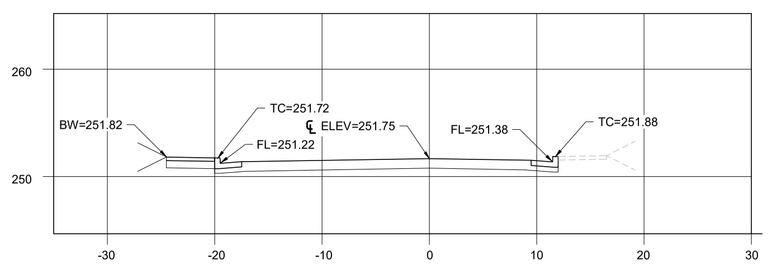
CROSS SECTION STA. 44+00

SCALE: 1"=10'



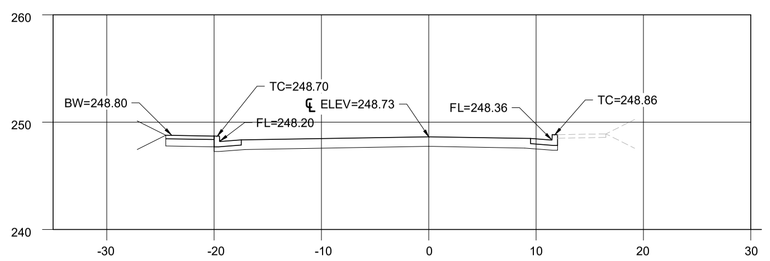
CROSS SECTION STA. 46+50

SCALE: 1"=10'



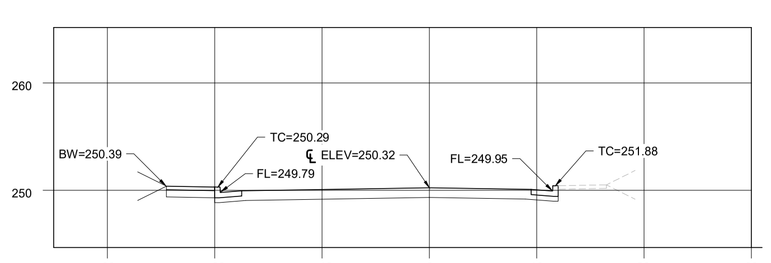
CROSS SECTION STA. 44+50

SCALE: 1"=10'



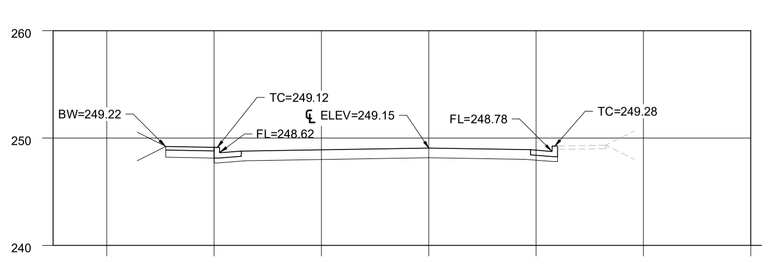
CROSS SECTION STA. 47+00

SCALE: 1"=10'



CROSS SECTION STA. 45+00

SCALE: 1"=10'



CROSS SECTION STA. 47+50

SCALE: 1"=10'

NOT FOR CONSTRUCTION

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1 INCH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * DANIEL C. LUND * NO. C85055 * STATE OF CALIFORNIA * CIVIL

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

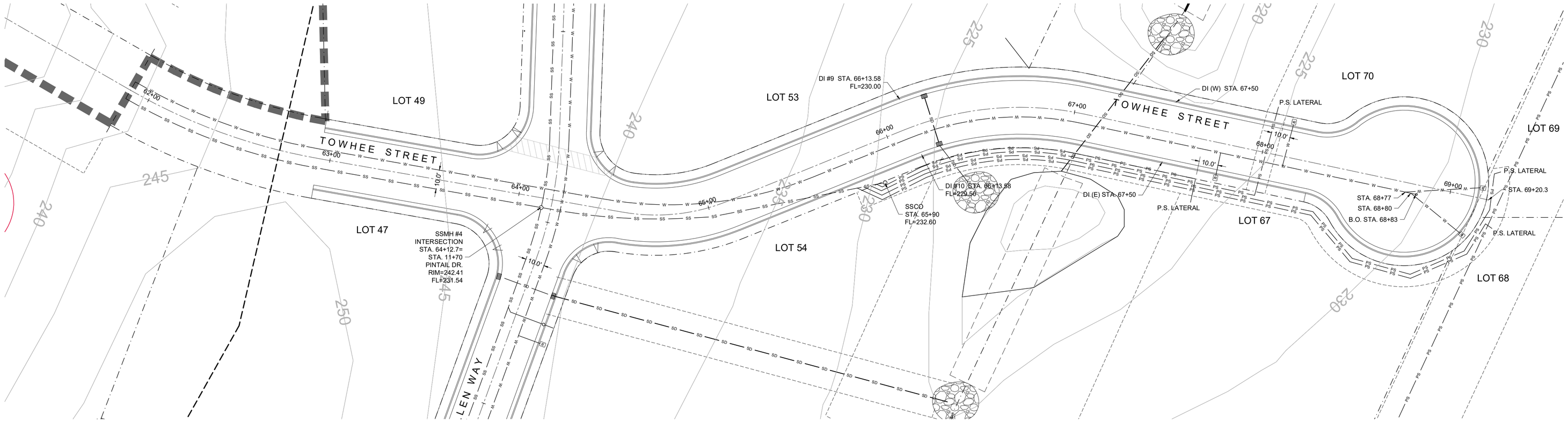
GULLIKSEN DRIVE CROSS SECTIONS

For: Wendt Construction Co. 3851 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	8

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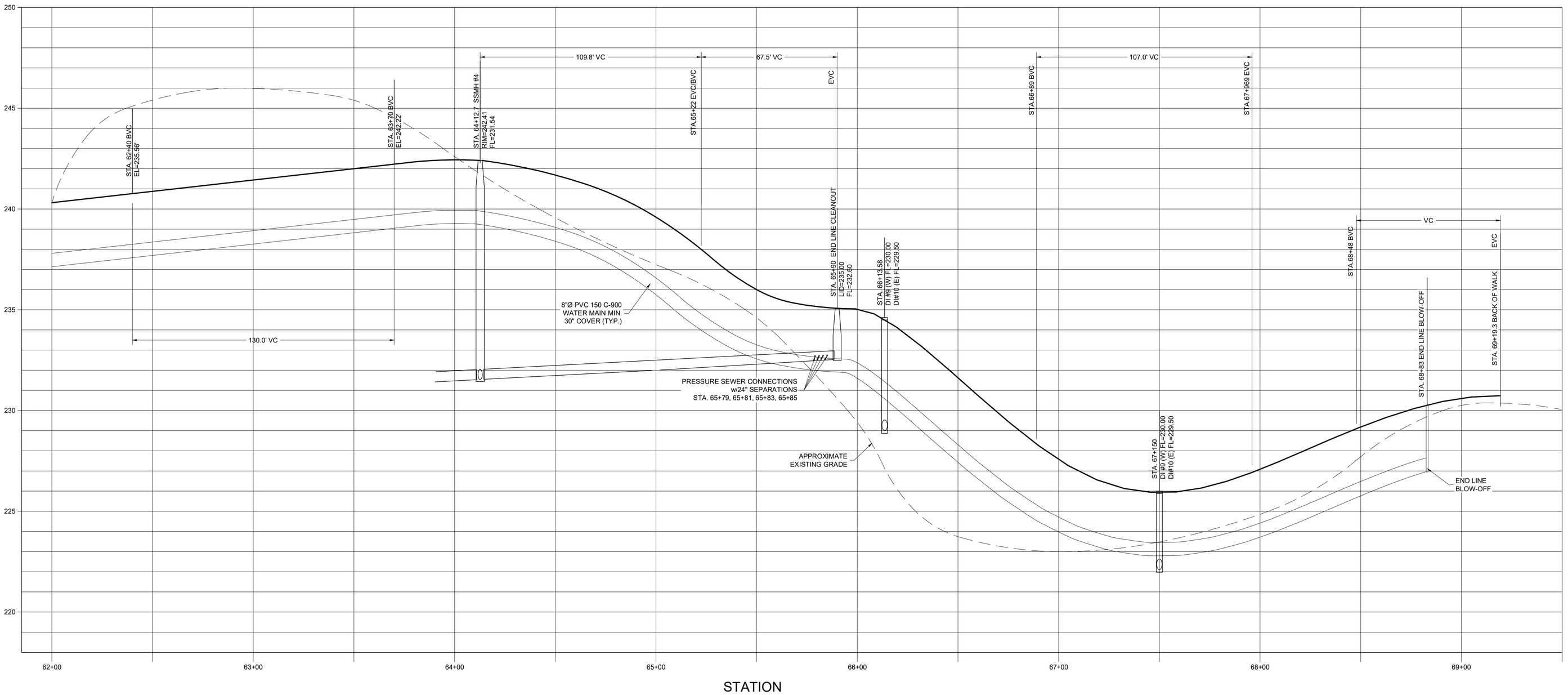
TOWHEE ST. SEWER CO & WATER LATERAL DATA			
LOT #	SSCO STA.	SSCO FL	WM STA.
67	65+86	PRESSURE	69+78
68	65+90	PRESSURE	69+09
69	65+88	PRESSURE	69+16
70	65+92	PRESSURE	68+12
			MIN. 30" COVER



UTILITY PLAN STA. 62+00 TO STA. 69+20.3

SCALE: 1"=30'

NORTH



UTILITY PROFILE STA. 62+00 TO STA. 69+20.3

SCALE: 1"=30' HORIZ.
1"=3' VERT.

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * CIVIL * STATE OF CALIFORNIA * NO. C85055 * DANIEL C. LYNG

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA 95540

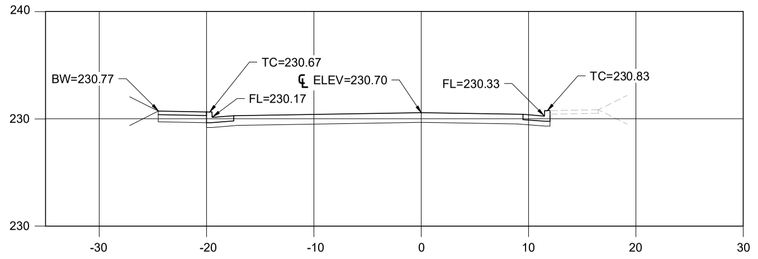
TOWHEE ST.

UTILITY PLAN & PROFILE STA. 62+00 TO

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

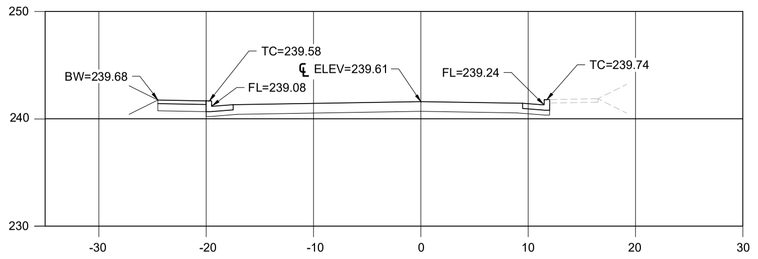
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Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	9

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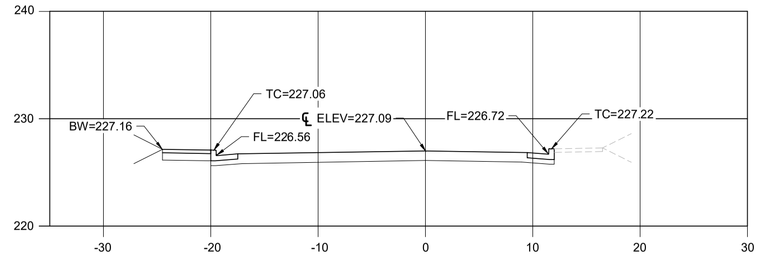
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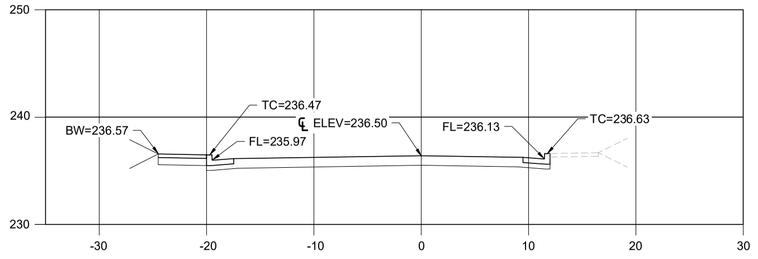
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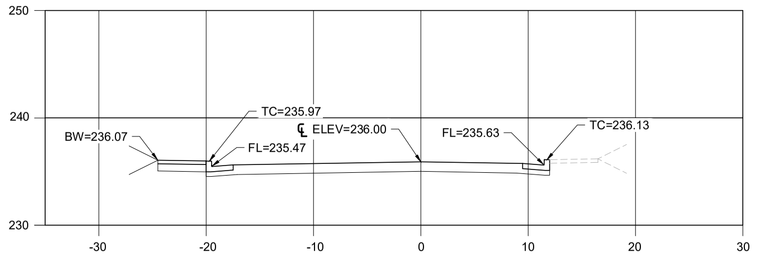
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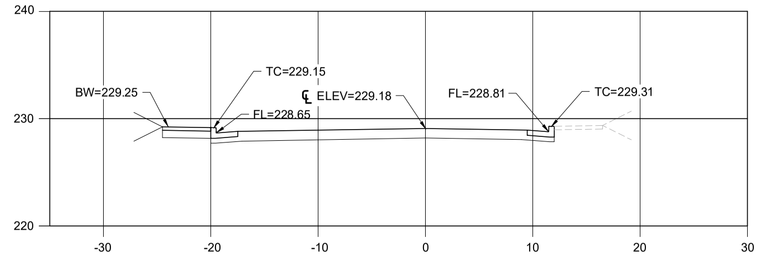
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SCALE: 1"=10'



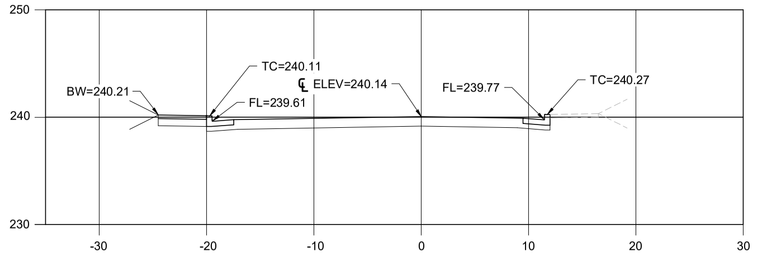
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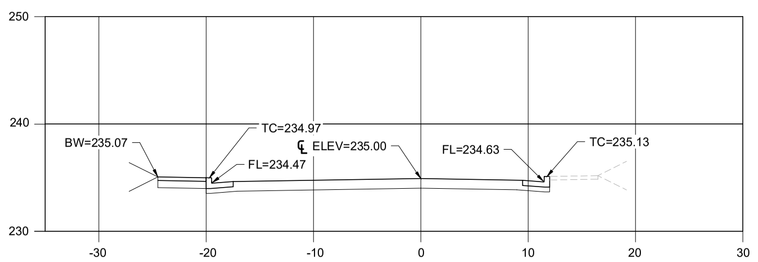
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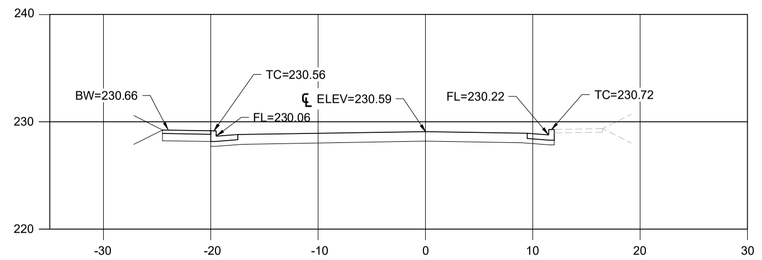
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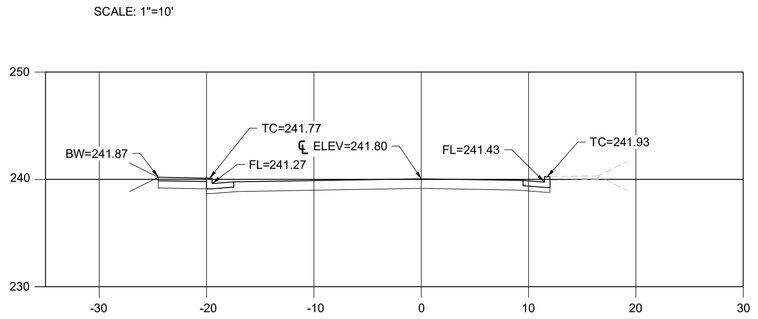
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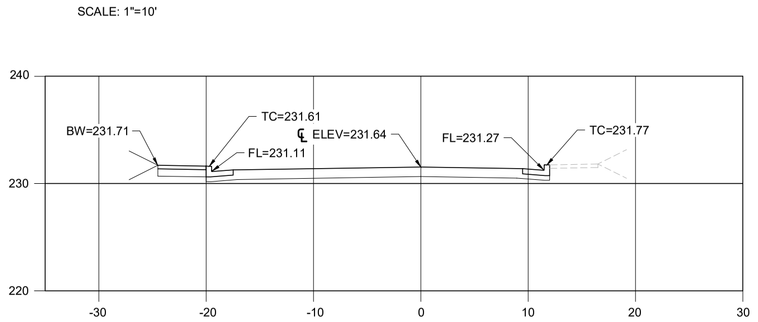
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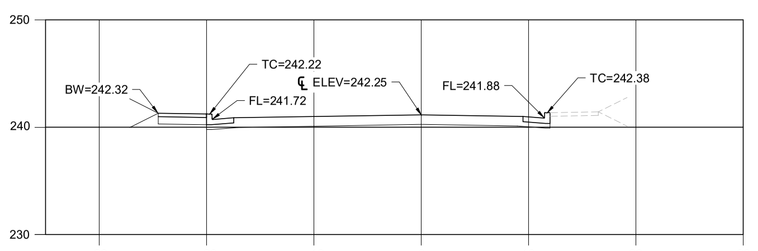
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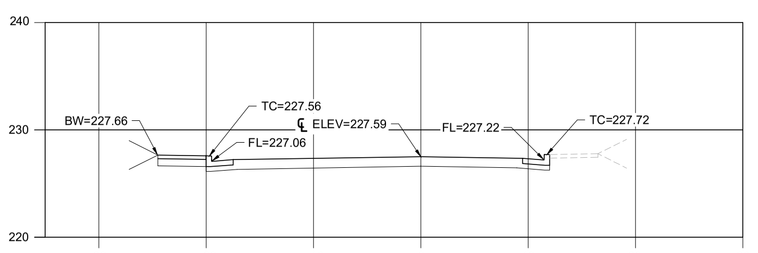
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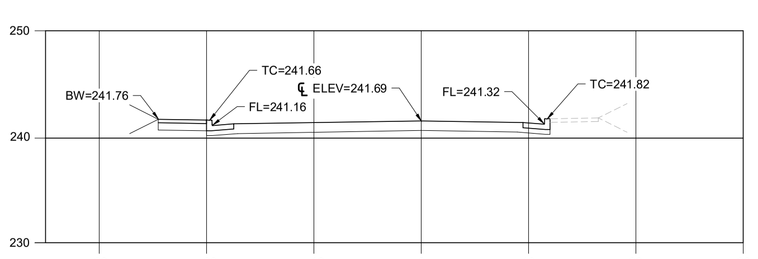
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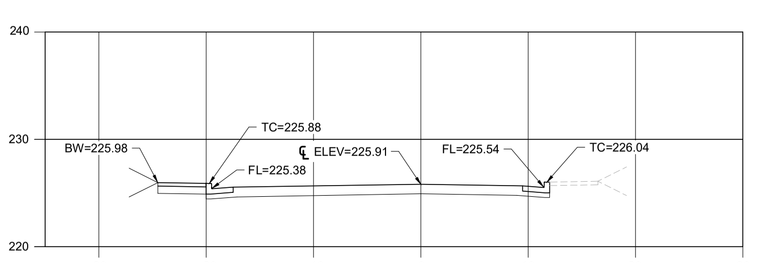
CROSS SECTION STA. 67+00

SCALE: 1"=10'



CROSS SECTION STA. 64+50

SCALE: 1"=10'



CROSS SECTION STA. 67+50

SCALE: 1"=10'

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * DANIEL C. LUND * NO. C85055 * STATE OF CALIFORNIA

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GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

TOWHEE STREET CROSS SECTIONS

For: Wendt Construction Co. 3851 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	10

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1. THE SANITARY SEWER SYSTEM SHALL BE DESIGNED AND CONSTRUCTED IN CONFORMANCE WITH THE CRITERIA ESTABLISHED BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS IN THE "MANUAL OF ENGINEERING PRACTICES NO. 60, GRAVITY SANITARY SEWER DESIGN AND CONSTRUCTION," AND IN ACCORDANCE WITH THE PLANS, PREPARED BY A REGISTERED CIVIL ENGINEER, AND APPROVED BY THE CITY ENGINEER.

2. THE SANITARY SEWER SYSTEM SHALL BE WITHIN THE ROAD RIGHT-OF-WAY OF CITY STREETS EXCEPT WHERE EASEMENTS ARE NECESSARY TO PROVIDE A GRAVITY FLOW SYSTEM.

3. SANITARY SEWER MAINS:

3.1. MINIMUM DIAMETER - SIX (6) INCHES.

3.2. ALIGNMENT WITH WATER MAINS - SANITARY SEWERS SHALL BE INSTALLED IN ACCORDANCE WITH CALIFORNIA CODE OF REGULATIONS, TITLE 22, SECTION 64572, WATER MAIN SEPARATION.

4. SANITARY SEWER MANHOLES:

4.1. NO MORE THAN 300' APART ON A COMMON MAIN, AND AT ADDITIONAL LOCATIONS SUCH AS CHANGES IN GRADE, PIPE SIZE, OR ALIGNMENT AS REQUIRED BY THE CITY ENGINEER.

4.2. MANHOLE RIM ELEVATIONS SHALL BE LOWER THAN THE TOPS OF ALL CLEANOUTS AT OR UPSTREAM OF THE MANHOLE AND LOWER THAN NEARBY FINISH FLOORS.

4.3. REQUIRED MANHOLE INSIDE DIAMETERS:
4.3.1. 48 " - TO BE USED ON SEWER MAINS LESS THAN 18" DIAMETER **AND** LESS THAN 8' DEEP FROM FINISHED GRADE.
4.3.2. 60 " - TO BE USED FOR SEWER MAINS GREATER THAN OR EQUAL TO 18" DIAMETER **OR** GREATER THAN OR EQUAL TO 8' DEEP FROM FINISHED GRADE.

4.4. CHANNELS WITHIN MANHOLES SHALL BE DESIGNED TO ACCOMMODATE BOTH EXISTING AND EXPECTED FUTURE MAINS.

5. SANITARY SEWER LATERALS:

5.1. IF A PROPOSED SANITARY SEWER LATERAL CONNECTION IS GREATER THAN 60 FEET IN LENGTH WITHIN THE PUBLIC RIGHT-OF-WAY, THE MAINLINE SEWER SHALL BE EXTENDED AS REQUIRED BY THE CITY ENGINEER.

6. ADDITIONAL SUBDIVISION REQUIREMENTS:

6.1. AN ADEQUATE SANITARY SEWER SYSTEM, INCLUDING PIPES, MANHOLES, PUMP STATIONS, AND OFFSITE LINES, CONNECTED TO THE SEWER SYSTEM SERVING THE CITY OF FORTUNA SHALL BE INSTALLED IN EACH SUBDIVISION.

6.1. WHERE A SANITARY SEWER MAIN IS CONSTRUCTED OR LAID WITHIN A ROAD RIGHT-OF-WAY, SANITARY SEWER LATERAL LINES SHALL BE INSTALLED TO SERVE EACH LOT IN A SUBDIVISION.

6.2. AN AT-GRADE CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE ON EACH SEWER LATERAL CONNECTION.

CITY OF FORTUNA STANDARD DETAILS	SANITARY SEWER DESIGN CRITERIA	APPROVED DATE: ---- STD. DWG. S-200

1. MATERIALS:

1.1. SANITARY SEWER MAINS AND LATERALS:
1.1.1. AT LEAST SDR-35
1.1.2. CONFORMING TO ASTM-D-3034.

1.2. PIPE BEDDING MATERIAL - 3/8 CRUSHED ANGULAR

1.3. TRENCH BACKFILL:
1.3.1. INSIDE PAVED AREAS - CLASS 2 A.B.
1.3.2. OUTSIDE PAVED AREAS - NATIVE MATERIAL (RIVER RUN OR CLASS 2 A.B. MAY BE SUBSTITUTED)

2. CONSTRUCTION:

2.3. SEWER CONNECTIONS TO BE STUBBED OFF SHALL BE CLOSED TO MAKE A WATER-TIGHT SEAL USING A CHERNE END-OF-PIPE GRIPPER PLUG W/WING NUT, OR EQUAL.

3. ACCEPTANCE REQUIREMENTS:

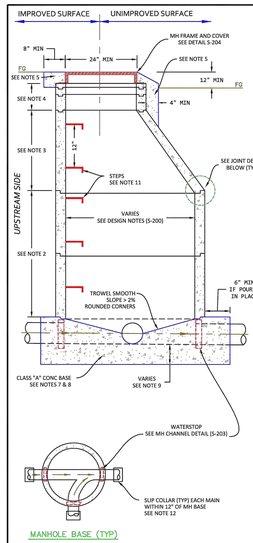
3.1. NEW SEWER LINES AND/OR MANHOLES SHALL NOT BE ACCEPTED BY THE CITY AND SHALL NOT BE OPERATED AS A PART OF THE CITY'S SANITARY SEWER SYSTEM UNTIL THE CITY'S ACCEPTANCE OF WATER INFILTRATION TESTING, WITH A MINIMUM OF 4' HEAD, IN CONFORMANCE WITH THE ASCE "MANUAL OF ENGINEERING PRACTICES NO. 60, GRAVITY SANITARY SEWER DESIGN."

3.2. MANHOLES AND PIPES SHALL BE TESTED SEPARATELY

3.3. INFILTRATION VS. EXFILTRATION TESTING:
3.3.1. GROUNDWATER IS 4 FEET OR MORE ABOVE THE TOP OF PIPE(S) -> INFILTRATION
3.3.1.1. MEASURE THE FLOW RATE AT THE PIPE OUTLET
3.3.2. GROUNDWATER IS NOT 4 FEET ABOVE THE TOP OF PIPE(S) -> EXFILTRATION
3.3.2.1. TEST MANHOLES BEFORE TESTING PIPES, AS NEEDED
3.3.2.2. PLUG DOWNSTREAM OUTLET AND FILL TO AT LEAST 4' ABOVE THE TOP OF PIPE(S) OR THE GROUNDWATER LEVEL, WHICHEVER IS HIGHER.

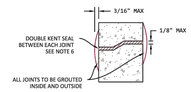
3.4. ACCEPTABLE INFILTRATION/EXFILTRATION RATES:
3.4.1. NEW SEWER PIPE: 50 GALLONS/INCH-DIAMETER/MILE-PIPE/DAY
3.4.2. NEW 48" DIAMETER MANHOLE: 0.4 GALLONS/HOUR/FT-HEAD
3.4.3. NEW 60" DIAMETER MANHOLE: 0.5 GALLONS/HOUR/FT-HEAD

CITY OF FORTUNA STANDARD DETAILS	SANITARY SEWER CONSTRUCTION CRITERIA	APPROVED DATE: ---- STD. DWG. S-201



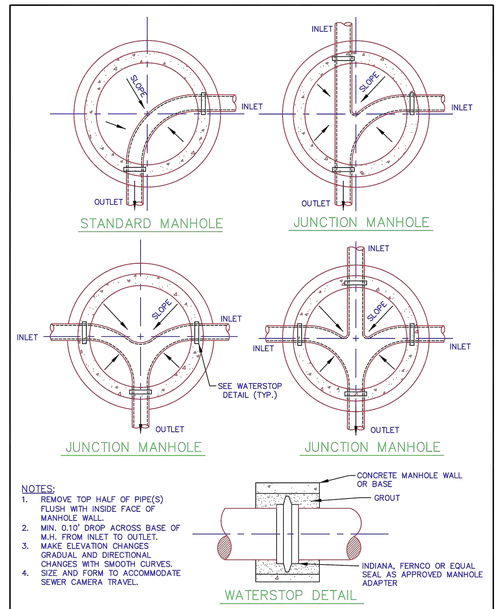
NOTES:

1. IN UNIMPROVED AREAS, TOP OF COVER SHALL BE LEVEL W/ PROPOSED FUTURE PAVING.
2. BARREL SHALL CONFORM TO ASTM C478.
3. CONE SECTION (TAPERS) SHALL BE ECCENTRIC, ORIENTED TO THE UPSTREAM SIDE AS SHOWN.
4. GRADE ADJUSTMENT RINGS:
   4.1. MINIMUM OF ONE 3" RING.
   4.2. MAX. TOTAL HEIGHT OF RINGS = 12"
   4.3. LEVEL WITH 1:3 MORTAR, 1" MIN
   4.4. ALTERNATIVELY, RINGS MAY BE CAST IN PLACE.
5. CONCRETE COLLAR:
   5.1. (6) SACK, 3,000 PSI MIN.
   5.2. W/ #4 REBAR
   5.3. 3LBS/CY LAMP BLACK
6. JOINTS (DOUBLE KENT SEAL):
   6.1. TYPICAL: 1½" (½" x 2½")
   6.2. BASE TO BARREL: 2½" (½" x 2½")
7. PRECAST BASE SHALL BE FROM A CITY-APPROVED LIST AND PLACED ON 12" THICK ¾" DRAIN ROCK SUBBASE INSTALLED AGAINST UNDISTURBED EARTH (NOT SHOWN)
8. POURED-IN-PLACE BASE:
   8.1. REQUIRED ON EXISTING SEWERS MAINS
   8.2. SHALL BE POURED FULL THICKNESS TO UNDISTURBED SIDES OF EXCAVATION OR SHALL BE FORMED
9. CONCRETE THICKNESS BELOW CHANNEL(S):
   9.1. 8" MIN WITH #4 REBAR @ 12" O.C., OR
   9.2. 12" MIN WITH NO REINFORCEMENT
10. FLOW CHANNELS (DETAIL S-203) SHALL BE CONSTRUCTED AFTER M.H. IS SET.
11. COAT INSIDE MH WITH THOROSEAL OR XYPEX.
12. STEPS SHALL BE FIBERGLASS ENCAPSULATED POLYETHYLENE.
13. SLIP COLLAR NOT REQUIRED WHEN PRECAST BASE MANUFACTURED W/FLEX COUPLINGS
14. BACKFILL WITH CLASS 2 AGGREGATE BASE:
   14.1. MIN 2' WIDE
   14.2. MAX 8' LIFTS
   14.3. 95% RELATIVE COMPACTION



JOINT DETAIL (TYP)

CITY OF FORTUNA STANDARD DETAILS	STANDARD PRECAST CONCRETE MANHOLE	APPROVED DATE: ---- STD. DWG. S-202

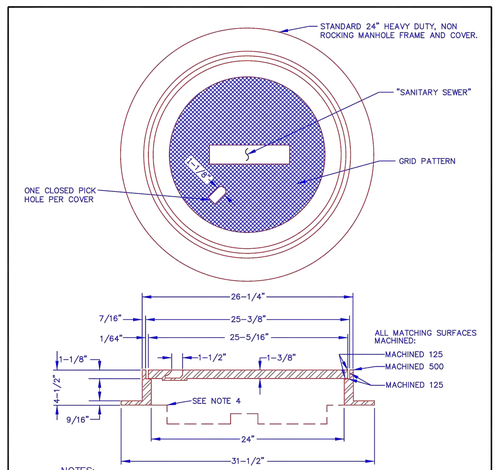


NOTES:

1. REMOVE TOP HALF OF PIPE(S) FLUSH WITH INSIDE FACE OF MANHOLE WALL.
2. MIN. 0.10' DROP ACROSS BASE OF M.H. FROM INLET TO OUTLET.
3. MAKE ELEVATION CHANGES GRADUAL AND DIRECTIONAL CHANGES WITH SMOOTH CURVES.
4. SIZE AND FORM TO ACCOMMODATE SEWER CAMERA TRAVEL.

WATERSTOP DETAIL

CITY OF FORTUNA STANDARD DETAILS	STANDARD MANHOLE CHANNEL DETAILS	APPROVED DATE: ---- STD. DWG. S-203



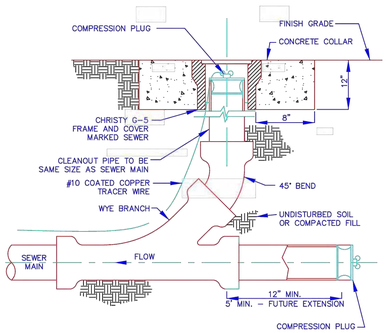
NOTES:

1. SPECIFY SANITARY SEWER WHEN ORDERING. ALL CASTING SHALL BE DIPPED IN APPROVED ASPHALT PAINT.
2. ALL MATERIAL USED IN MANUFACTURING SHALL CONFORM TO A.S.T.M. DESIGNATION A-159-G3000, OR OF UNITED STATES GOVERNMENT SPECIFICATIONS QQ-F-62B.
3. MINIMUM WEIGHT COMPONENTS: COVER – 130 POUNDS FRAME – 142 POUNDS
4. MANHOLES IN NON-PAVED AREAS SHALL HAVE "DUST" COVERS AT THE OPTION OF THE CITY.

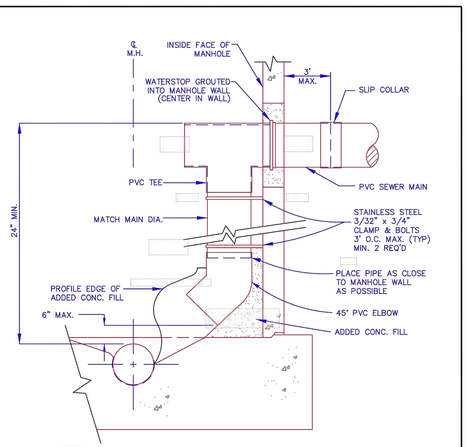
CITY OF FORTUNA STANDARD DETAILS	STANDARD MANHOLE FRAME AND COVER	APPROVED DATE: ---- STD. DWG. S-204

NOTES

1. COMPRESSION PLUGS TO BE CHERNE END-OF-PIPE GRIPPER PLUGS W/WING NUT, OR EQUAL



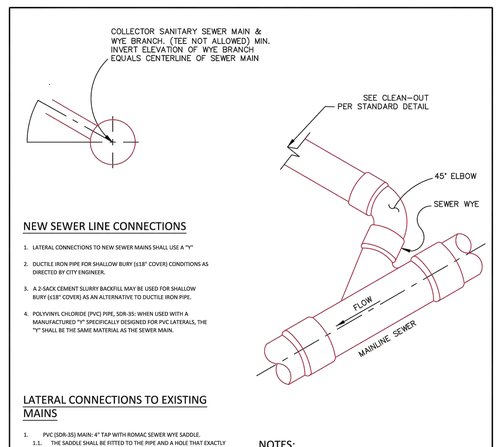
CITY OF FORTUNA STANDARD DETAILS	MAINLINE CLEANOUT	APPROVED DATE: ---- STD. DWG. S-209



NOTES:

1. INSIDE DROP TO BE USED ONLY WITH PRIOR APPROVAL OF CITY. CITY STANDARD IS OUTSIDE DROP MANHOLE.
2. INSTALL WATERSTOP IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AS SHOWN.
3. NEW MANHOLES CONSTRUCTED USING THIS STANDARD SHALL BE 60" IN DIAMETER, AND INSTALLED PER STD DETAIL. USE 72" MANHOLE WHERE THERE ARE TWO DROP CONNECTIONS.
4. ENCLOSE ELBOWS IN CONCRETE. FORM CHANNEL TO MANHOLE FLOWLINE.
5. PVC PIPE AND FITTINGS TO BE SDR-35
6. DROP MANHOLES SHALL NOT BE USED FOR PIPE DIAMETERS GREATER THAN 8".

CITY OF FORTUNA STANDARD DETAILS	INSIDE DROP IN SANITARY SEWER MANHOLE	APPROVED DATE: ---- STD. DWG. S-206



NEW SEWER LINE CONNECTIONS

1. LATERAL CONNECTIONS TO NEW SEWER MAINS SHALL USE A "Y"
2. DUCTILE IRON PIPE FOR SHALLOW BURY (≤18" COVER) CONDITIONS AS DIRECTED BY CITY ENGINEER.
3. A 2-SACK CEMENT SLURRY BACKFILL MAY BE USED FOR SHALLOW BURY (≤18" COVER) AS AN ALTERNATIVE TO DUCTILE IRON PIPE.
4. POLYVINYL CHLORIDE (PVC) PIPE, SDR-35: WHEN USED WITH A MANUFACTURED "Y" SPECIFICALLY DESIGNED FOR PVC LATERALS, THE "Y" SHALL BE THE SAME MATERIAL AS THE SEWER MAIN.

LATERAL CONNECTIONS TO EXISTING MAINS

1. PVC (SDR-35) MAIN: 4" TAP WITH ROMAC SEWER WYE SADDLE.
   1.1. THE SADDLE SHALL BE FITTED TO THE PIPE AND A HOLE THAT EXACTLY FITS THE SADDLE SHALL BE CUT INTO THE MAIN LINE.
   1.2. THE EDGES OF THE HOLE SHALL BE TRIMMED OF PROJECTIONS AND CARE EXERCISED TO PREVENT TRIMMINGS FROM ENTERING THE SEWER.
   1.3. THE STAINLESS STEEL CLAMP AND GASKETED SADDLE SHALL BE TIGHTENED TO CREATE A WATER-TIGHT SEAL AROUND PIPE.
2. LATERAL PIPE SHALL NOT PROTRUDE INTO THE MAINLINE.
3. ASBESTOS CEMENT (AC) OR CLAY MAIN: DESIGN AND MATERIALS TO BE APPROVED BY CITY ENGINEER PRIOR TO CONNECTION.
4. LATERALS GREATER THAN 4" DIAMETER REQUIRE MANHOLE CONNECTION TO MAIN UNLESS OTHERWISE APPROVED BY CITY ENGINEER.

NOTES:

1. THE SEWER SERVICE LATERAL SHALL BE OF SUFFICIENT DEPTH TO ADEQUATELY SERVE THE BUILDING SITE, AND IN NO CASE SHALL BE LESS THAN 3 FT. IN DEPTH AT THE BACK OF THE P.U.E. UNLESS OTHERWISE AUTHORIZED BY THE CITY OF FORTUNA.
2. WHERE PROBLEMS ARE ANTICIPATED IN PROVIDING SEWER SERVICE TO A GIVEN BUILDING SITE, THE LATERAL INVERT AT THE BACK OF THE P.U.E. SHALL BE STATED BY THE OWNER'S ENGINEER.
3. MINIMUM 2% SLOPE EXCEPT WHERE A VARIATION IS SPECIFICALLY APPROVED BY THE CITY OF FORTUNA.

CITY OF FORTUNA STANDARD DETAILS	SEWER SERVICE LATERAL	APPROVED DATE: ---- STD. DWG. S-207

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * CIVIL * STATE OF CALIFORNIA * NO. C85055 * EXP. 12-31-25

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5
Fortuna, CA. 95540

TYPICAL STANDARD SEWER DETAILS
For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	11

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CITY OF FORTUNA STANDARD DETAILS

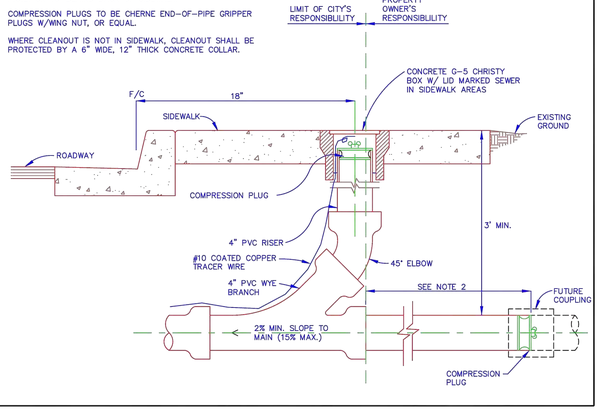
SEWER SERVICE LATERAL CLEANOUT

S-208

APPROVED DATE: ----
STD. DWG.

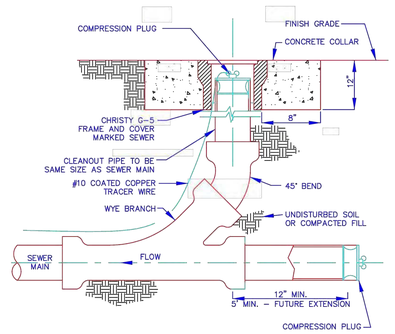
NOTES

1. WHERE SERVICE LATERAL IS LOCATED IN DRIVEWAY APPROACH, CLEANOUT IS TO BE LOCATED 18" BEHIND DRIVEWAY APRON.
2. COUPLING TO BE A MINIMUM OF 12" FROM WYE WHEN CONNECTING TO EXISTING SEWER LATERAL AND 1' BEHIND P.U.E. OR 10' BEHIND BACK OF SIDEWALK.
3. COMPRESSION PLUGS TO BE CHERNE END-OF-PIPE GRIPPER PLUGS W/WING NUT, OR EQUAL.
4. WHERE CLEANOUT IS NOT IN SIDEWALK, CLEANOUT SHALL BE PROTECTED BY A 6" WIDE, 12" THICK CONCRETE COLLAR.



NOTES

1. COMPRESSION PLUGS TO BE CHERNE END-OF-PIPE GRIPPER PLUGS W/WING NUT, OR EQUAL



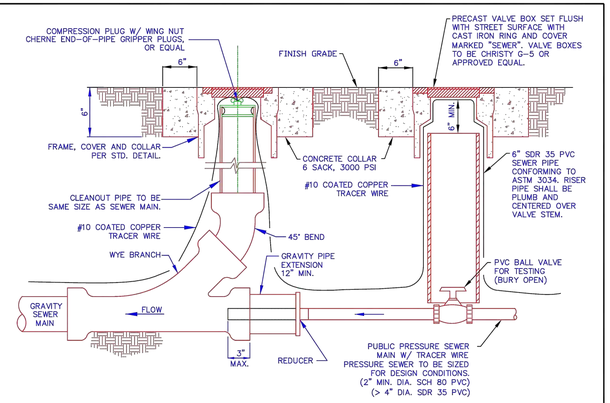
CITY OF FORTUNA STANDARD DETAILS | MAINLINE CLEANOUT | APPROVED DATE: ---- STD. DWG. S-209

CITY OF FORTUNA STANDARD DETAILS

PRESSURE MAIN CONNECTION TO ENDLINE MAIN CLEANOUT

S-210

APPROVED DATE: ----
STD. DWG.



PUBLIC PRESSURE MAIN CONNECTION TO ENDLINE GRAVITY MAIN CLEANOUT

NTS

NOT FOR CONSTRUCTION

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1 INCH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * VIRGINIA * CIVIL * STATE OF CALIFORNIA * NO. C85055

WHITCHURCH ENGINEERING, INC.
Phone (707) 725-6926
610 9th Street Fortuna, California 95540

GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

TYPICAL STANDARD SEWER DETAILS

For: Wendt Construction Co. 3851 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	12

Z:\Gulliksen\Gulliksen Active\WCO2302\WCO2302 Sht Nos 2-24.dwg 2/28/24

1. THE WATER SUPPLY SYSTEM AND ASSOCIATED APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS, PREPARED BY A REGISTERED CIVIL ENGINEER, AND APPROVED BY THE CITY ENGINEER.

2. DISTRIBUTION SYSTEM AND LAYOUT:

2.1. THE DISTRIBUTION SYSTEM SHALL BE:
2.1.1. WITHIN THE ROAD RIGHT-OF-WAY OF CITY STREETS EXCEPT WHERE EASEMENTS ARE NECESSARY TO PROVIDE A CIRCULATING SYSTEM, AND
2.1.2. IN GRID FORM, WHEREVER POSSIBLE.

2.2. THE DISTRIBUTION SYSTEM SHALL BE EQUIPPED WITH A SUFFICIENT NUMBER OF VALVES SO THAT NO SINGLE VALVE SHUTDOWN WILL RESULT IN REMOVING FROM SERVICE:
2.2.1. A TRANSMISSION MAIN, OR
2.2.2. A LENGTH OF PIPE GREATER THAN FIVE HUNDRED (500') FEET, OR
2.2.3. MORE THAN TWO FIRE HYDRANTS.

2.3. ALL MAINLINE TEES SHALL HAVE THREE GATE VALVES, ONE ON EACH BRANCH.

2.4. ALL DEAD END MAINS REQUIRE A STANDARD BLOW OFF OR OTHER ACCEPTABLE MEANS OF FLUSHING.

3. WATER MAIN PIPELINE SIZING:

3.1. MINIMUM DIAMETER - SIX (6") INCHES, UNLESS OTHERWISE APPROVED BY THE PUBLIC WORKS DIRECTOR

3.2. DISTRIBUTION SYSTEM SIZING SHALL BE THAT WHICH PROVIDES FOR:
3.2.1. FULL FIRE REQUIREMENTS OF THE AMERICAN INSURANCE ASSOCIATION (NOT LESS THAN 1,500 GALLONS PER MINUTE FOR A FIVE-HOUR DURATION), AND
3.2.2. THE DOMESTIC REQUIREMENTS FOR PEAK SUMMER FLOWS, AND
3.2.3. ALL OTHER REQUIREMENTS WITHIN CURRENT BUILDING AND FIRE CODES.

4. FIRE HYDRANTS:

4.1. HYDRANTS REQUIRED AT ALL STREET INTERSECTIONS (LOCATED TO MINIMIZE RISK OF DAMAGE BY TRAFFIC)

4.2. HYDRANT SPACING (MEASURED ALONG STREET FRONTAGE):
4.2.1. RESIDENTIAL AREAS - FIVE HUNDRED (500') FEET
4.2.2. COMMERCIAL AREAS - THREE HUNDRED (300') FEET

4.3. NUMBER OF HYDRANTS ON A MAIN BETWEEN INTERSECTING LINES:
4.3.1. 6-INCH MAIN: NO MORE THAN ONE
4.3.2. 8-INCH MAIN: NO MORE THAN TWO

5. ADDITIONAL SUBDIVISION REQUIREMENTS:

5.1. AN ADEQUATE WATER SUPPLY AND DISTRIBUTION SYSTEM, WATER MAINS AND FIRE HYDRANTS CONNECTED TO THE WATER SYSTEM SERVING THE CITY OF FORTUNA SHALL BE INSTALLED IN EACH SUBDIVISION.
5.2. WATER LINES CONNECTING EXISTING DISTRIBUTION SYSTEMS SHALL BE INSTALLED TO SERVE EACH LOT.
5.3. NO MORE THAN ONE SERVICE LINE SHALL BE INSTALLED PER LOT.
5.4. WHERE FURTHER DEVELOPMENT APPEARS PROBABLE BEYOND A PROPOSED SUBDIVISION, THE WATER DISTRIBUTION SYSTEM MAY BE REQUIRED TO ACCOMMODATE SUCH ADDITIONAL DEVELOPMENT.
5.5. IF ANALYSIS PROVES THAT RESERVOIR STORAGE REQUIREMENTS MUST BE INCREASED TO MEET THE DEMANDS OF A PROPOSED SUBDIVISION, THE SUBDIVIDER SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF ADEQUATE RESERVOIR CAPACITY.

CITY OF FORTUNA STANDARD DETAILS | WATER DISTRIBUTION SYSTEM DESIGN CRITERIA | APPROVED DATE: ----- STD. DWG. W-300

1. MATERIALS:

1.1. ALL MATERIALS SHALL BE NEW.

1.2. POLYVINYL CHLORIDE (PVC) SHALL CONFORM TO AWWA C900.

1.3. HIGH DENSITY POLYETHYLENE (HDPE) SHALL CONFORM TO AWWA C906.

1.4. FITTINGS AND SPECIALS SHALL CONFORM TO THE APPLICABLE SECTIONS OF AWWA C100, AWWA C110, AWWA C207, AWWA C208, OR OTHER APPROVED STANDARD OR SPECIFICATION UNDER WHICH THE FITTING OR SPECIAL IS MADE.

1.5. PIPE BEDDING MATERIAL - SAND - MIN. SAND EQUIVALENT 45

1.6. TRENCH BACKFILL:
1.6.1. INSIDE PAVED AREAS - CLASS 2 A.B.
1.6.2. OUTSIDE PAVED AREAS - NATIVE MATERIAL (RIVER RUN OR CLASS 2 A.B. MAY BE SUBSTITUTED)

2. CONSTRUCTION:

2.1. NO ACTIVE OR ABANDONED WATER MAIN AND/OR HYDRANT VALVES SHALL BE OPERATED WITHOUT THE PRESENCE OF CITY OF FORTUNA STAFF.

2.5. ALL CONNECTIONS TO THE CITY'S EXISTING WATER DISTRIBUTION SYSTEM SHALL BE MADE BY OR WITNESSED BY CITY OF FORTUNA STAFF.

2.6. THE CITY AND ALL AFFECTED CUSTOMERS SHALL BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF A SHUTDOWN.

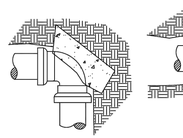
2.7. SHUTDOWNS SHALL LAST NO LONGER THAN 4 HOURS.

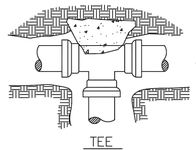
2.8. CONCRETE ANCHORS OR THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS, BEHIND TEES AND FIRE HYDRANTS, AND BEHIND CROSSES WHICH ARE VALVED IN SUCH A MANNER THAT THEY CAN BE USED AS TEES.

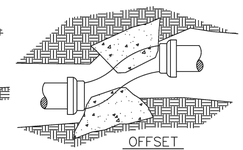
2.9. ALL VALVE STEMS SHALL BE CASED AND PROVIDED WITH REMOVABLE COVERS. WHEN LOCATED IN A PAVED AREA, COVERS SHALL BE FLUSH WITH SURFACING.

CITY OF FORTUNA STANDARD DETAILS | WATER DISTRIBUTION SYSTEM CONSTRUCTION CRITERIA | APPROVED DATE: ----- STD. DWG. W-301

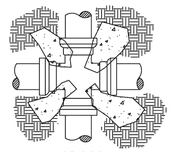
CITY OF FORTUNA STANDARD DETAILS | CONCRETE THRUST BLOCKING | APPROVED DATE: ----- STD. DWG. W-303







TYPICAL CONC. BLOCKING SHOWN IN PERSPECTIVE



THRUST BLOCK NOTES:

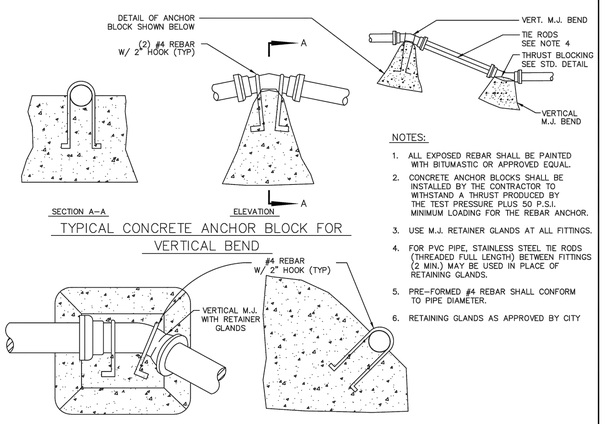
1. SAFE BEARING LOAD OF SOIL FOR HORIZONTAL THRUST SHALL NOT BE EXCEEDED.
2. CONCRETE BLOCKING, CAST-IN-PLACE, TO EXTEND FROM BELLS OF FITTINGS TO UNDISTURBED SOIL AND ENTIRE BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
3. IN USING THE THRUST BLOCKING TABLE BELOW, ASSUME 150 PSI TEST PRESSURE AND 2000 LBS/SQ FT. BEARING CAPACITY UNLESS OTHERWISE SHOWN ON THE PLANS. THE DESIGN ENGINEER SHALL SPECIFY THRUST BLOCKING REQUIREMENTS FOR ALL OTHER SOIL BEARING CONDITIONS.
4. FOR PLUGGED LEG(S) OF TEE OR CROSS, USE HARNESS TYPE BLOCKING AS SHOWN ON THE STD DETAILS AND CONCRETE BLOCKING INDICATED IN THE TABLE BELOW.
5. JOINTS TO BE KEPT FREE OF CONCRETE, ALLOW WORKING ROOM AROUND NUTS AND BOLTS. PLACE BITUMASTIC AROUND NUTS & BOLTS AND WRAP IN HEAVY GAGE PLASTIC.

THRUST BLOCK TABLE*

MAIN SIZE	TYPE OF FITTING	90° BEND	45° BEND	11 1/4° OR 22 1/2° BEND	TEE OR DEAD END
	REQUIRED TOTAL BEARING AREA IN SQUARE FEET				
	4"	2	2	1	2
	6"	4	2	1	2.5
	8"	6.5	3.5	2	4.5
	10"	10	5	3	7
	12"	14	8	4	10

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVDE BY 150

CITY OF FORTUNA STANDARD DETAILS | CONCRETE ANCHOR BLOCKS FOR VERTICAL BENDS | APPROVED DATE: ----- STD. DWG. W-304

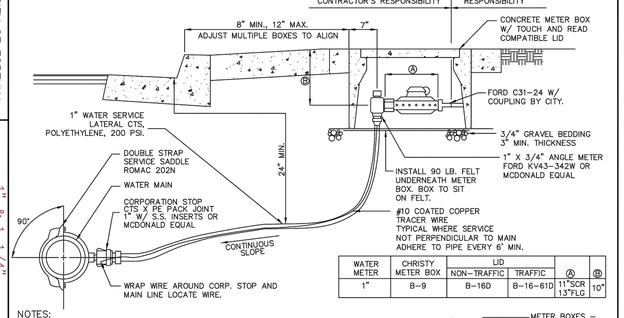


TYPICAL CONCRETE ANCHOR BLOCK FOR VERTICAL BEND

NOTES:

1. ALL EXPOSED REBAR SHALL BE PAINTED WITH BITUMASTIC OR APPROVED EQUAL.
2. CONCRETE ANCHOR BLOCKS SHALL BE INSTALLED BY THE CONTRACTOR TO WITHSTAND A THRUST PRODUCED BY THE TEST PRESSURE PLUS 50 P.S.I. MINIMUM LOADING FOR THE REBAR ANCHOR.
3. USE M.J. RETAINER GLANDS AT ALL FITTINGS.
4. FOR PVC PIPE, STAINLESS STEEL TIE RODS (THREADED FULL LENGTH) BETWEEN FITTINGS (2 MIN.) MAY BE USED IN PLACE OF RETAINING GLANDS.
5. PRE-FORMED #4 REBAR SHALL CONFORM TO PIPE DIAMETER.
6. RETAINING GLANDS AS APPROVED BY CITY

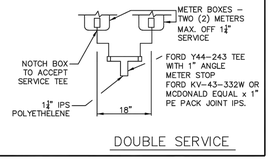
CITY OF FORTUNA STANDARD DETAILS | 1" & 1-1/4" DOMESTIC WATER SERVICE | APPROVED DATE: ----- STD. DWG. W-307



WATER METER	CHRISTY METER BOX	LID NON-TRAFFIC	LID TRAFFIC	Ⓐ	Ⓑ
1"	B-9	B-16D	B-16-61D	11"SQR 13"FLG	10"

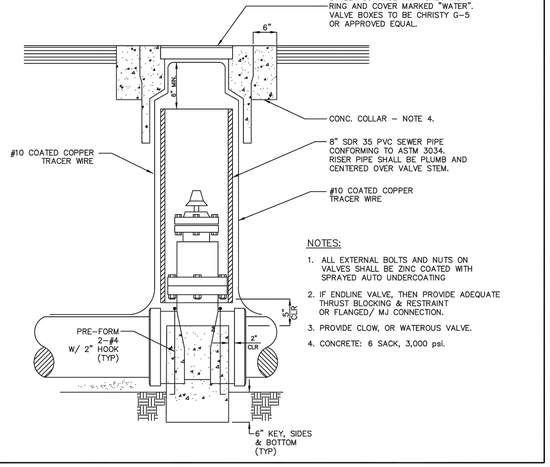
NOTES:

1. WATER SERVICE SIZE REFERS TO METER SIZE. UNLESS OTHERWISE SPECIFIED ON PLAN, PROVIDE FOR 1" METER INSTALLATION FOR SINGLE FAMILY RESIDENTIAL AND OFFICE COMMERCIAL PROJECTS.
2. INSTALL 1" METER FOR DUAL USES, DUPLEX SECOND UNITS, AND LARGER COMMERCIAL OFFICES.
3. METERS PROVIDED AND SET BY CITY OF FORTUNA AT DEVELOPERS EXPENSE.
4. WHERE NO SIDEWALK EXISTS, OR WHERE WS IS INSTALLED IN PLANTER STRIP, A 4" THICK BY 6" CLEAR WIDTH CONCRETE PAD SHALL BE INSTALLED.



DOUBLE SERVICE

CITY OF FORTUNA STANDARD DETAILS | TYPICAL GATE VALVE AND VALVE BOX | APPROVED DATE: ----- STD. DWG. W-309



NOTES:

1. ALL EXTERNAL BOLTS AND NUTS ON VALVES SHALL BE ZINC COATED WITH SPRAYED AUTO UNDERCOATING
2. IF ENDLINE VALVE, THEN PROVIDE ADEQUATE THRUST BLOCKING & RESTRAINT OR FLANGED/ MJ CONNECTION.
3. PROVIDE CLOW, OR WATEROUS VALVE.
4. CONCRETE: 6 SACK, 3,000 psi.

NOT FOR CONSTRUCTION

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1 INCH

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REGISTERED PROFESSIONAL ENGINEER * CHARLES D. WHITCHURCH * NO. C65055 * CIVIL * STATE OF CALIFORNIA

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5
Fortuna, CA. 95540

TYPICAL STANDARD WATER DETAILS

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
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Drawn	GKK
Job	WCO2302
Sheet	13

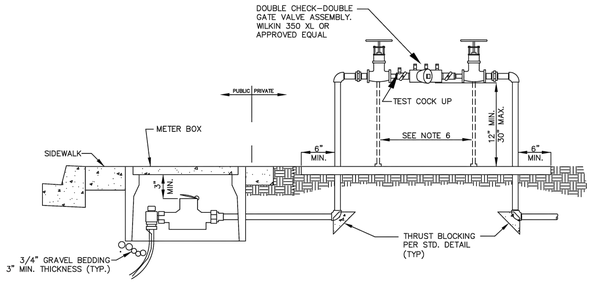
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CITY OF FORTUNA STANDARD DETAILS

3/4" DOUBLE CHECK VALVE TYPE BACKFLOW PREVENTER

STD. DWG. W— 311

APPROVED DATE: ----



NOTES:

1. DOUBLE CHECK VALVE ASSEMBLIES ARE USED FOR DOMESTIC SERVICE TO PARCELS WITH A SECOND WATER SOURCE.
2. OTHER DOUBLE CHECK VALVE ASSEMBLIES MAY VARY IN SIZE AND MAY REQUIRE A LARGER BOX.
3. ALL DOUBLE-CHECK VALVE ASSEMBLIES SHALL BE PROVIDED WITH A MINIMUM OF FOUR (4) TEST COCKS W/ QUICK COUPLINGS.
4. BACKFLOW PREVENTERS SHALL BE INSTALLED IN A SEPERATE METER BOX.
5. ALL PIPING SHALL BE SCH 80 PVC
6. 3" BACKFLOW PREVENTION DEVICE OR LARGER TO HAVE SUPPORTS.
7. ANY COVER OR SCREENING FOR THE DEVICE MUST BE APPROVED BY THE CITY PRIOR TO INSTALLATION. GUARD POST FOR PROTECTION AND VISIBILITY. PROTECTIVE ENCLOSURE FOR AESTHETIC, FREEZING, AND VANDALISM.

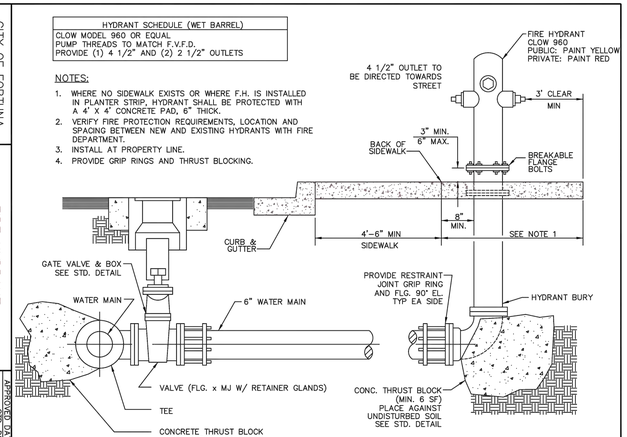
CITY OF FORTUNA STANDARD DETAILS

FIRE HYDRANT

STD. DWG. W— 313

APPROVED DATE: ----

HYDRANT SCHEDULE (WET BARREL)
CLOW MODEL 960 OR EQUAL PUMP THREADS TO MATCH F.V.F.D. PROVIDE (1) 4 1/2" AND (2) 2 1/2" OUTLETS



NOTES:

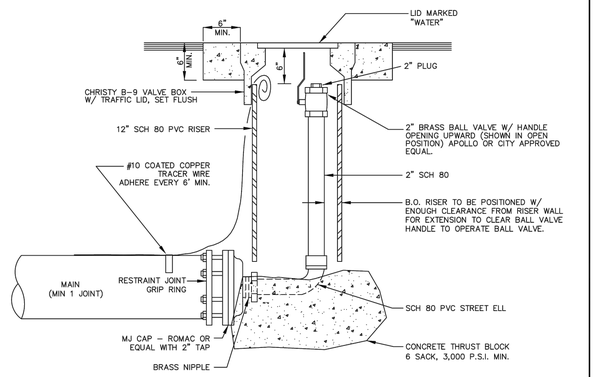
1. WHERE NO SIDEWALK EXISTS OR WHERE F.H. IS INSTALLED IN PLANTER STRIP, HYDRANT SHALL BE PROTECTED WITH A 4' x 4' CONCRETE PAD, 6" THICK.
2. VERIFY FIRE PROTECTION REQUIREMENTS, LOCATION AND SPACING BETWEEN NEW AND EXISTING HYDRANTS WITH FIRE DEPARTMENT.
3. INSTALL AT PROPERTY LINE.
4. PROVIDE GRIP RINGS AND THRUST BLOCKING.

CITY OF FORTUNA STANDARD DETAILS

ENDLINE BLOW-OFF

STD. DWG. W— 314

APPROVED DATE: ----

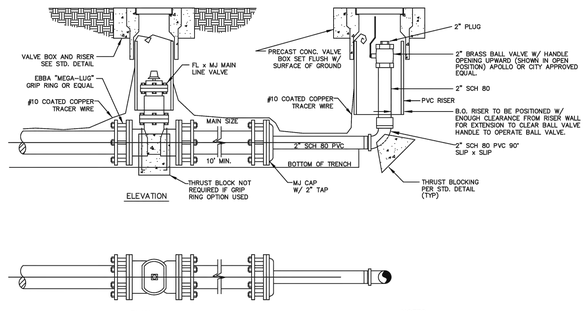


CITY OF FORTUNA STANDARD DETAILS

TEMPORARY BLOW-OFF WITH MAIN LINE VALVE

STD. DWG. W— 315

APPROVED DATE: ----



NOTES:

1. TO BE INSTALLED IN CASES WHERE MAIN MAY BE EXTENDED IN FUTURE.
2. FOR 12" PIPE SIZE OR LARGER USE FL x FL MAIN LINE VALVE, FL x MJ ADAPTER & MJ PLUG TAPPED AT BOTTOM FOR B.O.
3. ALL EXPOSED THREADS SHALL BE PAINTED WITH BITUMASTIC PAINT OR APPROVED SUB-STITUTE, AFTER NUTS ARE TIGHTENED.

BLOW-OFF WITH MAIN LINE VALVE

NOT FOR CONSTRUCTION

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GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

TYPICAL STANDARD WATER DETAILS

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
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Drawn	GKK
Job	WCO2302
Sheet	14

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1. TRENCHES:

1.1. MATERIALS:

1.1.1. 3/8 CRUSHED ANGULAR - CLEAN CONSISTENT 3/8" CRUSHED ANGULAR ROCK.
1.1.2. SAND - MIN. SAND EQUIVALENT 45

1.1.3. CLASS 2 AGGREGATE BASE
1.1.3.1. 3/4" MAXIMUM
1.1.3.2. CONFORMING TO CALTRANS 2010 STANDARD SPECIFICATIONS SECTION 26-1.02B

1.1.4. RIVER RUN
1.1.4.1. VARYING MATERIAL EXCAVATED FROM RIVER BED
1.1.4.2. FREE OF ORGANICS
1.1.4.3. 3" MAXIMUM IN GREATEST DIMENSION

1.1.5. NATIVE FILL MATERIAL
1.1.5.1. FREE OF ORGANIC MATTER, REFUSE OR OTHER UNSATISFACTORY MATERIALS
1.1.5.2. NO STONES OR LUMPS GREATER THAN OR EXCEEDING 3" IN GREATEST DIMENSION.

1.2. CONSTRUCTION:

1.2.1. A #10 COPPER COATED TRACER WIRE SHALL BE BURIED OVER ALL NON-METALLIC PIPELINE.

1.3. COMPACTION REQUIREMENTS:

1.3.1. BEDDING MATERIAL SHALL EITHER BE HAND TAMPED UNDER AND AT THE SIDES OF THE PIPES IN LIFTS NOT GREATER THAN 6" OR SHAPED AND COMPACTED PRIOR TO PIPE INSTALLATION.

1.3.2. AGGREGATE BASE SHALL BE COMPACTED WITH MECHANICAL HAND OPERATED EQUIPMENT, OR EQUIPMENT MOUNTED OR TOWED TO ACHIEVE THE REQUIRED COMPACTION. IN ANY EVENT, COMPACTION METHODS SHALL NOT DAMAGE THE PIPE, EXCEED THE LOADING CAPACITY OF THE PIPE, OR RESULT IN A CHANGE TO THE DESIGN PIPE SLOPE REQUIRED OR DEFLECTION UNITS. JETTING SHALL NOT BE ALLOWED.

1.3.3. NATIVE MATERIAL COMPACTED TO MINIMUM OF 90% R.C.

2. CONCRETE STRUCTURES:

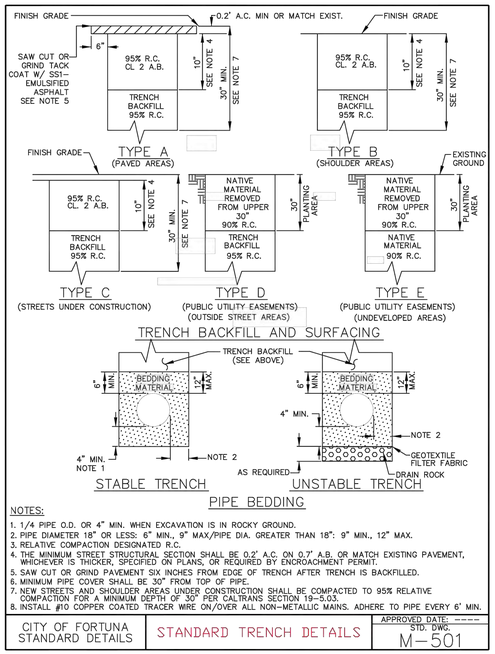
2.1. MATERIALS:

2.1.1. CLASS 1 CONCRETE

2.1.2. PORTLAND CEMENT CONFORMING TO SECTION 51 OF CALTRANS 2010 STANDARD SPECIFICATIONS

2.1.3. BAR REINFORCING STEEL AND MESH REINFORCEMENT CONFORMING TO SECTION 52 OF CALTRANS 2010 STANDARD SPECIFICATIONS

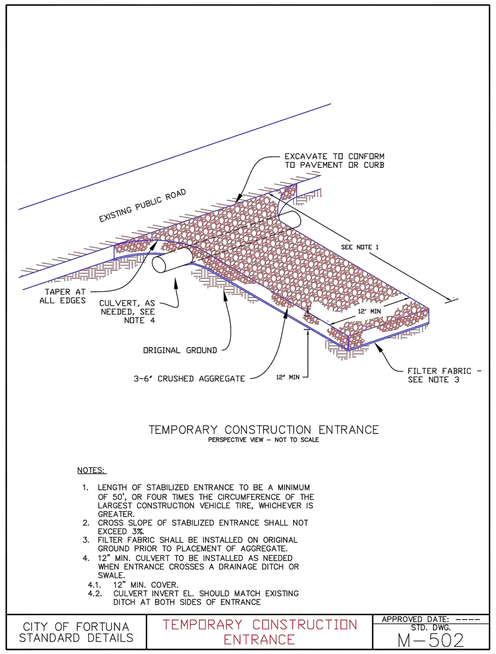
CITY OF FORTUNA STANDARD DETAILS	MISCELLANEOUS CONSTRUCTION NOTES	APPROVED DATE: ---- STD. DWG. M-500



NOTES:

1. 1/4 PIPE O.D. OR 4" MIN. WHEN EXCAVATION IS IN ROCKY GROUND.
2. PIPE DIAMETER 18" OR LESS: 6" MIN., 9" MAX/PIPE DIA. GREATER THAN 18": 9" MIN., 12" MAX.
3. RELATIVE COMPACTION DESIGNATED R.C.
4. THE MINIMUM STREET STRUCTURAL SECTION SHALL BE 0.2' A.C. ON 0.7' A.B. OR MATCH EXISTING PAVEMENT, WHICHEVER IS THICKER, SPECIFIED ON PLANS, OR REQUIRED BY ENCROACHMENT PERMIT.
5. SAW CUT OR GRIND PAVEMENT SIX INCHES FROM EDGE OF TRENCH AFTER TRENCH IS BACKFILLED.
6. MINIMUM PIPE COVER SHALL BE 30" FROM TOP OF PIPE.
7. NEW STREETS AND SHOULDER AREAS UNDER CONSTRUCTION SHALL BE COMPACTED TO 95% RELATIVE COMPACTION FOR A MINIMUM DEPTH OF 30" PER CALTRANS SECTION 19-5.03.
8. INSTALL #10 COPPER COATED TRACER WIRE ON/OVER ALL NON-METALLIC MAINS. ADHERE TO PIPE EVERY 6' MIN.

CITY OF FORTUNA STANDARD DETAILS	STANDARD TRENCH DETAILS	APPROVED DATE: ---- STD. DWG. M-501

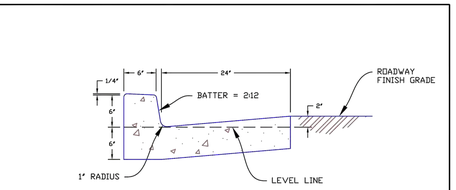


TEMPORARY CONSTRUCTION ENTRANCE
PERSPECTIVE VIEW - NOT TO SCALE

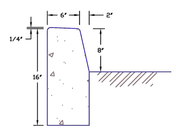
NOTES:

1. LENGTH OF STABILIZED ENTRANCE TO BE A MINIMUM OF 50', OR FOUR TIMES THE CIRCUMFERENCE OF THE LARGEST CONSTRUCTION VEHICLE TIRE, WHICHEVER IS GREATER.
2. CROSS SLOPE OF STABILIZED ENTRANCE SHALL NOT EXCEED 3%.
3. FILTER FABRIC SHALL BE INSTALLED ON ORIGINAL GROUND PRIOR TO PLACEMENT OF AGGREGATE.
4. 12" MIN. CULVERT TO BE INSTALLED AS NEEDED WHEN ENTRANCE CROSSES A DRAINAGE DITCH OR SWALE.
   4.1. 12" MIN. COVER.
   4.2. CULVERT INVERT EL. SHOULD MATCH EXISTING DITCH AT BOTH SIDES OF ENTRANCE

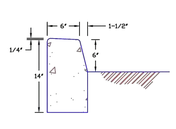
CITY OF FORTUNA STANDARD DETAILS	TEMPORARY CONSTRUCTION ENTRANCE	APPROVED DATE: ---- STD. DWG. M-502



TYPICAL A2-6 CURB AND GUTTER
NOT TO SCALE



TYPICAL A1-8 CURB
NOT TO SCALE



TYPICAL A1-6 CURB
NOT TO SCALE

NOTES:

1. ALL EXPOSED CORNERS TO BE ROUNDED WITH ½" RADIUS.
2. ALL CONCRETE SHALL BE CLASS 'A' P.C.C.
3. SEE CITY STANDARD DETAIL R-109 FOR WEAKENED PLANE AND EXPANSION JOINT REQUIREMENTS.

CITY OF FORTUNA STANDARD DETAILS	TYPICAL CURBS	APPROVED DATE: ---- STD. DWG. R-104

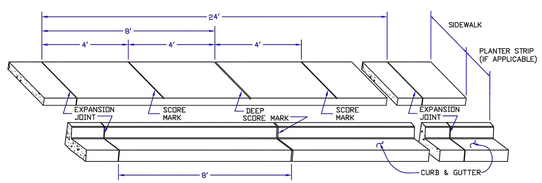
CITY OF FORTUNA STANDARD DETAILS

TYPICAL SIDEWALK

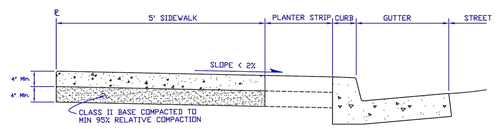
APPROVED DATE: ---- STD. DWG. R-105

NOTES:

1. DEPTH OF DEEP SCORE MARKS OR WEAKENED PLANE JOINTS SHALL BE ¼".
2. EXPANSION JOINT MATERIAL TO BE ½" THICK PREMOLDED JOINT FILLER FULL THICKNESS OF CONCRETE. EXPANSION JOINTS IN SIDEWALK TO ALIGN WITH EXPANSION JOINTS IN CURB & GUTTER.
3. ALL EXPOSED EDGES TO BE ROUNDED WITH ½" RADIUS.
4. SIDEWALK SHALL BE BROOM FINISHED, PERPENDICULAR TO PATH OF TRAVEL.
5. OPTIONAL PLANTER STRIP SUBJECT TO APPROVAL BY CITY.
6. SUBGRADE SHALL BE SCARIFIED 6" DEEP, MOISTURE CONDITIONED, AND RECOMPACTED TO 90% RELATIVE COMPACTION.
7. WHEN REPLACING, REPAIRING, OR CONNECTING TO EXISTING SIDEWALK OR CURB & GUTTER:
   7.1. 12" #3 DOWELS AT 24" O.C., WITH EPOXY, INTO EXISTING CONCRETE.
   7.2. CURB AND GUTTER SHALL BE POURED MONOLITHICALLY.
   7.3. REPLACED SIDEWALK SHALL BE THE FULL WIDTH AND AT LEAST 4' LONG.
   7.4. 3 LBS/CY OF LAMP BLACK MAY BE ADDED AS DIRECTED BY CITY ENGINEER



EXPANSION JOINTS AND SCORE MARKS

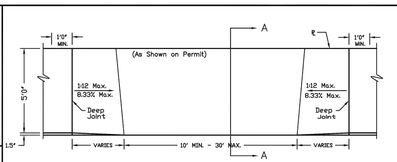


TYPICAL SIDEWALK

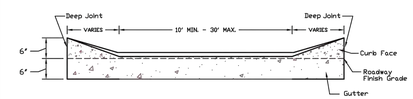
CITY OF FORTUNA STANDARD DETAILS

DRIVEWAY APPROACH - OPTION 'A'

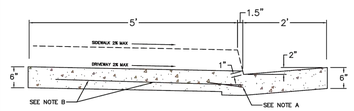
APPROVED DATE: ---- STD. DWG. R-106a



PLAN



ELEVATION



SECTION A-A

GENERAL CONSTRUCTION NOTES:

1. ALL SIDEWALK CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH GRADES AND STANDARDS AS ESTABLISHED OR APPROVED BY THE CITY OF FORTUNA ENGINEERING DEPT.
2. ALL DEBRIS, SOIL, AND OTHER DELETERIOUS MATERIALS SHALL BE REMOVED FROM WITHIN FORMS AND CURB EXCAVATIONS PRIOR TO ANY PLACEMENT OF CONCRETE. SUBGRADE SHALL BE TRUE TO GRADE AND CROSS SECTION A MINIMUM OF FOUR (4) INCHES BELOW THE FINISH GRADE ACROSS THE ENTIRE SIDEWALK AREA.
3. FILL REQUIRED TO ATTAIN FINISH SUBGRADE ELEVATION SHALL EITHER BE SAND OR CLASS 2 AGGREGATE BASE, AND SHALL BE COMPACTED UNTIL A FIRM AND SOLID FOUNDATION IS ACHIEVED.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR OF ADJACENT CURB AND GUTTER IF DAMAGED DURING CONSTRUCTION.
5. INSPECTION OF FORMS AND FINISH WORK SHALL BE REQUIRED BY THE CITY OF FORTUNA ENGINEERING DEPT.

SPECIFIC NOTES:

A. 12" #3 REBAR DOWELS @ 24" O.C. WITH EPOXY, IF NOT CONSTRUCTED MONOLITHICALLY.
B. #4 REBAR @ 18" O.C. REQUIRED IN COMMERCIAL DRIVEWAYS, #3 REBAR @ 18" O.C. REQUIRED OTHERWISE
C. INSTALL DEEP JOINTS AT EACH END OF DRIVEWAY APPROACH.

NOT FOR CONSTRUCTION

THESE PLANS ARE ORIGINALLY PRINTED ON 24"x36" PAPER.

1 INCH

This drawing or drawing set shall not be used for construction unless a jurisdictional stamp (County, City, State, Federal) has been issued on the drawing, stating "FOR PERMIT" or similar verbiage, a wet signed professional engineer's stamp, and permit documents have been issued for the project.

REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * CIVIL * STATE OF CALIFORNIA * NO. C85055

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

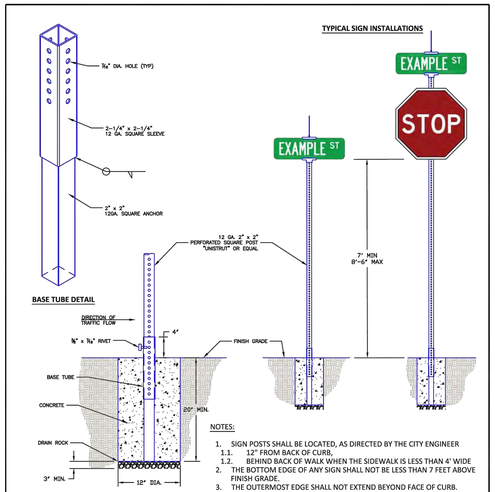
GULLIKSEN IMPROVEMENT PLANS PH 4&5
Fortuna, CA 95540

MISCELLANEOUS STANDARD DETAILS

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	15

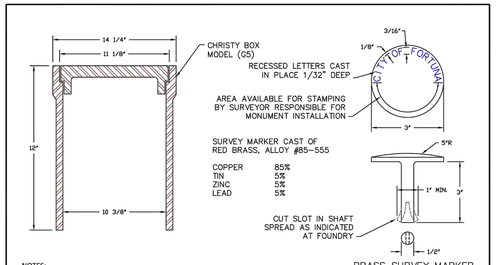
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NOTES:

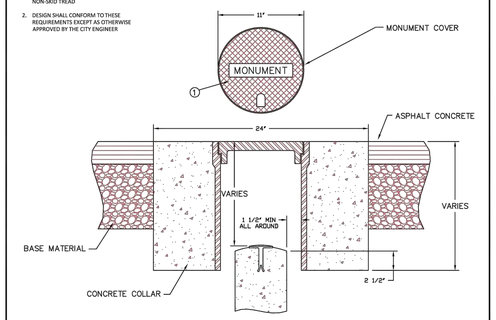
1. SIGN POSTS SHALL BE LOCATED, AS DIRECTED BY THE CITY ENGINEER
   1.1. 12" FROM BACK OF CURB.
   1.2. BEHIND BACK OF WALK WHEN THE SIDEWALK IS LESS THAN 4' WIDE
2. THE BOTTOM EDGE OF ANY SIGN SHALL NOT BE LESS THAN 7 FEET ABOVE FINISH GRADE.
3. THE OUTERMOST EDGE SHALL NOT EXTEND BEYOND FACE OF CURB.
4. POST AND BASE SHALL BE GALVANIZED STEEL PER ASTM A653 DES. G90
5. STREET NAME SIGNS:
   5.1. TWO DOUBLE-FACED SIGNS MOUNTED AT RIGHT ANGLES
   5.2. ALLOWABLE SIZES: 9"x24", 9"x30", OR 9"x36" WITH 1-1/2" CORNER RADIUS. LENGTH OF PLATE SHALL BE GOVERNED BY LENGTH OF STREET NAME.
   5.3. TWO COMPLETE ASSEMBLIES PER INTERSECTION ON DIAGONALLY OPPOSITE CORNERS WITH THE SIGNS ON THE FAR RIGHT-HAND SIDE OF THE INTERSECTION FOR TRAFFIC ON THE MOST TRAVELED STREET.
   5.4. SHALL CONFORM TO THE SIZE, FINISH, AND LETTERING STYLE IN USE BY THE CITY OF FORTUNA.
3. STOP SIGNS AND STREET SIGNS SHALL BE PURCHASED FROM THE CITY OF FORTUNA.

CITY OF FORTUNA STANDARD DETAILS	STREET NAME AND STOP SIGN INSTALLATION	APPROVED DATE: ~~~~ STD. DWG. R-110



NOTES:

1. MONUMENT COVER SHALL HAVE NON-SKID TREAD
2. DESIGN SHALL CONFORM TO THESE REQUIREMENTS EXCEPT AS OTHERWISE APPROVED BY THE CITY ENGINEER

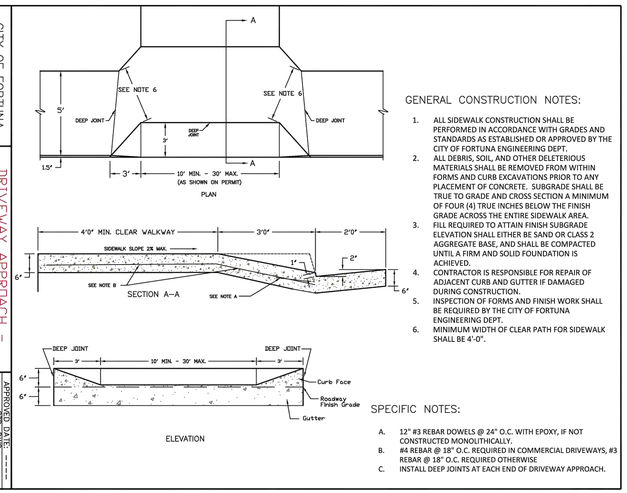


CITY OF FORTUNA STANDARD DETAILS	STANDARD SURVEY MONUMENT	APPROVED DATE: ~~~~ STD. DWG. R-113

CITY OF FORTUNA STANDARD DETAILS

DRIVEWAY APPROACH - OPTION 'B'

APPROVED DATE: ~~~~ STD. DWG. R-106b



GENERAL CONSTRUCTION NOTES:

1. ALL SIDEWALK CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH GRADES AND STANDARDS AS ESTABLISHED OR APPROVED BY THE CITY OF FORTUNA ENGINEERING DEPT.
2. ALL DEBRIS, SOIL, AND OTHER DELETERIOUS MATERIALS SHALL BE REMOVED FROM WITHIN FORMS AND CURB EXCAVATIONS PRIOR TO ANY PLACEMENT OF CONCRETE. SUBGRADE SHALL BE TRUE TO GRADE AND CROSS SECTION A MINIMUM OF FOUR (4) TRUE INCHES BELOW THE FINISH GRADE ACROSS THE ENTIRE SIDEWALK AREA.
3. FILL REQUIRED TO ATTAIN FINISH SUBGRADE ELEVATION SHALL EITHER BE SAND OR CLASS 2 AGGREGATE BASE, AND SHALL BE COMPACTED UNTIL A FIRM AND SOLID FOUNDATION IS ACHIEVED.
4. CONTRACTOR IS RESPONSIBLE FOR REPAIR OF ADJACENT CURB AND GUTTER IF DAMAGED DURING CONSTRUCTION.
5. INSPECTION OF FORMS AND FINISH WORK SHALL BE REQUIRED BY THE CITY OF FORTUNA ENGINEERING DEPT.
6. MINIMUM WIDTH OF CLEAR PATH FOR SIDEWALK SHALL BE 4'-0".

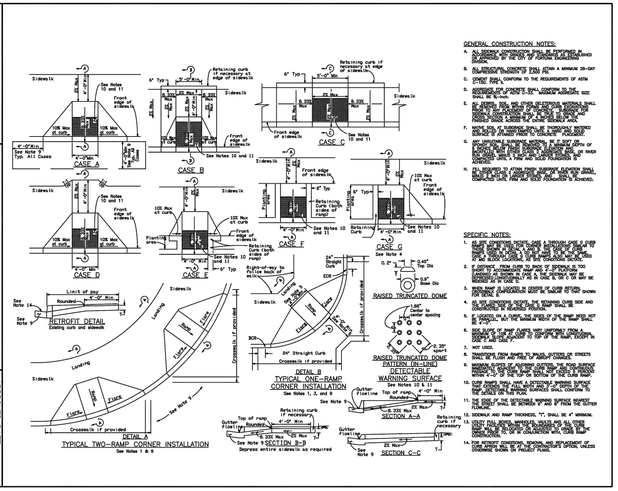
SPECIFIC NOTES:

A. 12" #3 REBAR DOWELS @ 24" O.C. WITH EPOXY, IF NOT CONSTRUCTED MONOLITHICALLY.
B. #4 REBAR @ 18" O.C. REQUIRED IN COMMERCIAL DRIVEWAYS, #3 REBAR @ 18" O.C. REQUIRED OTHERWISE
C. INSTALL DEEP JOINTS AT EACH END OF DRIVEWAY APPROACH.

CITY OF FORTUNA STANDARD DETAILS

CURB RAMPS

APPROVED DATE: ~~~~ STD. DWG. R-107a

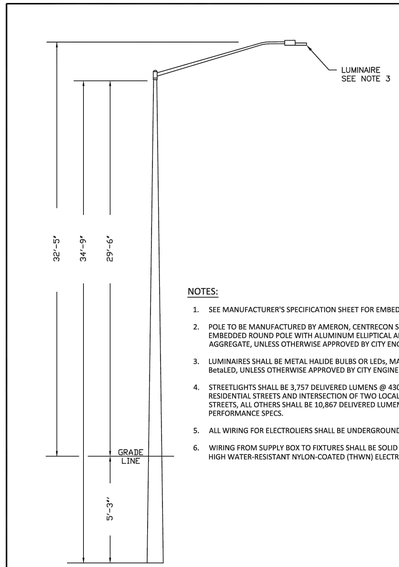


GENERAL CONSTRUCTION NOTES:

A. ALL ASPECTS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF CALTRANS STANDARD PLANS.
B. ALL PERSONAL CONTACTS SHALL BE MADE A MINIMUM 28-DAY ADVANCE NOTICE.
C. CURRENT WORK SHALL CONFORM TO THE REQUIREMENTS OF ADA STANDARDS.
D. MAXIMUM CROSS SLOPE OF SIDEWALK OR LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
E. ALL EXISTING ADA CURB RAMPS AND SIDEWALK MATERIALS SHALL BE REMOVED AND REPLACED WITH NEW MATERIALS WHERE NECESSARY TO MEET ADA STANDARDS.
F. WHERE A CONFLICT EXISTS BETWEEN THE CONTRACT DOCUMENTS AND ADA STANDARDS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.
G. ANY EXISTING ADA RAMPS, SIDEWALK, OR CURB AND GUTTER DAMAGED DURING CONSTRUCTION SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.
H. ALL EXISTING STORM DRAIN INLETS WITHIN THE LIMITS OF CONSTRUCTION SHALL BE PROTECTED FROM DEBRIS AND SEDIMENT AT ALL TIMES.

SPECIFIC NOTES:

1. ALL ADA CONSTRUCTION SHALL CONFORM TO ALL OF THE REQUIREMENTS OF THE LATEST EDITION OF CALTRANS STANDARD PLANS, THE LATEST EDITION OF THE CALIFORNIA BUILDING CODE, AND THE AMERICANS WITH DISABILITIES ACT.
2. IF CONFLICTS FROM CURB TO FACE OF SIDEWALK IS TOO SMALL TO ACCOMMODATE ONE OF THE STANDARD CASES, THE CONTRACTOR SHALL CONSTRUCT A CASE A, B, C, D, E, OR F, AS DIRECTED BY THE ENGINEER.
3. NOT USED.
4. MAXIMUM ALLOWABLE GRADE ON RAMP RUNS SHOWN ON THESE PLANS IS 8.33%.
5. ALL SIDEWALK AND RAMP SURFACES SHALL BE BROOM FINISHED TRANSVERSE TO DIRECTION OF TRAVEL.
6. NOT USED.
7. WHERE A CURB RAMP IS CONSTRUCTED WITHIN A PLANTING STRIP, THE PLANTING STRIP SHALL BE A MINIMUM OF 4' WIDE.
8. NOT USED.
9. CONSTRUCTION ZONE BARRICADES SHALL BE PLACED AT ALL TIMES TO PROTECT THE PUBLIC FROM HAZARDS.
10. CURB RAMPS SHALL NOT BE CONSTRUCTED WITHIN DRIVEWAY APPROACHES. DRIVEWAY APPROACHES SHALL BE CONSTRUCTED SO THAT THE SLOPES OF THE DRIVEWAY SURFACE SHALL CONFORM TO THE SLOPES OF THE SIDEWALK.
11. THE RAMP AT THE INTERSECTION OF TWO STREETS SHALL BE CENTERED ON THE CROSSWALK.
12. WIDENING AND RAMP THICKNESS, TT, SHALL BE 6" MINIMUM.
13. JOINT FILL MATERIAL SHALL CONSIST OF A PREFORMED, NON-EXTRUDING, RESILIENT BITUMINOUS MATERIAL CONFORMING TO ASTM D1751 OR D1752.
14. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS WITH EXISTING UTILITIES OR OTHER OBSTRUCTIONS.
15. FOR SIGNS AND OTHER DETAILS NOT SHOWN, SEE CALTRANS STANDARD PLANS.



NOTES:

1. SEE MANUFACTURER'S SPECIFICATION SHEET FOR EMBED DEPTH AND BASE OD.
2. POLE TO BE MANUFACTURED BY AMERON, CENTRECON SERIES, MEDIUM EMBEDDED ROUND POLE WITH ALUMINUM ELLIPTICAL ARM, FINISH EXPOSED AGGREGATE, UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
3. LUMINAIRES SHALL BE METAL HALIDE BULBS OR LEDs, MANUFACTURED BY BetaLED, UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
4. STREETLIGHTS SHALL BE 3,757 DELIVERED LUMENS @ 4300K AT LOCAL OR RESIDENTIAL STREETS AND INTERSECTION OF TWO LOCAL OR RESIDENTIAL STREETS, ALL OTHERS SHALL BE 10,867 DELIVERED LUMENS @4300K PER LED PERFORMANCE SPECS.
5. ALL WIRING FOR ELECTROLIERS SHALL BE UNDERGROUND.
6. WIRING FROM SUPPLY BOX TO FIXTURES SHALL BE SOLID #10 THERMOPLASTIC HIGH WATER-RESISTANT NYLON-COATED (THWN) ELECTRICAL WIRE.

CITY OF FORTUNA STANDARD DETAILS	STANDARD STREETLIGHT POLE	APPROVED DATE: ~~~~ STD. DWG. R-111

NOT FOR CONSTRUCTION

THESE PLANS ARE ORIGINALLY PRINTED ON 24"x36" PAPER.

1 INCH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * CIVIL * STATE OF CALIFORNIA * NO. C85055

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5
Fortuna, CA. 95540

MISCELLANEOUS STANDARD DETAILS

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	16

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1. STORMWATER DRAINAGE FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS, PREPARED BY A REGISTERED CIVIL ENGINEER, AND APPROVED BY THE CITY ENGINEER.

2. ALL DEVELOPMENT SHALL COMPLY WITH THE REQUIREMENTS OF THE CITY'S MS4 NPDES PERMIT AS OUTLINED IN THE HUMBOLDT COUNTY LOW IMPACT DEVELOPMENT (LID) STORMWATER MANUAL.

3. IN LOW IMPACT DEVELOPMENT "REGULATED PROJECTS", WHEN THE MS4 PERMIT REQUIRES A BIORETENTION FACILITY BE INSTALLED, THEN THE FOLLOWING ADDITIONAL CONDITIONS ARE REQUIRED:

3.1. THE POST-PROJECT RUNOFF RATE(S) SHALL NOT EXCEED THE PRE-PROJECT RUNOFF RATE(S) FOR THE 25-YEAR 24-HOUR STORM EVENT.

3.2. PRIOR TO CONSTRUCTION, A STORMWATER DRAINAGE REPORT DEMONSTRATING COMPLIANCE WITH THE ABOVE REQUIREMENT MUST BE APPROVED BY THE CITY ENGINEER.

3.3. STORMWATER DRAINAGE REPORTS SHALL:
3.3.1. INCLUDE MAPS/DRAWINGSTHAT USE CONTOUR INTERVALS OF 5 FEET OR LESS.
3.3.2. IDENTIFY DRAINAGE MANAGEMENT AREAS, BASINS, DRAINAGE STRUCTURES, AND LID SITE DESIGN MEASURES, CORRELATED TO CALCULATIONS.

4. DRAINAGE FACILITIES:

4.1. SHALL BE LOCATED IN THE PUBLIC RIGHT-OF-WAY WHERE FEASIBLE, OR IN PERPETUAL UNOBSTRUCTED EASEMENTS OF APPROPRIATE WIDTH.

4.2. SHALL ENSURE THE ACCEPTANCE AND DISPOSAL OF RUNOFF WITHOUT DAMAGE TO STREETS OR TO ADJACENT PROPERTIES.

5. DISPOSAL OF SURFACE WATER AND/OR STORMWATER INTO DRAINAGE WELLS OR SEWER LINES SHALL NOT BE PERMITTED.

6. STORM DRAIN MANHOLES SHALL USE SANITARY SEWER MANHOLE DETAILS WITH THE FOLLOWING MH INSIDE DIAMETER REQUIREMENTS:

OUTLET PIPE DIA.	*MH DEPTH < 8'*	*MH DEPTH 8'+*
8"–24"	4'	5'
24"–48"	5'	5'
48"+	6'	6'

7. ADDITIONAL SUBDIVISION REQUIREMENTS:

7.1. A STORMWATER DRAINAGE SYSTEM, INCLUDING BUT NOT LIMITED TO STORM SEWERS, DRAINAGE CHANNELS, AND DRAINAGE PUMPS, AS MAY BE NECESSARY FOR ADEQUATE DRAINAGE OF STORM WATERS, SURFACE WATERS, AND/OR SPRINGS, SHALL BE INSTALLED IN EACH SUBDIVISION

7.2. THE DRAINAGE SYSTEM SHALL BE DESIGNED TO ACCOMMODATE POTENTIAL RUNOFF FROM ITS ENTIRE UPSTREAM DRAINAGE AREA, WHETHER INSIDE OR OUTSIDE OF THE PROPOSED SUBDIVISION.

7.3. IF ANY PORTION OF LAND WITHIN BOUNDARIES SHOWN ON A FINAL MAP IS SUBJECT TO SPECIAL FLOOD HAZARDS BY STORM WATERS, THE DESIGN SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY OF FORTUNA MUNICIPAL CODE (§15.58).

CITY OF FORTUNA STANDARD DETAILS | STORMWATER DRAINAGE DESIGN CRITERIA | APPROVED DATE: ---- STD. DWG. D–400

1. MATERIALS:

1.1. REINFORCED CONCRETE PIPE (RCP), ROUND OR OVAL, SHALL CONFORM TO SECTION 65 OF THE CALTRANS 2010 STANDARD SPECIFICATIONS.

1.2. CORRUGATED METAL PIPE (CMP):

1.2.1. CMP SHALL CONFORM TO SECTION 66 OF THE CALTRANS 2010 STANDARD SPECIFICATIONS.
1.2.1.1. THE PROVISIONS FOR THE END FINISH OF SECTION 66-1.02E(3) SHALL NOT APPLY.

1.2.2. CMP SHALL BE STEEL, MINIMUM GAGE: 14 (0.079 IN.)

1.2.3. AN EXTENSION TO AN EXISTING CULVERT PIPE MAY CONSIST OF A DISSIMILAR METAL IF THE PROPER PROTECTIVE MEASURES ARE FOLLOWED. SUCH PROTECTIVE MEASURES MAY INCLUDE A BITUMINOUS COATED BAND OR COUPLER AND PIPE SEPARATED BY A THICK PLASTIC MATERIAL SUCH AS POLYETHYLENE.

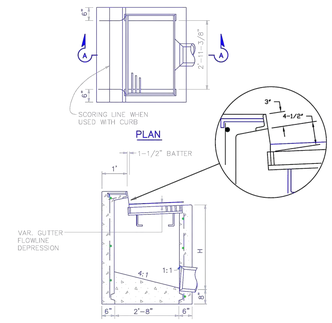
1.2.4. BAND COUPLERS FOR PIPE ARCHES SHALL NOT BE LESS THAN TWELVE INCHES (12") IN WIDTH.

1.3. PIPE BEDDING MATERIAL - 3/8 CRUSHED ANGULAR

1.4. TRENCH BACKFILL:
1.4.1. INSIDE PAVED AREAS - RIVER RUN (CLASS 2 A.B. MAY BE SUBSTITUTED)
1.4.2. OUTSIDE PAVED AREAS - NATIVE MATERIAL (RIVER RUN OR CLASS 2 A.B. MAY BE SUBSTITUTED)

1.5. PRECAST CONCRETE CATCH BASINS AND DROP INLETS SHALL CONFORM TO SECTION 70-1.02 OF THE CALTRANS 2010 STANDARD SPECIFICATIONS.

CITY OF FORTUNA STANDARD DETAILS | STORMWATER DRAINAGE CONSTRUCTION CRITERIA | APPROVED DATE: ---- STD. DWG. D–401

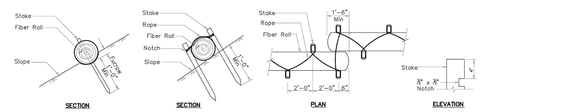


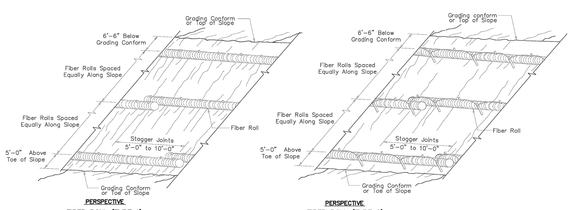
NOTES:
1. WALL REINFORCING NOT REQUIRED WHEN "H" IS 8'–0" OR LESS.
2. GALVANIZED STEPS ARE REQUIRED WHERE DEPTH IS GREATER THAN 3'–0".
3. FOR ADDITIONAL INFORMATION, SEE CALTRANS STANDARD PLAN D74B.

TYPE "GO" DRAINAGE INLET

CITY OF FORTUNA STANDARD DETAILS | TYPICAL DRAINAGE INLET | APPROVED DATE: ---- STD. DWG. D–402

CITY OF FORTUNA STANDARD DETAILS | FIBER ROLL | APPROVED DATE: ---- STD. DWG. D–403

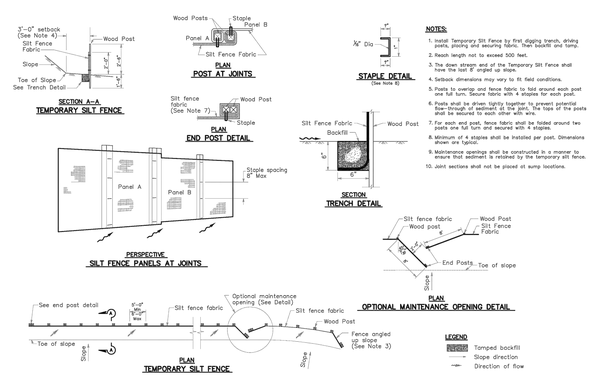




FIBER ROLL
NO SCALE

NOTES:
1. FIBER ROLL SPACING VARIES DEPENDING UPON SLOPE INCLINATION.
2. LOCATE FIBER ROLLS ON LEVEL CONTOURS SPACED AS FOLLOWS:
   - SLOPE INCLINATION OF 4:1 (H:V) OR FLATTER: FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 20 FT.
   - SLOPE INCLINATION BETWEEN 4:1 AND 2:1 (H:V): FIBER ROLES SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 15 FT. (A CLOSER SPACING IS MORE EFFECTIVE).
   - SLOPE INCLINATION 2:1 (H:V) OR GREATER: FIBER ROLLS SHOULD BE PLACED AT A MAXIMUM INTERVAL OF 10 FT. (A CLOSER SPACING IS MORE EFFECTIVE).
3. STAKE FIBER ROLLS AT THE ENDS OF EACH ROW AND AT APPROXIMATELY 10 FT INTERVALS.
4. STAKE FIBER ROLLS INTO A 2 TO 4 IN. DEEP TRENCH WITH A WIDTH EQUAL TO THE DIAMETER OF THE FIBER ROLL.
   - DRIVE STAKES AT THE END OF EACH FIBER ROLL AND SPACED 4FT MAXIMUM ON CENTER.
   - USE WOOD STAKES WITH A NOMINAL CLASSIFICATION OF 0.75 BY 0.75 IN. AND MINIMUM LENGTH OF 24 IN.
5. IF MORE THAN ONE FIBER ROLL IS PLACED IN A ROW, THE ROLLS SHOULD BE OVERLAPPED, NOT ABUTTED.

CITY OF FORTUNA STANDARD DETAILS | SILT FENCE | APPROVED DATE: ---- STD. DWG. D–404



NOTES:
1. Install Temporary Silt Fence by first digging trench, driving posts, placing and securing fabric. Then backfill and tamp.
2. Reach length not to exceed 500 feet.
3. The down stream end of the Temporary Silt Fence shall have the last 8' angled up slope.
4. Setback dimensions may vary to fit field conditions.
5. Posts to overlap and fence fabric to fold around each post one full turn. Secure fabric with 4 staples for each post.
6. Posts shall be driven tightly together to prevent potential flow-through of sediment at the joint. The tops of the posts shall be secured to each other with wire.
7. For each end post, fence fabric shall be folded around two posts one full turn and secured with 4 staples.
8. Minimum of 4 staples shall be installed per post. Dimensions shown are typical.
9. Maintenance openings shall be constructed in a manner to ensure that sediment is retained by the temporary silt fence.
10. Joint sections shall not be placed at sump locations.

TEMPORARY SILT FENCE
NO SCALE

NOT FOR CONSTRUCTION

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1 INCH

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER * CIVIL * CALIFORNIA * STATE OF * DANIEL C. LONG * NO. C85055

WHITCHURCH ENGINEERING, INC.
610 9th Street Fortuna, California 95540
Phone (707) 725-6926

GULLIKSEN IMPROVEMENT PLANS PH 4&5

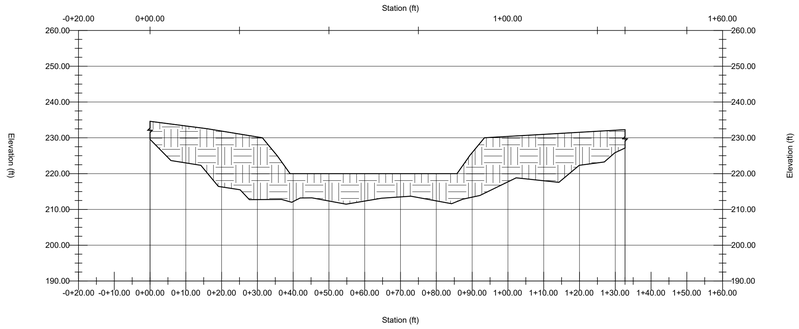
Fortuna, CA 95540

MISCELLANEOUS STANDARD DETAILS

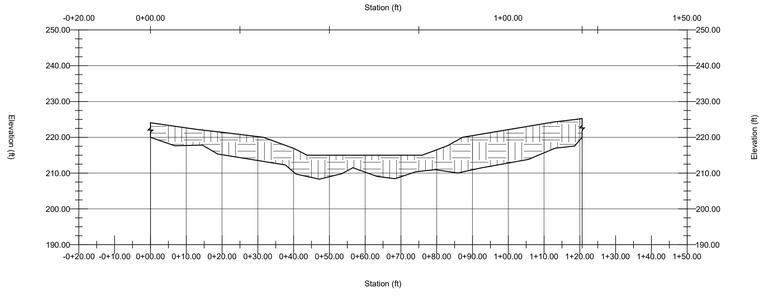
For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	17

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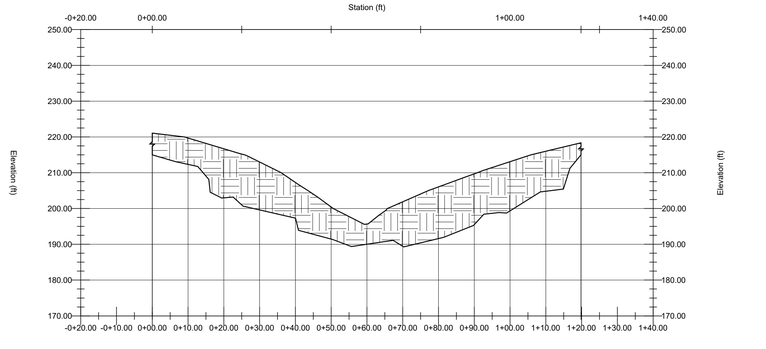


1 - EXISTING POND CROSS SECTION



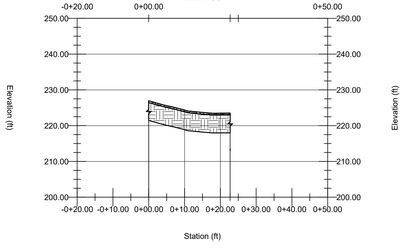
2 - EXISTING EAST OF TOWHEE RETENTION CROSS SECTION

SCALE: 1"=20' VERT.
1"=20' HORIZ.



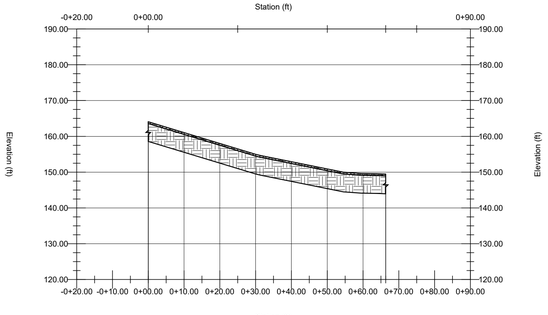
3 - EXISTING WEST OF TOWHEE RETENTION CROSS SECTION

SCALE: 1"=20' VERT.
1"=20' HORIZ.



4 - EXISTING DRAINAGE EASEMENT SWALE CROSS SECTION

SCALE: 1"=20' VERT.
1"=20' HORIZ.



5 - EXISTING DRAINAGE EASEMENT SWALE CROSS SECTION

SCALE: 1"=20' VERT.
1"=20' HORIZ.



DRAINAGE STRUCTURE PRELIMINARY GRADING

SCALE: 1"=100'

NORTH

NOT FOR CONSTRUCTION

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REVISIONS	BY

REGISTERED PROFESSIONAL ENGINEER · DAVID C. LEWIS · NO. C65055 · STATE OF CALIFORNIA · CIVIL

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GULLIKSEN IMPROVEMENT PLANS PH 4&5

Fortuna, CA. 95540

DRAINAGE STRUCTURES PRELIMINARY GRADING

For: Wendt Construction Co. 3651 Rohnerville Road, Fortuna, CA. 95540

Date	MAY 1 '24
Scale	AS NOTED
Design	DCL
Drawn	GKK
Job	WCO2302
Sheet	18

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Attachment B: September 2022 – Aquatic Resources Delineation Report- Gulliksen Drive Development Project

Aquatic Resources Delineation Report

Gulliksen Drive Development Project

Wendt Construction Company

September 09, 2022
May 26, 2023 – rev 1





Aquatic Resources Delineation Report
Gulliksen Drive Development Project

This document has been prepared for:

Wendt Construction Company

1660 Newburg Rd

Fortuna, CA 95540

By:

GHD

718 Third Street
Eureka, CA 95501, United States
T (707) 267 2207 | **E** kerry.mcnamee@ghd.com | **ghd.com**

September 09, 2022
May 26, 2023 – rev 1

Table of Contents

1. Summary 5

2. Introduction 5

2.1 Project Location 5

2.2 Project Description 6

2.3 Regulatory Background 6

2.3.1 Federal 6

2.3.2 State 7

2.3.3 Local Jurisdiction– City of Fortuna General Plan 9

3. Methodology 10

3.1 Aquatic Resources Delineation Approach 10

3.2 Botanical Methodology 11

3.3 Soils Methodology 11

3.3.1 Existing Soils Information 12

3.4 Hydrology Methodology 12

4. Results 13

4.1 Wetland 1 13

4.2 Wetland 2 14

4.2.1 Site Conditions at Transect W2T1-W 14

4.2.2 Site Conditions at Transect W2T2-W 14

4.3 Upland Sampling Points 15

4.3.1 Upland 1 15

5. Conclusions 15

6. Special Terms and Conditions 16

6.1 Purpose of this Report 16

6.2 Scope and Limitations 16

7. References 17

8. Report Preparers 18

8.1 Client 18

8.2 GHD 18

Appendix A Figures 20

Appendix B Datasheets 21

Appendix C NRCS Custom Soil Resources Report 22

Appendix D Record of Climatological Observations and WETS Table 23

Appendix E Site Photographs 24

Table Index

Table 4-1 Aquatic Resources within the PSB 15
Table 4-2 Upland Sampling Point Locations 15

Figure Index

Figure 1 Vicinity Map
Figure 2 Project Study Boundary
Figure 3 Wetland Delineation
Figure 4 FEMA Floodmap
Figure 5 NRCS Soils
Figure 6 National Wetlands Inventory

1. Summary

GHD prepared this Aquatic Resources Delineation Report and accompanying appendices on behalf of the Wendt Construction Company (hereafter “Wendt” or “Client”), to determine whether and to what extent aquatic resources were potentially present in the footprint or vicinity of the Gulliksen Drive Development Project (hereafter “Project,” described below). This effort was conducted to support future potential development and associated regulatory compliance documentation. The Project Study Boundary (PSB) consists of a 13-acre area within the City of Fortuna, California (**Appendix A, Figure 1,** and **Figure 2**).

GHD conducted the aquatic resource delineation fieldwork on September 1, 2022. The PSB is located outside of the Coastal Zone, and therefore only Waters of the U.S. including United States Army Corps of Engineers (USACE) three-parameter wetlands based on wetland indicative vegetation, hydric soils, and wetland hydrology, and Waters of the State (such as riparian habitat) were mapped. Two three-parameter wetlands were observed and mapped (see **Appendix A, Figure 3**). One of these features (Wetland 1) appeared to be isolated (i.e. not surficially hydrologically connected to a receiving waterway) and is therefore not anticipated to be under the jurisdiction of the USACE and Regional Water Quality Control Board (RWQCB). Wetland 2 appeared to be hydrologically connected to a receiving navigable waterway via a drainage swale to the west of the PSB (which drains to Strongs Creek and thus the Eel River), and is therefore anticipated to be under the jurisdiction of the USACE and RWQCB. No riparian habitat was observed.

Upon an inquiry from the Client, GHD revisited the site on May 8, 2023 and found that the edges of Wetland 1 were submerged. GHD conducted a subsequent investigation and inventoried wetland soils, hydrology and vegetation at the site and determined that the original delineation did not capture the entirety of Wetland 1. Wetland 1 appears to have been mapped erroneously in September 2022 due to the multi-month dry conditions, and the updated boundary of Wetland 1 appears to more accurately align with historic imagery of wet conditions over the last decade. The boundary was expanded to include the entirety of Wetland 1 (see dark green polygon in **Appendix A, Figure 3**). The boundary of Wetland 2 was also extended in conformance with the site topography.

2. Introduction

This report supports the Client’s environmental documentation, permitting, and construction planning within the Project Study Boundary (PSB) as deemed appropriate. The proposed PSB includes 13 acres that may be developed at a future date (**Appendix A, Figure 2**). The proposed PSB was established to determine whether aquatic resources are present, based upon vegetation, soils and wetlands hydrology data indicative of wetlands or other aquatic resources. This report is subject to, and must be read in conjunction with, the limitations set out in Section 6, Special Terms and Conditions, and the assumptions and qualifications contained throughout the report.

2.1 Project Location

The Project is located in the City Fortuna, Humboldt County, California. The Project Area contains vacant parcels designated for single family residential and rural residential development (County of Humboldt WebGIS 2022). The PSB encompasses portions of two APNs: 202-093-060-000 (southern half) and 202-041-005-000 (northern half). The Project Area is situated along the easternmost edge of the City of Fortuna city limits boundary. Surrounding land uses include residential, commercial, and rural residential

development to the west (City of Fortuna proper), and a small area of residential development to the east, bordered by extensive forested land comprised of privately owned timberlands (**Appendix A, Figure 2**).

The northernmost boundary of the PSB is approximately 0.12 miles south of a small tributary to Strongs Creek, and the southernmost boundary of the PSB is approximately 0.38 miles north of Jameson Creek. There are no Streamside Management Areas in the PSB. The PSB is not in the FEMA 100-year and 500-year floodplain (**Appendix A, Figure 4**).

2.2 Project Description

Wendt Construction Company proposes to subdivide and develop rural residential housing within (and adjacent to) the PSB. The PSB is the area of delineation because areas outside of the PSB but within the proposed development footprint were observed to contain uplands at a reconnaissance level site visit in July 2022. The PSB is located in a topographical depression that contains two isolated segments (Wetlands 1 and 2). Adjacent areas include rolling hills and redwood forest. The timeline of future potential development is anticipated to occur within a few years.

2.3 Regulatory Background

2.3.1 Federal

Waters of the United States

The Code of Federal Regulations (CFR), 40 CFR § 230.3 states the following:

The term waters of the United States are defined as:

> *(1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;*
>
> *(2) All interstate waters including interstate wetlands;*
>
> *(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:*
>
> > *(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes; or*
> >
> > *(ii) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or*
> >
> > *(iii) Which are used or could be used for industrial purposes by industries in interstate commerce;*
>
> *(4) All impoundments of waters otherwise defined as waters of the United States under this definition;*
>
> *(5) Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;*
>
> *(6) The territorial sea;*
>
> *(7) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or*

lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. (40 CFR § 230.3).

Wetlands Definition

40 CFR § 230.3 continues and defines, "(t) The term wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas" (40 CFR § 230.3).

Wetland Delineation Manual

The 1987 USACE Wetland Delineation Manual provides guidelines and methods to determine whether an area is a wetland subject to federal regulation under Section 404 of the Clean Water Act. The manual specifies that wetland hydrology, soil, and vegetation indicators must be present to identify a wetland (USACE 1987, p. 10). In addition, the Wetlands Delineation Manual states, "If hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity (e.g., irrigation) were to be terminated, the area should not be considered a wetland," (USACE 1987).

Federal Geographic Data Committee (FGDC) Wetland Classification Standard

The Classification of Wetlands and Deepwater Habitats of the United States (FGDC 2013) provides a nationally standardized hierarchical system for classifying wetland and deepwater habitats based on Cowardin et al. (1979). The National Wetland Inventory (NWI), a publicly available resource that provides information on the distribution of wetlands in the U.S., classifies wetlands according to the FDGC standard. The FDGC classification is based on a definition of wetlands with at least one of the three wetland attributes: predominantly hydrophytic vegetation, predominantly hydric soil, and hydrology. However, they state that all available information should be used, and all three attributes should be considered if they are present (FGDC 2013).

2.3.2 State

State Wetland Definition and Procedures

The State Water Resources Control Board's (SWRCB) April 2019 (revised April 2021) *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* says the following:

> *II. An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.*
>
> *The Water Code defines "waters of the state" broadly to include "any surface water or groundwater, including saline waters, within the boundaries of the state." "Waters of the state" includes all "waters of the U.S." The following wetlands are waters of the state:*
>
> 1. *Natural wetlands,*
> 2. *Wetlands created by modification of a surface water of the state, and*
> 3. *Artificial wetlands that meet any of the following criteria:*

a. Approved by an agency as compensatory mitigation for impacts to other waters of the state, except where the approving agency explicitly identifies the mitigation as being of limited duration;

b. Specifically identified in a water quality control plan as a wetland or other water of the state;

c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or

d. Greater than or equal to one acre in size, unless the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes (i.e., the following artificial wetlands are not waters of the state unless they also satisfy the criteria set forth in 2, 3a, or 3b):

i. Industrial or municipal wastewater treatment or disposal,

ii. Settling of sediment,

iii. Detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program,

iv. Treatment of surface waters,

v. Agricultural crop irrigation or stock watering,

vi. Fire suppression,

vii. Industrial processing or cooling,

viii. Active surface mining – even if the site is managed for interim wetlands functions and values,

ix. Log storage,

x. Treatment, storage, or distribution of recycled water, or

xi. Maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or

xii. Fields flooded for rice growing.

All artificial wetlands that are less than an acre in size and do not satisfy the criteria set forth in 2, 3.a, 3.b, or 3.c are not waters of the state. If an aquatic feature meets the wetland definition, the burden is on the applicant to demonstrate that the wetland is not a water of the state" (SWRCB 2019).

The April 2020 Implementation Guidance for the State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State further clarifies as follows:

Human activity can cause changes to the surrounding landscape (e.g., grading activities, road construction, direct hydromodification) such that wetlands form where wetlands did not previously exist. Where such artificial wetlands are now a relatively permanent part of the natural landscape, and are not subject to ongoing operation and maintenance, they are waters of the state. By requiring that the wetlands are relatively permanent, the framework excludes wetlands that are temporary or transitory. That they are part of the natural landscape also indicates the relative permanence of the wetlands and suggests that the wetland is self-sustaining without ongoing operation and maintenance

activities, and provides similar ecosystem services as natural wetlands. By way of example, this category of wetlands includes situations where water flow is permanently redirected as the result of human activity, such as grading in another area, such that new wetlands form in areas that were previously dry. These wetlands may not be natural wetlands because they result from human activity and they were not formed by modifying a water of the state (rather they were an indirect result), but nevertheless they take on the function of natural wetlands such that they should be considered waters of the state. This category would not include artificial wetlands constructed for specific purposes listed in section II.3.d because the construction of the artificial wetlands would be too recent to be deemed "historic" and the artificial wetland would likely require ongoing maintenance such that they would not be deemed "relatively permanent," and/or the artificial wetland is not part of the "natural landscape" (SWRCB 2020).

The RWQCB carry out and regionally regulate the SWRCB's definition of Waters of the State.

2.3.3 Local Jurisdiction– City of Fortuna General Plan

The City of Fortuna's General Plan contains the following policy related to development in relation to aquatic resources:

Policy NCR-2.10 Wetland Identification and Protection. *In considering new development projects, the City shall conduct an initial screening, as described in Policy NCR-2.6 in order to determine whether the proposal would have the potential to impact wetlands. If the initial screening indicates the potential presence of wetlands, a wetland assessment/ delineation shall be prepared to determine the presence of jurisdictional wetlands. The assessment/delineation, with proposed mitigation, shall be submitted to the City, and appropriate state (CDF&G) and federal (USCOE) agencies for concurrence prior to permitting. Mitigation may include, but may not be limited to, avoidance, minimization of impacts, restoration, off-site replacement, and/or the use of buffers.*

Policy NCR-15. *The City shall prepare a streamside management/wetland protection ordinance, following collaboration with resource agencies including but not limited to CDFG* (CDFW)*, establishing setback recommendations for perennial and intermittent streams, wetlands, and riparian corridors. At a minimum, the City shall implement the following watercourse, wetland and riparian area protection measures:*

Watercourses and Riparian Areas

a) *The City shall maintain Streamside Management Areas (SMAs) of at least 50 feet around perennial streams and 25 feet around ephemeral streams, unless a biological report indicates that such SMA setbacks are not required. The buffers shall be measured from the top of the stream bank (for example, the 50 foot setback would be 50 feet from each stream bank, for a total of a 100 foot wide buffer);*

b) *New development/activities within SMAs shall be limited to: (1) activities for wildlife enhancement/restoration, flood control or drainage, new fencing so long as it would not impede natural drainage or wildlife, and bank protection; (2) commercial timber management and harvest activities regulated by the Forest Practices Act; (3) road and bridge replacement or construction, when it can be demonstrated that it would not degrade fish and wildlife resources or water quality; (4) removal of vegetation for disease control or public safety; and (5) management and maintenance of trees, shrubs and other plant life; and*

c) *New development within SMAs shall minimize adverse effects, including, at a minimum: retaining snags and live trees with visible evidence of use as nesting sites; replanting disturbed areas with riparian vegetation; and performing erosion control measures.*

Wetlands

a) *The City shall maintain Wetland Buffer Areas of at least 50 feet around jurisdictional wetlands, unless a biological report indicates that such Wetland Buffer Areas are not required;*

b) *New development within Wetland Buffer Areas shall be limited to: fish and wildlife management; wetland restoration; removal of trees for disease control and public safety; and new fencing so long as it does not impede drainage or wildlife movement;*

c) *No new development shall be permitted in Wetland Buffer Areas which degrades the wetland; and*

d) *Wetland Buffer Areas disturbed by permitted activities shall be restored to the original contours and promptly replanted with native riparian vegetation.*

Combined Watercourses/Riparian Areas and Wetlands

a) *Storm water runoff to watercourses and wetlands shall not exceed the existing rate of storm runoff for a 50 year storm of 10 minute duration;*

b) *Sediment in storm water runoff draining to watercourses and wetlands shall be minimized through the use of sediment basins, seeding or replacing bare soil, diversion of runoff away from graded areas and areas heavily used during construction, and limiting grading in buffer areas to the dry season (May through October);*

c) *Stormwater outfalls, culverts, gutters, and other similar facilities draining to watercourses and wetlands shall be dissipated; and*

d) *Septic systems shall not be permitted within wetland buffer areas. Adjacent to these areas, septic systems shall meet County Health Department and RWQCB standards.*

All future potential development would need to adhere to all City of Fortuna policies.

3. Methodology

3.1 Aquatic Resources Delineation Approach

The GHD wetland scientist team conducted the aquatic resource delineation on September 1, 2022, with a follow up investigation on May 8, 2023. To define a wetland, the USACE requires that vegetation, soil, and hydrology (three-parameters) all show wetland attributes (USACE 1987; USACE 2010). The wetland delineation used USACE criteria from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)* (USACE 2010). The current standard field forms provided by the USACE (2010) were used to collect vegetation, soils, and hydrology data (**Appendix B**).

In potential three-parameter wetland areas, vegetation, soil, and hydrology data were collected in a transect across the upland/wetland boundary with two plots (upland/wetland) per transect. The naming convention used on datasheets to designate upland or wetland plots associated with a transect is -U or -W, respectively.

Three-parameter wetland/upland boundaries and plots were mapped in the field with an Eos Arrow 100 Submeter Global Positioning System (GPS) Receiver with Global Navigation Satellite System (GNSS) and an iPad running ArcGIS Collector software. The wetland/upland boundary was recorded with the GPS unit as needed to map the wetland's spatial extent. The points were then connected in the office using ArcMap software for figure creation.

Each three-parameter wetland area was designated with a number (e.g., W1). The wetland points were also labeled with their respective wetland number. In addition to the wetland sampling points, upland sampling points were described. These were labeled beginning with a "U" and numbered in sequence (e.g., U1, U2). The upland sampling points were completed to confirm and document the absence of any wetland indicators (soils, hydrology, and vegetation). **Appendix B** contains all datasheets recorded during the delineation.

3.2 Botanical Methodology

Vegetation data collection consisted of listing the dominant species in the herbaceous, shrub, and tree layer within a standard-sized plot determined by the strata layer. Nomenclature follows *The Jepson Manual* (Baldwin et al. 2012), which was cross-checked to federal standard nomenclature to identify the indicator status. The species' wetland indicator status for the Western Mountains, Valleys, and Coast Region was denoted in the respective column, using the standard reference: *National Wetland Plant List* (USACE 2020). This list classifies species based on the probability that they are found in wetlands (USACE 1987) as follows:

– Obligate (OBL): almost always in wetlands (99% probability)
– Facultative Wetland (FACW): usually occurring in wetlands (67% to 99% probability)
– Facultative (FAC): commonly occurring in wetlands and uplands (34% to 66% probability of occurring in wetlands)
– Facultative Upland (FACU): usually occurring in uplands (1% to 33% probability of occurring in wetlands)
– Upland (UPL): upland obligate, rarely in wetlands (1% in wetlands)

Species that do not appear on the list are considered to be in the upland category (USACE 2020). Standard procedures for documenting hydrophytic vegetation indicators were used per the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE 2010).

3.3 Soils Methodology

Hydric soils were defined based on the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE 2010) procedures in combination with the Natural Resources Conservation Service's (NRCS) definitions presented in *Field Indicators of Hydric Soils in the United States* (USDA/NRCS 2018). Soil pits were dug to an approximate depth of 14 inches unless soil was compacted, or soil was absent. Data on soil color, texture, and redoximorphic features (iron concentrations) were recorded. Any observed redoximorphic features were noted along with their percentage within the soil matrix, and care was taken to distinguish chromas of 1 and 2 indicative of an iron-depleted soil within 12 inches of the soil surface (USACE 2010; USDA/NRCS 2018).

The *Munsell Soil Color Book* (Color, M. 2000) was used to describe the soil colors for the entire depth of the test pit. Moist, natural soil aggregate (ped) surfaces, which had not been crushed, were used to determine the soil's color. Soils with low chroma were verified as being hydric or upland with *Field Indicators of Hydric Soils in the United States* (Version 8.2, USDA/NRCS 2018).

3.3.1 Existing Soils Information

The NRCS identifies one soil unit within the PSB (**Appendix A, Figure 5**). A brief map unit description, as generated by the NRCS, is provided for each soil unit below (NRCS 2022). Although NRCS soil mapping is informative, the scale is generally too broad to definitively characterize potential wetlands. Please see the full NRCS report included as **Appendix C** for complete details.

Hookton-Tablebluff-Cannonball complex, 9 to 15 percent slopes

The Hookton-Tablebluff-Cannonball complex nine to 15 percent slopes map unit composition contains: 40 percent Tablebluff and similar soils, 35 percent Hookton and similar soils, 15 percent Cannonball and similar soils, and ten percent minor components (five percent Halfbluff and five percent Urban land/residential). Tablebluff and Hookton are the major components of this complex. Tablebluff can be found on the backslope of erosional remnants in low elevation riparian areas. The parent material is eolian deposits over mixed alluvium. Tablebluff consists of a top horizon of loam, with silt loam in the middle horizons until it meets clay loam at 45 to 63 inches depth. This soil type is moderately well draining and the depth to water table is 20 to 39 inches. The soil type has a land capability classification (LCC) of 4e if irrigated and nonirrigated. Tablebluff is not a hydric soil. Hookton, the next most prevalent soil in the complex, can be found on the backslope of erosion remnants in low elevation marine and floodplain terraces. It is derived from mixed alluvium parent material. Hookton consists of top horizons of loam that meet clay loam at 26 to 36 inches, and sandy clay loam in the bottommost horizon. This soil type is somewhat poorly drained and the depth to water table is about 10 to 20 inches. This soil type has a LCC of 3e if irrigated and if nonirrigated. Hookton is not a hydric soil. Cannonball can be found on the backslope of marine terraces. It is derived from mixed marine deposits parent material. Cannonball consists of an upper horizon of silt loam that grades into loam in the middle horizon, and clay loam in the bottommost horizons. It is a moderately well drained soil and the depth to water table is 20 to 39 inches. This soil has no LCC if irrigated and a LCC of 3e if nonirrigated. Cannonball is not a hydric soil. This complex is found throughout the PSB (**Appendix A, Figure 5**).

3.4 Hydrology Methodology

GHD investigated the presence or absence of wetlands within the PSB during September 1, 2022, following no precipitation preceded by an unseasonably dry winter. A WETS table showing climate data between 1971 to 2022 for the Scotia, CA, Station, and precipitation data for the 30 days preceding the delineation is provided in **Appendix D** (NOAA 2022). There was no precipitation that fell in the last 14 days prior to survey, and no precipitation was recorded within the 30 days preceding the survey (NOAA 2022). The follow up site visit and investigation occurred on May 8, 2023, following approximately 2.57 inches of precipitation in April 2023 and a wet winter prior to that totaling 35.81 inches of precipitation between Jan 1 through March 31. A WETS table showing climate data between 1971 to 2023 for the Scotia, CA, Station, and precipitation data for the month (April 2023) days preceding the delineation is provided in **Appendix D** (NOAA 2023).

The FEMA flood hazard map is also included as **Appendix A, Figure 4** (FEMA 2022). Aerial photography and the National Wetlands Inventory were referenced before conducting fieldwork which shows low precision aquatic resources within the PSB as mapped by the U.S. Fish and Wildlife Service (**Appendix A, Figure 6**)

(NWI 2022). Wetland hydrology indicators when observed, such as drainage patterns, material deposits, soil saturation, high water table, or surface water presence, were recorded in the field at upland points.

4. Results

Weather conditions during the field visit were cloudy and temperatures averaging 63 degrees Fahrenheit. As mentioned above, no precipitation was recorded within the last 14 days of the survey. The PSB contains two, three-parameter wetlands: Wetlands 1 and 2. Wetland 1 did not appear to contain a surface-level hydrologic connection with a receiving navigable waterway, and is therefore considered isolated and likely non-jurisdictional under the USACE. Wetland 1 may be jurisdictional by the RWQCB under water of the state definition 3c. Wetland 2 appeared to be hydrologically connected to a receiving waterway (navigable water [i.e. the Eel River via Strongs Creek]) via a drainage swale, located west of the PSB. Additionally, the City of Fortuna General Plan requires 50-foot buffers around "jurisdictional wetlands" (see Section 2.3.3, Policy NCR-15). Both wetlands should have the 50-foot buffer given their potential jurisdictional status., ~~therefore Wetland 1 would not require a wetland buffer and Wetland 2 would require a wetland buffer under City General Plan policies.~~ Upland sampling points associated with each transect were also described within areas of planned disturbance to confirm and document the absence of wetland indicators in these areas. **Appendix A, Figure 3** shows the results of the aquatic resource delineation, and photos are available in **Appendix E**. Summaries and potential jurisdictional status of each aquatic resource is presented in **Table 4-1** below.

4.1 Wetland 1

Wetland 1 was identified approximately 325 feet north-northwest of the terminus of Gulliksen Drive. Wetland 1 consisted of a vegetated three-parameter wetland depression and can be classified according to the Cowardin system as a Palustrine Emergent wetland (PEM) (FGDC 2013). It was observed to retain water, as the soils were saturated; however, it did not appear hydrologically connected to a receiving waterway under typical conditions. The area of Wetland 1 is 16,200 ft^2 (0.37 acres)~~4,885 ft^2 (0.112 acres)~~. See **Appendix A, Figure 3** for the associated map.

The vegetation was characterized by only herbaceous groundcover including dotted smartweed (*Persicaria punctata,* OBL), Kentucky bluegrass (*Poa pratensis,* FAC), and creeping bentgrass (*Agrostis stolonifera,* FAC), with lesser amounts of buttercup (*Ranunculus muricatus,* FACW). Wetland 1 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydrophytic vegetation.

Soil in Wetland 1 consisted of a 2.5Y 2.5/1 silty clay loam matrix in the upper horizon (0-5 inches) with 10% 10YR 5/8 redox concentrations in the matrix. The lower horizon (5-14 inches) consisted of a 5Y 2.5/1 silty clay loam matrix with 10% 10YR 5/6 redox concentrations in pore linings. The additional soil pit dug on May 8, 2023 exhibited low chroma, and the presence of redox throughout the upper horizon. Both soil pits met ~~The upper horizon meets~~ the criteria of hydric soil indicator Redox Dark Surface (F6) due to a combination of low matrix value (2.5; 2), low chroma, depth, thickness, and presence of redoximorphic features in the soil layer. Observed primary indicators of wetland hydrology were Surface Water (A1) (September 2022), High Water Table (A2), Saturation (A3) (both May 2023) with the secondary indicator of Geomorphic Position (D2) (both visits).

Wetland 1 was not observed to be surficially hydrologically connected to a receiving navigable waterway, and is therefore not anticipated to be USACE- or RWQCB-jurisdictional. Please see attached data forms for sample points W1T1-W in **Appendix B** for additional details.

4.2 Wetland 2

Wetland 2 was identified approximately 180 feet west-northwest of Wetland 1. Wetland 2 exhibits swale characteristics, and extends for a total length of approximately 355 feet from east to west. Wetland 2 consisted of a vegetated three-parameter wetland and can be classified according to the Cowardin system as a Palustrine Forested wetland (FGDC 2013). Similarly to Wetland 1, it was observed to exhibit all three parameters to be considered a wetland. The area of Wetland 2 was mapped to 5,230 ft^2 (0.12 acres).~~4,500 ft^2 (0.103 acres).~~ See **Appendix A, Figure 3** for the associated map. The eastern extent of Wetland 2 is characterized by the data collected for transect "W2T1-W." The western extent of Wetland 2 is characterized by the data collected for transect "W2T2-W" (**Appendix A, Figure 3; Appendix B**). Wetland 2 was observed to be surficially hydrologically connected to a receiving waterway via the drainage swale that runs through and west of Wetland 2 and eventually drains into Strongs Creek. Therefore Wetland 2 is anticipated to be jurisdictional under the USACE and RWQCB.

4.2.1 Site Conditions at Transect W2T1-W

The eastern extent of Wetland 2 was observed within a concavity in the central portion of the PSB. The vegetation at this site was a combination of herbaceous cover, woody vines and some small diameter trees. Herbaceous vegetation at this site was dominated by lady fern (*Athyrium felix femina var. femina,* FAC), creeping bentgrass (FAC), and creeping buttercup (*Ranunculus repens,* FAC), with a minor presence of other herbs. The woody vine stratum was dominated by California blackberry (*Rubus ursinus,* FACU). The tree layer was dominated by red alder (*Alnus rubra,* FAC). The vegetation at Transect 1 for Wetland 2 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydrophytic vegetation.

Soils at this site were clay loam in the uppermost horizon, with very sticky clay below two inches. The upper horizon (0-2 inches) consisted of a 2.5Y 3/2 matrix with 5% 10YR 5/8 redox concentrations in the matrix. The middle horizon (2-12 inches) was a Gley 1 14/10Y matrix with no redoximorphic features. The lowest horizon (12-17 inches) consisted of a 2.5Y 2.5/1 matrix with no redoximorphic features. The soils at this site meet the criteria of hydric soils indicators Loamy Mucky Mineral (F1) and Hydrogen Sulfide (A4). The primary hydrology indicators were Saturation (A3), with secondary indicator of Geomorphic Position (D2).

4.2.2 Site Conditions at Transect W2T2-W

The western extent of Wetland 2 was observed within a swale feature near the western edge of the PSB. The vegetation at this site was a combination of herbaceous cover, shrubs, and woody vines. Herbaceous vegetation at this site was dominated by skunk cabbage (*Lysichiton americanus,* OBL) and lady fern (FAC), with lesser amounts of sword fern (*Polystichum munitum,* FACU) and stinking hedge nettle (*Stachys ajugoides,* OBL). The woody vine stratum was dominated by California blackberry (FACU). The shrub layer was dominated by thimbleberry (*Rubus parviflorus,* FAC). The vegetation at Transect 2 for Wetland 2 passed the dominance test for hydrophytic vegetation and is therefore considered to contain hydrophytic vegetation.

Soils at this site were wet and mucky silt loam. The soil consisted of a 5Y 3/1 matrix with no presence of redoximorphic features. This soil meets the hydric soil indicator of Loamy Mucky Mineral (F1). There was obvious wetlands hydrology present on-site, including standing water. The primary hydrology indicator met were Surface Water (A1) and the secondary indicator met was Geomorphic Position (D2).

Wetland 2 is surficially hydrologically connected to a navigable waterway. Please see attached data forms for sample points W2T1-W and W2T2-W in **Appendix B** for additional details.

Table 4.1 Aquatic Resources within the PSB

Wetland or Other Water Name	Location (lat/long) center of transect	Size of Wetland or Other Water	Likely Jurisdictional?	
			USACE	RWQCB
Wetland 1	40.584252, -124.122371	16,200 ft^2/0.37 ac ~~4,885 ft^2/ 0.112 ac~~	No	~~No~~Yes
Wetland 2	40.584638, -124.123588	5,230 ft^2/0.12 ac ~~4,500 ft^2/ 0.103 ac~~	Yes	Yes
Total three parameter wetlands within the PSB:		**21,430 ft^2/0.37 ac** **~~9,385 ft^2 (0.215 ac)~~**		

4.3 Upland Sampling Points

Upland sampling points were collected to characterize areas that could potentially be affected by the Project within the PSB. No wetlands or other aquatic resources were detected within the areas characterized by the following upland points.

4.3.1 Upland 1

The Upland 1 sample point ("Upland 1") was located between Wetland 1 and Wetland 2 (**Appendix A, Figure 3**). The site was dominated by velvet grass (*Holcus lanatus,* FAC) and rush (*Juncus patens,* FACW), with lesser amounts of bracken fern (*Pteridium aquilinum,* FACU) and bird's foot trefoil (*Hosackia gracilis,* FACW). Vegetation at the site did pass the dominance test for hydrophytic vegetation. The soil was a dark, friable silt loam that lacked redoximorphic features. The entire soil pit (0-12 inches) was a 10YR 2/1 matrix with no redoximorphic features, which does not meet any criteria that define it as a hydric soil. It met one secondary indictor for hydrology, which is Geomorphic Position (D2), as it was in a minor depression. It did not meet any primary indicators of hydrology. The manual specifies that wetland hydrology, soil, and vegetation indicators must be present to identify a wetland (USACE 1987, p. 10). Only one of the parameters were met (vegetation), therefore this site is not considered a three-parameter wetland.

Table 4.2 Upland Sampling Point Locations

Upland Sample Point	Location (lat/long) center of transect
Upland 1	40.584400, -124.122778

5. Conclusions

The delineation of aquatic resources within the PSB, completed on September 1, 2022, determined the extent of three-parameter wetlands based on hydrophytic vegetation, hydric soils, and wetland hydrology using methods and indicators outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)* (USACE 2010). A follow up site visit and investigation on May 8, 2023 resulted in an expansion of Wetland 1 by 11,315 ft^2 (0.26 ac) and minor expansion of Wetland 2 by 730 ft^2 (0.02 ac). Wetland 1 appears to have been mapped erroneously in September 2022 due to the multi-month dry conditions, and the updated boundary of Wetland 1 appears to

more accurately align with historic imagery of wet conditions over the last decade. The total area of three-parameter wetlands mapped within the PSB, as well as the total area of aquatic resources, is **21,430 ft²/0.37 ac ~~9,385 ft² (0.215 ac).~~**

Wetland 1 is not anticipated to be under the jurisdiction of the USACE ~~and RWQCB~~ due to the absence of surface level hydrologic connectivity with a receiving waterway. Wetland 1 can be considered isolated. It may still be under the jurisdiction of the RWQCB though due to it being an artificial wetland that isn't subject to ongoing maintenance (water of the state definition 3c). However, Wetland 2 is anticipated to be USACE and RWQCB jurisdictional due to surficial hydrologic connectivity within a receiving navigable waterway (i.e. the Eel River via Strongs Creek and the drainage swale to Strongs Creek). Additionally, the City of Fortuna General Plan requires 50-foot buffers around "jurisdictional wetlands" (see Section 2.3.3, Policy NCR-15), therefore both Wetland 1 and Wetland 2 are ~~is~~ anticipated to require a wetland buffer under City General Plan policies. Upland sampling points associated with each transect were also described within areas of planned disturbance to confirm and document the absence of wetland indicators in these areas.

Data sheets for all aquatic resources, including plot data collected in transects across wetland boundaries and the additional upland sampling point is included as **Appendix B**.

6. Special Terms and Conditions

6.1 Purpose of this Report

GHD prepared this report for Wendt Construction Company, and Wendt Construction Company may only use and rely on this report for the purpose agreed upon between GHD and Wendt Construction Company as set out in the scope and contract for work effort reported herein. GHD Inc. is not liable for any action arising out of the reliance of any third party on the information contained within this report. GHD otherwise disclaims responsibility to any entity other than Wendt Construction Company arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

6.2 Scope and Limitations

This report does not authorize any individuals to develop, fill, or alter the delineated wetlands. Verification of the delineation by jurisdictional agencies is necessary prior to the use of this report for planning and development purposes. **A USACE and Regional Water Quality Control Board delineation map, and a jurisdictional approval letter are required to signify confirmation of delineation results. In situations where a field investigation determines that no jurisdictional wetlands occur, jurisdictional concurrence with these agencies is highly recommended prior to any filling of ANY onsite wetlands.**

The delineation conclusions were based on the information available during the period of the investigation, which took place on September 1, 2022 and the follow up site visit on May 8, 2023.

The opinions, conclusions, and any recommendations in this report are based on conditions encountered and information reviewed by the date of preparation of the report. Site conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change unless contracted to do so.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions, and any recommendations in this report are based on the information obtained from and testing undertaken at or in connection with specific sample points. Conditions at other locations of the site may be different from the conditions found at the specific sample points.

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8. Report Preparers

8.1 Client

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8.2 GHD

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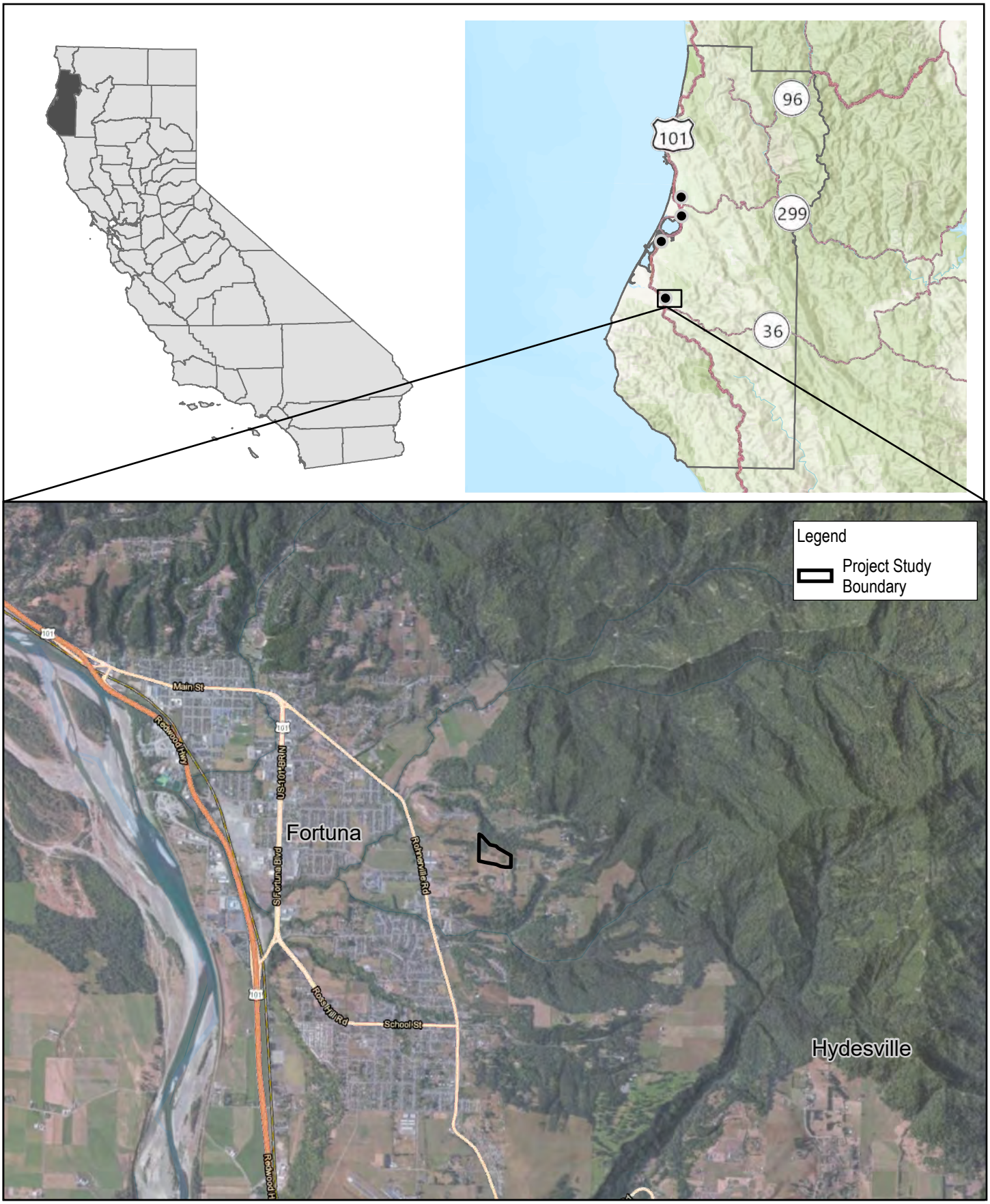
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Appendices

Appendix A

Figures



Paper Size ANSI A

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Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California II FIPS 0402 Feet

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Gulliksen Subdivision Project

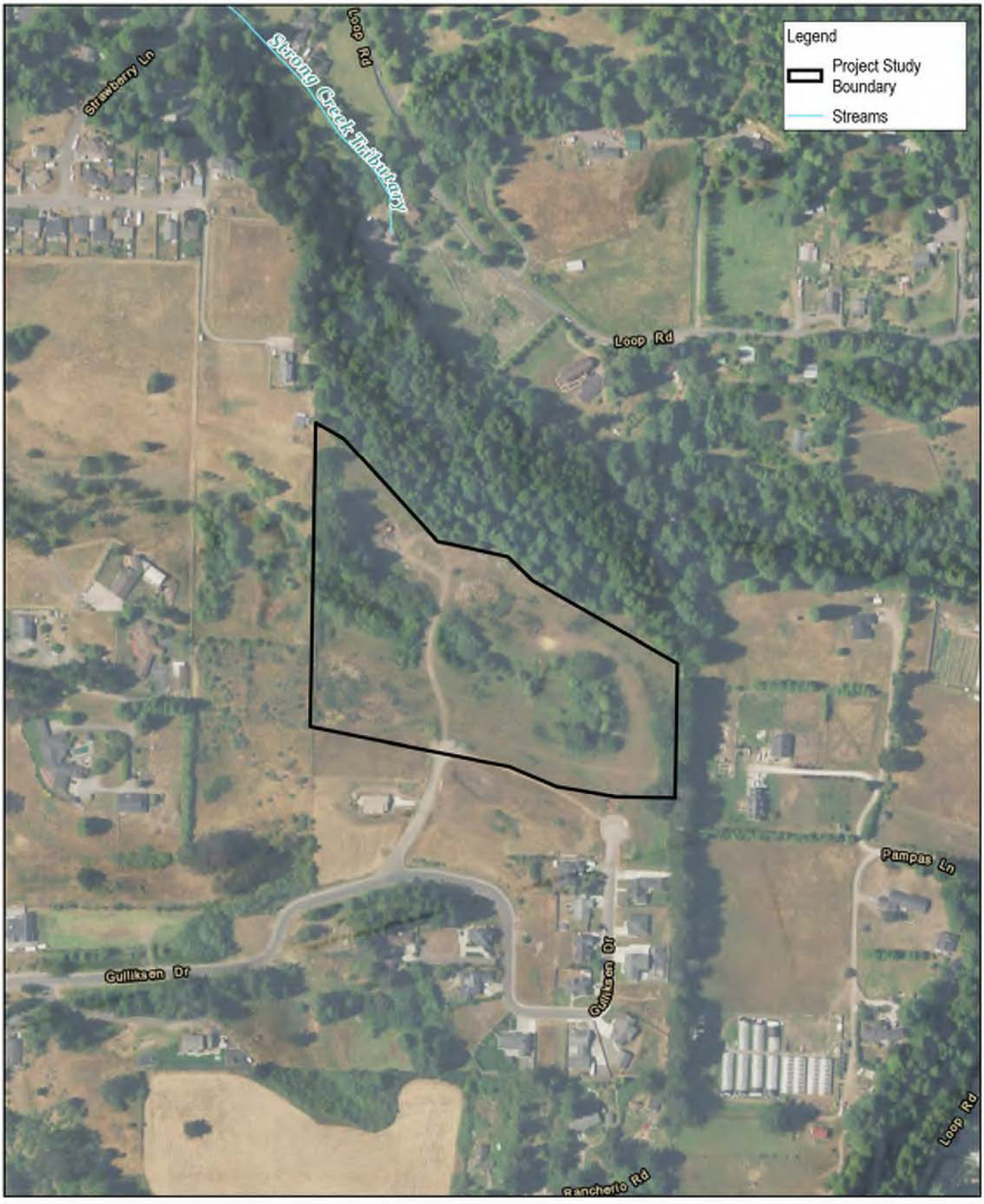
Project No. **12592861**
Revision No. **-**
Date **Sep 2022**

Vicinity Map

FIGURE 1

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Data source: World Imagery (Clarity): This work is licensed under the Esri Master License Agreement.View Summary | View Terms of UseExport: This layer is not intended to be used to export tiles for offline. Data Collection and Editing: This layer may be used in various ArcGIS apps to support data collection and editing, with the results used internally or shared with others, as described for these use cases.; World Topographic Map - labelless: California State Parks, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, Bureau of Land Management, EPA, NPS, USDA; transportation: USGS The National Map: National Transportation Dataset; U.S. Census Bureau – TIGER/Line; U.S. Forest Service. Data Refreshed July, 2022.; World Hillshade: Esri, NASA, NGA, USGS, FEMA; World_Transportation: Esri, HERE; World Topographic Map - labelless: California State Parks, Esri, HERE, Garmin, FAO,



Paper Size ANSI A

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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Gulliksen Subdivision Project

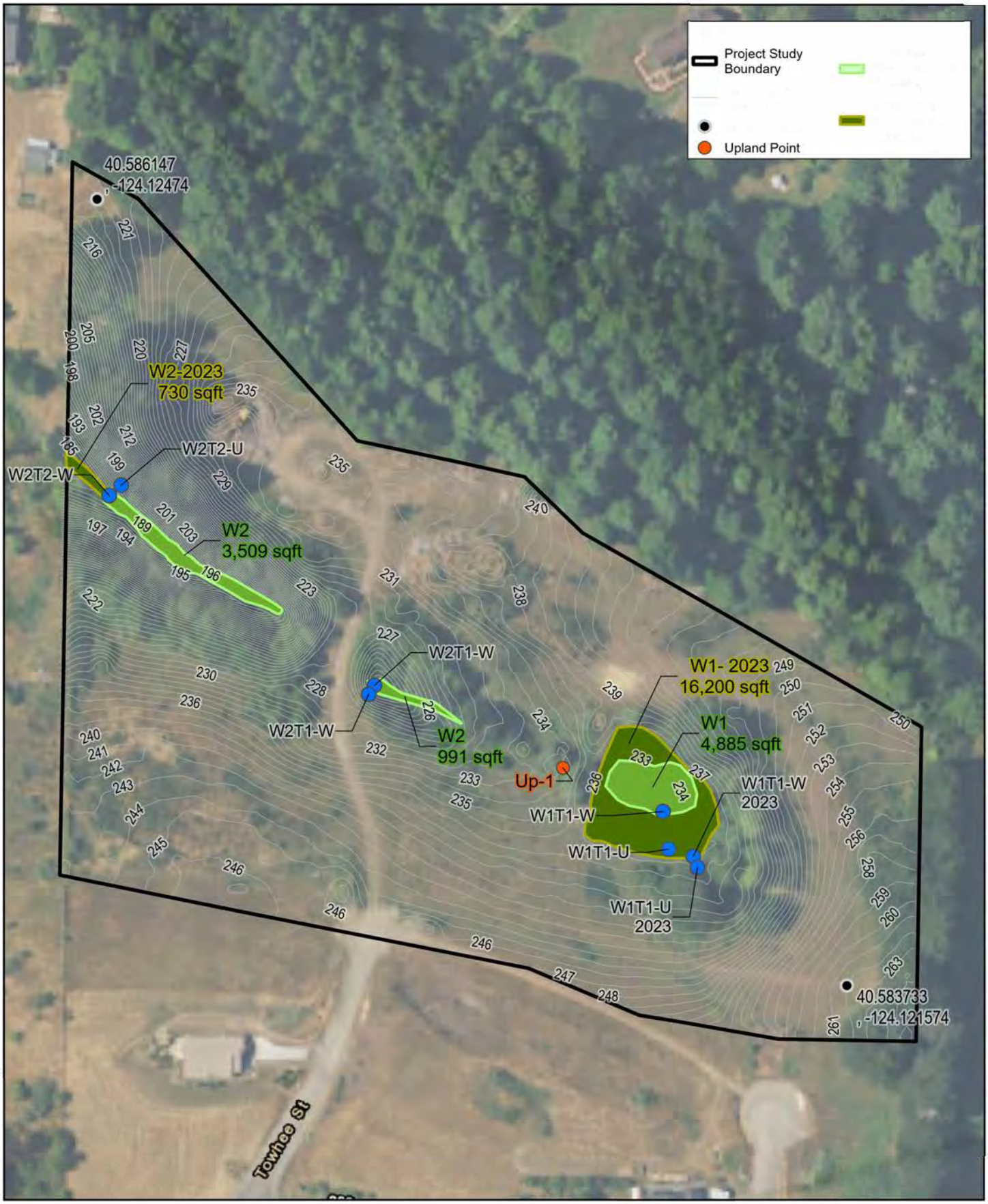
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Revision No. -
Date September 2022

Project Study Boundary

FIGURE 2

Print date: 09 Sep 2022 - 16:54

Data source: 2020 NMP, World Hillshade: Esri, NASA, NGA, USGS, FEMA, World_Transportation: Esri, HERE, GeoTechnologies, Inc. Created by: jlopez



Paper Size ANSI A

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Map Projection: Lambert Conformal Conic
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Wendt Construction Company
Gulliksen Subdivision Project

Project No. **12592861**
Revision No. -
Date **May 2023**

Wetland Delineation

FIGURE 3

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Print date: 12 May 2023 - 12:05

Data source: 2020 NAIP, World_Transportation: Esri, HERE, iPC
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Map Projection: Lambert Conformal Conic
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Gulliksen Subdivision Project

Project No. **12592861**
Revision No. **-**
Date **September 2022**

FEMA Floodmap

FIGURE 4

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World Hillshade: Esri, NASA, NGA, USGS, FEMA. Created by: jlopez4



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Feet

Map Projection: Lambert Conformal Conic
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Wendt Construction Company
Gulliksen Subdivision Project

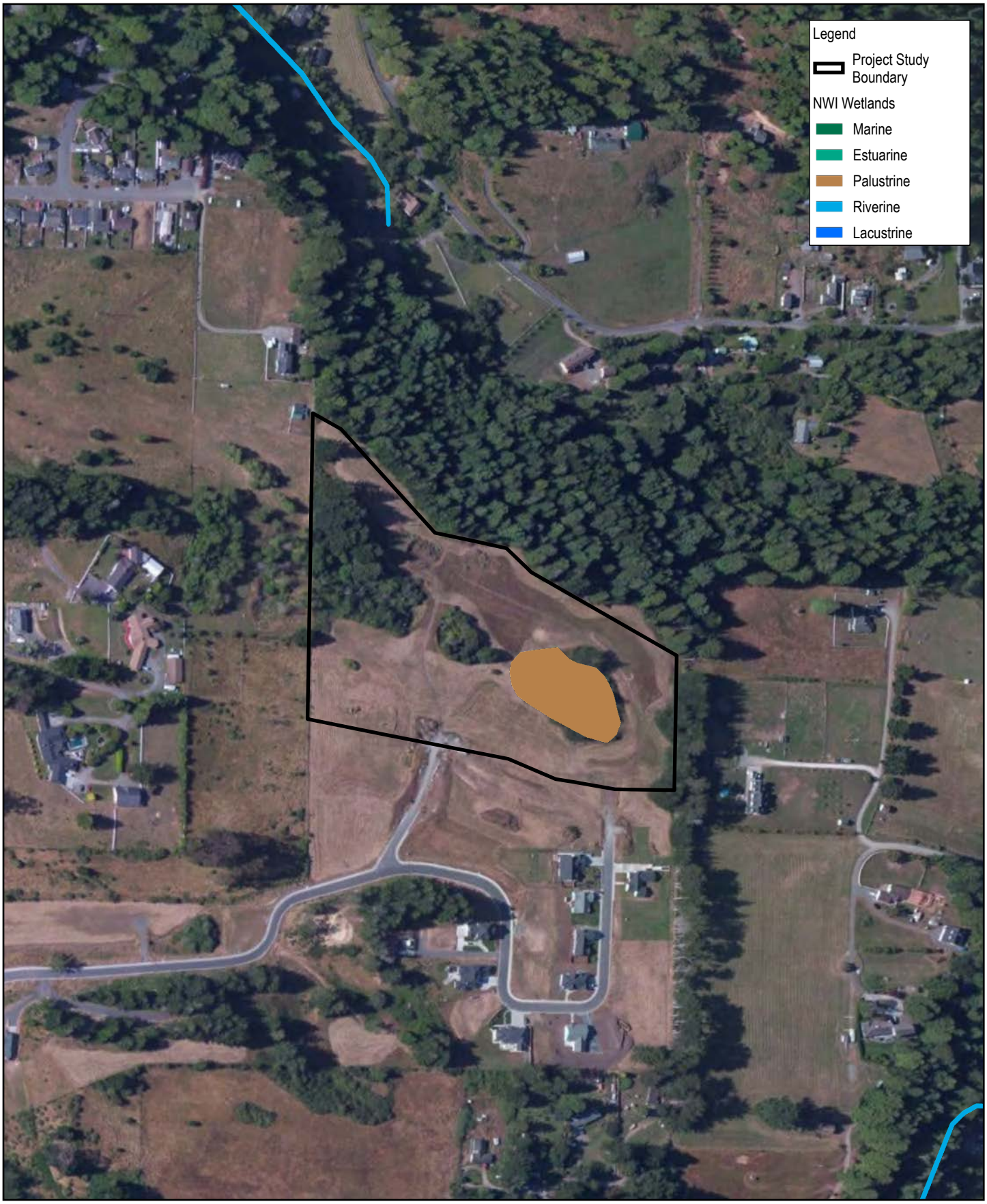
Project No. **12592861**
Revision No. **-**
Date **September 2022**

NRCS Soils

FIGURE 5

\\ghdnet\ghd\US\Eureka\Projects\561\12592861\GIS\Maps\Deliverables\12592861_Wetland_Delineation\12592861_Wetland_Delineation.aprx
Print date: 07 Sep 2022 - 13:19

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World Hillshade: Esri, USGS
World Hillshade: Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community. Created by: jlopez4



Paper Size ANSI A

0 100 200 300 400

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

Wendt Construction Company
Gulliksen Subdivision Project

Project No. **12592861**
Revision No. **-**
Date **September 2022**

National Wetlands Inventory

FIGURE 6

\\ghdnet\ghd\US\Eureka\Projects\561\12592861\GIS\Maps\Deliverables\12592861_Wetland_Delineation\12592861_Wetland_Delineation.aprx
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Appendix B

Datasheets

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt, Gulliksen Drive City/County: Eureka, Humco Sampling Date: 9/1/22

Applicant/Owner: Wendt Construction Co. State: CA Sampling Point: WITT-W

Investigator(s): K.McNamee / K.Lundgren Section, Township, Range: _____

Landform (hillslope, terrace, etc.): low depression Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Hookton-Table Bluff-Carlotta complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Ranunculus muricatus	5		FACW
2. Persicaria punctata	30	Y	OBL
3. Agrostis stolonifera	15	Y	FAC
4. Poa pratensis	20	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	70 = Total Cover		35.5
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		
% Bare Ground in Herb Stratum 30			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Gulliksen Drive - 1259 2861 - 9/1/22

SOIL

Sampling Point: WI-T1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	2.5Y 2.5/1	90%	10YR 5/8	10%	C	M	Silty clay loam	muddy bog
5-14	5Y 2.5/1	90%	10YR 5/6	10%	C	PL	Silty clay loam	bog

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Redox more widespread in upper horizon.

Redox concentrated along pore linings in lower horizon (a lot of redox)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X (1) No ___ Depth (inches): 2

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 12

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

(1) Standing water visible adjacent to soil pit.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt, Gulliksen Drive City/County: Fortuna, Humco Sampling Date: 9/1/22

Applicant/Owner: Wendt Construction Co. State: CA Sampling Point: WLT1-U

Investigator(s): K. Lundgren; K. McNamee Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Hockton-Tallebluff-Carnahan complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1 m²)			
1. Juncus effusus	2%		FACW
2. Scirpus microcarpus	2%		OBL
3. Potentilla anserina	10	Y	OBL
4. Ranunculus repens	15	Y	FAC
5. Mentha pulegium	15	Y	OBL
6. Hypochaeris radicata	7	Y	FACU
7.			
8.			
9.			
10.			
11.			
	51 = Total Cover	25 %	10 %
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		
% Bare Ground in Herb Stratum 49			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3/4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: WI-T1-U

Profile Description: (Describe to the depth needed to document the in ator or confirm the absence of indicators.)

Depth (inches)	Matrix olor (mo..		Redox Features Color (moist)	%	Type[1]	Lo[2]	Texture	Remarks
0-7	7.5YR3/1	99%	5YR6/8	1	C	PL	loamy Sand	brittle
7-14	10YR2/1	100%					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic A3)
- ___ Hydrogen Sulfide A4)
- ___ Depleted Below Dark Surface A11)
- ___ Thick Dark Surface (A12
- ___ Sandy Mucky Mineral S1
- ___ Sandy Gleyed Matrix S4)
- ___ Sandy Redox S5)
- ___ Stripped Matrix S6)
- ___ Loamy Mucky Mineral F1) (except MLRA 1
- ___ Loamy Gleyed Matrix F2)
- ___ Depleted Matrix F3)
- ___ Redox Dark Surface F6)
- ___ Depleted Dark Surface F7)
- ___ Redox Depressions F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 m Muck A10)
- ___ Re Parent Material TF2)
- ___ Very Shallow Dark Surface TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

minor redox along pore linings in upper horizon. Redox nowhere else.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water A1)
- ___ High Water Table A2)
- ___ Saturation A3)
- ___ Water Marks B1)
- ___ Sediment Deposits B2)
- ___ Drift Deposits B3)
- ___ Algal Mat or Crust B4)
- ___ Iron Deposits B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves B9) (except MLRA 1, 2, 4A, an 4B
- ___ Salt Crust B11)
- ___ Aquatic Invertebrates B13)
- ___ Hydrogen Sulfide Odor C1)
- ___ Oxidized Rhizospheres along Living ts C3)
- ___ Presence of Re uced Iron C4)
- ___ Recent Iron Reduction in Tilled Soils C6)
- ___ Stunted or Stressed Plants D1) (LRR A)
- ___ Other Explain in Remarks)

Se ondary Indicators (2 or more required)

- ___ Water-Stained Leaves B9) (MLRA 1, , 4A, and 4B)
- ___ Drainage Patterns B10)
- ___ Dry-Season Water Table C2)
- ___ Saturation Visible on Aerial Imagery C9)
- X Geomorphic Position D2)
- ___ Shallow Aquitard D3)
- ___ FAC-Neutral Test D5)
- ___ Raised Ant Moun s D6 (LRR A)
- ___ Frost-Heave Hummocks D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth inches): ___

Water Table Present? Yes ___ No X Depth inches): ___

Sat ration Present? (includes apillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Although in area below upper hillslope (geomorphic portion) wetland hydrology not present

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt, Gulliksen Drive City/County: Fortuna, Humco Sampling Date: 9/1/2022

Applicant/Owner: Wendt Construction CO State: CA Sampling Point: W2TI-W

Investigator(s): K. McNamara, K. Lundgren Section, Township, Range: _____

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Hookton-Tablebluff-Carnegall complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m²)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	10	Y	FAC
2. Cotoneaster	<1		UPL
3.			
4.			
	11	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m²)			
1. Rubus ursinus	25	Y	FACU
2.			
3.			
4.			
5.			
	25	= Total Cover	
Herb Stratum (Plot size: 1m²)			
1. Ranunculus lapens	7	Y	FAC
2. Athyrium felix-femina	10	Y	FAC
3. Rumex obtusifolius	2		FAC
4. Equisetum telmateia	1		FACW
5. Agrostis stolonifera	8	Y	FAC
6. Carex leptopoda	3		FAC
7.			
8.			
9.			
10.			
11.			
	36	= Total Cover	18
Woody Vine Stratum (Plot size: _____)			7.2
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: W2-T1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/2	95%	10YR5/8	5%	C	M	clay loam	Redox associated w/om
2-12	Gley 1 4/10Y	100%					clay	very sticky
12-17	2.5Y 2.5/1	100%					clay	very sticky + dark

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1) (except MLRA 1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

clear horizons of light brown → light grey → dark grey/black. smells like sulfur, extremely sticky + plastic.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 12

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

drainage patterns, leaf litter, geomorphic position + saturated soil indicate wetlands hydrology.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt - Gullikson Drive City/County: Fairfield, Solano Co Sampling Date: 9/1/2022

Applicant/Owner: Wendt Construction Co State: CA Sampling Point: W2T1-U

Investigator(s): K. McNamee, K Lundgren Section, Township, Range:

Landform (hillslope, terrace, etc.): slope leading to swale Local relief (concave, convex, none): Convex Slope (%): 7

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Hookton-Talbott-Carneros complex, 9-15% NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 3m²)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	10	Y	FACW
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m²)			
1. Rubus ursinus	15	Y	FACU
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Ranunculus hepens	5	Y	FAC
2. Equisetum telmateia	1		FACW
3. Poa annua	20	Y	FAC
4. Hypochaeris radicata	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	27 = Total Cover		13 5 3 4
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 50

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: brambles dense in areas

SOIL

Sampling Point: W2-T1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 4/3	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol A1)
- ___ Histic Epipedon A2)
- ___ Black Histic A3)
- ___ Hydrogen Sulfide A4)
- ___ Depleted Below Dark Surface A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral S1)
- ___ Sandy Gleyed Matrix S4)
- ___ Sandy Redox S5)
- ___ Stripped Matrix S6)
- ___ Loamy Mucky Mineral F1) except MLRA 1
- ___ Loamy Gleyed Matrix F2)
- ___ Depleted Matrix F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface F7)
- ___ Redox Depressions F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck A10)
- ___ Red Parent Material TF2)
- ___ Very Shallow Dark Surface TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: pale, dusty soil on hillslope

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water A1)
- ___ High Water Table (A2)
- ___ Saturation A3)
- ___ Water Marks B1)
- ___ Sediment Deposits B2)
- ___ Drift Deposits B3)
- ___ Algal Mat or Crust B4)
- ___ Iron Deposits B5)
- ___ Surface Soil Cracks B6)
- ___ Inundation Visible on Aerial Imagery B7)
- ___ Sparsely Vegetated Concave Surface B8)
- ___ Water-Stained Leaves B9) except MLRA 1, , A, and 4B)
- ___ Salt Crust B11)
- ___ Aquatic Invertebrates B13)
- ___ Hydrogen Sulfide Odor C1)
- ___ Oxidized Rhizospheres along Living Roots C3)
- ___ Presence of Reduced Iron C4)
- ___ Recent Iron Reduction in Tilled Soils C6
- ___ Stunted or Stressed Plants D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves B9) (MLRA 4A, and 4B)
- ___ Drainage Patterns B10)
- ___ Dry-Season Water Table C2)
- ___ Saturation Visible on Aerial Imagery C9)
- ___ Geomorphic Position D2)
- ___ Shallow Aquitard D3)
- ___ FAC-Neutral Test D5)
- ___ Raised Ant Mounds D6 (LRR A)
- ___ Frost-Heave Hummocks D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: no indicators of wetlands hydrology. Located on hillslope

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt, Gulliksen Drive City/County: Fortuna, HumCo Sampling Date: 9/1/2022

Applicant/Owner: Wendt Construction Co. State: CA Sampling Point: W2T2W

Investigator(s): K.McNamee, K.Lundgren Section, Township, Range:

Landform (hillslope, terrace, etc.): swale/depression Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: Hacktown-Tableland-Carlotti complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m²)			
1. Rubus ursinus	10	Y	FACU
2. Rubus parviflorus	3	Y	FAC
3.			
4.			
5.			
	13 = Total Cover		6.5 / 2.6
Herb Stratum (Plot size: 1m²)			
1. Lysichiton americanus	35	Y	OBL
2. Stachys ajugoides	2		OBL
3. Polystichum munitum	3	Y	FACU
4. Athyrium felix-femina	7	Y	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	47 = Total Cover		23.5 / 9.4
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: W2-T2-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	5Y 3/1	100					Silt Loam	wet, mucky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

grey-colored, mucky, wet

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X① No ___ Depth (inches): 2

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetlands hydrology present via the standing water, drainage patterns & geomorphic position

① Standing water was adjacent to soil pit

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt, Gulliksen Drive City/County: Fortuna/Humco Sampling Date: 9/1/2022

Applicant/Owner: Wendt Construction Co State: CA Sampling Point: W2T1-U

Investigator(s): K. McNamee, K Lundgren Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Hookton-Table Bluff-Carlotta complex NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 3m^2)			
1. Rubus ursinus	13	Y	FACU
2. Ribes sanguineum	2	Y	UPL
3. Rubus parviflorus	5	Y	FAC
4. Ilex aquifolium	15	Y	FACU
5.			
	35 = Total Cover		17.5
Herb Stratum (Plot size: _____)			
1. Prosartes hooker	8	Y	UPL
2. Stachys ajugoides	3	Y	OBL
3. Tellima grandiflora	2		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	13 = Total Cover		4.5
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		
% Bare Ground in Herb Stratum 10			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: heavy leaf litter

SOIL

Sampling Point: W2-T2-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5y 3/2	100					Sandy loam	very nice

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except RA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

very pale when dry. Friable

HYDROLOGY

Wetland Hydrology ndicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (LRR A)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (LRR A)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

On hillslope — no wetlands hydrology features present.

				Statusee
1.				
2.				
3.				
4.				
		= Total Cover		

Sapling/Shrub Stratum (Plot size: 3m²)

Rubus ursinus	30	Y	FACU	
2.eee Rubus armeniacus eee	7	Y	FAC	
3.eee Rosa gymnocarpa	5	Y	FACU	
4.				
5.				
	42	= Total Cover	2.1 8.4	

Herb Stratum (Plot size: 1m²) eee

Juncus patens	15	Y	FACW	
2. Holcus lanatus	35	Y	FACe	
3. Pteridium aquilinum	3		FACU	
4.				
5. Hosackia gracilis	3		FACW	
6.				
7.				
8.				
9.				
10.				
11.				
	56	= Total Cover	1.0 11.2	

Woody Vine Stratum (Plot size: _____)

1.				
2.				
		= Total Cover		

% Bare Ground in Herb Stratum _____

Number of Dominant Species That Are OBL, FACW, or FAC:e 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC:e 2/5=40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =e	
Column Totals: (A)		(B)e

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supportingeee data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology muste be present, unless disturbed or problematic.e

Hydrophytic Vegetation Present? Yes ____ No ✓

Re

heavy bramble cover

SOIL

Sampling Point: Up-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: dark, friable soil lacking redox. Located in a minor depression

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (except **MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt - Gulliksen Drive City/County: Fortuna/Humboldt Sampling Date: 5/8/23

Applicant/Owner: Wendt Construction Co. State: CA Sampling Point: WIT1-update

Investigator(s): K. McNamee, K. Lundgren Section, Township, Range: T02N, 001W

Landform (hillslope, terrace, etc.): large swale Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): 4A Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: r=5ft)			
1. Salix hookeriana	3%	Y	FACW
2. Rubus ursinus	<3%	Y	FACU
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: r=5ft)			
1. Ranunculus muricatus	10	Y	FACW
2. Juncus patens	15	Y	FACW
3. Potentilla anserina	8	—	OBL
4. Carex obnupta	50	Y	OBL
5.			
6.			
7.			
8.			
9.			
10			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4/5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Gallikses 5/8/23

SOIL

Sampling Point: W1-T1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	95%	10YR 5/8	2%	C	M	silt loam	some redox

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location PL=Pore Lining M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present unless disturbed or problematic.

Restrictive Layer (if present):

Type ___

Depth (inches) ___

Hydric Soil Present? Yes X No ___

Remarks

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required, check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) ___

Water Table Present? Yes X No ___ Depth (inches) 24" C

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches) 4"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available

Remarks

Alpha alpha positive, lower topography

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Wendt-Gulliksen Dr City/County: Fortuna/Humboldt Sampling Date: 5/8/23

Applicant/Owner: Wendt Construction Co. State: CA Sampling Point: WIT1-U upd

Investigator(s): K. McNamee, K. Lundgren Section, Township, Range: T02N, 001W

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): slope Slope (%): 4

Subregion (LRR): 4A Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ____
Hydric Soil Present?	Yes ____ No ____	
Wetland Hydrology Present?	Yes ____ No ____	

Remarks: Above average precip. for several months following dry year

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Hesperocyparis sp.	20	Y	UPL
2.			
3.			
4.			
	20 = Total Cover		

Sapling/Shrub Stratum (Plot size: r=5ft)			
1. Rubus ursinus	10	Y	FACU
2. Rubus armeniacus	6	Y	FAC
3.			
4.			
5.			
	16 = Total Cover		

Herb Stratum (Plot size: r=5ft)			
1. Mentha pulegium	11	Y	OBL
2. Ranunculus muricatus	7	Y	FACW
3. Athyrium felix-femina	5	–	UPL
4. Cystopteris fragilis	6	Y	FACU
5. Juncus effusus	<3	–	FACW
6. Anthoxanthum odoratum	20	Y	FACU
7.			
8.			
9.			
10.			
11.			
	47 = Total Cover		

Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- ____ 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Gulliksen 5/8/23

SOIL

Sampling Point: WH-TI-Up Updated

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1	100					Silt loam	

[1]Type. C=Concentration, D=Depletion RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type _____

Depth (inches) _____

Hydric Soil Present? Yes _____ No X

Remarks

dark, damp soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches) _____

Water Table Present? Yes X No ___ Depth (inches) 11

Saturation Present? Yes X No ___ Depth (inches) _____

(includes capillary fringe)

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks

Appendix C

NRCS Custom Soil Resources Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Humboldt County, Central Part, California

12592861- Gulliksen



August 30, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface.....2
How Soil Surveys Are Made.....5
Soil Map.....8
Soil Map.....9
Legend.....10
Map Unit Legend.....11
Map Unit Descriptions.....11
Humboldt County, Central Part, California.....13
231—Hookton-Tablebluff-Cannonball complex, 9 to 15 percent slopes.....13
References.....16

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,540 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 35 70 140 210

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Humboldt County, Central Part, California
Survey Area Data: Version 7, Sep 6, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 8, 2019—Jun 21, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
231	Hookton-Tablebluff-Cannonball complex, 9 to 15 percent slopes	12.8	100.0%
Totals for Area of Interest		**12.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Humboldt County, Central Part, California

231—Hookton-Tablebluff-Cannonball complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2ljdn
Elevation: 30 to 820 feet
Mean annual precipitation: 42 to 54 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition

Tablebluff and similar soils: 40 percent
Hookton and similar soils: 35 percent
Cannonball and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tablebluff

Setting

Landform: Erosion remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits over mixed alluvium

Typical profile

Ap - 0 to 18 inches: loam
Bt1 - 18 to 24 inches: silt loam
Bt2 - 24 to 35 inches: silt loam
Bt3 - 35 to 41 inches: silt loam
Bt4 - 41 to 45 inches: silt loam
Bt5 - 45 to 55 inches: clay loam
C - 55 to 63 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 20 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 12.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: R004BA203CA - Riparian

Hydric soil rating: No

Description of Hookton

Setting

Landform: Erosion remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

A1 - 0 to 5 inches: loam
A2 - 5 to 12 inches: loam
Bw - 12 to 26 inches: loam
C1 - 26 to 36 inches: clay loam
C2 - 36 to 61 inches: sandy clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 10 to 20 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F004BI101CA - Low elevation marine and floodplain terraces
Hydric soil rating: No

Description of Cannonball

Setting

Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, tread
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Mixed marine deposits

Typical profile

A1 - 0 to 3 inches: silt loam
A2 - 3 to 11 inches: silt loam
Bt1 - 11 to 27 inches: loam
Bt2 - 27 to 61 inches: clay loam
Bt3 - 61 to 76 inches: clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 2.00 in/hr)
Depth to water table: About 20 to 39 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F004BI101CA - Low elevation marine and floodplain terraces
Hydric soil rating: No

Minor Components

Halfbluff

Percent of map unit: 5 percent
Landform: Marine terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F004BX118CA - Sitka spruce-redwood/salal/western brackenfern, marine terraces, marine deposits, fine sandy loam
Other vegetative classification: Forest Type IV, coastal (RNPF004CA)
Hydric soil rating: No

Urban land, residential

Percent of map unit: 5 percent
Landform: Marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

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Appendix D

Record of Climatological Observations and WETS Table

Climatological Data for SCOTIA, CA - August 2022

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2022-08-01	71	57	64.0	24	14	0.00	M	M
2022-08-02	74	56	65.0	25	15	0.00	M	M
2022-08-03	74	55	64.5	25	15	0.00	M	M
2022-08-04	74	55	64.5	25	15	0.00	M	M
2022-08-05	75	53	64.0	24	14	0.00	M	M
2022-08-06	71	54	62.5	23	13	0.00	M	M
2022-08-07	71	54	62.5	23	13	0.00	M	M
2022-08-08	71	54	62.5	23	13	0.00	M	M
2022-08-09	70	56	63.0	23	13	0.00	M	M
2022-08-10	75	52	63.5	24	14	0.00	M	M
2022-08-11	72	59	65.5	26	16	0.00	M	M
2022-08-12	69	56	62.5	23	13	0.00	M	M
2022-08-13	69	52	60.5	21	11	0.00	M	M
2022-08-14	69	54	61.5	22	12	0.00	M	M
2022-08-15	70	56	63.0	23	13	0.00	M	M
2022-08-16	74	56	65.0	25	15	0.00	M	M
2022-08-17	76	53	64.5	25	15	0.00	M	M
2022-08-18	73	53	63.0	23	13	0.00	M	M
2022-08-19	71	56	63.5	24	14	0.00	M	M
2022-08-20	73	52	62.5	23	13	0.00	M	M
2022-08-21	75	51	63.0	23	13	0.00	M	M
2022-08-22	76	51	63.5	24	14	0.00	M	M
2022-08-23	73	61	67.0	27	17	0.00	M	M
2022-08-24	66	56	61.0	21	11	0.00	M	M
2022-08-25	72	58	65.0	25	15	0.00	M	M
2022-08-26	M	M	M	M	M	M	M	M
2022-08-27	M	M	M	M	M	M	M	M
2022-08-28	M	M	M	M	M	M	M	M
2022-08-29	M	M	M	M	M	M	M	M
2022-08-30	M	M	M	M	M	M	M	M
2022-08-31	M	M	M	M	M	M	M	M
Average|Sum	72.2	54.8	63.5	594	344	0.00	M	M

WETS Table

WETS Station: SCOTIA, CA

Requested years: 1971 - 2022

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	56.5	40.8	48.7	8.00	4.18	9.77	11	0.1
Feb	57.8	41.5	49.7	7.29	3.99	8.90	10	0.2
Mar	59.1	42.6	50.9	7.09	4.53	8.54	11	0.0
Apr	61.0	44.2	52.6	3.60	2.11	4.38	8	0.0
May	63.9	47.7	55.8	1.68	0.78	2.06	4	0.0
Jun	67.2	50.9	59.0	0.53	0.19	0.63	1	0.0
Jul	70.0	53.0	61.5	0.12	0.03	0.11	0	0.0
Aug	71.4	53.5	62.5	0.23	0.04	0.18	1	0.0
Sep	71.8	51.2	61.5	0.74	0.18	0.73	2	0.0
Oct	68.0	47.7	57.8	2.72	0.97	3.28	5	0.0
Nov	60.4	43.9	52.2	6.11	3.46	7.44	10	0.0
Dec	55.5	40.5	48.0	8.98	4.54	10.98	12	0.1
Annual:					39.18	53.97		
Average	63.6	46.5	55.0	-	-	-	-	-
Total	-	-	-	47.11			75	0.4

GROWING SEASON DATES

Years with missing data:	24 deg = 0	28 deg = 3	32 deg = 3
Years with no occurrence:	24 deg = 52	28 deg = 37	32 deg = 2
Data years used:	24 deg = 52	28 deg = 49	32 deg = 49
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	2/3 to 12/18: 318 days
70 percent *	No occurrence	No occurrence	1/21 to 1/1: 345 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1926	7.18	10.17	T	1.53	1.17	0.00	0.00	0.21	0.51	5.67	18.65	7.95	53.04
1927		13.15	3.66	4.01	1.53	1.35	T	0.00	0.36	1.67	9.29	4.11	39.13
1928	4.31	3.81	7.43	6.77	0.11	0.56	T	0.03	0.27	0.69	6.42	8.00	38.40
1929	3.11	3.25	3.15	2.20	0.16	1.75	0.00	0.00	0.00	0.16	T	9.37	23.15
1930	6.77	6.54	3.54	3.39	1.09	0.22	T	0.00	0.73	0.90	3.92	2.99	30.09
1931	M2.86	M2.40	3.74	1.63	0.38	0.84	0.00	0.00	0.19	4.17	6.32	13.81	36.34
1932	9.09	1.51	2.74	4.17	2.49	0.06	0.13	0.01	0.00	0.53	7.48	6.88	35.09
1933	10.37	2.11	12.13	1.60	4.72	0.17	0.00	T	0.39	2.17	0.47	13.49	47.62
1934	4.75	5.04	2.98	1.27	3.36	1.20	T	0.03	0.	6.53	8.44	6.26	40.

									70				56
1935	10.13	4.00	7.12	5.38	0.16	0.13	0.01	T	0.69	3.81	2.74	7.98	42.15
1936	14.11	8.74	2.97	3.43	1.62	1.97	0.25	0.00	0.00	0.30	0.03	3.37	36.79
1937	7.33	11.17	7.98	4.30	0.57	1.24	0.00	0.09	0.06	4.28	15.15	8.52	60.69
1938	9.93	19.39	16.54	2.65	M0.41	0.00	0.00	0.00	1.10	3.53	6.14	6.96	66.65
1939	6.51	5.05	5.24	0.29	1.88	0.50	0.06	T	T	1.33	1.37	14.65	36.88
1940	8.58	14.60	6.38	0.67	1.95	0.65	0.00	0.00	1.05	3.57	2.30	17.11	56.86
1941	15.32	11.92	5.70	4.85	2.28	1.48	0.01	0.09	0.91	2.18	3.81	18.94	67.49
1942	5.94	9.39	2.32	6.33	5.41	0.27	T	0.00	0.00	1.00	10.29	8.81	49.76
1943	10.05	3.12	5.80	2.95	1.34	1.14	0.00	0.21	0.07	5.82	3.66	2.49	36.65
1944	6.16	5.42	3.25	4.06	1.88	1.44	T	0.00	0.27	3.11	9.01	8.94	43.54
1945	3.38	9.83	8.61	2.28	2.30	0.00	0.00	0.02	0.32	7.02	10.78	15.31	59.85
1946	5.06	6.69	4.44	0.75	0.79	0.07	0.19	T	0.33	1.96	7.69	1.73	29.70
1947	4.84	3.60	7.48	1.86	0.04	1.49	0.35	0.26	0.33	7.31	2.02	3.76	33.34
1948	7.30	4.72	6.77	10.19	3.39	1.49	0.03	0.15	0.88	2.11	2.92	9.65	49.60
1949	1.88	6.79	14.05	0.19	1.27	0.37	0.02	0.18	0.27	2.28	2.65	4.21	34.16
1950	13.01	6.73	7.35	2.03	1.63	0.80	0.01	0.01	0.34	14.55	4.83	7.31	58.60
1951	10.78	7.61	3.48	2.05	1.52	0.00	0.11	MT	0.23	4.82	8.93	12.91	52.44
1952	15.22	6.74	7.14	1.53	1.99	1.68	0.00	0.00	0.17	0.30	2.47	18.66	55.90
1953	13.23	2.98	8.70	3.35	5.61	1.63	0.01	0.27	0.03	3.00	10.24	M4.27	53.32
1954	16.08	7.54	6.96	3.44	0.06	1.80	0.01	1.74	0.60	1.78	6.26	10.15	56.42
1955	5.64	3.59	1.73	7.92	0.12	0.11	0.11	0.01	0.78	1.71	7.65	22.88	52.25
1956	14.43	11.37	1.82	0.72	1.70	0.98	0.04	0.00	0.00	5.76	0.44	5.73	42.99
1957	8.21	8.92	8.34	3.21	4.14	0.10	0.09	0.10	2.88	5.17	5.62	8.03	54.81
1958	11.48	21.54	8.23	6.39	1.12	1.83	0.11	0.04	M0.66	M0.43	3.79	3.77	59.39
1959	19.75	15.52	2.86	0.24	0.73	0.11	0.00	0.00	2.16	0.77	0.25	3.84	46.23
1960	6.20	10.78	6.83	2.62	M4.17	M0.00	0.00	T	0.00	1.27	8.53	7.55	47.95
1961	4.48	7.91	9.78	M2.42	M2.43	0.19	0.06	M0.19	0.40	1.73	6.60	3.60	39.79
1962	3.17	11.56	7.18	2.34	0.86	0.04	0.01	1.46	0.98	9.14	6.57	4.52	47.83
1963	2.73	7.54	9.26	12.38	2.45	0.25	0.08	0.02	0.36	5.66	8.70	2.65	52.08
1964	9.59	1.68	6.11	0.86	1.65	0.87	0.16	0.10	0.03	2.73	9.74	18.37	51.89
1965	9.50	1.78	1.20	8.77	0.18	0.28	0.00	0.15	0.00	0.39	11.25	6.79	40.29
1966	14.24	5.95	6.08	1.31	0.08	0.37	0.03	0.34	1.13	0.61	11.33	8.38	49.85
1967	10.84	1.13	12.42	4.65	1.08	0.19	T	0.00	0.85	2.75	4.96	6.48	45.35
1968	11.39	3.51	5.11	0.32	0.98	0.32	0.06	1.53	0.	3.23	5.64	17.	49.

									19			37	65
1969	16.19	13.52	2.08	3.78	0.73	0.43	0.01	0.00	0.70	1.40	3.40	14.45	56.69
1970	17.32	4.65	3.24	1.33	1.03	0.09	0.00	T	0.10	2.30	12.96	13.32	56.34
1971	8.60	3.34	7.76	3.30	0.71	0.66	0.07	0.34	1.83	1.19	10.29	11.21	49.30
1972	6.33	5.53	5.54	3.83	0.83	0.73	T	0.07	1.65	3.98	7.47		35.96
1973	10.80	7.91	6.94	1.11	0.36	0.06	0.00	T	2.41	4.49	21.53	11.21	66.82
1974	11.73	8.36	10.44	4.20	0.40	0.26	0.15	0.80	T	1.95	3.58	10.36	52.23
1975	5.86	10.77	14.78	3.61	0.72	0.34	0.08	0.60	T	8.60	4.67	5.08	55.11
1976	1.51	8.80	3.81	5.45	0.12	0.15	0.25	1.63	0.01	0.20	2.33	0.71	24.97
1977	2.53	3.43	4.90	0.67	2.89	0.16	T	0.08	3.34	2.40	6.60	9.58	36.58
1978	17.20	10.27	5.52	5.17	1.02	0.16	0.03	0.39	3.30	0.06	2.10	2.48	47.70
1979	6.31	8.69	4.89	4.93	2.87	0.05	0.11	0.25	0.39	8.68	8.14	7.35	52.66
1980	7.62	9.83	6.91	4.86	2.11	0.15	0.01	0.02	0.18	1.48	1.94	8.72	43.83
1981	12.90	4.90	5.50	1.26	1.54	0.34	0.01	0.03	1.41	5.44	13.81	10.58	57.72
1982	M6.16	6.55	11.46	8.74	0.05	0.48	0.20	0.15	0.81	6.78	8.16	15.51	65.05
1983	13.34	13.76	15.12	5.94	1.45	M0.46	0.41	3.15	0.37	1.03	16.01	17.31	88.35
1984	0.74	6.03	6.27	3.44	1.01	1.02	T	0.05	0.25	3.22	18.70	3.44	44.17
1985	0.55	3.61	6.18	0.46	0.65	0.41	0.04	0.24	1.13	3.51	2.96	4.59	24.33
1986	9.62	16.10	8.31	1.25	2.31	0.12	0.04	T	3.85	1.56	1.88	4.34	49.38
1987	6.20	5.81	12.04	0.75	1.11	0.28	0.05	0.03	0.00	1.25	4.80	18.02	50.34
1988	6.38	0.16	1.36	2.70	1.59	3.57	0.04	T	0.07	0.65	10.84	9.04	36.40
1989	4.95	2.70	10.26	2.10	1.86	0.43	0.03	0.72	1.09	5.10	1.76	0.11	31.11
1990	9.14	5.40	3.28	1.22	4.50	0.15	0.11	0.67	0.26	2.47	2.99	2.84	33.03
1991	1.40	3.66	13.33	1.79	3.29	0.35	0.97	0.05	T	2.08	2.33	3.99	33.24
1992	5.05	10.19	6.11	2.58	1.29	1.02	0.52	T	0.03	2.68	2.43	13.27	45.17
1993	10.81	7.30	3.40	5.76	5.06	1.59	0.05	0.26	T	1.36	2.10	8.66	46.35
1994	6.19	8.93	2.93	3.26	1.83	0.18	0.03	T	0.10	0.70	8.54	6.32	39.01
1995	26.41	1.65	16.07	6.67	1.69	1.25	0.17	0.05	0.30	0.39	1.10	14.82	70.57
1996	11.05	9.33	4.81	5.26	2.47	0.17	0.03	0.00	0.74	3.01	5.42	22.58	64.87
1997	12.90	3.02	2.38	2.27	0.59	1.17	0.01	0.45	0.79	2.33	9.39	5.83	41.13
1998	16.47	19.83	9.07	3.56	4.70	0.20	0.10	0.01	0.01	1.98	11.99	6.04	73.96
1999	4.72	13.30	10.16	2.71	1.08	0.06	T	0.22	T	2.32	9.17	4.59	48.33
2000	10.11	11.79	2.54	2.62	1.64	0.51	0.03	0.01	0.39	3.49	3.16	3.17	39.46
2001	7.14	6.65	5.02	3.12	0.23	0.68	0.08	0.08	0.11	1.44	9.41	12.45	46.41
2002	6.35	3.88	4.84	2.74	0.83	0.04	0.02	T	0.	0.02	5.02	27.	51.

									08			44	26
2003	5.13	4.23	7.38	13.95	1.27	0.10	0.01	0.13	0.30	0.20	4.98	12.90	50.58
2004	8.02	14.41	2.72	1.33	1.45	0.06	0.00	0.21	M0.25	6.46	1.85	9.92	46.68
2005	7.60	3.98	8.36	5.96	4.64	2.77	0.01	0.00	0.03	1.48	7.32	M18.79	60.94
2006	11.66	6.65	15.20	5.21	1.46	0.14	0.01	0.00	0.24	0.55	7.65	9.46	58.23
2007	1.70	12.31	2.91	3.61	0.82	0.46	0.67	0.02	0.31	3.62	1.89	10.72	39.04
2008	14.64	5.13	2.35	2.38	0.05	0.24	0.02	M0.00			6.38	5.39	36.58
2009	1.94	10.05	M5.88	1.31	2.76	0.06	0.02	0.01	0.45	4.33	4.59	4.58	35.98
2010	16.23	6.20	5.53	7.97	3.21	1.55	0.00	0.17	0.53	4.16	4.94	14.02	64.51
2011	M1.12	5.70	M15.08	3.89	M2.34	1.11	0.24	0.01	0.19	M2.82	4.29	1.07	37.86
2012	M6.47	4.20	13.39	M3.84	0.91	1.03	0.76	0.02	0.00	M2.24	M8.66	14.44	55.96
2013	3.02	1.47	M3.45	1.61	M0.87	M0.37	0.00	M0.50	3.78	M0.03	M0.88	0.64	16.62
2014	0.87	M4.19	7.25	M0.94	M0.81	M0.18	0.06	0.00	2.46	5.60	M3.99	11.67	38.02
2015	1.22	11.92	2.30	3.66	0.33	M0.02	0.19	M0.28	0.50	0.68	4.85	14.81	40.76
2016	15.17	3.45	M12.25	M2.74	1.36	0.07	0.06	T	0.06	M10.39	8.19	7.32	61.06
2017	M16.33	M16.84	M7.80	M6.84	M1.01	M0.46	0.11	M0.00	0.56	M0.98	6.58	1.21	58.72
2018	M7.38	M3.01	8.90	4.00	M0.90	0.27	0.00	0.02	0.47	1.24	5.70	6.26	38.15
2019	10.80	17.62	6.66	2.98	4.78	0.00	0.03	M0.19	1.00	0.76	2.04	11.06	57.92
2020	8.01	0.74	2.34	1.86	3.72	0.49	0.00	0.05	0.29	0.14	2.94	3.95	24.53
2021	9.50	5.08	4.88	0.66	0.22	0.30	0.08	0.00	0.76	4.57	3.39	9.25	38.69
2022	2.14	0.63	2.00	5.26	1.87	0.73	0.22	M0.00					12.85

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2022-08-30

Date	Max Temperature	Min Temperature	Avg Temperature	GDD Base 40	GDD Base 50	Precipitation	Snowfall	Snow Depth
2023-04-01	54	37	45.5	6	0	0	M	M
2023-04-02	50	38	44	4	0	0.19	M	M
2023-04-03	47	35	41	1	0	0.35	M	M
2023-04-04	49	31	40	0	0	0.03	M	M
2023-04-05	50	37	43.5	4	0	0.01	M	M
2023-04-06	54	46	50	10	0	0.04	M	M
2023-04-07	52	46	49	9	0	1	M	M
2023-04-08	56	41	48.5	9	0	0	M	M
2023-04-09	60	43	51.5	12	2	0	M	M
2023-04-10	63	46	54.5	15	5	0	M	M
2023-04-11	60	38	49	9	0	0.34	M	M
2023-04-12	52	40	46	6	0	0	M	M
2023-04-13	51	31	41	1	0	0.09	M	M
2023-04-14	54	46	50	10	0	0	M	M
2023-04-15	55	45	50	10	0	0	M	M
2023-04-16	56	41	48.5	9	0	0	M	M
2023-04-17	54	39	46.5	7	0	0.24	M	M
2023-04-18	52	36	44	4	0	0.14	M	M
2023-04-19	52	40	46	6	0	0.02	M	M
2023-04-20	55	38	46.5	7	0	0	M	M
2023-04-21	65	43	54	14	4	0	M	M
2023-04-22	64	51	57.5	18	8	0.01	M	M
2023-04-23	64	51	57.5	18	8	0.04	M	M
2023-04-24	59	43	51	11	1	0	M	M
2023-04-25	66	48	57	17	7	0	M	M
2023-04-26	70	46	58	18	8	0	M	M
2023-04-27	76	48	62	22	12	0	M	M
2023-04-28	70	50	60	20	10	0	M	M
2023-04-29	66	51	58.5	19	9	0	M	M
2023-04-30	65	46	55.5	16	6	0.07	M	M
Average|Sum	**58**	**42.4**	**50.2**	**312**	**80**	**2.57**	**M**	**M**

WETS Table

WETS Station: SCOTIA, CA

Requested years: 1971 - 2023

Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	56.5	40.8	48.6	8.17	4.26	9.98	11	0.1
Feb	57.7	41.4	49.6	7.29	4.02	8.89	10	0.2
Mar	59.0	42.6	50.8	7.18	4.59	8.65	11	0.0
Apr	61.0	44.2	52.6	3.58	2.11	4.35	8	0.0
May	63.9	47.7	55.8	1.68	0.78	2.06	4	0.0
Jun	67.2	50.9	59.0	0.53	0.19	0.63	1	0.0
Jul	70.0	53.0	61.5	0.12	0.03	0.11	0	0.0
Aug	71.4	53.5	62.4	0.23	0.04	0.18	1	0.0
Sep	71.9	51.3	61.6	0.74	0.19	0.74	2	0.0
Oct	68.0	47.7	57.8	2.67	0.94	3.21	4	0.0
Nov	60.4	43.8	52.1	6.07	3.46	7.39	10	0.0
Dec	55.5	40.5	48.0	9.02	4.60	11.03	12	0.1
Annual:					38.76	53.61		
Average	63.5	46.4	55.0	-	-	-	-	-
Total	-	-	-	47.30			75	0.4

GROWING SEASON DATES

Years with missing data:	24 deg = 1	28 deg = 4	32 deg = 3
Years with no occurrence:	24 deg = 52	28 deg = 37	32 deg = 2
Data years used:	24 deg = 52	28 deg = 49	32 deg = 50
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	No occurrence	No occurrence	2/3 to 12/18: 318 days
70 percent *	No occurrence	No occurrence	1/21 to 12/31: 344 days

* Percent chance of the growing season occurring between the Beginning and Ending dates.

STATS TABLE - total precipitation (inches)

Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1926	7.18	10.17	T	1.53	1.17	0.00	0.00	0.21	0.51	5.67	18.65	7.95	53.04
1927		13.15	3.66	4.01	1.53	1.35	T	0.00	0.36	1.67	9.29	4.11	39.13
1928	4.31	3.81	7.43	6.77	0.11	0.56	T	0.03	0.27	0.69	6.42	8.00	38.40
1929	3.11	3.25	3.15	2.20	0.16	1.75	0.00	0.00	0.00	0.16	T	9.37	23.15
1930	6.77	6.54	3.54	3.39	1.09	0.22	T	0.00	0.73	0.90	3.92	2.99	30.09
1931	M2.86	M2.40	3.74	1.63	0.38	0.84	0.00	0.00	0.19	4.17	6.32	13.81	36.34
1932	9.09	1.51	2.74	4.17	2.49	0.06	0.13	0.01	0.00	0.53	7.48	6.88	35.09
1933	10.37	2.11	12.13	1.60	4.72	0.17	0.00	T	0.39	2.17	0.47	13.49	47.62
1934	4.75	5.04	2.98	1.27	3.36	1.20	T	0.03	0.	6.53	8.44	6.26	40.

									70				56
1935	10.13	4.00	7.12	5.38	0.16	0.13	0.01	T	0.69	3.81	2.74	7.98	42.15
1936	14.11	8.74	2.97	3.43	1.62	1.97	0.25	0.00	0.00	0.30	0.03	3.37	36.79
1937	7.33	11.17	7.98	4.30	0.57	1.24	0.00	0.09	0.06	4.28	15.15	8.52	60.69
1938	9.93	19.39	16.54	2.65	M0.41	0.00	0.00	0.00	1.10	3.53	6.14	6.96	66.65
1939	6.51	5.05	5.24	0.29	1.88	0.50	0.06	T	T	1.33	1.37	14.65	36.88
1940	8.58	14.60	6.38	0.67	1.95	0.65	0.00	0.00	1.05	3.57	2.30	17.11	56.86
1941	15.32	11.92	5.70	4.85	2.28	1.48	0.01	0.09	0.91	2.18	3.81	18.94	67.49
1942	5.94	9.39	2.32	6.33	5.41	0.27	T	0.00	0.00	1.00	10.29	8.81	49.76
1943	10.05	3.12	5.80	2.95	1.34	1.14	0.00	0.21	0.07	5.82	3.66	2.49	36.65
1944	6.16	5.42	3.25	4.06	1.88	1.44	T	0.00	0.27	3.11	9.01	8.94	43.54
1945	3.38	9.83	8.61	2.28	2.30	0.00	0.00	0.02	0.32	7.02	10.78	15.31	59.85
1946	5.06	6.69	4.44	0.75	0.79	0.07	0.19	T	0.33	1.96	7.69	1.73	29.70
1947	4.84	3.60	7.48	1.86	0.04	1.49	0.35	0.26	0.33	7.31	2.02	3.76	33.34
1948	7.30	4.72	6.77	10.19	3.39	1.49	0.03	0.15	0.88	2.11	2.92	9.65	49.60
1949	1.88	6.79	14.05	0.19	1.27	0.37	0.02	0.18	0.27	2.28	2.65	4.21	34.16
1950	13.01	6.73	7.35	2.03	1.63	0.80	0.01	0.01	0.34	14.55	4.83	7.31	58.60
1951	10.78	7.61	3.48	2.05	1.52	0.00	0.11	MT	0.23	4.82	8.93	12.91	52.44
1952	15.22	6.74	7.14	1.53	1.99	1.68	0.00	0.00	0.17	0.30	2.47	18.66	55.90
1953	13.23	2.98	8.70	3.35	5.61	1.63	0.01	0.27	0.03	3.00	10.24	M4.27	53.32
1954	16.08	7.54	6.96	3.44	0.06	1.80	0.01	1.74	0.60	1.78	6.26	10.15	56.42
1955	5.64	3.59	1.73	7.92	0.12	0.11	0.11	0.01	0.78	1.71	7.65	22.88	52.25
1956	14.43	11.37	1.82	0.72	1.70	0.98	0.04	0.00	0.00	5.76	0.44	5.73	42.99
1957	8.21	8.92	8.34	3.21	4.14	0.10	0.09	0.10	2.88	5.17	5.62	8.03	54.81
1958	11.48	21.54	8.23	6.39	1.12	1.83	0.11	0.04	M0.66	M0.43	3.79	3.77	59.39
1959	19.75	15.52	2.86	0.24	0.73	0.11	0.00	0.00	2.16	0.77	0.25	3.84	46.23
1960	6.20	10.78	6.83	2.62	M4.17	M0.00	0.00	T	0.00	1.27	8.53	7.55	47.95
1961	4.48	7.91	9.78	M2.42	M2.43	0.19	0.06	M0.19	0.40	1.73	6.60	3.60	39.79
1962	3.17	11.56	7.18	2.34	0.86	0.04	0.01	1.46	0.98	9.14	6.57	4.52	47.83
1963	2.73	7.54	9.26	12.38	2.45	0.25	0.08	0.02	0.36	5.66	8.70	2.65	52.08
1964	9.59	1.68	6.11	0.86	1.65	0.87	0.16	0.10	0.03	2.73	9.74	18.37	51.89
1965	9.50	1.78	1.20	8.77	0.18	0.28	0.00	0.15	0.00	0.39	11.25	6.79	40.29
1966	14.24	5.95	6.08	1.31	0.08	0.37	0.03	0.34	1.13	0.61	11.33	8.38	49.85
1967	10.84	1.13	12.42	4.65	1.08	0.19	T	0.00	0.85	2.75	4.96	6.48	45.35
1968	11.39	3.51	5.11	0.32	0.98	0.32	0.06	1.53	0.	3.23	5.64	17.	49.

									19			37	65
1969	16.19	13.52	2.08	3.78	0.73	0.43	0.01	0.00	0.70	1.40	3.40	14.45	56.69
1970	17.32	4.65	3.24	1.33	1.03	0.09	0.00	T	0.10	2.30	12.96	13.32	56.34
1971	8.60	3.34	7.76	3.30	0.71	0.66	0.07	0.34	1.83	1.19	10.29	11.21	49.30
1972	6.33	5.53	5.54	3.83	0.83	0.73	T	0.07	1.65	3.98	7.47		35.96
1973	10.80	7.91	6.94	1.11	0.36	0.06	0.00	T	2.41	4.49	21.53	11.21	66.82
1974	11.73	8.36	10.44	4.20	0.40	0.26	0.15	0.80	T	1.95	3.58	10.36	52.23
1975	5.86	10.77	14.78	3.61	0.72	0.34	0.08	0.60	T	8.60	4.67	5.08	55.11
1976	1.51	8.80	3.81	5.45	0.12	0.15	0.25	1.63	0.01	0.20	2.33	0.71	24.97
1977	2.53	3.43	4.90	0.67	2.89	0.16	T	0.08	3.34	2.40	6.60	9.58	36.58
1978	17.20	10.27	5.52	5.17	1.02	0.16	0.03	0.39	3.30	0.06	2.10	2.48	47.70
1979	6.31	8.69	4.89	4.93	2.87	0.05	0.11	0.25	0.39	8.68	8.14	7.35	52.66
1980	7.62	9.83	6.91	4.86	2.11	0.15	0.01	0.02	0.18	1.48	1.94	8.72	43.83
1981	12.90	4.90	5.50	1.26	1.54	0.34	0.01	0.03	1.41	5.44	13.81	10.58	57.72
1982	M6.16	6.55	11.46	8.74	0.05	0.48	0.20	0.15	0.81	6.78	8.16	15.51	65.05
1983	13.34	13.76	15.12	5.94	1.45	M0.46	0.41	3.15	0.37	1.03	16.01	17.31	88.35
1984	0.74	6.03	6.27	3.44	1.01	1.02	T	0.05	0.25	3.22	18.70	3.44	44.17
1985	0.55	3.61	6.18	0.46	0.65	0.41	0.04	0.24	1.13	3.51	2.96	4.59	24.33
1986	9.62	16.10	8.31	1.25	2.31	0.12	0.04	T	3.85	1.56	1.88	4.34	49.38
1987	6.20	5.81	12.04	0.75	1.11	0.28	0.05	0.03	0.00	1.25	4.80	18.02	50.34
1988	6.38	0.16	1.36	2.70	1.59	3.57	0.04	T	0.07	0.65	10.84	9.04	36.40
1989	4.95	2.70	10.26	2.10	1.86	0.43	0.03	0.72	1.09	5.10	1.76	0.11	31.11
1990	9.14	5.40	3.28	1.22	4.50	0.15	0.11	0.67	0.26	2.47	2.99	2.84	33.03
1991	1.40	3.66	13.33	1.79	3.29	0.35	0.97	0.05	T	2.08	2.33	3.99	33.24
1992	5.05	10.19	6.11	2.58	1.29	1.02	0.52	T	0.03	2.68	2.43	13.27	45.17
1993	10.81	7.30	3.40	5.76	5.06	1.59	0.05	0.26	T	1.36	2.10	8.66	46.35
1994	6.19	8.93	2.93	3.26	1.83	0.18	0.03	T	0.10	0.70	8.54	6.32	39.01
1995	26.41	1.65	16.07	6.67	1.69	1.25	0.17	0.05	0.30	0.39	1.10	14.82	70.57
1996	11.05	9.33	4.81	5.26	2.47	0.17	0.03	0.00	0.74	3.01	5.42	22.58	64.87
1997	12.90	3.02	2.38	2.27	0.59	1.17	0.01	0.45	0.79	2.33	9.39	5.83	41.13
1998	16.47	19.83	9.07	3.56	4.70	0.20	0.10	0.01	0.01	1.98	11.99	6.04	73.96
1999	4.72	13.30	10.16	2.71	1.08	0.06	T	0.22	T	2.32	9.17	4.59	48.33
2000	10.11	11.79	2.54	2.62	1.64	0.51	0.03	0.01	0.39	3.49	3.16	3.17	39.46
2001	7.14	6.65	5.02	3.12	0.23	0.68	0.08	0.08	0.11	1.44	9.41	12.45	46.41
2002	6.35	3.88	4.84	2.74	0.83	0.04	0.02	T	0.	0.02	5.02	27.	51.

									08			44	26
2003	5.13	4.23	7.38	13.95	1.27	0.10	0.01	0.13	0.30	0.20	4.98	12.90	50.58
2004	8.02	14.41	2.72	1.33	1.45	0.06	0.00	0.21	M0.25	6.46	1.85	9.92	46.68
2005	7.60	3.98	8.36	5.96	4.64	2.77	0.01	0.00	0.03	1.48	7.32	M18.79	60.94
2006	11.66	6.65	15.20	5.21	1.46	0.14	0.01	0.00	0.24	0.55	7.65	9.46	58.23
2007	1.70	12.31	2.91	3.61	0.82	0.46	0.67	0.02	0.31	3.62	1.89	10.72	39.04
2008	14.64	5.13	2.35	2.38	0.05	0.24	0.02	M0.00			6.38	5.39	36.58
2009	1.94	10.05	M5.88	1.31	2.76	0.06	0.02	0.01	0.45	4.33	4.59	4.58	35.98
2010	16.23	6.20	5.53	7.97	3.21	1.55	0.00	0.17	0.53	4.16	4.94	14.02	64.51
2011	M1.12	5.70	M15.08	3.89	M2.34	1.11	0.24	0.01	0.19	M2.82	4.29	1.07	37.86
2012	M6.47	4.20	13.39	M3.84	0.91	1.03	0.76	0.02	0.00	M2.24	M8.66	14.44	55.96
2013	3.02	1.47	M3.45	1.61	M0.87	M0.37	0.00	M0.50	3.78	M0.03	M0.88	0.64	16.62
2014	0.87	M4.19	7.25	M0.94	M0.81	M0.18	0.06	0.00	2.46	5.60	M3.99	11.67	38.02
2015	1.22	11.92	2.30	3.66	0.33	M0.02	0.19	M0.28	0.50	0.68	4.85	14.81	40.76
2016	15.17	3.45	M12.25	M2.74	1.36	0.07	0.06	T	0.06	M10.39	8.19	7.32	61.06
2017	M16.33	M16.84	M7.80	M6.84	M1.01	M0.46	0.11	M0.00	0.56	M0.98	6.58	1.21	58.72
2018	M7.38	M3.01	8.90	4.00	M0.90	0.27	0.00	0.02	0.47	1.24	5.70	6.26	38.15
2019	10.80	17.62	6.66	2.98	4.78	0.00	0.03	M0.19	1.00	0.76	2.04	11.06	57.92
2020	8.01	0.74	2.34	1.86	3.72	0.49	0.00	0.05	0.29	0.14	2.94	3.95	24.53
2021	9.50	5.08	4.88	0.66	0.22	0.30	0.08	0.00	0.76	4.57	3.39	9.25	38.69
2022	2.14	0.63	2.00	5.26	1.87	0.73	0.22	0.00	0.71	0.26	4.10	11.13	29.05
2023	16.94	7.04	11.83	2.57	M0.02								38.40

Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.

Data missing for all days in a month or year is blank.

Creation date: 2023-05-26

Appendix E

Site Photographs



Photo 1. Conditions within Wetland 1.



Photo 2. Conditions within the eastern portion of Wetland 2. Note the culvert between the west and east sides of Wetland 2.



Photo 3. View of the west side of Wetland 2. Note the area below the culvert extends an estimated 30 feet downwards, and this area appears to hold water during the wet season due to the high placement of the culvert in the soil column.



Photo 4. Conditions within the eastern extent of Wetland 2 (at Transect 2)



Photo 5. Surrounding topographical land conditions adjacent to Wetland 2, Transect 2.



Photo 6. The road between the eastern and western portions of Wetland 2. Upland conditions visible in the background.

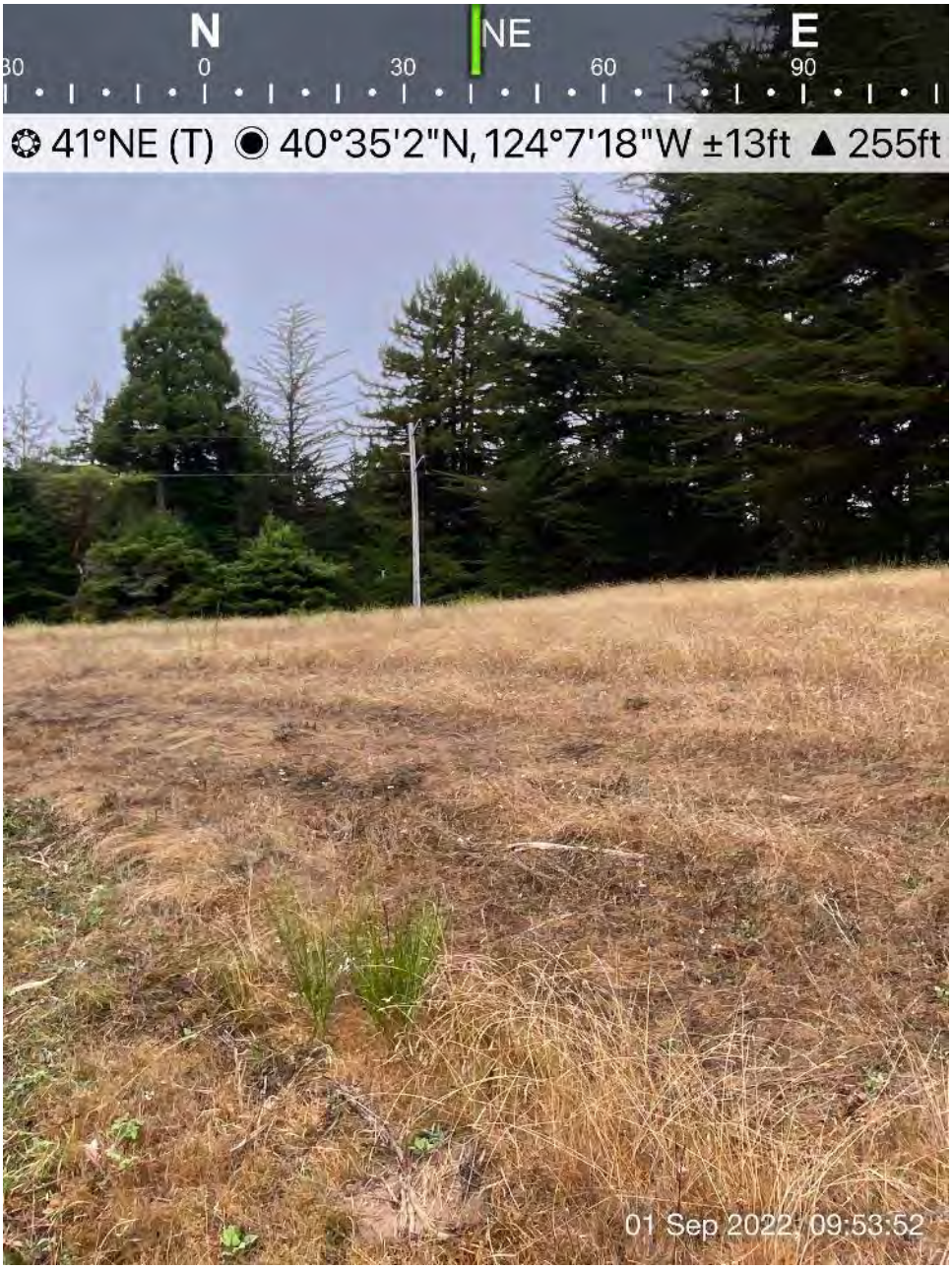


Photo 7. Upland conditions surrounding Wetlands 1 and 2.



Photo 8. Wetland conditions surrounding Wetland 1 on May 8, 2023. Hydrophytic vegetation, hydric soils and a high water table in foreground.



Photo 9. Wetland conditions surrounding Wetland 1 on May 8, 2023. Hydrophytic vegetation, hydric soils and a high water table in foreground.

Attachment C: Cultural Resources Survey

COVER PAGE

A. FORTUNA, WENDT HUMBOLDT COUNTY, CA, APN'S 202-093-060, 202-041-005 and 202-092-018, 30 ACRES

B. MAJOR SUBDIVISION

C. WENDT CONSTRUCTION

D. PROJECT DESCRIPTION

1. Historic Resource Evaluation of Significance
2. 30-acres total
3. Major Subdivision
4. Unfettered access to property, poor visibility <25-50%.

E. THIS REPORT EVALUATES A HISTORIC RESOURCE AND PROVIDES A DETERMINATION OF SIGNIFICANCE.

F. RESULTS

1. SIGNIFICANT RESOURCES IN AND OUT OF APE: NONE

2. RESOURCES AFFECTED OR NOT BY PROJECT: NONE

3. SPECIAL CIRCUMSTANCES: NONE

4. REQUESTED ACTION BY SPECIFIC LAW: NONE

5. CONTACT: NICK ANGELOFF 707-407-6205; nangeloff.ceo@gmail.com

A Historic Resource Evaluation of Significance of the Fortuna Wendt Property

Final Report

Fortuna, Humboldt County, California

Fortuna 7.5' USGS Quadrangle

Location: APN'S 202-093-060, 202-041-005 and 202-092-018

30-acres



Prepared by:

Nick Angeloff, MA
Nyah Hawkins, BS
Jessica Morris, BS
Archaeological Research and Supply Company
440 Wildwood Avenue
Rio Dell, CA 95562
With contributions by Jerry Rohde, MA

Prepared for:

Wendt Construction
610 9th Street
Fortuna, CA 95540

November 2025
CONFIDENTIAL

ACRONYMS AND ABBREVIATIONS

AB – (California State) Assembly Bill

APE – Area of Potential Effect

ARSC – Archaeological Research and Supply Company

cal – Calendar years before present

CEQA – California Environmental Quality Act

CRHR – California Register of Historic Resources

NAHC – Native American Heritage Commission

NEPA – National Environmental Policy Act

NPS – National Park Service

NTMP – Nonindustrial Timber Harvest Plan

NRHP – National Register of Historic Places

THPO – Tribal Historic Preservation Officer

TABLE OF CONTENTS

SECTION **Page**

1.0 SUMMARY OF FINDINGS **1**

1.1 Coordination/Background **1**

1.2 Survey Methods/Dates/Findings **1**

1.3 Affects to Significant Resources 3

1.4 Constraints 3

1.5 Recommendations 3

1.6 Field Notes, Photographs, and Report on File: 3

2.0 INTRODUCTION AND PROJECT DESCRIPTION **4**

2.1 Introduction 4

2.1.1 Contracting Institution, Permit Number 4

2.1.2 Undertaking, Laws, Previous Studies 4

2.1.3 Undertaking Description 7

2.2 Project Location and Description 8

3.0 SETTING **12**

3.1 Natural Setting 12

3.2 Cultural Setting 12

3.2.1 Ethnography **13**

3.2.2 History 15

3.2.3 Archaeology **15**

4.0 Research Design **17**

4.1 Theoretical Basis **17**

4.2 Previous Research **18**

4.3 Hypothesis **18**

4.4 Expectations **19**

5.0 Methods **19**

6.0 Report of Findings **19**

7.0 Discussion and Interpretation **20**

6.0 Management Considerations **20**

7.0 References **21**

Appendix A: Inadvertent Discovery Tear Sheet **24**

Appendix B: Tribal Communications/Coordination **25**

Appendix C: Confidential Records Search **29**

Appendix C: Confidential Site Record ..... Error! Bookmark not defined.

FIGURES

Figure **Page**
Figure 1 Project and Survey Area Map....2
Figure 2 1:24,000 Project Location Map USGS 7.5' Fortuna Quadrangle....9
Figure 3 1:100,000 Project Location Map USGS 7.5' FortunaQuadrangle....10
Figure 4 1:3,000,000 Project Location Map....11

TABLES

Table **Page**
Table 1 Previous Surveys....29
Table 2 Resources....29

1.0 SUMMARY OF FINDINGS

This report is the result of an historic resource evaluation of significance for a major subdivision of APN'S 202-093-060, 202-041-005 and 202-092-018. The project area includes approximately 30 acres located in Fortuna, California. There were no historic or prehistoric findings as a result of this investigation.

1.1 Coordination/Background

Background research by the Bear River Band of Rohnerville Rancheria and the Wiyot Tribe upon a request for information resulted in no comments regarding the subject property to known archaeological or cultural sites. The Bear River Tribal Historic Preservation Officer (THPO) and Wiyot THPO recommended proceeding with the survey given the sensitivity of the area. Bear River and Wiyot Tribe also requested a copy of the draft final report be submitted to them prior to submitting a final report to Humboldt County to afford opportunity for further comment.

1.2 Survey Methods/Dates/Findings

The survey of the entirety of the parcels was conducted by Field Director Jessica Morris, BS, Nyah Hawkins, BS, Nick Mavrolas, BS, Ian Carpenter, BS, Ani Botelho Klein, BA and Principal Investigator, Nick Angeloff, MA, in November 2025 (Figure 1). Survey coverage included all areas of existing disturbance on the parcels, including any slopes less than 35%. Visibility was approximately <25-50%. In areas where visibility was obscured by vegetation, systematic shovel probes and surface scrapes were employed at 15-meter intervals or as practical. Zero significant historic or prehistoric cultural resources were identified, one isolated piece of chert debitage was noted and recorded as a result of this survey.

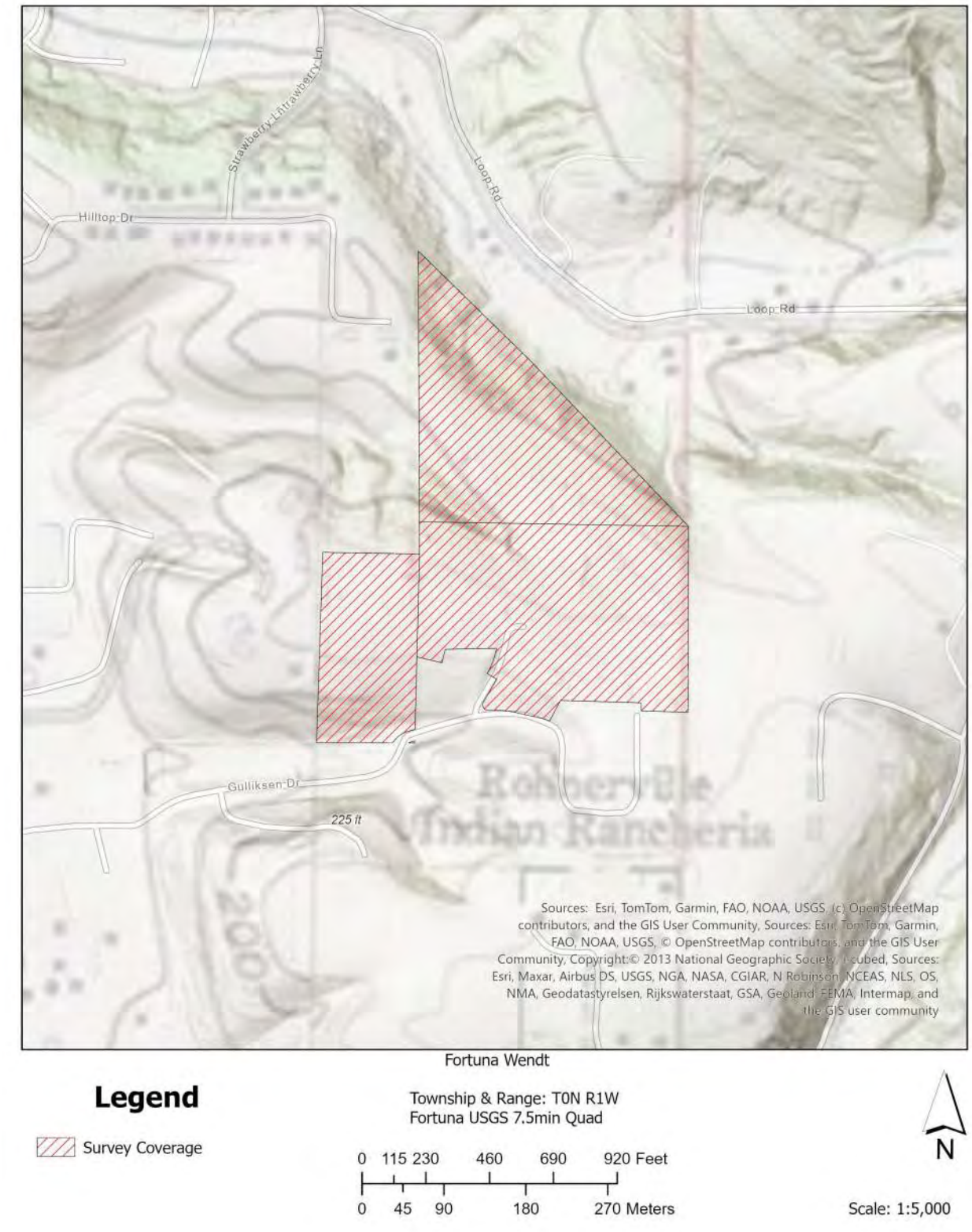


Figure 1 Project and Survey Area Map

1.3 Affects to Significant Resources
This project will not affect significant historic resources.

1.4 Constraints
There were no constraints regarding this project.

1.5 Recommendations
It is recommended that no further archaeological studies be conducted for this property. There is always a potential of finding buried archaeological deposits. If these or any other project conducted on these properties inadvertently expose cultural resources, all work shall halt within 100 feet of the find and a qualified archaeologist and tribal representative(s) should be contacted immediately to evaluate the find, as per the attached inadvertent discovery protocol (Appendix A).

1.6 Field Notes, Photographs, and Report on File:
Archaeological Research and Supply, 440 Wildwood Avenue, Rio Dell, CA 95562.

2.0 INTRODUCTION AND PROJECT DESCRIPTION

2.1 Introduction

2.1.1 Contracting Institution, Permit Number

The Archaeological Research and Supply Company survey of the Fortuna Wendt property was initiated by the property owner in June of 2019.

2.1.2 Undertaking, Laws, Previous Studies

Undertaking and Regulatory Requirements:

The undertaking of this project is a major lot subdivision and is guided by the California Code of Regulations (CCR), Public Resources Code and Humboldt County code as they pertain to historic resources. Historical resources as provided in Section 15064.5 of the State CEQA Guidelines include:

1) a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources;
2) a resource listed in a local register of historical resources; or
3) any object, building structure, site, area or place which the County Planning Division determines to be historically significant.

Generally, a resource is "historically significant" if it:

- is associated with events that have made a significant contribution to broad patterns of California's history and cultural heritage;
- is associated with the lives of persons important in our past;
- embodies distinctive characteristics of a type, period, region, or method of construction; or
- has yielded or may be likely to yield information important in prehistory or history.

Because the project has the potential to impact a historic resource, a preliminary assessment report (Historic Assessment Study) is required. This report consists of a visual examination of the property conducted by a professional historic resource consultant as reported herein including provision of findings and recommendations. This report also indicates that no further actions are needed to avoid or lessen impacts to any historical resources encountered.

Cultural resources include historic and prehistoric archaeological sites, historic architectural and engineering features and structures, and sites and resources of traditional cultural significance to Native Americans and other groups. The archaeological study was directed by Nick Angeloff, MA, who meets the Standards and Guidelines for Archaeology and Historic Preservation (National Park Service [NPS], 1983) for archaeology. This survey and report are consistent with CEQA compliance procedures.

Significant cultural resources (as defined for federal undertakings) include those prehistoric and historic sites, districts, buildings, structures, and objects, as well as properties with traditional religious or cultural importance to Native Americans or other groups, which are listed, or are eligible for listing, on the National Register of Historic Places (NRHP), according to the criteria outlined in 36 C.F.R. Section 60.4. Cultural resources that do not meet the NRHP criteria but may qualify as uniquely characteristic of an area are considered under the National Environmental Policy Act (NEPA), and resources that may qualify for the California Register of Historic Resources (CRHR) are considered under CEQA. Any substantial adverse change in the significance of a historical resource listed in or eligible to be listed in the CRHR is considered a significant effect on the environment. Impacts to cultural resources would result from activities that affect characteristics that qualify a property for the NRHP or substantially adversely change the significance of a resource that is qualified to be listed in the CRHR. Therefore, impacts to cultural

resources from the proposed project will be considered significant if the project:

- Physically destroys or damages all or part of a property
- Changes the character of the use of the property or physical features within the setting of the property which contribute to its historic significance
- Introduces visual, atmospheric, or audible elements that diminish the integrity of the significant historic features of a property

With the exception of isolated artifacts or features that appear to lack integrity or potentially important information, all new cultural resource findings would be treated as though they are eligible for the NRHP/CRHR. If possible, all recorded resources should be avoided completely. However, if avoidance is not possible through project redesign, the significance of the affected resources will be evaluated formally using NRHP/CRHP and/or CEQA criteria and guidelines. If a resource is determined to be significant, avoidance, a data recovery program, or some other appropriate mitigative effort will be undertaken in consultation with the local tribes and the County of Humboldt.

The undertaking of this project is to remove three redwood water tanks and associated decking in Humboldt County in satisfaction of the requirements under Humboldt Counties' land use ordinances as regulated per the California Environmental Quality Act (CEQA). CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Cal. Pub. Res. Code Section 21084.1) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Cal. Pub. Res. Code Section 5020.1). Public Resources Code Section 21084.1 stipulates that any resource listed in, or eligible for listing in the California Register of Historical Resources (CRHR) is presumed to be historically or culturally significant. Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g of the Public Resources Code) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not. A resource that is not listed in or determined to be eligible for listing in the CRHR, is not included in a local register of historic resources, or is not deemed significant in a historical resource survey may nonetheless be historically significant (Section 21084.1; see Section 21098.1). Cal. Pub. Res. Code Section 21098.1 stipulates:

- A project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.

For the purposes of this section, a historical resource is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources. Historical resources included in a local register of historical resources, as defined in subsection (k) of Section 5020.1 [see below], are presumed to be historically or culturally significant for purposes of this section, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant. The fact that a resource is not listed in, or determined to be eligible for listing in, the CRHR; not included in a local register or historical resources; or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1 [see below] shall not preclude a lead agency from determining whether the resource may be a historical resource for purposes of this section. Cal. Pub. Res. Code Sections 5020.1 and 5024.1 provide the following definitions:

- Historic district means a definable unified geographic entity that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.
- Historical landmark means any historical resource that is registered as a state historical landmark pursuant to Section 5021.

- Historical resource includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic agricultural, educational, social, political, military, or cultural annals of California.
- Local register of historic resources means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.
- Substantial adverse change means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired. CEQA requires a lead agency to identify and examine environmental effects that may result in significant adverse effects.

Where a project may adversely affect a unique archaeological resource, Section 21083.2 requires the lead agency to treat that effect as a significant environmental effect and prepare an environmental impact report. When an archaeological resource is listed in or is eligible to be listed in the CRHR, Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources. Cal. Pub. Res. Code Section 21083.2 (g) defines unique archaeological resource to be:

- 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 there is a demonstrable public interest in that information,
(2) has a special and particular quality such as being the oldest of its type or the best available example of its type, or
(3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

Other state-level requirements for cultural resources management appear in the Cal. Pub. Res. Code Sections Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency.

Local Laws and Regulations regarding cultural and historic preservation exist at the county level and are linked with those of cities and with state and federal preservation programs. Ground-disturbing activities have the potential to damage or destroy historic or prehistoric archaeological resources that may be present on or below the ground surface. Damage to or destruction of these resources, as a result of development, should be minimized.

The Humboldt County General Plan establishes the following policies for the protection of cultural resources, consistent with the federal and state regulatory framework. The identified goal is to provide for the protection and enhancement of cultural resources for the historic, scientific, educational, and social contributions they render to the present generation and to generations that follow by enforcing the following policies:

1. Cultural resources (including but not limited to archaeological, paleontological and architectural sites, grave sites and cemeteries) shall be identified where feasible, assessed as to significance, and if found to be significant, protected from loss or destruction.
2. Concerned citizens, historical organizations and applicable agencies shall be consulted

during project review for the identification and protection of cultural resources.
3. Projects located in areas found to have cultural resources shall be conditioned and designed to avoid loss or degradation of these resources.
4. Expert opinions and field reconnaissance at the applicant's expense may be required during environmental assessment to determine the presence, extent, and condition of cultural resources and the likely impact upon such resources.
5. Archaeological and paleontological resources shall not be knowingly destroyed or lost through a discretionary action unless:
    - The site or resource has been found to be of insignificant value by relevant experts and representatives of the cultural resources community, or;
    - There is an overriding public benefit from the project, and compensating mitigation to offset the loss is made part of the project.
6. Mitigation measures shall be required where new development would adversely impact archaeological or paleontological resources.

Previous Studies:
The recommendation for archaeological study for this specific project was the result of the research that took place at the Northwest Information Center at Sonoma State University and the Bear River Band of Rohnerville Rancheria, subsequently assessed by the Humboldt County Planning Department and resulting in the requirement to conduct an archaeological inventory of the project areas. The record search for the project was conducted by Northwest Information Center (NWIC) staff for Nick Angeloff, MA in June 2019. The record search at the NWIC revealed four (4) previous surveys and one (1) previously recorded archaeological sites within ½ mile of the subject property (Confidential Appendix B).

Additional background research conducted by Mr. Angeloff and Mr. Rohde, MA, revealed nothing further about the properties.

2.1.3 Undertaking Description

Project Description
The project consists of a major lot subdivision of APN'S 202-093-060, 202-041-005 and 202-092-018.

Potential Disturbances
Extent and nature of existing project includes the parcels subdivision, development and associated infrastructure.

Schedule of Undertaking
The project will be implemented upon issuance of county permits.

Survey Area
The survey was conducted by Archaeological Technician Jessica Morris, under the direction of Principal Investigator, Nick Angeloff, MA, in July 2019. Survey coverage included all areas of existing disturbance on the parcels, including 600-foot buffers and any slopes less than 35%. Visibility was approximately <25-50%. In areas where visibility was obscured by vegetation, systematic shovel probes and surface scrapes were employed at 15-meter intervals or as practical. Zero archaeological finding were identified.

Personnel Description and Duties
Nick Angeloff, MA, Principle Investigator, coordinated or conducted all background research, survey, and reporting. Jerry Rohde, MA produced the ethnographic and historic background.

The level of survey, documentation, and the qualifications of personnel meet or exceed the requirements of local, state and federal law, including the California Environmental Quality Act (CEQA), the National Historic Preservation Act (NHPA) of 1966 as amended, and the National Environmental Protection Act (NEPA), and the California Code of Regulations (CCR), as applicable. The current survey revealed no sites within the project area (Appendix C).

2.2 Project Location and Description

The project proponent owns the 30-acre project area APN'S 202-093-060, 202-041-005 and 202-092-018 in Fortuna, Humboldt County, California, identified as the Fortuna Wendt project on the 7.5' USGS, Fortuna 1:24,000 and 1:100,000 Quadrangle maps (Figures 2 and 3). The project area is flat with native grass covering the entirety of the parcels.

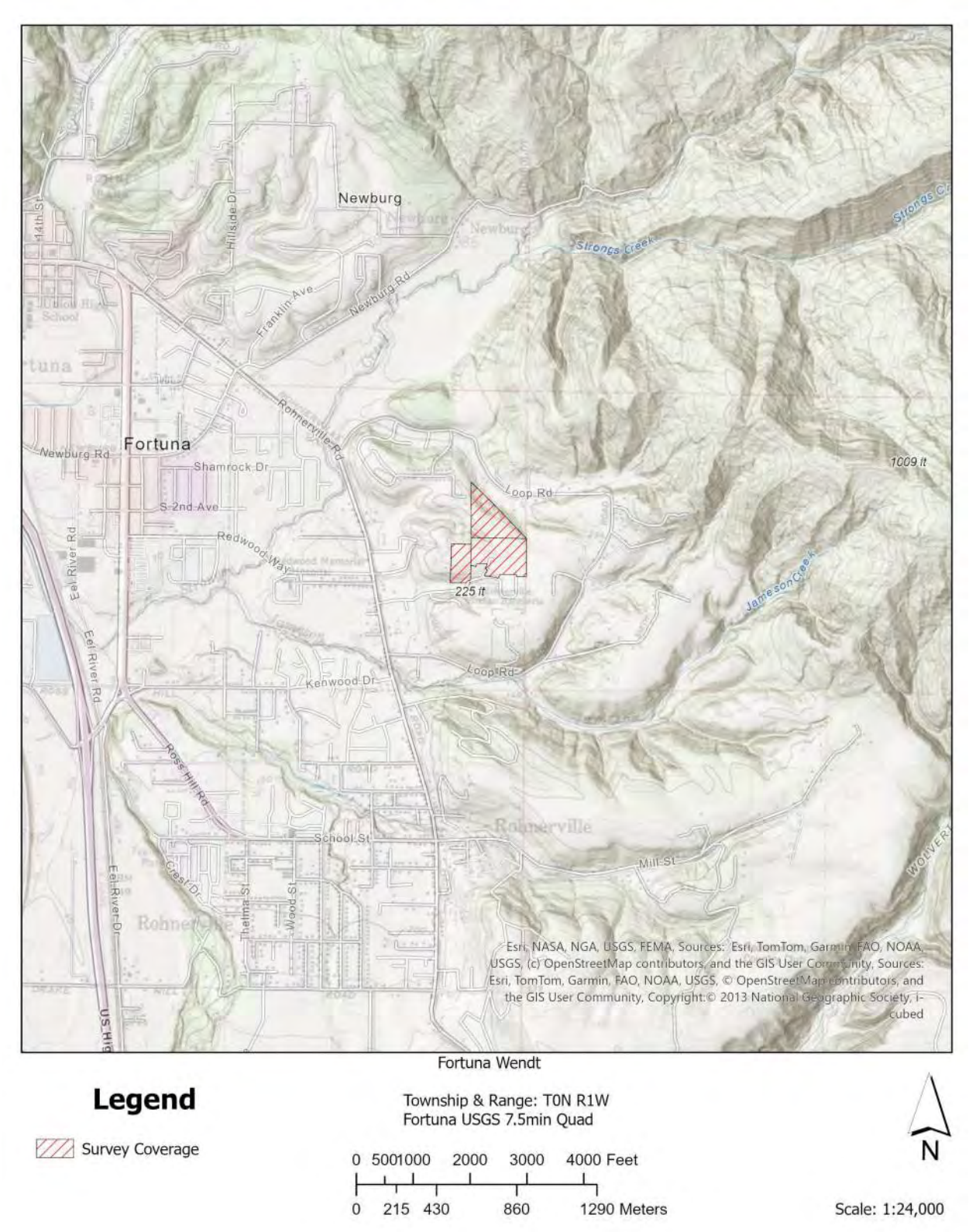


Figure 2 1:24,000 Project Location Map USGS 7.5' Fortuna Quadrangle

The project is located in Humboldt County, California in the Fortuna area, as identified on the below 1:100,000 scale map (Figure 3).

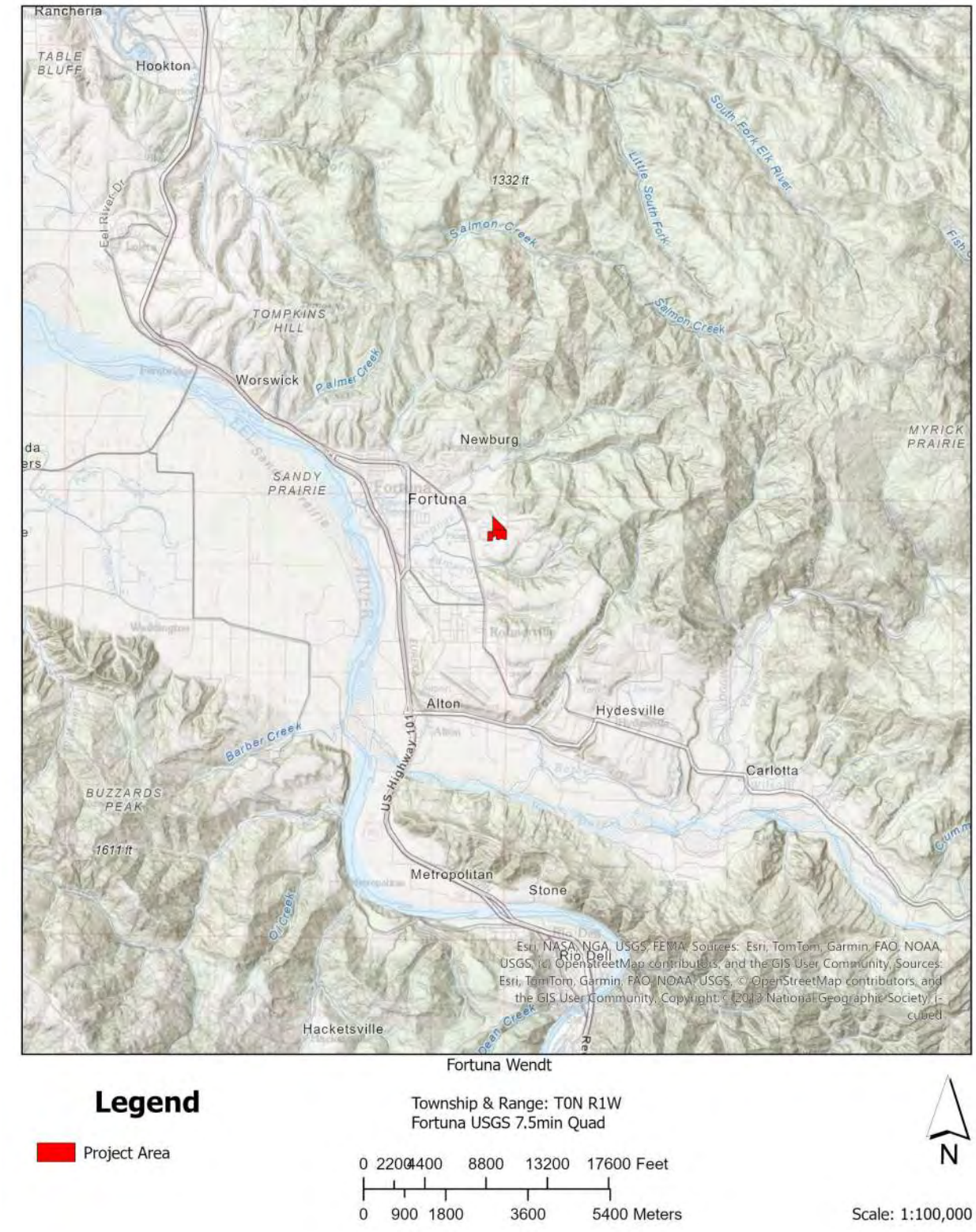


Figure 3 1:100,000 Project Location Map USGS 7.5' Fortuna Quadrangle

In order to provide a broader geographic understanding of the project location, below is a 1:3,000,000 scale map (Figure 4).

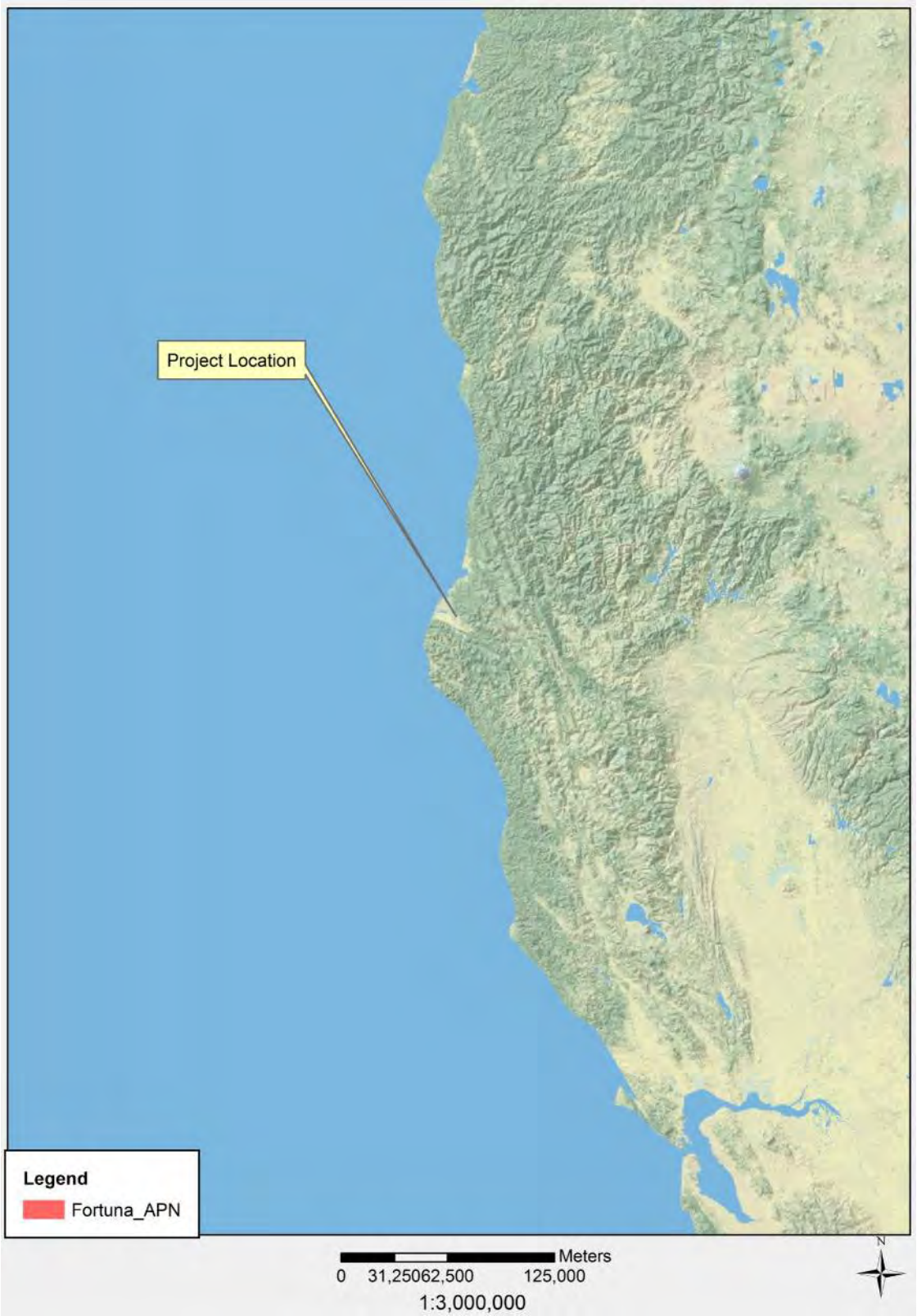


Figure 4 1:3,000,000 Project Location Map

3.0 SETTING

3.1 Natural Setting

Geography, Geology, Climate, and Hydrology
The regional geology is within the Franciscan range and incorporates a wide variety of rock types with culturally important types including Cryptocrystalline Silicate (Chert), Soapstone and sandstones use for lithic tools. Regional soils are typically acidic clayey loams due to the presence of dense forests throughout time. Upland areas generally harbor a more balanced pH clayey loam soil, and coastal areas are typically a sandy loam that is slightly basic. The project area is within a typical forest-sol environment with acidic soils.

The regional climate is Mediterranean in nature with warm summers and cool winters. There is variation with the regional micro-climates with coastal areas seeing much more moderate temperatures and precipitation during both winter and summer. Inland areas see snow and high summer temperatures can reach into the 110-degree Fahrenheit range. The climate in Fortuna is characteristic of coastal microclimates with measurable precipitation 79 days per year and totaling 54 inches, with no snow. On average, there are 177 sunny days per year, excluding the fog. The July high is around 63 degrees Fahrenheit and the January low is typically around 41.

The hydrology of the area is a result of the high annual precipitation amounts, from 30 inches per year to well over 100 inches. The region is dominated by coastal lagoons, large rivers with significant numbers of tributaries, all of which harbor Salmon runs today and significantly higher numbers and frequency of these runs in early historic and late prehistoric periods. The project area is located east of Fortuna with several feeder creeks to the north and south.

Flora and Fauna
The property is generally a forest environment, and prehistorically was most likely dominated by old growth coniferous forest.

The project location is populated by native native plant species, predominantly Coast Redwood (*Sequoia Sempervirons)* and Douglas Fir (*Pseudotsuga menziesii*), common pines in the extended surrounding area include lodgepole pine (Pinus contorta), bishop pine (*Pinus muricata*), Monterey pine (*Pinus radiata*), and knobcone pine (*Pinus attenuata*). Other vegetation include Bracken Fern (*Pteridium*), Salal (*Gaultheria shallon*), Blue Blossom (*Ceanothus thyrsiflorus*), Trillium (*Trillium grandiflorum*), and Red Alder (*Alnus rubrus*),. Examples of other species that are present, or may have been present prior to EuroAmerican settlement with cultural significance include: Clover (*Trifolium microdon*), Deer Fern (*Blechnum spicant*), Sword Fern (*Polystichum munitum*), Salmonberry (*Scutellaria* spp), Thimbleberry (*Rubus parviflorus*), Tobacco (*Nicotiana quadrivalvis*), Willow (*Salix* spp), Stinging nettle (*Urtica dioica* ssp. *gracilis*), and California blackberry (*Rubus ursinus*).

Within the Fortuna area there are numerous faunal species present with economic and cultural importance, most significantly Salmon (*Oncorhynchus kisutch* and *Oncorhynchus tshawytscha*) and Steelhead (*Oncorhynchus mykiss*), Blacktail Deer (*Odocoileus hemionus*), Roosevelt Elk (*Cervus canadensis roosevelti*), Bobcat (*Lynx rufus*), Mountain Lion (*Puma concolor*), Rabbit (*Oryctolagus cuniculus*), and various other minor and less common species.

Current Land Use and Condition
The property is currently utilized for various small land-owning activities occurring on a day to day basis.

3.2 Cultural Setting

The following history of the property is specific to this land holding and is intended to be a project specific history, not a general overview of the Fortuna region. The scope of this contract includes an evaluation of a specific structure and while a surface survey of the immediate area was conducted, it was intended to provide context for the age of the structure and the intensity of its use and modifications. No effort was made, to identify pre-historic resources and no such survey was intended. In this light, a point of clarification must be made as an historic era company utilized the same name as the contemporary company for which this report has been produced, the California Redwood Company. In the following section, 3.2.1 History, reference to the California Redwood Company pertains to the historic company, in the balance of this document the name or acronym refers to the contemporary company.

3.2.1 Ethnography

The project area is within the traditional territory of the Wiyot tribe. The closest village site is at the mouth of Strong's Creek, approximately two miles to the northwest (Loud 1918:Map 1). No known Wiyot use was made of the project area.

There were three tribal groups, all speaking the Wiyot (Sulatelak) language. The Patawats inhabited the lower Mad River, from its mouth to just below Blue Lake; the McKinleyville area north to Little River, and part of Mad River Slough. The Wiki held the Humboldt Bay and its surroundings. The Wiyot group occupied the lower Eel River, from its mouth up to just below the confluence with the Van Duzen River, and south across the Ferndal bottom and up to Bear River Ridge (Rohde 2014:5).

South of the Wiyot tribe was the territory of the Bear River tribe, which occupied all of its namesake drainage and also spilled over southwestward to the vicinity of the Cape Mendocino lighthouse and northeast to the Eel and Van Duzen rivers. Knowledge of the Wiyot-Bear River boundary is inexact, but in general terms it ran from the coast up onto Bear River Ridge, dropping from there to reach the Eel just north of the mouth of the Van Duzen. After crossing the Eel, the boundary continued northeast to a point north of Hydesville, where the Bear River tribe's territory met that of the Nongatls and ended (Rohde 2014:9).

Many of the tribes of southern and eastern Humboldt County, including the Bear River people, spoke one of the California Athabascan languages. The Bear River Indians' name for themselves was Nekanni, but this term long ago drifted into obscurity and now is almost never used. In addition, several ethnographers have conflated the Bear Rivers with their neighbors to the south, the Mattoles, and referred to the combined tribes only by the latter's name (Rohde 2014:9).

Most of the Bear River tribe lived in the lower part of the Bear River canyon, where they had at least eight villages, which were "usually situated on the north bank of the river with a hinterland of narrow valley." Like the Wiyot village of Tolotpilik on the Eel, the Bear Rivers' largest community, Tcodallammi, was near their river's mouth (Rohde 2014:9).

There is little historical information pertaining to the Bear River tribe. One report comes from 1858, when a group of whites traveled along the coast and "east of Cape Mendocino" encountered what they called the "whistling Indians." The whites came to a village, from which the women fled. The men immediately began whistling, and nothing the whites did or said distracted the Indians from this activity. When the leader of the whites left, the Indians

> . . . got up from their sitting posture, and filing in single file, whistled me back to camp. . . . During the night they posted themselves in the brush and continued the serenade; and when we broke camp in the

> morning , they accompanied us some 4 miles, giving us specimens of their skill in the art of whistling (Rohde 2014:9).

In 1907 Goddard found one member of the tribe still living on Bear River and indicated that the tribe had been "nearly exterminated in conflicts with the white settlers about Humboldt Bay." The Indian who remained in the valley, Peter, was "living by himself in a rude cabin." Peter told Goddard that he had been at Hoopa, where he was "kicked by the [Indian] agent" and where his wife died by hanging. When Nomland came to Bear River in 1938, there was nothing left to see, since "all village sites have been plowed up by white settlers" (Rohde 2014:9).

By then, some Bear River Indians were living at the Rohnerville Rancheria, which had been established in 1910. The rancheria has ancestral links to at least eight tribes; it eventually moved to its current site, on the hillside above Fernbridge, and is now known as the Bear River Band of the Rohnerville Rancheria (Rohde 2014:9).

According to Goddard, there was a village of unknown name "at the mouth of the Van Duzen creek which was allied to Bear River both in its dialect and politically." From there, it appears that the Bear River tribe's territory extended up the Van Duzen to Hydesville and up the Eel probably as far as Scotia. Both the Bear River and the Wiyot languages were reportedly spoken throughout most of these stretches of river. It is unclear how this "dual language area" developed. Perhaps it was friendly proximity, but at least two sources stated that the tribes were hostile to one another. Nora Coonskin, a woman of Wiyot-Bear River parentage, indicated that many people were killed in conflicts between the two tribes and that the Bear Rivers "always had trouble with them [the Wiyots]." Dandy Bill, a Wiyot, was the probable source of Loud's claim that the Wiyots "seem never to have entertained friendly relations" with the Bear River tribe. These statements suggest that the cultural overlapping and tribal intermingling in the areas south and east of the mouth of the Van Duzen came about through conquest rather than by inclination. Such a situation was documented by Loud as occurring near Blue Lake in the late 1840s when Whilkuts (another California Athabascan tribe) swooped down from the hills and attacked, defeated, and then claimed a Wiyot village. Something similar may have happened to the south, with one or more California Athabascan groups forcing their way into Wiyot territory: the Bear River tribe coming over the mountains to the Alton-Rio Dell-Hydesville area and possibly another Athabascan group coming down the Eel to Scotia (Rohde 2014:9-10).

Upstream from the mouth of the Van Duzen was what one Bear River Indian called the "Hydesville Indian village," which was named Inako. The exact location of this village is not known, but it may have been near the boundary, at Yager Creek, between the Bear River tribe and a Nongatl group called the Tcelindun, which occupied the lower Yager drainage. Nothing further is known about Inako (Rohde 2014:9-10).

Ethnographers have used the term Nongatl as if it described a single tribe, one whose territory included the Larabee Creek drainage, part of the Mad River drainage, and much of the Van Duzen River drainage. In actuality there were numerous tribal groups in these areas, and unraveling their exact names and locations requires a detailed examination of unpublished information. The ethnographer Pliny E. Goddard worked with a knowledgeable Nongatl named Van Duzen Pete to determine the names and locations of the various Nongatl groups. Pete indicated that the area at the mouth of Yager Creek was the homeland for the group called the Tcelindun but provided no additional information (Rohde forthcoming).
Given the above information it is most likely that Yager Creek formed the boundary between the Nongatl and Nekanni tribes, with Wiyot land a short distance to the north. If so, the project area was within the

domain of an unnamed group of the Nekanni tribe. If not, the Nongatl tribal group called the Tcelindun may have controlled both sides of Yager Creek, in which case the project area belonged to them. The third possibility is that the valley of lower Yager Creek was an intertribal area where members of the Nekanni and Nongatl mingled with no fixed claims to the territory.

3.2.2 History

The Surveyor General's office had mapped the area by 1857. Nothing is noted within the project area, but "Lieurence's field" is shown directly to the south, "Borden's house and field" to the west, and "Jamison's field" to the north (Surveyor General 1876). The county maps show no specific ownership of the project area until 1921, when C. E. Perrott is shown as the owner (Belcher 1921:1). In 1949 the owners are O. and E. Prudek (Metsker 1949:17). Charles E. Perrott was part of a large family that came to Rohnerville in 1855 (Irvine 1915:1022-1023).

3.2.3 Archaeology

Pleistocene-Holocene Transition—The Post Pattern (11,500 to 8000 cal BP)
The earliest evidence for human occupation of northwestern California is labeled the Post Pattern. This pattern is characterized by fluted projectile points and flaked stone crescents. There has been no evidence for this occupation in the project vicinity or anywhere in Humboldt County, California. An isolated fluted point was found on the coast in Mendocino County (Simons et al. 1985). The best evidence for the Post Pattern comes from the Borax Lake site in Lake County. Even though no intact cultural strata could be identified at the site, the presence of fluted points, stone crescents, and very large obsidian hydration rim measurements all indicate a Terminal Pleistocene or very Early Holocene occupation.

Early Holocene—Borax Late Pattern (8000 to 5000 cal BP)
Contemporary archaeological theory posits that the original inhabitants of Humboldt County are represented by Borax Lake Pattern artifacts including the Borax Lake Widestem projectile point, handstones, milling slabs, small, serrated bifaces, and cobble spalls. The first Archaic or Early period sites discovered in Humboldt County are CA-HUM-245 and 246 located on Pine Ridge (Flynn and Roop 1975, Jackson 1977). These sites acted to tie this area into the broader Borax Lake Pattern that was known throughout all other areas of northern California during this period. Hildebrandt and Hayes documented artifact assemblages associated with this pattern at sites along Pilot Ridge, to the south of the Pine Ridge area (West? Hildebrandt and Hayes?1984). The significance of early to mid-Holocene archaeological assemblages in northern California lies in their antiquity and in the physical environment during this period. These assemblages reflect life-ways of 4000-8000 years ago during a warmer and drier climate which caused an expansion of Oak woodlands into higher elevations (West 1984). It has been proposed that this expansion of optimal resource patches resulted in distinct, highly mobile, upland focused subsistence systems represented by unique tool assemblages (West 1984, Hildebrandt and Hayes 1984). The Borax Lake Pattern within far northern California also includes locations in lowland riverine environments as identified by Sundahl and Henn at CA-TRI-1008 on the Trinity River and again in Shasta County at CA-SHA-475 along a tributary of the Pitt River (1993). Although hypotheses regarding environmental change and subsequent highly mobile montane adaptations have been advanced, they have not been tested on a broad scale within the North Coast Range (Fredrickson 1974, Clewett and Sundahl 1983, Hildebrandt and Hayes 1984, West 1984, White 2000) until Angeloff (2011) reported on his analysis of existing collections from Pilot Ridge, Squaw Creek and Cox Bar. Angeloff (2011) identifies distinct tool assemblages along Pilot Ridge at sites CA-HUM-573, HUM-577, and HUM-367, while lower elevation sites contained relatively broad and homogeneous stone tool assemblages. This analysis suggests a relatively sedentary lifestyle in the upland areas associated with specialized use areas and stable village areas potentially relying on an expanded elk and deer population tethered to sparse water sources.

Middle Holocene Gap—Mendocino Pattern (5000 cal BP to cal AD 500)
During the middle period, upland areas of Humboldt County seem to have been virtually abandoned, likely due to a change in environment from a warm and dry middle Holocene to a cooler and wetter late Holocene that reduced the volume of subsistence resources in upland areas. According to G. James West's (1984) palynological analysis of data acquired on Pilot Ridge in Humboldt County, coniferous forests began to encroach on the upland areas during this period, effectively reducing the number of subsistence resources available to human beings. The archaeological record pertaining to upland areas reveals a relatively low artifact count attributable to the middle period (Hildebrandt and Hayes 1984) but this is likely a direct result of the relative dearth of synthesized archaeological information in northwestern California.

Hildebrandt (2007) notes that the transition from the Borax Lake Pattern to the later Mendocino Pattern (3000 cal BP to cal AD 500) through the Middle Holocene is not well understood. There is almost no visible record dating between 5000 and 3000 cal BP, although it is unclear whether this represents a reduction in human population at the time, or simply a lack of well-dated archaeological remains from the region corresponding with this time period.

Use of these upland areas may have been task-specific during the middle period (Cassidy 1992) and therefore concentrated in discrete upland areas but visited just as intensively as the earlier inhabitants who sought a broader array or a more dispersed resource base within the more productive altithermal upland environment. Some coastal sites do provide evidence of occupation during this period, indicating to Hildebrandt (2007) that we may not be recognizing materials from this period.

The Mendocino Pattern first appears around 3000 cal BP and continues in the North Coast Ranges through the Late Holocene until cal AD 500. Sites associated with this period in the region are specialized hunting camps found on ridgetops at higher elevation and generally include concave-base, side-notched, and corner-notched dart points; handstones and milling slabs; flake tools; and occasionally mortars and pestles. Hildebrandt and Hayes (1984) argue that these camps reflect logistical forays from more permanent villages along the major river valleys, and that the subsistence pattern of fish and acorn storage supported a more sedentary lifeway. Recent excavations at Jedediah Smith State Park in Del Norte County offer evidence of riverine occupation during the Mendocino Pattern time period (Tushingham 2009). In contrast to the coastal and uplands record, it appears that people were living intensively on the rivers of northern California during this period.

Additionally, artifacts representing the middle period have been associated with distinct mobility patterns that may have influenced the use of upland areas. Specifically, the McKee Uniface has been used as a marker of middle period land use. This artifact is highly distinct in its morphology, being a formed unifacial tool metrically discrete from other unifacial artifacts. Cassidy (1992) studied the manufacture, use, and re-use of these artifacts at the Doe Peak site in northeastern California.

The Doe Peak site was dated using obsidian hydration data to between 2,500 and 3,300 years before present, which roughly concurs with Hildebrandt and Hayes (1984) determination of this artifact type representing the period between 1,100 and 2,800 years before present in the North Coast Ranges. Hildebrandt suggests further chronometric analysis of this artifact type may be in order. The Center for Indian Community Development-Cultural Resource Facility has recently conducted archaeological excavations along Tip-Top Ridge. Obsidian hydration analysis of a McKee Uniface from Tip-Top Ridge returned a relative date of 2,100 years before present (Burns 2007). In all cases, a relative reconstruction of the typological sequence places this artifact type solidly between 2000 and 3500 years before present.

Cassidy accurately distinguishes the flint knapping technique used in the manufacture of this artifact type as blade-core reduction, as evidenced by the preponderance of prepared blade cores at the site (1992).

Using extensive evidence, Cassidy concludes that the formed artifacts and debitage found at the Doe Peak site represent a specialized tool manufactured in a distinct manner (1992). She further ventures that the combination of these factors suggests a specialized technological organization reflecting residentially mobile subsistence strategies as seen in the Inuit by Binford.

The evidence strongly suggests that the Doe Peak site was used by people who were residentially mobile and definitely using a distinct technological organization and stone tool reduction technique. What is clear from Cassidy's (1992) research is that the McKee Uniface was used as a hafted tool, most likely a projectile point as evidenced through reworking in the haft and breakage patterns reminiscent of projectile points. Additionally, mobility patterns as argued by Cassidy (1992) from the evidence at the Doe Peak site does suggest a relatively mobile settlement subsistence system was used by the manufacturers of this artifact type. While this period of time may reflect a decrease in use of the upland areas of northwest California, it more likely represents a highly specialized use of the upland areas. Archaeological expressions of middle period sites should leave evidence of highly specialized maintainable and durable tools that would leave less of a deposit in the archaeological record relative to earlier societies.

Late Period (Post cal AD 500)

The archaeological theory pertaining to this area focuses on Late Period riverine and coastal based subsistence patterns. The late period was a time of increased populations and constricted resource bases; this led to intensive use and management of riverine and coastal resources as well as an increase in use and management of upland areas. During annual salmon runs people lived along the rivers; in the summer, people would break down into smaller groups, moving into smaller residential bases in coastal or upland areas (Whittaker 2006). Hildebrandt (2007) notes that the details of Late Period occupation are not as clear for inland riverine areas as for the coast, due to the lack of excavated sites. Golla (2007) suggests that the Late Period archaeological signature likely relates to the migration of Algic and Athabaskan groups into the area between cal AD 100 and cal AD 800. These migrations likely pushed the Yuki out of portions of their more northern territory into something similar to the boundaries noted at European contact. This period also fits into the estimated time depth for the differentiation of southern Athabaskan dialects. Artifact assemblages reflecting this period reflect a substantially more sedentary residential base with artifacts such as toggle harpoons, net spacers, net weights, zoomorphs, calendar stones, Hopper mortars and pestles, large bifaces, phallic charmstones, Olivella beads, Tuluwat Barbed projectile points, adze heads, stylized pestles and mortars, and abalone pendants, among a variety of other artifacts. Temporal indicators for late period archaeological deposits are arrow sized projectile points, and bowl and hopper mortars and pestles among a wide variety of specialized tools found at task specific sites.

4.0 Research Design

This project is one of multiple surveys that will be accomplished through the ARSC. While a single small survey provides little data that can be associated with a research design, the aggregation of these surveys has the potential to provide rough grained data that can answer unresolved questions associated with the prehistory of Humboldt County. Research objectives outlined for the Humboldt County Rural Development Survey archaeological project are predicated on the nature of the sites and constraints of the limited investigative program. These aims are focused mainly on reconstructing subsistence-settlement organization within the county, examining how environmental parameters and local topography affected prehistoric resource use and attendant technologies. Issues of pivotal concern relate to levels of residential mobility, and variation in flaked and ground stone artifacts in distinct geographic settings. Chert sources occur locally and have no doubt had a strong influence on manufacturing strategies and tool use profiles. Outlined below are several key research topics to be addressed by this research.

4.1 Theoretical Basis

The theoretical basis for this research is well described in the archaeological background section of this

report. Effectively, the understanding of non-coastal Humboldt County prehistory is limited to studies on the South Fork Mountain and Pilot Ridge with smaller research efforts more recently conducted by the Archaeological Research Center at California State University, Sacramento in collaboration with the Bear River Band of Rohnerville Rancheria.

This attenuated research plan outlines basic goals of the Humboldt County Rural Development Survey archaeological project, the general intent of proposed field investigations, and the sorts of questions the subsequent analytical program will address. With a focus on issues related to prehistoric subsistence-settlement strategies within the project area, the work should offer a baseline for understanding the history of local land-use and an avenue toward broader regional integration or synthesis. Combined with critical information on the ethnographic/ethnohistoric occupation of project environs, being assembled by another researcher on the team, the work proposed herein will establish the extent to which land-use patterns changed during the Holocene and whether such shifts appear related to natural or social processes.

4.2 Previous Research

Chronology: Available data suggest that Humboldt County has an extended record of occupation, beginning ca. 8,000 B.P. or earlier and continuing into the historic period. A significant data gap exists in the pre-8,000 B.P. record found both to the north and south of Humboldt County but not identified within the geography of Humboldt County.

Subsistence: Paleoclimatic data from northwestern California suggest significant shifts in the nature and distribution of biotic communities during the Holocene era. Warmer/drier conditions during the Middle Holocene (ca. 7,500-4,000 B.P.) effectively opened up upland areas and replaced conifer-dominated forests with tracts of oak woodland and grass-rich meadows. Levels of resource productivity probably peaked during this interval, when the intensity of upland residential use was perhaps at its zenith. The data lacking regarding subsistence is tied to a broader assessment of archaeological patterns within the project area. Research is limited to the South Fork Mountain/Pilot Ridge project for non-coastal archaeological research.

Settlement: The regional data indicates that settlement patterns change throughout time with early patterns reflecting relatively mobile residential bases and later assemblages reflecting sedentary residences. Again, this information is based on a series of four archaeological deposits along a single ridge system in Humboldt and Trinity counties. The data is lacking from a widespread analysis of site types based on known artifact types from interior Humboldt County.

Technology: Regional technological patterns are relatively clear as described above in the archaeological background section. The regional data regarding artifact types is a little better with regard to the scope of potential data that exists. Many archaeological surveys within Humboldt County have documented artifact types and these data can be accessed through thorough records searches from the NWIC. The data gap that exists within this category is a simple aggregation of existing survey level data.

4.3 Hypothesis

Chronology: Artifact patterns will reflect technological adaptation to environmental conditions both geographically and chronologically as pertains to changes in climate.

Subsistence: Indirect measures, artifact patterns, will reflect changes in technological patterns corresponding to environmental conditions, geographically and temporally.

Settlement: Efforts to reconstruct settlement organization within Humboldt County will build on subsistence data and involve an assessment of what kinds of sites were used during particular time periods and the extent to which people moved around or remained tethered to particular locations. Levels of residential mobility should also be reflected in the organization of artifact assemblages. Groups moving

through the project area on a relatively rapid basis should have had more portable implements, higher rates of non-local raw materials in their tool-kits, and should show greater degrees of artifact curation or retention; conversely, artifacts discarded by less mobile people will tend to be more massive, made primarily from local materials, and should show less concern with reworking and recycling. Artifact assemblages, together with other characteristics of particular sites (e.g., midden development, domestic features, etc.), will also be important in developing functional profiles for each location; determinations that are, in turn, essential in attempting to sort out how multiple settlements were integrated or linked.

Technology: All formed artifacts will be characterized in terms of production stage, use-wear damage, and condition at the time of discard; samples of chipping waste or debitage will be analyzed to track the nature and intensity of on-site manufacturing activity.

4.4 Expectations

Chronology: The chronological sequence of habitation patterns in Humboldt County will generally reflect those of greater California regarding artifact types and function as adaptive technology to environmental conditions. Efforts will be made to flesh-out this record via dating individual sites and site components using associated artifacts, and potentially obsidian hydration, and radiocarbon. Of particular interest are trends in the intensity of occupation over time and whether these correspond to changes in habitat and paleoclimatic conditions.

Subsistence: Artifact assemblages will provide an indirect measure of past subsistence strategies, especially the relative abundance of functionally distinctive tool forms like hunting and plant-processing implements. Past subsistence practices will be approached using indirect indicators.

Technology: It is expected that much lithic material was locally obtained, but that non-local or exotic toolstone will be reflected among some artifact categories and smaller size waste debris; obsidian is an obvious example in this case, necessarily obtained via travel or exchange from quarries in northeastern California / southeastern Oregon or the southern Coast Ranges.

This research will use the definitions found in the standard Department of Parks and Recreation descriptions of historic resources.

5.0 Methods

Key elements of technological organization will be assessed by looking for variation in patterns of tool stone acquisition, manufacturing practices, use profiles, and levels of reuse or recycling. All formed artifacts will be characterized in terms of production stage, use-wear damage, and condition at the time of discard; samples of chipping waste or debitage will be analyzed to track the nature and intensity of on-site manufacturing activity.

All recording methods will utilize California Department of Parks and Recreation standards.
Field methods utilized intensive survey techniques with no more than 15 meter transects. The reality of Humboldt County survey projects is that much of the area harbors poor visibility; in that light, survey crews will employ shovel probes in 15-meter intervals where necessary. Through the overall project it is expected that no artifacts will be collected, and analyses will occur in the field.

All field notes and photographs are stored at ARSC, 440 Wildwood Ave., Rio Dell, CA 95562.

6.0 Report of Findings

No archaeological resources were located during this survey beyond a single isolated chert flake. While

conducting a records search, four (4) previous surveys within ½ mile of this property resulted in one (1) previously recorded historic resource outside the current APE but within ½ mile.

7.0 Discussion and Interpretation

There were no significant historic or prehistoric era resources located during this survey. The single chert flake was noted and recorded to add to the broader record of pre-contact land use patterns. In recording the flake, all potential information from the isolate has been documented and the potential resource has been mitigated. The record search shows one (1) previously recorded historic resource within a ½ mile of the current project area, yet it will remain unaffected by project activities. While the current project area has been subject to past activities that may have disturbed evidence of prehistoric use, it is highly doubtful that evidence of a significant deposit was completely eradicated by historic use activities and that this professional archaeological survey missed any remnants of prehistoric activities.

6.0 Management Considerations

No further archaeological work is recommended for this project and inadvertent discovery protocol should be followed (appendix A). There is always the possibility of the inadvertent discovery of buried archaeological resources during ground disturbing activities with project implementation. If buried archaeological resources are discovered during project implementation all work should be halted within 100 feet of the find and county officials, a professional archaeologist and tribal representatives should be contacted immediately to evaluate the find. If human remains are discovered during project implementation all work shall be halted and the permitting agency, Humboldt County, shall be contacted immediately. The County shall contact the County Coroner immediately and the Coroner will evaluate the find to determine the subsequent course of action. Inadvertent discovery procedures are attached in detail as Appendix A.

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Appendix A: Inadvertent Discovery Tear Sheet

If suspected archaeological resources are encountered during the project:

1. Stop work within 100' of the find.
2. Call the CalFire project representative, a professional archaeologist and representatives from the Bear River Band of Rohnerville Rancheria and the Wiyot Tribe.
3. The professional historic resource consultant, Tribes and CalFire officials will coordinate provide an assessment of the find and determine the significance and recommend next steps.

If human remains are encountered:

1. All work shall stop and per CA Health and Safety Code Section 7050.5:
2. Call the Humboldt County Coroner: (707) 445-7242.
3. The Coroner will determine if the remains are of prehistoric/historic Native American origin. If the remains are Native American, then;
4. The Humboldt County Coroner will contact the Native American Heritage Commission within 24 hours.
5. The NAHC is responsible under CA PRC 5097.98. (a) for identifying the most likely descendent (MLD) immediately and providing contact information. Within 48 hours the MLD may contact the landowner, and with landowner permission inspect the location, making subsequent recommendations regarding the most appropriate disposition of their descendent.

Appendix B: Tribal Communications/Coordination

1. Native American Heritage Commission
2. Communications Bear River Band of Rohnerville Rancheria
3. Communications Wiyot Tribe

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Fortuna Wendt

County: Humboldt County

USGS Quadrangle Name: Fortuna 1979

Township: 2N **Range:** 1W **Section(s):** 12

Company/Firm/Agency: Archaeological Research and Supply Company

Street Address: 156 Grayland Heights Road

City: Rio Dell **Zip:** 95562

Phone: 707-407-6205

Fax: 707-202-6949

Email: nangeloff.ceo@gmail.com

Project Description: Archaeological survey of major subdivision for a city permit.

Archaeological Research and Supply Company

To: Ed Smith, THPO
266 Keisner Rd.
Loleta, CA 95551
Tel: 707.733.1900 x 233
Cell: 707.502.5233
Email: thpo@brb-nsn.gov

From: Archaeological Research and Supply Company
Nick Angeloff, MA
440 Wildwood Ave.
Rio Dell, CA 95562
Nangeloff.ceo@gmail.com
707.407.6205

Dear Mr. Smith,

This letter is a request for any information the Bear River Band of Rohnerville Rancheria may wish to contribute regarding a property in Humboldt County that is currently undergoing archaeological evaluations for major development. The individual project is presented in the table below and the attached maps are numerically coordinated with listing in the table. In this light ARSC proposes to survey the APE of the parcel, including a 600' buffer.

PROJECT	MAP	APN	APPS
Fortuna Wendt	1, 2	202-093-060, 202-041-005, 202-092-018	TBD

The survey will be intensive, using 15-meter transects. If conditions require, extended survey techniques will be employed using shovel probes or other expedient methods to examine soils in heavily vegetated areas. A standard Archaeological Resource Management Report (ARMR) formatted survey report will be developed including recommendations for any identified cultural resources. The report will be submitted to you for review prior to submission to the county to allow for any further insight or recommendations you may wish to incorporate.

In order to develop a complete report and inform the field survey, we are requesting any information that you may have regarding Tribal Cultural Resources regarding the subject parcel. We look forward to continuing this coordinated effort to develop recommendations and a copy of the completed report will be forwarded to you for your records.

Sincerely and with Highest Regards,

_____
Nick Angeloff, Principal Investigator

Archaeological Research and Supply Company

To: Theodore Hernandez, THPO
Hazel James
1000 Wiyot Drive
Loleta, CA 95551
Tel: 707.733.5055
Email: ted@wiyot.us
hazel@wiyot.us

From: Archaeological Research and Supply Company
Nick Angeloff, MA
440 Wildwood Ave.
Rio Dell, CA 95562
Nangeloff.ceo@gmail.com
707.407.6205

Dear Mr. Hernandez,

This letter is a request for any information the Wiyot Tribe may wish to contribute regarding a property in Humboldt County that is currently undergoing archaeological evaluations for major subdivision. The individual project is presented in the table below and the attached maps. ARSC proposes to survey the entirety of each parcel.

PROJECT	MAP	APN	APPS
Fortuna Wendt	1	202-093-060, 202-041-005, 202-092-018	TBD

The surveys will be intensive, using 15-meter transects. If conditions require, extended survey techniques will be employed using shovel probes to examine soils in heavily vegetated areas. A standard Archaeological Resource Management Report (ARMR) formatted survey report will include recommendations for any identified cultural resources.

In order to develop a complete report and inform the field survey, we are requesting any information that you may have regarding Tribal Cultural Resources regarding the subject parcel. We look forward to continuing this coordinated effort to develop recommendations and a copy of the completed report will be forwarded to you for your records.

Sincerely and with Highest Regards,

Nick Angeloff, Principal Investigator

Appendix C: Confidential Records Search

Survey Number	Description	Author	Date
S-000275	An Archaeological Survey of the Proposed Sewage System Area for the Town of Rohnerville, Humboldt County, California. A survey within and surrounding the current project area found one (1) prehistoric site P-12-000523 (see table 2 below) within the ½ mile buffer	Gorrell, Barbara	1976
S-009575	Rohnerville Historic District. A survey found no historic or prehistoric cultural markers within ½ mile of the current project area.	Van Kirk, Susie	1977
S-023550	Archival Literature Search and On-Site Archaeological Surface Reconnaissance of an Approximately 10 Acre Parcel of Land, Commonly Referred to as the Ogawa Nursery Property, Located at 1225 andf 1245 Lawerence Road, Within the Town of Danville.	Pastron, Allen G.	1996
S-039747	Cultural Resources Survey for the Grizzly Bluff Natural Gas Field Development Project (PL 822-31), Humboldt County, California. A survey northwest of the current project area found no historic or prehistoric cultural markers with the ½ mile buffer.	Holson, John	2007

Table 1 Previous Surveys

P Number	Site Type/ Description	Author	Date
P-12-000523	A prehistoric site consisting of a scatter of chert debitage with less than 20 flakes noted and tools, north of the current project area.	Stradford, Richard	1980

Table 2 Resources

Attachment D: Final Drainage Analysis- A.M. Baird Engineering & Surveying

A.M. BAIRD
ENGINEERING & SURVEYING
1257 Main Street • P.O. Box 396 • Fortuna, CA. 95540 • (707) 725-5182 • Fax (707) 725-5581
CONSULTING – LAND DEVELOPMENT – DESIGN – SURVEYING

FINAL DRAINAGE ANALYSIS

PREPARED FOR

Dennis Wendt
Gulliksen Pud Subdivision Phase 2&3

APN: 202-091-04

Fortuna, CA

PREPARED BY:

ALLAN M. BAIRD, RCE 23681
License Expires 12-31-05

October 6, 2005
JN 05-092-79

A.M. BAIRD
ENGINEERING & SURVEYING
1257 Main Street • P.O. Box 396 • Fortuna, CA. 95540 • (707) 725-5182 • Fax (707) 725-5581
CONSULTING – LAND DEVELOPMENT – DESIGN – SURVEYING

October 6, 2005

City of Fortuna
621 11th Street
Fortuna, CA 95540

Subject: Wendt/Gulliksen Subdivision Phase 2/3 Drainage Analysis

Introduction

Our office has prepared a final drainage plan with the objective of addressing the capacity of the Rock Lined Ditch (RLD), Curb and Gutters (C&G), and Rock Energy Dissipators (RED). The Preliminary Drainage Analysis prepared by this office (dated March 4, 2004) was referenced for time of concentration determination and off site drainage areas. The pertaining pages from the Preliminary Report are enclosed for reference.

Method

The rational method was used to determine post development runoff to the proposed drainage system. The attached Drainage Calculations show the calculated runoff to drainage areas 2A-2C. These areas were used to determine RLD capacity and size the RED's. Curb and Gutter capacity was analyzed using a variation of Mannings Equation and comparing the theoretical curb-full gutter flow to the post development runoff.

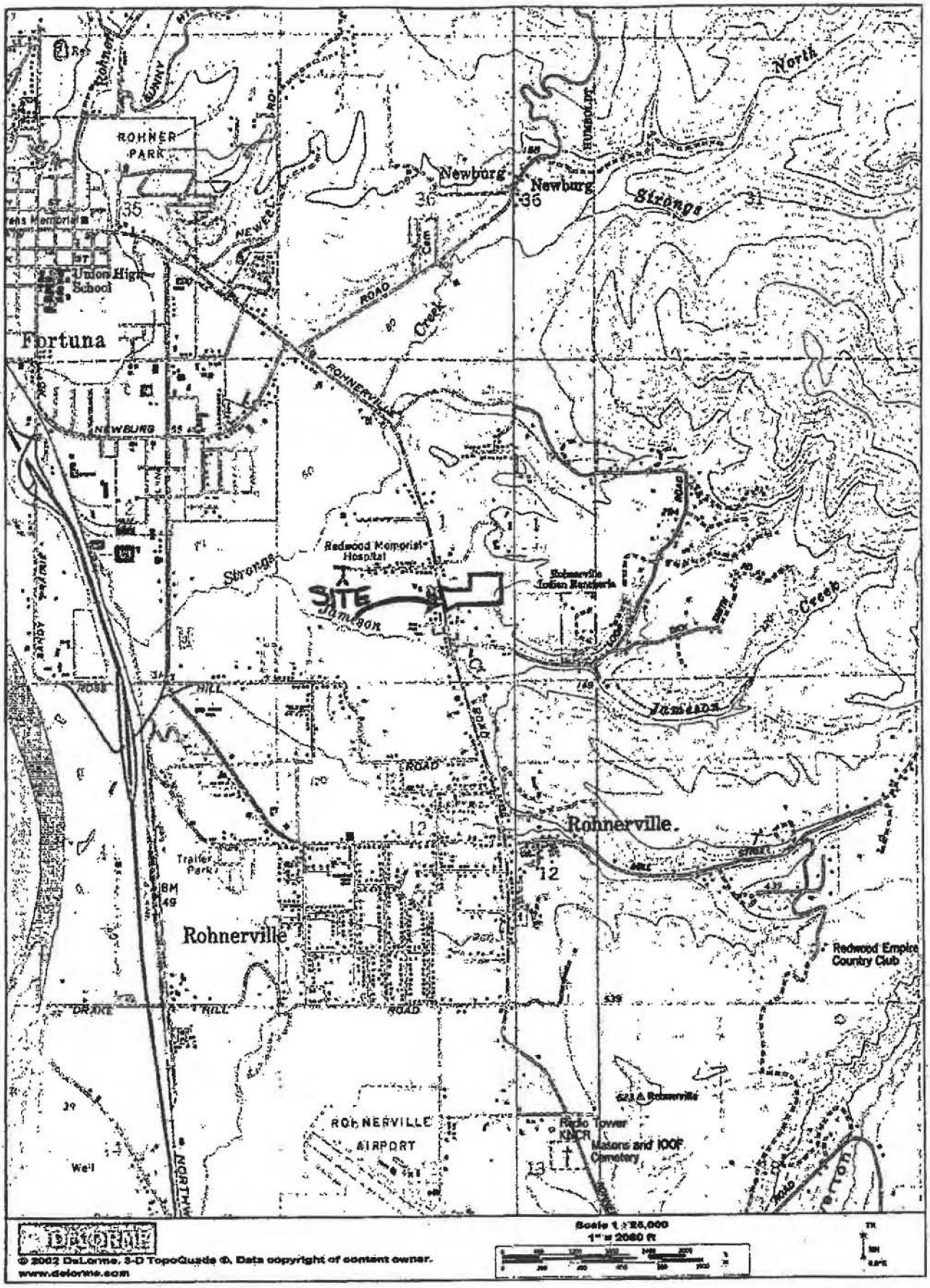
Conclusion

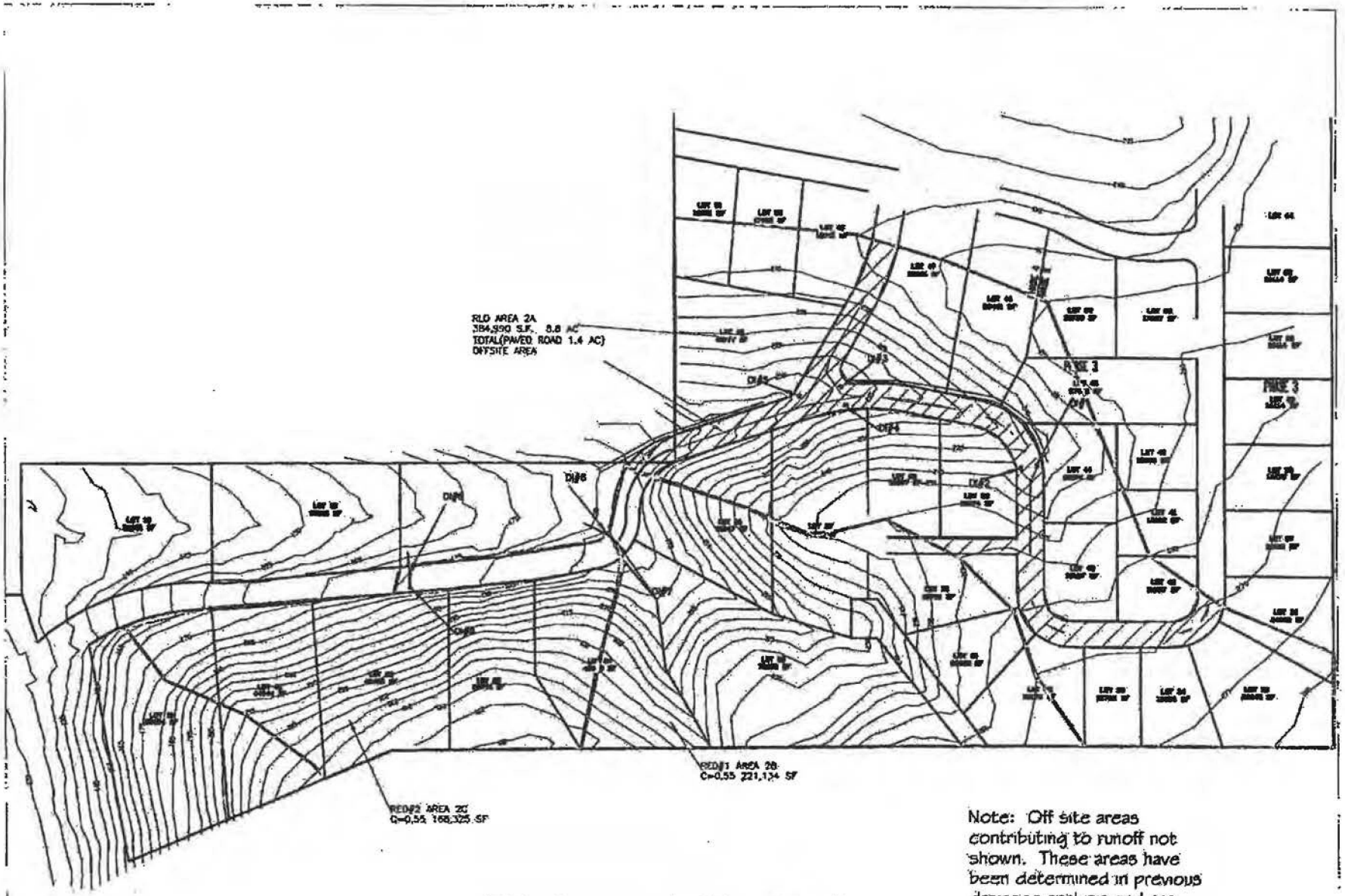
The proposed 6-foot RLD is sufficient to handle the Q_{10} or 10-year flow for the subdivision and surrounding area. Rock Energy Dissipators shall be constructed according to the minimum design characteristics from the Caltrans Storm Water Quality Handbook Construction Site Best Management Practices Manual. The RED detail is enclosed in this report. The proposed gutter and storm drain drop inlet system is sufficient to handle the Q_{10} for the subdivision.

REGISTERED PROFESSIONAL ENGINEER
ALLAN M. BAIRD
No. 23681
Exp. 12-31-05
CIVIL
STATE OF CALIFORNIA

10-24-05

Allan M. Baird
Principal Engineer

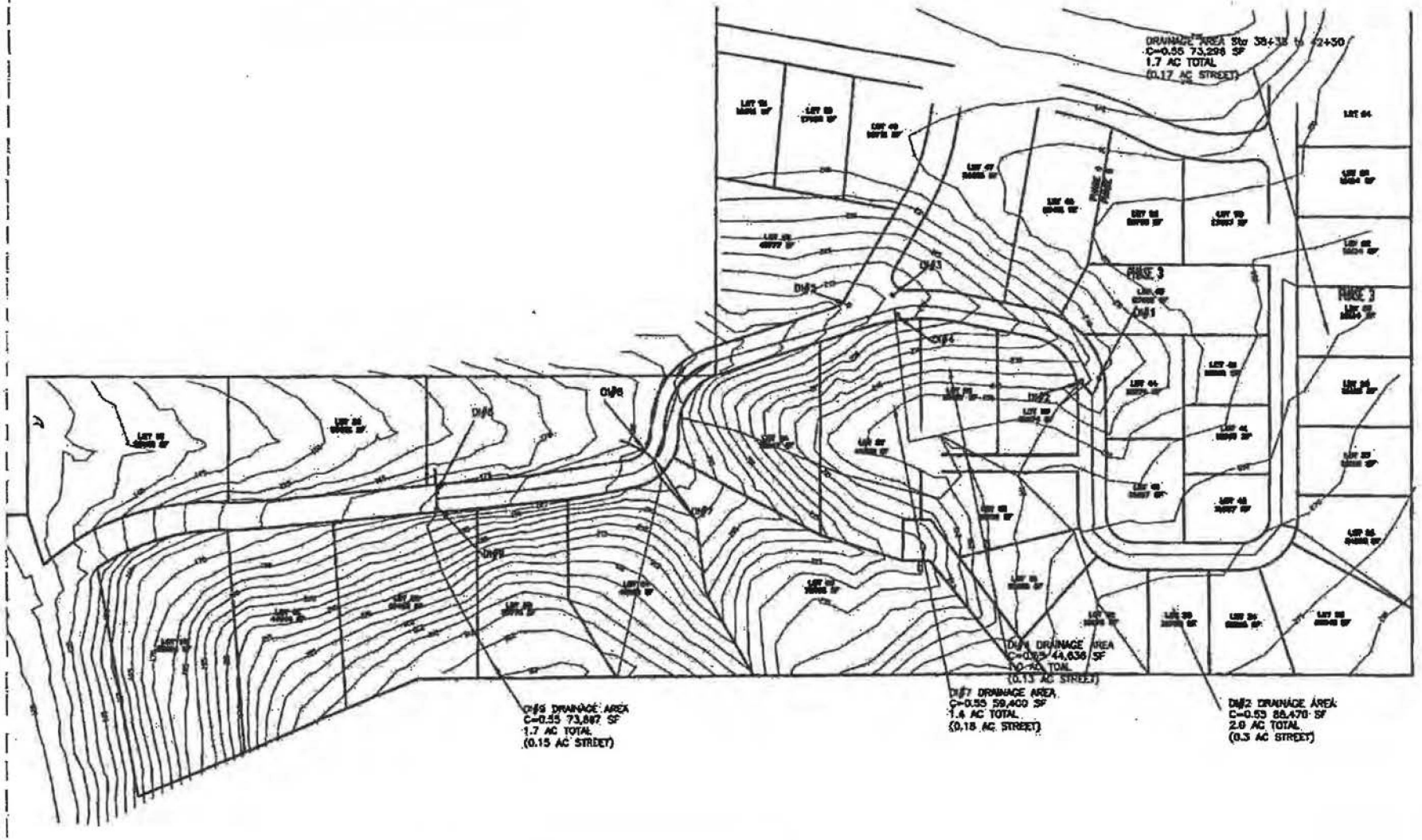

ROHNER PARK
Newburg
Newburg
Union High School
Fortuna
NEWBURG
ROHNERVILLE ROAD
Redwood Memorial Hospital
SITE
Jameson
Strongs
Rohnerville
Trailer Park
Rohnerville
Redwood Empire Country Club
ROHNERVILLE AIRPORT
Radio Tower KNCR
Masons and IOOF Cemetery
Well
DRAKE HILL ROAD
NORTHW
Scale 1 : 25,000
1" = 2080 ft
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www.delorme.com



Note: Off site areas contributing to runoff not shown. These areas have been determined in previous drainage analysis and are included in the calculations.

Ditch and Dissipator Drainage Areas

SCALE: 1:200



Curb and Gutter Drainage Areas

SCALE: 1:200

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DRAINAGE ANALYSIS FOR GULLIKSEN PHASE 2 & 3 10/4/2005

Flow Rates for 10 year and 100 year Storm Events

Using rational method $Q = C_f C i A$ (Gupta, 2001, p 674)

Where: Q = Peak flow rate (cfs)
C_f = Frequency factor (10 yr = 1.0; 100 yr = 1.25)
i = Rainfall intensity (in/hr)
A = Drainage area (acres)
C = Runoff coefficient

Assume time of concentration=10 min
I_{10} = 2.0 in/hr
I_{100} = 3.0 in/hr

Area 2A

Residential Lots: Runoff to Rock Lined Ditch
(10 year) Q_{10} = 13.32 cfs
(100 year) Q_{100} = 24.98 cfs

Paved Roads: Runoff to Rock Lined Ditch
(10 year) Q_{10} = 1.54 cfs
(100 year) Q_{100} = 2.89 cfs

Offsite: Runoff to Rock Lined Ditch
(10 year) Q_{10} = 5.04 cfs
(100 year) Q_{100} = 9.45 cfs

Total Q_{10} = 19.9 cfs
Total Q_{100} = 37.3 cfs

Area 2B

Residential: Runoff to DI # 7 and Energy Dissipator
(10 year) Q_{10} = 5.50 cfs
(100 year) Q_{100} = 10.31 cfs

Offsite: Runoff to DI # 7 and Energy Dissipator
(10 year) Q_{10} = *3.4* cfs
(100 year) Q_{100} = *6.4* cfs

Area 2C

Residential: Runoff to DI # 9 and Energy Dissipator
(10 year) Q_{10} = 4.18 cfs
(100 year) Q_{100} = 7.84 cfs

Offsite: Runoff to DI # 9 and Energy Dissipator
(10 year) Q_{10} = 1.71 cfs
(100 year) Q_{100} = 3.21 cfs

Gulliksen Phase 2 & 3 10/4/2005

Drainage Calculations

by: ARK

Drainage Area	Area Label	Area (ac)	C_i	Travel Time	Intensity (in/hr) from IDF curve (10 year storm)	Intensity (in/hr) from IDF curve (100 year storm)	Q_{10} (cfs)	Q_{100} (cfs)
Area 2A	Residential-on site	7.4	0.9	10	2.0	3.0	13.32	24.98
	Road	1.4	0.55	10	2.0	3.0	1.54	2.89
*	Off site-undev.	6.3	0.4	10	2.0	3.0	5.04	9.45
							19.90	37.31
Area 2B	Residential	5	0.55	10	2.0	3.0	5.50	10.31
*	Off site-undev.	3.8	0.45	10	2.0	3.0	3.42	6.41
							8.92	16.73
Area 2C	Residential	3.8	0.55	10	2.0	3.0	4.18	7.84
*	Off site-undev.	1.9	0.45	10	2.0	3.0	1.71	3.21
							5.89	11.04
						TOTAL :	34.71	65.08
DI#2	Residential	1.7	0.55	10	2.0	3.0	1.87	3.51
		0.3	0.95	10	2.0	3.0	0.57	1.07
							2.44	4.58
DI#4	Residential	0.87	0.55	10	2.0	3.0	0.96	1.79
		0.13	0.95	10	2.0	3.0	0.25	0.46
							1.20	2.26
DI#7	Residential	1.22	0.55	10	2.0	3.0	1.34	2.52
		0.18	0.95	10	2.0	3.0	0.34	0.64
							1.68	3.16
DI#9	Residential	1.55	0.55	10	2.0	3.0	1.71	3.20
		0.15	0.95	10	2.0	3.0	0.29	0.53
							1.99	3.73
Sta 38+35 to 42+50		1.53	0.55	10	2.0	3.0	1.68	3.16
		0.17	0.95	10	2.0	3.0	0.32	0.61
							2.01	3.76

* Value determined from previous analysis and reported in Preliminary Drainage Analysis, dated March 4, 2004. Variations in street location and lot size from Preliminary Analysis are negligable and can be ignored in this analysis.

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Capacity of Gutters

Curb Full:

$$Q_{max} = 1.2 k_q \left(\frac{z}{n}\right) s^{1/2} \cdot Y^{8/3} \qquad \text{(Maidment, 1993)} \qquad Q_{max} = 0.56 \left(\frac{T}{Y}\right) n^{-1} \cdot s^{1/2} \cdot Y^{8/3}$$

Where: Q_{max} = Curb Full Gutter Capacity (cfs) 10-year event
k_q = 0.47 for US units
z = T/Y; T = Top width of flow (ft)
n = Manning's coefficient (0.016 for paved streets)
s = longitudinal slope of the gutter (ft/ft)
Y = Depth of flow at the curb, (0.5 ft)

Calculated Flow in Gutters

Station	s	Qmax (cfs)
42+50	2.0%	1.87
41+00	3.2%	2.37
38+35	1.8%	1.75
37+00	12.0%	4.58
33+50	8.5%	3.86
30+25	6.8%	3.44
25+85	3.0%	2.29
22+60	4.0%	2.65

kg	0.47
T	12
n	0.16
Y	0.5

Compare Allowable Gutter Flow with Calculated Flow

	Station	Qmax (cfs)	Q_{10} (cfs)	Notes	
	38+35	1.75 to 2.37	2.01	OK by inspection	
DI#2	33+50	3.86	2.44	$Q_{max} > Q_{10}$	gutter O.K.
DI#4	30+25	3.44	1.20	$Q_{max} > Q_{10}$	gutter O.K.
DI#7	25+85	2.29	1.68	$Q_{max} > Q_{10}$	gutter O.K.
DI#9	22+60	2.65	1.99	$Q_{max} > Q_{10}$	gutter O.K.

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ROCK LINED DITCH CAPACITY

$$Q_{RLD} = \frac{k}{n} A (R)^{2/3} S^{1/2}$$

where:

k= 1.49 for US units
R is the hydraulic radius = A/P
A is area in sq.ft.
S is the bottom slope
P is the wetted perimeter

k	1.49
n	0.03 for RLD
base	6.00
height	1.00
A=1/2bh	3.00
P	6.32
R	0.47
S-min	8%

Q_{RLD}= 30.3722 cfs

Compare Q_{RLD} to Q_{10}:

30.37 cfs >19.90 cfs

$Q_{RLD} > Q_{10}$ Therefore RLD O.K.

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e-mail ambaird@cox.net

SUBJECT Gullikson Phase 2/3 JOB NO.

BY DATE CLIENT CHECKED BY APPROVED

R&D Design:

RED-1 @ sta 25+79:

$Q = CiA$

$A = 17,900 ft^2 = 0.41 ac$

$C = 0.55$ for 35% lot coverage

$i = 2.0$ for Q10 3.0 for Q100

$Q_{10} = 0.55 \times 2.0 \times 0.45 ac = 0.5 cfs = 0.015 m^3/s$

$Q_{100} = 0.55 \times 3.0 \times 0.45 \times 1.25 = .93 cfs = 0.026 m^3/s$

For 18" dia. → 3m (9.8') apron length w/ 150mm (0.5') up Appendix F

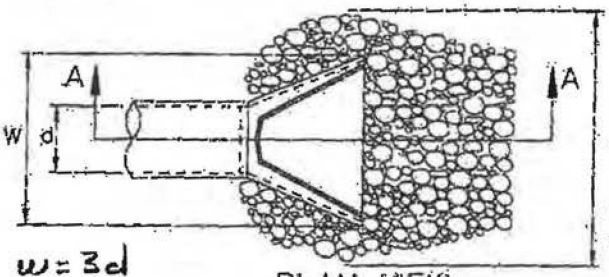
Check: 0.26 [illegible] 20

R_2 19,000 ft^2

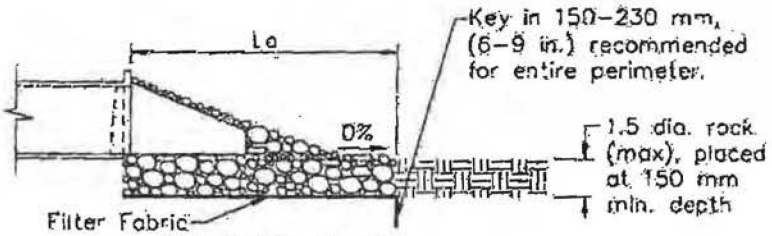
$A_2 < A_1$ OK? [illegible]

Outlet Protection/Velocity Dissipation Devices

SS-10



PLAN VIEW
NTS



SECTION A–A
NTS

Pipe Diameter mm	Discharge m^3/s	Apron Length, La m	Rip Rap D_{50} Diameter Min mm
300	0.14	3	100
	0.28	4	150
450 (18")	0.28 (9.8 cfs)	3 (9.8')	150 (0.5')
	0.57	5	200
	0.85	7	300
	1.13	8	400
600	0.85	5	200
	1.13	8	200
	1.42	8	300
	1.70	9	400
For larger or higher flows, consult a Registered Civil Engineer			

Source: USDA – SCS

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EXCERPTS
PRELIMINARY DRAINAGE ANALYSIS
REVISED 3/4/04

PREPARED FOR

Dennis Wendt

APN: 202-091-04

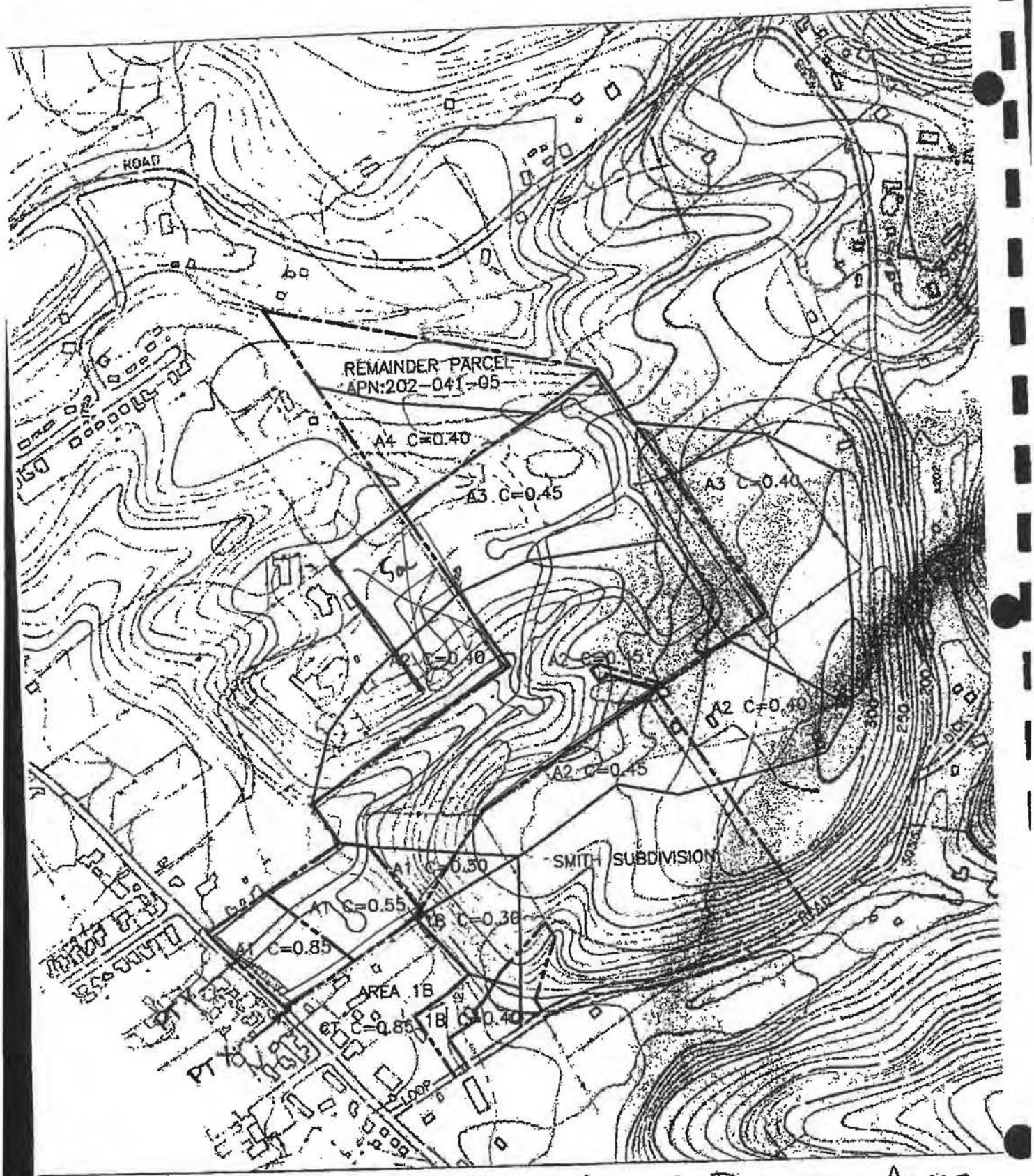
FORTUNA, CALIFORNIA

PREPARED BY:

For Reference Only

ALLAN M. BAIRD, RCE 23681
License Expires 12-31-05

JN 03-092-39
March 4, 2004



10' contours
1" = 500'

Post Development Drainage Areas
Wendt | Gulliksen Subdivision

From: Prelim. Analysis

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Fortuna, CA 95540
e-mail baird@northcoast.com

SUBJECT Drainage Report JOB NO. 03-092-39

BLB DATE 2/4/04 CLIENT Wendt/Gullixson CHECKED BY _____ APPROVED _____

A_2 ONSITE $A_2 = 939318$ SF $= 21.6$ AC $C = 0.45$

OFFSITE $A_2 = 272873$ SF $= 6.3$ AC $C = 0.45$

$A_2 = 273209$ SF $= 6.3$ AC $C = 0.40$

$A_2 = 253715$ SF $= 5.8$ AC $C = 0.40$

$L = 1500'$

$S = \frac{50'}{1500'} = 0.033$

$t_c = \frac{0.0078 (1500)^{0.77}}{(0.033)^{0.385}}$

$t_c = 8.1$ min

$L = 550'$

$S = \frac{110'}{550'} = 0.20$

$t_c = \frac{0.0078 (550')^{0.77}}{(0.20)^{0.385}}$

$t_c = 1.9$ min

$i_{10} = 2.0 \frac{in}{hr}$ $i_{100} = 3.0 \frac{in}{hr}$

$Q_{10} = 2.0 \frac{in}{hr} ((0.45 * 27.9 AC) + (0.40 * 12.1))$

$Q_{10} = 34.8$ cfs

$Q_{100} = 52.2$ cfs

From: Prelim. Analysis

Attachment E: Engineering Geologic Soils Report- A.M. Baird Engineering & Surveying

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CONSULTING – LAND DEVELOPMENT – DESIGN – SURVEYING

GEOLOGIC HAZARDS AND DEVELOPMENT CLASS R2 SOILS REPORT FOR THE GULLIKSEN SUBDIVISION PHASE 4 & 5

PREPARED FOR:

Wendt Construction
APNs: 202-093-060 & 202-092-018
Fortuna, CA 95540
Humboldt County

PREPARED BY:



ALLAN M. BAIRD, RCE 23681

February 25, 2025
Job# 22-092-142

A.M. BAIRD
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Contents

Purpose 1
Site Location and Description 1
Site Investigation 1
Soil Conditions 1
Groundwater 2
Slope Stability and Drainage Hazards 2
Geological Hazards 3
Earthquake Motion Hazards 4
Flood Hazards 4
Grading (Cut/Fill) 4
Recommendations and Specifications 4
Conclusion 7
References 8
Appendix 9
Assessor's Parcel Maps 10
Soil Test Site Plan 11
Topographic Map 12
Flood Map, 100-yr 13
Fault Activity Map 14
Seismic Design Parameters 15
Soil Profile TH#1 16
Soil Profile TH#2 17
Soil Profile TH#3 18
Soil Profile TH#4 19
Soil Profile TH#5 20
Soil Texture TH#1 @ 18" 21
Soil Texture TH#1 @ 48" 22
Soil Texture TH#2 @ 24" 23
Soil Texture TH#2 @ 48" 24
Soil Texture TH#3 @ 18" 25
Soil Texture TH#3 @ 48" 26
Soil Texture TH#4 @ 18" 27
Soil Texture TH#4 @ 48" 28
Soil Texture TH#5 @ 18" 29
Soil Texture TH#5 @ 48" 30
Soil Chart 31

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Building Official
City of Fortuna
621 11th Street
Fortuna, CA 95540

RE: Gulliksen Subdivision Engineering Geologic Soils Report, R-2
Client: Wendt Construction

Purpose

This report represents the evaluation and recommendations to satisfy the standards for an 'R-2' Geological Report for the construction of residential lots, road installation, site improvements, development, drainage and foundation design for The City of Fortuna.

Site Location and Description

The approximate 18.5-acre area that was reviewed for this soils report is designated Phase 4 and 5 of the Gulliksen subdivision, with road access provided by Towhee Street and from Gulliksen Drive. These lots range in elevation from approximately 210 to 250 feet above sea level.

Site Investigation

On February 07, 2025, representatives from A.M. Baird Engineering and Surveying, Inc. performed a site investigation at the afore-mentioned property. Five test holes (TH#1, TH#2, TH#3, TH#4, TH#5) were excavated to a depth of approximately 5 feet at various locations within the developable area in the proposed subdivision (see Soil Testing Site Plan, attached). Soil samples were taken at approximately 18 inches below grade and approximately 48 inches below grade from each test hole. Field texturing and laboratory analyses were performed on each sample.

Soil Conditions

Soil sampling at TH#1 revealed Zone 3 dark brown loam (Munsell color 10 YR 3/3) to approximately 18 inches below grade with a coarse content of approximately 2.3% (by weight) consisting of small gravels. The soil has a crumb structure with very little plasticity. The soil horizon between 18 inches below grade to approximately 60 inches below grade consists of Zone 3 yellowish-brown loam (Munsell color 10 YR 5/8) with a coarse content of approximately 3.0% (by weight). The soil has a crumb to blocky structure and is slightly sticky and slightly plastic when moist. Water seepage was observed at approximately 18 inches below grade.

Soil sampling at TH#2 revealed Zone 2 dark brown loam (Munsell color 10 YR 2/2) to approximately 18 inches below grade with a coarse content of approximately 2.3% (by weight) consisting of small gravels. The soil has a crumb structure with very little plasticity. The soil horizon between 18 inches below grade to approximately 60 inches below grade consists of Zone 2 yellowish-brown loam (Munsell color 10 YR 5/8) with a coarse content of approximately 3.0% (by weight). The soil has a crumb to blocky structure and is slightly sticky and slightly plastic when moist. Water seepage was observed at approximately 18 inches below grade.

Soil sampling at TH#3 revealed Zone 2 dark brown sandy clay loam (Munsell color 10 YR 3/3) to approximately 18 inches below grade with a coarse content of approximately 4.3% (by weight) consisting of small gravels. The soil has a crumb structure with very little plasticity. The soil horizon between 18 inches below grade to approximately 60 inches below grade consists of Zone 2 dark yellowish-brown silty loam (Munsell color 10 YR 4/6) with a coarse content of approximately 2.1% (by weight). The soil has a crumb to blocky structure and is slightly sticky and slightly plastic when moist. Water seepage was observed at approximately 28 inches below grade.

Soil sampling at TH#4 revealed Zone 2 dark brown loam (Munsell color 10 YR 3/3) to approximately 18 inches below grade with a coarse content of approximately 3.0% (by weight) consisting of small gravels. The soil has a crumb structure with very little plasticity. The soil horizon between 18 inches below grade to approximately 60 inches below grade consists of Zone 2 dark yellowish-brown loam (Munsell color 10 YR 4/6) with a coarse content of approximately 1.9% (by weight). The soil has a crumb to blocky structure and is slightly sticky and slightly plastic when moist. Water seepage was observed at approximately 24 inches below grade.

Soil sampling at TH#4 revealed Zone 2 dark brown loam (Munsell color 10 YR 3/3) to approximately 24 inches below grade with a coarse content of approximately 3.0% (by weight) consisting of small gravels. The soil has a crumb structure with very little plasticity. The soil horizon between 24 inches below grade to approximately 60 inches below grade consists of Zone 2 dark yellowish-brown loam (Munsell color 10 YR 4/6) with a coarse content of approximately 1.9% (by weight). The soil has a crumb to blocky structure and is slightly sticky and slightly plastic when moist. Water seepage was observed at approximately 30 inches below grade.

No expansive soils were encountered during this investigation that would require specific recommendations. Total and differential settlement are not anticipated to be detrimental (less than 1/2 inch for a 25-foot span over a 50-year lifespan) provided considerations are given to the recommendations presented herein.

Groundwater

Groundwater seepages were observed at depths of approximately 18 inches at TH#1, 18 inches at TH#2, 28 inches at TH#3, 24 inches at TH#4, and 30 inches at TH#5.

Slope Stability and Drainage Hazards

The nature of the subdivision property appears to be stable and should remain stable provided the recommendations given in this report are followed. There were no indications in the surrounding area of any slumps, faults, or springs that would be detrimental to development of these lots. Areas disturbed during construction activities should be re-vegetated prior to the rainy season. Impermeable surfaces should be designed to be contained in designated drainage conveyances or uniformly diffuse runoff away from structures and site improvements. Significant quantities of concentrated runoff should not be discharged over slopes greater than 20% unless designed.

The vast majority of the subdivision area in question slopes at less than 20% and all lots have significant available flat areas of approximately 10% or less for placement of residential structures. There is an existing pond and proposed retention basin which will receive roadway and impervious drainage for these phases of the subdivision. This pond and retention basin route flow westerly by drainage ditch which flows off the subject property at the rear of lot 51.

Geological Hazards

This area of California is seismically very active and is subject to earthquakes of large magnitude, which can produce significant ground shaking. This high to very high level of risk of seismic hazard is typical for the majority of coastal areas in Humboldt County

In general, there are many sources of large magnitude earthquakes that could potentially affect this project area. These sources include but are not limited to the San Andreas Fault (north coast), and the complex northwesterly oriented fault systems surrounding the Humboldt Bay area (including the Freshwater and Gorda Fault Zones).This parcel is located within 5 kilometers of the active Type A Little Salmon Fault (onshore), within 10 kilometers of the Type B Fickle Hill Fault and Table Bluff Fault, within 30 kilometers of the Type B Mad River Fault and Little Salmon Fault (offshore), and within 40 kilometers of the Type A Cascadia Subduction Zone.

The San Andreas Fault has produced major earthquakes in this area at intervals of approximately 75-150 years. Earthquakes with average magnitudes of 5.8 occur on average every 2 years at varying locations in or near Humboldt County, and geological evidence suggests that the San Andreas Fault is capable of generating magnitudes much higher (7+). This high to very high level of risk of seismic hazard is typical for Northern California and this risk is assumed when developing in this area. Earthquakes capable of causing intense ground shaking and structural damage can be expected to occur within the design life of the proposed structure (50+ years). Developers and residents should be aware these natural hazards cannot be fully eliminated with engineered design. As required, all structural design should be in conformance with the 2022 California Building Code (CBC) Seismic Design Category (SDC) "E". Latitude and Longitude values were taken from the Humboldt County Web GIS website. Site-specific soil parameters were calculated using the ACSE online hazard tool (Table 1).

Table 1: USGS Ground Motion Parameters.

Latitude	40.5844
Longitude	-124.1233
Occupancy Category	II (normal buildings)
Importance Factor, I	1.0
Site Class	D (stiff soil)
Site Coefficients	F_a=1.2
	F_v=null
Mapped Spectral Response Acceleration Parameters	S_s=3.01 g (0.2-second spectral response)
	S_1=1.15 g (1-second spectral response
Design Spectral Response Acceleration Parameters	S_{MS}=3.46 g (0.2-second period)
	S_{M1}=2.38 (1-second period)

Design Spectral Response Acceleration Parameters (five-percent damped design spectral response)	S_{DS}=2.31 g (0.2-second period)
	S_{D1}=1.58 (1-second period)
Seismic Design Category (SDC)	E (S_1>0.75g)
Peak Ground Acceleration (S_S/2.5)	1.204 g

Earthquake Motion Hazards

Slope instability, liquefaction, and surface rupture due exclusively to faulting or lateral spreading are not considered consequential as to require specific analysis. Dynamic seismic loading for retaining walls if required shall be based upon peak ground acceleration for design purposes with a value of SS/2.5 using ASCE 7-22, unless additional site-specific analysis or alternate method is employed per code and shown for design.

Flood Hazards

The site is not located within the 100-yr flood zone (see Flood Map, attached). The hazard for flooding is considered low with proper pond and detention pond design and routing.

Grading (Cut/Fill)

No evidence of previous significant grading on the property during this site inspection was observed. Minor grading is required for road access, drainage requirements, and roadway construction during development of these lots, but not anticipated to be more than 4 feet in depth except where might be required for specific storm-water drainage retention or conveyances.

Recommendations and Specifications

Construction of structural improvements for the subdivision and single or multilevel residential homes (including manufactured homes) are appropriate developments for the soils and topography of this site. Guidelines and recommendations for construction of improvements and residential structures are as follows:

Roadway Design / Structural Fill and Recommendations (as applicable):

- Roadway, pavement and sidewalk supporting soils shall be removed of the vegetation and scarified to 8 inches and compacted to minimum 95% of maximum relative compaction by ASTM Test Method D 1557-78. Paving shall consist of a minimum of 0.2 ft of type “B” asphalt concrete, underlain by a minimum of 0.67’ of class 2 aggregate base (R-78 typical) complying with CALTRANS standard specifications (typical values based on an approximate typical section of R-Value of 45 and traffic index of 6.0).

- Building area fill if used can be any soils and aggregate less debris, organic material and particles greater than 3 inches, with an expansion index less than or equal to 20. All fills placed on natural subgrade should be compacted to minimum 95% relative compaction and optimum moisture (ASTM-D 1557). Footings for structures shall extend beyond any

encountered fill unless such fill has been tested for compaction and meets minimum design standards. Alternatively, a 2-sack slurry cement mixture in place of structural fill can be used.

- Trench back fill soils and aggregate shall meet gradation and quality requirements for "Structural Back Fill" for Caltrans Standard Specifications. Contractor shall employ standard methods to avoid damage to utility trenches and place backfill in 8-inch lifts – 95% of maximum relative compaction for the upper 12 inches in areas supporting base-rock and surfacing, 90% for other areas in improved locations, and 85% in unimproved areas.

1. Concrete foundation for structures shall be designed compliant with the 2022 CBC, and should be reinforced and be contained in firm, undisturbed and native soil. The foundation for structures should be extended a minimum depth of 12" into grade and also past any loamy dark topsoil or fill to bear on natural undisturbed ground. Spread footings and foundation walls should be reinforced and be at minimum 12" wide for one-story structures, 15" for two story structures and 18" for three-story structures. Foundation walls should be a minimum of 7.5" thick for single-story structures, a minimum of 8" for two-story structures, and a minimum of 10" for three-story structures. Foundation footing setbacks to slope breaks shall comply with specifications chapter 18 of the 2022 CBC. Footings shall comply with the following maximum loads:

Loading Condition	Allowable Bearing Pressure
Dead plus long-term live load	1000 psf *
Dead plus all live loads	1500 psf
Total design loads including wind/seismic	2000 psf

* This load may be increased to 1500 psf if design criteria warrant, in which case expected settlement will be 1/2" to 1" total over the length of the structure.

2. Initial preparation of the development area for grading should include stripping and removal of all vegetation and debris. The depth for removal for vegetation and debris will generally be 3" to 6" but deeper removal may be necessary to remove isolated organic matter and roots. This material shall be completely removed to expose firm undisturbed native soils, and should not be reused for any fill. Any proposed fill and cut slopes shall be re-vegetated or landscaped to prevent erosion. If cutting, grading, or foundation preparation is to be done at a depth greater than 6 feet, further investigation for specific comments and recommendations are recommended by specific review.

3. All surface runoff from developed or paved areas of the lot should be controlled to flow and drain away or be routed in such a manner as not to affect slope stability or the integrity of the surrounding foundation or supporting soils. Erosion control dissipation devices shall be installed at all locations where water is discharged over slopes greater than 20%.

4. All excavation shall be completed in conformance with Section 1804 of the 2022 CBC. Additionally, earthwork grading/excavation shall be conducted during the dry season.

5. If any foundation fill is to be used, it shall be approved by this office and be placed in lifts of 6" to 8", compacted to 95% relative compaction (per ASTM-D 1557). On-site sub-soils that have been removed of debris and organic matter can be considered acceptable for use as compacted fill with engineering review.

6. All existing and proposed fill and cut slopes are to be re-vegetated to prevent erosion. This is to be done to the satisfaction of local building officials. Existing vegetation beyond the construction area should be left undisturbed if feasible.

7. If cutting or grading is to be done at a depth greater than 5 feet, it is recommended that this office be contacted for specific comments and recommendations. Cut and fill under 5 feet should be limited to 2:1 max slope.

8. Gutters are to extend along all roof lines and lead to down spouts. In turn, down spouts should lead to pipes carrying roof runoff away from the building site, as well as any fill or foundations that may adversely affect the site soil or adjacent slopes.

9. Floor slabs should be reinforced and be underlain by at least 2” of sand over a vapor barrier over 4" of class 2 aggregate bases with limited fines to act as a capillary moisture break. Contractor and owners are responsible for determining the extent of waterproofing methods necessary and implementing the appropriate measures as described in recommendation #11 and shall be aware of the current recommendations and guidelines for slabs below grade according to the American Concrete Institute.

10. All foundation design and construction shall be in conformance with Chapter 18 of the 2022 CBC or current code at time of permit issuance. All footings are to meet local requirements for seismic criteria, as required by the 2022 CBC. Seismic design parameters have been included in this report based on latitude and longitude values taken from the Humboldt County Web GIS website (County of Humboldt)

11. It is recommended that any floor space at or below existing grade level that will be used as inhabitable areas, or for storage, shall be appropriately damp-proofed or waterproofed as described in Section 1805 of the 2022 CBC. These appropriate measures at minimum will constitute installation of 6-mil vapor barrier or equivalent against the foundation or retaining wall, along with drain rock a minimum of 12” thick to the bottom of the footing and made to drain by 4” perforated pipe tight-lines to daylight away from the foundation soils.

12. It is recommended that slabs below grade used for living space be underlain with a minimum of 6” of open graded aggregate instead of 4” as described in recommendation #7 for an increased protection from capillary water infiltration. Additional or superior

measures may include installation of sub-slab drainage pipes or geo-textile membranes and should be installed according to current standards of practice.

13. Retaining walls over 4 feet are not anticipated based on the review of the development. Retaining walls shall be designed for a 2:1 or less backfill slope using an active pressure of 45 psf/f, at rest pressure of 60 psf/f, passive pressure of 300 pcf, and a soil friction factor of 0.4. For purposes of potential groundwater table loads for permanent or temporary retaining walls or shoring, and where drainage is not provided to alleviate hydrostatic water pressure, calculated loads shall include water surcharge loads as high as 2 feet below existing ground level unless further investigation of groundwater table is conducted. Temporary shoring excavations shall be in accordance with CAL OSHA requirements.

Conclusion

It is the opinion of this office based upon the review conducted of the site and surrounding topography, that no further geological evaluation is required for purposes of construction of site improvements and lot suitability for a residential subdivision; therefore, no additional specific geologist or geotechnical engineer consultation is warranted.

It has been assumed that observed soils are representative of the entire subsurface conditions on the property in question. If it is found during construction that subsoil conditions differ from those described, the conclusions and recommendations of this report should be considered invalid unless the changes are reviewed and the conclusions and recommendations are modified or approved in writing. This analysis was conducted in accordance with the standards maintained by professionals in the engineering field for the purposes as described herein. Therefore, the findings presented are considered representative of site conditions and probable site behavior based on this investigation. Due to the inexact nature of many engineering analyses, there can be no absolute guarantee or warranty expressed or implied. Enclosed in this report are site maps, Assessor's Parcel Maps, and geologic maps as referenced

Enclosed are supporting soil testing logs and site plan layout as referenced, and related property and topography maps for the subject property as available at the time of report preparation. An environmental hazards investigation was not in the scope of this report.

If you have any questions regarding this report, please feel free to contact this office at (707) 725-5182.

Sincerely,

Allan M. Braid
Principal, RCE#23681

References

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Appendix

Assessor's Parcel Maps, pg. 10

Soil Test Site Plan, pg. 11

Topographic Map, pg. 12

Flood Map, 100-year, pg. 13

Fault Activity Map, pg. 14

Seismic Design Parameters, pg. 15

Soil Profile TH#1, pg. 16

Soil Profile TH#2, pg. 17

Soil Profile TH#3, pg. 18

Soil Profile TH#4, pg. 19

Soil Profile TH#5, pg. 20

Soil Texture TH#1 @ 18", pg. 21

Soil Texture TH#1 @ 48", pg.22

Soil Texture TH#2 @ 24", pg. 23

Soil Texture TH#2 @ 48", pg. 24

Soil Texture TH#3 @ 18", pg. 25

Soil Texture TH#3 @ 48", pg. 26

Soil Texture TH#4 @ 18", pg. 27

Soil Texture TH#4 @ 48", pg. 28

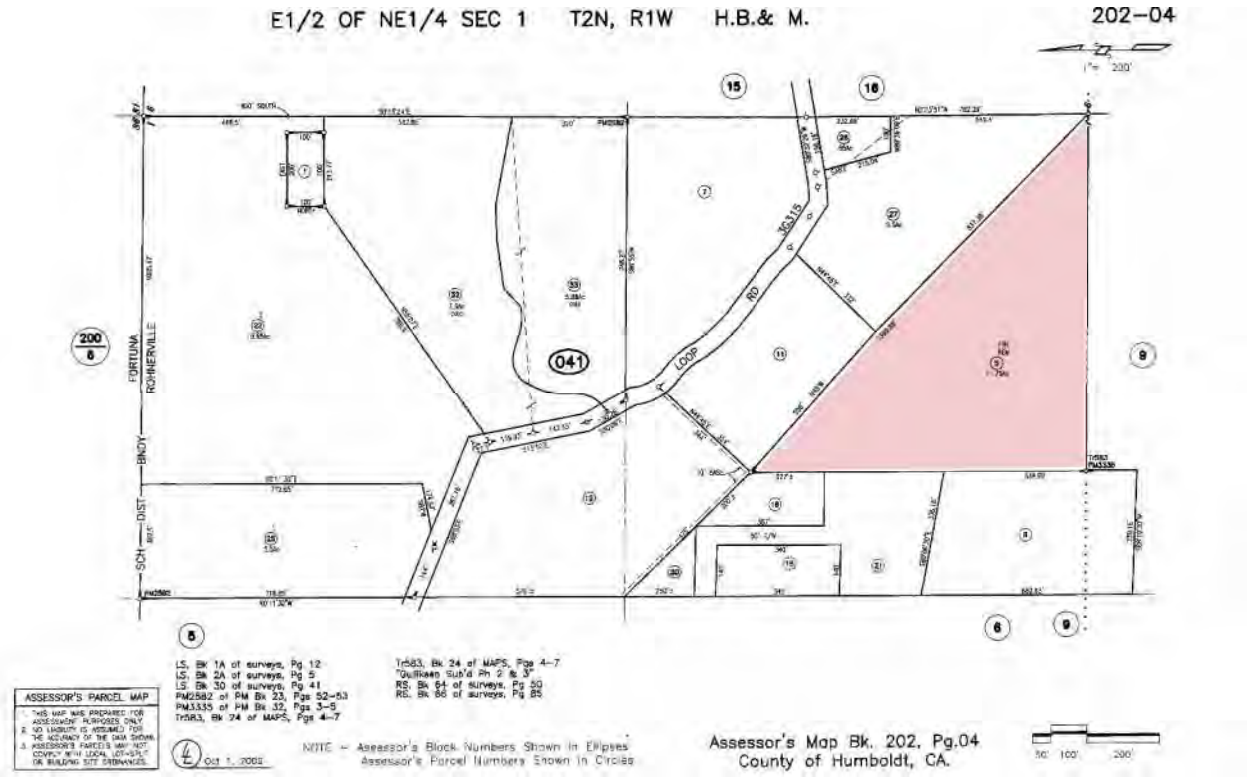
Soil Texture TH#5 @ 24", pg. 29

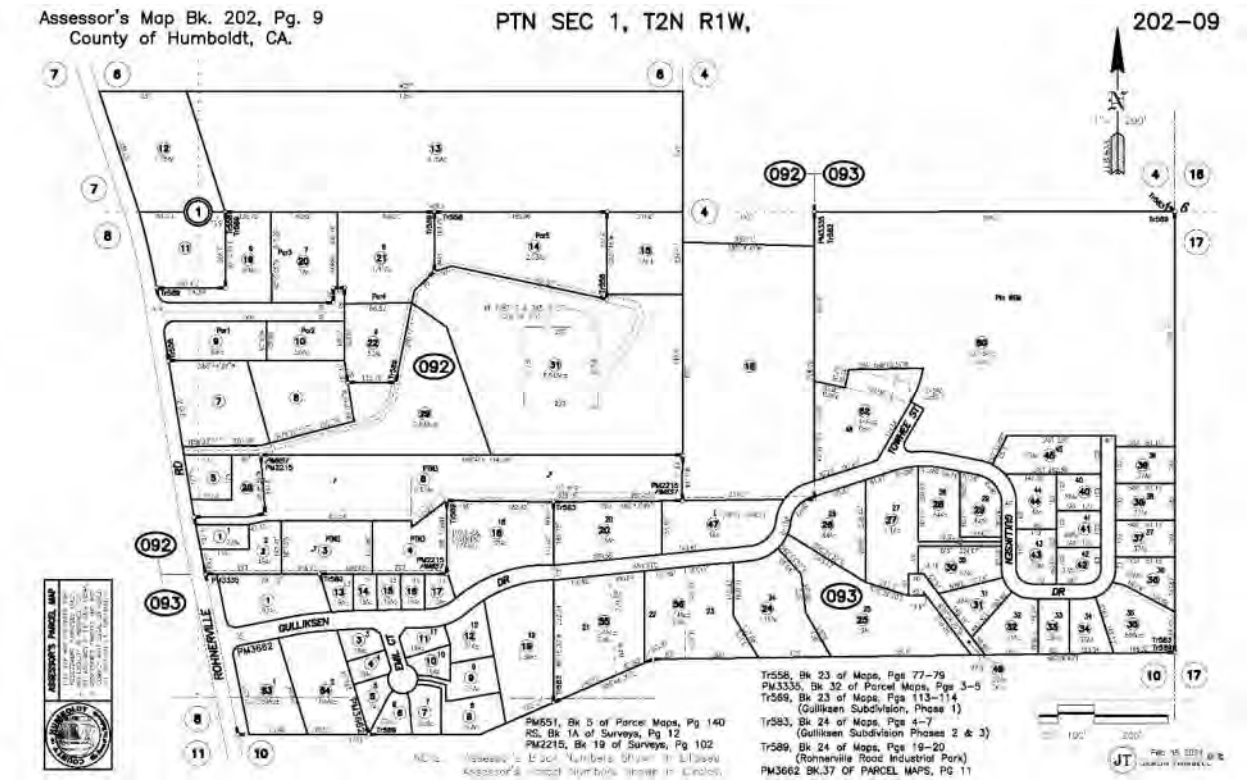
Soil Texture TH#5 @ 48", pg. 30

Soil Chart, pg. 31

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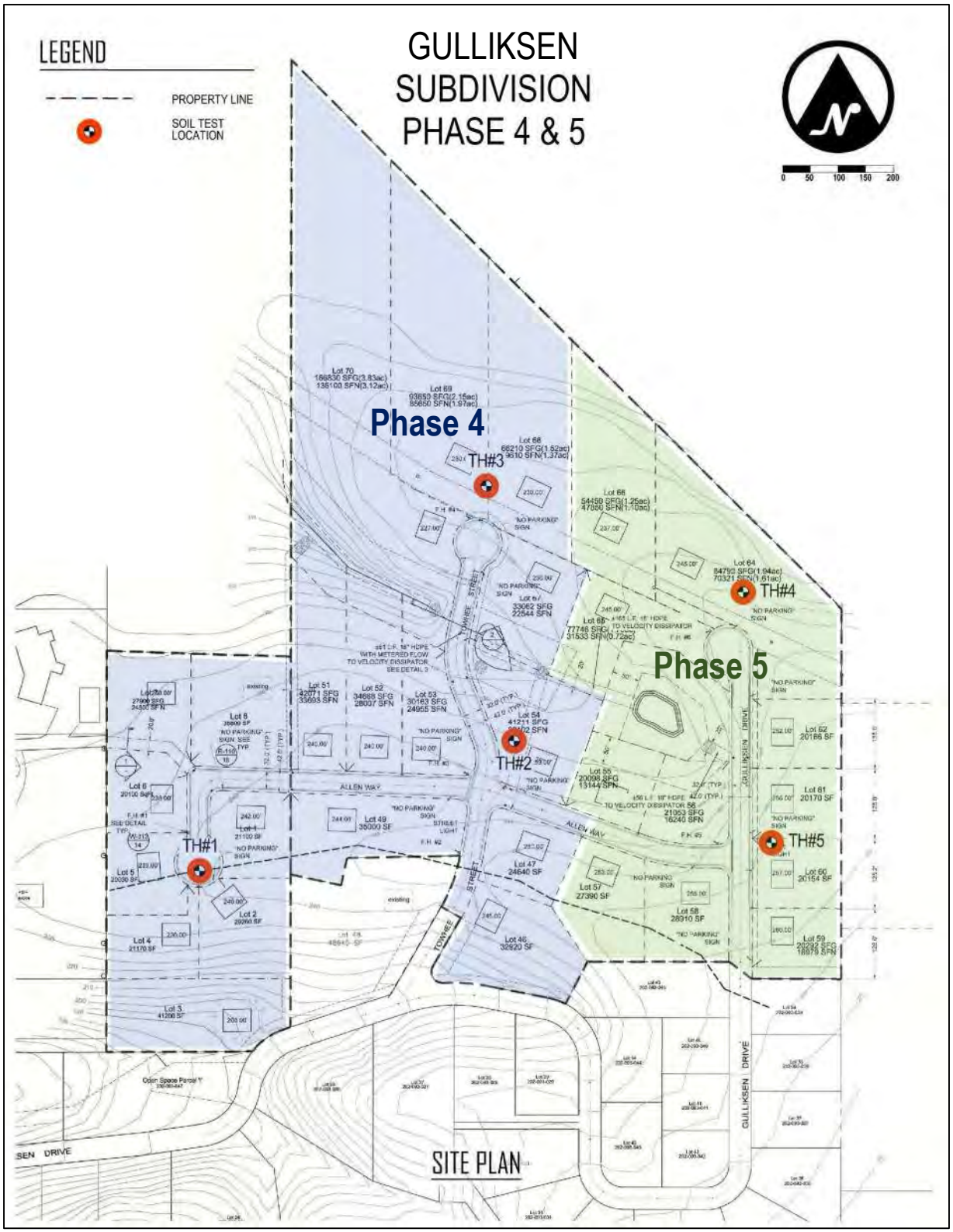
Assessor's Parcel Maps





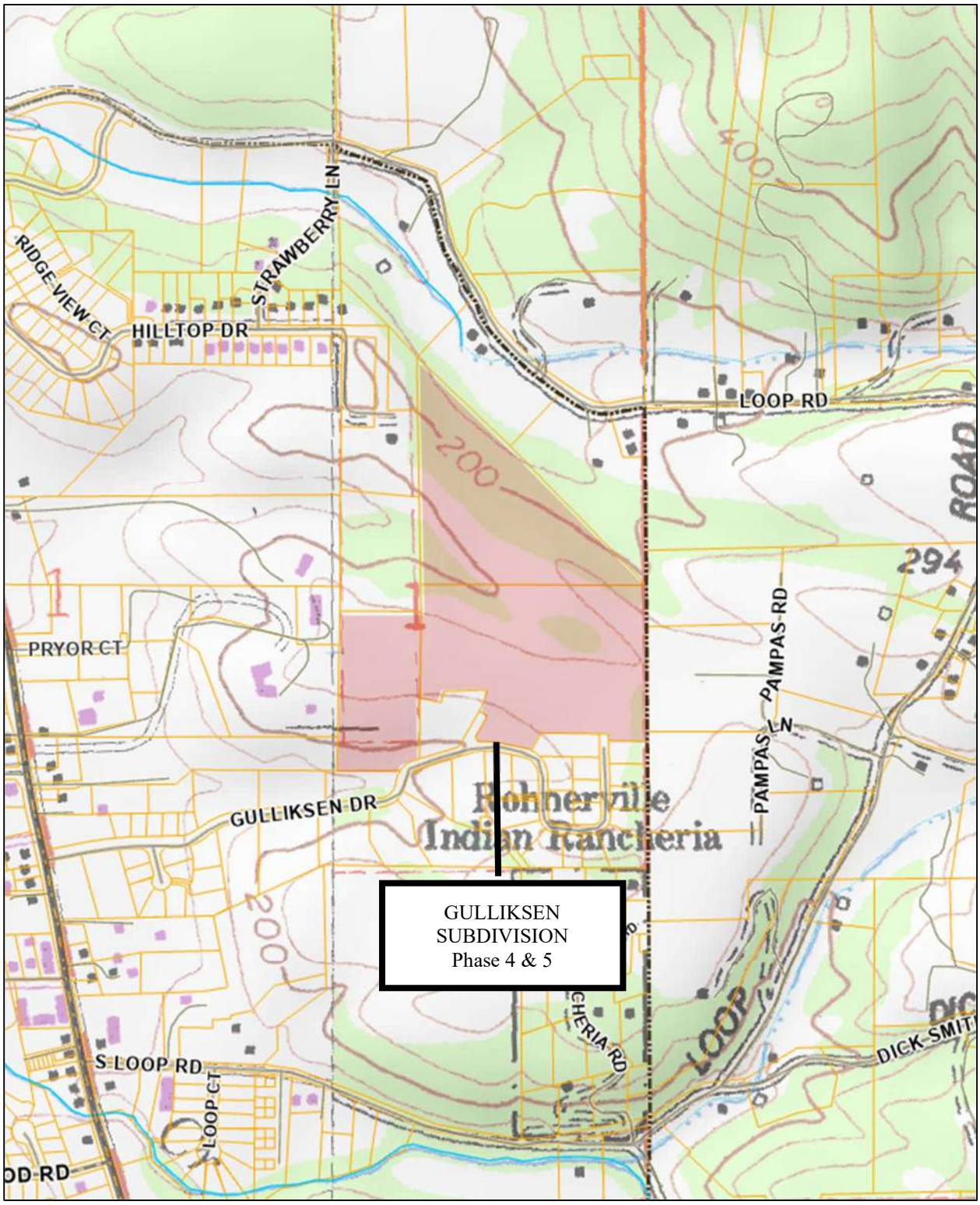
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Soil Test Site Plan



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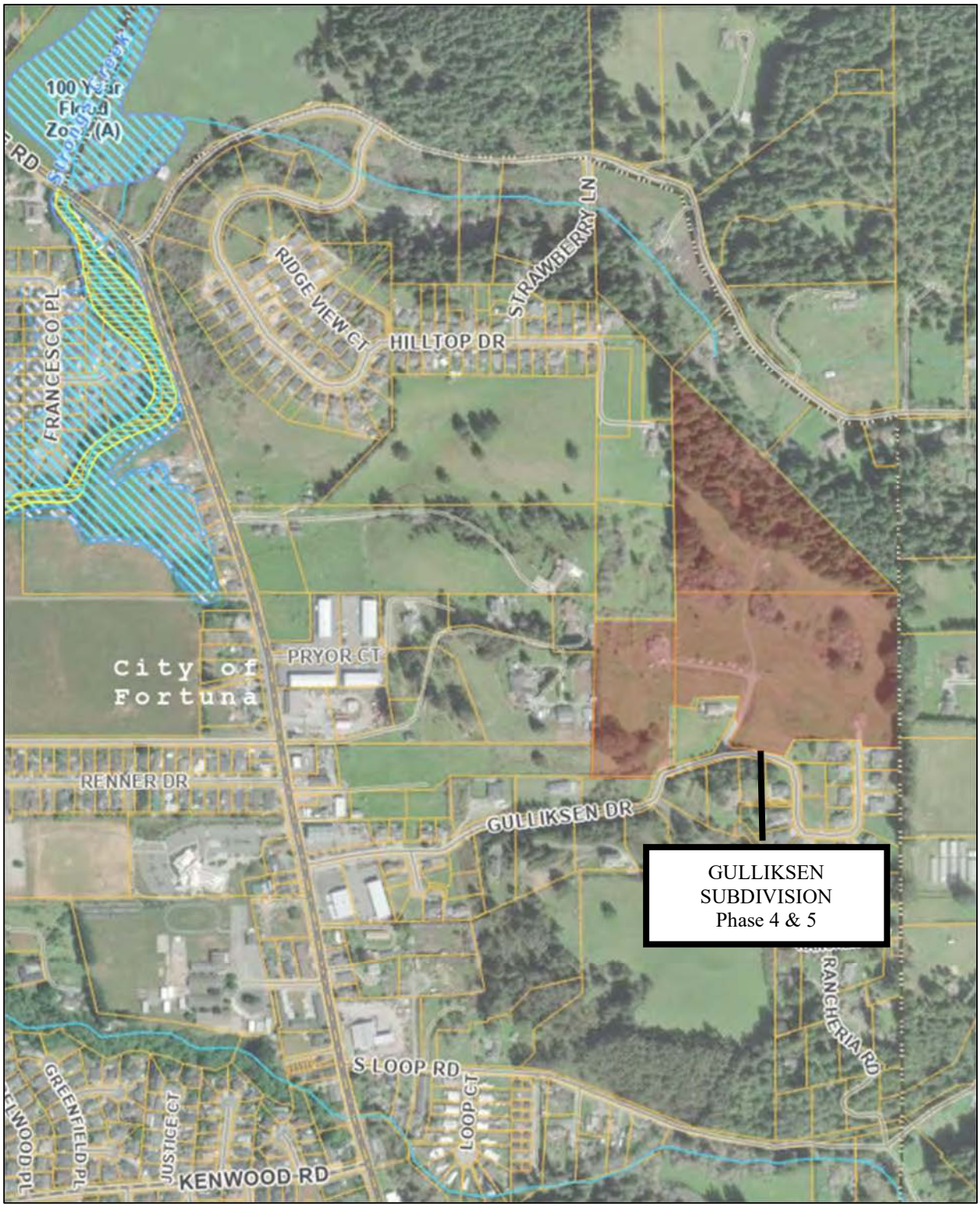
Topographic Map



Reference: United States Geological Survey, Fortuna Quadrangle, 7.5 min series.

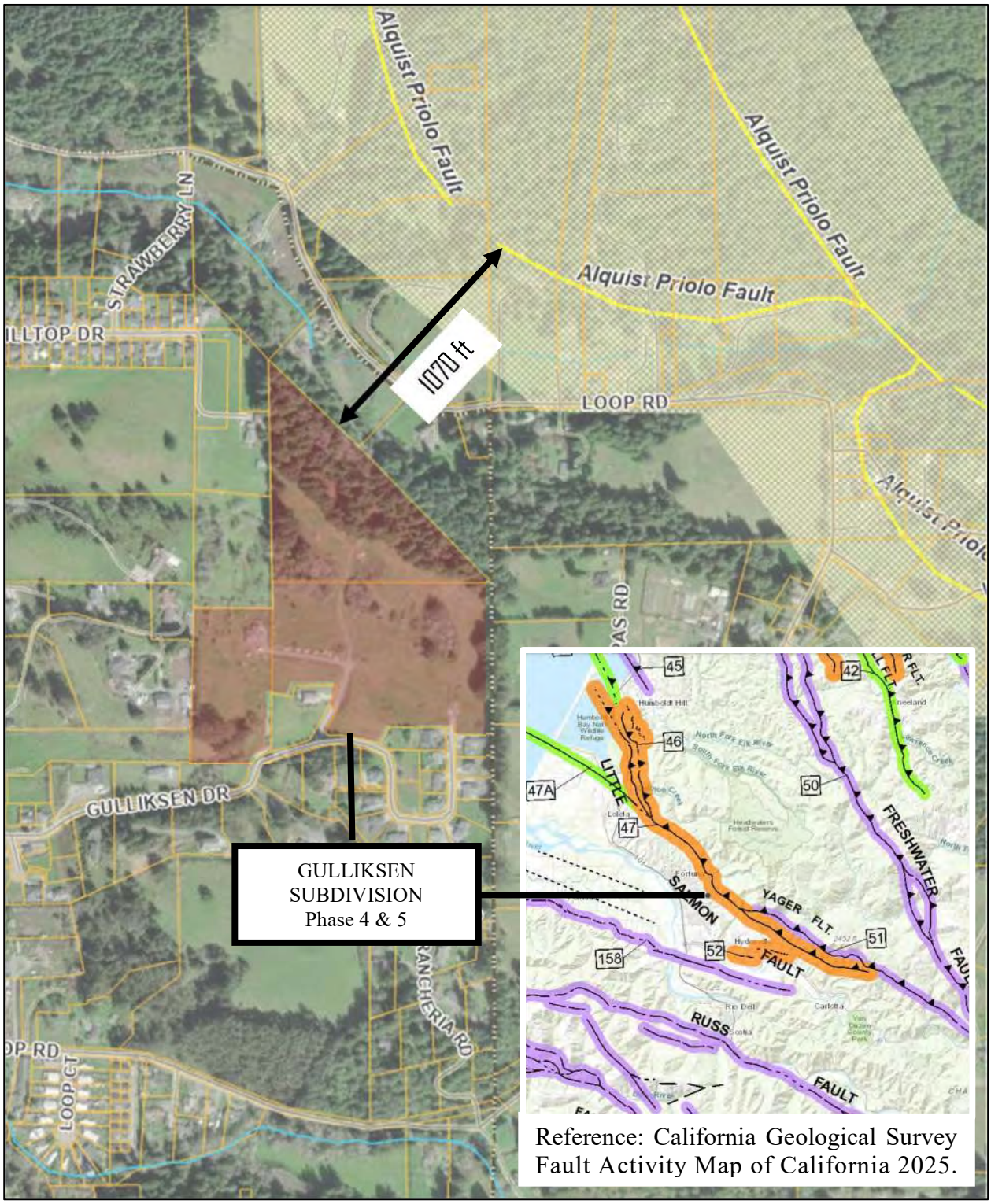
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Flood Map, 100-yr



Reference: County of Humboldt GIS FEMA Flood mapping layer.

Fault Activity Map



Reference: County of Humboldt Online GIS Earthquake Faults mapping layer 2024.

Seismic Design Parameters

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

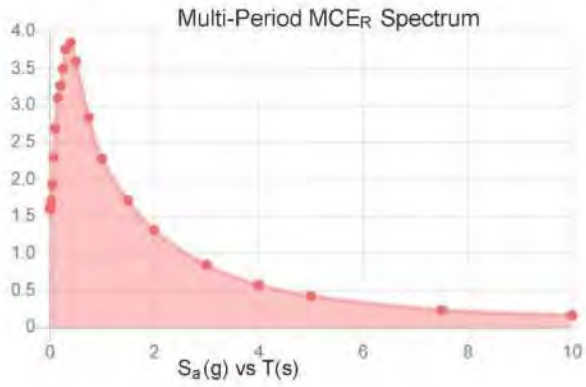
Seismic

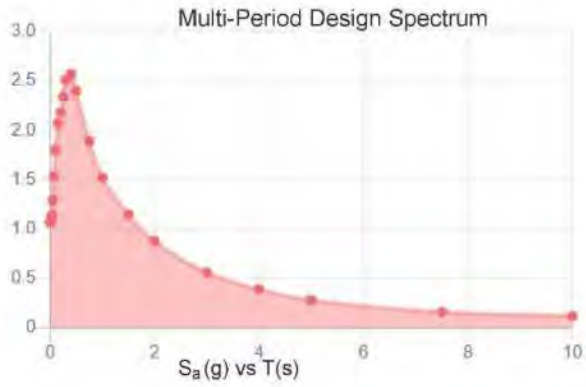
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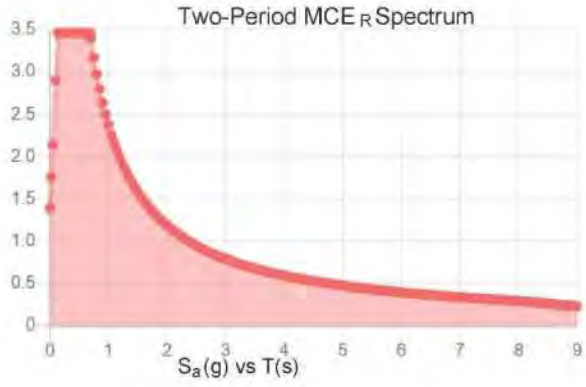
Results:

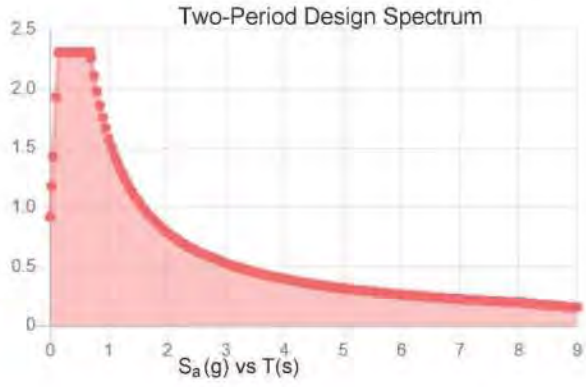
PGA_M :	1.38	T_L :	8
S_{MS} :	3.46	S_S :	3.01
S_{M1} :	2.38	S_1 :	1.15
S_{DS} :	2.31	V_{S30} :	260
S_{D1} :	1.58		

Seismic Design Category: E









MCE_R Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

Design Vertical Response Spectrum

Vertical ground motion data has not yet been made available by USGS.

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Soil Profile TH#1

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	1	LOGGED BY:	AMB

DEPTH (ft)	DESCRIPTION	COLOR	SAMPLE DEPTH	SOIL CLASS
0				
0.5	TOP SOIL , ROOTS			LOAM
1.0	MUNSELL COLOR: 10 YR 3/3 - dark brown COARSE (%): <5% ROOTS: few to none STRUCTURE: crumb CONSISTENCY: non-sticky , little to no plasticity GROUNDWATER: seep @ 12"-18"		•	LOAM
1.5	~~~~~~ Water seepage			
2.0				
2.5				
3.0	MUNSELL COLOR: 10 YR 5/8 - yellowish brown COARSE (%): <5% ROOTS: none STRUCTURE: blocky CONSISTENCY: sticky , plastic GROUNDWATER: seep above			LOAM
3.5				
4.0				
4.5				
5.0			•	
5.5				
6.0				
6.5				
7.0				
7.5				
8.0				
8.5				
9.0				
9.5				
10.0				

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Soil Profile TH#2

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	2	LOGGED BY:	AMB

DEPTH (ft)	DESCRIPTION	COLOR	SAMPLE DEPTH	SOIL CLASS
0	TOP SOIL , ROOTS			LOAM
0.5 – 1.0 – 1.5	MUNSELL COLOR: 10 YR 2/2 - very dark brown COARSE (%): <5% ROOTS: few to none STRUCTURE: crumb CONSISTENCY: non-sticky , little to no plasticity GROUNDWATER: seep @ 12"-18"		•	LOAM
2.0 – 2.5 – 3.0 – 3.5 – 4.0 – 4.5 – 5.0	~~~~~~ Water seepage MUNSELL COLOR: 10 YR 5/8 - yellowish brown COARSE (%): <5% ROOTS: none STRUCTURE: blocky CONSISTENCY: sticky , plastic GROUNDWATER: seep above		•	LOAM
5.5 – 6.0 – 6.5 – 7.0 – 7.5 – 8.0 – 8.5 – 9.0 – 9.5 – 10.0				

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Soil Profile TH#3

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	3	LOGGED BY:	AMB

DEPTH (ft)	DESCRIPTION	COLOR	SAMPLE DEPTH	SOIL CLASS
0	TOP SOIL , ROOTS			LOAM
0.5 – 1.0 – 1.5	MUNSELL COLOR: 10 YR 3/3 - dark brown COARSE (%): <5% ROOTS: few STRUCTURE: crumb CONSISTENCY: non-sticky , little to no plasticity GROUNDWATER: seep @ 12"-18"		•	SANDY CLAY LOAM
2.0 – 2.5	Water seepage			
3.0 – 3.5 – 4.0 – 4.5 – 5.0	MUNSELL COLOR: 10 YR 4/6 - dark yellowish brown COARSE (%): <5% ROOTS: none STRUCTURE: blocky CONSISTENCY: sticky , plastic GROUNDWATER: seep above		•	SILT LOAM
5.5 – 6.0 – 6.5 – 7.0 – 7.5 – 8.0 – 8.5 – 9.0 – 9.5 – 10.0				

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Soil Profile TH#4

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	4	LOGGED BY:	AMB

DEPTH (ft)	DESCRIPTION	COLOR	SAMPLE DEPTH	SOIL CLASS
0	TOP SOIL , NO ROOTS			LOAM
0.5	MUNSELL COLOR: 10 YR 3/3 - dark brown COARSE (%): <5% ROOTS: few to none STRUCTURE: crumb CONSISTENCY: non-sticky , little to no plasticity GROUNDWATER: seep @ 12"-18"		•	LOAM
1.5				
2.0	Water seepage			
2.5				
3.0	MUNSELL COLOR: 10 YR 4/6 - dark yellowish brown COARSE (%): <5% ROOTS: none STRUCTURE: blocky CONSISTENCY: sticky , plastic GROUNDWATER: seep above			LOAM
3.5				
4.0				
4.5			•	
5.0				
5.5				
6.0				
6.5				
7.0				
7.5				
8.0				
8.5				
9.0				
9.5				
10.0				

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Soil Profile TH#5

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	5	LOGGED BY:	AMB

DEPTH (ft)	DESCRIPTION	COLOR	SAMPLE DEPTH	SOIL CLASS
0	TOP SOIL , ROOTS			LOAM
0.5 – 1.0 – 1.5	MUNSELL COLOR: 10 YR 2/2 - very dark brown COARSE (%): <5% ROOTS: few to none STRUCTURE: crumb CONSISTENCY: non-sticky , little to no plasticity GROUNDWATER: seep @ 24"		•	LOAM
2.0 – 2.5	Water seepage			
3.0 – 3.5 – 4.0 – 4.5	MUNSELL COLOR: 10 YR 5/6 - yellowish brown COARSE (%): <5% ROOTS: none STRUCTURE: blocky CONSISTENCY: sticky , plastic GROUNDWATER: seep above		•	LOAM
5.0 – 5.5 – 6.0 – 6.5 – 7.0 – 7.5 – 8.0 – 8.5 – 9.0 – 9.5 – 10.0				

Soil Texture TH#1 @ 18”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	1 @ 18"	LOGGED BY:	AMB / CPL
TH1 -1	SAMPLE NUMBER		
1.5	DEPTH (ft)		
750.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
17.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
64.0	C. TEMP @ 40 SEC. (°F)		
60.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.3	E. COMPOSITE CORRECTION (gm/l)		
52.7	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
64.0	G. TEMP @ 2.0 HRS. (°F)		
23.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-7.3	I. COMPOSITE CORRECTION (gm/l)		
15.7	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
29.7	K. %SAND [100-(F/A *100)]		
20.9	L. %CLAY [J/A *100]		
49.3	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
70.3	P. COMBINED %SILT AND CLAY [L+M]		
2.3	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.3	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

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Soil Texture TH#1 @ 48”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	1 @ 48"	LOGGED BY:	AMB / CPL
TH1 - 2	SAMPLE NUMBER		
4.0	DEPTH (ft)		
710.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
21.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
64.0	C. TEMP @ 40 SEC. (°F)		
55.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.3	E. COMPOSITE CORRECTION (gm/l)		
47.7	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
66.0	G. TEMP @ 2.0 HRS. (°F)		
26.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-6.9	I. COMPOSITE CORRECTION (gm/l)		
19.1	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
36.4	K. %SAND [100-(F/A *100)]		
25.5	L. %CLAY [J/A *100]		
38.1	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
63.6	P. COMBINED %SILT AND CLAY [L+M]		
3.0	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.3	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#2 @ 24”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	2 @ 18"	LOGGED BY:	AMB / CPL
TH2 -1	SAMPLE NUMBER		
1.5	DEPTH (ft)		
710.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
21.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
64.0	C. TEMP @ 40 SEC. (°F)		
45.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.3	E. COMPOSITE CORRECTION (gm/l)		
37.7	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
66.0	G. TEMP @ 2.0 HRS. (°F)		
16.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-6.9	I. COMPOSITE CORRECTION (gm/l)		
9.1	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
49.7	K. %SAND [100-(F/A *100)]		
12.1	L. %CLAY [J/A *100]		
38.1	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
50.3	P. COMBINED %SILT AND CLAY [L+M]		
3.0	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.3	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#2 @ 48”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	2 @ 48"	LOGGED BY:	AMB / CPL
TH2 - 2	SAMPLE NUMBER		
4.0	DEPTH (ft)		
904.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
68.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
62.0	C. TEMP @ 40 SEC. (°F)		
45.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.7	E. COMPOSITE CORRECTION (gm/l)		
37.3	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
64.0	G. TEMP @ 2.0 HRS. (°F)		
15.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-7.3	I. COMPOSITE CORRECTION (gm/l)		
7.7	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
50.3	K. %SAND [100-(F/A *100)]		
10.3	L. %CLAY [J/A *100]		
39.5	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
49.7	P. COMBINED %SILT AND CLAY [L+M]		
7.5	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.9	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#3 @ 18”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	3 @ 18"	LOGGED BY:	AMB / CPL
TH3 -1	SAMPLE NUMBER		
1.5	DEPTH (ft)		
750.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
32.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
60.0	C. TEMP @ 40 SEC. (°F)		
45.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-8.1	E. COMPOSITE CORRECTION (gm/l)		
36.9	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
62.0	G. TEMP @ 2.0 HRS. (°F)		
26.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-7.7	I. COMPOSITE CORRECTION (gm/l)		
18.3	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
50.8	K. %SAND [100-(F/A *100)]		
24.4	L. %CLAY [J/A *100]		
24.8	M. %SILT [100-K-L]		
Sandy Clay Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
49.2	P. COMBINED %SILT AND CLAY [L+M]		
4.3	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.5	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#3 @ 48”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	3 @ 48"	LOGGED BY:	AMB / CPL
TH3 - 2	SAMPLE NUMBER		
4.0	DEPTH (ft)		
780.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
16.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
64.0	C. TEMP @ 40 SEC. (°F)		
54.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.3	E. COMPOSITE CORRECTION (gm/l)		
46.7	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
66.0	G. TEMP @ 2.0 HRS. (°F)		
15.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-6.9	I. COMPOSITE CORRECTION (gm/l)		
8.1	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
37.7	K. %SAND [100-(F/A *100)]		
10.8	L. %CLAY [J/A *100]		
51.5	M. %SILT [100-K-L]		
Silt Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
62.3	P. COMBINED %SILT AND CLAY [L+M]		
2.1	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.2	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#4 @ 18”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	4 @ 18"	LOGGED BY:	AMB / CPL
TH4 -1	SAMPLE NUMBER		
1.5	DEPTH (ft)		
772.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
23.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
64.0	C. TEMP @ 40 SEC. (°F)		
50.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.3	E. COMPOSITE CORRECTION (gm/l)		
42.7	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
66.0	G. TEMP @ 2.0 HRS. (°F)		
17.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-6.9	I. COMPOSITE CORRECTION (gm/l)		
10.1	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
43.1	K. %SAND [100-(F/A *100)]		
13.5	L. %CLAY [J/A *100]		
43.5	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
56.9	P. COMBINED %SILT AND CLAY [L+M]		
3.0	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.3	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#4 @ 48”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	4 @ 48"	LOGGED BY:	AMB / CPL
TH4 - 2	SAMPLE NUMBER		
4.0	DEPTH (ft)		
845.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
16.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
60.0	C. TEMP @ 40 SEC. (°F)		
51.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-8.1	E. COMPOSITE CORRECTION (gm/l)		
42.9	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
62.0	G. TEMP @ 2.0 HRS. (°F)		
20.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-7.7	I. COMPOSITE CORRECTION (gm/l)		
12.3	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
42.8	K. %SAND [100-(F/A *100)]		
16.4	L. %CLAY [J/A *100]		
40.8	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
57.2	P. COMBINED %SILT AND CLAY [L+M]		
1.9	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.2	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

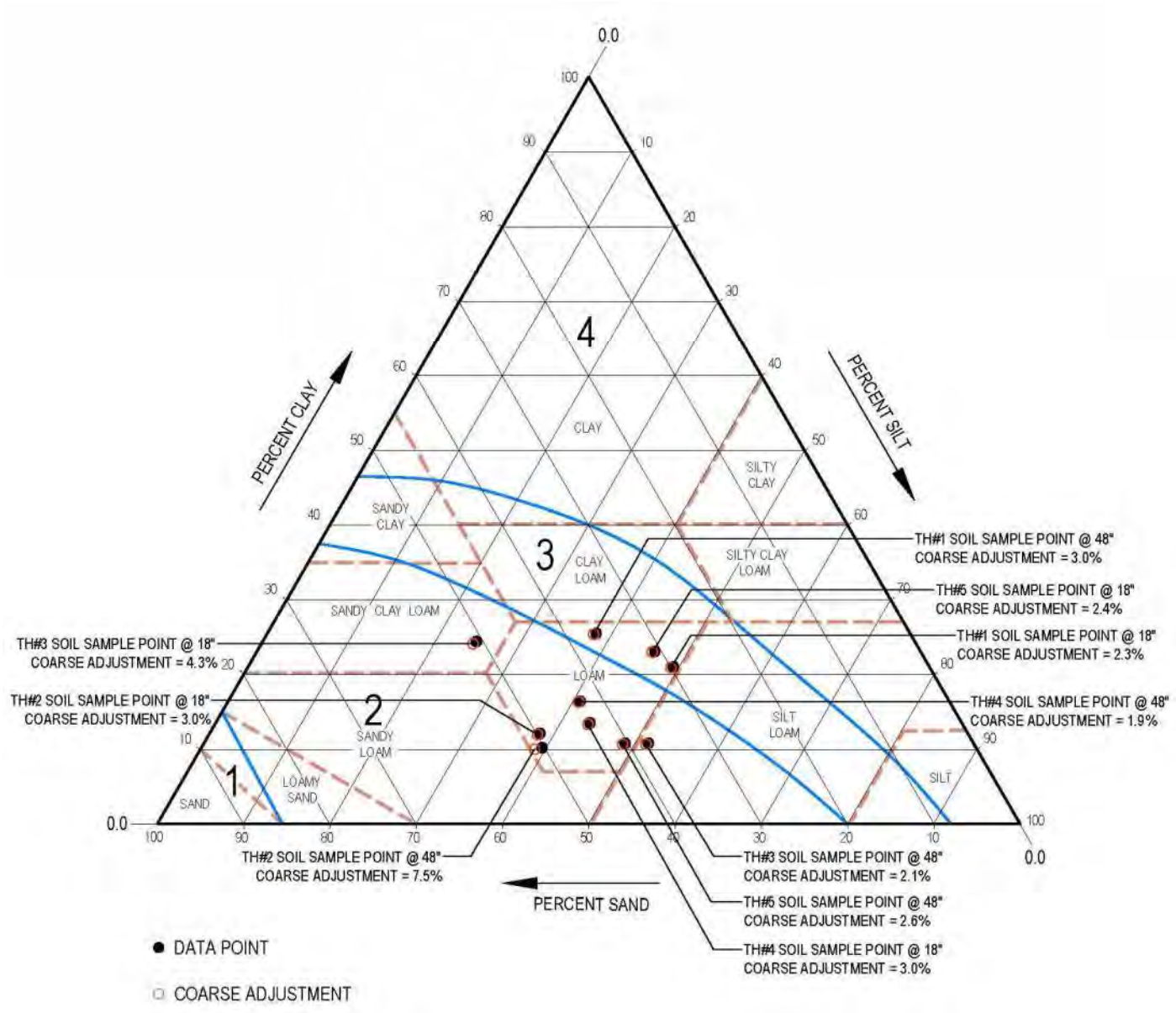
Soil Texture TH#5 @ 18”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	5 @ 18"	LOGGED BY:	AMB / CPL
TH5 -1	SAMPLE NUMBER		
1.5	DEPTH (ft)		
760.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
18.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
60.0	C. TEMP @ 40 SEC. (°F)		
60.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-8.1	E. COMPOSITE CORRECTION (gm/l)		
51.9	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
62.0	G. TEMP @ 2.0 HRS. (°F)		
25.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-7.7	I. COMPOSITE CORRECTION (gm/l)		
17.3	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
30.8	K. %SAND [100-(F/A *100)]		
23.1	L. %CLAY [J/A *100]		
46.1	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
69.2	P. COMBINED %SILT AND CLAY [L+M]		
2.4	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.3	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Texture TH#5 @ 48”

PROJECT NAME:	WENDT CONSTRUCTION	DATE OF EXCAVATION:	02-07-25
PROJECT #:	24-092-142	EXCAVATION METHOD:	EXCAVATOR / HAND
TEST HOLE #:	5 @ 48"	LOGGED BY:	AMB / CPL
TH5 - 2	SAMPLE NUMBER		
48.0	DEPTH (ft)		
772.0	TOTAL DRIED SAMPLE WEIGHT (gm)		
20.0	COARSE WEIGHT (gm)		
75.0	A. OVENDRY WEIGHT (gm)		
9:01:00 AM	B. STARTING TIME (hh:mm:ss)		
64.0	C. TEMP @ 40 SEC. (°F)		
52.0	D. HYDROMETER READING @ 40 SEC. (gm/l)		
-7.3	E. COMPOSITE CORRECTION (gm/l)		
44.7	F. TRUE DENSITY @ 40 SEC. (gm/l) [D-E]		
66.0	G. TEMP @ 2.0 HRS. (°F)		
15.0	H. HYDROMETER READING @ 2.0 HRS. (gm/l)		
-6.9	I. COMPOSITE CORRECTION (gm/l)		
8.1	J. TRUE DENSITY @ 2.0 HRS. (gm/l) [H-I]		
40.4	K. %SAND [100-(F/A *100)]		
10.8	L. %CLAY [J/A *100]		
48.8	M. %SILT [100-K-L]		
Loam	N. USDA TEXTURE		
2	O. SOIL PERCOLATION SUITABILITY CHART ZONE		
59.6	P. COMBINED %SILT AND CLAY [L+M]		
2.6	Q. COARSE %BY WEIGHT [COARSE WEIGHT/A *100]		
0.3	R. %COARSE ADJUSTMENT [0.000006Q^3+0.00012Q^2+0.11936Q-0.01882]		

Soil Chart


PERCENT CLAY
PERCENT SILT
PERCENT SAND
CLAY
SILTY CLAY
SANDY CLAY
CLAY LOAM
SILTY CLAY LOAM
SANDY CLAY LOAM
LOAM
SILT LOAM
SANDY LOAM
LOAMY SAND
SAND
SILT
1
2
3
4
TH#1 SOIL SAMPLE POINT @ 48" COARSE ADJUSTMENT = 3.0%
TH#5 SOIL SAMPLE POINT @ 18" COARSE ADJUSTMENT = 2.4%
TH#1 SOIL SAMPLE POINT @ 18" COARSE ADJUSTMENT = 2.3%
TH#4 SOIL SAMPLE POINT @ 48" COARSE ADJUSTMENT = 1.9%
TH#3 SOIL SAMPLE POINT @ 18" COARSE ADJUSTMENT = 4.3%
TH#2 SOIL SAMPLE POINT @ 18" COARSE ADJUSTMENT = 3.0%
TH#2 SOIL SAMPLE POINT @ 48" COARSE ADJUSTMENT = 7.5%
TH#3 SOIL SAMPLE POINT @ 48" COARSE ADJUSTMENT = 2.1%
TH#5 SOIL SAMPLE POINT @ 48" COARSE ADJUSTMENT = 2.6%
TH#4 SOIL SAMPLE POINT @ 18" COARSE ADJUSTMENT = 3.0%
DATA POINT
COARSE ADJUSTMENT

Attachment F: Technical Advisory on Evaluating Transportation Impacts in CEQA

TECHNICAL ADVISORY

ON EVALUATING TRANSPORTATION IMPACTS IN CEQA



April 2018

Contents

A. Introduction 1

B. Background 1

C. Technical Considerations in Assessing Vehicle Miles Traveled 3

1. Recommendations Regarding Methodology 3

D. General Principles to Guide Consideration of VMT 5

E. Recommendations Regarding Significance Thresholds 6

1. Screening Thresholds for Land Use Projects 10

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects 12

3. Recommendations Regarding Land Use Plans 15

4. Other Considerations 15

F. Considering the Effects of Transportation Projects on Vehicle Travel 16

1. Recommended Significance Threshold for Transportation Projects 18

2. Estimating VMT Impacts from Transportation Projects 19

G. Analyzing Other Impacts Related to Transportation 21

H. VMT Mitigation and Alternatives 22

Appendix 1. Considerations About Which VMT to Count 25

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches 28

A. Introduction

This technical advisory is one in a series of advisories provided by the Governor's Office of Planning and Research (OPR) as a service to professional planners, land use officials, and CEQA practitioners. OPR issues technical assistance on issues that broadly affect the practice of land use planning and the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). (Gov. Code, § 65040, subds. (g), (l), (m).) The purpose of this document is to provide advice and recommendations, which agencies and other entities may use at their discretion. This document does not alter lead agency discretion in preparing environmental documents subject to CEQA. This document should not be construed as legal advice.

Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. As one appellate court recently explained: "During the last 10 years, the Legislature has charted a course of long-term sustainability based on denser infill development, reduced reliance on individual vehicles and improved mass transit, all with the goal of reducing greenhouse gas emissions. Section 21099 is part of that strategy . . . ." (*Covina Residents for Responsible Development v. City of Covina* (Feb. 28, 2018, B279590) __Cal.App.5th__, ordered pub. Mar. 22, 2018.) Pursuant to Section 21099, the criteria for determining the significance of transportation impacts must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." (*Id.*, subd. (b)(1).) To that end, OPR has proposed changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. Once the California Natural Resources Agency adopts these changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally will no longer constitute a significant environmental effect under CEQA.

This advisory contains technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. Again, OPR provides this Technical Advisory as a resource for the public to use at their discretion. OPR is not enforcing or attempting to enforce any part of the recommendations contained herein. (Gov. Code, § 65035 ["It is not the intent of the Legislature to vest in the Office of Planning and Research any direct operating or regulatory powers over land use, public works, or other state, regional, or local projects or programs."].)

This April 2018 technical advisory is an update to the advisory it published in November 2017. OPR will continue to monitor implementation of these new provisions and may update or supplement this advisory in response to new information and advancements in modeling and methods.

B. Background

VMT and Greenhouse Gas Emissions Reduction. Senate Bill 32 (Pavley, 2016) requires California to reduce greenhouse gas emissions 40 percent below 1990 levels by 2030, and Executive Order B-16-12

provides a target of 80 percent below 1990 emissions levels for the transportation sector by 2050. The transportation sector has three major means of reducing greenhouse gas emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth.

VMT and Other Impacts to Health and Environment. Beyond greenhouse gas emissions, increases in VMT also impact human health and the natural environment. Human health is impacted as increases in vehicle travel leads to more vehicle crashes, poorer air quality, increases in chronic diseases associated with reduced physical activity, and worse mental health. Increases in vehicle travel also negatively affects other road users, including pedestrians, cyclists, other motorists, and many transit users. The natural environment is impacted as higher VMT leads to more collisions with wildlife and fragments habitat. Additionally, development which leads to more vehicle travel also tends to consume more energy, water, and open space (including farmland and sensitive habitat). This increase in impermeable surfaces raises the flood risk and pollutant transport into waterways. (Fang et al., 2017.)

VMT and Economic Growth. While it was previously believed that VMT growth was a necessary component of economic growth, data from the past two decades shows that economic growth is possible without a concomitant increase in VMT. (Figure 1.) Recent research shows that requiring development projects to mitigate LOS may actually reduce accessibility to destinations and impede economic growth.[1,2]

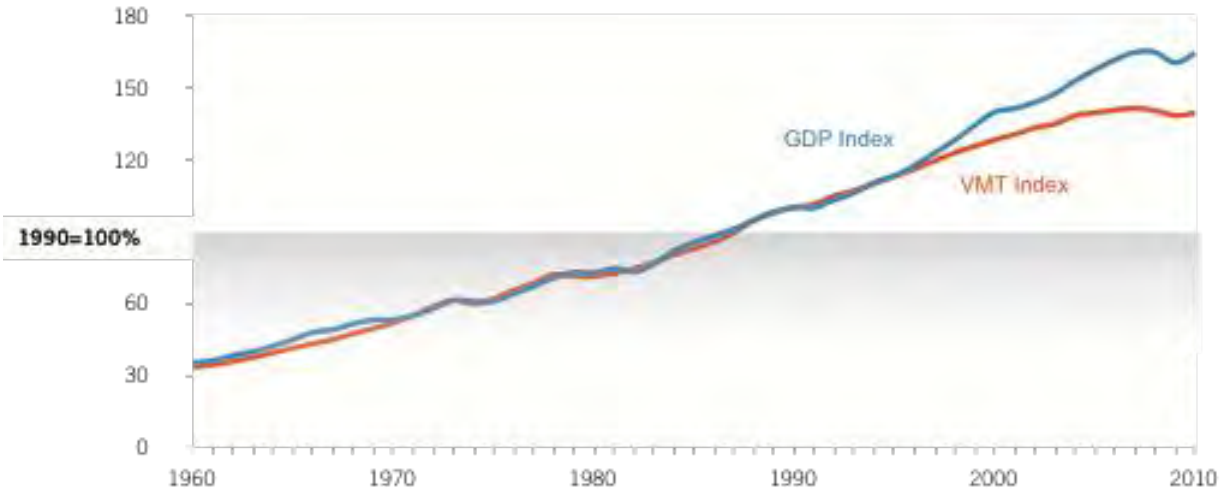


Figure 1. VMT and Gross Domestic Product (GDP), 1960-2010 (Kooshian and Winkelman, 2011)

[1] Haynes et al., *Congested Development: A Study of Traffic Delays, Access, and Economic Activity in Metropolitan Los Angeles*, Sept. 2015.

[2] Osman et al., *Not So Fast: A Study of Traffic Delays, Access, and Economic Activity in the San Francisco Bay Area*, March 2016.

C. Technical Considerations in Assessing Vehicle Miles Traveled

Many practitioners are familiar with accounting for VMT in connection with long-range planning, or as part of the CEQA analysis of a project's greenhouse gas emissions or energy impacts. This document provides technical information on how to assess VMT as part of a transportation impacts analysis under CEQA. Appendix 1 provides a description of which VMT to count and options on how to count it. Appendix 2 provides information on induced travel resulting from roadway capacity projects, including the mechanisms giving rise to induced travel, the research quantifying it, and information on additional approaches for assessing it.

1. Recommendations Regarding Methodology

Proposed Section 15064.3 explains that a "lead agency may use models to estimate a project's vehicle miles traveled . . . ." CEQA generally defers to lead agencies on the choice of methodology to analyze impacts. (*Santa Monica Baykeeper v. City of Malibu* (2011) 193 Cal.App.4th 1538, 1546; see *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 409 ["the issue is not whether the studies are irrefutable or whether they could have been better" … rather, the "relevant issue is only whether the studies are sufficiently credible to be considered" as part of the lead agency's overall evaluation].) This section provides suggestions to lead agencies regarding methodologies to analyze VMT associated with a project.

Vehicle Types. Proposed Section 15064.3, subdivision (a), states, "For the purposes of this section, 'vehicle miles traveled' refers to the amount and distance of automobile travel attributable to a project." Here, the term "automobile" refers to on-road passenger vehicles, specifically cars and light trucks. Heavy-duty truck VMT could be included for modeling convenience and ease of calculation (for example, where models or data provide combined auto and heavy truck VMT). For an apples-to-apples comparison, vehicle types considered should be consistent across project assessment, significance thresholds, and mitigation.

Residential and Office Projects. Tour- and trip-based approaches[3] offer the best methods for assessing VMT from residential/office projects and for comparing those assessments to VMT thresholds. These approaches also offer the most straightforward methods for assessing VMT reductions from mitigation measures for residential/office projects. When available, tour-based assessment is ideal because it captures travel behavior more comprehensively. But where tour-based tools or data are not available for all components of an analysis, a trip-based assessment of VMT serves as a reasonable proxy.

Models and methodologies used to calculate thresholds, estimate project VMT, and estimate VMT reduction due to mitigation should be comparable. For example:

[3] See Appendix 1, *Considerations About Which VMT to Count,* for a description of these approaches.

- A tour-based assessment of project VMT should be compared to a tour-based threshold, or a trip-based assessment to a trip-based VMT threshold.
- Where a travel demand model is used to determine thresholds, the same model should also be used to provide trip lengths as part of assessing project VMT.
- Where only trip-based estimates of VMT reduction from mitigation are available, a trip-based threshold should be used, and project VMT should be assessed in a trip-based manner.

When a trip-based method is used to analyze a residential project, the focus can be on home-based trips. Similarly, when a trip-based method is used to analyze an office project, the focus can be on home-based work trips.

When tour-based models are used to analyze an office project, either employee work tour VMT or VMT from all employee tours may be attributed to the project. This is because workplace location influences overall travel. For consistency, the significance threshold should be based on the same metric: either employee work tour VMT or VMT from all employee tours.

For office projects that feature a customer component, such as a government office that serves the public, a lead agency can analyze the customer VMT component of the project using the methodology for retail development (see below).

Retail Projects. Generally, lead agencies should analyze the effects of a retail project by assessing the change in total VMT[4] because retail projects typically re-route travel from other retail destinations. A retail project might lead to increases or decreases in VMT, depending on previously existing retail travel patterns.

Considerations for All Projects. Lead agencies should not truncate any VMT analysis because of jurisdictional or other boundaries. CEQA requires environmental analyses to reflect a "good faith effort at full disclosure." (CEQA Guidelines, § 15151.) Thus, where methodologies exist that can estimate the full extent of vehicle travel from a project, the lead agency should apply them to do so. Analyses should also consider a project's both short- and long-term effects on VMT.

Any project that includes in its geographic bounds a portion of an existing or planned Transit Priority Area (i.e., the project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high quality transit corridor) may employ VMT as its primary metric of transportation impact for the entire project. (See Pub. Resources Code, § 21099, subds. (a)(7), (b)(1).)

[4] See Appendix 1, *Considerations About Which VMT to Count, "*Assessing Change in Total VMT" section, for a description of this approach.

D. General Principles to Guide Consideration of VMT

SB 743 directs OPR to establish specific "criteria for determining the significance of transportation impacts of projects[.]" (Pub. Resources Code, § 21099, subd. (b)(1).) In establishing this criterion, OPR was guided by the general principles contained within CEQA, the CEQA Guidelines, and applicable case law.

To assist in the determination of significance, many lead agencies rely on "thresholds of significance." The CEQA Guidelines define a "threshold of significance" to mean "an identifiable **quantitative, qualitative[5] or performance level** of a particular environmental effect, non-compliance with which means the effect will ***normally*** be determined to be significant by the agency and compliance with which means the effect ***normally*** will be determined to be less than significant." (CEQA Guidelines, § 15064.7, subd. (a) (emphasis added).) Lead agencies have discretion to develop and adopt their own, or rely on thresholds recommended by other agencies, "provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence." (*Id*. at subd. (c); *Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Substantial evidence means "enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached." (*Id*. at § 15384 (emphasis added); *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099, 1108-1109.)

Additionally, the analysis leading to the determination of significance need not be perfect. The CEQA Guidelines describe the standard for adequacy of environmental analyses:

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

(CEQA Guidelines, § 15151 (emphasis added).)

These general principles guide OPR's recommendations regarding thresholds of significance for VMT set forth below.

[5] Because the amount of a project's VMT is needed (and is currently being used in practice) to assess the environmental impacts on a variety of resources (such as air quality, greenhouse gases, energy, and noise), qualitative analysis should only be applied when models or methods do not exist for undertaking a quantitative analysis.

E. Recommendations Regarding Significance Thresholds

As noted above, lead agencies have the discretion to set or apply their own thresholds of significance. (*Center for Biological Diversity v. California Dept. of Fish & Wildlife* (2015) 62 Cal.4th 204, 218-223 [lead agency had discretion to use compliance with AB 32's emissions goals as a significance threshold]; ***Save Cuyama Valley v. County of Santa Barbara*** (2013) 213 Cal.App.4th at p. 1068.) However, Section 21099 of the Public Resources Code states that the criteria for determining the significance of transportation impacts must promote: (1) reduction of greenhouse gas emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. It further directed OPR to prepare and develop criteria for determining significance. (Pub. Resources Code, § 21099, subd. (b)(1).) This section provides OPR's suggested thresholds, as well as considerations for lead agencies that choose to adopt their own thresholds.

Various legislative mandates and state policies establish quantitative greenhouse gas emissions reduction targets. For example:

- Assembly Bill 32 (2006) requires statewide greenhouse gas reductions to 1990 levels by 2020 and continued reductions beyond 2020.

- Senate Bill 32 (2016) requires at least a 40 percent reduction in greenhouse gas emissions by 2030.

- Pursuant to Senate Bill 375 (2008), the California Air Resources Board establishes greenhouse gas reduction targets for metropolitan planning organizations (MPOs) to achieve based on land use patterns and transportation systems specified in Regional Transportation Plans and Sustainable Community Strategies. Current targets for the largest metropolitan planning organizations range from 13% to 16% reductions by 2035.

- Executive Order B-30-15 (2015) sets a GHG emissions reduction target of 40 percent below 1990 levels by 2030.

- Executive Order S-3-05 (2005) sets a GHG emissions reduction target of 80 percent below 1990 levels by 2050.

- Executive Order B-16-12 (2012) specifies a GHG emissions reduction target of 80 percent below 1990 levels by 2050 specifically for transportation.

- Senate Bill 391 requires the California Transportation Plan to support 80 percent reduction in GHGs below 1990 levels by 2050.

- The *California Air Resources Board Mobile Source Strategy* (2016) describes California's strategy for containing air pollutant emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.
- The California Air Resources Board's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target* describes California's strategy for containing

> greenhouse gas emissions from vehicles, and quantifies VMT growth compatible with achieving state targets.

Considering these various targets, the California Supreme Court observed:

> Meeting our statewide reduction goals does not preclude all new development. Rather, the Scoping Plan … assumes continued growth and depends on increased efficiency and conservation in land use and transportation from all Californians.

(*Center for Biological Diversity v. California Dept. of Fish & Wildlife*, *supra*, 62 Cal.4th at p. 220.) Indeed, the Court noted that when a lead agency uses consistency with climate goals as a way to determine significance, particularly for long-term projects, the lead agency must consider the project's effect on meeting long-term reduction goals. (*Ibid*.) And more recently, the Supreme Court stated that "CEQA requires public agencies . . . to ensure that such analysis stay in step with evolving scientific knowledge and state regulatory schemes." (*Cleveland National Forest Foundation v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 504.)

Meeting the targets described above will require substantial reductions in existing VMT per capita to curb greenhouse gases and other pollutants. But those targets do not translate directly into VMT thresholds for individual projects for many reasons, including:

- Some, but not all, of the emissions reductions needed to achieve those targets could be accomplished by other measures, including increased vehicle efficiency and decreased fuel carbon content. The CARB's *First Update to the Climate Change Scoping Plan* explains: "Achieving California's long-term criteria pollutant and GHG emissions goals will require four strategies to be employed: (1) improve vehicle efficiency and develop zero emission technologies, (2) reduce the carbon content of fuels and provide market support to get these lower-carbon fuels into the marketplace, (3) **plan and build communities to reduce vehicular GHG emissions and provide more transportation options, and (4) improve the efficiency and throughput of existing transportation systems.**" (CARB, *First Update to the Climate Change Scoping Plan*, May 2014, p. 46 (emphasis added).) In other words, vehicle efficiency and better fuels are necessary, but insufficient, to address the greenhouse gas emissions from the transportation system. Land use patterns and transportation options also will need to change to support reductions in vehicle travel/VMT.

- New land use projects alone will not sufficiently reduce per-capita VMT to achieve those targets, nor are they expected to be the sole source of VMT reduction.

- Interactions between land use projects, and also between land use and transportation projects, existing and future, together affect VMT.

- Because location within the region is the most important determinant of VMT, in some cases, streamlining CEQA review of projects in travel efficient locations may be the most effective means of reducing VMT.

- When assessing climate impacts of land use projects, use of an efficiency metric (e.g., per capita, per employee) may provide a better measure of impact than an absolute numeric threshold. (*Center for Biological Diversity*, *supra*.)

Public Resources Code section 21099 directs OPR to propose criteria for determining the significance of transportation impacts. In this Technical Advisory, OPR provides its recommendations to assist lead agencies in selecting a significance threshold that may be appropriate for their particular projects. While OPR's Technical Advisory is not binding on public agencies, CEQA allows lead agencies to "consider thresholds of significance . . . recommended by other public agencies, provided the decision to adopt those thresholds is supported by substantial evidence." (CEQA Guidelines, § 15064.7, subd. (c).) Based on OPR's extensive review of the applicable research and literature on this topic, **OPR finds that in most instances a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold**.

First, as described above, Section 21099 states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions." SB 743 also states the Legislature's intent that the analysis of transportation in CEQA better promotes the State's goals of reducing greenhouse gas emissions. It cites in particular the reduction goals in the Global Warming Solutions Act (AB 32) and the Sustainable Communities and Climate Protection Act (SB 375), both of which call for substantial reductions. As indicated above, CARB established long-term reduction targets for the largest regions in the state that ranged from 13 to 16 percent.

Second, Caltrans has developed a statewide VMT reduction target in its Strategic Management Plan. Specifically, it calls for a 15 percent reduction in per capita VMT, compared to 2010 levels, by 2020.

Third, fifteen percent reductions in VMT are achievable at the project level in a variety of place types. (Quantifying Greenhouse Gas Measures, p. 55 CAPCOA, 2010).

Fourth, in CARB's most recent update to the Climate Change Scoping Plan, a 15 percent reduction in light-duty VMT beyond what existing plan and policies achieve is recommended to achieve the State's 2030 and 2050 targets. (CARB, *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target*, October 2017, pp. 116, 150; see generally, CARB, *Climate Change Scoping Plan: A Framework for Change*, December 2008, p. 27; CARB, *First Update to the Climate Change Scoping Plan*, May 2014, p. 113; CARB, *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target*, October 2017, p. 149.)

The Final 2017 Scoping Plan Update states,

> VMT reductions are necessary to achieve the 2030 target and must be part of any strategy evaluated in this Plan. Stronger SB 375 GHG reduction targets will enable the State to make significant progress toward this goal, but alone will not provide all of the VMT growth reductions that will be needed. There is a gap between what SB 375 can provide and what is needed to meet the State's 2030 and 2050 goals." (CARB, California's 2017 Climate Change Scoping Plan, November 2017, p. 75.)

Furthermore,

> At the State level, a number of important policies are being developed. Governor Brown signed Senate Bill 743 (Steinberg, 2013), which called for an update to the metric of transportation impact in CEQA. That update to the CEQA Guidelines is currently underway. Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. (*Id.* at p. 76.)
>
> . . . .
>
> Employing VMT as the metric of transportation impact statewide will help to ensure GHG reductions planned under SB 375 will be achieved through on-the-ground development, and will also play an important role in creating the additional GHG reductions needed beyond SB 375 across the State. Implementation of this change will rely, in part, on local land use decisions to reduce GHG emissions associated with the transportation sector, both at the project level, and in long-term plans (including general plans, climate action plans, specific plans, and transportation plans) and supporting sustainable community strategies developed under SB 375. The State can provide guidance and tools to assist local governments in achieving those objectives. (*Id.* at p. 76.)
>
> . . . .
>
> California's future climate strategy will require increased focus on integrated land use planning to support livable, transit-connected communities, and conservation of agricultural and other lands. Accommodating population and economic growth through travel- and energy-efficient land use provides GHG-efficient growth, reducing GHGs from both transportation and building energy use. GHGs can be further reduced at the project level through implementing energy-efficient construction and travel demand management approaches. Further, the State's understanding of transportation impacts continues to evolve. The CEQA Guidelines are being updated to focus the analysis of transportation impacts on VMT. OPR's Technical Advisory includes methods of analysis of transportation impacts, approaches to setting significance thresholds, and includes examples of VMT mitigation under CEQA. (*Id.* at p. 102.)

Also, the Scoping Plan includes the following item as a "Recommended Action": "forthcoming statewide implementation of SB 743[.]" (*Id*. at p. 103.)

Achieving 15 percent lower per capita (residential) or per employee (office) VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the State's emissions goals. The following pages describe a series of screening thresholds below which a detailed analysis may not be required. Next, this advisory describes numeric thresholds recommended for various project types. Finally, this advisory describes the analysis for certain unique circumstances.

1. Screening Thresholds for Land Use Projects

Many agencies use "screening thresholds" to quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study. (See e.g., CEQA Guidelines, §§ 15063(c)(3)(C), 15128, and Appendix G.) As explained below, this technical advisory suggests that lead agencies may screen out VMT impacts using project size, maps, and transit availability.

Screening Threshold for Small Projects

Many local agencies have developed screening thresholds to indicate when detailed analysis is needed. Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day[6] generally may be assumed to cause a less-than-significant transportation impact.

Map-Based Screening for Residential and Office Projects

Residential and office projects that locate in areas with low VMT, and that incorporate similar features (i.e., density, mix of uses, transit accessibility), will tend to exhibit similarly low VMT. Maps created with data from a travel survey or travel demand model can illustrate areas that are currently below threshold VMT (see recommendations below). Because new development in such locations would likely result in a similar level of VMT, such maps can be used to screen out residential and office projects from needing to prepare a detailed VMT analysis.

[6] CEQA provides a categorical exemption for existing facilities, including additions to existing structures of up to 10,000 square feet, so long as the project is in an area where public infrastructure is available to allow for maximum planned development and the project is not in an environmentally sensitive area. (CEQA Guidelines, § 15301, subd. (e)(2).) Typical project types for which trip generation increases relatively linearly with building footprint (i.e., general office building, single tenant office building, office park, and business park) generate or attract an additional 110-124 trips per 10,000 square feet. Therefore, absent substantial evidence otherwise, it is reasonable to conclude that the addition of 110 or fewer trips could be considered not to lead to a significant impact.

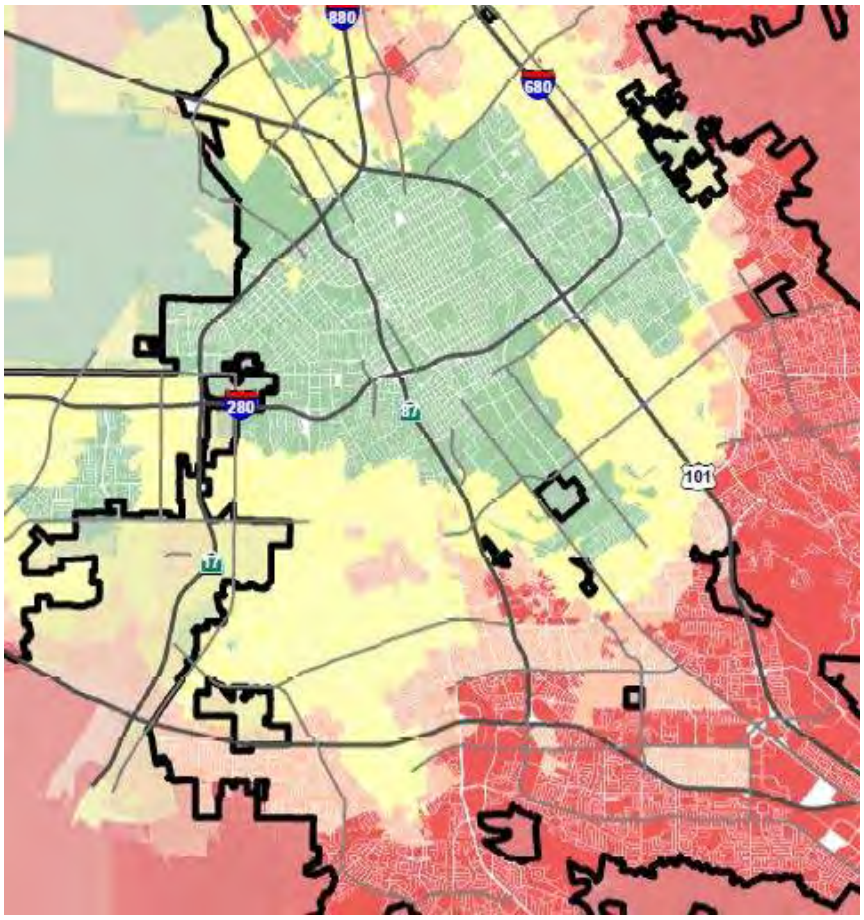


Figure 2. Example map of household VMT that could be used to delineate areas eligible to receive streamlining for VMT analysis. (Source: City of San José, Department of Transportation, draft output of City Transportation Model.)

Presumption of Less Than Significant Impact Near Transit Stations

Proposed CEQA Guideline Section 15064.3, subdivision (b)(1), states that lead agencies generally should presume that certain projects (including residential, retail, and office projects, as well as projects that are a mix of these uses) proposed within ½ mile of an existing major transit stop[7] or an existing stop along a high quality transit corridor[8] will have a less-than-significant impact on VMT. This presumption would not apply, however, if project-specific or location-specific information indicates that the project

[7] Pub. Resources Code, § 21064.3 ("'Major transit stop' means a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.").

[8] Pub. Resources Code, § 21155 ("For purposes of this section, a high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.").

will still generate significant levels of VMT. For example, the presumption might not be appropriate if the project:

- Has a Floor Area Ratio (FAR) of less than 0.75
- Includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is inconsistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)

If any of these exceptions to the presumption might apply, the lead agency should conduct a detailed VMT analysis to determine whether the project would exceed VMT thresholds (see below).

2. Recommended Numeric Thresholds for Residential, Office, and Retail Projects

Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing city VMT per capita should not cumulatively exceed the number of units specified in the SCS for that city, and should be consistent with the SCS.

Residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

For residential projects in unincorporated county areas, the local agency can compare a residential project's VMT to (1) the region's VMT per capita, or (2) the aggregate population-weighted VMT per capita of all cities in the region. In MPO areas, development in unincorporated areas measured against aggregate city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the regional threshold would undermine achievement of regional targets under SB 375.

These thresholds can be applied to either household (i.e., tour-based) VMT or home-based (i.e., trip-based) VMT assessments.[9] It is critical, however, that the agency be consistent in its VMT measurement

[9] See Appendix 1 for a description of these approaches.

approach throughout the analysis to maintain an "apples-to-apples" comparison. For example, if the agency uses a home-based VMT for the threshold, it should also be use home-based VMT for calculating project VMT and VMT reduction due to mitigation measures.

Recommended threshold for office projects: A proposed project exceeding a level of 15 percent below existing regional VMT per employee may indicate a significant transportation impact.

Office projects that would generate vehicle travel exceeding 15 percent below existing VMT per employee for the region may indicate a significant transportation impact. In cases where the region is substantially larger than the geography over which most workers would be expected to live, it might be appropriate to refer to a smaller geography, such as the county, that includes the area over which nearly all workers would be expected to live.

Office VMT screening maps can be developed using tour-based data, considering either total employee VMT or employee work tour VMT. Similarly, tour-based analysis of office project VMT could consider either total employee VMT or employee work tour VMT. Where tour-based information is unavailable for threshold determination, project assessment, or assessment of mitigation, home-based work trip VMT should be used throughout all steps of the analysis to maintain an "apples-to-apples" comparison.

Recommended threshold for retail projects: A net increase in total VMT may indicate a significant transportation impact.

Because new retail development typically redistributes shopping trips rather than creating new trips,[10] estimating the total change in VMT (i.e., the difference in total VMT in the area affected with and without the project) is the best way to analyze a retail project's transportation impacts.

By adding retail opportunities into the urban fabric and thereby improving retail destination proximity, local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume such development creates a less-than-significant transportation impact. Regional-serving retail development, on the other hand, which can lead to substitution of longer trips for shorter ones, may tend to have a significant impact. Where such development decreases VMT, lead agencies should consider the impact to be less-than-significant.

Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior. Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a

[10] Lovejoy, et al., *Measuring the impacts of local land-use policies on vehicle miles of travel: The case of the first big-box store in Davis, California, The Journal of Transport and Land Use*, 2013.

project will likely be local-serving. Generally, however, retail development including stores larger than 50,000 square feet might be considered regional-serving, and so lead agencies should undertake an analysis to determine whether the project might increase or decrease VMT.

Mixed-Use Projects

Lead agencies can evaluate each component of a mixed-use project independently and apply the significance threshold for each project type included (e.g., residential and retail). Alternatively, a lead agency may consider only the project's dominant use. In the analysis of each use, a project should take credit for internal capture. Combining different land uses and applying one threshold to those land uses may result in an inaccurate impact assessment.

Other Project Types

Of land use projects, residential, office, and retail projects tend to have the greatest influence on VMT. For that reason, OPR recommends the quantified thresholds described above for purposes of analysis and mitigation. Lead agencies, using more location-specific information, may develop their own more specific thresholds, which may include other land use types. In developing thresholds for other project types, or thresholds different from those recommended here, lead agencies should consider the purposes described in section 21099 of the Public Resources Code and regulations in the CEQA Guidelines on the development of thresholds of significance (e.g., CEQA Guidelines, § 15064.7).

Strategies and projects that decrease local VMT but increase total VMT should be avoided. Agencies should consider whether their actions encourage development in a less travel-efficient location by limiting development in travel-efficient locations.

Redevelopment Projects

Where a project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project would lead to a less-than-significant transportation impact. If the project leads to a net overall increase in VMT, then the thresholds described above should apply.

If a residential or office project leads to a net increase in VMT, then the project's VMT per capita (residential) or per employee (office) should be compared to thresholds recommended above. Per capita and per employee VMT are efficiency metrics, and, as such, apply only to the existing project without regard to the VMT generated by the previously existing land use.

If the project leads to a net increase in provision of locally-serving retail, transportation impacts from the retail portion of the development should be presumed to be less than significant. If the project consists of regionally-serving retail, and increases overall VMT compared to with existing uses, then the project would lead to a significant transportation impact.

RTP-SCS Consistency (All Land Use Projects)

Section 15125, subdivision (d), of the CEQA Guidelines provides that lead agencies should analyze impacts resulting from inconsistencies with regional plans, including regional transportation plans. For this reason, if a project is inconsistent with the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), the lead agency should evaluate whether that inconsistency indicates a significant impact on transportation.

3. Recommendations Regarding Land Use Plans

As with projects, agencies should analyze VMT outcomes of land use plans over the full area over which the plan may substantively affect travel patterns, including beyond the boundary of the plan or jurisdiction's geography. Analysis of specific plans may employ the same thresholds described above for projects. A general plan, area plan, or community plan may have a significant impact on transportation if it is not consistent with the relevant RTP-SCS.

Thresholds for plans in non-MPO areas may be determined on a case-by-case basis.

4. Other Considerations

Rural Projects Outside of MPOs

In rural areas of non-MPO counties (i.e., areas not near established or incorporated cities or towns), fewer options may be available for reducing VMT, and significance thresholds may be best determined on a case-by-case basis. Note, however, that clustered small towns and small town main streets may have substantial VMT benefits compared to isolated rural development, similar to the transit oriented development described above.

Impacts to Transit

Because criteria for determining the significance of transportation impacts must promote "the development of multimodal transportation networks" pursuant to Public Resources Code section 21099, subd. (b)(1), lead agencies should consider project impacts to transit systems and bicycle and pedestrian networks. For example, a project that blocks access to a transit stop or blocks a transit route itself may interfere with transit functions. Lead agencies should consult with transit agencies as early as possible in the development process, particularly for projects that are located within one half mile of transit stops.

When evaluating impacts to multimodal transportation networks, lead agencies generally should not treat the addition of new transit users as an adverse impact. An infill development may add riders to transit systems and the additional boarding and alighting may slow transit vehicles, but it also adds

destinations, improving proximity and accessibility. Such development also improves regional vehicle flow by adding less vehicle travel onto the regional network.

Increased demand throughout a region may, however, cause a cumulative impact by requiring new or additional transit infrastructure. Such impacts may be adequately addressed through a fee program that fairly allocates the cost of improvements not just to projects that happen to locate near transit, but rather across a region to all projects that impose burdens on the entire transportation system, since transit can broadly improve the function of the transportation system.

F. Considering the Effects of Transportation Projects on Vehicle Travel

Many transportation projects change travel patterns. A transportation project which leads to additional vehicle travel on the roadway network, commonly referred to as "induced vehicle travel," would need to quantify the amount of additional vehicle travel in order to assess air quality impacts, greenhouse gas emissions impacts, energy impacts, and noise impacts. Transportation projects also are required to examine induced growth impacts under CEQA. (See generally, Pub. Resources Code, §§ 21065 [defining "project" under CEQA as an activity as causing either a direct or reasonably foreseeable indirect physical change], 21065.3 [defining "project-specific effect" to mean all direct or indirect environmental effects], 21100, subd. (b) [required contents of an EIR].) For any project that increases vehicle travel, explicit assessment and quantitative reporting of the amount of additional vehicle travel should not be omitted from the document; such information may be useful and necessary for a full understanding of a project's environmental impacts. (See Pub. Resources Code, §§ 21000, 21001, 21001.1, 21002, 21002.1 [discussing the policies of CEQA].) A lead agency that uses the VMT metric to assess the transportation impacts of a transportation project may simply report that change in VMT as the impact. When the lead agency uses another metric to analyze the transportation impacts of a roadway project, changes in amount of vehicle travel added to the roadway network should still be analyzed and reported. (See, e.g., California Department of Transportation, Guidance for Preparers of Growth-related, Indirect Impact Analyses (2006).)

While CEQA does not require perfection, it is important to make a reasonably accurate estimate of transportation projects' effects on vehicle travel in order to make reasonably accurate estimates of GHG emissions, air quality emissions, energy impacts, and noise impacts. (See, e.g., *California Clean Energy Com. v. City of Woodland* (2014) 225 Cal.App.4th 173, 210 [EIR failed to consider project's transportation energy impacts]; *Ukiah Citizens for Safety First v. City of Ukiah* (2016) 248 Cal.App.4th 256, 266.) Appendix 2 describes in detail the causes of induced vehicle travel, the robust empirical evidence of induced vehicle travel, and how models and research can be used in conjunction to quantitatively assess induced vehicle travel with reasonable accuracy.

If a project would likely lead to a measurable and substantial increase in vehicle travel, the lead agency should conduct an analysis assessing the amount of vehicle travel the project will induce. Project types that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges

Projects that would not likely lead to a substantial or measurable increase in vehicle travel, and therefore generally should not require an induced travel analysis, include:

- Rehabilitation, maintenance, replacement and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and assets that serve bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity
- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Addition of an auxiliary lane of less than one mile in length designed to improve roadway safety
- Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left, right, and U-turn pockets, or emergency breakdown lanes that are not utilized as through lanes
- Addition of roadway capacity on local or collector streets provided the project also substantially improves conditions for pedestrians, cyclists, and, if applicable, transit
- Conversion of existing general purpose lanes (including ramps) to managed lanes or transit lanes, or changing lane management in a manner that would not substantially increase vehicle travel
- Addition of a new lane that is permanently restricted to use only by transit vehicles
- Reduction in number of through lanes
- Grade separation to separate vehicles from rail, transit, pedestrians or bicycles, or to replace a lane in order to separate preferential vehicles (e.g., HOV, HOT, or trucks) from general vehicles
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Traffic metering systems
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Installation of roundabouts or traffic circles
- Installation or reconfiguration of traffic calming devices
- Adoption of or increase in tolls
- Addition of tolled lanes, where tolls are sufficient to mitigate VMT increase
- Initiation of new transit service
- Conversion of streets from one-way to two-way operation with no net increase in number of traffic lanes
- Removal or relocation of off-street or on-street parking spaces
- Adoption or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs)
- Addition of traffic wayfinding signage

- Rehabilitation and maintenance projects that do not add motor vehicle capacity
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of-way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel
- Installation of publicly available alternative fuel/charging infrastructure
- Addition of passing lanes in rural areas that do not increase overall vehicle capacity along the corridor

1. Recommended Significance Threshold for Transportation Projects

As noted in Section 15064.3 of the CEQA Guidelines, lead agencies for roadway capacity projects have discretion, consistent with CEQA and planning requirements, to choose which metric to use to evaluate transportation impacts. This section recommends considerations for evaluating impacts using vehicle miles traveled. Lead agencies have discretion to choose a threshold of significance for transportation projects as they do for other types of projects. As explained above, Public Resources Code section 21099, subdivision (b)(1), provides that criteria for determining the significance of transportation impacts must promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

Whether adopting a threshold of significance, or evaluating transportation impacts on a case-by-case basis, a lead agency should ensure that the analysis addresses:

- Direct, indirect and cumulative effects of the transportation project (CEQA Guidelines, § 15064, subds. (d), (h))
- Near-term and long-term effects of the transportation project (CEQA Guidelines, §§ 15063, subd. (a)(1), 15126.2, subd. (a))
- The transportation project's consistency with state greenhouse gas reduction goals (Pub. Resources Code, § 21099)[11]
- The impact of the transportation project on the development of multimodal transportation networks (Pub. Resources Code, § 21099)

[11] The Air Resources Board has ascertained, in *The 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (p. 116) and *Mobile Source Strategy* (p. 37), the limits of VMT growth compatible with California containing greenhouse gas emissions to levels research shows would allow for climate stabilization. The Staff Report on Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets (Figure 1, p. 10, and Figure 2, p. 23), illustrates that Regional Transportation Plans and Sustainable Communities Strategies will fall short of achieving GHG reductions research says is needed to achieve climate stabilization, so OPR recommends not basing transportation project thresholds on those documents.

- The impact of the transportation project on the development of a diversity of land uses (Pub. Resources Code, § 21099)

The recommendations in this technical advisory may be updated over time.

2. Estimating VMT Impacts from Transportation Projects

CEQA requires analysis of a project's potential growth-inducing impacts. (Pub. Resources Code, § 21100, subd. (b)(5); CEQA Guidelines, § 15126.2, subd. (d).) Many agencies are familiar with the analysis of growth inducing impacts associated with water, sewer, and other infrastructure. This technical advisory addresses growth that may be expected from roadway expansion projects.

Because a roadway expansion project can induce substantial VMT, incorporating quantitative estimates of induced VMT is critical to calculating both transportation and other impacts of these projects. Induced travel also has the potential to reduce or eliminate congestion relief benefits. An accurate estimate of induced travel is needed to accurately weigh costs and benefits of a highway capacity expansion project.

The effect of a transportation project on vehicle travel should be estimated using the "change in total VMT" method described in *Appendix 1*. This means that an assessment of total VMT without the project and an assessment with the project should be made; the difference between the two is the amount of VMT attributable to the project. The assessment should cover the full area in which driving patterns are expected to change. As with other types of projects, the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary.

Transit and Active Transportation Projects

Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects. Streamlining transit and active transportation projects aligns with each of the three statutory goals contained in SB 743 by reducing GHG emissions, increasing multimodal transportation networks, and facilitating mixed use development.

Roadway Projects

Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects.

Building new roadways, adding roadway capacity in congested areas, or adding roadway capacity to areas where congestion is expected in the future, typically induces additional vehicle travel. For the types of projects previously indicated as likely to lead to additional vehicle travel, an estimate should be made of the change in vehicle travel resulting from the project.

For projects that increase roadway capacity, lead agencies can evaluate induced travel quantitatively by applying the results of existing studies that examine the magnitude of the increase of VMT resulting from a given increase in lane miles. These studies estimate the percent change in VMT for every percent change in miles to the roadway system (i.e., "elasticity"). (See U.C. Davis, Institute for Transportation Studies, *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, (October 2015); Boarnet and Handy, *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions*, California Air Resources Board Policy Brief, September 30, 2014.) Given that lead agencies have discretion in choosing their methodology, and the studies on induced travel reveal a range of elasticities, lead agencies may appropriately apply professional judgment in studying the transportation effects of a particular project. The most recent major study (Duranton and Turner, 2011), estimates an elasticity of 1.0, meaning that every percent change in lane miles results in a one percent increase in VMT.

To estimate VMT impacts from roadway expansion projects:

1. Determine the total lane-miles over an area that fully captures travel behavior changes resulting from the project (generally the region, but for projects affecting interregional travel look at all affected regions).
2. Determine the percent change in total lane miles that will result from the project.
3. Determine the total existing VMT over that same area.
4. Multiply the percent increase in lane miles by the existing VMT, and then multiply that by the elasticity from the induced travel literature:

[% increase in lane miles] x [existing VMT] x [elasticity] = [VMT resulting from the project]

This method would not be suitable for rural (non-MPO) locations in the state which are neither congested nor projected to become congested. It also may not be suitable for a new road that provides new connectivity across a barrier (e.g., a bridge across a river) if it would be expected to substantially shorten existing trips. If it is likely to be substantial, the trips-shortening effect should be examined explicitly.

The effects of roadway capacity on vehicle travel can also be applied at a programmatic level. For example, in a regional planning process the lead agency can use that program-level analysis to streamline later project-level analysis. (See CEQA Guidelines, § 15168.) A program-level analysis of VMT should include effects of the program on land use patterns, and the VMT that results from those land use effects. In order for a program-level document to adequately analyze potential induced demand

from a project or program of roadway capacity expansion, lead agencies cannot assume a fixed land use pattern (i.e., a land use pattern that does not vary in response to the provision of roadway capacity). A proper analysis should account for land use investment and development pattern changes that react in a reasonable manner to changes in accessibility created by transportation infrastructure investments (whether at the project or program level).

Mitigation and Alternatives

Induced VMT has the potential to reduce or eliminate congestion relief benefits, increase VMT, and increase other environmental impacts that result from vehicle travel.[12] If those effects are significant, the lead agency will need to consider mitigation or alternatives. In the context of increased travel that is induced by capacity increases, appropriate mitigation and alternatives that a lead agency might consider include the following:

- Tolling new lanes to encourage carpools and fund transit improvements
- Converting existing general purpose lanes to HOV or HOT lanes
- Implementing or funding off-site travel demand management
- Implementing Intelligent Transportation Systems (ITS) strategies to improve passenger throughput on existing lanes

Tolling and other management strategies can have the additional benefit of preventing congestion and maintaining free-flow conditions, conferring substantial benefits to road users as discussed above.

G. Analyzing Other Impacts Related to Transportation

While requiring a change in the methodology of assessing transportation impacts, Public Resources Code section 21099 notes that this change "does not relieve a public agency of the requirement to analyze a project's potentially significant transportation impacts related to air quality, noise, safety, or any other impact associated with transportation." OPR expects that lead agencies will continue to address mobile source emissions in the air quality and noise sections of an environmental document and the corresponding studies that support the analysis in those sections. Lead agencies should continue to address environmental impacts of a proposed project pursuant to CEQA's requirements, using a format that is appropriate for their particular project.

Because safety concerns result from many different factors, they are best addressed at a programmatic level (i.e., in a general plan or regional transportation plan) in cooperation with local governments,

[12] See *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion*, National Center for Sustainable Transportation, October 2015, available at http://www.dot.ca.gov/newtech/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf; see Duranton and Turner, *The Fundamental Law of Road Congestion: Evidence from US cities,* 2011, available at http://www.nber.org/papers/w15376.

metropolitan planning organizations, and, where the state highway system is involved, the California Department of Transportation. In most cases, such an analysis would not be appropriate on a project-by-project basis. Increases in traffic volumes at a particular location resulting from a project typically cannot be estimated with sufficient accuracy or precision to provide useful information for an analysis of safety concerns. Moreover, an array of factors affect travel demand (e.g., strength of the local economy, price of gasoline), causing substantial additional uncertainty. Appendix B of the General Plan Guidelines summarizes research which could be used to guide a programmatic analysis under CEQA. Lead agencies should note that automobile congestion or delay does not constitute a significant environmental impact (Pub. Resources Code, §21099(b)(2)), and safety should not be used as a proxy for road capacity.

H. VMT Mitigation and Alternatives

When a lead agency identifies a significant impact, it must identify feasible mitigation measures that could avoid or substantially reduce that impact. (Pub. Resources Code, § 21002.1, subd. (a).) Additionally, CEQA requires that an environmental impact report identify feasible alternatives that could avoid or substantially reduce a project's significant environmental impacts.

Indeed, the California Court of Appeal recently held that a long-term regional transportation plan was deficient for failing to discuss an alternative which could significantly reduce total vehicle miles traveled. In *Cleveland National Forest Foundation v. San Diego Association of Governments, et al.* (2017) 17 Cal.App.5th 413, the court found that omission "inexplicable" given the lead agency's "acknowledgment in its Climate Action Strategy that the state's efforts to reduce greenhouse gas emissions from on-road transportation will not succeed if the amount of driving, or vehicle miles traveled, is not significantly reduced." (*Cleveland National Forest Foundation*, *supra*, 17 Cal.App.5th at p. 436.) Additionally, the court noted that the project alternatives focused primarily on congestion relief even though "the [regional] transportation plan is a long-term and congestion relief is not necessarily an effective long-term strategy." (*Id.* at p. 437.) The court concluded its discussion of the alternatives analysis by stating: "Given the acknowledged long-term drawbacks of congestion relief alternatives, there is not substantial evidence to support the EIR's exclusion of an alternative focused primarily on significantly reducing vehicle trips." (*Ibid*.)

Several examples of potential mitigation measures and alternatives to reduce vehicle miles traveled are described below. However, the selection of particular mitigation measures and alternatives are left to the discretion of the lead agency, and mitigation measures may vary, depending on the proposed project and significant impacts, if any. Further, OPR expects that agencies will continue to innovate and find new ways to reduce vehicular travel.

Potential measures to reduce vehicle miles traveled include, but are not limited to:

- Improve or increase access to transit.
- Increase access to common goods and services, such as groceries, schools, and daycare.

- Incorporate affordable housing into the project.
- Incorporate neighborhood electric vehicle network.
- Orient the project toward transit, bicycle and pedestrian facilities.
- Improve pedestrian or bicycle networks, or transit service.
- Provide traffic calming.
- Provide bicycle parking.
- Limit or eliminate parking supply.
- Unbundle parking costs.
- Provide parking or roadway pricing or cash-out programs.
- Implement or provide access to a commute reduction program.
- Provide car-sharing, bike sharing, and ride-sharing programs.
- Provide transit passes.
- Shifting single occupancy vehicle trips to carpooling or vanpooling, for example providing ride-matching services.
- Providing telework options.
- Providing incentives or subsidies that increase the use of modes other than single-occupancy vehicle.
- Providing on-site amenities at places of work, such as priority parking for carpools and vanpools, secure bike parking, and showers and locker rooms.
- Providing employee transportation coordinators at employment sites.
- Providing a guaranteed ride home service to users of non-auto modes.

Notably, because VMT is largely a regional impact, regional VMT-reduction programs may be an appropriate form of mitigation. In lieu fees have been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur. (*Save Our Peninsula Committee v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 140-141; *Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359; *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 727–728.) Fee programs are particularly useful to address cumulative impacts. (CEQA Guidelines, § 15130, subd. (a)(3) [a "project's incremental contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact"].) The mitigation program must undergo CEQA evaluation, either on the program as a whole, or the in-lieu fees or other mitigation must be evaluated on a project-specific basis. (*California Native Plant Society v. County of El Dorado* (2009) 170 Cal.App.4th 1026.) That CEQA evaluation could be part of a larger program, such as a regional transportation plan, analyzed in a Program EIR. (CEQA Guidelines, § 15168.)

Examples of project alternatives that may reduce vehicle miles traveled include, but are not limited to:

- Locate the project in an area of the region that already exhibits low VMT.
- Locate the project near transit.
- Increase project density.
- Increase the mix of uses within the project or within the project's surroundings.

- Increase connectivity and/or intersection density on the project site.
- Deploy management strategies (e.g., pricing, vehicle occupancy requirements) on roadways or roadway lanes.

Appendix 1. Considerations About Which VMT to Count

Consistent with the obligation to make a good faith effort to disclose the environmental consequences of a project, lead agencies have discretion to choose the most appropriate methodology to evaluate project impacts.[13] A lead agency can evaluate a project's effect on VMT in numerous ways. The purpose of this document is to provide technical considerations in determining which methodology may be most useful for various project types.

Background on Estimating Vehicle Miles Traveled

Before discussing specific methodological recommendations, this section provides a brief overview of modeling and counting VMT, including some key terminology.

Here is an illustrative example of some methods of estimating vehicle miles traveled. Consider the following hypothetical travel day (all by automobile):

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

Trip-based assessment of a project's effect on travel behavior counts VMT from individual trips to and from the project. It is the most basic, and traditionally the most common, method of counting VMT. A trip-based VMT assessment of the residence in the above example would consider segments 1, 5, 6 and 7. For residential projects, the sum of home-based trips is called *home-based* VMT.

A *tour-based* assessment counts the entire home-back-to-home tour that includes the project. A tour-based VMT assessment of the residence in the above example would consider segments 1, 2, 3, 4, and 5 in one tour, and 6 and 7 in a second tour. A tour-based assessment of the workplace would include segments 1, 2, 3, 4, and 5. Together, all tours comprise *household* VMT.

[13] The California Supreme Court has explained that when an agency has prepared an environmental impact report:

> [T]he issue is not whether the [lead agency's] studies are irrefutable or whether they could have been better. The relevant issue is only whether the studies are sufficiently credible to be considered as part of the total evidence that supports the [lead agency's] finding[.]

(*Laurel Heights Improvement Assn. v. Regents of the University of California* (1988) 47 Cal.3d 376, 409; see also *Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 372.)

Both trip- and tour-based assessments can be used as measures of transportation efficiency, using denominators such as per capita, per employee, or per person-trip.

Trip- and Tour-based Assessment of VMT

As illustrated above, a tour-based assessment of VMT is a more complete characterization of a project's effect on VMT. In many cases, a project affects travel behavior beyond the first destination. The location and characteristics of the home and workplace will often be the main drivers of VMT. For example, a residential or office development located near high quality transit will likely lead to some commute trips utilizing transit, affecting mode choice on the rest of the tour.

Characteristics of an office project can also affect an employee's VMT beyond the work tour. For example, a workplace located at the urban periphery, far from transit, can require an employee to own a car, which in turn affects the entirety of an employee's travel behavior and VMT. For this reason, when estimating the effect of an office development on VMT, it may be appropriate to consider total employee VMT if data and tools, such as tour-based models, are available. This is consistent with CEQA's requirement to evaluate both direct and *indirect* effects of a project. (See CEQA Guidelines, § 15064, subd. (d)(2).)

Assessing Change in Total VMT

A third method, estimating the *change in total VMT* with and without the project, can evaluate whether a project is likely to divert existing trips, and what the effect of those diversions will be on total VMT. This method answers the question, "What is the net effect of the project on area VMT?" As an illustration, assessing the total change in VMT for a grocery store built in a food desert that diverts trips from more distant stores could reveal a net VMT reduction. The analysis should address the full area over which the project affects travel behavior, even if the effect on travel behavior crosses political boundaries.

Using Models to Estimate VMT

Travel demand models, sketch models, spreadsheet models, research, and data can all be used to calculate and estimate VMT (see Appendix F of the preliminary discussion draft). To the extent possible, lead agencies should choose models that have sensitivity to features of the project that affect VMT. Those tools and resources can also assist in establishing thresholds of significance and estimating VMT reduction attributable to mitigation measures and project alternatives. When using models and tools for those various purposes, agencies should use comparable data and methods, in order to set up an "apples-to-apples" comparison between thresholds, VMT estimates, and VMT mitigation estimates.

Models can work together. For example, agencies can use travel demand models or survey data to estimate existing trip lengths and input those into sketch models such as CalEEMod to achieve more

accurate results. Whenever possible, agencies should input localized trip lengths into a sketch model to tailor the analysis to the project location. However, in doing so, agencies should be careful to avoid double counting if the sketch model includes other inputs or toggles that are proxies for trip length (e.g., distance to city center). Generally, if an agency changes any sketch model defaults, it should record and report those changes for transparency of analysis. Again, trip length data should come from the same source as data used to calculate thresholds to be sure of an "apples-to-apples" comparison.

Additional background information regarding travel demand models is available in the California Transportation Commission's "2010 Regional Transportation Plan Guidelines," beginning at page 35.

Appendix 2. Induced Travel: Mechanisms, Research, and Additional Assessment Approaches

Induced travel occurs where roadway capacity is expanded in an area of present or projected future congestion. The effect typically manifests over several years. Lower travel times make the modified facility more attractive to travelers, resulting in the following trip-making changes:

- **Longer trips.** The ability to travel a long distance in a shorter time increases the attractiveness of destinations that are farther away, increasing trip length and vehicle travel.
- **Changes in mode choice.** When transportation investments are devoted to reducing automobile travel time, travelers tend to shift toward automobile use from other modes, which increases vehicle travel.
- **Route changes.** Faster travel times on a route attract more drivers to that route from other routes, which can increase or decrease vehicle travel depending on whether it shortens or lengthens trips.
- **Newly generated trips.** Increasing travel speeds can induce additional trips, which increases vehicle travel. For example, an individual who previously telecommuted or purchased goods on the internet might choose to accomplish those tasks via automobile trips as a result of increased speeds.
- **Land Use Changes.** Faster travel times along a corridor lead to land development farther along that corridor; that new development generates and attracts longer trips, which increases vehicle travel. Over several years, this induced growth component of induced vehicle travel can be substantial, making it critical to include in analyses.

Each of these effects has implications for the total amount of vehicle travel. These effects operate over different time scales. For example, changes in mode choice might occur immediately, while land use changes typically take a few years or longer. CEQA requires lead agencies to analyze both short-term and long-term effects.

Evidence of Induced Vehicle Travel. A large number of peer reviewed studies[14] have demonstrated a causal link between highway capacity increases and VMT increases. Many provide quantitative estimates of the magnitude of the induced VMT phenomenon. Collectively, they provide high quality evidence of the existence and magnitude of the induced travel effect.

Most of these studies express the amount of induced vehicle travel as an "elasticity," which is a multiplier that describes the additional vehicle travel resulting from an additional lane mile of roadway capacity added. For example, an elasticity of 0.6 would signify an 0.6 percent increase in vehicle travel for every 1.0 percent increase in lane miles. Many of these studies distinguish "short run elasticity" (increase in vehicle travel in the first few years) from "long run elasticity" (increase in vehicle travel

[14] See, for example, *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief* (CARB, Sept. 30, 2014) and *Increasing Highway Capacity Unlikely to Relieve Traffic Congestion* (National Center for Sustainable Transportation, Oct. 2015).

beyond the first few years). Long run elasticity is larger than short run elasticity, because as time passes, more of the components of induced vehicle travel materialize. Generally, short run elasticity can be thought of as excluding the effects of land use change, while long run elasticity includes them. Most studies find a long run elasticity between 0.6 and just over 1.0 (See *Impact of Highway Capacity and Induced Travel on Passenger Vehicle Use and Greenhouse Gas Emissions: Policy Brief*, p. 2.), meaning that every increase in lanes miles of one percent leads to an increase in vehicle travel of 0.6 to 1.0 percent. The most recent major study (Duranton and Turner, *The Fundamental Law of Road Congestion: Evidence from US Cities*, 2011) finds the elasticity of vehicle travel by lanes miles added to be 1.03; in other words, each percent increase in lane miles results in a 1.03 percent increase in vehicle travel. (An elasticity greater than 1.0 can occur because new lanes induce vehicle travel that spills beyond the project location.) In CEQA analysis, the long-run elasticity should be used, as it captures the full effect of the project rather than just the early-stage effect.

Quantifying Induced Vehicle Travel Using Models. Lead agencies can generally achieve the most accurate assessment of induced vehicle travel resulting from roadway capacity increasing projects by applying elasticities from the academic literature, because those estimates include vehicle travel resulting from induced land use. If a lead agency chooses to use a travel demand model, additional analysis would be needed to account for induced land use. This section describes some approaches to undertaking that additional analysis.

Proper use of a travel demand model can capture the following components of induced VMT:

- Trip length (generally increases VMT)
- Mode shift (generally shifts from other modes toward automobile use, increasing VMT)
- Route changes (can act to increase or decrease VMT)
- Newly generated trips (generally increases VMT)
    - Note that not all travel demand models have sensitivity to this factor, so an off-model estimate may be necessary if this effect could be substantial.

However, estimating long-run induced VMT also requires an estimate of the project's effects on land use. This component of the analysis is important because it has the potential to be a large component of the overall induced travel effect. Options for estimating and incorporating the VMT effects that are caused by the subsequent land use changes include:

1. *Employ an expert panel.* An expert panel could assess changes to land use development that would likely result from the project. This assessment could then be analyzed by the travel demand model to assess effects on vehicle travel. Induced vehicle travel assessed via this approach should be verified using elasticities found in the academic literature.
2. *Adjust model results to align with the empirical research.* If the travel demand model analysis is performed without incorporating projected land use changes resulting from the project, the

assessed vehicle travel should be adjusted upward to account for those land use changes. The assessed VMT after adjustment should fall within the range found in the academic literature.

3. *Employ a land use model, running it iteratively with a travel demand model.* A land use model can be used to estimate the land use effects of a roadway capacity increase, and the traffic patterns that result from the land use change can then be fed back into the travel demand model. The land use model and travel demand model can be iterated to produce an accurate result.

A project which provides new connectivity across a barrier, such as a new bridge across a river, may provide a shortened path between existing origins and destinations, thereby shortening existing trips. In some cases, this trip-shortening effect might be substantial enough to reduce the amount of vehicle travel resulting from the project below the range found in the elasticities in the academic literature, or even lead a net reduction in vehicle travel overall. In such cases, the trip-shortening effect could be examined explicitly.

Whenever employing a travel demand model to assess induced vehicle travel, any limitation or known lack of sensitivity in the analysis that might cause substantial errors in the VMT estimate (for example, model insensitivity to one of the components of induced VMT described above) should be disclosed and characterized, and a description should be provided on how it could influence the analysis results. A discussion of the potential error or bias should be carried into analyses that rely on the VMT analysis, such as greenhouse gas emissions, air quality, energy, and noise.

Attachment G: EPANET Model Results

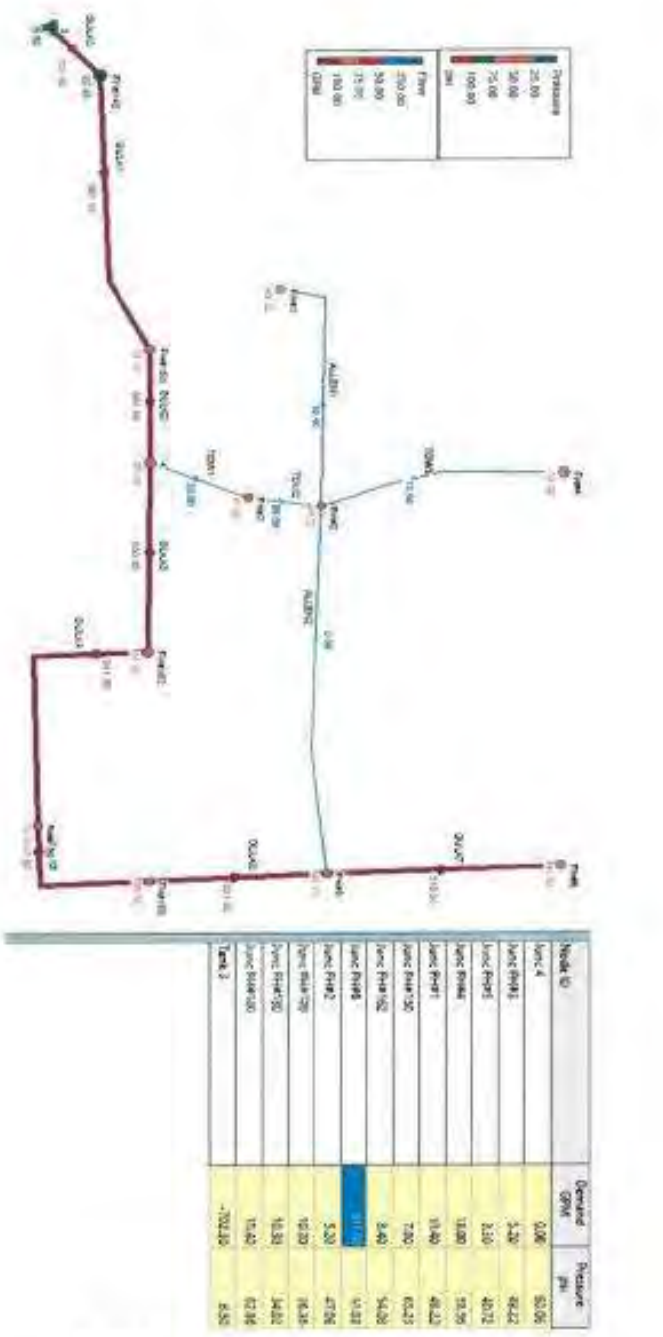


Figure 1: Node Pressure and Demand Flow

Attachment H: EPANET Water Service Report and Performance

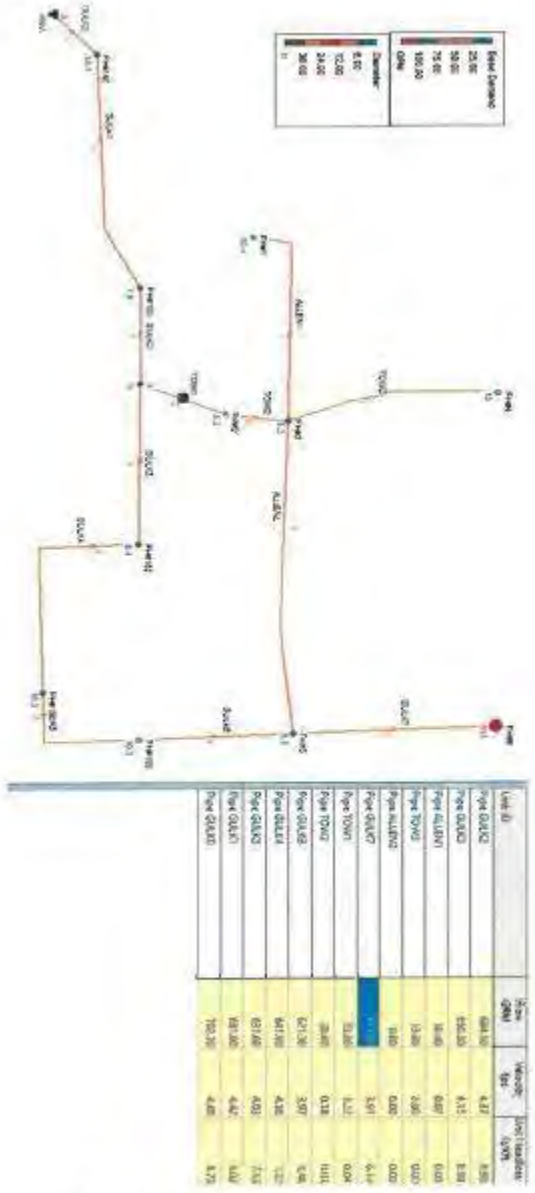


Figure 2: Pipe Diameter and Node Demand

Attachment I: CalEEMod Results

WCO2302.1 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. Site Preparation (2025) - Unmitigated

3.2. Site Preparation (2025) - Mitigated

3.3. Grading (2025) - Unmitigated

3.4. Grading (2025) - Mitigated

3.5. Grading (2026) - Unmitigated

3.6. Grading (2026) - Mitigated

3.7. Paving (2025) - Unmitigated

3.8. Paving (2025) - Mitigated

3.9. Trenching (2026) - Unmitigated

3.10. Trenching (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	WCO2302.1
Construction Start Date	9/2/2025
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.90
Precipitation (days)	56.8
Location	40.58421791759065, -124.12264725882524
County	Humboldt
City	Fortuna
Air District	North Coast Unified APCD
Air Basin	North Coast
TAZ	115
EDFZ	2
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.29

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	32.0	Dwelling Unit	10.4	62,400	374,811	—	72.0	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-1-A	Use Electric or Hybrid Powered Equipment
Construction	C-1-B	Use Cleaner-Fuel Equipment
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-3	Use Local Construction Contractors
Construction	C-4*	Use Local and Sustainable Building Materials
Construction	C-5	Use Advanced Engine Tiers
Construction	C-6	Use Diesel Particulate Filters
Construction	C-7	Use Oxidation Catalyst
Construction	C-8	Use Renewable Diesel
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-B	Water Active Demolition Sites
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads
Construction	C-12	Sweep Paved Roads
Transportation	T-14*	Provide Electric Vehicle Charging Infrastructure
Transportation	T-32*	Orient Project Toward Transit, Bicycle, or Pedestrian Facility
Transportation	T-34*	Provide Bike Parking
Transportation	T-35*	Provide Tra c Calming Measures
Transportation	T-38*	Provide First and Last Mile TNC Incentives
Transportation	T-50*	Required Project Contributions to Transportation Infrastructure Improvement
Waste	S-4*	Recycle Demolished Construction Material
Waste	S-5*	Source Wood Materials from Urban Wood Re-Use Program
Area Sources	LL-3*	Electric Yard Equipment Compatibility
Miscellaneous	M-5*	Fund Incentives for Green Technologies
Miscellaneous	M-6*	Off-Road Equipment Efficiency

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.05	3.41	31.7	31.0	0.05	1.37	19.8	21.1	1.26	10.1	11.4	—	5,419	5,419	0.22	0.05	0.57	5,439
Mit.	4.05	3.41	31.7	31.0	0.05	1.37	7.78	9.15	1.26	3.97	5.22	—	5,419	5,419	0.22	0.05	0.57	5,439
% Reduced	—	—	—	—	—	—	61%	57%	—	61%	54%	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.05	3.41	31.7	31.1	0.06	1.37	19.8	21.1	1.26	10.1	11.4	—	6,739	6,739	0.28	0.06	0.02	6,764
Mit.	4.05	3.41	31.7	31.1	0.06	1.37	7.78	9.15	1.26	3.97	5.22	—	6,739	6,739	0.28	0.06	0.02	6,764
% Reduced	—	—	—	—	—	—	61%	57%	—	61%	54%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.03	0.87	7.88	8.02	0.01	0.34	3.36	3.70	0.31	1.58	1.89	—	1,584	1,584	0.07	0.01	0.08	1,590
Mit.	1.03	0.87	7.88	8.02	0.01	0.34	1.33	1.67	0.31	0.62	0.93	—	1,584	1,584	0.07	0.01	0.08	1,590
% Reduced	—	—	—	—	—	—	60%	55%	—	61%	51%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.19	0.16	1.44	1.46	< 0.005	0.06	0.61	0.67	0.06	0.29	0.34	—	262	262	0.01	< 0.005	0.01	263
Mit.	0.19	0.16	1.44	1.46	< 0.005	0.06	0.24	0.30	0.06	0.11	0.17	—	262	262	0.01	< 0.005	0.01	263

% Reduced	—	—	—	—	—	—	60%	55%	—	61%	51%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.05	3.41	31.7	31.0	0.05	1.37	19.8	21.1	1.26	10.1	11.4	—	5,419	5,419	0.22	0.05	0.57	5,439
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.05	3.41	31.7	31.1	0.06	1.37	19.8	21.1	1.26	10.1	11.4	—	6,739	6,739	0.28	0.06	0.02	6,764
2026	3.74	3.15	27.3	28.6	0.06	1.12	9.34	10.5	1.03	3.69	4.72	—	6,737	6,737	0.28	0.06	0.02	6,762
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.03	0.87	7.88	8.02	0.01	0.34	3.36	3.70	0.31	1.58	1.89	—	1,584	1,584	0.07	0.01	0.08	1,590
2026	0.14	0.12	1.02	1.06	< 0.005	0.04	0.35	0.39	0.04	0.14	0.18	—	251	251	0.01	< 0.005	0.01	251
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.19	0.16	1.44	1.46	< 0.005	0.06	0.61	0.67	0.06	0.29	0.34	—	262	262	0.01	< 0.005	0.01	263
2026	0.03	0.02	0.19	0.19	< 0.005	0.01	0.06	0.07	0.01	0.02	0.03	—	41.5	41.5	< 0.005	< 0.005	< 0.005	41.6

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.05	3.41	31.7	31.0	0.05	1.37	7.78	9.15	1.26	3.97	5.22	—	5,419	5,419	0.22	0.05	0.57	5,439

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	4.05	3.41	31.7	31.1	0.06	1.37	7.78	9.15	1.26	3.97	5.22	—	6,739	6,739	0.28	0.06	0.02	6,764
2026	3.74	3.15	27.3	28.6	0.06	1.12	3.72	4.85	1.03	1.46	2.49	—	6,737	6,737	0.28	0.06	0.02	6,762
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.03	0.87	7.88	8.02	0.01	0.34	1.33	1.67	0.31	0.62	0.93	—	1,584	1,584	0.07	0.01	0.08	1,590
2026	0.14	0.12	1.02	1.06	< 0.005	0.04	0.14	0.18	0.04	0.05	0.09	—	251	251	0.01	< 0.005	0.01	251
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.19	0.16	1.44	1.46	< 0.005	0.06	0.24	0.30	0.06	0.11	0.17	—	262	262	0.01	< 0.005	0.01	263
2026	0.03	0.02	0.19	0.19	< 0.005	0.01	0.03	0.03	0.01	0.01	0.02	—	41.5	41.5	< 0.005	< 0.005	< 0.005	41.6

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	53.2	52.3	1.63	65.4	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	972	1,869	1.84	0.10	0.51	1,945
Mit.	53.2	52.3	1.63	65.4	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	972	1,869	1.84	0.10	0.51	1,945
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	53.1	52.2	1.65	64.5	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	969	1,866	1.85	0.10	0.45	1,943
Mit.	53.1	52.2	1.65	64.5	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	969	1,866	1.85	0.10	0.45	1,943
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	14.5	14.3	0.90	18.0	0.03	1.90	0.01	1.91	1.89	< 0.005	1.89	209	683	891	1.21	0.05	0.47	937
Mit.	14.5	14.3	0.90	18.0	0.03	1.90	0.01	1.91	1.89	< 0.005	1.89	209	683	891	1.21	0.05	0.47	937
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.66	2.61	0.16	3.28	< 0.005	0.35	< 0.005	0.35	0.34	< 0.005	0.35	34.5	113	148	0.20	0.01	0.08	155
Mit.	2.66	2.61	0.16	3.28	< 0.005	0.35	< 0.005	0.35	0.34	< 0.005	0.35	34.5	113	148	0.20	0.01	0.08	155
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.37	1.34	0.35	3.00	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	75.0	75.0	0.07	0.03	0.06	84.7
Area	51.8	51.0	0.97	62.3	0.11	8.33	—	8.33	8.29	—	8.29	889	375	1,264	0.82	0.06	—	1,304
Energy	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	513	513	0.05	< 0.005	—	515
Water	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Waste	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	53.2	52.3	1.63	65.4	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	972	1,869	1.84	0.10	0.51	1,945
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.39	1.35	0.39	3.88	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	76.7	76.7	0.08	0.03	< 0.005	87.4

Area	51.7	50.8	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Energy	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	513	513	0.05	< 0.005	—	515
Water	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Waste	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	53.1	52.2	1.65	64.5	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	969	1,866	1.85	0.10	0.45	1,943
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.37	1.34	0.37	3.39	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	75.8	75.8	0.07	0.03	0.03	85.9
Area	13.1	12.9	0.22	14.5	0.02	1.87	—	1.87	1.86	—	1.86	200	85.6	285	0.18	0.01	—	294
Energy	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	513	513	0.05	< 0.005	—	515
Water	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Waste	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	14.5	14.3	0.90	18.0	0.03	1.90	0.01	1.91	1.89	< 0.005	1.89	209	683	891	1.21	0.05	0.47	937
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.25	0.24	0.07	0.62	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.5	12.5	0.01	< 0.005	< 0.005	14.2
Area	2.40	2.36	0.04	2.64	< 0.005	0.34	—	0.34	0.34	—	0.34	33.1	14.2	47.2	0.03	< 0.005	—	48.7
Energy	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	84.9	84.9	0.01	< 0.005	—	85.3
Water	—	—	—	—	—	—	—	—	—	—	—	0.29	1.42	1.71	0.03	< 0.005	—	2.67
Waste	—	—	—	—	—	—	—	—	—	—	—	1.19	0.00	1.19	0.12	0.00	—	4.16
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	2.66	2.61	0.16	3.28	< 0.005	0.35	< 0.005	0.35	0.34	< 0.005	0.35	34.5	113	148	0.20	0.01	0.08	155

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.37	1.34	0.35	3.00	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	75.0	75.0	0.07	0.03	0.06	84.7
Area	51.8	51.0	0.97	62.3	0.11	8.33	—	8.33	8.29	—	8.29	889	375	1,264	0.82	0.06	—	1,304
Energy	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	513	513	0.05	< 0.005	—	515
Water	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Waste	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	53.2	52.3	1.63	65.4	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	972	1,869	1.84	0.10	0.51	1,945
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.39	1.35	0.39	3.88	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	76.7	76.7	0.08	0.03	< 0.005	87.4
Area	51.7	50.8	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Energy	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	513	513	0.05	< 0.005	—	515
Water	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Waste	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	53.1	52.2	1.65	64.5	0.11	8.36	0.01	8.37	8.32	< 0.005	8.32	898	969	1,866	1.85	0.10	0.45	1,943
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.37	1.34	0.37	3.39	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	75.8	75.8	0.07	0.03	0.03	85.9
Area	13.1	12.9	0.22	14.5	0.02	1.87	—	1.87	1.86	—	1.86	200	85.6	285	0.18	0.01	—	294
Energy	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	513	513	0.05	< 0.005	—	515
Water	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Waste	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	14.5	14.3	0.90	18.0	0.03	1.90	0.01	1.91	1.89	< 0.005	1.89	209	683	891	1.21	0.05	0.47	937
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	0.25	0.24	0.07	0.62	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.5	12.5	0.01	< 0.005	< 0.005	14.2
Area	2.40	2.36	0.04	2.64	< 0.005	0.34	—	0.34	0.34	—	0.34	33.1	14.2	47.2	0.03	< 0.005	—	48.7
Energy	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	84.9	84.9	0.01	< 0.005	—	85.3
Water	—	—	—	—	—	—	—	—	—	—	—	0.29	1.42	1.71	0.03	< 0.005	—	2.67
Waste	—	—	—	—	—	—	—	—	—	—	—	1.19	0.00	1.19	0.12	0.00	—	4.16
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	2.66	2.61	0.16	3.28	< 0.005	0.35	< 0.005	0.35	0.34	< 0.005	0.35	34.5	113	148	0.20	0.01	0.08	155

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.7	19.7	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.47	3.31	0.01	0.15	—	0.15	0.14	—	0.14	—	580	580	0.02	< 0.005	—	582
Dust From Material Movement	—	—	—	—	—	—	2.15	2.15	—	1.11	1.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.63	0.60	< 0.005	0.03	—	0.03	0.03	—	0.03	—	96.1	96.1	< 0.005	< 0.005	—	96.4
Dust From Material Movement	—	—	—	—	—	—	0.39	0.39	—	0.20	0.20	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.11	0.10	0.08	0.86	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	0.01	0.01	0.57	126
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	0.94	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	0.01	0.01	0.01	125
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.5	13.5	< 0.005	< 0.005	0.03	13.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.24	2.24	< 0.005	< 0.005	< 0.005	2.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—

Off-Road	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Off-Road Equipment	3.94	3.31	31.6	30.2	0.05	1.37	—	1.37	1.26	—	1.26	—	5,295	5,295	0.21	0.04	—	5,314
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.84	0.84	—	0.43	0.43	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.36	3.47	3.31	0.01	0.15	—	0.15	0.14	—	0.14	—	580	580	0.02	< 0.005	—	582
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.15	0.15	—	0.08	0.08	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.63	0.60	< 0.005	0.03	—	0.03	0.03	—	0.03	—	96.1	96.1	< 0.005	< 0.005	—	96.4

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.08	0.86	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	0.01	0.01	0.57	126
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.10	0.94	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	0.01	0.01	0.01	125
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.5	13.5	< 0.005	< 0.005	0.03	13.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.24	2.24	< 0.005	< 0.005	< 0.005	2.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.48	0.41	3.78	3.60	0.01	0.16	—	0.16	0.14	—	0.14	—	839	839	0.03	0.01	—	842
Dust From Material Movement	—	—	—	—	—	—	1.17	1.17	—	0.46	0.46	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.07	0.69	0.66	< 0.005	0.03	—	0.03	0.03	—	0.03	—	139	139	0.01	< 0.005	—	139
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.08	0.08	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	0.11	1.07	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	141	141	0.01	0.01	0.02	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.13	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.9	17.9	< 0.005	< 0.005	0.04	18.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.97	2.97	< 0.005	< 0.005	0.01	3.02
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.4. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.46	0.46	—	0.18	0.18	—	—	—	—	—	—	—
Off-Road Equipment	0.48	0.41	3.78	3.60	0.01	0.16	—	0.16	0.14	—	0.14	—	839	839	0.03	0.01	—	842
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.03	0.03	—	—	—	—	—	—	—
Off-Road Equipment	0.09	0.07	0.69	0.66	< 0.005	0.03	—	0.03	0.03	—	0.03	—	139	139	0.01	< 0.005	—	139
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.12	0.11	1.07	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	141	141	0.01	0.01	0.02	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.13	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.9	17.9	< 0.005	< 0.005	0.04	18.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.97	2.97	< 0.005	< 0.005	0.01	3.02
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.62	3.04	27.2	27.6	0.06	1.12	—	1.12	1.03	—	1.03	—	6,599	6,599	0.27	0.05	—	6,621

Dust From Material Movement	—	—	—	—	—	—	9.20	9.20	—	3.65	3.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.01	1.03	< 0.005	0.04	—	0.04	0.04	—	0.04	—	245	245	0.01	< 0.005	—	246
Dust From Material Movement	—	—	—	—	—	—	0.34	0.34	—	0.14	0.14	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.6	40.6	< 0.005	< 0.005	—	40.8
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.10	1.00	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	138	138	0.01	0.01	0.02	140

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	5.15	5.15	< 0.005	< 0.005	0.01	5.24
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.87
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Grading (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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Off-Road Equipment	3.62	3.04	27.2	27.6	0.06	1.12	—	1.12	1.03	—	1.03	—	6,599	6,599	0.27	0.05	—	6,621
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.05	0.05	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	1.01	1.03	< 0.005	0.04	—	0.04	0.04	—	0.04	—	245	245	0.01	< 0.005	—	246
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	0.02	0.02	—	0.01	0.01	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.18	0.19	< 0.005	0.01	—	0.01	0.01	—	0.01	—	40.6	40.6	< 0.005	< 0.005	—	40.8
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.10	1.00	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	138	138	0.01	0.01	0.02	140
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	5.15	5.15	< 0.005	< 0.005	0.01	5.24

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.85	0.85	< 0.005	< 0.005	< 0.005	0.87
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.61	0.82	< 0.005	0.03	—	0.03	0.03	—	0.03	—	124	124	0.01	< 0.005	—	125
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.15	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	20.6	20.6	< 0.005	< 0.005	—	20.6
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.08	0.80	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	105	105	0.01	< 0.005	0.01	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.69	8.69	< 0.005	< 0.005	0.02	8.83
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.44	1.44	< 0.005	< 0.005	< 0.005	1.46
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Paving (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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.07	0.61	0.82	< 0.005	0.03	—	0.03	0.03	—	0.03	—	124	124	0.01	< 0.005	—	125
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	0.00	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.15	< 0.005	0.01	—	0.01	< 0.005	—	< 0.005	—	20.6	20.6	< 0.005	< 0.005	—	20.6
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.09	0.08	0.80	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	105	105	0.01	< 0.005	0.01	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.69	8.69	< 0.005	< 0.005	0.02	8.83
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.44	1.44	< 0.005	< 0.005	< 0.005	1.46
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Trenching (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Trenching (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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Total	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Total	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	20.8	20.8	< 0.005	< 0.005	—	21.0

Total	—	—	—	—	—	—	—	—	—	—	—	—	20.8	20.8	< 0.005	< 0.005	—	21.0

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Total	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Total	—	—	—	—	—	—	—	—	—	—	—	—	126	126	0.02	< 0.005	—	127
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	20.8	20.8	< 0.005	< 0.005	—	21.0
Total	—	—	—	—	—	—	—	—	—	—	—	—	20.8	20.8	< 0.005	< 0.005	—	21.0

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Total	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Total	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	64.1	64.1	0.01	< 0.005	—	64.2
Total	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	64.1	64.1	0.01	< 0.005	—	64.2

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Total	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388

Total	0.04	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	387	387	0.03	< 0.005	—	388
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	64.1	64.1	0.01	< 0.005	—	64.2
Total	0.01	< 0.005	0.06	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	64.1	64.1	0.01	< 0.005	—	64.2

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	49.8	49.0	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Consumer Products	1.34	1.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.54	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.17	0.16	0.02	1.81	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.85	4.85	< 0.005	< 0.005	—	4.87
Total	51.8	51.0	0.97	62.3	0.11	8.33	—	8.33	8.29	—	8.29	889	375	1,264	0.82	0.06	—	1,304
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	49.8	49.0	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299

Consumer	1.34	1.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.54	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	51.7	50.8	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	2.04	2.01	0.04	2.48	< 0.005	0.34	—	0.34	0.34	—	0.34	33.1	13.8	46.8	0.03	< 0.005	—	48.3
Consumer Products	0.24	0.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.10	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	0.01	< 0.005	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.40	0.40	< 0.005	< 0.005	—	0.40
Total	2.40	2.36	0.04	2.64	< 0.005	0.34	—	0.34	0.34	—	0.34	33.1	14.2	47.2	0.03	< 0.005	—	48.7

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	49.8	49.0	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Consumer Products	1.34	1.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural	0.54	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.17	0.16	0.02	1.81	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.85	4.85	< 0.005	< 0.005	—	4.87
Total	51.8	51.0	0.97	62.3	0.11	8.33	—	8.33	8.29	—	8.29	889	375	1,264	0.82	0.06	—	1,304
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	49.8	49.0	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Consumer Products	1.34	1.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.54	0.54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	51.7	50.8	0.96	60.5	0.11	8.33	—	8.33	8.29	—	8.29	889	371	1,259	0.82	0.06	—	1,299
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	2.04	2.01	0.04	2.48	< 0.005	0.34	—	0.34	0.34	—	0.34	33.1	13.8	46.8	0.03	< 0.005	—	48.3
Consumer Products	0.24	0.24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.10	0.10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.02	0.01	< 0.005	0.16	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.40	0.40	< 0.005	< 0.005	—	0.40
Total	2.40	2.36	0.04	2.64	< 0.005	0.34	—	0.34	0.34	—	0.34	33.1	14.2	47.2	0.03	< 0.005	—	48.7

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Total	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Total	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.29	1.42	1.71	0.03	< 0.005	—	2.67
Total	—	—	—	—	—	—	—	—	—	—	—	0.29	1.42	1.71	0.03	< 0.005	—	2.67

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Total	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Total	—	—	—	—	—	—	—	—	—	—	—	1.74	8.58	10.3	0.18	< 0.005	—	16.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	0.29	1.42	1.71	0.03	< 0.005	—	2.67
Total	—	—	—	—	—	—	—	—	—	—	—	0.29	1.42	1.71	0.03	< 0.005	—	2.67

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Total	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Total	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.19	0.00	1.19	0.12	0.00	—	4.16
Total	—	—	—	—	—	—	—	—	—	—	—	1.19	0.00	1.19	0.12	0.00	—	4.16

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Total	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Total	—	—	—	—	—	—	—	—	—	—	—	7.18	0.00	7.18	0.72	0.00	—	25.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	1.19	0.00	1.19	0.12	0.00	—	4.16
Total	—	—	—	—	—	—	—	—	—	—	—	1.19	0.00	1.19	0.12	0.00	—	4.16

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.45	0.45
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.07	0.07

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. 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	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	9/2/2025	10/27/2025	5.00	40.0	—
Grading	Grading	10/28/2025	1/19/2026	5.00	60.0	—
Paving	Paving	1/20/2025	2/28/2025	5.00	30.0	—
Trenching	Trenching	2/10/2026	3/23/2026	5.00	30.0	—

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
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
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

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
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

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	9.53	LDA,LDT1,LDT2
Site Preparation	Vendor	—	7.16	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	9.53	LDA,LDT1,LDT2
Grading	Vendor	—	7.16	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	9.53	LDA,LDT1,LDT2

Paving	Vendor	—	7.16	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Trenching	—	—	—	—
Trenching	Worker	0.00	9.53	LDA,LDT1,LDT2
Trenching	Vendor	—	7.16	HHDT,MHDT
Trenching	Hauling	0.00	20.0	HHDT
Trenching	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	9.53	LDA,LDT1,LDT2
Site Preparation	Vendor	—	7.16	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	9.53	LDA,LDT1,LDT2
Grading	Vendor	—	7.16	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	9.53	LDA,LDT1,LDT2
Paving	Vendor	—	7.16	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Trenching	—	—	—	—
Trenching	Worker	0.00	9.53	LDA,LDT1,LDT2

Trenching	Vendor	—	7.16	HHDT,MHDT
Trenching	Hauling	0.00	20.0	HHDT
Trenching	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)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	60.0	0.00	—
Grading	—	—	180	0.00	—
Paving	0.00	0.00	0.00	0.00	0.35

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	0.35	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
Total all Land Uses	320	320	320	116,800	15.9	15.9	15.9	5,796

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	320	320	320	116,800	15.9	15.9	15.9	5,796

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	11
Gas Fireplaces	18
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	3
Conventional Wood Stoves	0

Catalytic Wood Stoves	2
Non-Catalytic Wood Stoves	2
Pellet Wood Stoves	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	11
Gas Fireplaces	18
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	3
Conventional Wood Stoves	0
Catalytic Wood Stoves	2
Non-Catalytic Wood Stoves	2
Pellet Wood Stoves	0

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)
126360	42,120	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	224,917	204	0.0330	0.0040	1,207,364

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	224,917	204	0.0330	0.0040	1,207,364

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	906,660	3,884,949

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	906,660	3,884,949

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	13.3	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	13.3	—

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	17.8	annual days of extreme heat
Extreme Precipitation	20.8	annual days with precipitation above 20 mm

Sea Level Rise	—	meters of inundation depth
Wildfire	23.8	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	2	2	3	2
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	3	2	4	2
Flooding	1	2	3	2
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	2	2	3	2
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	3	2	4	2
Flooding	1	2	3	2
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	3.91
AQ-PM	1.00
AQ-DPM	1.16
Drinking Water	32.1
Lead Risk Housing	39.0
Pesticides	19.3
Toxic Releases	7.95
Traffic	0.61
Effect Indicators	—

CleanUp Sites	0.00
Groundwater	67.2
Haz Waste Facilities/Generators	43.3
Impaired Water Bodies	43.8
Solid Waste	94.7
Sensitive Population	—
Asthma	47.5
Cardio-vascular	73.5
Low Birth Weights	51.3
Socioeconomic Factor Indicators	—
Education	29.3
Housing	9.19
Linguistic	0.00
Poverty	59.2
Unemployment	74.7

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	43.2567689
Employed	32.144232
Median HI	31.00218144
Education	—
Bachelor's or higher	46.42627999
High school enrollment	100
Preschool enrollment	31.61811882
Transportation	—

Auto Access	68.11240857
Active commuting	7.031951752
Social	—
2-parent households	80.16168356
Voting	64.78891313
Neighborhood	—
Alcohol availability	88.86179905
Park access	8.481971
Retail density	0.397792891
Supermarket access	14.76966508
Tree canopy	98.15218786
Housing	—
Homeownership	71.48723213
Housing habitability	81.86834339
Low-inc homeowner severe housing cost burden	63.91633517
Low-inc renter severe housing cost burden	76.76119595
Uncrowded housing	68.66418581
Health Outcomes	—
Insured adults	61.8760426
Arthritis	0.0
Asthma ER Admissions	21.4
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	10.7

Cognitively Disabled	6.7
Physically Disabled	19.5
Heart Attack ER Admissions	43.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
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	11.5
SLR Inundation Area	0.0
Children	50.1
Elderly	16.0
English Speaking	98.1
Foreign-born	0.5
Outdoor Workers	12.7
Climate Change Adaptive Capacity	—
Impervious Surface Cover	97.2
Traffic Density	5.5
Traffic Access	0.0
Other Indices	—
Hardship	36.4
Other Decision Support	—

2016 Voting	57.1

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	25.0
Healthy Places Index Score for Project Location (b)	53.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
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

Measure Title	Co-Benefits Achieved
CCD-1: Consult Pre-existing Community Knowledge/Priorities	Social Equity

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
Construction: Construction Phases	No previous buildings on site to demolish and project is not responsible for building homes