Harris & Associates

June 4, 2020

Justin Meek, AICP
Principal Planner
City of Watsonville
Watsonville, California

Mountain Propane Environmental Guidance Memorandum

Dear Mr. Meek:

The purpose of this memorandum prepared by Harris & Associates (Harris) is to support the City of Watsonville (City) in determining the appropriate California Environmental Quality Act (CEQA) documentation for the Mountain Propane Tank Relocation and Filling Station (project), proposed by project applicant Mountain Propane.

Harris' determination that a Common Sense Exemption is the appropriate documentation (instead of an Initial Study/Mitigated Negative Declaration) is based on the potential environmental impacts of the project, as identified in several technical studies prepared, and guidance on the potential use of the "common sense" exemption found in CEQA Guidelines Section 15061(b)(3).

Project Description

The Mountain Propane Tank Relocation and Filling Station Project (project) site is located at 950 West Beach Street in the City of Watsonville (**Figure 1**). The 0.69-acre project site is zoned General Industrial (IG) and is a previously developed industrial site, owned by Mountain Propane and previously owned by Venture Oil Company and used for propane storage. Currently, the project site is comprised of impervious pavement and concrete surfaces, heavily disturbed unpaved areas, and a 50,000-gallon propane storage tank that is not currently in use.

The applicant is proposing to relocate the existing 50,000-gallon propane storage tank westward to the middle of the site and to install four new 30,000-gallon propane storage tanks in the approximately 1,750 square foot area currently occupied by the existing tank, resulting in a total of 170,000 gallons of propane storage at the project site.

Additional site improvements include asphalt paving, bollard installation, foundation construction for the propane tanks, tank unloading stations, irrigation and landscaping, gate and fencing installation, liquefied petroleum gas (LPG) piping and appurtenance installation, mini mobile office, and private fire hydrant installation.

The propane storage tanks and LPG piping and appurtenance equipment would be installed and maintained in accordance with California Code of Regulations, Title 8, Article 7, Section 536[i]. The tanks and LPG piping would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keeps errant propane from being released. The site would be under video monitoring when company personnel is not onsite and throughout the evening.

The applicant would utilize the adjacent rail line for the delivery of the propane, which would then be transferred to a truck and then to the on-site propane storage tanks, and would fill bobtail delivery trucks at the site and deliver propane to customers. The transport rail and truck facilities would be operated and maintained in accordance with Federal Code of Regulations, Title 49, Part 174 (Carriage by Rail)[ii] and CHP Form 800C (Vehicles Transporting Hazardous Materials)[iii].

The project would be implemented in two phases. Phase 1 involves rotating and relocating the existing 50,000-gallon storage tank to allow easier access for filling and distribution and would be implemented this year (2020).

Phase 2 involves adding 120,000 gallons of storage (in four new 30,000-gallon storage tanks) and would be implemented within 2-3 years, contingent on demand and development of business services.

Following construction, it is estimated that the project would generate approximately 10 roundtrips for bobtail trucks, four daily roundtrips for passenger vehicles, and up to one heavy-duty truck trip daily at buildout, after both Phase 1 and 2 are constructed.

CEQA Compliance and Documentation

Because the project requires discretionary approval, it is considered a project subject CEQA. As a project under CEQA, the lead agency (City of Watsonville) is required to determine if the project is exempt from CEQA or requires further analysis. CEQA Guidelines Section 15061(b) states that a project is exempt from CEQA if:

1. The project is exempt by statute (Article 18);
2. The project is exempt pursuant to a categorical exemption (Article 19);
3. The activity is covered by the common sense exemption that CEQA applies only to projects that have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA;
4. The project will be rejected or disapproved by the public agency; or
5. The project is exempt pursuant to the provisions of Article 12.5 (Agricultural Housing, Affordable Housing, and Residential Infill Projects).

To determine if the "common sense" exemption applies (as described in #3), Harris conducted a review of the following five environmental topics based on the questions outlined in CEQA Guidelines Appendix G, Environmental Checklist Form, and documented the results in technical memoranda (attached).

- Air Quality/Greenhouse Gases
- Archeological/Cultural Resources
- Biological Resources
- Hazardous Materials
- Traffic/Transportation

Conclusion

The analyses all conclude that the proposed project would have either "no impact" or a "less than significant impact" on the environment. No mitigation measures are recommended or required to reduce potential impacts to a less than significant level for any of the environmental topics analyzed. Best Management Practices (BMPs) are recommended were applicable.

Therefore, it is clear, based on the evidence on the record, that the proposed project can be considered exempt from CEQA under Section 15061(b)(3), the "common sense" exemption, as it can be seen with certainty that there is no possibility that the activity (project) in question would have a significant effect on the environment. Refer to the five attached technical memoranda for documentation and evidence on the record.

Sincerely,

David J. R. Mack, AICP
Senior Planner/Project Manager

Attachments:

1. Air Quality/Greenhouse Gases Technical Memorandum
2. Archaeological/Cultural Resources Technical Memorandum
3. Biological Resources Technical Memorandum
4. Hazardous Materials Technical Memorandum
5. Traffic/Transportation Technical Memorandum

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[i] California Code of Regulations, Title 8, Section 536, printed May 7, 2020

[ii] Code of Federal Regulations, Title 49, Part 174.304, printed May 7, 2020

[iii] California Highway Patrol Form 800C, printed May 7, 2020.

Source: County of Santa Cruz Imagery 2016.

Harris & Associates

N

0 300 600

Feet

Figure 1

Mountain Propane Project Location

Harris & Associates

TECHNICAL MEMORANDUM

To: Justin Meek, AICP, Principal Planner, City of Watsonville
From: Sharon Toland, Project Manager and Air Quality/GHG Specialist, Harris & Associates
Subject: **Mountain Propane Project - Air Quality and Greenhouse Gas Emissions**
Date: June 4, 2020
CC: David Mack, Project Manager/Senior Planner, Harris & Associates
Att: 1, Model Outputs

Introduction

The purpose of this technical memorandum is to determine potential air quality and greenhouse gas (GHG) emissions impacts of the proposed Mountain Propane Tank Relocation and Filling Station Project, as they relate to compliance with the California Environmental Quality Act (CEQA) and the Monterey Air Resources Board's guidelines. Accordingly, the methodology used is to address the questions related to Air Quality and GHG in the CEQA Guidelines Appendix G, Environmental Checklist Form.

The information in this memorandum is based on project description information provided by the applicant[1], field survey, and research conducted by Harris & Associates staff.

Project Description

The Mountain Propane Tank Relocation and Filling Station Project (project) site is located at 950 West Beach Street in the City of Watsonville (**Figure 1**). The 0.69-acre project site is zoned General Industrial (IG) and is a previously developed industrial site, owned by Mountain Propane and previously owned by Venture Oil Company and used for propane storage. Currently, the project site is comprised of impervious pavement and concrete surfaces, heavily disturbed unpaved areas, and a 50,000-gallon propane storage tank that is not currently in use.

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Additional site improvements include asphalt paving, bollard installation, foundation construction for the propane tanks, tank unloading stations, irrigation and landscaping, gate and fencing installation, liquefied petroleum gas (LPG) piping and appurtenance installation, mini mobile office, and private fire hydrant installation.

The propane storage tanks and LPG piping and appurtenance equipment would be installed and maintained in accordance with California Code of Regulations, Title 8, Article 7, Section 536[i]. The tanks and LPG piping would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keeps errant propane from being released. The site would be under video monitoring when company personnel is not onsite and throughout the evening.

The applicant would utilize the adjacent rail line for the delivery of the propane, which would then be transferred to a truck and then to the on-site propane storage tanks, and would fill bobtail delivery trucks at the site and

[1] Project application documents and background studies were provided by Justin Meek, AICP, Principal Planner, City of Watsonville, on January 24, 2020. Additional information related to project construction and operation was provided by the applicant's engineer C2G Engineering via David Dauphin, in a March 22, 2020 email and Richard Kojak in a March 23, 2020 email.

deliver propane to customers. The transport rail and truck facilities would be operated and maintained in accordance with Federal Code of Regulations, Title 49, Part 174 (Carriage by Rail)[ii] and CHP Form 800C (Vehicles Transporting Hazardous Materials)[iii].

The project would be implemented in two phases. Phase 1 involves rotating and relocating the existing 50,000-gallon storage tank to allow easier access for filling and distribution and would be implemented this year (2020). Phase 2 involves adding 120,000 gallons of storage (in four new 30,000-gallon storage tanks) and would be implemented within 2-3 years, contingent on demand and development of business services.

Following construction, it is estimated that the project would generate approximately 10 roundtrips for bobtail trucks, four daily roundtrips for passenger vehicles, and up to one heavy-duty truck trip daily at buildout, after both Phase 1 and 2 are constructed.

Emissions of Concern

Air Quality

Historically, air quality laws and regulations have divided air pollutants into two broad categories: criteria air pollutants and non-criteria pollutants, or toxic air contaminants (TACs). Criteria air pollutants are a group of common air pollutants regulated by the federal and state governments by means of ambient standards based on criteria regarding health and environmental effects of pollution (USEPA 2018a). TACs are pollutants with the potential to cause significant adverse health effects. Unlike the air quality standards for criteria pollutants to protect health and the environment, in California, the California Air Resources Board (CARB) identifies exposure thresholds for TACs that indicate levels below which no significant adverse health effects are anticipated from exposure to the identified substance. However, no thresholds are specified for TACs that have been found to have no safe exposure level or where insufficient data are available to identify an exposure threshold (CARB 2020a).

The criteria air pollutants pertinent to the analysis in this report are carbon monoxide, nitrogen oxides, ozone, particulate matter, and sulfur dioxide. The following describes the health effects for each of these criteria air pollutants.

Carbon Monoxide (CO)

CO is a colorless, odorless, poisonous gas produced by combustion processes, primarily mobile sources. When CO gets into the body, it combines with chemicals in the blood and prevents blood from providing oxygen to cells, tissues, and organs. Because the body requires oxygen for energy, high-level exposure to CO can cause serious health effects, including death (USEPA 2016a).

Nitrogen Oxides (NOx)

NO_x is a general term pertaining to compounds including nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen. NO_x is produced from burning fuels, including gasoline, diesel, and coal. NO_x reacts with VOCs to form ground-level O_3 (smog). NO_x is linked to a number of adverse respiratory systems effects (USEPA 2016b).

Ozone (O3)

Ground level O_3 is not emitted directly into the air but is formed by chemical reactions of "precursor" pollutants (NO_x and VOCs) in the presence of sunlight. Major emissions sources include NO_x and VOC emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents. Propone is a volatile organic compound and O_3 precursor (CARB 2014). O_3 can trigger a variety of health problems, particularly for sensitive receptors, including children, the elderly, and people of all ages who have lung diseases, such as asthma (USEPA 2018b).

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter includes dust, metals, organic compounds, and other tiny particles of solid materials that are released into and move around in the air. Particulates are produced by many sources, including the burning of diesel fuels by trucks and buses, industrial processes, and fires. Particulate pollution can cause nose and throat irritation and heart and lung problems. Particulate matter is measured in microns, which are 1 millionth of a meter in length (or 1

thousandth of a millimeter). PM_{10} is small (i.e., respirable) particulate matter measuring no more than 10 microns in diameter, while $PM_{2.5}$ is fine particulate matter measuring no more than 2.5 microns in diameter (CARB 2020b).

Sulfur Dioxide (SO_2)

SO_2 is formed primarily by the combustion of sulfur-containing fossil fuels, especially at power plants and industrial facilities. SO_2 is linked to a number of adverse effects on the respiratory system (USEPA 2019a).

Toxic Air Contaminants

TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. The two primary emissions of concern regarding health effects for land development projects are CO and diesel particulate matter (DPM). The health effects of CO are described previously. DPM is a mixture of many exhaust particles and gases that is produced when an engine burns diesel fuel. Compounds found in diesel exhaust are carcinogenic. Some short-term (acute) effects of diesel exhaust exposure include eye, nose, throat, and lung irritation and headaches and dizziness. Long-term exposure is linked to increased risk of cardiovascular, cardiopulmonary, and respiratory disease and lung cancer (OSHA 2013).

Greenhouse Gas Emissions

The primary GHG emitted by human activities is carbon dioxide (CO_2). CO_2 enters the atmosphere through the burning of fossil fuels, solid waste, trees, and wood products and because of other chemical reactions, such as those produced through the manufacturing of cement. Globally, the largest source of CO_2 emissions is the combustion of fossil fuels in power plants, automobiles, industrial facilities, and other similar sources (USEPA 2020). Methane (CH_4) is emitted from natural and human-related sources, including fossil fuel production, animal husbandry, rice cultivation, biomass burning, and waste management (USEPA 2020). Nitrous oxide (N_2O) is emitted during agricultural and industrial activities and combustion of fossil fuels and solid waste (USEPA 2020). Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes and the production of chlorodifluoromethane. Construction or operation of the proposed project would not include any industrial processes other than propane storage, and chlorodifluoromethane has been mostly phased out of use in the United States, with the exception of feedstock production (USEPA 2020); therefore, these GHGs are not discussed further in this report.

Individual GHGs have varying heat-trapping properties and atmospheric lifetimes. **Table 1** identifies the CO_2 equivalent (CO_2e) and atmospheric lifetimes of basic GHGs. The CO_2e is a consistent method for comparing GHG emissions because it normalizes various GHG emissions to a consistent measure. Each GHG is compared to CO_2 with respect to its ability to trap infrared radiation, its atmospheric lifetime, and its chemical structure. For example, CH_4 is a GHG that is 25 times more potent than CO_2; therefore, 1 metric ton (MT) of CH_4 is equal to 25 metric tons of carbon dioxide equivalent ($MTCO_2e$).

Table 1. Global Warming Potentials and Atmospheric Lifetimes of Common Greenhouse Gases

GHG	Formula	100-Year Global Warming Potential (1)	Atmospheric Lifetime
Carbon dioxide	CO2	1	~100
Methane	CH4	25	12
Nitrous oxide	N2O	298	121

Source: CAPCOA 2017. Consistent with CalEEMod, Version 2016.3.2.

Definitions: CH4 = methane; CO2 = carbon dioxide; GHG = greenhouse gas; N2O = nitrous oxide

(1) The warming effects over a 100-year period relative to other GHGs.

Regulatory Setting

The project site is located within Watsonville, which is within the North Central Coast Air Basin (NCCAB), comprised of Monterey, Santa Cruz, and San Benito Counties. The Monterey Bay Air Resources District (MBARD) consists of all three counties within the NCCAB; therefore, MBARD is responsible for air monitoring, permitting, enforcement, long-range air

quality planning, regulatory development, education, and public information activities related to air pollution, as required by the California Clean Air Act (CCAA) and Amendments, and the Federal Clean Air Act (CAA) and Amendments.

The CAA of 1970 required the U.S. Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) with states retaining the option to adopt standards that are more stringent or to include other specific pollutants. The 1990 CAA Amendments require that each state have an air pollution control plan called the State Implementation Plan (SIP). The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The USEPA reviews the SIPs to determine whether the plans would conform to the 1990 CAA Amendments and achieve the air quality goals.

The USEPA has classified air basins (or portions thereof) as being in "attainment," "nonattainment," or "unclassified" for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. **Table 2** lists the attainment status of the North Central Coast Air Basin (NCCAB) for the applicable criteria pollutants. The USEPA classifies the NCCAB as in attainment or unclassified for all pollutants with respect to federal air quality standards. The NCCAB is not in nonattainment status for any pollutant under federal standards. On April 2, 2007, the U.S. Supreme Court ruled in Massachusetts v. USEPA that CO_2 is an air pollutant, as defined under the federal Clean Air Act, and that the USEPA has the authority to regulate emissions of GHGs. However, a NAAQS or equivalent standard has not been established for GHG emissions.

The state of California, under the California Clean Air Act (CCAA), has established standards for criteria pollutants that are generally stricter than federal standards. As shown in **Table 2**, the NCCAB is currently in nonattainment status for respirable particulate matter (PM_{10}), and transitional nonattainment status for ozone. An area is designated transitional nonattainment if, during a single calendar year, the state standard is not exceeded more than three times at any monitoring location within the district.

Table 2. North Central Coast Air Basin Attainment Status

Pollutant	Averaging Time	California Standards	Federal Standards
Ozone (O3)	1 Hour	Nonattainment – Transitional	No Federal Standard
	8 Hour		Attainment
Respirable Particulate Matter (PM10)	Annual Arithmetic Mean	Nonattainment	No Federal Standard
	24 Hour		Unclassified (1)
Fine Particulate Matter (PM2.5)	Annual Arithmetic Mean	Attainment	Attainment
	24 Hour	No State Standard	
Carbon Monoxide (CO)	8 Hour	Unclassified	Unclassified/Attainment
	1 Hour		
Nitrogen Dioxide (NO2)	Annual Arithmetic Mean	No State Standard	Attainment
	1 Hour	Attainment	No Federal Standard
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	No State Standard	Attainment
	24 Hour	Attainment	Attainment
	1 Hour	Attainment	No Federal Standard

Source: CARB 2018, USEPA 2017b.

Unclassified; indicates data are not sufficient for determining

In September 2006, the California Legislature adopted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 focuses on reducing GHG emissions in California. AB 32 identifies a statewide goal of reducing the statewide level of GHG emissions to 1990 levels by 2020. Effective January 1, 2017, Senate Bill (SB) 32 requires California to reduce its statewide GHG emissions by the year 2030 so that emissions are 40 percent below those that occurred in 1990. Additionally, in 2005, California Governor Arnold Schwarzenegger announced, through EO S-3-05, a statewide GHG emission reduction target of reducing GHG emissions to 80 percent below 1990 levels by 2050.

The 2017 Climate Change Scoping Plan (2017 Scoping Plan) was finalized in November 2017 and adopted in December 2017. This plan outlines the framework for achieving the statewide emissions reduction goals. The 2017 Scoping Plan identifies GHG reductions by emissions sector to achieve a statewide emissions level that is 40 percent below 1990 levels by 2030. CARB recommends statewide targets of no more than 6 $MTCO_2e$ per capita by 2030 and no more than 2 $MTCO_2e$ per capita by 2050. However, CARB specifically states that these goals are appropriate for the plan level (city, county, subregional, or regional level) but not for specific individual projects because the goals include all emissions sectors in the state (CARB 2017).

In 2015, Watsonville adopted a Climate Action Plan (CAP) to assist Watsonville in preparing for the potential impacts of climate change and protect public health, safety and critical infrastructure. The CAP identifies and prioritizes policies and programs that both reduce GHG emissions and increase the ability of the city to adapt to future climate impacts. Based on state guidance, the CAP establishes the goals of reducing GHG emissions by 15 percent from 2005 levels to meet the AB 32 target and 25 percent below 2005 emissions by 2030 to continue on the trajectory to reach the 2050 reduction target. The CAP includes a list of actions for the City to implement to reduce GHG emissions, including improvements for bicycle and pedestrian infrastructure and incentive programs to promote reduction in vehicles miles travelled and utility use. The CAP does not include specific requirements or emissions reduction targets for individual projects.

Potential Impacts

Methodology

Project criteria pollutant and GHG emissions were estimated using the CalEEMod Model, version 2016.3.2, based on construction information provided by the applicant and City of Watsonville. Detailed assumptions and modeling data sheets are provided in **Attachment 1**.

Construction of Phase 1 of the project would result in the disturbance of a total of 21,000 square feet. Construction would take place over a total of 4.5 months, and construction activities would potentially overlap. Construction would generally include demolition of existing material on-site (10 working days), grading (20 working days), paving (10 working days), and construction of the pad and installation of the permanent propane tank (67 working days). Construction and installation would consist of construction of concrete piers (3 weeks), installation of storm water and irrigation utilities (3 weeks), relocation of tank (2 days), installation of propane piping (3 weeks), lighting and electrical installation (2 weeks), and planting (1 week). The entire disturbance area of 21,000 square feet is assumed for demolition material. Grading is anticipated to require import of 156 cubic yards of material. CalEEMod default assumptions are assumed for anticipated construction fleet, hours of operation of construction equipment, and worker vehicle and truck trips. Phase 2 of the project would potentially add 120,000 gallons of storage (in four new 30,000-gallon storage tanks); however, earthwork and pad construction for this phase would be completed in Phase 1. Therefore, Phase 1 represents the worst-case construction emission that would occur from the project.

Following construction, the project would generate approximately 10 daily roundtrips for bobtail trucks at buildout. Additionally, four roundtrips for passenger vehicles are anticipated daily. Up to one heavy-duty truck trip is anticipated per week. Modeling conservatively assumes a daily heavy-duty truck trip. Most propane would be delivered by rail. The project site is currently served by rail, and the proposed project would not result in a change to existing rail operations. Emissions from rail are not included in this analysis. No permanent facilities for drivers would be provided on the site. Therefore, it is assumed that the proposed project would not generate

demand for water, natural gas, or solid waste onsite. The project would result in electricity demand for lighting. It is assumed that electricity service would be carbon-free electricity provided by Monterey Bay Community Power (MBCP). Therefore, no GHG emissions are calculated for electricity use.

The project site would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keeps errant propane from being released. However, VOC emissions from propane storage and loading operations are estimated based on calculations performed for the Watkins Glen Storage Facility in Schuyler County, New York, and the Marathon Petroleum Company LP Refinery in Detroit, Michigan, as part of the permitting processes for these facilities.

Watkins Glen Storage Facility proposed 150,000 gallons of propane storage for truck and rail delivery (Trinity Consultants 2010). The 2010 permit application for this facility estimated annual VOC emissions of 6.81 tons per year from loading and unloading activities and 0.07 tons per year from fugitive releases. However, calculations projected loading and unloading activities for 98,112 trucks per year, compared to approximately 2,500 per year for the proposed project at buildout. Therefore, loading emissions for the proposed project would be approximately three percent of this facility, or 0.17 tons (340 pounds) per year. Likewise, potential VOC emissions from fugitive releases would be approximately 0.08 tons (160 pounds) per year for the proposed project based on the relatively larger storage capacity. Thus, the estimated total daily VOC emissions for the proposed project would be approximately 0.25 tons (500 pounds) per year, or 1.4 pounds per day.

More recently, in 2015 the study for Marathon Petroleum Company LP Refinery calculated potential VOC emissions from LPG storage, including propane, and operations, including both truck and railcar loading (Horizon Environmental 2015). The study calculated total potential fugitive VOC emissions due to leaking components associated with the proposed storage and transfer operations using emission factors for individual storage and transfer components. The study calculated that the project's upgraded facilities would result an estimated 5,164 pounds per year of VOCs, or approximately 14 pounds per day. The Marathon Petroleum Company storage facilities would have a capacity of 59,100 barrels (approximately 2.48 million gallons). Based on the calculations for the Marathon Petroleum Company storage facilities, an emissions factor of approximately 0.002 pounds per year (0.000006 pounds per day) per gallon of propane storage. Based on this emissions factor, the potential storage capacity of 170,000 gallons of propane at the project site would result in emissions of approximately 0.17 tons (340 pounds) per year, or 0.9 pounds per day.

Detailed specifications of project equipment are unknown at this time; therefore, because the results of these permit applications from the aforementioned facilities result in similar emissions estimates for the proposed project, the conservative VOC estimate of 1.4 pounds per day is assumed to represent potential VOC emissions from propane release for buildout of the proposed project.

Air Quality

The following sections address the potential for the proposed project to result in a significant impact based on the questions outlined in Appendix G of the CEQA Guidelines related to air quality.

1. Would the project conflict with or obstruct implementation of the applicable air quality plan?

In accordance with the CCAA, MBARD has developed the 2012-2015 Air Quality Management Plan (AQMP) for the Monterey Bay Region (MBARD 2017). The focus of the plan is achieving the 8-hour ozone standard in the region. The plan includes an updated air quality trends analysis; emissions inventory that includes the latest information on stationary, area, and mobile emission sources; and mobile source programs. Projects that are inconsistent with the AQMP would result in a significant cumulative impact related to ozone emissions. A project is consistent with the AQMP if it is consistent with the growth assumptions in the AQMP and, therefore, accommodated in the emissions inventories.

According to MBARD Guidelines, a project would conflict with or obstruct implementation of the AQMP for the NCCAB if it is inconsistent with the growth assumptions included in the AQMP, in terms of population,

employment, or regional growth in vehicle miles traveled (VMT) (MBARD 2008). The proposed project does not contain a residential component and would therefore not increase the residential population. The commercial component replaces an existing temporary propone tank and would not provide a new employment center. The proposed project is consistent with existing zoning and is consistent with the growth assumptions in the AQMP. Construction of the proposed project would generate temporary employment opportunities, but jobs created by this construction activity would likely be filled by the existing workforce in Watsonville or immediately surrounding areas. No direct growth inducement is expected to result from proposed project implementation.

No stationary sources would be constructed that would be long-term permanent sources of emissions. Permanent propone storage would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keeps errant propane from being released. As further discussed below, the project would not result in an exceedance of numeric thresholds established by MBARD during construction or operation. Additionally, the proposed project would involve typical construction practices and general construction activity related emissions (i.e., temporary sources). According to Section 5.3 of the MBARD CEQA Air Quality Guidelines (2008), Criteria for Determining Construction Impacts, typical construction practices are accounted for in the emission inventories included in the air quality plans. Therefore, impacts to air quality plan objectives would be less than significant. Implementation of the project would not conflict with or obstruct any long-range air quality plans of the MBARD.

2. Would the project 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?

Construction

Construction activities associated with the project would result in temporary increases in air pollutant emissions. According to MBARD, construction activities (e.g., excavation, grading, on-site vehicles) which directly generate 82 pounds per day or more of PM_{10} would have a significant impact on local air quality. The screening level for construction with the potential to exceed this threshold is disturbance of 2.2 acres or more per day. The project site is less than one acre; therefore, the proposed project would not exceed the screening level for potential PM_{10} impacts. However, potential construction emissions from the project have been quantified and are presented in **Table 3**. As shown in **Table 3**, the project is not estimated to generate PM_{10} levels in exceedance of this threshold during any phase or simultaneous phase of construction.

MBARD does not identify quantitative thresholds for other criteria pollutants during construction. Construction projects using typical construction equipment such as dump trucks, scrapers, bulldozers, compactors and front-end loaders that temporarily emit precursors of ozone (i.e., VOC or NOx), are accommodated in the emission inventories of state- and federally-required air plans and would not have a significant impact on the attainment and maintenance of ozone AAQS. However, a project that would use non-typical equipment would have the potential to result in a significant impact related to emissions of VOCs or NOx. The proposed project would employ typical construction equipment. It would not require any non-typical construction equipment or techniques that have not been accounted for in the NCCAB emissions inventories. Thus, the proposed project would not result in a significant impact related to emissions of VOCs or NOx.

The proposed project would result in a less than significant impact related to maximum daily criteria pollutant emissions during construction. Because the emissions would be below the applicable health-based significance thresholds, no adverse health effects would occur. The project would not result in a cumulatively considerable net increase of any criteria pollutant. Therefore, construction emissions would be less than significant.

Table 3. Estimated Construction Daily Maximum Air Pollutant Emissions (lbs. /day)

Construction Phase	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Demolition	1	10	8	<1	3	1
Grading	1	10	8	<1	1	1
Paving	1	7	8	<1	<1	<1
Pad Construction, Utility Installation, and Tank Relocation	1	8	8	<1	1	<1
Maximum Simultaneous Daily Emissions	**2**	**20**	**16**	**<1**	**4**	**2**
MBARD Threshold	–	–	–	–	82	–
Significant Impact?	–	–	–	–	No	–

Source: CalEEMod Version 2016.3.2. Model output provided in Attachment 1.

Definitions: VOC = Volatile Organic Compounds. NOx = Oxides of Nitrogen. CO = Carbon Monoxide. SOx. = Sulfur oxides. PM10 = Particulate matter 10 micrometers or less in diameter. PM2.5 = Particulate matter 2.5 micrometers or less in diameter.

Operation

Following construction, the project would generate criteria pollutant emissions from truck delivery and personal vehicle trips. Minimal VOC emissions from propane leaks are anticipated. Emissions from operation of the project are provided in **Table 4**. The proposed project would not exceed MBARD thresholds for maximum daily criteria pollutant emissions for any pollutant during operation. Because the emissions would be below the applicable health-based significance thresholds, no adverse health effects would occur. The project would not result in a cumulatively considerable net increase of any criteria pollutant. Therefore, cumulative operational impacts related to emissions of criteria pollutants would be less than significant.

Table 4. Estimated Operation Daily Maximum Air Pollutant Emissions (lbs. /day)

Construction Phase	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Mobile Emissions	<1	2	1	<1	<1	<1
Propane Release	1.4	--	--	--	--	--
MBARD Threshold	137	137	550	150	82	–
Significant Impact?	No	No	No	No	No	–

Source: CalEEMod Version 2016.3.2 (mobile emissions). Model output provided in Attachment 1. Horizon Environmental 2015 (propane release).

Definitions: VOC = Volatile Organic Compounds. NOx = Oxides of Nitrogen. CO = Carbon Monoxide. SOx. = Sulfur oxides. PM10 = Particulate matter 10 micrometers or less in diameter. PM2.5 = Particulate matter 2.5 micrometers or less in diameter.

3. Would the project expose sensitive receptors to substantial pollutant concentrations?

MBARD defines sensitive receptors for CEQA purposes as any residence including private homes, condominiums, apartments, and living quarters; education resources such as preschools and kindergarten through grade twelve (k-12) schools; daycare centers; and health care facilities such as hospitals or retirement and nursing homes. Sensitive receptors also include long-term care hospitals, hospices, prisons, and dormitories or similar live-in housing.

The project site is located on lands used for industrial uses. The nearest sensitive receptors are residences located approximately 700 feet northwest of the project site. As shown in **Table 3**, construction emissions from the project would be minimal. Additionally, construction would only occur over a 4.5-month period. Therefore, because project construction activities, such as the operation of heavy equipment, would be minimal and would occur relatively far away from sensitive receptors, the proposed project is not anticipated to expose these receptors to short-term criteria pollutant emissions.

Following construction, the proposed project would result in new truck trips and permanently locate propane storage on the project site. New truck trips are a potential source of DPM. A maximum of 11 daily roundtrip truck trips are anticipated for the site. As shown in **Table 4**, these trips would result in emissions that would be minimal relative to MBARD thresholds. Particulate matter emissions would be less than one pound per day. Additionally,

a total of 15 roundtrips, including passenger vehicles, occurring throughout the workday, would not contribute to congestion that would result in a potential carbon monoxide hotpot. Propane is a VOC and ozone precursor; however, propane storage is not a use listed by CARB as potentially requiring a health risk assessment (CARB 2005). The project site would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keep errant propane from being released. As shown in **Table 4**, emissions are anticipated to be minimal. Therefore, due to distance and minimal emissions anticipated for the project, impacts to sensitive receptors from project operation would be less than significant.

4. Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Construction associated with the proposed project could result in minor amounts of odor compounds associated with diesel-heavy equipment exhaust. However, diesel equipment would not be operating together at one time, and construction near existing receptors, including employees at adjacent industrial land uses, would be temporary. Additionally, SOx is the only criteria air pollutant with a strong, pungent odor (ATSDR 2015). As shown in **Table 3**, maximum construction emissions of SOx would be less than 1 pound per day, which is well below the MBARD long-term threshold of 150 pounds per day. Therefore, impacts associated with odors during construction would not result in nuisance odors that would result in a significant impact.

CARB's Air Quality and Land Use Handbook (CARB 2005) includes a list of the most common sources of odor complaints received by local air districts. Typical sources of odor complaints include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations. The proposed project does not propose any new uses that would be associated with new objectionable odors. The project site would also be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keep errant propane from being released. As shown in **Table 4**, emissions are anticipated to be minimal. Odor emissions from the proposed project would be limited to odors associated with vehicle and engine exhaust and idling from cars entering, parking, and exiting the facility. A maximum of 11 trucks are anticipated for the site per day and would be dispersed throughout the day. Idling would be limited to five minutes or less in accordance with California Code of Regulations, Title 13, sections 2449(d)(3) and 2485. Therefore, the project does not include any known sources of objectionable odors associated with the long-term operations phase.

The project would not create objectionable odors affecting a substantial number of people; therefore, the project would result in a less than significant impact related to objectionable odors during construction or operation.

Greenhouse Gas Emissions

The following sections address the potential for the proposed project to result in a significant impact based on the questions outlined in Appendix G of the CEQA Guidelines related to GHG emissions.

1. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Implementation of the project would generate greenhouse gas (GHG) emissions by usage of fossil fuels during construction activities and vehicle trips during operation. The 4.5-month construction period for Phase 1 would result in one- time total GHG emissions of 72 $MTCO_2e$, based on the conservative assumptions for analysis. Placement of tanks during Phase 2 would result in some additional GHG emissions for tank transport and placement. However, major construction activities, such as earthwork and pad construction, would be completed during Phase 1. Phase 2 construction emissions would not exceed the worst-case annual emissions of 72 $MTCO_2e$ estimated for Phase 1. Following construction, the proposed project would result in annual GHG emissions of approximately 66 $MTCO_2e$ from truck and passenger vehicle trips at buildout. This estimate is conservative and assumes one daily heavy-duty truck trip in addition to regular bobtail truck trips. **Attachment 1** provides detailed model output for project emissions.

Neither Watsonville nor MBARD have established a numeric threshold for screening impacts related to GHG emissions. Additionally, the Watsonville CAP is not a qualified CAP according to CEQA Guidelines Section 15183.5. However, a threshold of 900 MTCO2e (annual operational emissions) is recommended by the California Air Pollution Control Officers Association (CAPCOA) (CAPCOA 2008), and a threshold of 1,100 MTCO2e (annual operational emissions) was adopted by neighboring air districts, including the Sacramento Metropolitan Air Quality Management District, as referenced in the 2017 Scoping Plan (CARB 2017), and the Bay Area Air Quality Management District (BBAQMD 2017). These bright-line thresholds address the state's long-term emissions reduction goals by determining a screening level under which a project would not be considered to hinder the state's ability to meet long-term goals. Bright-line thresholds are typically intended to screen out smaller projects with relatively minimal emissions so that the vast majority (typically 90 percent) of total future development would be subject to mitigation or project features that would reduce GHG emissions compared to business-as-usual emissions, and consistent with GHG reduction goals (CAPCOA 2008). Although these thresholds do not specifically address the contribution of emissions in Watsonville to the statewide goals or the goals of the CAS, these screening levels provide a reasonable proxy for screening project impacts related to statewide GHG reduction goals.

The proposed project would be responsible for a temporary increase in GHG emissions during construction and minimal on-going annual GHG emissions following construction. However, emissions would not exceed annual emissions thresholds recommended by CAPCOA or neighboring air districts for on-going operational impacts. Emissions would be less than 10 percent of the bright-line emissions thresholds adopted by neighboring agencies to screen out smaller projects whose emissions would be considered relatively minimal. Therefore, the project would not result in a significant on-going increase in annual GHG emissions. This impact would be less than significant.

2. Would the project conflict would an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The Watsonville CAP and statewide emissions reduction goals are the applicable plans and regulations adopted for the purpose of reducing GHG emissions. As discussed above, the project would result in relatively minimal GHG emissions that would not be anticipated to conflict with the ability of the City or the state to meet emissions reduction goals (AB 32, S-3-05, and SB 32). As a propane storage facility that does not include permanent services for drivers, the project does not propose any structures that would be subject to programs outlined in the CAP to reduce utility use. The project would accommodate only those truck trips that could be served by propane tank capacity, and truck trips are required for this kind of activity. As such, CAP measures related to reduction in vehicle miles travelled, primarily by increasing non-motorized travel, do not apply to the project. The proposed project would not conflict with the CAP or statewide emissions reduction goals. This impact would be less than significant.

Summary

The proposed project would not result in air quality or GHG emissions that would exceed applicable thresholds. All impacts would be less than significant with no mitigation required.

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[i] California Code of Regulations, Title 8, Section 536, printed May 7, 2020
[ii] Code of Federal Regulations, Title 49, Part 174.304, printed May 7, 2020
[iii] California Highway Patrol Form 800C, printed May 7, 2020.

Source: County of Santa Cruz Imagery 2016.

Harris & Associates

N

0 300 600

Feet

Figure 1

Mountain Propane Project Location

Attachment 1. Model Outputs

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950 W Beach St

North Central Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-Rail	3.50	1000sqft	0.08	3,500.00	0
Parking Lot	17.50	1000sqft	0.40	17,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on information from applicant

Grading -

Demolition -

Vehicle Trips - Based on estimate of up to 11 trucks and 4 passenger vehicles per day

Fleet Mix - Assumes 10 out of 15 vehicles would be MDT, 1 out of 15 HDT, and 4 out of 15 would be personal vehicles

Energy Use - No natural gas use.

Water And Wastewater - No water use

Solid Waste - No solid waste facilities

Table Name	Column Name	Default Value	New Value
tblEnergyUse	NT24NG	0.21	0.00
tblEnergyUse	T24NG	1.18	0.00
tblFleetMix	HHD	0.04	0.06
tblFleetMix	LDA	0.54	0.09
tblFleetMix	LDT1	0.03	0.09
tblFleetMix	LDT2	0.20	0.09
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.3010e-003	0.00
tblFleetMix	MCY	7.0280e-003	0.00
tblFleetMix	MDV	0.13	0.00
tblFleetMix	MH	8.9700e-004	0.00
tblFleetMix	MHD	0.02	0.67
tblFleetMix	OBUS	3.0720e-003	0.00
tblFleetMix	SBUS	1.0980e-003	0.00
tblFleetMix	UBUS	2.5650e-003	0.00
tblGrading	MaterialImported	0.00	156.00
tblSolidWaste	SolidWasteGenerationRate	3.29	0.00
tblVehicleTrips	ST_TR	1.68	0.00
tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	1.68	8.57
tblWater	IndoorWaterUseRate	809,375.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.0190	9.9840	8.4619	0.0208	2.3676	0.4493	2.7855	0.4883	0.4134	0.8874	0.0000	2,068.6688	2,068.6688	0.3649	0.0000	2,074.9956
Maximum	**1.0190**	**9.9840**	**8.4619**	**0.0208**	**2.3676**	**0.4493**	**2.7855**	**0.4883**	**0.4134**	**0.8874**	**0.0000**	**2,068.6688**	**2,068.6688**	**0.3649**	**0.0000**	**2,074.9956**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	1.0190	9.9840	8.4619	0.0208	2.3676	0.4493	2.7855	0.4883	0.4134	0.8874	0.0000	2,068.6687	2,068.6687	0.3649	0.0000	2,074.9956
Maximum	**1.0190**	**9.9840**	**8.4619**	**0.0208**	**2.3676**	**0.4493**	**2.7855**	**0.4883**	**0.4134**	**0.8874**	**0.0000**	**2,068.6687**	**2,068.6687**	**0.3649**	**0.0000**	**2,074.9956**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0966	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.6000e-003	4.6000e-003	1.0000e-005		4.9000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0750	1.6443	0.8293	5.3800e-003	0.2191	6.3200e-003	0.2254	0.0636	6.0200e-003	0.0696		558.1795	558.1795	0.0143		558.5357
Total	**0.1717**	**1.6443**	**0.8314**	**5.3800e-003**	**0.2191**	**6.3300e-003**	**0.2254**	**0.0636**	**6.0300e-003**	**0.0696**		**558.1841**	**558.1841**	**0.0143**	**0.0000**	**558.5406**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0966	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.6000e-003	4.6000e-003	1.0000e-005		4.9000e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0750	1.6443	0.8293	5.3800e-003	0.2191	6.3200e-003	0.2254	0.0636	6.0200e-003	0.0696		558.1795	558.1795	0.0143		558.5357
Total	**0.1717**	**1.6443**	**0.8314**	**5.3800e-003**	**0.2191**	**6.3300e-003**	**0.2254**	**0.0636**	**6.0300e-003**	**0.0696**		**558.1841**	**558.1841**	**0.0143**	**0.0000**	**558.5406**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	1/15/2021	5	10	
2	Grading	Grading	1/16/2021	1/19/2021	5	2	
3	Building Construction	Building Construction	1/20/2021	6/8/2021	5	100	
4	Paving	Paving	6/9/2021	6/15/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.4

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	96.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	20.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	9.00	3.00	0.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.1063	0.0000	2.1063	0.3190	0.0000	0.3190			0.0000			0.0000
Off-Road	0.7965	7.2530	7.5691	0.0120		0.4073	0.4073		0.3886	0.3886		1,147.4338	1,147.4338	0.2138		1,152.7797
Total	**0.7965**	**7.2530**	**7.5691**	**0.0120**	**2.1063**	**0.4073**	**2.5136**	**0.3190**	**0.3886**	**0.7076**		**1,147.4338**	**1,147.4338**	**0.2138**		**1,152.7797**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0762	2.5799	0.4992	7.5700e-003	0.1678	9.7700e-003	0.1776	0.0460	9.3500e-003	0.0553		798.8442	798.8442	0.0344		799.7038
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0436	0.3728	9.0000e-004	0.0935	7.5000e-004	0.0943	0.0248	6.9000e-004	0.0255		89.1056	89.1056	3.4200e-003		89.1910
Total	**0.1251**	**2.6235**	**0.8719**	**8.4700e-003**	**0.2613**	**0.0105**	**0.2719**	**0.0708**	**0.0100**	**0.0808**		**887.9498**	**887.9498**	**0.0378**		**888.8948**

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.1063	0.0000	2.1063	0.3190	0.0000	0.3190			0.0000			0.0000
Off-Road	0.7965	7.2530	7.5691	0.0120		0.4073	0.4073		0.3886	0.3886	0.0000	1,147.4338	1,147.4338	0.2138		1,152.7797
Total	**0.7965**	**7.2530**	**7.5691**	**0.0120**	**2.1063**	**0.4073**	**2.5136**	**0.3190**	**0.3886**	**0.7076**	**0.0000**	**1,147.4338**	**1,147.4338**	**0.2138**		**1,152.7797**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0762	2.5799	0.4992	7.5700e-003	0.1678	9.7700e-003	0.1776	0.0460	9.3500e-003	0.0553		798.8442	798.8442	0.0344		799.7038
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0436	0.3728	9.0000e-004	0.0935	7.5000e-004	0.0943	0.0248	6.9000e-004	0.0255		89.1056	89.1056	3.4200e-003		89.1910
Total	**0.1251**	**2.6235**	**0.8719**	**8.4700e-003**	**0.2613**	**0.0105**	**0.2719**	**0.0708**	**0.0100**	**0.0808**		**887.9498**	**887.9498**	**0.0378**		**888.8948**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7648	0.0000	0.7648	0.4156	0.0000	0.4156			0.0000			0.0000
Off-Road	0.7965	7.2530	7.5691	0.0120		0.4073	0.4073		0.3886	0.3886		1,147.4338	1,147.4338	0.2138		1,152.7797
Total	**0.7965**	**7.2530**	**7.5691**	**0.0120**	**0.7648**	**0.4073**	**1.1722**	**0.4156**	**0.3886**	**0.8042**		**1,147.4338**	**1,147.4338**	**0.2138**		**1,152.7797**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0794	2.6874	0.5200	7.8800e-003	0.1748	0.0102	0.1850	0.0479	9.7400e-003	0.0576		832.1294	832.1294	0.0358		833.0248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0436	0.3728	9.0000e-004	0.0935	7.5000e-004	0.0943	0.0248	6.9000e-004	0.0255		89.1056	89.1056	3.4200e-003		89.1910
Total	**0.1282**	**2.7310**	**0.8927**	**8.7800e-003**	**0.2683**	**0.0109**	**0.2793**	**0.0727**	**0.0104**	**0.0831**		**921.2350**	**921.2350**	**0.0392**		**922.2158**

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.7648	0.0000	0.7648	0.4156	0.0000	0.4156			0.0000			0.0000
Off-Road	0.7965	7.2530	7.5691	0.0120		0.4073	0.4073		0.3886	0.3886	0.0000	1,147.4338	1,147.4338	0.2138		1,152.7797
Total	**0.7965**	**7.2530**	**7.5691**	**0.0120**	**0.7648**	**0.4073**	**1.1722**	**0.4156**	**0.3886**	**0.8042**	**0.0000**	**1,147.4338**	**1,147.4338**	**0.2138**		**1,152.7797**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0794	2.6874	0.5200	7.8800e-003	0.1748	0.0102	0.1850	0.0479	9.7400e-003	0.0576		832.1294	832.1294	0.0358		833.0248
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0489	0.0436	0.3728	9.0000e-004	0.0935	7.5000e-004	0.0943	0.0248	6.9000e-004	0.0255		89.1056	89.1056	3.4200e-003		89.1910
Total	**0.1282**	**2.7310**	**0.8927**	**8.7800e-003**	**0.2683**	**0.0109**	**0.2793**	**0.0727**	**0.0104**	**0.0831**		**921.2350**	**921.2350**	**0.0392**		**922.2158**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7750	7.9850	7.2637	0.0114		0.4475	0.4475		0.4117	0.4117		1,103.2158	1,103.2158	0.3568		1,112.1358
Total	**0.7750**	**7.9850**	**7.2637**	**0.0114**		**0.4475**	**0.4475**		**0.4117**	**0.4117**		**1,103.2158**	**1,103.2158**	**0.3568**		**1,112.1358**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0115	0.3408	0.0904	8.4000e-004	0.0203	1.0700e-003	0.0214	5.8500e-003	1.0200e-003	6.8700e-003		87.9124	87.9124	5.0100e-003		88.0376
Worker	0.0440	0.0392	0.3355	8.1000e-004	0.0842	6.7000e-004	0.0849	0.0223	6.2000e-004	0.0230		80.1950	80.1950	3.0800e-003		80.2719
Total	**0.0555**	**0.3800**	**0.4259**	**1.6500e-003**	**0.1045**	**1.7400e-003**	**0.1062**	**0.0282**	**1.6400e-003**	**0.0298**		**168.1074**	**168.1074**	**8.0900e-003**		**168.3095**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7750	7.9850	7.2637	0.0114		0.4475	0.4475		0.4117	0.4117	0.0000	1,103.2158	1,103.2158	0.3568		1,112.1358
Total	**0.7750**	**7.9850**	**7.2637**	**0.0114**		**0.4475**	**0.4475**		**0.4117**	**0.4117**	**0.0000**	**1,103.2158**	**1,103.2158**	**0.3568**		**1,112.1358**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0115	0.3408	0.0904	8.4000e-004	0.0203	1.0700e-003	0.0214	5.8500e-003	1.0200e-003	6.8700e-003		87.9124	87.9124	5.0100e-003		88.0376
Worker	0.0440	0.0392	0.3355	8.1000e-004	0.0842	6.7000e-004	0.0849	0.0223	6.2000e-004	0.0230		80.1950	80.1950	3.0800e-003		80.2719
Total	**0.0555**	**0.3800**	**0.4259**	**1.6500e-003**	**0.1045**	**1.7400e-003**	**0.1062**	**0.0282**	**1.6400e-003**	**0.0298**		**168.1074**	**168.1074**	**8.0900e-003**		**168.3095**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7214	6.7178	7.0899	0.0113		0.3534	0.3534		0.3286	0.3286		1,035.3425	1,035.3425	0.3016		1,042.8818
Paving	0.2096					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9310**	**6.7178**	**7.0899**	**0.0113**		**0.3534**	**0.3534**		**0.3286**	**0.3286**		**1,035.3425**	**1,035.3425**	**0.3016**		**1,042.8818**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0880	0.0785	0.6710	1.6100e-003	0.1684	1.3400e-003	0.1697	0.0447	1.2400e-003	0.0459		160.3900	160.3900	6.1500e-003		160.5439
Total	**0.0880**	**0.0785**	**0.6710**	**1.6100e-003**	**0.1684**	**1.3400e-003**	**0.1697**	**0.0447**	**1.2400e-003**	**0.0459**		**160.3900**	**160.3900**	**6.1500e-003**		**160.5439**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7214	6.7178	7.0899	0.0113		0.3534	0.3534		0.3286	0.3286	0.0000	1,035.3425	1,035.3425	0.3016		1,042.8818
Paving	0.2096					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9310**	**6.7178**	**7.0899**	**0.0113**		**0.3534**	**0.3534**		**0.3286**	**0.3286**	**0.0000**	**1,035.3425**	**1,035.3425**	**0.3016**		**1,042.8818**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0880	0.0785	0.6710	1.6100e-003	0.1684	1.3400e-003	0.1697	0.0447	1.2400e-003	0.0459		160.3900	160.3900	6.1500e-003		160.5439
Total	**0.0880**	**0.0785**	**0.6710**	**1.6100e-003**	**0.1684**	**1.3400e-003**	**0.1697**	**0.0447**	**1.2400e-003**	**0.0459**		**160.3900**	**160.3900**	**6.1500e-003**		**160.5439**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0750	1.6443	0.8293	5.3800e-003	0.2191	6.3200e-003	0.2254	0.0636	6.0200e-003	0.0696		558.1795	558.1795	0.0143		558.5357
Unmitigated	0.0750	1.6443	0.8293	5.3800e-003	0.2191	6.3200e-003	0.2254	0.0636	6.0200e-003	0.0696		558.1795	558.1795	0.0143		558.5357

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-Rail	30.00	0.00	0.00	62,551	62,551
Total	30.00	0.00	0.00	62,551	62,551

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
Unrefrigerated Warehouse-Rail	0.090000	0.090000	0.090000	0.000000	0.000000	0.000000	0.670000	0.060000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0966	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.6000e-003	4.6000e-003	1.0000e-005		4.9000e-003
Unmitigated	0.0966	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.6000e-003	4.6000e-003	1.0000e-005		4.9000e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0153					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0811					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-004	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.6000e-003	4.6000e-003	1.0000e-005		4.9000e-003
Total	**0.0966**	**2.0000e-005**	**2.1500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.6000e-003**	**4.6000e-003**	**1.0000e-005**		**4.9000e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0153					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0811					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.0000e-004	2.0000e-005	2.1500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.6000e-003	4.6000e-003	1.0000e-005		4.9000e-003
Total	**0.0966**	**2.0000e-005**	**2.1500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.6000e-003**	**4.6000e-003**	**1.0000e-005**		**4.9000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

950 W Beach St

North Central Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-Rail	3.50	1000sqft	0.08	3,500.00	0
Parking Lot	17.50	1000sqft	0.40	17,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.8	**Precipitation Freq (Days)**	53
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Based on information from applicant

Grading -

Demolition -

Vehicle Trips - Based on estimate of up to 11 trucks and 4 passenger vehicles per day

Fleet Mix - Assumes 10 out of 15 vehicles would be MDT, 1 out of 15 HDT, and 4 out of 15 would be personal vehicles

Energy Use - No natural gas use.

Water And Wastewater - No water use

Solid Waste - No solid waste facilities

Table Name	Column Name	Default Value	New Value
tblEnergyUse	NT24NG	0.21	0.00
tblEnergyUse	T24NG	1.18	0.00
tblFleetMix	HHD	0.04	0.06
tblFleetMix	LDA	0.54	0.09
tblFleetMix	LDT1	0.03	0.09
tblFleetMix	LDT2	0.20	0.09
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.3010e-003	0.00
tblFleetMix	MCY	7.0280e-003	0.00
tblFleetMix	MDV	0.13	0.00
tblFleetMix	MH	8.9700e-004	0.00
tblFleetMix	MHD	0.02	0.67
tblFleetMix	OBUS	3.0720e-003	0.00
tblFleetMix	SBUS	1.0980e-003	0.00
tblFleetMix	UBUS	2.5650e-003	0.00
tblGrading	MaterialImported	0.00	156.00
tblSolidWaste	SolidWasteGenerationRate	3.29	0.00
tblVehicleTrips	ST_TR	1.68	0.00
tblVehicleTrips	SU_TR	1.68	0.00
tblVehicleTrips	WD_TR	1.68	8.57
tblWater	IndoorWaterUseRate	809,375.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0493	0.4945	0.4533	8.1000e-004	0.0183	0.0259	0.0442	3.9000e-003	0.0239	0.0278	0.0000	71.6397	71.6397	0.0186	0.0000	72.1047
Maximum	**0.0493**	**0.4945**	**0.4533**	**8.1000e-004**	**0.0183**	**0.0259**	**0.0442**	**3.9000e-003**	**0.0239**	**0.0278**	**0.0000**	**71.6397**	**71.6397**	**0.0186**	**0.0000**	**72.1047**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0493	0.4945	0.4533	8.1000e-004	0.0183	0.0259	0.0442	3.9000e-003	0.0239	0.0278	0.0000	71.6397	71.6397	0.0186	0.0000	72.1046
Maximum	**0.0493**	**0.4945**	**0.4533**	**8.1000e-004**	**0.0183**	**0.0259**	**0.0442**	**3.9000e-003**	**0.0239**	**0.0278**	**0.0000**	**71.6397**	**71.6397**	**0.0186**	**0.0000**	**72.1046**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-4-2021	4-3-2021	0.3049	0.3049
2	4-4-2021	7-3-2021	0.2359	0.2359
		Highest	0.3049	0.3049

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0176	0.0000	1.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.8000e-004	3.8000e-004	0.0000	0.0000	4.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.6408	5.6408	2.6000e-004	5.0000e-005	5.6629
Mobile	9.5700e-003	0.2120	0.1018	7.0000e-004	0.0277	8.1000e-004	0.0285	8.0800e-003	7.7000e-004	8.8600e-003	0.0000	66.0737	66.0737	1.6200e-003	0.0000	66.1141
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0272**	**0.2120**	**0.1019**	**7.0000e-004**	**0.0277**	**8.1000e-004**	**0.0285**	**8.0800e-003**	**7.7000e-004**	**8.8600e-003**	**0.0000**	**71.7149**	**71.7149**	**1.8800e-003**	**5.0000e-005**	**71.7774**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0176	0.0000	1.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.8000e-004	3.8000e-004	0.0000	0.0000	4.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.6408	5.6408	2.6000e-004	5.0000e-005	5.6629
Mobile	9.5700e-003	0.2120	0.1018	7.0000e-004	0.0277	8.1000e-004	0.0285	8.0800e-003	7.7000e-004	8.8600e-003	0.0000	66.0737	66.0737	1.6200e-003	0.0000	66.1141
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0272**	**0.2120**	**0.1019**	**7.0000e-004**	**0.0277**	**8.1000e-004**	**0.0285**	**8.0800e-003**	**7.7000e-004**	**8.8600e-003**	**0.0000**	**71.7149**	**71.7149**	**1.8800e-003**	**5.0000e-005**	**71.7774**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

950 W Beach St - North Central Coast Air Basin, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/4/2021	1/15/2021	5	10	
2	Grading	Grading	1/16/2021	1/19/2021	5	2	
3	Building Construction	Building Construction	1/20/2021	6/8/2021	5	100	
4	Paving	Paving	6/9/2021	6/15/2021	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.4

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	96.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	20.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	9.00	3.00	0.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	12.30	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0105	0.0000	0.0105	1.5900e-003	0.0000	1.5900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.9800e-003	0.0363	0.0379	6.0000e-005		2.0400e-003	2.0400e-003		1.9400e-003	1.9400e-003	0.0000	5.2047	5.2047	9.7000e-004	0.0000	5.2289
Total	**3.9800e-003**	**0.0363**	**0.0379**	**6.0000e-005**	**0.0105**	**2.0400e-003**	**0.0126**	**1.5900e-003**	**1.9400e-003**	**3.5300e-003**	**0.0000**	**5.2047**	**5.2047**	**9.7000e-004**	**0.0000**	**5.2289**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7000e-004	0.0129	2.3500e-003	4.0000e-005	8.2000e-004	5.0000e-005	8.6000e-004	2.2000e-004	5.0000e-005	2.7000e-004	0.0000	3.6702	3.6702	1.5000e-004	0.0000	3.6739
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	2.0000e-004	1.8000e-003	0.0000	4.5000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4061	0.4061	2.0000e-005	0.0000	0.4065
Total	**5.9000e-004**	**0.0131**	**4.1500e-003**	**4.0000e-005**	**1.2700e-003**	**5.0000e-005**	**1.3200e-003**	**3.4000e-004**	**5.0000e-005**	**3.9000e-004**	**0.0000**	**4.0763**	**4.0763**	**1.7000e-004**	**0.0000**	**4.0804**

3.2 Demolition - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0105	0.0000	0.0105	1.5900e-003	0.0000	1.5900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.9800e-003	0.0363	0.0379	6.0000e-005		2.0400e-003	2.0400e-003		1.9400e-003	1.9400e-003	0.0000	5.2047	5.2047	9.7000e-004	0.0000	5.2289
Total	**3.9800e-003**	**0.0363**	**0.0379**	**6.0000e-005**	**0.0105**	**2.0400e-003**	**0.0126**	**1.5900e-003**	**1.9400e-003**	**3.5300e-003**	**0.0000**	**5.2047**	**5.2047**	**9.7000e-004**	**0.0000**	**5.2289**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.7000e-004	0.0129	2.3500e-003	4.0000e-005	8.2000e-004	5.0000e-005	8.6000e-004	2.2000e-004	5.0000e-005	2.7000e-004	0.0000	3.6702	3.6702	1.5000e-004	0.0000	3.6739
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	2.0000e-004	1.8000e-003	0.0000	4.5000e-004	0.0000	4.6000e-004	1.2000e-004	0.0000	1.2000e-004	0.0000	0.4061	0.4061	2.0000e-005	0.0000	0.4065
Total	**5.9000e-004**	**0.0131**	**4.1500e-003**	**4.0000e-005**	**1.2700e-003**	**5.0000e-005**	**1.3200e-003**	**3.4000e-004**	**5.0000e-005**	**3.9000e-004**	**0.0000**	**4.0763**	**4.0763**	**1.7000e-004**	**0.0000**	**4.0804**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.6000e-004	0.0000	7.6000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	7.2500e-003	7.5700e-003	1.0000e-005		4.1000e-004	4.1000e-004		3.9000e-004	3.9000e-004	0.0000	1.0409	1.0409	1.9000e-004	0.0000	1.0458
Total	**8.0000e-004**	**7.2500e-003**	**7.5700e-003**	**1.0000e-005**	**7.6000e-004**	**4.1000e-004**	**1.1700e-003**	**4.2000e-004**	**3.9000e-004**	**8.1000e-004**	**0.0000**	**1.0409**	**1.0409**	**1.9000e-004**	**0.0000**	**1.0458**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-005	2.6900e-003	4.9000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.7646	0.7646	3.0000e-005	0.0000	0.7654
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	3.6000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0812	0.0812	0.0000	0.0000	0.0813
Total	**1.2000e-004**	**2.7300e-003**	**8.5000e-004**	**1.0000e-005**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**7.0000e-005**	**1.0000e-005**	**8.0000e-005**	**0.0000**	**0.8459**	**0.8459**	**3.0000e-005**	**0.0000**	**0.8467**

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.6000e-004	0.0000	7.6000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-004	7.2500e-003	7.5700e-003	1.0000e-005		4.1000e-004	4.1000e-004		3.9000e-004	3.9000e-004	0.0000	1.0409	1.0409	1.9000e-004	0.0000	1.0458
Total	**8.0000e-004**	**7.2500e-003**	**7.5700e-003**	**1.0000e-005**	**7.6000e-004**	**4.1000e-004**	**1.1700e-003**	**4.2000e-004**	**3.9000e-004**	**8.1000e-004**	**0.0000**	**1.0409**	**1.0409**	**1.9000e-004**	**0.0000**	**1.0458**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	8.0000e-005	2.6900e-003	4.9000e-004	1.0000e-005	1.7000e-004	1.0000e-005	1.8000e-004	5.0000e-005	1.0000e-005	6.0000e-005	0.0000	0.7646	0.7646	3.0000e-005	0.0000	0.7654
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	4.0000e-005	3.6000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0812	0.0812	0.0000	0.0000	0.0813
Total	**1.2000e-004**	**2.7300e-003**	**8.5000e-004**	**1.0000e-005**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**7.0000e-005**	**1.0000e-005**	**8.0000e-005**	**0.0000**	**0.8459**	**0.8459**	**3.0000e-005**	**0.0000**	**0.8467**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0388	0.3993	0.3632	5.7000e-004		0.0224	0.0224		0.0206	0.0206	0.0000	50.0410	50.0410	0.0162	0.0000	50.4456
Total	**0.0388**	**0.3993**	**0.3632**	**5.7000e-004**		**0.0224**	**0.0224**		**0.0206**	**0.0206**	**0.0000**	**50.0410**	**50.0410**	**0.0162**	**0.0000**	**50.4456**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	0.0171	4.1600e-003	4.0000e-005	9.9000e-004	5.0000e-005	1.0400e-003	2.9000e-004	5.0000e-005	3.4000e-004	0.0000	4.0626	4.0626	2.1000e-004	0.0000	4.0680
Worker	1.9900e-003	1.7800e-003	0.0162	4.0000e-005	4.0800e-003	3.0000e-005	4.1100e-003	1.0800e-003	3.0000e-005	1.1100e-003	0.0000	3.6547	3.6547	1.4000e-004	0.0000	3.6582
Total	**2.5400e-003**	**0.0189**	**0.0203**	**8.0000e-005**	**5.0700e-003**	**8.0000e-005**	**5.1500e-003**	**1.3700e-003**	**8.0000e-005**	**1.4500e-003**	**0.0000**	**7.7174**	**7.7174**	**3.5000e-004**	**0.0000**	**7.7262**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0388	0.3993	0.3632	5.7000e-004		0.0224	0.0224		0.0206	0.0206	0.0000	50.0410	50.0410	0.0162	0.0000	50.4456
Total	**0.0388**	**0.3993**	**0.3632**	**5.7000e-004**		**0.0224**	**0.0224**		**0.0206**	**0.0206**	**0.0000**	**50.0410**	**50.0410**	**0.0162**	**0.0000**	**50.4456**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	0.0171	4.1600e-003	4.0000e-005	9.9000e-004	5.0000e-005	1.0400e-003	2.9000e-004	5.0000e-005	3.4000e-004	0.0000	4.0626	4.0626	2.1000e-004	0.0000	4.0680
Worker	1.9900e-003	1.7800e-003	0.0162	4.0000e-005	4.0800e-003	3.0000e-005	4.1100e-003	1.0800e-003	3.0000e-005	1.1100e-003	0.0000	3.6547	3.6547	1.4000e-004	0.0000	3.6582
Total	**2.5400e-003**	**0.0189**	**0.0203**	**8.0000e-005**	**5.0700e-003**	**8.0000e-005**	**5.1500e-003**	**1.3700e-003**	**8.0000e-005**	**1.4500e-003**	**0.0000**	**7.7174**	**7.7174**	**3.5000e-004**	**0.0000**	**7.7262**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0168	0.0177	3.0000e-005		8.8000e-004	8.8000e-004		8.2000e-004	8.2000e-004	0.0000	2.3481	2.3481	6.8000e-004	0.0000	2.3652
Paving	5.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.3200e-003**	**0.0168**	**0.0177**	**3.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.3481**	**2.3481**	**6.8000e-004**	**0.0000**	**2.3652**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.8000e-004	1.6200e-003	0.0000	4.1000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3655	0.3655	1.0000e-005	0.0000	0.3658
Total	**2.0000e-004**	**1.8000e-004**	**1.6200e-003**	**0.0000**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3655**	**0.3655**	**1.0000e-005**	**0.0000**	**0.3658**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0168	0.0177	3.0000e-005		8.8000e-004	8.8000e-004		8.2000e-004	8.2000e-004	0.0000	2.3481	2.3481	6.8000e-004	0.0000	2.3652
Paving	5.2000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.3200e-003**	**0.0168**	**0.0177**	**3.0000e-005**		**8.8000e-004**	**8.8000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.3481**	**2.3481**	**6.8000e-004**	**0.0000**	**2.3652**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-004	1.8000e-004	1.6200e-003	0.0000	4.1000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3655	0.3655	1.0000e-005	0.0000	0.3658
Total	**2.0000e-004**	**1.8000e-004**	**1.6200e-003**	**0.0000**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3655**	**0.3655**	**1.0000e-005**	**0.0000**	**0.3658**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.5700e-003	0.2120	0.1018	7.0000e-004	0.0277	8.1000e-004	0.0285	8.0800e-003	7.7000e-004	8.8600e-003	0.0000	66.0737	66.0737	1.6200e-003	0.0000	66.1141
Unmitigated	9.5700e-003	0.2120	0.1018	7.0000e-004	0.0277	8.1000e-004	0.0285	8.0800e-003	7.7000e-004	8.8600e-003	0.0000	66.0737	66.0737	1.6200e-003	0.0000	66.1141

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-Rail	30.00	0.00	0.00	62,551	62,551
Total	30.00	0.00	0.00	62,551	62,551

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-Rail	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.543525	0.028472	0.201539	0.126188	0.021864	0.005301	0.018669	0.039782	0.003072	0.002565	0.007028	0.001098	0.000897
Unrefrigerated Warehouse-Rail	0.090000	0.090000	0.090000	0.000000	0.000000	0.000000	0.670000	0.060000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5.6408	5.6408	2.6000e-004	5.0000e-005	5.6629
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5.6408	5.6408	2.6000e-004	5.0000e-005	5.6629
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	6125	1.7818	8.0000e-005	2.0000e-005	1.7888
Unrefrigerated Warehouse-Rail	13265	3.8589	1.7000e-004	4.0000e-005	3.8741
Total		**5.6408**	**2.5000e-004**	**6.0000e-005**	**5.6629**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	6125	1.7818	8.0000e-005	2.0000e-005	1.7888
Unrefrigerated Warehouse-Rail	13265	3.8589	1.7000e-004	4.0000e-005	3.8741
Total		**5.6408**	**2.5000e-004**	**6.0000e-005**	**5.6629**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0176	0.0000	1.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.8000e-004	3.8000e-004	0.0000	0.0000	4.0000e-004
Unmitigated	0.0176	0.0000	1.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.8000e-004	3.8000e-004	0.0000	0.0000	4.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.8000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0148					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	1.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.8000e-004	3.8000e-004	0.0000	0.0000	4.0000e-004
Total	**0.0176**	**0.0000**	**1.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.0000**	**4.0000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.8000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0148					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	1.9000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.8000e-004	3.8000e-004	0.0000	0.0000	4.0000e-004
Total	**0.0176**	**0.0000**	**1.9000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.8000e-004**	**3.8000e-004**	**0.0000**	**0.0000**	**4.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-Rail	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Phase I Archaeological Investigations

for 950 West Beach Street, Watsonville, California

Prepared for Harris & Associates

ALBION

MAY 2020

Phase I Archaeological Investigations for 950 West Beach Street, Watsonville, California

May 2020
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Photo Credit: Matt Manigault

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Executive Summary

In 2020, Harris & Associates contracted with Albion Environmental, Inc. (Albion) to conduct Phase I archaeological investigations for a proposed project at 950 West Beach Street in Watsonville, California. Mountain Propane, which currently owns the approximately 0.69 acre triangular lot, is proposing to improve the parcel to transfer propane from the adjacent Santa Cruz Regional Transportation Commission railroad for distribution purposes. Proposed site improvements include asphalt paving, bollards, a foundation for the propane tank, irrigation, gates and fencing, LPG piping, mobile storage containers, a private fire hydrant, and planting. Mechanical grading will be undertaken to raise the grade where existing and future propane tanks will be placed. Portions of the existing concrete and asphalt paving will be removed to mitigate for storm water detention requirements.

As the proposed Project requires permits from the City of Watsonville, it must comply with the California Environmental Quality Act (CEQA) and Policy 9H of the Watsonville General Plan. As such, it is necessary for the Project to determine if it will have an effect on historical resources under CEQA, which includes archaeological resources.

In order to comply with CEQA requirements, Albion completed the following tasks: 1) background historical research, including archival maps and photos and a records search at the Northwest Information Center (NWIC), extending to a quarter-mile beyond the Project APE; 2) pedestrian field survey of the entire APE to identify any previously unidentified archaeological resources; 3) cultural resources report documenting the methods and results of each task, including identifying and determining potential effects on archaeological resources within the APE and making recommendations on how to address these effects.

A search of records at NWIC revealed one known cultural resources within the APE and two within a quarter-mile radius. The cultural resource documented as extending within the APE is a portion of the Santa Cruz Branch of the Southern Pacific Railroad (SPRR, P-44-000377). The two cultural resources recorded within a quarter-mile of the APE include a standard gauge spur of the SPRR (P-44-001157) and a possible site of unknown date or character (387A-004).

Background historical research revealed that the APE was once part of the Mexican Period Rancho Bolsa del Pajaro. Historic maps show that by the 1880s the Project vicinity had been divided into private parcels and that over the next several decades the parcel in which the APE is located passed through a series of private owners. The narrow gauge Santa Cruz Branch Railroad was constructed just north of the APE in 1876, converted to standard gauge in 1883 after it was acquired by the SPRR, and expanded with a railroad spur on the south side of the APE leading to a warehouse complex by the 1930s. Between the 1930s and 1960s, aerial photographs show a series of unidentified objects within the APE, probably parked vehicles or portable equipment associated with the adjacent railroad or warehouse complex.

The results of Albion's pedestrian survey turned up no evidence of precontact Native American or historic period cultural resources within the Project APE that would qualify as historical resources under CEQA. Our survey shows that, despite records search results indicating that the SPRR (P-44-000377) overlaps with the APE, this resource is actually located well outside the APE and will not be subject to Project impacts.

Based on results of this study, including the lack of known or newly identified cultural resources within the Project APE, Albion concludes that no historical resources will be affected by the Project and recommends no further archaeological measures prior to or during construction.

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Introduction

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PROJECT DESCRIPTION

In 2020, Harris & Associates contracted with Albion Environmental, Inc. (Albion) to conduct Phase I archaeological investigations for a proposed project at 950 West Beach Street in Watsonville, California (Figure 1). Mountain Propane, which currently owns the approximately 0.69 acre triangular lot, is proposing to improve the parcel to transfer propane from the adjacent Santa Cruz Regional Transportation Commission railroad for distribution purposes. Transfer would occur from rail cars to onsite tanks, then from the tanks to trucks for transport to customers. The Project will include installation of a pneumatic shut-off system for fail-safe redundancy, along with low-emission appurtenances for transferring liquid propane. It is anticipated that trucks will be parked on site overnight and empty propane tanks stored temporarily for maintenance.

The applicant is proposing to relocate the existing 50,000-gallon propane storage tank westward to the middle of the site and to install four new 30,000-gallon propane storage tanks in phases, resulting in a total of 170,000 gallons of propane storage at the project site. The four new tanks would be approximately 15 feet in height and would occupy approximately 1,750 square feet in the area currently occupied by the 50,000-gallon tank, which is approximately 15-feet in height.

The Project parcel is currently surrounded by chain link perimeter fencing and contains an existing light pole, partial asphalt and concrete paving, and an empty 50,000 gallon propane tank. Proposed site improvements include asphalt paving, bollards, foundations for the propane tanks, irrigation, gates and fencing, LPG piping, mobile storage containers, a private fire hydrant, and planting. Mechanical grading will be undertaken to raise the grade where existing and future propane tanks will be placed. Portions of the existing concrete and asphalt paving will be removed to mitigate for storm water detention requirements.

REGULATORY CONTEXT

As the proposed Project requires permits from the City of Watsonville, it must comply with the California Environmental Quality Act (CEQA) and Policy 9H of the Watsonville General Plan. As such, it is necessary for the Project to determine if it will have an effect on historical resources under CEQA, which includes archaeological resources.

The proposed Area of Potential Effect (APE) for this Project includes all areas that may experience ground disturbance as a result of project activities, including staging of vehicles, equipment, and construction materials. As described above, this area comprises the entire Project parcel.

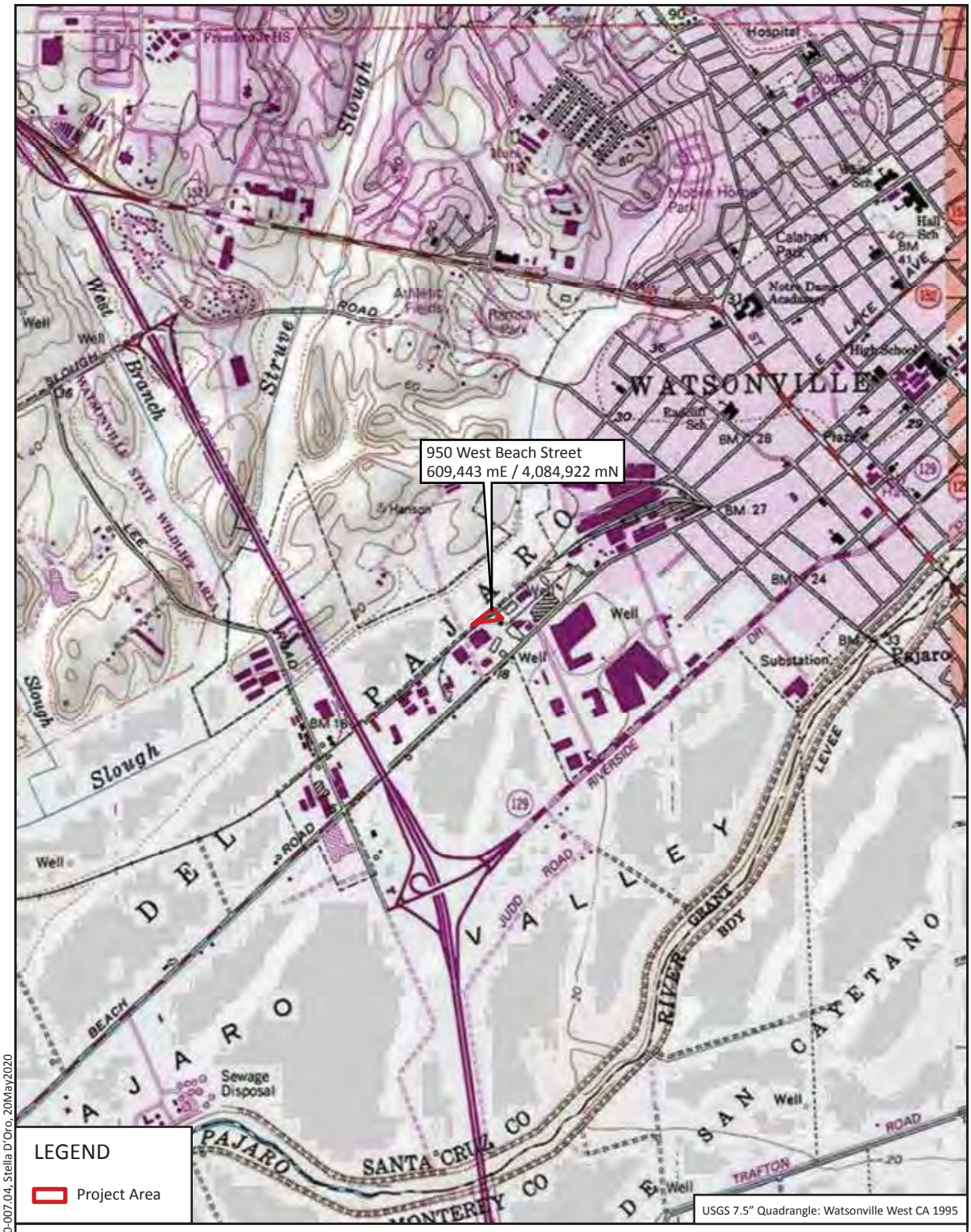
In order to comply with CEQA requirements, Albion completed the following tasks:

1) Background historical research, including archival maps and photos and a records search at the Northwest Information Center (NWIC), extending to a quarter-mile beyond the Project APE. The goal was to identify any known or potential archaeological resources in or near the APE.

2) Pedestrian field survey of the entire APE to identify any previously unidentified archaeological resources.

3) Cultural resources report documenting the methods and results of each task, including identifying and determining potential effects on archaeological resources within the APE and making recommendations on how to address these effects.

The Albion team conducted investigations per standards and guidelines outlined in CEQA regulations and the Secretary of the Interior's Standards for Archaeological Documentation. These investigations were completed under the supervision of Douglas Ross, PhD, who has been a professional archaeologist for over twenty years and exceeds the Secretary of the Interior's Professional Qualifications Standards.



File name: Figure_1.ai, J2020-007.04, Stella D'Oro, 20May2020

Figure 1. Project location, 950 West Beach Street, Watsonville, California.

Sources Consulted

2

To determine if cultural resources are recorded within or near the Project APE, Albion consulted the following sources as part of the NWIC records search (Appendix B):

CALIFORNIA INVENTORY OF HISTORIC RESOURCES

The California Inventory of Historic Resources, managed by the State of California Department of Parks and Recreation (1976), lists no cultural resources in or within proximity to the Project APE.

BUILT ENVIRONMENT RESOURCES DIRECTORY

The Built Environment Resources Directory (BERD) for Watsonville, managed by the State Office of Historic Preservation (including the California Register of Historical Resources, California Historic Landmarks, and California Points of Historical Interest), lists no resources within the Project APE or within a quarter mile of the APE.

STUDIES AND RESOURCES

A search of records at NWIC indicates that one cultural resource has been previously recorded within the Project APE and two cultural resources have been identified within a quarter-mile of the APE. Additionally, nine archaeological studies have been conducted within a quarter-mile radius, though none within the APE itself (Tables 2 and 3).

The nine cultural resource studies within a quarter-mile of the APE were conducted in conjunction with a food processing plant, wastewater treatment system, an industrial park, a fiber optic cable, a wetland restoration, and several public and private parcels.

The single documented resource that overlaps with the Project APE is a portion of the Santa Cruz Branch of the Southern Pacific Railroad (SPRR, P-44-000377). This line, eventually extending from Davenport to Watsonville, was constructed in segments between 1876 and 1905. The two known cultural resources recorded within a quarter-mile of the Project APE include a standard gauge spur of the SPRR (P-44-001157) and a possible site of unknown date or character (387A-004).

In sum, results of the records search identified one previously documented cultural resource within the Project APE and two cultural resource within a half-mile of the APE.

Table 1. Archaeological Studies Conducted Within a Quarter-Mile of the Project APE.

Study No.	Title	Author	Year
S-3852	Preliminary Field Reconnaissance of the Proposed Frozen Food Processing Plant, Industrial Road and Riverside Drive, City of Watsonville, Santa Cruz County	Jean Stafford	1974
S-3964	Santa Cruz Regional Wastewater Treatment System Project, Santa Cruz County, California	Ann S. Peak & Associates	1977
S-4036	Report of an Archaeological Reconnaissance of the Westside Annexation Properties	Archaeological Consulting and Research Services, Inc.	1976
S-6722	Cultural Resource Evaluation of the Landmark Industrial Park off Harkins Slough Road in the City of Watsonville, County of Santa Cruz [and related report]	Robert Cartier	1984
S-21986	Peer Review of Previous Archaeological Reconnaissance & Additional Archaeological Reconnaissance of Assessor's Parcel Number 018-372-02, Watsonville, Santa Cruz County, California [and related reports]	Mary Doane and Gary S. Breschini	1999
S-22657	Phase 1 Archaeological Survey Along Onshore Portions of the Global West Fiber Optic Cable Project [and related report]	Izaak Sawyer, Laurie Pfeiffer, Karen Rasmussen, and Judy Berryman	2000
S-25267	A Report of Findings from an Archaeological Field Inspection and Historical Building Evaluation of the Sea View Ranch Project Area, Watsonville, Santa Cruz County, California	Miley Paul Holman and Randall Dean	2000
S-26671	Bay Breeze Project, AC 2788B (letter report)	Mary Doane	2002
S-31355	Archaeological Survey Report for the Manabe Property Wetland Restoration Project, City of Watsonville, Santa Cruz County, California	Kevin Bartoy	2006

Table 2. Cultural Resources In and Within a Quarter-Mile of the Project APE.

Resource No.	Resource Name	Last Recorded
P-44-000377	Southern Pacific Railroad (SPRR)	Haas and Treffers 2018
P-44-001157	Standard Gauge Railroad Spur of the SPRR	Ehringer and Curry 2018
387A-004	Possible site (informal resource)	Riner 2019 (NWIC Staff)

Background

3

ENVIRONMENT

The Project APE is located in Township 12 South, Range 2 East within the City of Watsonville, California. It is approximately 0.1 miles southeast of Watsonville Slough and 3.5 miles east of Monterey Bay at an elevation of 19 feet above sea level. The parcel is on the edge of an industrial park at the south end of the city, bounded on the north by the Southern Pacific Railroad and to the south by an associated railroad spur. Native soils consist of Conejo Clay Loam, very deep, well drained soils that form on alluvial fans and stream terraces from igneous or sedimentary rock on slopes ranging from zero to nine percent (United States Department of Agriculture 2019). These soils are used for irrigated row crops, orchards, pasture, and grains.

PRECONTACT HISTORIC CONTEXT

In recent years, many contemporary archaeologists working along the central coast have adopted the chronological sequence proposed by Jones et al. (1996). This sequence recognizes six major prehistoric periods of cultural adaptation extending beyond the last 10,000 years of human occupancy. The proposed temporal periods emphasize changes in human adaptation over time and focus largely on the shifting significance of coastal vs. terrestrial habitats and the associated artifact assemblages. Jones et al. (2007) present a more recent application of this framework along with a regional overview.

The initial period in this sequence, termed the Paleoindian, originates in the late Pleistocene and continues until approximately 10,000 B.P. This is followed by the Millingstone Period (10,000–5,500 B.P.), and is recognized by increasingly abundant milling equipment (manos and metates) in the archaeological record when populations apparently followed a generalized subsistence pattern that placed an importance on coastal resources, namely shellfish. The ensuing Early Period (5,500–2,600 B.P.) was a time of new subsistence emphases that include a greater reliance on hunting and the initial exploitation of acorns. The Middle Period (2,600–1,000 B.P.) was marked by the intensification of subsistence practices, especially a greater reliance on marine and littoral foods where fish played an important role in the diet. During the Middle/Late Transition (1,000–750 B.P.), populations in central California experienced deteriorating environmental conditions, and apparently underwent major adaptive shifts in both subsistence and settlement. Finally, the Late Period (750 B.P.-Historic) marks the initial appearance of numerous projectile points, including small side-notched (Desert side-notched), triangular (Cottonwood), and leaf-shaped points, representing the introduction of the bow and arrow. There is an apparent shift in settlements to interior settings while the immediate coastal environments appear to have been used for more short term gathering and processing activities.

Indications of prehistoric inhabitation of the central California coast dating to the terminal Pleistocene/early Holocene is limited. The dearth of sites dating to this antiquity may, in part, be related to progressively rising sea levels that accompanied the end of the Pleistocene and the early Holocene (Masters and Aiello 2007). Between ca. 10,000 and 8,000 B.P., the Elkhorn Valley was inundated by saltwater and transformed into a high energy tidal channel (Jones et al. 1996:6). At 8,000 years ago, sea level was about 15 m below its present level at Elkhorn Slough (Masters and Aiello 2007:49). Bickle (1978:8) estimates that sea level rise has submerged 20,000 km^2 of land along the California coast. Sea level transgression slowed after about 7,000 years ago, prompting fluvial sedimentation and tectonic uplift. Consequently, coastal sites earlier than 7,000 B.P. may have been inundated by rising waters.

In general, researchers normally divide this early time span into two divisions: the Paleoindian (pre-10,000 B.P) and the Millingstone (10,000–5,500 B.P.). A coastal focused alternative to the large game focused Paleoindian model, the Paleo-Coastal Tradition, was first proposed by Davis et al. (1969) and later expanded upon by Moratto (1984). Although few sites or site components dating from this time period have been investigated and its presence is largely conjectural, some researchers have posited that Paleo-Coastal peoples established residences along estuaries and bay shores. Associated toolkits are suggested to be scrapers, scraper-planes, bifaces, and lack milling equipment. Jones et al. (1996:39) note that "the extent to which these assemblages are constituted to some unknown degree by materials mixed from more recent contexts is indicated by the occurrence of obsidian among strata assigned to these phases since none of the obsidian hydration results equate with a time depth greater than 7000 B.C." As a result, the Paleo-Coastal tradition is not readily described in the Monterey Bay area.

Coastal sites attributed to the Millingstone Period (10,000–5,500 B.P.) are best characterized by high density shell middens—composed primarily of mussel (*Mytilus* spp.)—located adjacent to extant estuaries or near areas where paleo-estuaries once existed as a result of early Holocene sea level rise. As the name for this period implies, site assemblages generally contain abundant milling stones and hand stones (Erlandson 1991, 1994; Fitzgerald and Jones 1999), although this is not always the case (Jones et al. 2004; Jones et al. 1996).

In addition to milling equipment, Millingstone Period sites are typified by eccentric crescents, long-stemmed projectile points, and cobble/core tools. In general, there is a low incidence of projectile points and other flaked stone. Shell beads from this time period are characterized as thick rectangular (L-series) *Olivella* beads (Glassow 1996). Erlandson (1991, 1994) has suggested that Millingstone Period groups were semi-sedentary, their diets emphasizing shellfish and small seeds. The hunting of large terrestrial game and marine mammals as well as the exploitation of fishes was apparently of minor importance. Other researchers, however, have argued that both coastal and interior habitats were exploited by early Holocene populations targeting small fauna, and a variety of grass seeds, nuts, and other inland plant taxa as well as shellfish (Jones and Richman 1995; McGuire and Hildebrandt 1994; Mikkelsen et al. 1998; Milliken et al. 1999). Jones (2003:218) argues for a more mobile settlement pattern during this time that included the exploitation of marine mammals.

The next few thousand years (between 5,500 and 2,600 B.P.) are referred to as the Early Period throughout southern and central California. Most notable about prehistoric adaptations at this time are innovations in subsistence technology, especially the initial appearance of mortars and pestles (perhaps signaling acorn use) and an increase in the frequency of large side-notched and

contracting-stem projectile points along with flaked stone debris. Shell beads common during this time period include thick rectangular (L-series), end-ground (B-series), and split (C-series) *Olivella* beads. The appearance of eastern California obsidian (mainly Casa Diablo) in Early Period assemblages also implies that long-distance trade and exchange relations developed during this period (Jones 1995). Jones (1995) and Jones and Waugh (1997) posit a decrease in residential mobility, which they attribute to the advent of mortar and pestle use and a clearer delineation of gender roles that accompanied a trend toward greater population circumscription. Jones and Waugh (1997) also contend that Early Period sites, in contrast to Millingstone Period sites, are found in more diverse settings, including interior, estuary, and outer coast contexts.

In terms of subsistence, mammals and fish increased in importance relative to shellfish. These resources, coupled with the addition of acorns, signified a broadening of the diet breadth. Glassow (1996:134) has pointed out that this expansion of the diet breadth was accompanied by a significant increase in labor devoted to food processing. Before acorns can be made palatable, the toxic tannic acid must be leached out of the meal, a process not required by hard seeds. Glassow (1996:134) stated, "it is likely, therefore, that people would consume acorns no more than necessary, as insurance against normal fluctuations in food resource productivity from one year to the next." While the introduction of acorns has implications for labor organization and settlement, the peripheral role played by the resource base at this time in prehistory may relate to more of a process of "extensification" (*sensu* Beaton 1991) where new foods are introduced to the diet, rather than "intensification" where greater amounts of labor are focused on the processing of a particular resource, as is more characteristic of later prehistoric times. Acorn macrofossils are recovered in lesser amounts in these early assemblages than in later ones.

The change that occurred from the Millingstone to the Early Period has traditionally been interpreted as an adaptive shift accompanying the arrival of Rogers's (1929) "Hunting Culture." In his original conception, Rogers described Hunting Culture people as a separate ethnic population more reliant upon use of the acorn and on both terrestrial and marine mammals. These Hunting peoples, he hypothesized, entered the central coast and gradually displaced the earlier populations of Millingstone-adapted peoples. This premise, however, has more recently been discounted largely in favor of the idea that observed differences in artifact assemblages are probably more indicative of seasonal or functional variability in site occupations (Erlandson 1997; Glassow 1997). Jones, moreover, views the transition from Millingstone to Hunting technologies largely as the result of population circumscription and economic intensification, an *in situ* development that reflected the shift from an earlier, mobile, more selective adaptive strategy to one emphasizing limited mobility and decreased subsistence efficiency.

Cultural changes marking the transition from the Early to Middle Period (2,600-1,000 B.P.) were much less pronounced than during the Millingstone/Early Period transition. Instead, many of the adaptive traits initiated during the Early Period continued and grew in relative importance. The use of mortars and pestles increased, as did reliance on small schooling fishes (e.g. anchovies, herring, smelt). The use of shellfish, however, appears to have steadily declined. Middle Period populations also began to focus more on the exploitation of smaller, more elusive game; sea otters and rabbits, for instance, were more important than they had been previously. Glassow (1996) and Lambert (1993) place a slightly stronger emphasis on the importance of increasingly maritime adaptations during this time, arguing that fishing and sea mammal hunting were important subsistence pursuits. Artifact assemblages are typified by large-stemmed points, mortars, pestles, handstones, and milling slabs. Shell beads include *Olivella* saucer (G-series) and saddle (F-series) types. Perhaps the most

significant change in the artifact assemblage was the introduction of the circular shell fishhook. This artifact class is recovered more commonly on rocky coasts than in protected slough habitats where schooling fishes were likely captured through other means such as baskets, nets, or other trapping methods (Jones et al. 1996:193; Strudwick 1986). Circular shell fishhooks no doubt facilitated an increase in the exploitation of fishes, but, at the same time, may have resulted in a decrease in dietary efficiency (Glassow 1990:89; Jones 2003:226), a pattern that continues throughout the Holocene. Trans-Sierran trade, especially in obsidian, appears to increase during the Middle Period. Casa Diablo obsidian, a source whose origin is east of the Sierra Nevada Mountains was the chief import in the vicinity Monterey Bay, whereas Coso obsidian is more common to the south (Jones et al. 1996:197, 199). Jones (2003:226) also notes a high frequency of sea otter (*Enhydra lutris*) bones at Middle Period sites, which he interprets as evidence of exchange in otter pelts.

It was also during the Middle Period that a few researchers (Breschini 1983; Moratto 1984; Whistler 1977, 1980) have suggested a major shift in population occurred in the Bay Area. This shift is usually viewed within an ethnolinguistic framework, whereby an indigenous Hokan-speaking population merged with or was displaced by a later Penutian-speaking population. Specifically, Breschini (1983) and Breschini and Haversat (1980) contend that ca. 2,500 B.P. a distinct ethnic population speaking a Penutian language expanded into the Monterey Bay area. These new peoples were the precursors of the ethnohistoric Ohlone, or Costanoans. Their settlement-subsistence pattern was characterized by low mobility, logistical organization, and a more specialized subsistence regime based primarily on the exploitation of the acorn. Breschini (1983) dubbed this the "Monterey Pattern," and stated that it was akin to a "collector" pattern. The prior language group, which Breschini argued had characterized the area since approximately 4,000 years B.P., was organized more around a "forager" pattern. Breschini called this the "Sur Pattern" and argued that it was typified by high mobility and a generalized adaptive pattern geared toward the exploitation of a wide range of resources and environments.

The Middle/Late Transition (1,000-750 B.P.) is a short period of time when there appears to have been a time of rapid change in settlement organization. It is represented along the central California coast by Contracting-stemmed and double Side-notched projectile points. Small leaf-shaped points also occur alongside these larger points, though their numbers are few (Jones 2003:221). Several types of *Olivella* shell beads, including split punched (D-series), are also found. Hopper mortars make their first appearance in the archaeological record and are found in tandem with bowl mortars and pestles, as well as handstones and milling slabs. Subsistence regimes during this time demonstrate substantial differences from the previous period. Marine resources, such as fish and marine mammals, appear to have been largely dropped from native diets. Instead, populations emphasized terrestrial resources, especially small mammals and acorns. This stands in marked contrast to developments along the Santa Barbara Channel where prehistoric populations underwent increasingly progressive maritime adaptations, and fishing was a major subsistence pursuit.

As originally perceived, these changes were largely considered to have resulted from an overexploitation of coastal resources accompanying the increased demographic pressures that were initiated during the Middle Period. However, more recent evidence suggests that other factors, especially environmental degradation, played a more significant role. Coinciding with the Middle/Late Transition (1,000-750 B.P.), California and parts of western North America underwent a dramatic warming trend, known as the "Medieval Climatic Anomaly" (Graumlich 1993; Jones and Kennett 1999; Stine 1990, 1994). Researchers have identified three major environmental trends

during this period: (1) changing sea temperatures (Arnold 1992; Kennett 1998; Kennett and Kennett 2000; Pisias 1978); (2) warmer summer temperatures (Graumlich 1993); and (3) decreased precipitation (Stine 1990, 1994). According to Jones (1995:223), this latter trend had especially serious consequences for prehistoric coastal populations.

Serious drought after A.D. 1000 (950 B.P.) caused such rapid, severe deterioration of the resource base that major subsistence problems developed, causing widespread settlement shifts and resource competition. Unlike the environmental changes of the early and Mid-Holocene, technological innovations could not mitigate the environmental problems, because they developed rapidly and were severe. Jones and Ferneau (2002) posit the argument that central coast populations during this time underwent a process of "deintensification." Population growth declined, diet breadth contracted, and interregional exchange systems collapsed. In Monterey County, for example, numerous coastal sites were abandoned and populations relocated to more interior settings (Jones 1995:215). Populations also apparently declined, perhaps as a result of resources stress, and systems of trade and exchange collapsed. Obsidian, for instance, virtually disappears from the archaeological record.

Late Period (750 B.P.-Historic) populations on the central coast apparently rebounded from the environmental stresses that characterized the previous period. Their subsistence practices continued to demonstrate a terrestrial focus. Jones (1995:221), for example, indicates that the consumption of fish and other marine resources was less intensive and the extraction of mussels perhaps more selective than during the previous interval. From his analysis of several sites in Big Sur, Jones (1995:206) suggests that Late Period populations focused their subsistence activities on black-tailed deer (*Odocoileus hemionus*). This view has recently been challenged by the findings from CA-MNT-1942 (Wohlgemuth et al. 2002), where fish, including several species of clupeidae (such as anchovies and herrings), constitute significant portions of the overall faunal assemblage.

Nevertheless, it appears that Late Period habitation on the central coast shifted to inland localities (Jones and Ferneau 2002:230), and many coastal sites occupied during the Middle Period were no longer used in the Late Period, or see less intensive use (Jones et al. 1996:196; Milliken et al. 1999:153). Late period midden sites on the interior are often associated with bedrock mortars (Jones et al. 2007:140), and on the coast are more often shellfish processing sites (Jones et al. 1996:41). Population circumscription is suggested by a drop off in the diversity of obsidian sources and its use as a raw material. In fact, a decrease in the presence of Franciscan chert relative to the more locally available Monterey chert has been identified in Late Period contexts, suggesting more restricted mobility (Hylkema 1991; Jones et al. 2007:143).

Jones (1995, 2003) suggests that central coast sites dating to this time period, excluding habitation sites along productive estuaries, probably represent specialized forays made from large interior settlements. During this time, populations did not undergo transformational changes in social and political organization that led to greater complexity. Instead, human populations in these areas maintained a tribelet system of socio-political organization (Jones 1995:223). Artifact assemblages from this time are marked by contracting-stem, leaf-shaped, and small, triangular-shaped and side-notched projectile points, mortars and pestles, and a variety of late prehistoric bead types, including *Olivella* lipped (E-series) and callus (K-series). Clam shell disk beads and talc schist disk beads are also common during this time. Bifacial bead drills and detritus from *Olivella* bead manufacture are also common at well sampled late period sites, suggesting bead manufacture was common and widespread, though not intensive (Jones et al. 2007:140).

ETHNOGRAPHIC CONTEXT

Native American populations living in the Project area at the time of European contact are attributed to the Ohlone. The Ohlone occupied lands from the Monterey peninsula inland to San Juan Bautista, and north to Santa Cruz, the Santa Clara Valley, the Delta, San Francisco Peninsula and the East Bay (Levy 1978). Organized as tribelets, the Ohlone were noted to have lived in approximately 50 autonomous villages (Kroeber 1925). During the course of the year it is likely that families came and went from a particular village depending on the season and important resources available, though winter was a time when families often coalesced and made use of food stores as well as to partake in ceremonial activities (Broadbent 1972; Margolin 1978). From the time of European contact and missionization, the Ohlone populations experienced a rapid decline from the 1770s to the mid-1800s (Cook 1943). Though the population suffered much from disease and discrimination, important information regarding language, folkways and material culture has been preserved among the few survivors. Likewise other pieces of information have been able to piece together a generalized picture of pre-contact Ohlone culture (Bean 1994; Broadbent 1972; Kroeber 1925; Levy 1978; Milliken 1995).

As the Ohlone inhabited varied coastal and interior environments, their subsistence practices varied depending on where they were. They were hunter-gatherers who supported themselves through the hunting and harvesting of plants and animal. They were noted to rely on acorn as a staple food, though other seeds, berries and roots, as well as kelp were regularly partaken of. Important terrestrial animals included deer, pronghorn and tule elk, though small game including squirrel, woodrats, and mice were also taken (Baumhoff 1963:17; Levy 1978:491).

Shellmounds common to the Bay Area attest to the importance of shellfish to the Ohlone diet. Mussels, abalone, clam and oyster were among important shellfish species eaten. These, in addition to sea lions, seals and sea otters were important coastal resources, along with fish and waterfowl in both coastal and inland contexts (Baumhoff 1963; Levy 1978).

While the Ohlone reportedly inhabited the coastal area is located, further south in the Carmel River Valley were the Esselen, their neighbors to the south. Little is known of the Esselen, likely due to their territory being largely comprised of thickly wooded mountainous habitats in the Carmel Valley down to Point Lopez (Hester 1978). It is likely that the two groups interacted, and that socio-political boundaries may have shifted at different points in prehistory.

POSTCONTACT HISTORIC CONTEXT

SPANISH AND MEXICAN PERIODS

Sebastian Vizcaino's landing at present day Monterey in 1602 is one of the earliest documented contact with Native Americans in the area. Following Vizcaino's landing, other Spanish ships may have stopped at Monterey, but contact was minimal until the initial overland exploration of the area by Gaspar de Portolá in 1769 (Hoover et al. 1990). Subsequent exploration of the region included Pedro Fages in 1770 and 1772, Fernando Javier de Rivera in 1774, and Juan Bautista de Anza in 1776 (Beck and Haase 1974).

In late September of 1769, Portolá's expedition encountered a small band of Indians engaged in collecting pine nuts. Miguel Costansó, one of the expedition's main chroniclers, called the natives

"wandering people without either house or home." A few days later, they came upon a village, which Costansó described as "very poor" and its inhabitants as "friendly and obsequious." Finally, on the 26th of September, they encountered another, larger band of Indians who were also engaged in pine nut collecting. Costansó wrote:

> At the foot of the slope was a band of wandering Indians, which must have numbered more than two hundred souls. They had no houses, and lived in the open near a fallen oak tree. For this reason the place was named *Rancheriá del Palo Caido*. These natives offered us a quantity of pine nuts and seeds. We remained a short time among them, and then passed on in order to make camp on the bank of a river… (Costanső 1992:81).

Portolá's expedition, though at the time producing little lasting and substantive contact, was a harbinger of later developments. As a direct result of the expedition, the Spanish established a system of fully functioning Franciscan missions over the length of Alta California, from San Diego to the northern San Francisco Bay. Missions in the area included Mission San Antonio de Padua (1771), Mission Soledad (1791), Mission Santa Cruz (1791), Mission San Juan Bautista (1797), and Mission San Miguel (1797).

In 1821, Mexico achieved her independence from Spain, and word of this event reached Alta California the following year. In California history, this era is known as the Mexican Period (ca. 1821–1848). The colonial policies of the republic were to be quite different from those of the Spanish monarchy. Not only were Californians allowed to trade with foreigners, but foreigners could also now hold land in the province once they had been naturalized and converted to Catholicism. Under Spain, land grants to individuals were few in number, and title to these lands remained in the hands of the crown. Under Mexican rule, however, governors were encouraged to make more grants for individual ranchos, and these grants were to be outright. Most importantly, the new Mexican republic was determined to move to "secularize" the missions, to remove the natives and the mission property from the control of the Franciscan missionaries.

Secularization was set in motion by the Mexican Governor Echeandia in 1826, but was not carried out in earnest until 1834 when Governor José Figueroa issued an official proclamation ordering the secularization of the California missions. His proclamation turned the mission properties over to Mexican civil authorities, allowed for the dispersement of mission property, opened mission land for settlement by petitioners, and created a series of pueblos. Indian neophytes were freed from their role as personal servants to the padres; however, in reality, the effects of secularization throughout California were to deprive a large percentage of the remaining mission Indians of their property. This resulted in the creation of a relatively large population of landless Indian tenants, many of whom sought work in the newly created *rancherias*.

The new ranchos that sprang up as a result of secularization created a wholly new culture in California, one that was centered on the raising and maintaining of vast herds of cattle. These ranchos were usually owned by individual families who supervised a veritable army of Indian laborers and vaqueros. The ranch owners owed their livelihood to the sale and trade of the products, primarily hide and tallow, derived from their cattle. A flourishing trade with foreign Marchants, mostly Americans, kept the Mexican ranchos afloat; hides and tallow were traded to American Marchants for everything from food staples and clothing to furniture and luxury goods.

AMERICAN PERIOD

The end of the Mexican-American War and the signing of the Treaty of Guadalupe Hidalgo in 1848 marked the beginning of the American Period (ca. 1848-Present) in California history. The onset of

this period, however, did nothing to change the economic condition of the Native American populations working on the ranchos.

The town of Watsonville was first established in 1852 on a small portion of Rancho Bolsa del Pajaro obtained from the Rodriguez family, originally granted to them in 1837 by the Mexican government. The nearby town of Freedom was settled around the same time on a portion of the former Rancho Los Corralitos, but until 1877 was known as Whiskey Hill. Watsonville became an incorporated municipality in 1868, with a population of almost 2,000 people (Archives and Architecture 2013). Residential and commercial development increased over the next three decades, including annexation of nearby residential lots between 1907 and 1925. Between 1940 and 1960, the city nearly doubled in size.

After 1940, the population of Watsonville changed significantly, with arrival of people from other parts of the United States and foreign immigrants (Archives and Architecture, LLC. 2013):

> The influx Americans from the Midwest continued to populate Watsonville Interwar period, and foreign immigrants including Chinese, Japanese, and Filipinos already in the Pajaro Valley were experiencing increased resentment from local whites. Hostilities because of union formation and increased demands by workers for better working conditions, combined with a general anti-immigrant (especially anti-Asian) sentiment were further strained by the plunge in economic vitality. By the time the United States entered into World War II against Germany and Japan, overt racism and discrimination was common in a location that had always been ethnically mixed and relatively tolerant compared to the rest of the country. The signing of Executive Order 9066 by President Roosevelt, which called for the systematic removal the Japanese population from all coastal areas, including those who resided in parts of Watsonville was the culmination of this period.
>
> A shift in local population began after the war. Many Japanese who were interned during World War II returned to the area and faced new competition from the large numbers of Mexican workers brought in through the Bracero Program. Some Japanese families stayed and rebuilt their lives, others left. As a whole, they did not return to agriculture in the same numbers as before the war. Their places, at least in the fields, were now filled by Mexicans, starting the trend that continues today. Growth in the community during the 1950s also marked the growth of Watsonville High across from the subject properties, with school expansion necessitating the construction of classrooms, music halls and shop buildings between 1956 and 1958.)

HISTORY OF THE PROJECT AREA

The 1867 Plat Map of Township 12 South, Range 2 East shows the Project APE within the former Mexican land grant known as Rancho Bolsa del Pajaro, granted to Sebastian Rodriguez by Mexican Governor Juan Alvarado in 1837 (Figure 2). Its name refers to its location on the north side of the Pajaro River and surrounded by sloughs (Hoffman 1862). No buildings or other improvements are depicted on the map in this location.

The 1880-1881 Map of Santa Cruz County shows that by then the APE was within a large 62.38 acre parcel owned by Charles Ford, with a note indicating that this includes railroad land, though the railroad itself is not shown on the map (Figure 3). The narrow gauge Santa Cruz Railroad was completed between Santa Cruz and Watsonville in 1876; in 1883 it became the standard gauge Santa Cruz Branch of the Southern Pacific Railroad (SPRR). As with the previous map, no improvements of any kind are shown within this parcel.

The 1906 Map of Santa Cruz County indicates that Ford's property had been acquired by Edward Kenhaugh. The SPRR is shown as passing through the northern portion of this property on the north

side of the APE just south of Watsonville Slough, but there are no structures or other signs of development within the APE itself (Figure 4). Likewise, the 1929 Map of Santa Cruz County shows no improvements within the APE but indicates that it was now part of a 20.77 acre parcel owned by John C. Mello (Figure 5).

A 1931 aerial photograph reveals that by the early 1930s a spur of the SPRR branched off to the south just outside the southern boundary of the Project APE toward a large warehouse complex, a spur which remains in place to this day (Figure 6). Within the APE is what appears to be a small cluster of objects between the SPRR and the spur with a gravel road leading to them, probably vehicles or other stored equipment. Similarly, aerial photos from 1939 and 1963 show distinct objects within the APE, again probably parked vehicles or other portable equipment associated with the adjacent railroad or industrial warehouse complex, rather than buildings or other structures (Figures 7 and 8). In the 1963 aerial photo the surface on which these objects are parked is very light in color, suggesting concrete paving, and this area was probably a small parking lot.

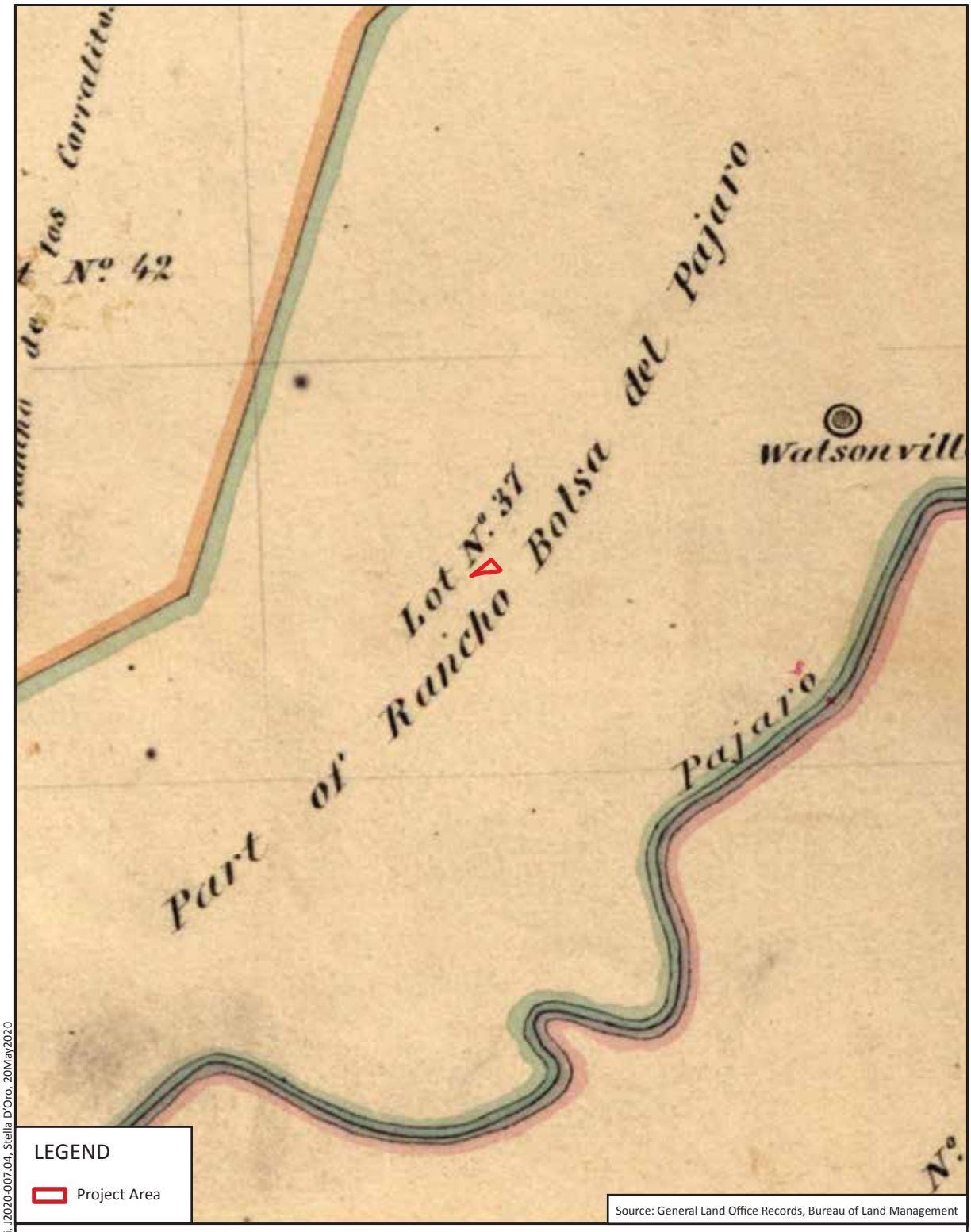


Figure 2. Detail of 1867 Plat Map of Township 12S, Range 2E, Santa Cruz County.

File name: Figure_2_1867.ai; J2020-007.04; Stella D'Oro; 20May2020

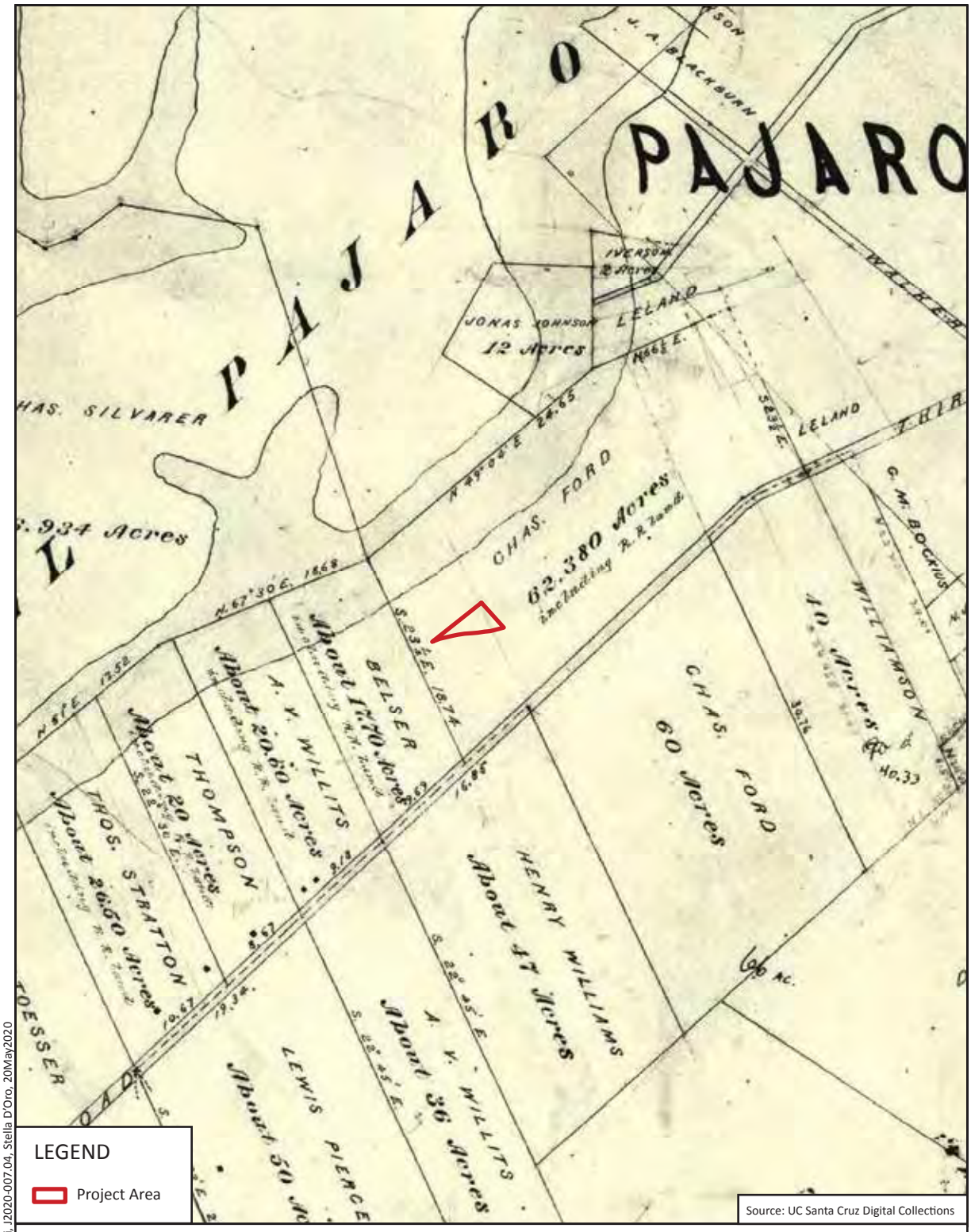


Figure 3. Detail of 1880-1881 Map of Santa Cruz County.

File name: Figure_3_1881.ai; J2020-007.04; Stella D'Oro; 20May2020

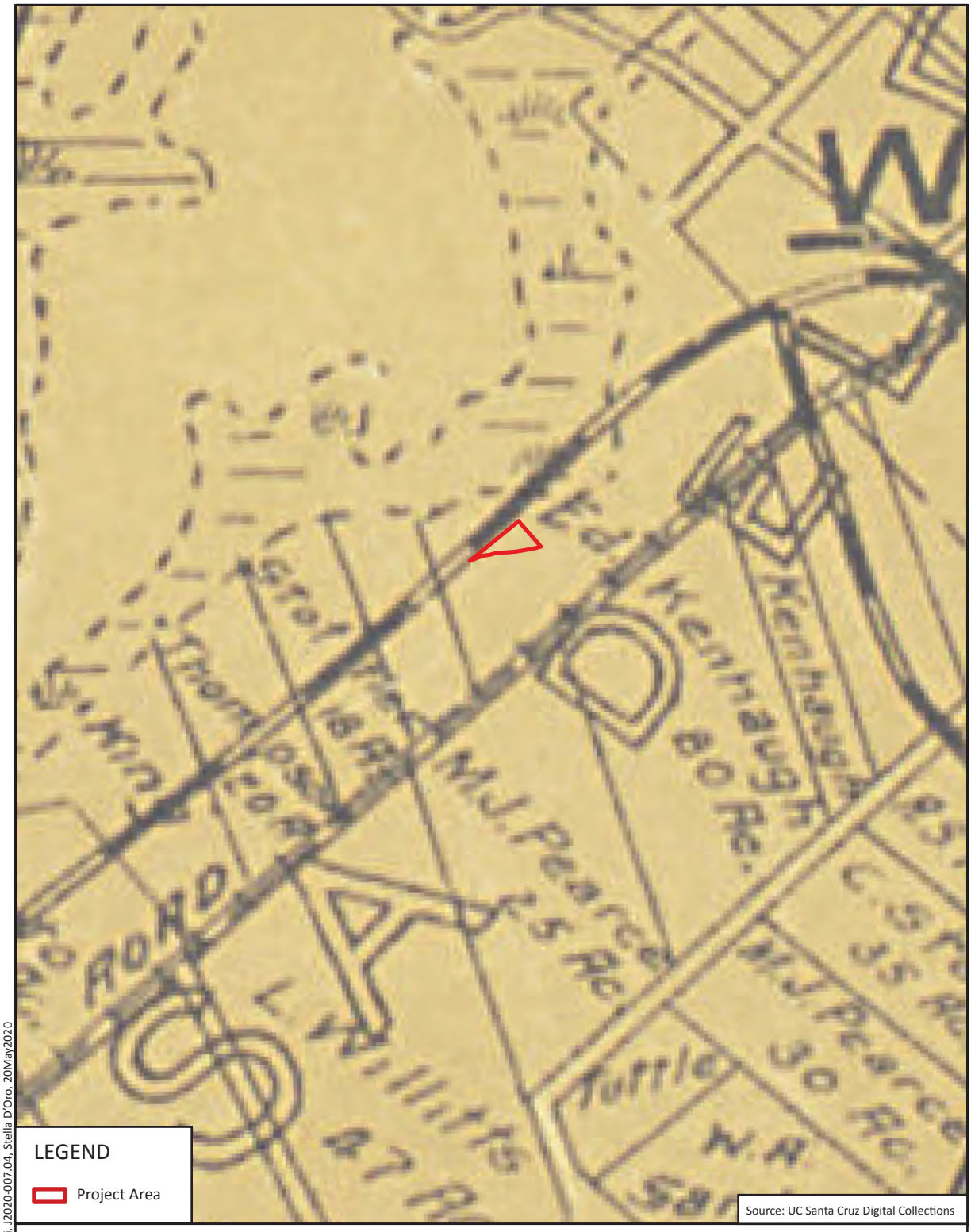
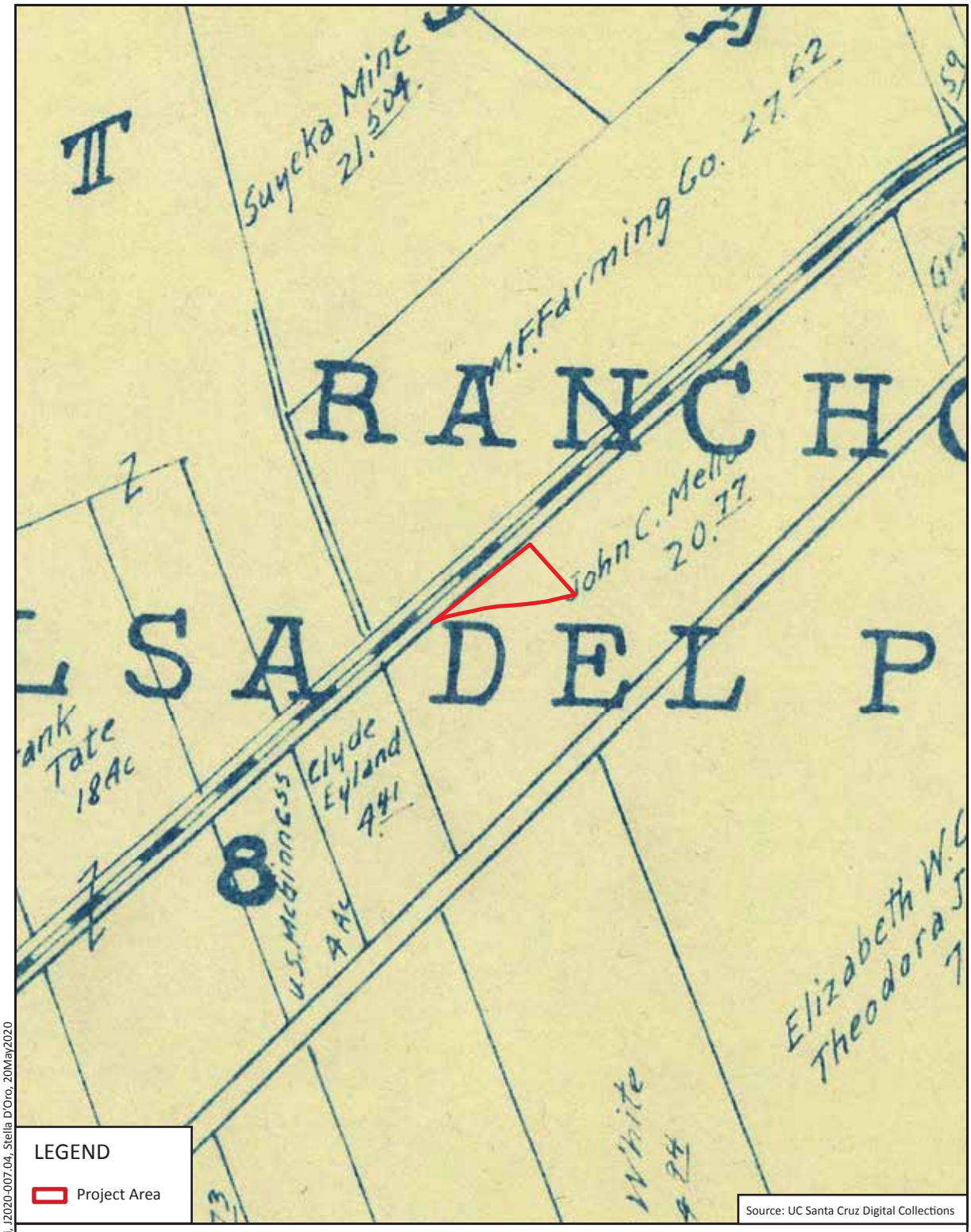


Figure 4. Detail of 1906 Map of Santa Cruz County.



File name: Figure_5_1929.ai; J2020-007.04; Stella D'Oro; 20May2020

Figure 5. Detail of 1929 Map of Santa Cruz County.

File name: Figure_6_1931.ai; J2020-007.04; Stella D'Oro; 20May2020

Figure 6. Detail of 1931 Aerial Photograph, Flight C-1550, Frame 35.

Figure 7. Detail of 1939 Aerial Photograph, Flight C-5750, Frame 298-12.

File name: Figure_7_1939.ai; J2020-007.04, Stella D'Oro, 20May2020

Figure 8. Detail of 1963 Aerial Photograph, Flight CA-SCR, Frame 2-25.

File name: Figure_8_1963.ai; J2020-007.04, Stella D'Oro, 20May2020

Field Methods and Results

4

FIELD METHODS

On May 8, 2020, Albion archaeologist Matt Manigault conducted a pedestrian surface survey of the Project APE (Figure 9). The survey involved a walkover of the entire APE and an intensive surface inspection of all areas of exposed ground for evidence of archaeological materials, documented by written notes and photos. Field notes documented details on disturbances, slope, ground cover, soil visibility, vegetation, the built environment, and any cultural material observed. Albion conducted no subsurface testing as part of this study. Upon completion of the fieldwork, all notes, maps, and photos were returned to Albion for processing.

FIELD RESULTS

The Project APE consists of a small triangular parcel bordered on the north by the SPRR and on the south by an SPRR railroad spur, two of the same resources identified in the records search (P-44-000377 and P-44-001157). These rail lines are located well outside the parcel, with the spur no longer active, having been partially paved over. There is a vacant grassy lot to the north and active warehouses belonging to other property owners on the remaining sides.

The parcel itself is surrounded by a chain link fence topped with barbed wire and is partially paved with asphalt and concrete, with dense grass, weeds, and shrubs surrounding the perimeter and filling in unpaved areas. The asphalt and concrete paving is patchy and in poor condition and there is a small pile of asphalt debris in the eastern portion of the parcel. Next to this pile is a power pole supporting an active line linking adjacent buildings, and there is a second inactive pole along the south fence line. Midway along the north side of the parcel is another wooden pole supporting a floodlight. Attached to the northern portion of the fence is a large piece of plywood supporting a series of disconnected former electrical utilities. Next to the plywood is a substantial tear in the fence.

In the middle of the parcel is a large cylindrical white steel fuel tank propped up on railroad ties and sitting on a section of intact concrete paving. A Simon MP110 aerial lift is parked between the tank and the power pole. The western portion of the parcel, west of the tank, is largely unpaved and is the most overgrown with grass and shrubs. Within this overgrown area is at least one large mound of soil. White and orange A-frame barricades are scattered across the parcel, with a cluster of them surrounding a shallow irregular hole 3-6 ft. in diameter dug into the surface sometime in the recent past.

File name: Figure_9_Current.ai, J2020-007.04, Stella D'Oro, 20May2020

Figure 9. 950 West Beach Street Project APE.

The profile of this hole shows that soils in this location consist of a few inches of sandy loam, followed by loose dry sand. No cultural materials were observed in these exposed deposits.

No archaeological artifacts, features, or deposits were observed anywhere within the APE that have the potential to be considered historical resources under CEQA. The fencing, fuel tank, aerial lift, power poles, and other objects and utilities are all less than fifty years old and otherwise lack the potential to qualify as eligible for the California Register of Historical Resources (CRHR). Based on the 1963 aerial photograph, some of the concrete paving within the parcel may be older than fifty years, but, as discussed in the following section, also lacks potential CRHR eligibility.

Study Findings and Recommendations 5

STUDY FINDINGS

Albion's Phase I archaeological investigations for the proposed 950 West Beach Street Project comprised an NWIC records search, background research, and a pedestrian survey of the entire Project APE. The records search revealed one known cultural resources within the APE and two within a quarter-mile radius. The cultural resource documented as extending within the APE is a portion of the Santa Cruz Branch of the Southern Pacific Railroad (SPRR, P-44-000377). The two cultural resources recorded within a quarter-mile of the APE include a standard gauge spur of the SPRR (P-44-001157) and a possible site of unknown date or character (387A-004).

Background historical research revealed that the APE was once part of the Mexican Period Rancho Bolsa del Pajaro, but no structures or other landscape features from this rancho overlap with the APE itself. Historic maps show that by the 1880s the Project vicinity had been divided into private parcels and that over the next several decades the parcel in which the APE is located passed through a series of private owners. The narrow gauge Santa Cruz Branch Railroad was constructed just north of the APE in 1876, converted to standard gauge in 1883 after it was acquired by the SPRR, and expanded with a railroad spur on the south side of the APE leading to a warehouse complex by the 1930s. Between the 1930s and 1960s, aerial photographs show a series of unidentified objects within the APE, probably vehicles or portable equipment associated with the adjacent railroad or warehouse complex. Evidence from the 1963 aerial photo suggests the APE may have been paved by that time, and that this was likely a small parking area.

The results of Albion's pedestrian survey turned up no evidence of precontact Native American or historic period cultural resources within the Project APE that would qualify as historical resources under CEQA. Our survey shows that, despite records search results indicating that the SPRR (P-44-000377) overlaps with the APE, this resource is actually located well outside the APE and will not be subject to Project impacts. The concrete and asphalt paving within the Project parcel is probably older than fifty years, and therefore has the potential to qualify as a historical resource under CEQA. However, it is in very poor condition, is peripheral to the core functioning of both the adjacent railroad and warehouse complex, and has no potential to contribute to research questions that cannot be addressed using historical sources. Consequently, it is Albion's opinion that the paving should not be considered a historical resource under CEQA.

RECOMMENDATIONS

Based on results of this study, including the lack of known or newly identified cultural resources within the Project APE, Albion concludes that no historical resources will be affected by the Project and recommends no further archaeological measures prior to or during construction.

If the Project scope changes in ways that affect the boundaries of the APE, additional archaeological survey and testing may be required to assess these potential effects and recommend appropriate mitigation measures.

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Appendix A

Fieldwork Photographs

Photograph 1. View toward Project parcel from the west, facing east.

Photograph 2. View toward Project parcel from the north, facing southeast.

Photograph 3. View of southern exterior of Project parcel facing east.

Photograph 4. View toward southeastern portion of Project parcel, facing northwest.

Photograph 5. View from east corner of Project parcel, facing west.

Photograph 6. View from east corner of Project parcel, facing northwest.

File name: Figure_A1_Photos.ai, J2020-007.04, Stella D'Oro, 20May2020

Figure A-1. Fieldwork photographs.

Photograph 7. Fuel tank, power pole, and aerial lift in eastern portion of Project parcel, facing northwest.

Photograph 8. View of southeastern portion of Project parcel, facing east.

Photograph 9. View of Project parcel west of fuel tank, facing north.

Photograph 10. View of western portion of Project parcel, facing west toward hole.

Photograph 11. Close-up of shallow hole, facing east.

Photograph 12. Vegetated earthen mound in western corner of Project parcel, facing east.

Figure A-2. Fieldwork photographs.

File name: Figure_A2_Photos.ai, J2020-007.04, Stella D'Oro, 20May2020

Photograph 13. View toward fuel tank from east side of earthen mound, facing east.

Photograph 14. View of western portion of Project parcel just east of mound, facing south.

Photograph 15. View of northern portion of Project parcel, facing northeast.

Photograph 16. View of northern portion of Project parcel, facing southwest.

Photograph 17. Electrical panel along northern fence line, facing northwest.

Photograph 18. View of eastern portion of Project parcel, facing southeast.

Figure A-3. Fieldwork photographs.

File name: Figure_A3_Photos.ai, J2020-007.04, Stella D'Oro, 20May2020

Appendix B

Records Search Summary Letter

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

4/16/2020 NWIC File No.: 19-1690

Stella D'Oro
Albion Environmental, Inc.
1414 Soquel Drive, Suite 205
Santa Cruz, CA 95062

re: 950 West Beach Street

The Northwest Information Center received your record search request for the project area referenced above, located on the Watsonville West USGS 7.5' quad. The following reflects the results of the records search for the project area and a 0.25 mile radius:

Resources within project area:	P-44-000377.
Resources within 0.25 mile radius:	P-44-001157; 387A-004.
Reports within project area:	None
Reports within 0.25 mile radius:	S-4036, 22657, 31355, 21986, 6722, 25267, 3964, 26671, & 3852.

Resource Database Printout (list):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (list):	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Report Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☐ enclosed	☒ not requested	☐ nothing listed
OHP Built Environment Resources Directory:	☒ enclosed	☐ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☒ enclosed	☐ not requested	☐ nothing listed
Caltrans Bridge Survey:	☐ enclosed	☒ not requested	☐ nothing listed
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☒ not requested	☐ nothing listed
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed

Shipwreck Inventory: ☐ enclosed ☒ not requested ☐ nothing listed

*Notes:
** Current versions of these resources are available on-line:
Caltrans Bridge Survey: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm
Soil Survey: http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=CA
Shipwreck Inventory: http://www.slc.ca.gov/Info/Shipwrecks.html

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Lisa C. Hagel
Researcher

Harris & Associates

TECHNICAL MEMORANDUM

To: Justin Meek, AICP, Principal Planner, City of Watsonville
From: Shannon Bane, Biologist
Subject: **Mountain Propane Project – Biotic Resources**
Date: June 4, 2020
CC: David Mack, Project Manager/Senior Planner, Harris & Associates
Att: 1, California Natural Diversity Database, Information for Planning and Consultation, and California Native Plant Society Rare and Endangered Plant Inventory Results

Introduction

This technical memorandum presents the results of Harris & Associates' analysis of potential impacts to biological resources from construction of the proposed Mountain Propane project (project). Impacts were assessed as they relate to existing conditions, the project description, and relevant regulations, including the California Environmental Quality Act (CEQA), federal and state Endangered Species Acts (FESA and CESA), Migratory Bird Treaty Act (MBTA), California Fish and Game Code, California Native Plant Protection Act, and City of Watsonville local ordinances (e.g., Noise Ordinance). Figures and attachments are located at the end of this memorandum.

Project Description

The project area is located at 950 West Beach Street, a previously developed industrial site (currently owned by Mountain Propane and previously owned by Venture Oil Company) within a larger industrial area on the south side of the City of Watsonville (**Figures 1 and 2**). The 0.69-acre project site is zoned General Industrial (IG), and was previously contaminated with hazardous materials that were remediated in 2013. Currently, the project site contains one 50,000-gallon propane tank and various areas of impervious surfaces that are composed of pavement and concrete (**Figure 2**).

The applicant is proposing to relocate the existing 50,000-gallon propane storage tank to the middle of the parcel. The project also includes the phased installation of four new 30,000-gallon propane storage tanks that would result in a total of 170,000 gallons of storage (**Figure 3**). Each of the proposed tanks are fifteen feet in height and would be installed on footings that keep the tanks off the ground, and would occupy approximately 1,750 square feet.

The proposed project would utilize an adjacent rail line for the delivery of the propane. The propane would then be transferred to a truck, and then to the on-site propane storage tanks. Mountain Propane Company would fill bobtail delivery trucks at the site and deliver propane to customers.

Additional site improvements include the removal of concrete and/or asphalt paving not essential to future operations, the repair and resurfacing of existing concrete and asphalt surfaces for the propane tanks, installation of foundation(s) for the propane tanks, tank unloading stations, irrigation and landscaping, gate and fencing installation, bollard installation, liquefied petroleum gas (LPG) piping and appurtenance installation, and private fire hydrant installation (**Figures 3 and 4**).

All elements of the project – including moving the existing tank, installation of new tanks, paving repair, and installation of respective ancillary facilities – would be located on disturbed areas within the existing property (**Figures 3 and 4**).

Methodology

Harris and Associates (Harris) biologists reviewed the project plans and available information about Watsonville Slough, which is within 580 feet of the project site. To identify federally- and state-listed species potentially occurring in the project site, Harris biologists obtained a species list from the USFWS Information for Planning and Conservation (IPaC) online planning tool (U.S. Fish and Wildlife Service 2020), queried the California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB) for special-status species occurrences within a 2-mile buffer around the project site (California Department of Fish and Wildlife 2020) (**Figure 5**), and queried the California Native Plant Society's (CNPS) Rare and Endangered Plant Inventory (California Native Plant Society 2018) for special-status plant occurrences in the Watsonville West quadrangle. The results of the USFWS species list, CNDDB query, and CNPS query are provided in **Attachment 1**.

A general habitat and natural resources assessment, including the potential for special-status species and habitats to occur within the project site was conducted during a reconnaissance-level pedestrian survey by Harris biologist Shannon Bane on March 19, 2020.

Results

Project Location

The project site is located at 950 West Beach Street, Watsonville, California 95076. The parcel (APN 018-331-28) consists of 0.69 acres (mostly paved or covered in concrete) and currently houses one 50,000-gallon propane tank. The parcel is located within the Watsonville West 7.5' U.S. Geological Survey (USGS) topographic quadrangle, at DD (NAD 83) -121.77163, 36.90401; UTM 609435E 4084928N Zone 10, PLSS Section M 12S 02E 8. It is located within the Pajaro Watershed (HUC 8), and is approximately 580 feet south of Watsonville Slough.

Habitats

Habitats are influenced by the soils and other physical characteristics within and adjacent to the property. The project site is located within 580 feet of Watsonville Slough; in this location the slough is channelized but does support riparian vegetation (**Figure 5**). Between the slough and the project site are two levees and dense nonnative vegetation, including weeds and nonnative grasses (see description of **Ruderal** habitat for more details, below).

Due to the proximity of the project site to Watsonville Slough, it is located in a FEMA designated 100-year flood zone (Zone AE), and soils within and adjacent to the project site are sandy.

Two habitat types were identified on the property during the field visit and are described below: developed/ disturbed and ruderal (**Figure 6**).

Developed/Disturbed

Almost half of the project site (approximately 0.33 acres) is developed/disturbed, covered with degraded concrete and pavement, a 50,000-gallon propane tank, and trash and debris (**Figures 7-9**). Weedy species such as narrow leaf plantain (*Plantago lanceolata*), cut leaf plantain (*Plantago coronopus*), bristly ox-tongue (*Helminthotheca echioides*), wild radish (*Raphanus raphanistrum*), and non-native grasses are growing in cracks and other areas where they were able to take root.

Ruderal

The remaining half of the project site (approximately 0.36 acres) that is not paved has been disturbed, as evidenced by stockpiles of soil, holes in the ground, and weedy and other early-successional species that are common in ruderal habitats (**Figures 10-11**). The soil in this area is sandy, and supports nonnative ruderal species including French broom (*Genista monspessulana*), poison hemlock (*Conium maculatum*), Italian thistle (*Carduus pycnocephalus*), vetch (*Vicia* spp.), and wild radish. Early successional native species seen in this area include coyote brush (*Baccharis pilularis*) and lupine (*Lupinus albifrons*).

Ruderal habitat is also adjacent to the project site, extending approximately 580 feet from the edge of the railroad tracks to the riparian area of Watsonville Slough (**Figures 12-13**). This area is dominated by thick, tall, invasive, nonnative vegetation, including thistles, wild radish, and non-native grasses. The current condition of this area is not conducive for the support or movement of wildlife species.

Common Wildlife Species

Common wildlife species that are expected to occur in the project site include species that are tolerant of disturbance from ongoing operations within the industrial area. Wildlife species certainly use the riparian corridor of Watsonville slough, approximately 580 feet north of the project site, and, to a lesser extent, the open ruderal area between the slough and the project site. However, it unlikely that anything other than species very tolerant of human disturbance would occur on site due to the lack of vegetation for roosting, shelter, or food.

Urban-adapted species that may be found at the project site include: European starling (*Sturnus vulgaris*), house finch (*Haemorhous mexicanus*), rock dove (*Columba livia*), house mouse (*Mus musculus*), American crow (*Corvus brachyrhynchos*), Eurasian collared dove (*Streptopelia decaocto*), house sparrow (*Passer domesticus*), raccoons (*Procyon lotor*), and western fence lizard (*Sceloporus occidentalis*). No bird species were observed during the biologist's field visit on March 19, 2020.

Special-Status Species That May Potentially Be Affected by the Project

The project site is very unlikely to support special status species because of the developed/disturbed nature of the site and the surrounding industrial uses. However, the project site is located 580 feet south of the Watsonville Slough, which, although channelized near the project site, likely serves as a movement corridor and provides habitat that supports special status species. There are known occurrences of special status species in Watsonville Slough, both upstream and downstream of the project site (**Figure 5** and **Attachment 1**).

The area between the slough and project site includes levees and open space (**Figures 12-13**). As discussed above in the **Habitats** section, this area is dominated by tall, dense stands of invasive nonnative weeds that do not provide quality habitat and make movement of terrestrial species difficult.

Results of the IPaC, CNDDB and CNPS RareFind database searches are included in **Attachment 1**. The CNDDB table in **Attachment 1** identifies the potential for special status species to occur on the project site and species that are unlikely to occur based on lack of suitable habitat or other factors. Harris identified suitable habitat for the following species as being potentially affected by the proposed project.

- **California Red-Legged Frog (*Rana draytonii*) (CRLF) (Federally Threatened Species; CDFW Species of Special Concern).** CRLF are known to occur in Watsonville Slough both upstream and downstream of the project site (**Figure 5**). The slough and associated riparian habitat are approximately 580 feet from the project site. The slough is channelized through this area of Watsonville, likely providing a movement corridor for CRLF, but no breeding habitat is present through this section.
  The soil in and around the project site is sandy and does not support any ground squirrel activity or burrows which would provide upland refugia for CRLF. In addition, there is very little debris that could provide refuge for frogs.
  Although no physical barriers exist between the slough and project site, the two tall and steep levees, open space with dense invasive nonnative weeds, and active railroad corridor make it unlikely that CRLF would occur at the project site. And, if CRLF were to travel to or through the project site, they would be exposed to an industrial area and roads, and not additional habitat. The next natural area beyond the adjacent industrial area is the Pajaro River, approximately 0.9 miles away.
- **Western Pond Turtle (*Emys marmorata*) (WPT) (CDFW Species of Special Concern, USFS Sensitive Species).** WPT are known to occur locally in Struve Slough and near Crestview Park in association with ponded water. Watsonville Slough does have potentially suitable habitat for WPT upstream and downstream of the project site (where the CNDDB occurrences were reported). There are sandy soils on the project site, and WPT nest in sandy areas within ½ mile of water. However, there are no ponds in this stretch of Watsonville Slough, and there are barriers between the slough and project site including two levees and dense weedy vegetation that are of low quality, hindering movement of small herpetiles. In addition, the conditions on the project site are

degraded in that the majority of the site is paved, and the unpaved portions are weedy. Based on the low quality habitat adjacent to and within the project site, it is unlikely that WPT would occur there.

- **Robust Spineflower (*Chorizanthe robusta* var. *robusta*) (Federally Endangered Species; USFS Sensitive Species; CNPS 1B.1 Species - plants rare, threatened, or endangered in California and elsewhere and/or seriously threatened in California).** Robust spineflower occurs in mildly disturbed sandy soils. There is one local population reported at Harkins Slough on the Land Trust of Santa Cruz County's Watsonville Slough Farm property. Although loose sand is present within the project site, the site was remediated for hazardous materials in the past; and as a result of this and other industrial uses, the site is disturbed and dominated by invasive, nonnative weeds. The degraded habitat on site is unlikely to support this species.
- **Santa Cruz Tarplant (*Holocarpha macradenia*) (Federally Threatened Species; California Endangered Species; CNPS 1B.1 Species: plants rare, threatened, or endangered in California and elsewhere and/or seriously threatened in California).** Santa Cruz tarplant is found in grasslands in sandy soils. The nearest local occurrences of this species are at Tarplant Hill in Struve Slough, Harkins Slough at High Ground Organics Farm, the Watsonville Municipal Airport, and the Apple Hill neighborhood in Watsonville. The closest population is at Tarplant Hill, approximately 0.5 miles away from the project site. Although soils on the site are sandy, the degraded condition of the soils and nonnative vegetation make it very unlikely that this species would occur on site.
- **Nesting Birds (protected).** Nesting Birds are protected by CEQA, the MBTA, and the California Fish and Game Code. Nesting birds may occur on the edge of the property in shrubs or on the ground during nesting season (from February 1 to September 1).

Critical Habitat

The project site does not fall within the boundaries of Critical Habitat for any listed species.

Impact Analysis

Potential impacts to identified biological resources from implementing the proposed project are discussed below.

Construction Impacts

Project construction activities that could potentially impact biological resources at the project site include relocating the existing propane tank, installing four new tanks, and implementing other site improvements as described in the Introduction above. However, the site has been previously developed and disturbed, so no new habitat impacts would occur. Shrubs at the fenceline/perimeter of the property and ruderal/weedy plant species throughout the property would be removed. Grading would redistribute soils throughout the project site. Some existing pavement and asphalt would also be removed, increasing the total amount of permeable surface. Repairs would be made to the existing concrete and pavement areas, and, where necessary, new concrete or pavement would be installed over existing infrastructure to provide a stable foundation for the tanks. Construction noise may affect any wildlife in the immediate vicinity of the work area.

Although no sensitive wildlife or plant species are anticipated to be present within the project site during construction, it is possible due to the project site's proximity to Watsonville Slough. If sensitive wildlife species were to occur on the project site during construction, there is a potential for "incidental take" under the FESA and/or CESA. "Take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct; incidental take is a take that results from activities that are otherwise lawful. Avoidance and minimization measures to avoid take of special status species are included in under **5. Best Management Practices and Avoidance and Minimization Measures**. When implemented, these measures would avoid take of sensitive wildlife and plant species, and no mitigation would be needed.

Best Management Practices and Avoidance and Minimization Measures

The following Best Management Practices (BMPs) and Avoidance and Minimization Measures would be included in the project construction specifications and/or as conditions of approval to minimize potential impacts to sensitive biological resources.

Avoidance and Minimization Measure 1: Preconstruction Surveys

California Red-Legged Frog and Western Pond Turtle

To prevent incidental take of California red-legged frog (CRLF) and Western Pond Turtle (WPT), preconstruction surveys shall be conducted by a qualified biologist within 48-hours of the start of construction activities to make sure that these species are not present on site. Surveys of open areas and any debris piles or crevices where a CRLF could take refuge and sandy soils where WPT could nest shall be surveyed. If any CRLF or WPT individuals or WPT nests are located, a buffer shall be established to protect it. Any animal(s) found during surveys shall be allowed to leave the property of its own accord. Construction may not start until the animal(s) has/have left the property.

Special Status Plants

Although no special status plants are expected to be present on the property, a qualified biologist shall survey the site prior to construction. If a special status plant occurs on site, the plant and immediate surrounding area shall be flagged and protected from impacts. If there is no way to protect the plant(s), construction shall be put on hold while the biologist consults with USFWS and/or CDFW (depending on the listing agency) for guidance. If this occurs, it is likely that mitigation would be needed, including removing and saving topsoil from graded areas and replacing it on open areas within the project site, and future management of the site to protect the species.

Nesting Birds

To protect nesting birds, no project activities shall be completed from February 1 through August 31 unless the following Avian Nesting Surveys are completed by a qualified biologist.

- **Birds of Prey.** Typically, a survey for nesting birds of prey is conducted prior to project construction to ensure that active raptor nests are not impacted by construction activities. Because there is a 500-foot avoidance buffer required for active nests of birds of prey, and the closest trees that could support nesting raptors are in the riparian corridor associated with Watsonville Slough, approximately 580 feet north of the project site, no surveys for nesting raptors are included for this project.
- **Other Avian Species.** A qualified biologist shall survey for nesting activity within the project site and a 250-foot radius within 7 days prior to starting project activities. If any nesting activity is detected, the qualified biologist shall designate nests and nest substrate (trees, shrubs, ground, or burrows) as an Environmentally Sensitive Area (ESA) and protected with a minimum 250-foot buffer until young have fledged and are no longer reliant on the nest site or parental care. Additional surveys would be needed if construction is halted for 7 days or more.

Avoidance and Minimization Measure 2: Education Materials and Training

A binder with information containing environmental requirements for the project, including avoidance of special-status species, shall be created and kept at the project site at all times. In addition, prior to starting the project, all employees, contractors, and visitors who will be present during project construction shall receive training from a qualified biologist on the contents of the binder, including species identification, avoidance and minimization measures, and stop work and reporting requirements (if any).

Avoidance and Minimization Measure 3: Protective Fencing

Protective fencing to exclude special status species shall be installed after the completion of preconstruction surveys for CRLF and WPT (**Avoidance and Minimization Measure 1**), and the qualified biologist has determined that no special status species are present on site. Protective fencing shall be constructed to provide a solid barrier that will not allow the passage of sensitive species into the project site during construction (similar to the one shown in **Figure 14-16)**. The qualified biologist shall delineate where the contractor shall install fencing and inspect the fencing prior to construction to ensure that the fencing was installed correctly. Fencing shall be inspected daily for integrity by a designated and qualified individual, and any necessary repairs shall be made prior to the start of construction that day.

If any CRLF or WPT are found within the project site at any time, the contractor shall stop work immediately and contact a qualified biologist, who shall inspect the animal and site to ensure that it leaves of its own volition (no animals may be picked up and moved). Work shall restart when the biologist deems the site clear. The regulatory agencies shall then be consulted, and daily monitoring of the site may be required.

Avoidance and Minimization Measure 4: Work Timing

Many of the special-status animals with a potential to occur within the project site are active at dusk and during the night. To avoid impacts to these species, all work activities shall be confined to daylight hours (between 7:00 a.m. and 7:00 p.m.) per the City's Noise Ordinance.

Conclusion and Recommendations

It is unlikely that special status species would occur within the project site due to the developed/disturbed conditions of the site. However, Watsonville Slough (located approximately 580 feet north of the project site) and the special status species that occur therein, are within dispersal distance for CRLF and WPT. Although unlikely, it is possible that a dispersing CRLF and/or WPT may inadvertently end up near or in the project site. Furthermore, nesting birds may occur in shrubs or ground vegetation during nesting season (February 1 through August 31), and vegetation removal, grading, or noise may harm or disturb any active nests in or near the project site. With the implementation of BMPs and avoidance and minimization measures, project construction would not result in incidental take of any special status species, and the potential impact would be less than significant.

To summarize, the following BMPs and Avoidance and Minimization Measures would be implemented.

- Within 7 days of the start of construction, preconstruction surveys shall be conducted for nesting birds by a qualified biologist. Buffers shall be established, if necessary, to prevent construction noise impacts to active nests.
- Within 48 hours, preconstruction surveys for CRLF and WPT shall be conducted by a qualified biologist. Any animals found within the project site shall be allowed to leave of their own volition; and construction shall not proceed until the animal(s) left the property.
- Before the start of construction, a construction education program presented by a qualified biologist shall be required of all construction workers and visitors to the site. This program would explain what sensitive species/resources may be encountered and how to avoid any impacts to them. A binder with all relevant information regarding sensitive resources shall be kept on site by the contractor throughout the duration of project implementation.
- Before the start of construction and after the qualified biologist determines that no special status species are present on site, protective fencing shall be installed by the contractor, at the qualified biologist's direction. The fencing shall be inspected daily by a designated and qualified individual for integrity, and any repairs shall be made to ensure that no special status species would be able to enter the property during construction.
- Construction shall be limited to daylight hours (7:00 a.m. to 7:00 p.m.) to prevent noise disturbance to sensitive receptors.

References

California Department of Fish and Wildlife. 2020. California Natural Diversity Database. Available online at https://www.wildlife.ca.gov/Data/CNDDB/Maps-and- Data#43018407-rarefind-5. Accessed June 25, 2018.

California Native Plant Society (CNPS). 2020. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Available online at: http://www.rareplants.cnps.org. Accessed June 25, 2018.

USFWS. 2020. Information for Planning and Conservation online planning tool. Available at: https://ecos.fws.gov/ipac/. Accessed June 25, 2018.

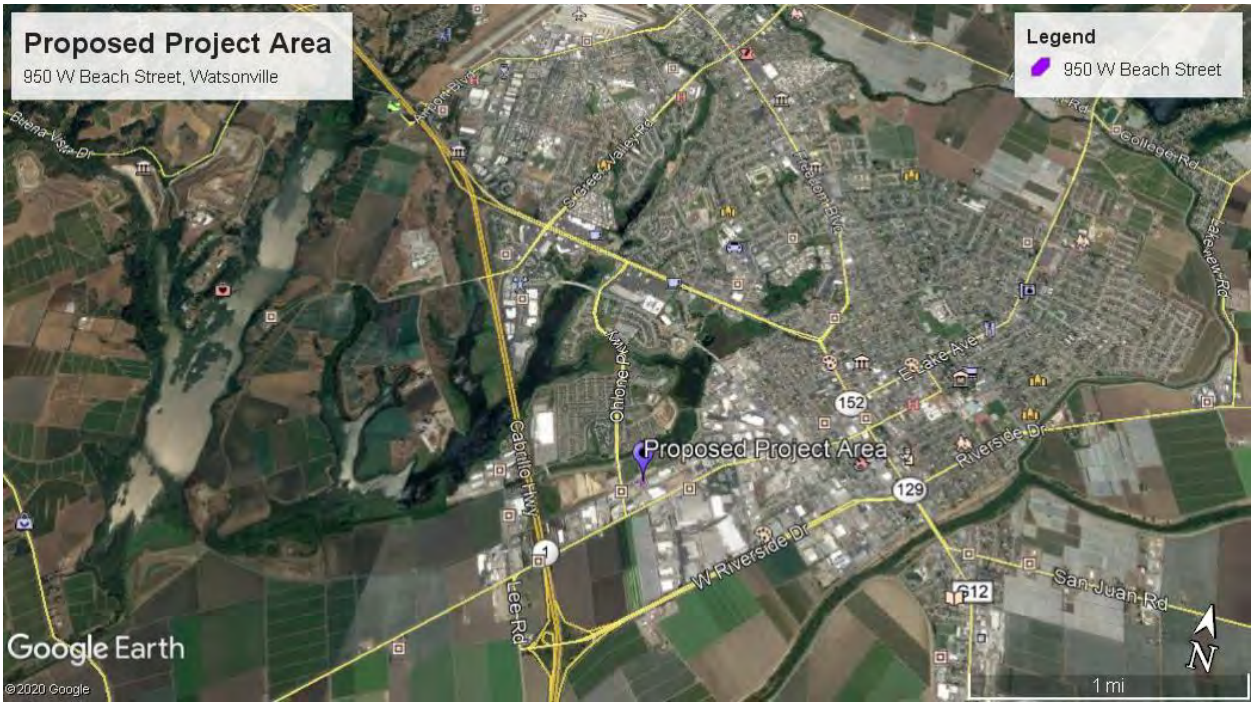


Figure 1. Regional Map of Project Site (Proposed Project Site)

Figure 2. Proposed Project Site

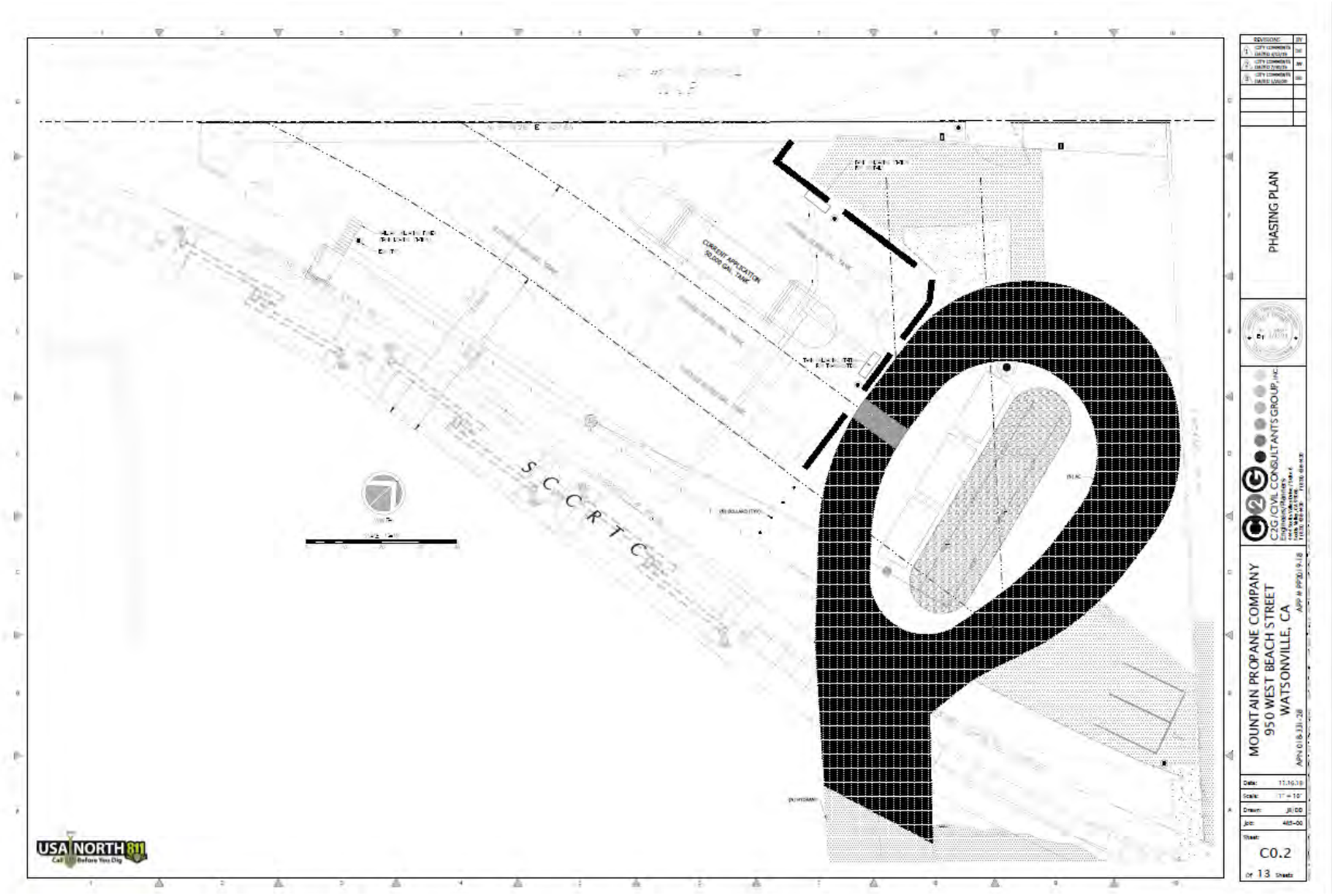


Figure 3. Project Plans

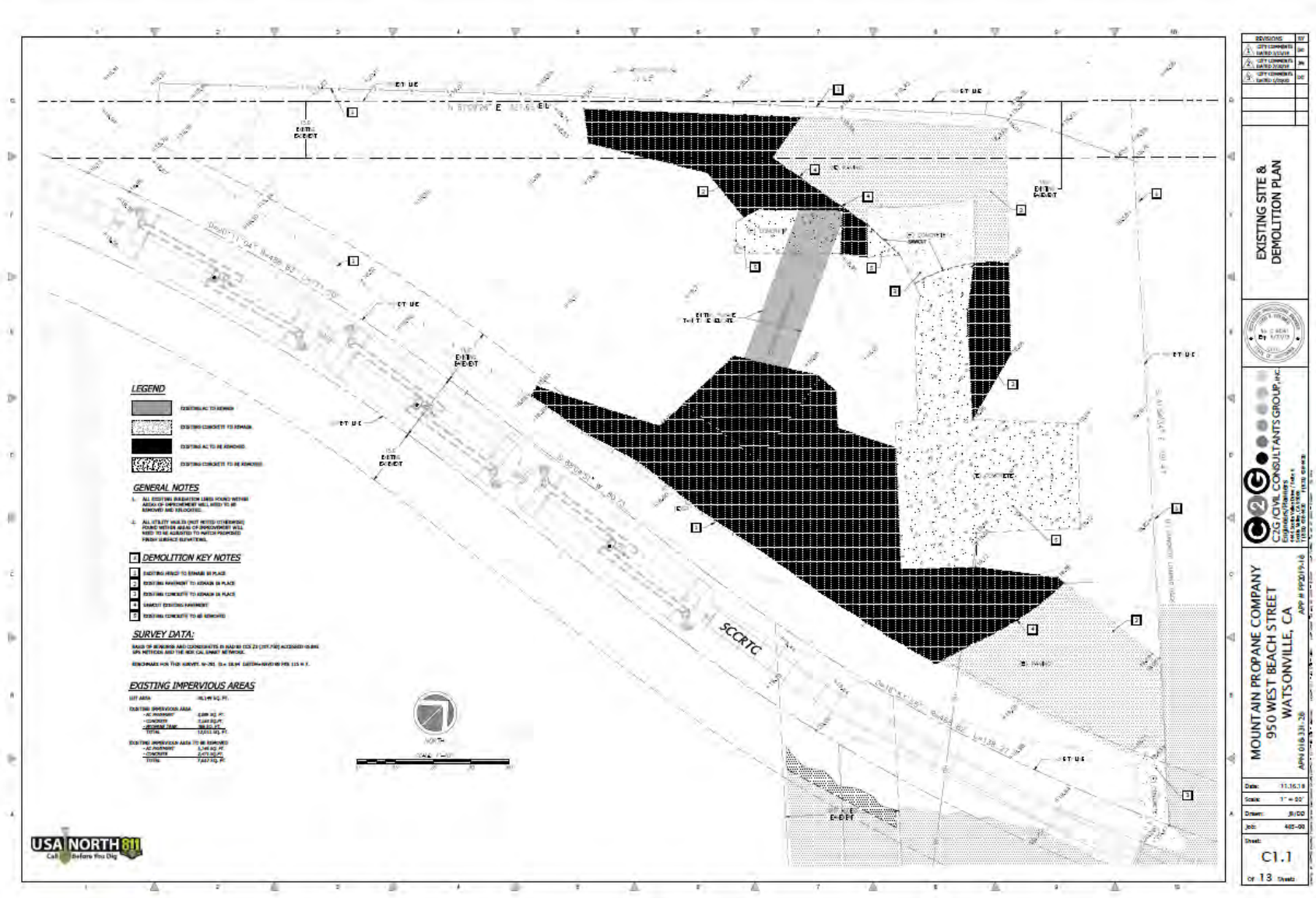
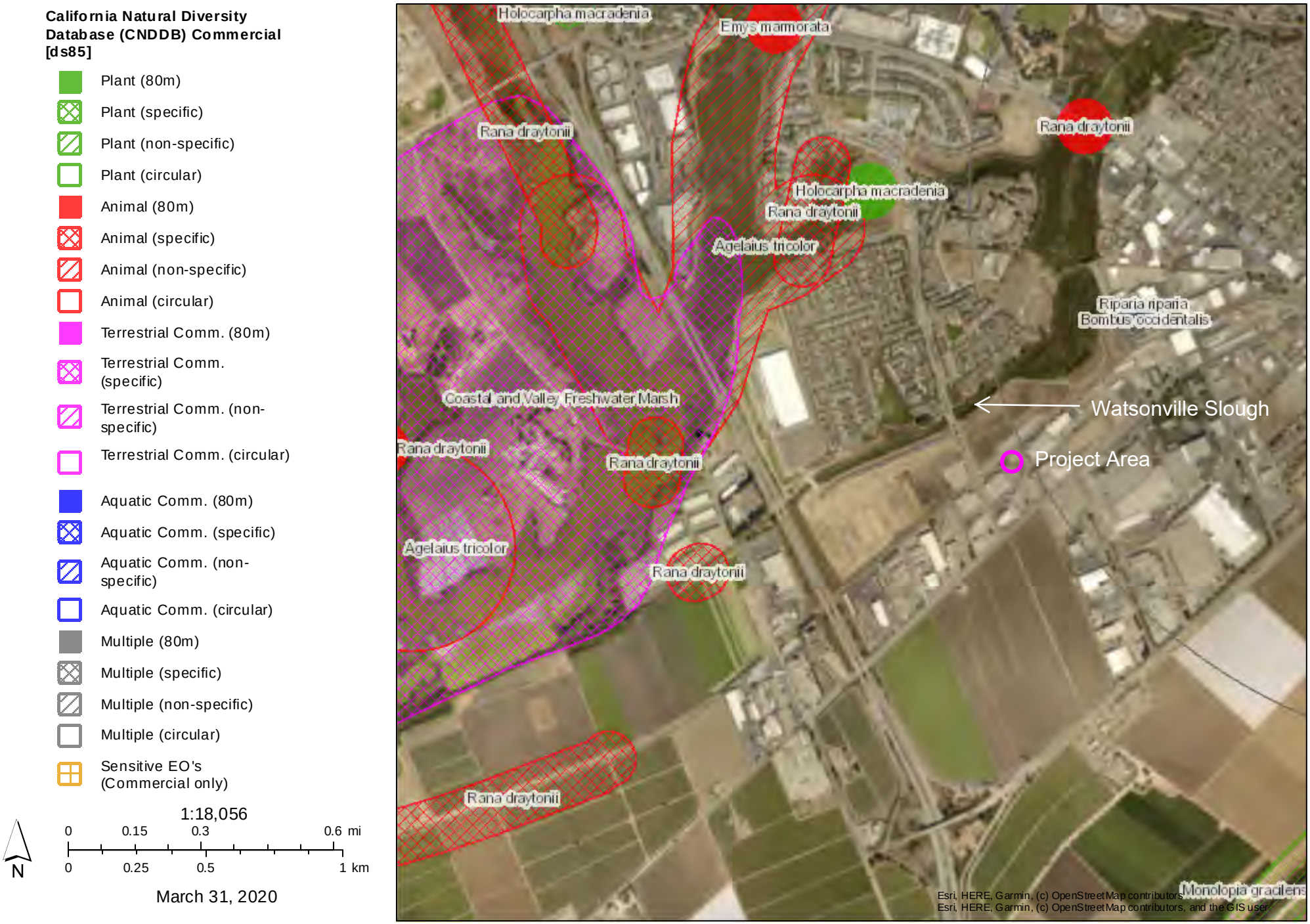


Figure 4. Existing Site and Demolition Plan (including Concrete and Asphalt Removal Areas)

Figure 5. CNDDB Map of the Project Area



Author: Harris & Associates


Figure 6: Habitats
Habitat types within the project area
Legend
Developed/Disturbed
Ruderal
Google Earth
© 2020 Google
N
100 ft

Figure 7. Degraded Asphalt in the Project Site

Figure 8. Degraded Asphalt and Stockpiled Rock in the Project Site

Figure 9. Existing Propane Tank and Ruderal (Weedy) Vegetation

Figure 10. Soil Stockpile with Ruderal (Weedy) Vegetation

Figure 11. Soil Stockpile and Ruderal (Weedy) Vegetation in the Project Site

Figure 12. Open Space Area between the Project Site (beyond the right side of the photo) and Watsonville Slough (beyond the left side of the photo)

Figure 13. Levee and Open Space between the Project Site (beyond the levee) and Watsonville Slough (beyond the left side of the photo)

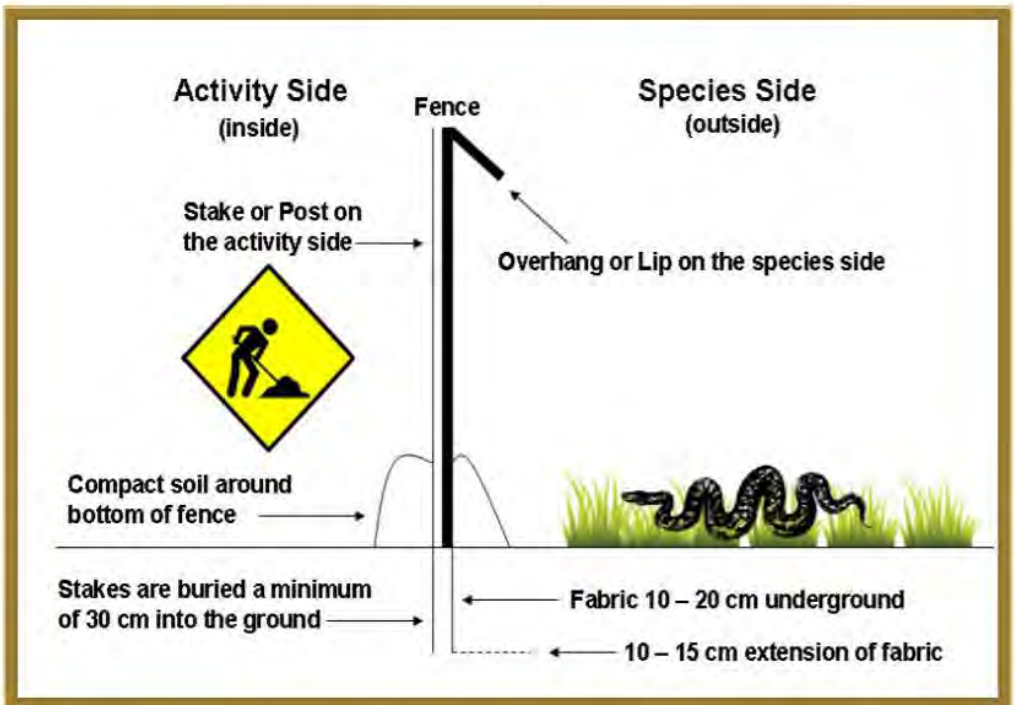


Figure 14. Exclusion Fencing

A side view of a basic exclusion fence including an overhang or flexible lip (optional) to deter animals from climbing or jumping over the fence. Placement of the stake on the activity side or the inside of the excluded area is also illustrated.

Figure 15. Photograph of a Drift Fence

Attachment 1. California Natural Diversity Database, Information for Planning and Consultation, and California Native Plant Society Rare and Endangered Plant Inventory Results

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CNDDB Results for Mountain Propane Project
City of Watsonville, CA
April 2, 2020

Scientific Name	Common Name	Status (Fed/State/Other)	Habitat	Notes
Animal				
Accipiter cooperii	Cooper's hawk	-/-/WL	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	This occurrence was reported in 2014, and documents a nest in Crestview Park, approximately 1.7 miles from the project site. No suitable nesting or foraging habitat is located on site, although potential habitat is located in Watsonville Slough, approximately 580 feet away.
Agelaius tricolor	tricolored blackbird	-/T/SSC, S, BCC	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	No habitat on site. Nearest occurrences are in freshwater marshes with cattails, tules, and other dense vegetation in Hansen and Struve Sloughs, approximately 0.5 miles away from the project site.
Bombus occidentalis	western bumble bee	-/C/S	Once common & widespread, species has declined precipitously from central CA to southern B.C., perhaps from disease.	No suitable habitat is available within the project site. Although the occurrence slightly overlaps with the project site, the record is vague and old (reported in 1959). It is likely that this population is extirpated.
Emys marmorata	western pond turtle	-/-/SSC, S	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	WPT are known to occur in Struve Slough and near Crestview Park, in association with ponded water. Watsonville Slough does have potentially suitable habitat, and there are sandy soils on the property. However, conditions between the slough and project site contain two levees and dense weedy vegetation, the conditions on the project site are degraded (the majority of the site is paved, and unpaved portions are weedy). It is unlikely that WPT would occur on the project site.
Eucyclogobius newberryi	tidewater goby	E/-/SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	No suitable habitat on or near the property. Tidewater goby have been reported in the Pajaro River (3 mi north of Moss Landing); the Pajaro River does not connect to Watsonville Slough and is approximately 0.9 miles away.
Falco peregrinus anatum	American peregrine falcon	D/D/FP, S, BCC	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	An Americal peregrine falcon nest was reported on the smokestack of powerplant at Moss Landing. No nesting or foraging habitat is present on site, but there is foraging habitat approximately 580 feet away in Watsonville Slough.
Rana draytonii	California red-legged frog	T/-/SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	Although no habitat is present on site, the project site is within 580 feet of Watsonville Slough, which is known to support CRLF both up and downstream from the project site. Although the slough is channelized in this area, it could provide movement corridor for CRLF. A railroad track/corridor and open space with two levees are located between Watsonville Slough and the project site. The open space area supports ruderal upland habitat that is densely vegetated with weeds. Although it is unlikely that CRLF would move through the steep levees and thick vegetation and end up on the project site, preconstruction surveys and best management practices will be implemented to prevent CRLF from entering the property before and during construction, including preconstruction surveys and physical barriers (e.g., drift fencing).
Riparia riparia	bank swallow	-/T/S	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.	This occurrence is from a vague record from 1962; the nesting colony was likely associated with the banks of the Pajaro River.

Plant				
Chorizanthe robusta var. robusta	robust spineflower	E/-/1B.1, S	Cismontane woodland, coastal dunes, coastal scrub, chaparral. Sandy terraces and bluffs or in loose sand. 9-245 m.	There is one population reported at Harkins Slough on the Land Trust of Santa Cruz County's Watsonville Slough Farm property. Although loose sand is present on the project site, the site is disturbed and dominated by invasive nonnative weeds. The degraded habitat on site is unlikely to support this species.
Holocarpha macradenia	Santa Cruz tarplant	T/E/1B.1	Coastal prairie, coastal scrub, valley and foothill grassland. Light, sandy soil or sandy clay; often with nonnatives. 10-220 m.	No habitat on site. Nearest occurrences are at Tarplant Hill in Struve Slough, Harkins Slough at High Ground Organics farm, the Watsonville airport, and Apple Hill neighborhood in Watsonville. Closest population is at Tarplant Hill, approximately 0.5 miles away from the project site. Although soils on the site are sandy, the degraded condition of the soils and nonnative vegetation make it very unlikely that this species would occur on site.
Monolopia gracilens	woodland woollythreads	-/-/1B.2	Chaparral, valley and foothill grassland, cismontane woodland, broadleafed upland forest, North Coast coniferous forest. Grassy sites, in openings; sandy to rocky soils. Often seen on serpentine after burns, but may have only weak affinity to serpentine. 120-975 m.	This occurrence is a record from 1915, documenting a population along the Pajaro River, likely extirpated. Although soils on the site are sandy, the degraded condition of the soils and nonnative vegetation make it very unlikely that this species would occur on site.
Key				
E: Federally Endangered		1B.1: Plants rare, threatened, or endangered in California and elsewhere; Seriously threatened in California		
T: Federally Threatened		1B.2: Plants rare, threatened, or endangered in California and elsewhere; Moderately threatened in California		
C: Candidate Species		1B.3: Plants rare, threatened, or endangered in California and elsewhere; Not very threatened in California		
D: Delisted				
SSC: CDFW Species of Special Concern				
S: USFS or BLM Sensitive Species				
FP: CDFW Fully Protected Species				
BCC: USFWS Bird of Conservation Concern				

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Santa Cruz County, California

Local office

Ventura Fish And Wildlife Office

(805) 644-1766
(805) 644-3958

2493 Portola Road, Suite B
Ventura, CA 93003-7726

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

San Joaquin Kit Fox Vulpes macrotis mutica — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2873

Birds

NAME	STATUS
California Least Tern Sterna antillarum browni No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8104	Endangered
Least Bell's Vireo Vireo bellii pusillus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5945	Endangered
Marbled Murrelet Brachyramphus marmoratus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/4467	Threatened
Southwestern Willow Flycatcher Empidonax traillii extimus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6749	Endangered
Western Snowy Plover Charadrius nivosus nivosus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
San Francisco Garter Snake Thamnophis sirtalis tetrataenia No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened

California Tiger Salamander Ambystoma californiense — Threatened
There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/2076

Santa Cruz Long-toed Salamander Ambystoma macrodactylum croceum — Endangered
There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
https://ecos.fws.gov/ecp/species/7405

Fishes

NAME	STATUS
Tidewater Goby Eucyclogobius newberryi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/57	Endangered

Flowering Plants

NAME	STATUS
Marsh Sandwort Arenaria paludicola No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2229	Endangered
Monterey Gilia Gilia tenuiflora ssp. arenaria No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/856	Endangered
Monterey Spineflower Chorizanthe pungens var. pungens There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/396	Threatened
Santa Cruz Tarplant Holocarpha macradenia There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/6832	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED,

WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Allen's Hummingbird Selasphorus sasin — Breeds Feb 1 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9637

Bald Eagle Haliaeetus leucocephalus — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black Turnstone Arenaria melanocephala — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Burrowing Owl Athene cunicularia — Breeds Mar 15 to Aug 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9737

Clark's Grebe Aechmophorus clarkii — Breeds Jan 1 to Dec 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Common Yellowthroat Geothlypis trichas sinuosa — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Long-billed Curlew Numenius americanus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Whimbrel Numenius phaeopus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

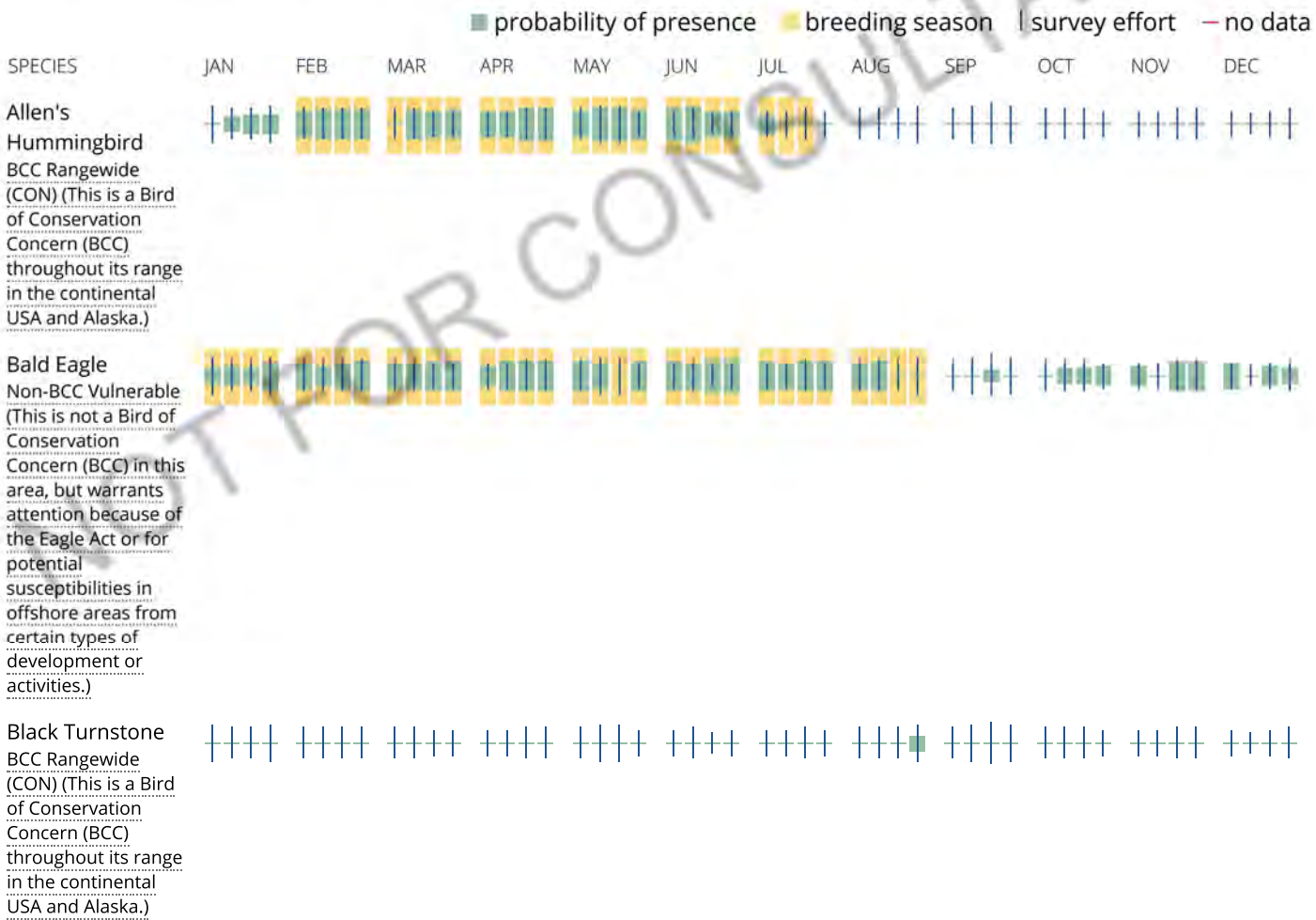
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

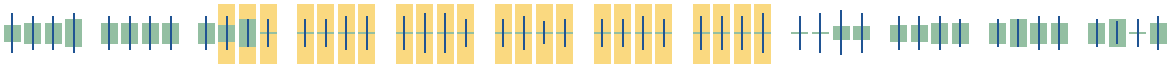
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

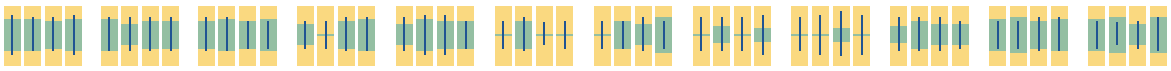
Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



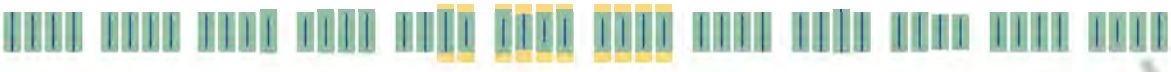
Burrowing Owl
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



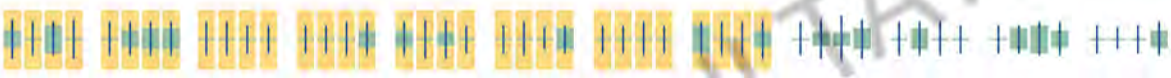
Clark's Grebe
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



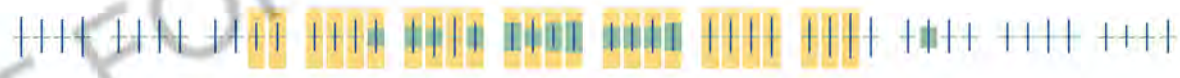
Common Yellowthroat
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



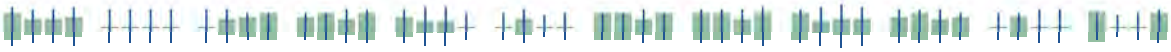
Golden Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



Lawrence's Goldfinch
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Long-billed Curlew
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Marbled Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Oak Titmouse
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Rufous Hummingbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Short-billed Dowitcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Song Sparrow
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

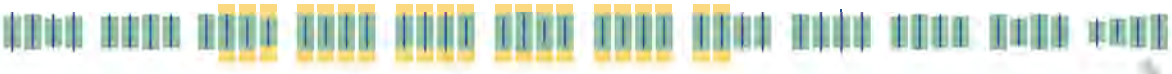
Spotted Towhee
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Tricolored Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Whimbrel
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Willet
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Wrentit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look

carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

California Native Plant Society
Rarefind Results, April 2, 2020

Scientific Name	Common Name	Rare Plant Rating	CESA	FESA	Blooming Period	Habitat	Micro Habitat	Elevation l	Elevation l	Notes
Abies bracteata	bristlecone fir	1B.3	None	None		Broadleafed upland forest, Chaparral, Lower montane coniferous forest, Riparian woodland	rocky	1555	5100	Known only from the Santa Lucia Mtns. Threatened by non-native plants. Possibly threatened by road maintenance.
Acanthomintha lanceolata	Santa Clara thorn-mint	4.2	None	None	Mar-Jun	Chaparral (often serpentinite), Cismontane woodland, Coastal scrub	rocky	1200	3935	Possibly threatened by non-native plants, grazing, and hydrological alterations.
Acanthomintha obovata ssp. cordata	heart-leaved thorn-mint	4.2	None	None	Apr-Jul	Chaparral (openings), Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland	clay	1540	5050	Possibly threatened by vehicles and grazing. See Madroño 38(4):278-286 (1991) for original description.
Acanthomintha obovata ssp. obovata	San Benito thorn-mint	4.2	None	None	Apr-Jul	Chaparral, Cismontane woodland, Valley and foothill grassland	heavy clay, alkaline, serpentinite	1500	4920	Threatened by grazing.
Agrostis blasdalei	Blasdale's bent grass	1B.2	None	None	May-Jul	Coastal bluff scrub, Coastal dunes, Coastal prairie		150	490	Historical occurrences need field surveys. Threatened by agriculture, recreation, development, and competition from non-native plants. Includes A. blasdalei var. marinensis, which is state-listed Rare.
Agrostis lacuna-vernalis	vernal pool bent grass	1B.1	None	None	Apr-May	Vernal pools (mima mounds)		145	475	Known only from Butterfly Valley and Machine Gun Flats of Ft. Ord National Monument. Possibly threatened by non-native plants, road construction, vehicles, grazing, and hydrological alterations. Similar to A. blasdalei, A. densiflora, and A. variabilis. Not in TJM 2. See Journal of the Botanical Research Institute of Texas 5(2):421-426 (2011) for original description.
Allium hickmanii	Hickman's onion	1B.2	None	None	Mar-May	Closed-cone coniferous forest, Chaparral (maritime), Coastal prairie, Coastal scrub, Valley and foothill grassland		200	655	Threatened by urbanization, grazing, non-native plants, trampling, road construction, and military activities. See Bulletin of the Torrey Botanical Club 30:483-502 (1903) for original description.
Allium howellii var. sanbenitense	San Benito onion	1B.3	None	None	Apr-May	Chaparral (openings), Valley and foothill grassland	Clay, often steep slopes	1365	4480	Possibly threatened by grazing and development. See Herbertia 12:68 (1945) for original description, and Plant Life 28:66 (1972)
Amorpha californica var. napensis	Napa false indigo	1B.2	None	None	Apr-Jul	Broadleafed upland forest (openings), Chaparral, Cismontane woodland		2000	6560	Threatened by development and habitat alteration. Potentially threatened by road maintenance. See Manual of the Flowering Plants of California, p. 556 (1925) by W.L. Jepson for original
Amsinckia douglasiana	Douglas' fiddleneck	4.2	None	None	Mar-May	Cismontane woodland, Valley and foothill grassland	Monterey shale, dry	1950	6400	Possibly threatened by agriculture.
Amsinckia lunaris	bent-flowered fiddleneck	1B.2	None	None	Mar-Jun	Coastal bluff scrub, Cismontane woodland, Valley and foothill grassland		500	1640	Many collections old; current status information needed. Does plant occur in SHA and SIS counties? Threatened by development and mining. Possibly threatened by non-native plants.
Anomobryum julaceum	slender silver moss	4.2	None	None		Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	damp rock and soil on outcrops, usually on roadcuts	1000	3280	Infrequent in CA but abundant in much of its range. See Pl. Crypt. Brit. Fasc. 4:16 (1801) for original description, and Bryothr. Eur. 25:331 (1873) for revised nomenclature.
Antirrhinum ovatum	oval-leaved snapdragon	4.2	None	None	May-Nov	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland	clay or gypsum, often alkaline	1000	3280	Appears only in favorable years. Threatened by grazing and vehicles. See Bulletin of the Torrey Botanical Club 32:213 (1905) for original description.
Arabis blepharophylla	coast rockcress	4.3	None	None	Feb-May	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub	rocky	1100	3610	Threatened by competition. Possibly threatened by overgrazing. See Rhodora 43(511):348-349 (1941) for taxonomic treatment, and Contributions from the Gray Herbarium 204:149-154 (1973)
Arctostaphylos andersonii	Anderson's manzanita	1B.2	None	None	Nov-May	Broadleafed upland forest, Chaparral, North Coast coniferous forest	openings, edges	760	2495	Confused with other species merged with it as varieties. Threatened by development and road maintenance. See Proceedings of the American Academy of Arts and Sciences 11:83 (1876) for original description, and North American Flora 29:98 (1914) for additional information.
Arctostaphylos cruzensis	Arroyo de la Cruz manzanita	1B.2	None	None	Dec-Mar	Broadleafed upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Chaparral, Coastal scrub, Valley and foothill grassland	sandy	310	1015	Possibly threatened by development and grazing. Potentially threatened by frequent wildfires and fire suppression activities. See Leaflets of Western Botany 9:218 (1962) for original description.
Arctostaphylos edmundsii	Little Sur manzanita	1B.2	None	None	Nov-Apr(May)	Coastal bluff scrub, Chaparral	sandy	105	345	Threatened by foot traffic and non-native plants. Includes A. edmundsii var. parvifolia, which is state-listed Rare. See Leaflets of Western Botany 6(10):202 (1952) for original description and 9(12):188-196 (1961) for information.
Arctostaphylos gabilanensis	Gabilan Mountains manzanita	1B.2	None	None	Jan	Chaparral, Cismontane woodland	granitic	700	2295	Not in The Jepson Manual. See Madroño (51)3: 322 (2004) for original description.
Arctostaphylos glutinosa	Schreiber's manzanita	1B.2	None	None	(Nov)Mar-Apr	Closed-cone coniferous forest, Chaparral	diatomaceous shale	685	2245	Threatened by road construction. See American Midland Naturalist 23:617 (1940) for original description.
Arctostaphylos hookeri ssp. hookeri	Hooker's manzanita	1B.2	None	None	Jan-Jun	Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub	sandy	536	1760	Threatened by agriculture, development, fire suppression, and competition with Eucalyptus.

Arctostaphylos hooveri	Hoover's manzanita	4.3	None	None	Feb-Jun	Broadleafed upland forest, Chaparral (rocky), Cismontane woodland, Lower montane coniferous forest		1035	3395	See Leaflets of Western Botany 9:152 (1961) for original description.
Arctostaphylos montereyensis	Toro manzanita	1B.2	None	None	Feb-Mar	Chaparral (maritime), Cismontane woodland, Coastal scrub	sandy	730	2395	Threatened by development. See Leaflets of Western Botany 10:88 (1964) for original description.
Arctostaphylos obispoensis	Bishop manzanita	4.3	None	None	Feb-Jun	Closed-cone coniferous forest, Chaparral, Cismontane woodland	serpentinite, rocky	1005	3295	See Leaflets of Western Botany 2:8 (1937) for original description.
Arctostaphylos ohloneana	Ohlone manzanita	1B.1	None	None	Feb-Mar	Closed-cone coniferous forest, Coastal scrub	siliceous shale	530	1740	Possibly threatened by road maintenance and vehicles. Potentially threatened by Phytophthora root rot. See Madroño 55(3):238-243 for original description.
Arctostaphylos pajaroensis	Pajaro manzanita	1B.1	None	None	Dec-Mar	Chaparral (sandy)		760	2495	Threatened by development and non-native plants. Possibly threatened by road construction. See Journal of the Elisha Mitchell Scientific Society 56:41 (1940) for original description.
Arctostaphylos pumila	sandmat manzanita	1B.2	None	None	Feb-May	Closed-cone coniferous forest, Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub	sandy, openings	205	675	Threatened by urbanization, and by military activities at Ft. Ord.
Arctostaphylos regismontana	Kings Mountain manzanita	1B.2	None	None	Dec-Apr	Broadleafed upland forest, Chaparral, North Coast coniferous forest	granitic or sandstone	730	2395	Plants north of Big Basin in SCR Co. (408B) look intermediate; identification uncertain. Threatened by urbanization. Not regenerating well. See Leaflets of Western Botany 1:77 (1933) for
Arctostaphylos silvicola	Bonny Doon manzanita	1B.2	None	None	Jan-Mar	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest	inland marine sands	600	1970	Threatened by sand mining and urbanization. See Erythea 8:101 (1938) for original description.
Arenaria paludicola	marsh sandwort	1B.1	CE	FE	May-Aug	Marshes and swamps (freshwateror brackish)	sandy, openings	170	560	Threatened by vehicles, development, erosion, hydrological alterations, and non-native plants. Individuals re-introduced in Black Lake Cyn. in 1995. Introduced population in Los Osos well established as of 2003. Experimental introduction also underway in Nipomo as of 2004. Collection from Mexico needs confirmation. See Proceedings of the California Academy of Natural Sciences 3:61 (1863) for original description.
Aristocapsa insignis	Indian Valley spineflower	1B.2	None	None	May-Sep	Cismontane woodland (sandy)		600	1970	Threatened by development. See Bulletin of the California Academy of Sciences 1:275 (1885) for original description, Great Basin Naturalist Memoirs 2:169-190 (1978) for taxonomic treatment, and Phytologia 66(2):83-88 (1989) for revised nomenclature and taxonomic treatment.
Aspidotis carlotta-halliae	Carlotta Hall's lace fern	4.2	None	None	Jan-Dec	Chaparral, Cismontane woodland	usually serpentinite	1400	4595	Fertile hybrid between A. californica and A. densa; sometimes backcrosses. See American Journal of Botany 44:738 (1957) for original description, and American Fern Journal 58:141 (1968) for revised nomenclature.
Astragalus macrodon	Salinas milk-vetch	4.3	None	None	Apr-Jul	Chaparral (openings), Cismontane woodland, Valley and foothill grassland	sandstone, shale, or serpentinite	950	3115	
Astragalus nuttallii var. nuttallii	ocean bluff milk-vetch	4.2	None	None	Jan-Nov	Coastal bluff scrub, Coastal dunes		120	395	Possibly threatened by foot traffic and road maintenance. See Leaflets of Western Botany 5(6):107 (1948) for revised nomenclature.
Astragalus tener var. tener	alkali milk-vetch	1B.2	None	None	Mar-Jun	Playas, Valley and foothill grassland (adobe clay), Vernal pools	alkaline	60	195	Threatened by development, competition from non-native plants, and habitat destruction, especially agricultural conversion. Possibly threatened by trampling. Potentially threatened by energy transmission line construction. See Proceedings of the American Academy of Arts and Sciences 6:206 (1864) for original description, and Systematic Botany 17(3):367-379 (1992) for distributional information.
Astragalus tener var. titi	coastal dunes milk-vetch	1B.1	CE	FE	Mar-May	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie (mesic)	often vernally mesic areas	50	165	Threatened by urbanization, recreational activities, and non-native plants. See Bulletin of the Torrey Botanical Club 32:195-196 (1905) for original description, and Memoirs of the New York Botanical Garden 13:1048 (1964) for taxonomic treatment.
Atriplex coronata var. coronata	crownscale	4.2	None	None	Mar-Oct	Chenopod scrub, Valley and foothill grassland, Vernal pools	alkaline, often clay	590	1935	Does plant occur in SJQ Co.? Similar to A. cordulata and A. vallicola. See Proceedings of the American Academy of Arts and Sciences 9:114 (1874) for original description.
Baccharis plummerae ssp. glabrata	San Simeon baccharis	1B.2	None	None	Jun	Coastal scrub		480	1575	Probably threatened by grazing. See Vascular Plants of San Luis Obispo County, p. 302 (1970) by R. Hoover for original description.
Benitoa occidentalis	western lessingia	4.3	None	None	May-Nov	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland	Clay or serpentinite	1070	3510	See Novon 2(3):213-214 (1992) for revised nomenclature.

Bryoria spiralifera	twisted horsehair lichen	1B.1	None	None		North Coast coniferous forest (immediate coast)	Usually on conifers	30	100	Largest known population is on the Samoa Peninsula in HUM Co. Possibly threatened by coastal development, air pollution, and climate change. Usually on Picea sitchensis, Pinus contorta var. contorta, Pseudotsuga menziesii, Abies grandis, and Tsuga heterophylla. Similar to B. pseudocapillaris and Sulcaria badia. See Bulletin of the California Lichen Society 15(1):4-6 (2008) for CALS Conservation Committee sponsorship.
Calandrinia breweri	Brewer's calandrinia	4.2	None	None	(Jan)Mar-Jun	Chaparral, Coastal scrub	sandy or loamy, disturbed sites and burns	1220	4005	Potentially threatened by development. Possibly threatened by fire suppression and road maintenance. Plant appears to be widely scattered but uncommon everywhere, and most collections are old; needs field surveys. See Proceedings of the American Academy of Arts and Sciences 11:124 (1876) for original description.
Calochortus fimbriatus	late-flowered mariposa lily	1B.3	None	None	Jun-Aug	Chaparral, Cismontane woodland, Riparian woodland	often serpentinite	1905	6250	Threatened by grazing, development, road maintenance, and fire suppression. See Proceedings of the California Academy of Sciences III 2:133 (1901) for original description.
Calochortus umbellatus	Oakland star-tulip	4.2	None	None	Mar-May	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland	often serpentinite	700	2295	Possibly threatened by recreational activities. See Proceedings of the Academy of Natural Sciences of Philadelphia 20(6):168 (1868) for original description, and Proceedings of the California Academy of Sciences III 2:123-124 (1901) for taxonomic treatment.
Calochortus uniflorus	pink star-tulip	4.2	None	None	Apr-Jun	Coastal prairie, Coastal scrub, Meadows and seeps, North Coast coniferous forest		1070	3510	Threatened by agriculture, development, and non-native plants.
Calycadenia micrantha	small-flowered calycadenia	1B.2	None	None	Jun-Sep	Chaparral, Meadows and seeps (volcanic), Valley and foothill grassland	Roadsides, rocky, talus, scree, sometimes serpentinite, sparsely vegetated areas	1500	4920	Most populations small. Surveys at type locality unsuccessful in 2005. Threatened by road maintenance, and potentially threatened by fuel breaks, development, alteration of fire regimes, non-native plants, military activities, and feral pigs. Formerly included in C. truncata ssp. microcephala, a synonym of C. truncata in TJM (1993). See SIDA 21(2):261 (2004) for original description.
Calycadenia villosa	dwarf calycadenia	1B.1	None	None	May-Oct	Chaparral, Cismontane woodland, Meadows and seeps, Valley and foothill grassland	rocky, fine soils	1350	4430	Probably consists of northern and southern unrecognized subspecies. Habitat lost to construction of San Antonio Reservoir; also threatened by urbanization, vehicles, grazing, feral pigs, alteration of fire regimes, road construction, road maintenance, and non-native plants.
Calyptridium parryi var. hesseae	Santa Cruz Mountains pussypaws	1B.1	None	None	May-Aug	Chaparral, Cismontane woodland	sandy or gravelly, openings	1530	5020	Threatened by alteration of fire regime, development, non-native plants, and mining.
Calystegia collina ssp. venusta	South Coast Range morning-glory	4.3	None	None	Apr-Jun	Chaparral, Cismontane woodland, Valley and foothill grassland	serpentinite or sedimentary	1490	4890	Can be relatively abundant and tolerant of disturbance. See Kew Bulletin 35(2):328 (1980) for original description.
Camissonia benitensis	San Benito evening-primrose	1B.1	None	FT	Apr-Jun	Chaparral, Cismontane woodland, Valley and foothill grassland	serpentinite alluvium, clay or gravelly	1280	4200	Known only from the New Idria area. Seriously threatened by vehicles. Protected in part at ACEC (BLM). See Contributions from the U.S. National Herbarium 37(5):332 (1969) for original description.
Camissoniopsis hardhamiae	Hardham's evening-primrose	1B.2	None	None	Mar-May	Chaparral, Cismontane woodland	sandy, decomposed carbonate, disturbed or burned areas	945	3100	Threatened by proposed road construction in SLO Co; also threatened by grazing, mining, military activities, non-native plants, road maintenance, and vehicles. See Contributions from the U.S. National Herbarium 37(5):301 (1969) for original description.
Campanula californica	swamp harebell	1B.2	None	None	Jun-Oct	Bogs and fens, Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Marshes and swamps (freshwater), North Coast coniferous forest	mesic	405	1330	Many occurrences have few plants. Threatened by competition, grazing, development, marsh habitat loss, logging, road maintenance, and trampling. See Proceedings of the California Academy of Sciences I 2:158 (1861) for original description.
Carex comosa	bristly sedge	2B.1	None	None	May-Sep	Coastal prairie, Marshes and swamps (lake margins), Valley and foothill grassland		625	2050	Location, rarity, and endangerment information needed; need historical quads for SFO Co. Fairly widely distributed, but apparently rarely collected. Threatened by marsh drainage and road maintenance. Endangered in ID, endangered in OR, and state-listed as Sensitive in WA.
Carex obispoensis	San Luis Obispo sedge	1B.2	None	None	Apr-Jun	Closed-cone coniferous forest, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland	often serpentinite seeps, sometimes gabbro; often on clay soils	820	2690	Threatened by grazing, non-native plants, military activities, and mining. Possibly threatened by recreational activities.
Carex saliniformis	deceiving sedge	1B.2	None	None	May-Jun(Jul)	Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps (coastal salt)	mesic	230	755	Possibly threatened by grazing. See Bulletin of the Torrey Botanical Club 36(8):477 (1909) for original description.

Carlquistia muirii	Muir's tarplant	1B.3	None	None	Jul-Aug(Oct)	Chaparral (montane), Lower montane coniferous forest, Upper montane coniferous forest	granitic	2500	8200	Possibly threatened by recreational activities. A synonym of Raillardiopsis muirii in The Jepson Manual (1993). See Botany of California 1:618 (1876) for original description, and Novon 9:462-471 (1999) for revised nomenclature
Castilleja ambigua var. ambigua	johnny-nip	4.2	None	None	Mar-Aug	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins		435	1425	Threatened by development. See C. ambigua ssp. ambigua in TJM 2. See Phytologia 90(1):63-82 (2008) for revised nomenclature.
Castilleja ambigua var. insalutata	pink Johnny-nip	1B.1	None	None	May-Aug	Coastal prairie, Coastal scrub		100	330	Threatened by development. Possibly threatened by non-native plants. See C. ambigua ssp. insalutata in TJM 2. See Manual of the Flowering Plants of California (Jepson 1925) for original taxonomy and Phytologia 90(1):63-82 (2008) for revised nomenclature.
Castilleja latifolia	Monterey Coast paintbrush	4.3	None	None	Feb-Sep	Closed-cone coniferous forest, Cismontane woodland (openings), Coastal dunes, Coastal scrub	sandy	185	605	Threatened by non-native plants and sand mining.
Caulanthus lemmonii	Lemmon's jewelflower	1B.2	None	None	Feb-May	Pinyon and juniper woodland, Valley and foothill grassland		1580	5185	Need quads for SBT Co. Threatened by development, grazing, and vehicles. See Proceedings of the American Academy of Arts and Sciences 23:261 (1888) for original description, and Aliso 4(3):503 (1960) for revised nomenclature.
Ceanothus rigidus	Monterey ceanothus	4.2	None	None	Feb-Apr(Jun)	Closed-cone coniferous forest, Chaparral, Coastal scrub	sandy	550	1805	Threatened by development. Plants identified as C. rigidus in SLO and SBA cos. are part of the C. cuneatus complex, and may belong to an undescribed taxon.
Centromadia parryi ssp. congdonii	Congdon's tarplant	1B.1	None	None	May-Oct(Nov)	Valley and foothill grassland (alkaline)		230	755	Severely threatened by development. Possibly threatened by grazing and non-native plants. A synonym of Hemizonia parryi ssp. congdonii in TJM (1993). See Botanical Gazette 22:169 (1896) for original description, and Novon 9:462-471 (1999) for revised nomenclature.
Chlorogalum purpureum var. purpureum	Santa Lucia purple amole	1B.1	None	FT	Apr-Jun	Chaparral, Cismontane woodland, Valley and foothill grassland	gravelly, clay	385	1265	Known only from Ft. Hunter Liggett and Camp Roberts. Threatened by habitat fragmentation, habitat conversion, non-native plants, foot traffic, vehicles, and military activities. Potentially threatened by grazing. See Zoe 4:159 (1893) for original description.
Chorizanthe biloba var. immemora	Hernandez spineflower	1B.2	None	None	May-Aug(Sep)	Chaparral, Cismontane woodland	Usually serpentinite, often gravelly, sometimes clay	1115	3660	Possibly threatened by trampling. See Phytologia 66(2):137-139 (1989) for original description.
Chorizanthe breweri	Brewer's spineflower	1B.3	None	None	Apr-Aug	Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub	serpentinite, rocky or gravelly	800	2625	Threatened by pipeline construction. Possibly threatened by road construction, road maintenance, and vehicles. Closely related to C. staticoides. See Proceedings of the American Academy of Arts and Sciences 12:270 (1877) for original description, and Phytologia 66(2):163-164 (1989) for taxonomic treatment.
Chorizanthe douglasii	Douglas' spineflower	4.3	None	None	Apr-Jul	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland	sandy or gravelly	1600	5250	Possibly threatened by non-native plants. See Phytologia 66(2):118-120 (1989) for taxonomic treatment.
Chorizanthe minutiflora	Fort Ord spineflower	1B.2	None	None	Apr-Jul	Chaparral (maritime), Coastal scrub	Sandy openings	150	490	Discovered in 1994 by R. Morgan. Threatened by lack of disturbance and chaparral succession. Also threatened by non-native plants. See Phytoneuron 63:1-9 (2014) for original description.
Chorizanthe palmeri	Palmer's spineflower	4.2	None	None	Apr-Aug	Chaparral, Cismontane woodland, Valley and foothill grassland	rocky, serpentinite	945	3100	Does plant occur in SBT Co.? Isolated populations show local differences. Taxonomic revision in Phytologia 66(4):295-441 (1989) indicates species occurs mainly in the Santa Lucia Mtns. of MNT and SLO counties. See Proceedings of the American Academy of Arts and Sciences 12:271 (1877) for original description, and Phytologia 66(2):135-137 (1989) for taxonomic treatment.
Chorizanthe pungens var. hartwegiana	Ben Lomond spineflower	1B.1	None	FE	Apr-Jul	Lower montane coniferous forest (maritime ponderosa pine sandhills)		610	2000	Known only from sandhill parklands in the Santa Cruz Mtns. Threatened by sand mining, development, and non-native plants. See C. pungens in The Jepson Manual. See Annals of the Missouri Botanical Garden 21:37 (1934) for original description, and Phytologia 66(2):123-126 (1989) for taxonomic treatment, Fremontia 24(4):8-11 (1996) for taxonomic discussion, and Madroño 45(2):119-127 (1998) for ecological information.

Chorizanthe pungens var. pungens	Monterey spineflower	1B.2	None	FT	Apr-Jun(Jul-Aug)	Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland	sandy	450	1475	Collected in SLO Co. only once (1842). Threatened by foot traffic, urbanization, recreational development and activities, agriculture, military activities, and non-native plants. Possibly threatened by road construction. See C. pungens in The Jepson Manual. See Phytologia 66(2):123-125 (1989) for taxonomic treatment, and Fremontia 24(4):8-11 (1996) for taxonomic discussion.
Chorizanthe rectispina	straight-awned spineflower	1B.3	None	None	Apr-Jul	Chaparral, Cismontane woodland, Coastal scrub		1035	3395	Possibly threatened by development and non-native plants. See Annals of the Missouri Botanical Garden 21:72 (1934) for original description, and Phytologia 66(2):143 (1989) for taxonomic treatment.
Chorizanthe robusta var. hartwegii	Scotts Valley spineflower	1B.1	None	FE	Apr-Jul	Meadows and seeps (sandy), Valley and foothill grassland (mudstone and Purisima outcrops)		245	805	Known only from Scotts Valley. Threatened by development, vehicles, and non-native plants. See C. robusta in TJM (1993). See Phytologia 67(5):357-360 (1989) for revised nomenclature, and Fremontia 24(4):8-11 (1996) for taxonomic discussion.
Chorizanthe robusta var. robusta	robust spineflower	1B.1	None	FE	Apr-Sep	Chaparral (maritime), Cismontane woodland (openings), Coastal dunes, Coastal scrub	sandy or gravelly	300	985	Threatened by development, recreation, mining, and non-native plants. See C. robusta in The Jepson Manual. See Phytologia 66(2):130-131 (1989) for taxonomic treatment, and Fremontia 24(4):8-11 (1996) for taxonomic discussion.
Chorizanthe ventricosa	potbellied spineflower	4.3	None	None	May-Sep	Cismontane woodland, Valley and foothill grassland	serpentinite	1235	4050	Closely related to C. palmeri. See Leaflets of Western Botany 2(2):193 (1939) for original description, and Phytologia 66(2):139-140 (1989) for taxonomic treatment.
Cirsium occidentale var. compactum	compact cobwebby thistle	1B.2	None	None	Apr-Jun	Chaparral, Coastal dunes, Coastal prairie, Coastal scrub		150	490	Threatened by grazing and insect predation, and potentially by road construction and development. Some inland plants weakly separated from var. occidentale. Compact, low-growing plants from MNT Co. (344C) are probably not var. compactum.
Cirsium scariosum var. loncholepis	La Graciosa thistle	1B.1	CT	FE	May-Aug	Cismontane woodland, Coastal dunes, Coastal scrub, Marshes and swamps (brackish), Valley and foothill grassland	mesic, sandy	220	720	Threatened by development, vehicles, groundwater pumping, and non-native plants. Possibly threatened by grazing.
Clarkia breweri	Brewer's clarkia	4.2	None	None	Apr-Jun	Chaparral, Cismontane woodland, Coastal scrub	often serpentinite	1115	3660	Threatened by cattle grazing, and potentially by reservoir construction.
Clarkia concinna ssp. automixa	Santa Clara red ribbons	4.3	None	None	(Apr)May-Jun(Jul)	Chaparral, Cismontane woodland		1500	4920	See Madroño 34(1):41-47 (1987) for original description.
Clarkia jolonensis	Jolon clarkia	1B.2	None	None	Apr-Jun	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland		660	2165	Can be confused with C. lewisii. Threatened by grazing. Possibly threatened by foot traffic and non-native plants. See Madroño 20(6):322 (1970) for original description.
Clarkia lewisii	Lewis' clarkia	4.3	None	None	May-Jul	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub		1195	3920	Possibly threatened by non-native plants. Can be confused with C. jolonensis. See Annals of the Missouri Botanical Garden 64:642 (1977) for revised taxonomy.
Clinopodium mimuloides	monkey-flower savory	4.2	None	None	Jun-Oct	Chaparral, North Coast coniferous forest	streambanks, mesic	1800	5905	See Satureja mimuloides in The Jepson Manual (1993). See Rev. Gen. Pl. 2: 515 (1891) for revised nomenclature.
Collinsia antonina	San Antonio collinsia	1B.2	None	None	Mar-May	Chaparral, Cismontane woodland		365	1200	Possibly threatened by grazing and road maintenance. As treated here, includes sspp. antonina and purpurea. A synonym of C. parryi in The Jepson Manual. See Leaflets of Western Botany 10:133-135 (1964) for original description, and Madroño 49(4):295-297 (2002) for discussion of taxonomic distinctiveness.
Collinsia multicolor	San Francisco collinsia	1B.2	None	None	(Feb)Mar-May	Closed-cone coniferous forest, Coastal scrub	sometimes serpentinite	250	820	Threatened by non-native plants, foot traffic and urbanization.
Cordylanthus rigidus ssp. littoralis	seaside bird's-beak	1B.1	CE	None	Apr-Oct	Closed-cone coniferous forest, Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub	sandy, often disturbed sites	515	1690	Threatened by development, energy projects, road widening, vehicles, and military operations. Possibly threatened by non-native plants. See Bulletin of the Torrey Botanical Club 45:399-423 (1918) for original description, and Systematic Botany Monographs 10:35-48 (1986) for taxonomic treatment.
Corethrogyne leucophylla	branching beach aster	3.2	None	None	May,Jul,Aug,Sep,Oct,Dec	Closed-cone coniferous forest, Coastal dunes		60	195	Move to CRPR 4? Potentially threatened by development. Needs taxonomic study; a synonym of Lessingia filaginifolia var. filaginifolia in TJM (1993).
Cryptantha rattanii	Rattan's cryptantha	4.3	None	None	Apr-Jul	Cismontane woodland, Riparian woodland, Valley and foothill grassland		915	3000	See C. decipiens in The Jepson Manual.

Cypripedium fasciculatum	clustered lady's-slipper	4.2	None	None	Mar-Aug	Lower montane coniferous forest, North Coast coniferous forest	usually serpentinite seeps and streambanks	2435	7990	Widely scattered, but most occurrences small. Not seen recently in SCL or SMT counties. Threatened by logging and horticultural collecting. Monitoring needed for protected populations on USFS lands to assess reproduction, which may be inadequate. Threatened in ID, candidate for state listing in OR, and state-listed as Threatened in WA. See Proceedings of the American Academy of Arts and Sciences 17:380 (1882) for original description, Lindleyana 2(1):553-57 (1987) for distributional information, and Fremontia 17(2):17-19 (1989) and The Wild Orchids of California, p. 65-68 (1995) by R. Coleman for species accounts.
Cypripedium montanum	mountain lady's-slipper	4.2	None	None	Mar-Aug	Broadleafed upland forest, Cismontane woodland, Lower montane coniferous forest, North Coast coniferous forest		2225	7300	Widely scattered, but most occurrences small. Many protected populations on USFS land not reproducing. Threatened by logging and horticultural collecting. Possibly threatened by road maintenance, vehicles, recreational activities, non-native plants, alteration of fire regimes, and grazing. On watch list in OR. See Fremontia 17(2):17-19 (1989) and The Wild Orchids of California, p. 69-72 (1995) by R. Coleman for species accounts.
Dacryophyllum falcifolium	tear drop moss	1B.3	None	None		North Coast coniferous forest	carbonate	275	900	Known in CA from Monterey and Santa Cruz Counties. See Novon 14: 70-74 (2004) for original description.
Deinandra halliana	Hall's tarplant	1B.2	None	None	(Mar)Apr-May	Chenopod scrub, Cismontane woodland, Valley and foothill grassland	clay, sometimes alkaline	950	3115	Threatened by grazing and non-native plants. Appears only in unusually wet years. A synonym of Hemizonia halliana in The Jepson Manual. See Madroño 3(1):12 (1935) for original description, and Novon 9:462-471 (1999) for revised nomenclature.
Delphinium californicum ssp. interius	Hospital Canyon larkspur	1B.2	None	None	Apr-Jun	Chaparral (openings), Cismontane woodland (mesic), Coastal scrub		1095	3595	Threatened by vehicles and recreational activities. See Leaflets of Western Botany 2:137 (1938) for original description.
Delphinium gypsophilum ssp. parviflorum	small-flowered gypsum-loving larkspur	3.2	None	None	(Mar)Apr-Jun	Cismontane woodland, Valley and foothill grassland	Rocky clay, sometimes serpentinite.	350	1150	Move to List 1B? Previously on List 4.3; apparently rarer than previously thought. May not be distinct from D. gypsophilum; a synonym of this plant in TJM 2. Needs further study. Threatened by grazing. Possibly threatened by road widening. See Brittonia 8(1):5 (1954) for original description, and Madroño 48(2):90-97 (2001) for alternate taxonomic treatment.
Delphinium hutchinsoniae	Hutchinson's larkspur	1B.2	None	None	Mar-Jun	Broadleafed upland forest, Chaparral, Coastal prairie, Coastal scrub		427	1400	Threatened by foot traffic, non-native plants, recreational activities, grazing and trampling. See Bulletin of the Torrey Botanical Club 78:379 (1951) for original description.
Delphinium recurvatum	recurved larkspur	1B.2	None	None	Mar-Jun	Chenopod scrub, Cismontane woodland, Valley and foothill grassland	alkaline	790	2590	Many occurrences historical; need current information on status. Much habitat converted to agriculture; also threatened by grazing, trampling, and non-native plants.
Delphinium umbraculorum	umbrella larkspur	1B.3	None	None	Apr-Jun	Chaparral, Cismontane woodland		1600	5250	Possibly threatened by grazing. Hybridizes with D. parryi ssp. parryi. See Brittonia 8:19 (1954) for original description, and Phytologia 67(6):490-491 (1989) for taxonomic treatment.
Elymus californicus	California bottle-brush grass	4.3	None	None	May-Aug(Nov)	Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest, Riparian woodland		470	1540	Possibly threatened by fire suppression.
Eriastrum luteum	yellow-flowered eriastrum	1B.2	None	None	May-Jun	Broadleafed upland forest, Chaparral, Cismontane woodland	sandy or gravelly	1000	3280	Threatened by vehicles and grazing. Possibly threatened by development. See Madroño 8:81 (1945) for revised nomenclature.
Eriastrum virgatum	virgate eriastrum	4.3	None	None	May-Jul	Coastal bluff scrub, Chaparral, Coastal dunes, Coastal scrub	sandy	700	2295	Threatened by competition, grazing, and development.
Ericameria fasciculata	Eastwood's goldenbush	1B.1	None	None	Jul-Oct	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub	sandy, openings	275	900	Known only from the Monterey Bay area. Threatened by development. See Bulletin of the Torrey Botanical Club 32: 215 (1905) for original description, and Madroño 57(2):77-84 (2010) for effects of fire and restoration information.
Eriogonum argillosum	clay buckwheat	4.3	None	None	Mar-Jun	Cismontane woodland (serpentinite or clay)		800	2625	See Phytologia 66(4):376 (1989) for taxonomic treatment.
Eriogonum butterworthianum	Butterworth's buckwheat	1B.3	CR	None	Jun-Jul	Chaparral (sandstone), Valley and foothill grassland	sandy	740	2430	See Leaflets of Western Botany 9(9-10):153-154 (1961) for original description, and Phytologia 66(4):328 (1989) for taxonomic treatment. Potentially threatened by foot traffic.
Eriogonum eastwoodianum	Eastwood's buckwheat	1B.3	None	None	May-Sep	Cismontane woodland, Valley and foothill grassland	sandy, shale, talus, or barren clay	1000	3280	Marginally distinct from E. temblorense and E. vestitum; only fully mature plants can be identified with certainty. Potentially threatened by road maintenance and grazing. See Leaflets of Western Botany 2: 133 (1938) for original description, and Phytologia 66(4): 374-375 (1989) and Flora North America 5: 417-418 (2005) for taxonomic treatment.

Eriogonum elegans	elegant wild buckwheat	4.3	None	None	May-Nov	Cismontane woodland, Valley and foothill grassland	Usually sandy or gravelly, often washes, sometimes roadsides	1525	5005	Similar to E. baileyi. See Pittonia 2:161-216 (1891) for original description.
Eriogonum heermannii var. occidentale	western Heermann's buckwheat	1B.2	None	None	Jul-Oct	Cismontane woodland (openings)	Often serpentinite; usually roadsides or alluvium floodplains, rarely clay or shale slopes	795	2610	Previously CRPR 4.2; rarer than originally thought. Possibly threatened by hydrological alterations caused by past vehicle use. See Leaflets of Western Botany 1(4):30 (1932) for original description, and Phytologia 66(4):314-316 (1989) for taxonomic treatment.
Eriogonum nortonii	Pinnacles buckwheat	1B.3	None	None	(Apr)May-Aug(Sep)	Chaparral, Valley and foothill grassland	sandy, often on recent burns	975	3200	See Phytologia 66(4):376 (1989) for taxonomic treatment.
Eriogonum nudum var. decurrens	Ben Lomond buckwheat	1B.1	None	None	Jun-Oct	Chaparral, Cismontane woodland, Lower montane coniferous forest (maritime ponderosa pine sandhills)	sandy	800	2625	Threatened by development and sand mining. See Phytologia 66(4):329-333 (1989) for taxonomic treatment.
Eriogonum nudum var. indictum	protruding buckwheat	4.2	None	None	(Apr)May-Oct(Dec)	Chaparral, Chenopod scrub, Cismontane woodland	clay, serpentinite	1463	4800	Not always distinct from var. auriculatum in FRE and SBT counties. See Flora of California 1(4):421 (1914) by W.L. Jepson for original description, and Phytologia 66(4):329-332 (1989) for taxonomic treatment.
Eriogonum temblorense	Temblor buckwheat	1B.2	None	None	(Apr)May-Sep	Valley and foothill grassland (clay or sandstone)		1000	3280	Marginally distinct from E. eastwoodianum; needs study. Threatened by energy development. See Leaflets of Western Botany 10:45 (1963) for original description, and Phytologia 66(4):375 (1989) for taxonomic treatment.
Eriogonum umbellatum var. bahiiforme	bay buckwheat	4.2	None	None	Jul-Sep	Cismontane woodland, Lower montane coniferous forest	rocky, often serpentinite	2200	7220	See Phytologia 66(4): 341-346 (1989) for taxonomic treatment.
Eriophyllum jepsonii	Jepson's woolly sunflower	4.3	None	None	Apr-Jun	Chaparral, Cismontane woodland, Coastal scrub	sometimes serpentinite	1025	3365	
Erysimum ammophilum	sand-loving wallflower	1B.2	None	None	Feb-Jun	Chaparral (maritime), Coastal dunes, Coastal scrub	sandy, openings	60	195	Need quads for SRO Isl. Occurrences from SDG Co. previously included in this species are E. capitatum ssp. capitatum. Threatened by development.
Erysimum franciscanum	San Francisco wallflower	4.2	None	None	Mar-Jun	Chaparral, Coastal dunes, Coastal scrub, Valley and foothill grassland	often serpentinite or granitic, sometimes roadsides	550	1805	Rare and declining in SCR Co. Possibly threatened by recreational activities and non-native plants. Includes E. franciscanum var. crassifolium. Inland plants approach E. capitatum. See Aliso 4(1):118-121 (1958) for original description.
Erysimum menziesii	Menzies? wallflower	1B.1	CE	FE	Mar-Sep	Coastal dunes		35	115	Plants treated as sspp. eurekense (known only from the Humboldt Bay area; threatened by development, vehicles, and non-native plants), menziesii (nearly extirpated on the Monterey Peninsula; seriously threatened by development, vehicles, deer browsing, and non-native plants), and yadonii (known only from near Marina on Monterey Bay; threatened by development and sand mining) are not validly published; see these names in TJM (1993). See Zoe 5(6-8):103 (1901) for original description.
Erysimum teretifolium	Santa Cruz wallflower	1B.1	CE	FE	Mar-Jul	Chaparral, Lower montane coniferous forest	inland marine sands	610	2000	Seriously threatened by development, sand mining, and vandalism. See Leaflets of Western Botany 2(5):73 (1938) for original description.
Erythranthe hardhamiae	Santa Lucia monkeyflower	1B.1	None	None	Mar-May	Chaparral (openings)	sandy, sandstone outcrops, sometimes serpentinite	730	2395	Many occurrences historical; needs field surveys. Threatened by development. Possibly threatened by grazing, road maintenance, and non-native plants. Previously identified as E. palmeri. Similar to E. androsacea. Not in TJM 2. See Aliso 30(1):49-68 (2012) for original description.
Eschscholzia hypecoides	San Benito poppy	4.3	None	None	Mar-Jun	Chaparral, Cismontane woodland, Valley and foothill grassland	serpentinite clay	1500	4920	
Extriplex joaquinana	San Joaquin spearscale	1B.2	None	None	Apr-Oct	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland	alkaline	835	2740	Many occurrences extirpated. Need historical quads for TUL Co. Need quads for MNT Co. Report from SLO Co. (247D) needs verification. Threatened by grazing, agriculture, development, and non-native plants. See Proceedings of the American Academy of Arts and Sciences 9:108 (1874) for original description, Proceedings of the Biological Society of Washington 17:99 (1904) for alternative nomenclature, and Systematic Botany 35(4):839-857 (2010) for revised nomenclature.
Fissidens pauperculus	minute pocket moss	1B.2	None	None		North Coast coniferous forest (damp coastal soil)		1024	3360	See Erythea 2:97-101 (1894) for original description.
Fritillaria agrestis	stinkbells	4.2	None	None	Mar-Jun	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland	Clay, sometimes serpentinite	1555	5100	Most populations small. Threatened by development, grazing, and vehicles. Possibly threatened by non-native plants.
Fritillaria falcata	talus fritillary	1B.2	None	None	Mar-May	Chaparral, Cismontane woodland, Lower montane coniferous forest	serpentinite, often talus	1525	5005	Threatened by vehicles. See Flora of California 1(6):309 (1922) by W.L. Jepson for original description, and Madroño 7(5):133-159 (1944) for revised nomenclature.

Fritillaria liliacea	fragrant fritillary	1B.2	None	None	Feb-Apr	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland	Often serpentinite	410	1345	Threatened by grazing, agriculture, urbanization, and non-native plants. Possibly threatened by recreational activities and foot traffic. Quite variable.
Fritillaria ojaiensis	Ojai fritillary	1B.2	None	None	Feb-May	Broadleafed upland forest (mesic), Chaparral, Cismontane woodland, Lower montane coniferous forest	rocky	998	3275	Possibly threatened by road maintenance and recreational activities. Closely related to F. affinis.
Fritillaria viridea	San Benito fritillary	1B.2	None	None	Mar-May	Chaparral, Cismontane woodland	Serpentinite slopes; sometimes streambanks, sometimes rocky, sometimes roadsides	1525	5005	Needs study; plants from MNT Co. may be F. ojaiensis. Threatened by vehicles and expansion of mining. See Proceedings of the California Academy of Sciences 2:9 (1863) for original description.
Galium andrewsii ssp. gatense	phlox-leaf serpentine bedstraw	4.2	None	None	Apr-Jul	Chaparral, Cismontane woodland, Lower montane coniferous forest	serpentinite, rocky	1450	4755	See Brittonia 10:186 (1958) for original description, and Flora of California 4(2):35-36 (1979) by L. Dempster for taxonomic treatment.
Galium californicum ssp. luciense	Cone Peak bedstraw	1B.3	None	None	Mar-Sep	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest	Often rocky, rarely serpentinite	1525	5005	See Madroño 18(4):107 (1965) for original description, and Flora of California 4(2):39-40 (1979) by L. Dempster for taxonomic treatment.
Galium clementis	Santa Lucia bedstraw	1B.3	None	None	(Apr)May-Jul	Lower montane coniferous forest, Upper montane coniferous forest	granitic or serpentinite, rocky	1780	5840	See Leaflets of Western Botany 1:56 (1933) for original description, and Flora of California 4(2):38 (1979) by L. Dempster for taxonomic treatment.
Galium cliftonsmithii	Santa Barbara bedstraw	4.3	None	None	May-Jul	Cismontane woodland		1220	4005	See Brittonia 10:183 (1958) for original description, and Flora of California 4(2):44 (1979) by L. Dempster for taxonomic treatment.
Galium hardhamiae	Hardham's bedstraw	1B.3	None	None	Apr-Oct	Closed-cone coniferous forest, Chaparral	serpentinite	975	3200	See Madroño 16(5):166 (1962) for original description, and Flora of California 4(2):35 (1979) by L. Dempster for taxonomic treatment.
Gilia tenuiflora ssp. amplifaucalis	trumpet-throated gilia	4.3	None	None	Mar-Apr	Cismontane woodland, Valley and foothill grassland	sandy	900	2955	See Aliso 3(3):246 (1956) for original description.
Gilia tenuiflora ssp. arenaria	Monterey gilia	1B.2	CT	FE	Apr-Jun	Chaparral (maritime), Cismontane woodland, Coastal dunes, Coastal scrub	sandy, openings	45	150	Seriously threatened by development, sand mining, vehicles, recreational activities, foot traffic, and non-native plants. Intergrades with ssp. tenuiflora near the Salinas River mouth. See Aliso 3(3):246 (1956) for revised nomenclature.
Githopsis tenella	delicate bluecup	1B.3	None	None	Apr-Jun	Chaparral, Cismontane woodland	mesic, serpentinite	1900	6235	Possibly also in the Cholame Hills, MNT Co.; need confirmation. Threatened by foot traffic and recreational activities. See Systematic Botany 8(4):465 (1983) for original description.
Grimmia torenii	Toren's grimmia	1B.3	None	None		Chaparral, Cismontane woodland, Lower montane coniferous forest	Openings, rocky, boulder and rock walls, carbonate, volcanic	1160	3805	Similar to G. ovalis and G. tergestina. See The Bryologist 111(3):463-475 (2008) for original description.
Grimmia vaginulata	vaginulate grimmia	1B.1	None	None		Chaparral (openings)	Rocky, boulder and rock walls, carbonate	685	2245	Potentially threatened by fire. Similar to G. anodon and G. plagiopodia. See Madroño 58(3):190-198 (2011) for original description.
Grindelia hirsutula var. maritima	San Francisco gumplant	3.2	None	None	Jun-Sep	Coastal bluff scrub, Coastal scrub, Valley and foothill grassland	sandy or serpentinite	400	1310	Previously on List 1B. Plants from MNT and SCR counties need verification. Threatened by coastal development and non-native plants. Can be difficult to identify; many herbarium specimens need to be checked for correct identification. May be a hybrid between G. hirsutula var. hirsutula and G. stricta var. platyphylla or G. stricta var. angustifolia; needs further study. Not in TJM 2. See Pittonia 2:289 (1892) for original description and Novon 2(3):215-217 (1992) for revised nomenclature.
Hesperevax caulescens	hogwallow starfish	4.2	None	None	Mar-Jun	Valley and foothill grassland (mesic, clay), Vernal pools (shallow)	sometimes alkaline	505	1655	Threatened by development and agriculture. Possibly threatened by overgrazing. See Proceedings of the American Academy of Arts and Sciences 7:356 (1868) for revised nomenclature, and Systematic Botany 17(2):293-310 (1992) for taxonomic treatment.
Hesperevax sparsiflora var. brevifolia	short-leaved evax	1B.2	None	None	Mar-Jun	Coastal bluff scrub (sandy), Coastal dunes, Coastal prairie		215	705	Threatened by development, competition with non-native plants, foot traffic, and recreational activities. Potentially threatened by trail construction. May intergrade with var. sparsiflora in the San Francisco Bay area. On review list in OR. See Synoptical Flora of North America 1(2):229 (1884) for original description, and Systematic Botany 17:293-310 (1992) for revised nomenclature.

Hesperocyparis abramsiana var. abramsiana	Santa Cruz cypress	1B.2	CE	FT		Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest	sandstone or granitic	800	2625	Known only from the Santa Cruz Mtns. Threatened by development, agriculture, alteration of fire regimes, and introgression from planted H. macrocarpa and H glabra. See Cupressus abramsiana in The Jepson Manual (1993); USFWS also uses this name. See Aliso 1:215-222 (1948) for original description, Madroño 2(4):189-194 (1952) for distributional information, and Phytologia 91(1):160-185 and 91(2):287-299 (2009) for taxonomic treatments.
Hesperocyparis goveniana	Gowen cypress	1B.2	None	FT		Closed-cone coniferous forest, Chaparral (maritime)		300	985	Threatened by development and altered fire regimes, and possibly by non-native plants.
Hesperocyparis macrocarpa	Monterey cypress	1B.2	None	None		Closed-cone coniferous forest		30	100	
Hoita strobilina	Loma Prieta hoita	1B.1	None	None	May-Jul(Aug-Oct)	Chaparral, Cismontane woodland, Riparian woodland	usually serpentinite, mesic	860	2820	Threatened by urbanization. Possibly threatened by feral pigs and foot traffic. See North American Flora 24:11 (1919) for revised nomenclature, and Memoirs of the New York Botanical Garden 61:1-114 (1990) for taxonomic treatment.
Holocarpha macradenia	Santa Cruz tarplant	1B.1	CE	FT	Jun-Oct	Coastal prairie, Coastal scrub, Valley and foothill grassland	often clay, sandy	220	720	All extant CCA Co. occurrences (465B, 466A) are introduced; nearly half have failed. Last remaining natural population in the S.F. Bay Area extirpated by development in 1993. Seriously threatened by urbanization, agriculture, non-native plants, and lack of appropriate ecological disturbance. See Fremontia 5(4):15-16 (1978) for species account.
Horkelia cuneata var. sericea	Kellogg's horkelia	1B.1	None	None	Apr-Sep	Closed-cone coniferous forest, Chaparral (maritime), Coastal dunes, Coastal scrub	sandy or gravelly, openings	200	655	Threatened by coastal development. Historical occurrences need field surveys. Occurrence from the Crocker Hills probably last remaining location in S.F. Bay; remaining plants less distinct from ssp. cuneata than those formerly occurring near San Francisco. See Novon 17(3):315-325 (2007) for revised nomenclature.
Horkelia marinensis	Point Reyes horkelia	1B.2	None	None	May-Sep	Coastal dunes, Coastal prairie, Coastal scrub	sandy	755	2475	Populations from near Ft. Bragg, MEN Co. may be varietally distinct. Historical occurrences need field surveys. Threatened by non-native plants and residential development. Possibly threatened by road maintenance and foot traffic. See Systematic Botany 18(1):137-144 (1993) for distributional information.
Horkelia yadonii	Santa Lucia horkelia	4.2	None	None	Apr-Jul	Broadleafed upland forest, Chaparral, Cismontane woodland, Meadows and seeps, Riparian woodland	granitic, sandy	1900	6235	Possibly threatened by vehicles and recreational activities. Confused with H. cuneata ssp. sericea, H. rydbergii, and H. tenuiloba. See Systematic Botany 18(1):139 (1993) for original description.
Hosackia gracilis	harlequin lotus	4.2	None	None	Mar-Jul	Broadleafed upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Cismontane woodland, Coastal prairie, Coastal scrub, Meadows and seeps, Marshes and swamps, North Coast coniferous forest, Valley and foothill grassland	wetlands, roadsides	700	2295	Designated as Endangered in Canada. Threatened by development, grazing, feral pigs, habitat alteration, and competition. Thought to be a larval food plant of the Federally Endangered lotis blue butterfly (Lycaeides argyrognomon ssp. lotis).
Iris longipetala	coast iris	4.2	None	None	Mar-May	Coastal prairie, Lower montane coniferous forest, Meadows and seeps	mesic	600	1970	Many collections old; need field surveys. May hybridize with Iris missouriensis. Threatened by development and trampling.
Juncus luciensis	Santa Lucia dwarf rush	1B.2	None	None	Apr-Jul	Chaparral, Great Basin scrub, Lower montane coniferous forest, Meadows and seeps, Vernal pools		2040	6695	Potentially threatened by development.
Lagophylla diabolensis	Diablo Range hare-leaf	1B.2	None	None	Apr-Sep	Cismontane woodland, Valley and foothill grassland	Clay.	885	2905	Known only from the Diablo Range. Many occurrences historical; need field surveys. Possibly threatened by development and non-native plants. Formerly included within L. dichotoma, but genetic data show that L. diabolensis is actually more closely related to L. ramosissima. See Madroño 60(3):249-254 (2013) for original description.
Lagophylla dichotoma	forked hare-leaf	1B.1	None	None	Apr-May	Cismontane woodland, Valley and foothill grassland	Sometimes clay	335	1100	Threatened by vehicles and non-native plants. Many occurrences historical; need field surveys. Formerly included plants from the Diablo Range, which are now treated as L. diabolensis. Similar to L. minor. See Plantas Hartwegianas pp. 317-318 (1849) by G. Bentham for original description.

Lasthenia californica ssp. macrantha	perennial goldfields	1B.2	None	None	Jan-Nov	Coastal bluff scrub, Coastal dunes, Coastal scrub		520	1705	Threatened by competition from non-native plants and recreational activities. Potentially threatened by trail construction and foot traffic. See Report of the Pacific Railroad Expedition 4:106 (1857) for original description, University of California Publications in Botany 40:59-62 (1966) for taxonomic treatment, and Madrono 48(3): 208 (2001) for revised nomenclature.
Lasthenia conjugens	Contra Costa goldfields	1B.1	None	FE	Mar-Jun	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools	mesic	470	1540	Many historical occurrences extirpated by development and agriculture. Currently threatened by development, habitat alteration, hydrological alterations, overgrazing, and non-native plants. See Pittonia 1:221 (1888) for original description, and Madroño 50(2):83-93 (2003) for ecological information.
Lasthenia ferrisiae	Ferris' goldfields	4.2	None	None	Feb-May	Vernal pools (alkaline, clay)		700	2295	Threatened by development and agriculture. Possibly threatened by vehicles and foot traffic. See University of California Publications in Botany 40:74 (1966) for original description.
Lasthenia leptalea	Salinas Valley goldfields	4.3	None	None	Feb-Apr	Cismontane woodland, Valley and foothill grassland		1065	3495	See Proceedings of the American Academy of Arts and Sciences 6:546 (1865) for original description, University of California Publications in Botany 40:63-66 (1969) for revised nomenclature, and Madroño 48(3):205-210 (2001) for taxonomic treatment.
Layia carnosa	beach layia	1B.1	CE	FE	Mar-Jul	Coastal dunes, Coastal scrub (sandy)		60	195	Threatened by coastal development, foot traffic, vehicles, and non-native plants.
Layia heterotricha	pale-yellow layia	1B.1	None	None	Mar-Jun	Cismontane woodland, Coastal scrub, Pinyon and juniper woodland, Valley and foothill grassland	alkaline or clay	1705	5595	Threatened by agricultural conversion and previous construction of San Antonio Reservoir, grazing, non-native plants, and vehicles. Potentially threatened by road maintenance and wind energy development.
Legenere limosa	legenere	1B.1	None	None	Apr-Jun	Vernal pools		880	2885	Many historical occurrences extirpated. Threatened by grazing, road widening, non-native plants, and development. See Pittonia 2:81 (1890) for original description, North American Flora 32(1):13-14 (1943) for revised nomenclature, and Wasmann Journal of Biology 33(1-2):91 (1975) for distributional information.
Leptosiphon ambiguus	serpentine leptosiphon	4.2	None	None	Mar-Jun	Cismontane woodland, Coastal scrub, Valley and foothill grassland	usually serpentinite	1130	3705	Threatened by non-native plants and habitat alteration. To be expected in other adjacent counties. A synonym of Linanthus ambiguus in TJM (1990). See Botanical Gazette 11:339 (1886) for original description, and Aliso 19(1):55-91 (2000) for revised nomenclature.
Leptosiphon grandiflorus	large-flowered leptosiphon	4.2	None	None	Apr-Aug	Coastal bluff scrub, Closed-cone coniferous forest, Cismontane woodland, Coastal dunes, Coastal prairie, Coastal scrub, Valley and foothill grassland	usually sandy	1220	4005	Many historical occurrences extirpated by development; need status information. A synonym of Linanthus grandiflorus in The Jepson Manual. See Pittonia 2:260 (1892) for revised nomenclature, and Aliso 19(1):55-91 (2000) for taxonomic treatment.
Lessingia hololeuca	woolly-headed lessingia	3	None	None	Jun-Oct	Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland	clay, serpentinite	305	1000	Move to List 4? Need location, rarity, and endangerment information. Probably more widespread in the southern Sacramento Valley, southern North Coast Ranges, and northern S.F. Bay. Possibly threatened by grazing, and non-native plants. See Flora Franciscana, p. 377 (1897) by E. Greene for original description, and University of California Publications in Botany 16:40 (1929) for taxonomic treatment.
Lessingia tenuis	spring lessingia	4.3	None	None	May-Jul	Chaparral, Cismontane woodland, Lower montane coniferous forest	openings	2150	7055	Possibly threatened by feral pigs, grazing, and alteration of fire regimes.
Lilium rubescens	redwood lily	4.2	None	None	Apr-Aug(Sep)	Broadleafed upland forest, Chaparral, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest	Sometimes serpentinite, sometimes roadsides	1910	6265	Increasingly rare in southern portion of range. Threatened by urbanization, horticultural collecting, logging, road construction and maintenance, non-native plants, and grazing. See Proceedings of the American Academy of Arts and Sciences 14:256 (1879) for original description.
Lomatium parvifolium	small-leaved lomatium	4.2	None	None	Jan-Jun	Closed-cone coniferous forest, Chaparral, Coastal scrub, Riparian woodland	serpentinite	700	2295	Rare in SCR Co.
Lupinus albifrons var. abramsii	Abrams' lupine	3.2	None	None	Apr-Jun	Broadleafed upland forest, Chaparral, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland	Sometimes serpentinite	2000	6560	Move to List 1B? Possibly more widespread, but only specimens from 320B match the type; plants from SLO Co. are probably var. albifrons.
Lupinus cervinus	Santa Lucia lupine	4.3	None	None	May-Jun	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest		1425	4675	

Lupinus tidestromii	Tidestrom's lupine	1B.1	CE	FE	Apr-Jun	Coastal dunes		100	330	Seriously threatened by coastal development, trampling, hybridization with L. chamissonis, and non-native plants; properly timed grazing may be beneficial. Possibly threatened by seed predation. Includes L. tidestromii var. layneae. Only MNT Co. plants are state-listed Endangered as var. tidestromii. See Erythea 3:17 (1895) for original description.
Madia radiata	showy golden madia	1B.1	None	None	Mar-May	Cismontane woodland, Valley and foothill grassland		1215	3985	Occurrences scattered. Most collections old; field work needed. Threatened by grazing and non-native plants.
Malacothamnus abbottii	Abbott's bush-mallow	1B.1	None	None	May-Oct	Riparian scrub		490	1610	Rediscovered in 1990 by D. Mitchell near Sargent Creek. Threatened by housing development, grazing, energy development, and road construction. See Leaflets of Western Botany 1:215 (1936) for original description.
Malacothamnus aboriginum	Indian Valley bush-mallow	1B.2	None	None	Apr-Oct	Chaparral, Cismontane woodland	Rocky, granitic, often in burned areas	1700	5575	Appears in abundance after fires. Threatened by grazing, vehicles, road maintenance. M. densiflorus specimens from SDG Co. have been confused with this species. See Synoptical Flora of North America 1(1):311 (1897) for original description.
Malacothamnus arcuatus	arcuate bush-mallow	1B.2	None	None	Apr-Sep	Chaparral, Cismontane woodland		355	1165	Threatened by alteration of fire regimes. A synonym of M. fasciculatus in The Jepson Manual. See Manual of the Botany of the Region of San Francisco Bay, p. 66 (1894) by E. Greene for original description, Leaflets of Botanical Observation and Criticism 1:208 (1906) for revised nomenclature, and Leaflets of Western Botany 6(6):132-133 (1951) for taxonomic treatment.
Malacothamnus davidsonii	Davidson's bush-mallow	1B.2	None	None	Jun-Jan	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland		1140	3740	Threatened by urbanization in LAX Co. Potentially threatened by development, maintenance activities and erosion. Intergrades with M. fasciculatus; see Madroño 46(3):142-152 (1999) for information.
Malacothamnus jonesii	Jones' bush-mallow	4.3	None	None	(Mar)Apr-Oct	Chaparral, Cismontane woodland		1075	3525	Includes M. niveus. Treated differently here than in TJM (1993) and TJM 2; which include both M. gracilis and M. niveus as synonyms. See Bulletin of the Southern California Academy of Sciences 24(3):88 (1925) for original description and Leaflets of Western Botany 6(6):135 (1951) for taxonomic treatment.
Malacothamnus palmeri var. involucratus	Carmel Valley bush-mallow	1B.2	None	None	Apr-Oct	Chaparral, Cismontane woodland, Coastal scrub		1100	3610	Threatened by development in MNT Co. A synonym of M. palmeri in TJM (1993). See Synoptical Flora of North America 1(1):310 (1897) for original description and Leaflets of Western Botany 6(6):121 (1951) for revised nomenclature.
Malacothamnus palmeri var. lucianus	Arroyo Seco bush-mallow	1B.2	None	None	(Apr)May-Aug	Chaparral, Cismontane woodland, Meadows and seeps		915	3000	Threatened by road maintenance. A synonym of M. palmeri in TJM (1993) and of M. palmeri var. palmeri in TJM 2; observations by field botanists suggest that recognition is warranted. See Leaflets of Western Botany 7(12):289-290 (1955) for original description.
Malacothamnus palmeri var. palmeri	Santa Lucia bush-mallow	1B.2	None	None	May-Jul	Chaparral (rocky)		360	1180	MNT Co. plants need confirmation. Threatened by alteration of fire regimes. A synonym of M. palmeri in TJM (1993). See Proceedings of the American Academy of Arts and Sciences 12:250 (1877) for original description and Leaflets of Botanical Observation and Criticism 1(15): 208 (1906) for taxonomic treatment.
Malacothrix phaeocarpa	dusky-fruited malacothrix	4.3	None	None	Apr-Jun	Closed-cone coniferous forest, Chaparral	openings, burned or disturbed areas	1400	4595	Similar to M. floccifera. See Madroño 40(2):101 (1993) for original description.
Malacothrix saxatilis var. arachnoidea	Carmel Valley malacothrix	1B.2	None	None	(Mar)Jun-Dec	Chaparral (rocky), Coastal scrub		1036	3400	Threatened by road maintenance. See Bulletin of the Torrey Botanical Club 36:605 (1909) for original description, and American Midland Naturalist 58(2):509 (1957) for revised nomenclature.
Meconella oregana	Oregon meconella	1B.1	None	None	Mar-Apr	Coastal prairie, Coastal scrub		620	2035	Threatened by alteration of fire regimes. Candidate for state listing in OR, and state-listed as Threatened in WA. Not in The Jepson Manual.
Micropus amphibolus	Mt. Diablo cottonweed	3.2	None	None	Mar-May	Broadleafed upland forest, Chaparral, Cismontane woodland, Valley and foothill grassland	rocky	825	2705	Move to List 4? Can be confused with M. californicus. Many occurrences old; need current status information. Potentially threatened by vineyard development. See Proceedings of the American Academy of Arts and Sciences 17:214 (1882) for original description.
Microseris paludosa	marsh microseris	1B.2	None	None	Apr-Jun(Jul)	Closed-cone coniferous forest, Cismontane woodland, Coastal scrub, Valley and foothill grassland		355	1165	Need quads for MEN Co. Similar to M. laciniata spp. leptosepala. See Bulletin of the California Academy of Sciences 2(5):52 (1886) for original description, and Leaflets of Western Botany 5:108 (1948) for revised nomenclature.

Mielichhoferia elongata	elongate copper moss	4.3	None	None		Broadleafed upland forest, Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Meadows and seeps, Subalpine coniferous forest	Metamorphic rock, usually acidic, usually vernally mesic, often roadsides, sometimes carbonate	1960	6430	Previously CRPR 2B.2; more common than originally known. Potentially threatened in PLU Co. by road maintenance. Commonly called copper mosses - distinctive glossy blue-green coloration aids identification. See Bryologia Germanica 2(2):186 (1831) for original description.
Mimulus rattanii ssp. decurtatus	Santa Cruz County monkeyflower	4.2	None	None	May-Jul	Chaparral, Lower montane coniferous forest	margins, gravelly	500	1640	Field work needed. Threatened by sand mining. A synonym of M. rattanii in The Jepson Manual (1993) and TJM 2.
Mimulus subsecundus	one-sided monkeyflower	4.3	None	None	May-Jul	Chaparral, Lower montane coniferous forest		915	3000	A synonym of M. fremontii in TJM (1993). See Annals of the Missouri Botanical Garden 11(2-3):285-286 (1924) for taxonomic treatment.
Monardella antonina ssp. antonina	San Antonio Hills monardella	3	None	None	Jun-Aug	Chaparral, Cismontane woodland		1000	3280	Move to List 4? Possibly threatened by road maintenance, pipeline construction, and feral pigs. Easily confused with M. villosa ssp. villosa, which may be the taxon occurring in ALA, CCA, SBT, and SCL counties; needs clarification.
Monardella antonina ssp. benitensis	San Benito monardella	4.3	None	None	Jun-Jul	Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland	Usually serpentinite	1570	5150	See Leaflets of Western Botany 8(3):55 (1956) for original description, and Phytologia 72(1):9-16 (1992) for revised nomenclature.
Monardella palmeri	Palmer's monardella	1B.2	None	None	Jun-Aug	Chaparral, Cismontane woodland	serpentinite	800	2625	Possibly threatened by development and trail maintenance.
Monardella sinuata ssp. nigrescens	northern curly-leaved monardella	1B.2	None	None	(Apr)May-Jul(Aug-Sep)	Chaparral (SCR Co.), Coastal dunes, Coastal scrub, Lower montane coniferous forest (SCR Co., ponderosa pine sandhills)	Sandy.	300	985	Threatened by non-native plants. Possibly threatened by development, habitat loss, habitat fragmentation, and climate shifts. Previously included in M. undulata. Similar to M. breweri and M. douglasii. See Novon 19(3):315-345 (2009) for original description.
Monolopia gracilens	woodland woolythreads	1B.2	None	None	(Feb)Mar-Jul	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland	Serpentine	1200	3935	Threatened by development, road maintenance, and road widening. Possibly threatened by logging.
Mucronea californica	California spineflower	4.2	None	None	Mar-Jul(Aug)	Chaparral, Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland	sandy	1400	4595	Rare in southern California. Many herbarium records old. Threatened by aggregate mining, vehicles, flood control modification, urbanization, and water percolation projects. Possibly threatened by non-native plants. Includes Chorizanthe californica var. suskdorfii. See Phytologia 66(3):203-205 (1989) for revised nomenclature.
Navarretia nigelliformis ssp. nigelliformis	adobe navarretia	4.2	None	None	Apr-Jun	Valley and foothill grassland vernally mesic, Vernal pools sometimes	clay, sometimes serpentinite	1000	3280	Possibly threatened by grazing. See Leaflets West. Bot. 2: 136 (1938) for original subspecies description.
Navarretia nigelliformis ssp. radians	shining navarretia	1B.2	None	None	(Mar)Apr-Jul	Cismontane woodland, Valley and foothill grassland, Vernal pools	Sometimes clay	1000	3280	Threatened by development. Possibly threatened by grazing and competition from non-native plants. Similar to N. heterandra. See Leaflets of Western Botany 2(8):136 (1938) for original description, and Novon 3(4):331-340 (1993) for revised nomenclature.
Navarretia prostrata	prostrate vernal pool navarretia	1B.1	None	None	Apr-Jul	Coastal scrub, Meadows and seeps, Valley and foothill grassland (alkaline), Vernal pools	Mesic	1210	3970	Threatened by vehicles, road maintenance, and recreational activities. See Proceedings of the American Academy of Arts and Sciences 17:223 (1881) for original description, and Pittonia 1:130 (1887) for revised nomenclature.
Nemacladus secundiflorus var. secundiflorus	large-flowered nemacladus	4.3	None	None	Apr-Jun	Chaparral, Valley and foothill grassland	gravelly, openings	2000	6560	Potentially threatened by wind energy development. See J. Bot. Res. Inst. Texas 2(1):397-400 (2008) for revised nomenclature.
Ophioglossum californicum	California adder's-tongue	4.2	None	None	(Dec)Jan-Jun	Chaparral, Valley and foothill grassland, Vernal pools (margins)	mesic	525	1720	
Orthotrichum kellmanii	Kellman's bristle moss	1B.2	None	None	Jan-Feb	Chaparral, Cismontane woodland	sandstone, carbonate	685	2245	See The Bryologist 107(2): 210 (2004) for original description.
Pedicularis dudleyi	Dudley's lousewort	1B.2	CR	None	Apr-Jun	Chaparral (maritime), Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland		900	2955	Threatened by foot traffic, trail maintenance, and erosion. Potentially threatened by development. Plants from Arroyo de la Cruz (SLO Co.) are somewhat different and warrant further study. See Botanical Gazette 41:316-317 (1906) for original description.
Penstemon rattanii var. kleei	Santa Cruz Mountains beardtongue	1B.2	None	None	May-Jun	Chaparral, Lower montane coniferous forest, North Coast coniferous forest		1100	3610	
Pentachaeta bellidiflora	white-rayed pentachaeta	1B.1	CE	FE	Mar-May	Cismontane woodland, Valley and foothill grassland (often serpentinite)		620	2035	once attributed to this species is actually P. exilis var. aeolica. See Bulletin of the California Academy of Sciences 1:86 (1885) for original description, and University of California Publications in
Pentachaeta exilis ssp. aeolica	San Benito pentachaeta	1B.2	None	None	Mar-May	Cismontane woodland, Valley and foothill grassland		855	2805	foot traffic. Possibly threatened by non-native plants. See University of California Publications in Botany 65:1-41 (1973) for
Pentachaeta fragilis	fragile pentachaeta	4.3	None	None	Mar-Jun	Chaparral, Lower montane coniferous forest (sandy)	often openings	2100	6890	of California Publications in Botany 6(7):170 (1915) for original description and 65:38 (1973) for taxonomic treatment.

Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	4.2	None	None	Jun-Oct	Broadleafed upland forest, Chaparral, Coastal prairie, Valley and foothill grassland, Vernal pools	vernally mesic	610	2000	occurrences uncertain. Can be relatively common locally, especially in northern counties. Is plant extant in SMT Co.? Threatened by agriculture, grazing, non-native plants, habitat alteration, and urbanization. See University of California
Perideridia pringlei	adobe yampah	4.3	None	None	Apr-Jun(Jul)	Chaparral, Cismontane woodland, Coastal scrub, Pinyon and juniper woodland	Serpentinite, often clay	1800	5905	Possibly threatened by wind energy development.
Phacelia ramosissima var. austrolitoralis	south coast branching phacelia	3.2	None	None	Mar-Aug	Chaparral, Coastal dunes, Coastal scrub, Marshes and swamps (coastal salt)	sandy, sometimes rocky	300	985	may be misidentified. Many collections old; need field surveys. Threatened by development. Possibly threatened by non-native plants. Characters distinguishing the varieties of P. ramosissima
Pinus radiata	Monterey pine	1B.1	None	None		Closed-cone coniferous forest, Cismontane woodland		185	605	Only three native stands in CA, at Ano Nuevo, Cambria, and the Monterey Peninsula; introduced in many areas. Only one-half of the species' historical extent remains undeveloped on the Monterey Peninsula, and forest destruction has been unevenly distributed over different geomorphic surfaces. Threatened by development, genetic contamination, pine pitch canker disease, and forest fragmentation, especially at Del Monte Forest (MNT Co.) and in SLO Co.; seriously threatened by feral goats on GU Isl. Plants from BA (Cedros Isl.) and GU Isl. are genetically distinct. See Fremontia 18(2):15-21 (1990) for discussion of genetic conservation work.
Piperia candida	white-flowered rein orchid	1B.2	None	None	(Mar)May-Sep	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	sometimes serpentinite	1310	4300	Difficult to determine rarity as some populations rarely flower. Populations often have small numbers. Threatened by logging. Difficult to identify from herbarium material. See Lindleyana 5(4):205-211 (1990) for original description, and The Wild Orchids of California, p. 109-110 (1995) by R. Coleman for species account.
Piperia leptopetala	narrow-petaled rein orchid	4.3	None	None	May-Jul	Cismontane woodland, Lower montane coniferous forest, Upper montane coniferous forest		2225	7300	Threatened b vegetation/fuels management. See Bulletin of the Torrey Botanical Club 28:270 (1901) for original description, and The Wild Orchids of California, p. 124-125 (1995) by R. Coleman for species account.
Piperia michaelii	Michael's rein orchid	4.2	None	None	Apr-Aug	Coastal bluff scrub, Closed-cone coniferous forest, Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest		915	3000	Recent surveys in VEN Co. have been unsuccessful. Known from SCZ Isl. from a single collection in 1968. Possibly threatened by road widening. See Bulletin of the California Academy of Sciences 1:282 (1885) for original description, Bulletin of the Torrey Botanical Club 28:640 (1901) for revised nomenclature, and The Wild Orchids of California, p. 126-128 (1995) by R. Coleman for species account.
Piperia yadonii	Yadon's rein orchid	1B.1	None	FE	(Feb)May-Aug	Coastal bluff scrub, Closed-cone coniferous forest, Chaparral (maritime)	sandy	755	2475	Threatened by urbanization, recreational development, non-native plants, road maintenance, and herbivory. See Lindleyana 5(4):205-211 (1990) for original description, and The Wild Orchids of California, p. 134-135 (1995) by R. Coleman for species account.
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	1B.2	None	None	Mar-Jun	Chaparral, Coastal prairie, Coastal scrub	mesic	160	525	Taxonomic work needed; intergrades with var. hickmanii, and differences may be environmentally induced. Threatened by development, foot traffic, and non-native plants.
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	4.2	None	None	Apr-Jun	Closed-cone coniferous forest, Chaparral, Coastal scrub, Marshes and swamps, Vernal pools		185	605	Does plant occur in SMT Co.? Intergrades with var. chorisianus. See Pittonia 1:13 (1887) for original description, and Contributions from the Arnold Arboretum 3:49 (1932) for revised nomenclature.
Plagiobothrys diffusus	San Francisco popcornflower	1B.1	CE	None	Mar-Jun	Coastal prairie, Valley and foothill grassland		360	1180	Threatened by development and non-native plants. Possibly threatened by grazing and vehicles. Identification difficult; taxonomic work needed. See P. reticulatus var. rossianorum in The Jepson Manual. See Pittonia 1:14 (1887) for original description, and Contributions from the Arnold Arboretum 3:77 (1932) for revised nomenclature.
Plagiobothrys uncinatus	hooked popcornflower	1B.2	None	None	Apr-May	Chaparral (sandy), Cismontane woodland, Valley and foothill grassland		760	2495	Field surveys needed in Gabilan and Santa Lucia ranges to determine status.
Plagiobryoides vinosula	wine-colored tufa moss	4.2	None	None		Cismontane woodland, Mojavean desert scrub, Meadows and seeps, Pinyon and juniper woodland, Riparian woodland	usually granitic rock or granitic soil along seeps and streams, sometimes clay	1735	5690	Threatened by grazing, trampling, and vehicles. Potentially threatened by hydrological alterations. See Revue Bryologique 38(1):6-7 (1911) for original description, and Phytologia 91(3):499 (2009) for revised nomenclature.
Pogogyne clareana	Santa Lucia mint	1B.2	CE	None	Apr-Jul	Chaparral, Cismontane woodland, Riparian woodland	intermittent streams	630	2065	Known only from Ft. Hunter Liggett. Possibly threatened by road maintenance and military activities. See Four Seasons 4(3):22 (1973) for original description.

Polygonum hickmanii	Scotts Valley polygonum	1B.1	CE	FE	May-Aug	Valley and foothill grassland (mudstone and sandstone)		250	820	Known only from Scotts Valley. Fewer than 3500 individuals as of 1998. Threatened by development and non-native plants. Not in TJM (1993). See Novon 5(4):336 (1995) for original description.
Potentilla hickmanii	Hickman's cinquefoil	1B.1	CE	FE	Apr-Aug	Coastal bluff scrub, Closed-cone coniferous forest, Meadows and seeps (vernally mesic), Marshes and swamps (freshwater)		149	490	Seriously threatened by urbanization, recreational activities, non-native grasses, grazing, and the proposed Devil's Slide Bypass highway project. Collections from SON Co. are actually P. uliginosa. See Bulletin of the Torrey Botanical Club 29:77-78 (1902) for original description, and Fremontia 21(1):25-29 (1993) and 24(1):3-11 (1996) for species accounts.
Puccinellia simplex	California alkali grass	1B.2	None	None	Mar-May	Chenopod scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools	Alkaline, vernally mesic; sinks, flats, and lake margins	930	3050	Threatened by hydrological alterations, urbanization, agricultural conversion, development, and habitat fragmentation, disturbance, alteration, and loss; resulting in extirpation of some occurrences. Potentially threatened by solar energy development. Possibly threatened by grazing and proximity to roads. Similar to P. parishii. See Circular, United States Department of Agriculture, Division of Agrostology 16:1 (1899) for original description.
Ramalina thrausta	angel's hair lichen	2B.1	None	None		North Coast coniferous forest	On dead twigs and other lichens	430	1410	Populations in decline, with net loss of 12.5% of sites in three-year period. Potentially threatened by air pollution. In northern CA it is usually found on dead twigs, and has been found on Alnus rubra, Calocedrus decurrens, Pseudotsuga menziesii, Quercus garryana, and Rubus spectabilis. In SON Co. it grows on and among dangling mats of Ramalina menziesii and Usnea spp. Similar to Alectoria sarmentosa, A. vancouverensis, and R. menziesii. See Bulletin of the California Lichen Society 13(1):17 (2006) for CALS Conservation Committee sponsorship.
Ranunculus lobbii	Lobb's aquatic buttercup	4.2	None	None	Feb-May	Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools	mesic	470	1540	Threatened by urbanization, habitat alteration, agriculture, and development.
Ribes sericeum	Santa Lucia gooseberry	4.3	None	None	Feb-Apr	Broadleafed upland forest, Coastal bluff scrub, Cismontane woodland, North Coast coniferous forest		1220	4005	Known only from the Santa Lucia Mtns.
Rosa pinetorum	pine rose	1B.2	None	None	May,Jul	Closed-cone coniferous forest, Cismontane woodland		945	3100	Possible hybrid of R. spithamea, R. gymnocarpa, or others; needs further study. See Muhlenbergia 1:53 (1904) for original description.
Sanicula hoffmannii	Hoffmann's sanicle	4.3	None	None	Mar-May	Broadleafed upland forest, Coastal bluff scrub, Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest	often serpentinite or clay	300	985	Potentially threatened by development. Possibly threatened by logging.
Sanicula maritima	adobe sanicle	1B.1	CR	None	Feb-May	Chaparral, Coastal prairie, Meadows and seeps, Valley and foothill grassland	clay, serpentinite	240	785	Threatened by foot traffic, non-native plants, recreational activities, trampling, and urbanization. See Botany of California 2:451 (1880) for original description, and University of California Publications in Botany 25:61-62 (1951) for taxonomic treatment.
Senecio aphanactis	chaparral ragwort	2B.2	None	None	Jan-Apr(May)	Chaparral, Cismontane woodland, Coastal scrub	sometimes alkaline	800	2625	Threatened by development. Rare in LAX, ORA, and RIV counties. Need quads for RIV Co. and SCT Isl. Not seen on SCZ Isl. between 1934 and 1991. See Pittonia 1:220 (1888) for original description, and North American Flora II 10:50-139 (1978) for taxonomic treatment.
Senecio astephanus	San Gabriel ragwort	4.3	None	None	May-Jul	Coastal bluff scrub, Chaparral	rocky slopes	1500	4920	See Pittonia 1: 174 (1888) for original description.
Sidalcea hickmanii ssp. hickmanii	Hickman's checkerbloom	1B.3	None	None	May-Jul	Coastal bluff scrub, Chaparral (openings), Cismontane woodland		1220	4005	Threatened by road maintenance. Possibly threatened by fire suppression and grazing. See Fremontia 6(2):8-14 (1978) for discussion of Marble-Cone fire and effects.
Sidalcea malachroides	maple-leaved checkerbloom	4.2	None	None	(Mar)Apr-Aug	Broadleafed upland forest, Coastal prairie, Coastal scrub, North Coast coniferous forest, Riparian woodland	Often in disturbed areas	730	2395	SCL Co. (427A) occurrence based on old specimen, needs confirmation. Threatened by logging and associated road usage, non-native plants, competition, low reproduction, road maintenance, and development. Endangered in OR. See University of Washington Publications in Biology 18:1-96 (1957) for taxonomic treatment.
Silene verecunda ssp. verecunda	San Francisco campion	1B.2	None	None	(Feb)Mar-Jun(Aug)	Coastal bluff scrub, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland	sandy	645	2115	Threatened by development, recreational activities, and non-native plants. Not in TJM 2. See Proceedings of the American Academy of Arts and Sciences 10:344 (1875) for original description, and University of Washington Publications in Biology 13:41-42 (1947) for taxonomic treatment.

Stebbinsoseris decipiens	Santa Cruz microseris	1B.2	None	None	Apr-May	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Coastal prairie, Coastal scrub, Valley and foothill grassland	open areas, sometimes serpentinite	500	1640	Threatened by grazing. USFWS uses the name Microseris decipiens. See Contributions from the Dudley Herbarium 4:290-291 (1955) for original description, and American Journal of Botany 78(8):1015-1027 (1991) for revised nomenclature.
Streptanthus albidus ssp. peramoenus	most beautiful jewelflower	1B.2	None	None	(Mar)Apr-Sep(Oct)	Chaparral, Cismontane woodland, Valley and foothill grassland	serpentinite	1000	3280	Historical occurrences need field surveys. Threatened by development, non-native plants, and grazing. Possibly threatened by dam maintenance, road construction and maintenance, and recreational activities. Similar plants from MNT and SLO counties may be S. glandulosus ssp. glandulosus; see this name in TJM 2; further study is underway to determine its relationship to the S. glandulosus complex. See Bulletin of the Torrey Botanical Club 13(1):142 (1886) for original description, and Madroño 14(7):217-227 (1958) for taxonomic treatment.
Stylocline masonii	Mason's neststraw	1B.1	None	None	Mar-May	Chenopod scrub, Pinyon and juniper woodland	sandy	1200	3935	Collected only once (1991) since 1971; need status of occurrences. Most of known sites surveyed unsuccessfully in 1989. Threatened by development and habitat disturbance. See Madroño 39(2):117 (1992) for original description and 43(3):434-435 (1996) for information on recent collection.
Syntrichopappus lemmonii	Lemmon's syntrichopappus	4.3	None	None	Apr-May(Jun)	Chaparral, Joshua tree woodland, Pinyon and juniper woodland	sandy or gravelly	1830	6005	Potentially threatened by non-native plants and vehicles. Possibly threatened by wind energy development.
Systenotheca vortriedei	Vortriede's spineflower	4.3	None	None	May-Sep	Chaparral, Cismontane woodland	sandy or serpentinite	1600	5250	See Great Basin Naturalist Memoirs 2:169-190 (1978) for taxonomic revision, and Phytologia 66(2):83-88 (1989) for revised nomenclature.
Tortula californica	California screw-moss	1B.2	None	None		Chenopod scrub, Valley and foothill grassland	sandy, soil	1460	4790	Need quad for Santa Rosa Island occurrence. See The Bryologist 48:90-92 (1945) for original description.
Toxicoscordion fontanum	marsh zigadenus	4.2	None	None	Apr-Jul	Chaparral, Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps	vernally mesic, often serpentinite	1000	3280	See Leaflets of Western Botany 2:41 (1937) for original description, and Phytologia 73(4):307-311 (1992) for revised nomenclature.
Trifolium buckwestiorum	Santa Cruz clover	1B.1	None	None	Apr-Oct	Broadleafed upland forest, Cismontane woodland, Coastal prairie	gravelly, margins	610	2000	Threatened by land clearing and non-native plants. Possibly threatened by road maintenance. See Madroño 39(2):90 (1992) for original description.
Trifolium hydrophilum	saline clover	1B.2	None	None	Apr-Jun	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools		300	985	Many sites likely extirpated; need current information on rarity and endangerment. Need quads for COL Co. Threatened by development, trampling, road construction, and vehicles. See Manual of the Botany of the Region of San Francisco Bay, p.100 (1894) for original description, and Brittonia 32(1):55 (1980) for revised nomenclature.
Trifolium polyodon	Pacific Grove clover	1B.1	CR	None	Apr-Jun(Jul)	Closed-cone coniferous forest, Coastal prairie, Meadows and seeps, Valley and foothill grassland	mesic, sometimes granitic	425	1395	Seriously threatened by urbanization, recreation, foot traffic, and trampling. Potentially threatened by non-native plants. A synonym of T. variegatum (phase 4) in The Jepson Manual, but appears to be distinct. See Pittonia 3:215 (1897) for original description.
Trifolium trichocalyx	Monterey clover	1B.1	CE	FE	Apr-Jun	Closed-cone coniferous forest (sandy, openings, burned areas)		305	1000	Discovered in Big River Forest (TCF), MEN Co. by K. Heise and G. Hulse-Stephens in 2011. Seriously threatened by urbanization and altered fire regimes. Appears to be a fire follower. Possibly of hybrid origin. See Muhlenbergia 1:55 (1904) for original description and Madroño 59(3):167 (2012) for discovery of MEN Co. occurrence.
Triteleia ixioides ssp. cookii	Cook's triteleia	1B.3	None	None	May-Jun	Closed-cone coniferous forest, Cismontane woodland	serpentinite seeps	700	2295	See Aliso 8(8):273 (1975) for revised nomenclature.
Triteleia lugens	dark-mouthed triteleia	4.3	None	None	Apr-Jun	Broadleafed upland forest, Chaparral, Coastal scrub, Lower montane coniferous forest		1000	3280	Threatened by development. Related to T. ixioides; needs further study. See Bulletin of the California Academy of Sciences 2(6):142 (1886) for original description, and American Midland Naturalist 25:87-88 (1941) for taxonomic treatment.
Tropidocarpum capparideum	caper-fruited tropidocarpum	1B.1	None	None	Mar-Apr	Valley and foothill grassland (alkaline hills)		455	1495	Rediscovered in 2000 on Ft. Hunter Liggett (DOD). Possibly threatened by grazing, military activities, trampling, and non-native plants. See Pittonia 1:217 (1888) for original description, and Novon 11:292-293 (2001) for taxonomic information.
Usnea longissima	Methuselah's beard lichen	4.2	None	None		Broadleafed upland forest, North Coast coniferous forest	On tree branches; usually on old growth hardwoods and conifers	1460	4790	Threatened by development, road maintenance, and logging. See CALS Conservation Committee sponsorship by E. Peterson (2005) for additional information.

Harris & Associates

TECHNICAL MEMORANDUM

To: Justin Meek, AICP, Principal Planner, City of Watsonville
From: David J.R. Mack, AICP, Project Manager/Senior Planner
Topic: **Mountain Propane Project – Hazards and Hazardous Materials**
Date: June 4, 2020
CC: Kate Giberson, Project Director, Harris & Associates

Introduction

Harris & Associates has received and reviewed the information provided by Mountain Propane Company (applicant) relating to their proposed Mountain Propane Tank Relocation and Filling Station Project (project), which includes the storage of hazardous materials (liquid propane) on their property, which was previously used for propane storage, in the City of Watsonville (City).

The purpose of this technical memorandum is to determine potential environmental impacts of the project as they relate to compliance with the California Environmental Quality Act (CEQA). Accordingly, the methodology used is to address the questions related to Hazards and Hazardous Materials in the CEQA Guidelines Appendix G, Environmental Checklist Form.

The information in this memorandum is based on project description information provided by the applicant[i], field survey, and research conducted by Harris & Associates staff.

Project Location and Setting

The project is located at 950 West Beach Street in the City of Watsonville (**Figure 1**). The 0.69-acre project site is a previously developed industrial site, currently owned by Mountain Propane and previously owned by Venture Oil Company and used for propane storage. The site was previously contaminated with hazardous materials (petroleum hydrocarbons) that were remedied in 2013[ii],[iii],[iv]. Currently, the project site is comprised of impervious pavement and concrete surfaces, heavily disturbed unpaved areas, and a 50,000-gallon propane storage tank that is not currently in use.

The triangular shaped site is surrounded by industrial land uses to the west, east and south and the Santa Cruz Branch Rail Line to the north. North of the railroad tracks, there is undeveloped land planned for mixed use development (Manabe-Ow Specific Plan) and the Watsonville Slough.

Project Description

The applicant is proposing to relocate the existing 50,000-gallon propane storage tank westward to the middle of the site and to install four new 30,000-gallon propane storage tanks in phases, resulting in a total of 170,000-gallons of propane storage at the project site. The four new tanks would be approximately 15 feet in height and would occupy approximately 1,750 square feet in the area currently occupied by the 50,000-gallon tank, which is approximately 15-feet in height.

Additional site improvements include: asphalt paving, bollard installation, foundation construction for the propane tanks, tank unloading stations, irrigation and landscaping, gate and fencing installation, liquefied propane gas (LPG) piping and appurtenance installation, and private fire hydrant installation.

The propane storage tanks and LPG piping and appurtenance equipment would be installed and maintained in accordance with California Code of Regulations, Title 8, Article 7, Section 536[v]. The tanks and LPG piping would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keeps errant propane from being released. This system is similar to the systems used and in place for commercial gas/fueling stations. The site would be under video monitoring when company personnel is not onsite and throughout the evening.

The applicant would utilize the adjacent rail line for the delivery of the propane, which would then be transferred to a truck and then to the on-site propane storage tanks, and would fill bobtail delivery trucks at the site and deliver propane to customers. The transport rail and truck facilities would be operated and maintained in accordance with Federal Code of Regulations, Title 49, Part 174 (Carriage by Rail)[vi] and CHP Form 800C (Vehicles Transporting Hazardous Materials)[vii].

The project would be implemented in two phases. Phase 1 involves rotating and relocating the existing 50,000-gallon storage tank to allow easier access for filling and distribution and would be implemented this year (2020). Phase 2 involves adding 120,000 gallons of storage (in four new 30,000-gallon storage tanks) and would be implemented within 2-3 years, contingent on demand and development of business services.

Zoning Compliance

The project site is zoned "IG" or "General Industrial", which allows *petroleum products refining and storage* as a Conditional Use, pursuant to the issuance of a Special Use Permit. Therefore, the proposed use of the propane storage and filling facility can be permitted, and the proposed project is compliant with the provisions for sites zoned IG once a Special Use Permit is obtained.

Potential Impacts

As stated above, this technical memorandum addresses potential hazardous materials impacts based on the questions contained in "Section IX – Hazards ad Hazardous Materials" of the CEQA Guidelines, Appendix G-Environmental Checklist Form, as follows.

IX. HAZARDS AND HAZARDOUS MATERIALS. Would the project:

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?

As described in the Project Description above, the proposed project would serve as a liquid propane storage and distribution facility. Liquid propane is proposed to be delivered to the project site via the use of the existing rail lines adjacent to the site. Liquid propane will then be transferred from the rail car to the existing onsite 50,000-gallon storage tank, and then transferred to "bob-tail" distribution trucks for disbursement to customers. When rail car delivery is not available, or if lower quantities of supply are required, liquid propane may also be delivered to the site via traditional 18-wheel transport truck, similar to the delivery of automotive fuel to commercial fueling station sites. However, in this case the project site would not be open to the general public.

Liquid propane gas is the only potentially hazardous material (fuel) that would be stored onsite. However, as described in the Project Description above, the propane storage and delivery system would be equipped with redundant safety valves and systems that are designed to prevent any major release of propane. The systems would also be equipped with low emission fittings and equipment that keeps errant propane from being released. The site would be under video monitoring when company personnel is not onsite and throughout the evening. Additionally, the transport of liquid propane to the project site and to customers would be in accordance with regulations and requirements found in California Highway Patrol Form 800C. There would be no other hazardous materials used, transported, or disposed at the project site or elsewhere.

Therefore, the project would not create a significant hazard to the public or the environment through the transport, use, or disposal of liquid propane or other hazardous materials; and it would not create a significant hazard to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

c. Emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile on existing or proposed school?

The project site is located within an existing industrial zoned, previously disturbed area, and is not within one-quarter mile of an existing or proposed school. The closest school is Ceiba College Preparatory Academy, located at 260 W Riverside Drive, which is one mile east of the project site and outside the 0.25-mile radius shown in the figure below. Therefore, the project would not have the potential to emit hazardous emissions or handle hazardous materials, substance, or waste in the vicinity of any school.

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or environment?

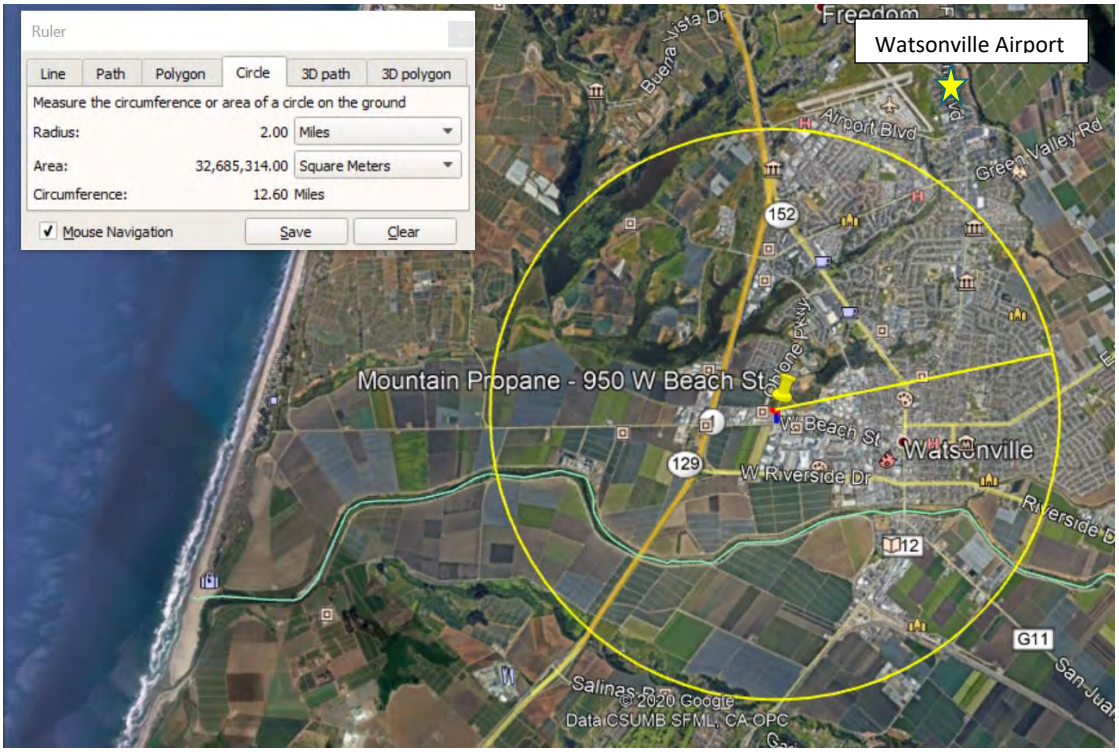
The project site was previously contaminated with hazardous materials (petroleum hydrocarbons) but was remediated in 2013. At this time, the project site is not included on a list of hazardous materials sites complied pursuant to Government Code Section 65962.5, according to the California Department of Toxic Substances Control EnviroStor database (www.envirstor.dtsc.ca.gov) and the California Water Resources Control Board GeoTracker database (www.geotracker.waterboards.ca.gov) on July 20, 2019. Therefore, the project would not create a significant hazard to the public or environment.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

The project site is located within an existing industrial area, surrounded by industrial land uses, and is not located within an airport land use plan, or within two miles of a public airport or public use airport. The Watsonville Municipal Airport is located 2.15 miles north of the project site, as shown in the figure below.

Liquid propane would be delivered to the site via rail car or 18-wheel transport truck, and would be transported off the site in bobtail delivery trucks to customers. Furthermore, the site would not be open to the public and would serve as a distribution site for delivery of propane to off-site areas. As described in the project description and the discussion under questions "a" and "b", the propane storage and delivery system would be equipped with safety features, and the transport would be in accordance with applicable laws and regulations.

Although operating the transport vehicles would result in some increased noise in and around the project area, it is an industrial area without sensitive land uses or a significant number of people residing or working in the area. The vehicular noise would disseminate as the vehicles leave the area. Therefore, the project would not create excessive noise for people residing or working in the area.



f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The project site is located within an existing industrial area and is not a part of, and would not interfere with an adopted emergency response plan or emergency evacuation plan. The project site has adjacent open space and clear access to leave the property in the event of an emergency.

g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

The project site is located within an existing industrial urban area. According to the Santa Cruz County Wildland Fire Map, the nearest wildland fire area is located 1.59 miles to the most western portion of the project site. Therefore, and the project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving or resulting from wildland fires.

Recommended Best Management Practices and Conditions of Approval

1. During construction and excavation activities, if hydrocarbon contamination is encountered, work must be stopped immediately, and the contamination must be reported to Santa Cruz County Environmental Health at (831) 454-2022 and Tom Sayles at the Water Board (805) 542-4640. This measure is a precaution because the site was formerly contaminated with petroleum hydrocarbons, although the site was remediated and determined a closed case.
2. Prior to storing propane at the site, the applicant must obtain a permit to store hazardous materials from Santa Cruz County Environmental Health. To obtain a hazardous materials permit, the applicant must create an account on the CERS (California Environmental Reporting System) website (https://cers.calepa.ca.gov/ ad submit a Hazardous Materials Management Plan online. For additional information contact the Environmental Health office at (831) 454-2200 and ask to speak to one of the Hazardous Materials Inspectors or Hazardous Material Program Manager.

References

[i] City of Watsonville Environmental Information Form, dated 01/23/2019.
[ii] Water Board Closure Summary, dated July 14, 2014.
[iii] Water Board Closure Letter, dated July 15, 2014.
[iv] GeoTracker Case Summary, dated July 20, 2018.
[v] California Code of Regulations, Title 8, Section 536, printed May 7, 2020.
[vi] Code of Federal Regulations, Title 49, Part 174.304, printed May 7, 2020.
[vii] California Highway Patrol Form 800C, printed May 7, 2020.

Source: County of Santa Cruz Imagery 2016.

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Figure 1

Mountain Propane Project Location

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TECHNICAL MEMORANDUM

To: Justin Meek, AICP, Principal Planner, City of Watsonville
From: David J. R. Mack, AICP, Project Manager/Senior Planner, Harris & Associates
Subject: **Mountain Propane Project - Transportation**
Date: June 4, 2020
CC: Kate Giberson, Project Director, Harris & Associates

Introduction

Harris & Associates has received and reviewed the information provided by Mountain Propane Company (applicant) relating to the proposed Mountain Propane Tank Relocation and Filling Station Project (project) and anticipated truck trip/traffic generation to and from the project site.

The purpose of this technical memorandum is to determine potential environmental impacts of the project as they relate to compliance with the California Environmental Quality Act (CEQA). Accordingly, the methodology used is to address the questions in the CEQA Guidelines Appendix G, Environmental Checklist Form, Section XVII. Transportation.

The information in this memorandum is based on project description information provided by the applicant[i], field survey, and research conducted by Harris & Associates staff.

Project Location and Setting

The project is located at 950 West Beach Street in the City of Watsonville (City), shown in **Figure 1**. The 0.69-acre project site is a previously developed industrial site, currently owned by Mountain Propane and previously owned by Venture Oil Company and used for propane storage. Currently, the project site is comprised of impervious pavement and concrete surfaces, heavily disturbed unpaved areas, and a 50,000-gallon propane storage tank that is not currently in use.

The triangular shaped site is surrounded by industrial land uses to the west, east and south and the Santa Cruz Branch Rail Line to the north. North of the railroad tracks, there is undeveloped land planned for mixed use development (Manabe-Ow Specific Plan) and the Watsonville Slough.

Project Description

The applicant is proposing to relocate the existing 50,000-gallon propane storage tank westward to the middle of the site and to install four new 30,000-gallon propane storage tanks in phases, resulting in a total of 170,000 gallons of propane storage at the project site. The four new tanks would be approximately 15 feet in height and would occupy approximately 1,750 square feet in the area currently occupied by the 50,000-gallon tank, which is approximately 15-feet in height.

Additional site improvements include: asphalt paving, bollard installation, foundation construction for the propane tanks, tank unloading stations, irrigation and landscaping, gate and fencing installation, liquefied petroleum gas (LPG) piping and appurtenance installation, and private fire hydrant installation.

The applicant would utilize the adjacent rail line for the delivery of the propane, which would then be transferred to a truck and then to the on-site propane storage tanks, and would fill bobtail delivery trucks at the site and deliver propane to customers. The transport rail and truck facilities would be operated and maintained in

accordance with Federal Code of Regulations, Title 49, Part 174 (Carriage by Rail)[ii] and CHP Form 800C (Vehicles Transporting Hazardous Materials)[iii] .

The project would be implemented in two phases. Phase 1 involves rotating and relocating the existing 50,000-gallon storage tank to allow easier access for filling and distribution and would be implemented this year (2020). Phase 2 involves adding 120,000 gallons of storage (in four new 30,000-gallon storage tanks) and would be implemented within 2-3 years, contingent on demand and development of business services.

Following construction, it is estimated that the project would generate approximately 15 roundtrips daily, including 10 bobtail propane delivery trucks, four passenger (worker) vehicles, and up to one heavy-duty truck trip at buildout, after both Phase 1 and 2 are constructed.

Zoning Compliance

The project site is zoned "IG" or "General Industrial", which allows *petroleum products refining and storage* as a Conditional Use, pursuant to the issuance of a Special Use Permit. Therefore, the proposed use of the propane storage and filling facility can be permitted, and the proposed project is compliant with the provisions for sites zoned IG once a Special Use Permit is obtained.

Potential Impacts

As stated above, this technical memorandum addresses potential transportation impacts based on the questions contained in "Section XVII – Transportation" of the CEQA Guidelines, Appendix G-Environmental Checklist Form, as follows.

XVII. TRANSPORTATION. Would the project:

a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

The project includes a total of 15 roundtrips, including passenger vehicles, occurring throughout the workday (10 bobtail delivery truck trips and 5 employee trips). The project site is accessed via an existing driveway off West Beach Street, and has secondary access from a driveway/road located near the Industrial Road/West Beach Street intersection, which runs through the existing industrial complex (**Figure 1**).

The primary roadways used to access the project site are West Beach Road, Industrial Road, Ohlone Parkway, Riverside Drive (Highway 129) and State Route 1. The project site is accessible by pedestrian/bicycle transit, through the use of the existing shoulder/bike lane on West Beach Street. The nearest transit access is along West Beach (to the west), approximately 0.26 mile from the project site.

Ohlone Parkway is a two- to four-lane roadway in western Watsonville, connecting the industrial and agricultural uses north of Riverside Drive (Highway 129), the residential neighborhoods, and commercial uses along Main Street (Highway 152). It is classified as a collector street north of Harkins Slough Road and a minor arterial south of Harkins Slough Road.

Riverside Drive (Highway 129) is a two- to four-lane arterial street in Watsonville. Regionally, it connects State Route 1 in Watsonville with US 101 near San Juan Bautista. In Watsonville, Riverside Drive (Highway 129) is the principal east-west arterial south of the Downtown central business district, connecting the largely residential southeastern portion of the city with the industrial and agricultural uses on the southwestern portion of the city. The Circulation Element of the City's General Plan designates Highway 129 as the designated truck route between Watsonville and State Route 1.

West Beach Road is a two- to four-land street in southern Watsonville. It connects industrial and agricultural uses in southeastern Watsonville to the Downtown central business district and residential neighborhoods immediately east of the Downtown. It is classified as a collector street west of Lee Road, an arterial street between Lee Road and Walker Street, and a minor arterial street east of Walker Street.

Industrial Road is a two-lane street in southern Watsonville. It connects Riverside Drive (Highway 129) to West Beach Street. It is classified as an arterial street, is a truck route servicing various properties in the industrially zoned area.

Based on information in the transportation analysis prepared for the nearby Sunshine Vista Home Project to the north (City of Watsonville May 2018), the intersection of Ohlone Parkway/West Beach Street currently operates at a level-of-service (LOS) of "A" for both AM and PM peak hours. The intersection of State Route 1 Northbound Ramps/Riverside Drive (Highway 129) currently operates at LOS "A" for both AM and PM peak hours. The intersection of State Route 1 Southbound Ramps/Riverside Drive (Highway 129) currently operates at LOS "B" for the AM peak and LOS "C" for the PM peak. All of these operational levels are above the standard of LOS "D" or higher.

The anticipated 15 trips/day generated by the project is not expected to result in increased traffic congestion or significant delay(s) upon existing local or regional roadways, change the level of service on the surrounding roadways, or necessitate roadway improvements or expansion. The project would not interfere with any existing or planned transit, bicycle or pedestrian facilities.

Therefore, the project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. *Less-than-Significant.*

b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

In response to the passage of Senate Bill 743 in 2013 and other climate change strategies, the Governor's Office of Planning and Research (OPR) amended the CEQA Guidelines to replace Level-of-Service (LOS) with vehicle miles traveled (VMT) as the measurement for traffic impacts. The "Technical Advisory on Evaluating Transportation Impacts in CEQA," prepared by OPR (2018) provided recommended thresholds and methodologies for assessing impacts of new developments on VMT. Tying significant thresholds to the State's GHG reduction goals, the guidance recommends a threshold reduction of 15% under current average VMT levels for residential projects (per capita) and office projects (per employee), and tour-based reduction from current trips for retail projects. Based on the latest estimates compiled from the Highway Performance Monitoring System, the average daily VMT in Santa Cruz County is 18.3 miles per capita. (Department of Finance [DOF] 2018; Caltrans 2018a). The guidelines also recommend a screening threshold for residential and office projects – trip generation under 110 trips per day is generally considered a less-than-significant impact.

The project would produce less than 110 trips/day during both construction and operational phases. The project would involve an estimated total of 15 roundtrips, including passenger vehicles, occurring throughout the workday, which is far below the 100 trips/day threshold. Therefore, the project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3(b)(1) applicable to land use projects. *Less-than-significant.*

c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project does not involve the construction or alteration of roadways, access roads, or changes to the existing rail line. Therefore, the project would not substantially increase hazards due to a geometric design feature. The project site is zoned for industrial uses, which conditionally allows the establishment of the propane facility. The use occasional use of bobtail filling trucks and refueling trucks would not be an incompatible use. *Less-than-Significant.*

d. Result in inadequate emergency access?

The project site is an existing industrially zoned parcel and would continue to function as an industrial site. The site would be accessed from West Beach Street, utilizing an existing driveway access point. While the project does involve the relocation and addition of propane storage tanks, these activities would not inhibit or block emergency access to the site. Emergency personnel would be able to access using the main driveway off West Beach Street, as well as an additional driveway located near the intersection of Industrial Road/West Beach Street (eastern side of the industrial complex). Furthermore, if needed, emergency access could be obtained from the rear of the site along the existing railway/tracks. *Less-than-significant.*

[i] City of Watsonville Environmental Information Form, dated 01/23/2019.
[ii] Code of Federal Regulations, Title 49, Part 174.304, printed May 7, 2020
[iii] California Highway Patrol Form 800C, printed May 7, 2020.

Source: County of Santa Cruz Imagery 2016.

Harris & Associates

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Figure 1

Mountain Propane Project Location