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APPENDIX B

Air Quality, Public Health and GHG Technical Report

Prepared for
California Energy Commission

Prepared by
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Project Number
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AIR QUALITY AND GREENHOUSE GAS TECHNICAL REPORT PITTSBURG DATA HUB

PITTSBURG DATA HUB, LLC
PITTSBURG, CALIFORNIA

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ACRONYMS AND ABBREVIATIONS

AERMOD	American Meteorological Society/Environmental Protection Agency regulatory air dispersion model
AQ	Air Quality
ARB	California Air Resources Board
aREL	Acute Reference Exposure Level
ASF	Age Sensitivity Factor
BAAQMD	Bay Area Air Quality Management District
CalEEMod®	California Emissions Estimator Model
Cal/EPA	California Environmental Protection Agency
CAP	Criteria Air Pollutant
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
CPF	Cancer Potency Factor
cREL	Chronic Reference Exposure Level
DPF	Diesel Particulate Filter
DPM	Diesel Particulate Matter
GHG	Greenhouse Gas
HHDT	Heavy Heavy-Duty Trucks
HI	Hazard Index
HQ	Hazard Quotient
HRA	Health Risk Assessment
MAF	Modelling Adjustment Factor
MEDR	Maximally Exposed Daycare Receptor
MEIR	Maximally Exposed Individual Resident
MEISR	Maximally Exposed Individual Sensitive Receptor
MEIW	Maximally Exposed Individual Worker
MERR	Maximally Exposed Recreational Receptor
MESR	Maximally Exposed School Receptor

N_2O	Nitrogen Dioxide
NO_X	Nitrous Oxide
OEHHA	Office of Environmental Health Hazard Assessment
PBGF	Pittsburg Backup Generating Facility
PDH	Pittsburg Data Hub
PG&E	Pacific Gas and Electric Company
$PM_{2.5}$	Fine Particulate Matter Less than 2.5 Micrometers in Aerodynamic Diameter
PM_{10}	Respirable Particulate Matter Less than 10 Micrometers in Aerodynamic Diameter
ROG	Reactive Organic Gas
SCR	Selective-Catalytic Reduction Unit
SPPE	Small Power Plant Exemption
TAC	Toxic Air Contaminant
TOG	Total Organic Gas
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	Volatile Organic Compounds

Units

g	gram	ppm	parts per million
lb/day	pounds per day	s	second
m	meter	tpy	ton per year
MT	metric ton	yr	year
MW	megawatts		
MWh	megawatts hour		
$\mu g/m^3$	micrograms per cubic meter		

EXECUTIVE SUMMARY

Pittsburg Data Hub, LLC, a wholly owned subsidiary of AVAIO Digital Partners I, LLC, is proposing to develop a new data center and backup generating facility at 2232 Golf Club Road in Pittsburg, California ("Project" or "Facility"). The Facility would be located on an approximately 22-acre plot bounded to the north by West Leland Road and existing residential development, to the south and west by the Contra Costa Canal, and to the east by an existing Pacific Gas and Electric Company (PG&E) transmission easement. The data center building will be a minimum of 400 feet to the fenceline of the nearest residentially-zoned properties to the north (near the intersection of West Leland Road and Golf Club Road) and a minimum of 1,000 feet to the fenceline of the nearest residentially-zoned properties to the east (near Orinda Circle).

The proposed buildout plan for the Project includes one (1) three-story building with six (6) 10-megawatt (MW) data halls, providing 60 MW of power to information technology equipment. At full build-out, the Project would include thirty-seven (37) 3-megawatts (MW) capacity Tier-2 backup emergency generators with diesel particulate filters (DPF) and selective-catalytic reduction (SCR) units (equivalent to Tier 4 standards) with a total backup capacity covering the maximum power demand of the building (98 MW), housed in a generator yard on the western side of the three-story data center building.

Construction of Facility, which includes the Pittsburg Data Hub (PDH), and the Pittsburg Backup Generating Facility (PBGF) would take place from November 2025 through May 2027. Project construction includes grading of the entire site, installation of utility services, construction of an on-site substation, construction of the data center building, and paving of the site.

This report evaluates the air quality (AQ) and greenhouse gas (GHG) impacts, together with risks and hazards associated with Project construction and operational activities. The local air agency, the Bay Area Air Quality Management District (BAAQMD) has published California Environmental Quality Act (CEQA) Guidelines for use in determining significance, which will apply here for AQ and GHG (BAAQMD 2023).

The relevant thresholds for the Project include:

- Construction criteria air pollutant (CAP) and precursor emissions
- Operational CAP and precursor emissions
- Local carbon monoxide (CO) concentrations
- Operational GHG emissions
- Excess lifetime cancer risk, chronic hazard index (HI), acute HI, and fine particulate matter ($PM_{2.5}$) concentrations from construction of Project and PBGF operation on off-site receptors; and
- Cumulative excess lifetime cancer risk, chronic HI, acute HI, and $PM_{2.5}$ concentration from PBGF operation and surrounding sources on off-site receptors.

Furthermore, the Project's ambient air quality impacts from construction and operational emissions were evaluated against the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Construction and operational CAP and GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod®) version 2022.1, using project-specific information where available. Emissions from backup generator operations were estimated using manufacturer specification sheets.

Health impacts from diesel particulate matter and speciated total organic gas (TOG) emissions were calculated consistent with guidance in BAAQMD's CEQA guidelines (2023) and the 2015 California Environmental Protection Agency (Cal/EPA) Office of Environmental Health Hazard Assessment (OEHHA) Hot Spots Guidance (2015). Consistent with BAAQMD and OEHHA Hot Spots guidance, health impacts were based on emissions of toxic air contaminants (TACs). Concentrations of TACs were estimated using AERMOD, a Gaussian air dispersion model recommended by United States Environmental Protection Agency (USEPA), California Air Resources Board (ARB), and BAAQMD for use in preparing environmental documentation for stationary sources. Health impacts were calculated using the TAC concentrations and TAC toxicities and exposure assumptions consistent with the 2015 OEHHA Hot Spots Guidance.

Table ES-1 shows the Project construction related emissions in comparison to the BAAQMD CEQA thresholds. GHG emissions related to Project construction are estimated to be 1,171 metric tons (MT) carbon dioxide equivalents (CO_2e).

Table ES-1: Summary of Project Construction Emissions

	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Construction Daily Emissions (lb/day)				
Total	14	6.0	0.09	0.08
BAAQMD CEQA Thresholds	***54***	***54***	***82***	***54***

Table ES-2 shows the Project operational emissions at full buildout (in 2027), including emissions from generator testing and facility operation, and the BAAQMD CEQA thresholds. Project operational GHG emissions related to the emergency generators are 2,862 MT per year (MT/yr).

Table ES-2: Summary of Project Operational Emissions at Full Build-Out

	ROG^A	$NO_X{}^A$	$PM_{10}{}^A$	$PM_{2.5}{}^A$
Operational Daily Emissions (lb/day)				
Generators	4.1	16	0.65	0.65
Site Operations	15.3	1.2	2.5	0.65
Stationary Source Offsets		-16		
Total	**19.4**	**1.2**	**3.1**	**1.3**
BAAQMD CEQA Thresholds	***54***	***54***	***82***	***54***
Operational Annual Emissions (tpy)				
Generators	0.75	3.0	0.12	0.12
Site Operations	2.8	0.23	0.45	0.12
Stationary Source Offsets		-3.0		
Total	**3.5**	**0.23**	**0.57**	**0.24**
BAAQMD CEQA Thresholds	***10***	***10***	***15***	***10***

Maximum modeled ambient concentrations from Project construction and operation of the PBGF, when combined with background concentrations were found to be less than the applicable NAAQS and CAAQS for all pollutants, except the 24-hour $PM_{2.5}$ NAAQS and 24-hour PM_{10} CAAQS. In these two cases, the $PM_{2.5}$ and PM_{10} background concentrations exceed the standards on their own. Therefore, Project concentrations were compared against the respective significant impact levels (SILs) and were found to be below those values. As a result, emissions from Project construction and operation of the PBGF would not cause or contribute to an exceedance of these standards.

Table ES-3 shows the health risk impacts due to Project construction at the Maximally Exposed Individual Sensitive Receptor (MEISR), the receptor type and the BAAQMD CEQA thresholds.

Table ES-3: Summary of Construction Health Impacts at the Maximally Exposed Individual Sensitive Receptor

	Excess Lifetime Cancer Risk in one million	Noncancer Chronic HI (unitless)	Noncancer Acute HI (unitless)	$PM_{2.5}$ Concentration (µg/m^3)
Maximum Impact	0.31	0.0013	--	0.042
Receptor Type	Residential	Recreational	--	Recreational
BAAQMD CEQA Thresholds	***10***	***1***	***1***	***0.3***

Table ES-4 shows the total health impacts due to Project operations at full build-out at the Maximally Exposed Individual Receptor, the receptor type and the BAAQMD CEQA thresholds.

Table ES-4: Summary of Operational Health Impacts at the Maximally Exposed Individual Sensitive Receptor

	Excess Lifetime Cancer Risk in one million	Noncancer Chronic HI (unitless)	Noncancer Acute HI (unitless)	$PM_{2.5}$ Concentration (µg/m^3)
Maximum Impact	9.2	0.0081	0.082	0.041
Receptor Type	Residential	Residential	Recreational	Recreational
BAAQMD CEQA Thresholds	***10***	***1***	***1***	***0.3***

Table ES-5 shows the cumulative excess lifetime cancer risk, chronic HI, acute HI, and $PM_{2.5}$ concentration from PBGF operation and surrounding sources on the MEISR, which for Project operations is a residential receptor, and the BAAQMD CEQA thresholds**.**

Table ES-5: Summary of Health Risk Impacts at the Maximally Exposed Individual Sensitive Receptor

Emission Source	Excess Lifetime Cancer Risk in one million	Noncancer Chronic HI (unitless)	Noncancer Acute HI (unitless)	$PM_{2.5}$ Concentration (µg/m³)
Project Generators (100% Load)	9.2	0.0025	0.041	0.012
Existing Stationary Sources	0.28	4.4E-04	NA	3.6E-04
Railroad	0.24	6.5E-05	NA	3.1E-04
Major Roadways	2.2	0.0086	NA	0.075
Total Cumulative Impact	11.9	0.0116	0.041	0.09
BAAQMD CEQA Thresholds	***100***	***10***	***10***	***0.80***

1. INTRODUCTION

At the request of Pittsburg Data Hub, LLC, Ramboll Americas Engineering Solutions, Inc. (Ramboll) has prepared this technical report documenting air quality (AQ) and greenhouse gas (GHG) analyses for the construction and operational activities of a data center project ("Project" or "Facility"), which includes the proposed Pittsburg Data Hall (PDH) and the proposed Pittsburg Backup Generating Facility (PBGF), located at 2232 Golf Club Road in Pittsburg, California. The analyses follow the Bay Area Air Quality Management District (BAAQMD) 2022 California Environmental Quality Act (CEQA) Guidelines released in 2023 (BAAQMD 2023).

1.1 Project Description

The proposed PDH and PBGF would be located on an approximately 22-acre lot at 2232 Golf Club Road in Pittsburg, California and would be bounded to the north by West Leland Road and existing residential development, to the south and west by the Contra Costa Canal, and to the east by an existing PG&E transmission easement. The main data center building will be a minimum of 400 feet to the fenceline of the nearest residentially-zoned properties to the north (near the intersection of West Leland Road and Golf Club Road) and a minimum of 1,000 feet to the fenceline of the nearest residentially-zoned properties to the east (near Orinda Circle). The proposed Project location and boundary are shown in **Figure 1**. The PDH and PBGF would be constructed from November 2025 through May 2027. At full build-out, the Project would include thirty-seven (37) 3-megawatt (MW) capacity Tier-2 backup emergency generators with diesel particulate filters (DPF) and selective-catalytic reduction (SCR) units (equivalent to Tier 4 standards) with a total backup capacity of up to 98 MW, housed in a generator yard on the western side of a three-story data center building. Driveways, surface parking spaces, and outdoor storage areas around the building are planned to be paved.

1.2 Objective and Methodology

The BAAQMD 2022 CEQA Guidelines contain recommended thresholds for criteria air pollutant (CAP) emissions, GHG emissions, and risks and hazards associated with toxic air contaminant (TAC) emissions from an individual project. This report evaluates the AQ and GHG impacts associated with the construction and operation of the PDH and PBGF. This report also evaluates the health risks and hazards associated with construction of the PDH and PBGF, and operations of the PBGF on off-site receptors.

1.3 Thresholds Evaluated

The AQ analysis of this report evaluates the average daily and maximum annual emissions of CAPs from construction and operation of the Project and evaluates these emissions against BAAQMD's significance thresholds for emissions (BAAQMD 2023). These thresholds are as follows:

Construction CAP Emissions:

- Average daily emissions of Reactive Organic Gases (ROG) greater than 54 pounds per day (lb/day);
- Average daily emissions of Nitrogen Oxides (NO_X) greater than 54 lb/day;
- Average daily exhaust emissions of particulate matter less than 10 micrometers in diameter (PM_{10}) greater than 82 lb/day; and

- Average daily exhaust emissions of fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) greater than 54 lb/day.

Operational CAP Emissions:

- Average daily emissions of ROG greater than 54 lb/day, or maximum annual emissions of 10 tons per year (tpy);
- Average daily emissions of NO_X greater than 54 lb/day, or maximum annual emissions of 10 tpy;
- Average daily emissions of PM_{10} greater than 82 lb/day, or maximum annual emissions of 15 tpy; and
- Average daily emissions of $PM_{2.5}$ greater than 54 lb/day, or maximum annual emissions of 10 tpy.

Local carbon monoxide (CO) concentrations:

- 8-hour average concentration of 9.0 parts per million (ppm)
- 1-hour average concentration of 20.0 ppm

The GHG analysis of this report evaluates the GHG emissions from operation of the PDH and PBGF and evaluates these emissions against BAAQMD's significance thresholds for emissions. These thresholds are as follows:

- Stationary source direct GHG emissions of 10,000 metric tons per year (MT/yr)

The health risk assessment (HRA) in this report evaluates the estimated cancer risk, noncancer chronic hazard index (HI), acute HI, and $PM_{2.5}$ concentration associated with the PDH and PBGF construction, and PBGF's operational emissions of TACs. The TACs considered are those included in BAAQMD Rule 2-5, New Source Review of Toxic Air Contaminants. The HRA evaluates potential sensitive receptor locations including:

- "Residential dwellings, including apartments, houses, condominiums;
- Schools, colleges, and universities;
- Daycares;
- Hospitals; and
- Senior-care facilities." (BAAQMD 2023)

Ramboll conducted a sensitive receptor search within a 1,000-meter radius of the Project site and determined that the closest residential uses are to the north and east, located on property zoned for residential use.

To meet the above stated objectives, this HRA was conducted consistent with the following guidance:

- Air Toxics Hot Spots Program Risk Assessment Guidelines (Office of Environmental Health Hazard Assessment [OEHHA] 2015);
- BAAQMD 2022 CEQA Guidelines (BAAQMD 2023); and
- BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2023).

Ramboll compared the results of emissions and health risk analyses to the BAAQMD significance thresholds. Health risk impacts from construction of the Facility were compared against the single source impact thresholds. Operational health impacts of the backup emergency generators were also compared against the BAAQMD single source significance thresholds. The thresholds for single source impacts are:

- An excess lifetime cancer risk level of more than 10 in one million;
- A noncancer chronic HI greater than 1.0;
- A noncancer acute HI greater than 1.0; and
- An incremental increase in the annual average $PM_{2.5}$ concentration of greater than 0.3 micrograms per cubic meter (μg/m^3).

The BAAQMD has also identified significance thresholds for cumulative impacts, and the thresholds of significance are:

- An excess lifetime cancer risk level of more than 100 in one million;
- A noncancer chronic HI greater than 10.0; and
- An annual average $PM_{2.5}$ concentration of greater than 0.8 μg/m^3.

1.4 Report Organization

This technical report is divided into eight sections as follows:

Section 1.0 – Introduction: describes the purpose and scope of this technical report, the objectives and methodology used, and the report organization.

Section 2.0 – Emission Estimates: describes the methods used to estimate the emissions of CAPs, GHGs, and TACs from the PDH and PBGF;

Section 3.0 – Ambient Air Quality Impact Assessment: discusses the air dispersion modeling, the selection of the dispersion models, the data used in the dispersion models (e.g., terrain, meteorology, source characterization), and evaluation of Project construction and operational impacts against the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

Section 4.0 – Health Risk Assessment: provides an overview of the methodology for conducting the HRA and evaluation of excess lifetime cancer risks, noncancer chronic HIs, noncancer acute HIs, and $PM_{2.5}$ concentrations related to construction of the PDH and PBGF and operation of the PBGF.

Section 5.0 – References: includes a listing of all references cited in this report.

2. EMISSION ESTIMATES

Ramboll estimated CAP, GHG, and TAC emissions from construction and operation of the Project. The CAPs of interest include ROG, NO_X, $PM_{2.5}$ and PM_{10}. The GHGs of interest include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), which are commonly combined by global warming potential-weighted average into carbon dioxide equivalents (CO_2e). One of the TACs of interest on the Project is diesel particulate matter (DPM), emissions of which are assumed to be equal to exhaust PM_{10} from on- and off-road construction equipment, and exhaust PM_{10} from backup diesel engines during operation. Other TACs of interest are speciated from total organic gas (TOG) emissions. These estimates were used to compare emissions to BAAQMD significance thresholds and as inputs to the construction and operational HRAs. The methodologies used by Ramboll are summarized below.

Table 1 presents the Project characteristics and **Table 2** presents the land use assumptions used in the emissions estimation.

2.1 Calculation Methodologies for Construction Emissions

Emissions from construction activities were estimated using the California Emissions Estimator Model (CalEEMod®) version 2022.1. CalEEMod® was developed by the California Air Pollution Control Officers Association in coordination with California air districts for use in developing emission inventories suitable for CEQA analyses. Sources of construction CAP and TAC emissions are exhaust from off-road equipment, on-road vehicles, fugitive dust, and ROG emissions from architectural coating and paving activities.

2.1.1 Emissions from Off-road Equipment

CAP and TAC emissions from off-road equipment were based on the equipment inventory, equipment specifications, and their daily usage, which were based on CalEEMod® defaults. All off-road equipment for construction was assumed to be Tier 4 Final engines. CalEEMod® defaults are based on the project land use area for each land use type. The construction phasing and number of days of each phase was determined using CalEEMod® v2022.1 default assumptions based on the anticipated Project acreage, with the building construction phase shortened to align with the approximate start and end dates of construction provided by Pittsburg Data Hub, LLC. Due to the lack of existing buildings and infrastructure on site, it was assumed that there would not be a separate demolition phase of construction. **Table 3** presents the construction schedule and **Table 4** presents the construction equipment list.

2.1.2 Emissions from On-road Vehicles

CalEEMod® estimates CAP and TAC emissions from on-road haul trucks and worker and vendor trips based on vehicle type, emission factor, distance travelled, and number of trips. The number of construction worker, vendor, and hauling trips were derived from the CalEEMod® default trip rates. The construction trip generation rate for the Project is shown in **Table 5**. The emission factors used in the analysis are CalEEMod® defaults. All haul trucks were assumed by CalEEMod® to be Heavy Heavy-Duty Trucks (HHDT), vendor trucks were assumed to be 50% HHDT and 50% Medium Heavy-Duty Truck, and worker vehicles were assumed to be a 25%/50%/25% mix of Light Duty Automobiles, Light Duty Truck Class 1, and Light Duty Truck Class 2, consistent with CalEEMod® defaults. CalEEMod® contains fuel-type information by fleet mix for each year. The default trip lengths in CalEEMod® were used. That is, for haul trucks, a 20-mile one-way trip length was used. For worker trips, a 11.7-

mile one-way trip length was used. For vendor trips, a 8.4-mile one-way trip length was used.

2.1.3 Emissions from Fugitive Dust

Fugitive dust emissions are typically generated during construction phases, and fugitive dust contributes to both PM_{10} and $PM_{2.5}$ emissions. Fugitive dust is generated by various activities during construction such as site preparation and grading. Project-specific quantities for material import and export are specified in **Table 6**. On-road fugitive dust is also generated by vehicles traveling on paved and unpaved roads. Fugitive dust emissions associated with material movement and on-road sources were estimated based on CalEEMod® defaults. BAAQMD has identified eight best management practices (BMPs) to control fugitive dust emissions from construction activities. The proposed Project would commit to watering exposed areas twice daily, consistent with BAAQMD BMPs.

2.1.4 Emissions from Architectural Coating and Asphalt Paving

ROG off-gassing emissions from paving are calculated based on the paved parking area of the Project site using CalEEMod®'s volatile organic compounds (VOC) per square foot emission factor.

ROG off-gassing emissions from architectural coatings are calculated based on the square footage of the new buildings, an assumed VOC content of the paint, and an application rate of 100%, consistent with CalEEMod® methodology. The VOC content of the interior and exterior paints are assumed to be consistent with the limits set in BAAQMD Regulation 8, Rule 3 (BAAQMD 2009).

2.1.5 Summarized Construction Emissions

CAP and GHG emissions from on- and off-road construction sources are presented by construction phase in **Table 7**. To compute the average daily construction CAP emissions, CAP emissions from each construction phase were added and then normalized over the total number of days of construction. The resulting average daily construction CAP emissions are compared against the average daily BAAQMD construction CAP thresholds in **Table 7**.

CalEEMod® outputs for PDH and PBGF construction emissions are included in **Appendix A** of this technical report.

2.2 Calculation Methodologies for Operational Emissions

Emissions from PDH and PBGF operation were estimated using CalEEMod® for land use and building emissions (except energy) and manufacturer's data for stationary sources (i.e., emergency generators). Emissions from building energy usage were estimated separately outside of CalEEMod®.

2.2.1 Stationary Sources

The proposed PBGF includes 37 diesel backup emergency generators, the locations of which are shown in **Figure 1**. **Table 8** presents the uncontrolled and controlled emission factors used to calculate the average daily and maximum annual criteria pollutant emissions. Ramboll used emissions factors provided by MIRATECH for the ACIS-3 (M3-80-70-30PF-B-R4) engine configuration based on the outlet emission performance, with the controlled emission factors accounting for the presence of DPF and SCR control devices. Emission factors for all pollutants except NO_X and PM were considered uncontrolled. The uncontrolled emission factors conservatively incorporate safety factors to make the nominal emission factors more reflective of potential site variation (i.e., worst-case) emission factors. Manufacturer specification sheets are provided in **Appendix B**.

Table 9 and **Table 10** present the average daily and maximum annual emissions, respectively, based on 34 hours of operations for testing and maintenance purposes, conservatively assuming operation at 100% load. GHG emissions from the diesel engines were calculated following the same methodology as described above for CAPs. GHG emission factors were obtained from AP-42 documentation for Large Stationary Diesel Engines. Ramboll used the United States Environmental Protection Agency's (USEPA's) Mandatory Reporting Rule emission factors for CH_4 and N_2O emissions (USEPA 2013a), which were used to develop a CO_2e emission factor using the same global warming potentials as is described in USEPA's 40 CFR Part 98 Vol. 78 rules and regulations (USEPA 2013b).

In addition, Ramboll evaluated the Project's potential obligations for emission offsets under BAAQMD Rule 2-2. According to BAAQMD Rule 2-2, emissions offsets are required at a 1:1 ratio for facilities with a potential to emit (PTE) more than 100 tpy of $PM_{2.5}$, PM_{10}, or SO_2. For emissions of NO_X or precursor organic compounds (POC), offsets are required at a 1:1 ratio for facilities with a PTE more than 10 tpy, and these offsets are available from the BAAQMD Small Facility Banking Account (SFBA) until a facility's PTE exceeds 35 tpy. Offsets are required at a 1.15:1 ratio for facilities with a PTE more than 35 tons/year of NO_X or POC, and such facilities must purchase their own offsets. In 2019, BAAQMD adopted a policy affecting emissions calculations for emergency generators. Under this policy, when evaluating regulatory applicability, annual emissions calculations must include 100 hours of operation for each engine during emergency periods, in addition to the allowable hours for non-emergency testing and maintenance operation. Therefore, when comparing emissions to the offset thresholds listed above, emissions from emergency and non-emergency operation must be included. BAAQMD's policy also states that emissions during emergency operation should not be included for compliance evaluations, such as determining the quantity of offsets that are required to be purchased.

To evaluate the Project's potential obligations for emission offsets, Ramboll estimated the annual emissions from the backup generators assuming 34 hours of operation for testing and maintenance purposes, plus an additional 100 hours of emergency operation. **Table 11** presents annual CAP emissions for 134 hours of operation per generator. The resulting emission estimate exceeds the offset threshold of 10 tpy NO_X, thus the Project will offset these emissions consistent with BAAQMD Rule 2-2.

The Project would also emit ammonia from the generator SCR control devices. Ramboll estimated the Project's potential ammonia emissions assuming a maximum exhaust concentration of 10 parts per million by volume (ppmv) and assuming that the SCRs will operate a maximum of 34 hours per year. These emissions are presented in **Table 12**.

2.2.2 Diesel Storage Tanks

The bottom generator of each stacked pair will have an approximate 10,400-gallon diesel fuel storage tank to serve both generators. For emissions estimation purposes, Ramboll conservatively assumed that the single-stacked generator would have a similarly-sized fuel tank, for a total of 19 primary storage tanks. The upper generators in the stacked configuration would also each have a day tank with a storage capacity of approximately 500 gallons. Ramboll assumes that the emissions from the day tanks would be de minimis.

Ramboll estimated the VOC emissions from the 19 primary tanks using methodology consistent with AP-42, Vol.1, Section 7.1 for Liquid Storage Tanks. To estimate the annual fuel throughput of each tank, Ramboll multiplied the hourly fuel usage rate for the generators at 100% load (205 gallons per hour) by the proposed maximum annual hours of operation for the generators (34 hours per year). This assumption is conservative as the generators are anticipated to operate at 100% load for only a fraction of their use in a given year. In addition, the emissions were conservatively calculated assuming the storage tanks would remain 50% full, which would result in greater emissions than if the tanks were assumed mostly full, which is the probable scenario. Ultimately, the combined VOC emissions from all 19 tanks was estimated to be 0.021 tons per year, or less than 1% of operational VOC emissions at full buildout. **Tables 13** and **14** summarize the tank VOC and TAC emissions calculations, and the tank VOC emissions in the context of the broader project operational emissions is provided in **Table 18**.

2.2.3 Land Use Sources

Ramboll used CalEEMod® to estimate CAP and GHG emissions due to mobile sources, area sources such as landscaping maintenance equipment, water treatment and distribution, and wastewater usage. GHG emissions due to electricity usage at the site were calculated outside of CalEEMod® based on the Project's estimated maximum annual energy consumption. The energy usage for building operations exclusive of the operations of the data center are included in this estimate.

The Project site is not expected to have any natural gas consumption. GHG emissions from energy use is reported in **Table 15**. Annual GHG emissions associated with electricity usage are the product of the maximum estimated annual electricity usage and the utility-specific carbon intensity factor, which depends on the utility's portfolio of power generation sources. The electricity for the PDH will be provided by the Pacific Gas and Electric Company (PG&E). The energy use emission estimate for operations was conservatively based on the default CO_2, CH_4, and N_2O intensity per megawatt-hour (MWh) forecasted by CalEEMod® for PG&E for 2027.

Maximum energy use for data center activities was estimated to be 858,480 MWh/year. Total energy usage estimates for PDH operations are presented in **Table 15**.

For trip-related emissions, Ramboll relied on a Project-specific estimate for operational trip generation of 463 trips per day. Ramboll conservatively assumed that there were not any trips at the site associated with the existing land use, which is the abandoned Delta View Golf Course. The operational trip rates used in CalEEMod® are shown in **Table 16**.

In addition, annual GHG emissions associated with water usage were based on an estimated indoor annual water usage of 15,029,638 gallons per year for the Data Halls and Mechanical Galleries land use and 151,772 gallons per year for the Admin/Office/Storage land use, as well as an estimated outdoor annual water usage of 6,208,744 gallons per year for the landscaping area, as provided by Pittsburg Data Hub, LLC for site operations. Water usage rates for the Project are provided in **Table 17**.

Total PDH and PBGF operational CAP emissions are the sum of land-use, emergency generator, and diesel storage tank emissions, as shown in **Table 18**. The average daily CAP emissions and annual CAP emissions are compared against the BAAQMD thresholds of significance for operational emissions. As discussed previously, the Project will be required to offset its NOx emissions consistent with BAAQMD Rule 2-2.

CalEEMod® outputs for PDH and PBGF operational emissions are included in **Appendix A** of this technical report.

2.2.4 Summary of Project Operational GHG Emissions

GHG emissions for PDH and PBGF operation are presented in **Table 19**. CalEEMod® outputs for PDH and PBGF operational emissions are included in **Appendix A** of this technical report. GHG emissions from the emergency generators are subject to the BAAQMD CEQA threshold for stationary sources.

Electricity usage makes up over 95% of the Project's operational GHG emissions. GHG emissions associated with electricity usage from the data center will continue to decline after 2027 due to increasing requirements for renewable power in California. As described above, electricity to the PDH would be provided by PG&E, a utility that is on track to meet the 2030 Renewable Portfolio Standards and its associated GHG emissions reductions.

3. AMBIENT AIR QUALITY IMPACT ASSESSMENT

3.1 Modeling Methodology, Settings, and Inputs

Ramboll conducted an air dispersion modeling analysis to determine compliance of PDH and PBGF construction and PBGF operation with the NAAQS and CAAQS. The analyses were conducted consistent with the following guidance documents:

- United States Environmental Protection Agency (USEPA) Guideline on Air Quality Models 40 CFR 51, Appendix W (Revised, January 17, 2017), herein referred to as Appendix W;
- USEPA's AERMOD Implementation Guide (Rev. June 2022);

The applicable NAAQS and CAAQS are shown in **Table 20**.

3.1.1 Background Concentrations

Background concentration data for the Project's air quality impact assessment were obtained from the Concord AQS Monitoring Station (2956-A Treat Boulevard, Monitor Site ID 06-013-0002) for the years 2020-2022 and are presented in **Table 21**. The selection of this station was made in consideration of input from BAAQMD staff, given the lack of an appropriate station in Pittsburg.

For the nitrogen dioxide (NO_2) modeling, hourly NO_2 data from 2020-2022 was obtained from the Concord AQS Monitoring Station, with missing data substituted in two stages. If one or two consecutive hours were missing, the values were replaced by the larger value of the preceding or following hour. If three or more consecutive hours were missing, the three-year (i.e., 2020-2022) 98th percentile value was used to substitute for the missing hours. The resulting dataset was used to develop season-by-hour values for input into the modeling.

Hourly ozone data for 2020-2022 was also obtained from the Concord AQS Monitoring Station. Due to automated daily maintenance at 2 AM, no hourly ozone data was collected by the monitor for 2 AM for any day in years 2020-2022. To fill this missing hour, the value was interpolated from the 1 AM and 3 AM values surrounding this timepoint each day. If additional hours were missing, then it was assumed a maximum hourly concentration was not occurring at that time and a concentration value of zero was used. The resulting dataset was used to develop season-by-hour values for input into the modeling.

3.1.2 Model Selection and Settings

To estimate off-property ambient concentrations, Ramboll used version 23132 of the AERMOD modeling system. AERMOD is USEPA's recommended air dispersion model for near-field (within 50 kilometers [km]) modeling analyses. AERMOD is appropriate for use in estimating ground-level, short-term ambient air concentrations resulting from non-reactive buoyant emissions from sources located in simple and complex terrain.

This analysis was conducted using AERMOD's regulatory default settings. Ambient concentrations were estimated using AERMOD in conjunction with information about the site, the locations of the emitting stacks, representative meteorological data, and nearby receptors. The North American Datum of 1983 (NAD83) of the Universal Transverse Mercator (UTM) Coordinate System (Zone 10) was used, which provides a constant distance relationship anywhere on the map or domain. The units of the coordinates are in meters.

3.1.3 Model Sources and Release Parameters

The NAAQS and CAAQS analyses added impacts from the Facility sources and the background to yield a cumulative impact. The following sections describe the release parameters that were used in the model.

3.1.4 Construction Sources

The emissions used in the air dispersion modeling analysis for construction of the PDH and PBGF include the exhaust and fugitive dust emissions from the Project's on-site off-road construction equipment, as well as the exhaust and fugitive dust emissions from the Project's off-site on-road mobile sources up to 1,000 feet from the Project boundary, as shown in **Table 22**. These emissions were estimated in CalEEMod® following the methodology described in **Section 2**. BAAQMD does not provide numerical thresholds of significance for assessing fugitive dust related impacts during construction. Instead, the BAAQMD 2022 CEQA Guidelines call for the use of its BMPs to consider impacts from fugitive dust emissions less than significant. The construction of the proposed Project would involve implementation of the BAAQMD-recommended BMPs, thereby limiting potential impacts due to fugitive dust emissions.

Maximum hourly emission rates were derived by identifying the construction subphase with the maximum daily emissions for each pollutant from CalEEMod® and dividing by 8 hours per day. To avoid being overly conservative, daily emission rates were calculated using a weighted average approach, whereby the daily emissions for each pollutant from CalEEMod® were divided by 11 hours per day to account for the full construction workday and then weighted according to the length of each construction subphase. This approach avoids overestimating impacts from one-time construction phases that are short in duration and unlikely to overlap with worst-case meteorological conditions. Annual emission rates were calculated using the maximum annual emissions and dividing by 4,015 hours per year (365 days per year x 11 hours per day). These emission rates can be found in **Tables 23-25.** The EMISFACT option in AERMOD was utilized to indicate that construction activities would occur between the hours of 7 AM and 6 PM.

In the model, the construction exhaust and fugitive dust emissions were represented as area sources covering the entire Project site.

3.1.5 Operational Sources

Recognizing the short-term nature of many of the CAAQS and NAAQS, the air dispersion modeling analysis for operation of the PBGF evaluated all discrete load levels for which generator emissions data was available (i.e., 25%, 50%, 75%, and 100%) to identify the potential worst-case ambient air quality impacts.

At full buildout of the PBGF, there will be a single row of backup emergency generators in a double-stacked arrangement with 18 generators on each level, as well as 1 unstacked generator on the lower level. **Figure 1** shows locations for all 37 generators and source parameters are detailed in **Table 26.** The generators were represented by point sources with identical exit temperatures, exit velocities, and exit diameters, specific to each load scenario and based on manufacturer provided information.

Generator gram-per-second emission rates were derived using manufacturer-provided emission rates in grams per horsepower-hour. Hourly emission rates were calculated assuming 60 minutes of operation in an hour. Daily emission rates were calculated by dividing 60 minutes of operation by 24 hours, as maintenance activities could occur at any hour of the day. Annual emission rates were calculated assuming 34 hours per year of operation and dividing by 8,760 hours per year (365 days per year x 24 hours per day). For 25% generator load, NOx emissions were assumed to be fully uncontrolled. For generator loads at or above 50%, NOx emission rates were conservatively calculated assuming 15 minutes of uncontrolled emissions and 45 minutes of controlled emissions for every hour of operation, to account for the warm-up period of the SCR. The final model emission rates can be found in **Tables 27-29**.

3.1.6 Building Downwash

The AERMOD model incorporates Plume Rise Modeling Enhancements (PRIME) to account for downwash. The direction-specific building downwash dimensions used as inputs were determined by the latest version (04274) of the Building Profile Input Program, PRIME (BPIP PRIME). BPIP PRIME uses building downwash algorithms incorporated into AERMOD to account for the plume dispersion effects of the aerodynamic wakes and eddies produced by buildings and structures.

Ramboll evaluated onsite buildings at the Facility for downwash effects on each modeled point source, as well as nearby offsite buildings. It was determined that the nearby offsite buildings would not influence the generators based on the dimensions of those buildings and their distance from the generators (i.e., outside of the 5L downwind area of influence). Each generator is located inside its own weather-proof enclosure, which was included as a downwash structure in the model, as an onsite building. The modeled parameters for the buildings and the weather-proof enclosures for the generators are provided in **Table 30**.

3.1.7 Good Engineering Practice Stack Height Analysis

USEPA has promulgated regulations that limit the maximum stack height one may use in a modeling analysis to no more than the Good Engineering Practice (GEP) stack height. The purpose of this requirement is to prevent the use of excessively tall stacks to reduce the modeled concentrations of a pollutant. GEP stack height is impacted by the heights of nearby structures. In general, the maximum value for GEP stack height is 65 meters. The stack heights for the Facility’s generator stacks do not exceed the GEP stack height.

3.1.8 Terrain Data and Land Use

Per USEPA guidance, terrain elevations were incorporated into the model using the latest version (18081) of AERMAP, AERMOD’s terrain preprocessor. Terrain elevation data for the entire modeling domain was extracted from 1/3 arc-second National Elevation Data (NED) files with a resolution of approximately 10 meters. The NED files were obtained from the United States Geological Survey (USGS) Multi-Resolution Land Characteristics (MRLC) Consortium. AERMAP was configured to assign elevations for the property line receptors and discrete gridded receptors in the modeling domain. All onsite features (i.e., buildings) were assumed to be at the same elevation.

Land use classification determines the type of area to be modeled. The different classifications, urban or rural, incorporate distinct pollutant dispersion characteristics and affect the estimation of downwind concentrations when used in the model. Based on the land use around the Facility, the rural boundary layer option in the model was selected.

3.1.9 Meteorological Data

AERMOD requires a meteorological input file to characterize the transport and dispersion of pollutants in the atmosphere. Surface and upper air meteorological data inputs, as well as surface parameter data describing the land use and surface characteristics near the site, are processed using AERMET, the meteorological preprocessor to AERMOD. The output file generated by AERMET is the meteorological input file required by AERMOD.

A representative meteorological data set from the Pittsburg PG&E meteorological station (Site ID 2801) for the three-year period from January 2009 through December 2011 was provided to Ramboll by BAAQMD staff. This data set was processed by BAAQMD using AERMET (version 18081) and used by Ramboll for dispersion modeling purposes in this analysis.

3.1.10 Receptor Grid

Concentrations were calculated at receptors placed along the facility fence line and on a Cartesian grid. For this analysis, receptors extending up to 500 meters from the fence line were modeled using the following resolutions (**Figure 2**):

- 10-meter resolution for fence line receptors; and
- 20-meter resolution extending from the fence line to 500 meters.
- 50-meter resolution extending from 500 meters to 1,500 meters.
- 100-meter resolution extending from 1,500 meters to 3,000 meters.

3.1.11 Modeling Approach

For all pollutants except 1-hour NO_2, concentrations were modeled using unit emission rates (i.e., 1 gram per second [g/s]), and the model estimates dispersion factors with units of ($\mu g/m^3$)/(g/s). Emission rates for the appropriate averaging period were combined with the corresponding dispersion factors to obtain modeled concentrations.

To evaluate results against the NAAQS, the average three-year (2020-2022) background concentration from the Concord AQS Monitoring Station was added to the maximum modeled concentration and compared against the applicable standard. To evaluate results against the CAAQS, the maximum 2020-2022 background concentration was added to the maximum modeled concentration and compared against the applicable standard.

<u>1-Hour NO_2 Modeling</u>

The Tier 3 Plume Volume Molar Ratio Method (PVMRM) was used to demonstrate compliance with the 1-hour NO_2 NAAQS and CAAQS. As part of the recent Appendix W updates, USEPA incorporated the PVMRM as a regulatory default method for NO_2 modelling. The modeled generator source groups are presented in **Figure 3**.

Ramboll used a NO_2/NO_X in-stack ratio of 0.10 for the Facility's proposed backup emergency generators. This value was selected based on data from onsite generators of similar makes and models as the proposed generators, and from USEPA's In-Stack Ratio Database for diesel/kerosene-fired reciprocating internal combustion engines (RICE).[1]

For evaluations of 1-hour NO_2 impacts against the NAAQS, seasonal, hour-of-day background values were input into the model via the BACKGRND keyword. By using this approach, AERMOD automatically pairs the modeled impacts with the appropriate seasonal, hour-of-day value. For the CAAQS, AERMOD was run with the H1H setting on the POLLUTID

[1] Available at: https://www.epa.gov/scram/nitrogen-dioxidenitrogen-oxide-stack-ratio-isr-database. Accessed: January 2024.

line to produce the true highest-first-high (H1H) value for comparison to the 1-hour NO_2 CAAQS. A copy of the worksheet used to develop the seasonal hour-of-day values can be found in **Appendix C**. Results from that worksheet were processed using a python script where the seasonal-by-hour background values were determined. The output of the python script was used in the 1-hour NO_2 AERMOD input files.

3.2 Summary of Modeling Results

Tables 31-34 summarize the modeling results and comparison against the NAAQS and CAAQS. Maximum modeled ambient concentrations, when combined with background concentrations are less than the NAAQS and CAAQS for all pollutants, except the 24-hour $PM_{2.5}$ NAAQS and 24-hour PM_{10} CAAQS. In these cases, the $PM_{2.5}$ and PM_{10} background concentrations exceed the standards on their own. Therefore, the Project concentrations were compared against the respective significant impact levels (SILs). As shown in **Tables 35 and 36**, the Project concentrations are below the SILs and thus would not be considered significant. As a result, emissions from construction of the PDH and PBGF and operation of the PBGF would not cause or contribute to an exceedance of these standards.

4. HEALTH RISK ASSESSMENT

Emissions during the construction of the PDH and PBGF and operation of the PBGF have the potential to be transported outside of the physical boundaries of the Project site and impact nearby sensitive receptors. To evaluate those potential impacts, Ramboll conducted a health risk assessment of the sources of TAC emissions from construction of the PDH and PBGF and operation of the PBGF and compared the results against BAAQMD significance thresholds.

4.1 Estimated Air Concentrations

To evaluate the health risks and concentration of air toxics in the surrounding community, BAAQMD recommends estimating concentrations using air dispersion modeling. The methodologies used to evaluate TAC emissions from the Project are based on Appendix E: *Recommended Methods for Screening and Modeling Local Risks and Hazards* from the BAAQMD 2022 CEQA Guidelines (BAAQMD 2023) and the most recent Air Toxics Hot Spots Program Risk Assessment Guidelines from OEHHA and updated in 2015. The 2015 OEHHA guidelines are based on years of scientific studies evaluating health risks and include several conservative assumptions to be protective of human health and to estimate potentially higher risks and sensitivity factors for infants, children, and other sensitive receptors.

Similar to the Air Quality Impact Assessment described in **Section 3**, air concentrations of TACs from construction of the PDH and PBGF and operation of the PBGF were estimated using version 23132 of the AERMOD modeling system. Details on the inputs and methodology used in the dispersion modeling are discussed further in the sections below.

4.1.1 Sources of Emissions

The relevant sources of TAC emissions during construction of the PDH and PBGF are off-road equipment and on-road trucks, both of which are assumed to operate on diesel fuel. For operation of the PBGF, the relevant source of TAC emissions is maintenance and testing of the backup emergency generators, which also operate on diesel fuel. Emissions estimates for operational mobile sources were not included in the operational HRA since the total number of vehicle trips are estimated to be less than 500 trips per day which BAAQMD has historically considered as a minor, low-impact source which does not pose a significant health risk. Furthermore, TAC emissions from the Project's diesel storage tanks were not included in the analysis as they were found to be *de minimis*.

4.1.2 Chemical Selection

The primary source of TAC emissions during construction of the PDH and PBGF and operation of the PBGF is diesel exhaust. Diesel exhaust, a complex mixture that includes hundreds of individual constituents, is identified by the State of California as a known carcinogen (California Environmental Protection Agency [Cal/EPA] 1998). CARB classified "particulate emissions from diesel-fueled engines" (17 CCR 93000) as a TAC in August 1998. DPM is emitted from a broad range of diesel engines, including: on-road diesel engines of trucks, buses, and cars, and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Under California regulatory guidelines, DPM is used as a surrogate measure of exposure for the mixture of chemicals that make up diesel exhaust as a whole. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003). The DPM analyses for cancer and chronic hazards for this Project were based on the surrogate approach, as recommended by Cal/EPA.

In the absence of an acute toxicity value for diesel exhaust, speciated diesel TOG emissions were used as a conservative estimate for assessing acute hazards related to operation of the PBGF.

4.1.3 Air Dispersion Modeling

AERMOD Version 23132 was used to evaluate ambient air concentrations of DPM, $PM_{2.5}$ and TOG at off-site receptors from PBGF non-emergency use of the backup generators and during Project construction. Source parameters, terrain elevations, land use assumptions, and meteorological data were incorporated into the analysis consistent with the methodology for the Air Quality Impact Assessment described in **Section 3**.

Emission rates: Emissions were modeled using unit emission rates (i.e., 1 g/s), with the model estimating dispersion factors with units of (µg/m^3)/(g/s). Emission rates for the appropriate averaging period were combined with the corresponding dispersion factors to obtain modeled concentrations.

For PBGF operation, the proposed generators will be able to be tested 24/7. Construction activities were assumed to be restricted to the hours of 7 AM to 6 PM. Modeled annual emission rates for construction were calculated by dividing total emissions for each year by 4,015 hours per year (365 days per year x 11 hours per day). Operational modeled annual emission rates were calculated assuming 34 hours of operation for each generator and dividing by 8,760 hours per year (365 days per year x 24 hours per day). The modeled emissions rates are shown in **Table 37**.

Consistent with BAAQMD's permitting approach, the health risk impact from operation of the generators was assessed assuming the generators were operated at 100% load for all runtime hours in the year. When evaluating acute impacts related to operations, the generators were analyzed in the same source groups as presented in **Figure 3.**

Receptors: Nearby sensitive receptor populations were identified within a 1,000-meter radius of the Project site, which is larger than Project's 1,000-foot zone of influence, as defined by BAAQMD. A receptor grid was created to cover all potential sensitive receptors within 1,000 meters of the Project site. Receptors falling on roadways or railways were labeled as such and removed from further analysis. A grid of receptors with 20-meter spacing was used and modeled off-site receptors are shown in **Figure 4.**

As discussed previously, nearby sensitive receptors include residents to the north and east of the Project site. In addition, Ramboll identified three schools within 1,000 meters of the Project site and modeled sensitive receptors at those locations. All locations within the 1,000 meters that were identified as commercial or industrial land uses were modeled as worker receptors. Lastly, areas identified as open spaces or greenways within the 1,000-meter radius were modeled as recreational receptors. A list of all discrete non-residential sensitive receptors that were identified and included in the analysis can be found in **Table 38.**

Receptors were modeled at 1.5 meters of height, consistent with BAAQMD guidance for breathing height (BAAQMD 2023) and average annual and maximum hourly dispersion factors were estimated for each receptor location.

Concentrations: For annual average ambient air concentrations, the estimated annual average dispersion factors were multiplied by the annual average emission rates. For maximum hourly ambient air concentrations, the estimated maximum hourly dispersion factors were multiplied by the maximum hourly emission rates.

4.2 Risk Characterization Methods

The following sections discuss in detail the various components required to conduct the HRA of the construction of the PDH and PBGF and operation of the PBGF.

4.2.1 Exposure Assessment

Potentially Exposed Populations: This assessment evaluated off-site receptors potentially exposed to emissions from PDH and PBGF construction and PBGF operations. These exposed populations include residential receptors, school receptors, worker receptors, and recreational receptors. Both long-term health impacts (cancer risk, chronic HI, and $PM_{2.5}$ concentration) and acute hazards were evaluated for all sensitive receptor locations. Receptors falling within a roadway or railway were excluded from the analysis.

Exposure Assumptions: The exposure parameters used to estimate excess lifetime cancer risks due to Project construction and operational activities were obtained using risk assessment guidelines from BAAQMD (2023) and OEHHA (2015) and are presented in **Table 39**. Based on the TACs considered, the only relevant exposure pathway is inhalation, so this analysis considers inhalation exposure only.

For offsite residential receptors, Ramboll selected conservative exposure parameters assuming that exposure would begin during the third trimester of a residential child's life. Ramboll used 95th percentile breathing rates up to age 2, and 80th percentile breathing rates above age 2, consistent with BAAQMD guidance (2023) OEHHA guidance (2015). For construction, off-site residents were assumed to be present at one location for the entire duration of the construction period. For operation, off-site residents were assumed to be present at one location for a 30-year period, beginning with exposure in the third trimester.

For offsite school receptors, Ramboll used the default student breathing rate from BAAQMD guidance (2023), which are consistent with the 95th percentile 8-hour breathing rate for moderate intensity activities from OEHHA guidelines (2015) and assumed the child would be at the elementary school for a period of 7 years and the junior high school for a period of 3 years. For construction and operations, the child was assumed to be present at the location for 8 hours a day, for 5 days a week for a maximum of 180 days per year.

For offsite worker receptors, Ramboll used the 95th percentile 8-hour breathing rate from the BAAQMD guidance (2023) and OEHHA guidelines (2015). It was assumed that a worker would be present at the location 8 hours a day, for 5 days a week for 250 days per year. For construction, off-site workers were assumed to be present at one location for the entire duration of construction. For operation, off-site workers were assumed to be present for a 25-year period.

For offsite recreational receptors, exposure parameters were selected with the conservative assumption that a person would visit the maximally exposed location within the open space and greenways around the project site starting from birth (age 0) for one hour every week for a total of 52 hours per year. For construction, recreational receptors were assumed to visit the site for 1 hour a week for the entire duration of construction. For operation, recreational receptors were assumed to continue visiting the site over a 30-year period. Ramboll used the 95th percentile 8-hour breathing rate for moderate intensity activities from the OEHHA (2015) guidelines, scaled to 1 hour.

All areas within the 1,000-meter buffer of the project site contain receptor locations that have been classified as either residential, worker, student or recreational receptors. As shown in **Figure 4**, the only areas within the buffer that do not contain receptor locations are the areas where roadways and sidewalks exist. It is unreasonable to assume exposure parameters or calculate health risks for these areas.

Calculation of Intake: The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * CF}{AT}$$

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
FAH	=	Fraction of Time at Home (unitless)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the OEHHA Hot Spots guidance (2015).

4.2.2 Modeling Adjustment Factors

Cal/EPA recommends applying an adjustment factor to the annual average concentration determined through dispersion modeling by assuming continuous emissions (*i.e.*, 24 hours per day, 7 days per week), when the actual emissions occur less than 24 hours per day and exposures are concurrent with emissions-generating activities occurring at the Project. The modeling adjustment factors are discussed below.

Residents are assumed to be exposed to Project emissions 24 hours per day, seven days per week. This assumption is consistent with the modeled annual average air concentration. Thus, the annual average concentration need not be adjusted for residential receptors.

While the emissions associated with reliability-related activities could occur at all hours of the day and the dispersion was modeled as such, estimates of exposure were adjusted to conservatively assume that most emissions would occur during daytime hours and during the week when offsite workers are present and children are expected to be at school. Thus, a MAF of 4.2 was applied to the annual average concentration used in the evaluation of the offsite worker receptors to account for an emissions schedule equivalent to a worker's schedule of 8 hours per day, 260 days per year ([24 hours/8 hours]*[365 days/260 days]). These concentrations represent the theoretical maximum average concentrations over the operating period to which the offsite worker might be exposed. To be conservative, the modelling adjustment factor of 4.2 was also applied to student and recreational receptors despite their assumed exposure being less than that of a worker receptor.

The exposure point concentrations for the offsite worker, student, and recreational receptor are calculated using the following equation:

$$C_i = C_{i,annual} \times MAF$$

4.2.3 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer endpoints. Toxicity values used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

Excess lifetime cancer risk and chronic HI calculations for Project construction and PBGF operation utilized the toxicity values for DPM. Acute HI calculations for operations utilized the toxicity values for TACs from speciated diesel TOG emissions. The speciation profiles used are presented in **Table 40**. The toxicities of each chemical are shown in **Table 41**. The TACs of concern have inhalation health effects only.

4.2.4 Age Sensitivity Factors

The estimated excess lifetime cancer risks for a resident child were adjusted using the age sensitivity factors (ASFs) recommended by OEHHA (2015). This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 to 30 years. **Table 39** shows the ASFs used.

4.2.5 Risk Characterization

4.2.5.1 Estimation of Cancer Risks

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific cancer potency factor (CPF).

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_{inh} = C_i \times CF \times IF_{inh} \times CPF \times ASF$$

Where:

$Risk_{inh}$	=	Cancer risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)
C_i	=	Annual average air concentration for chemical during $activities_i$ ($\mu g/m^3$)
CF	=	Conversion factor (mg/μg)
IF_{inh}	=	Intake factor for inhalation (m^3/kg-day)
CPF_i	=	Cancer potency factor for $chemical_i$ (mg chemical/kg body weight-day)$^{-1}$
ASF	=	Age sensitivity factor (unitless)

4.2.5.2 Estimation of Chronic and Acute Noncancer Hazard Quotients/Indices

Chronic HQ

The potential for exposure to result in adverse chronic noncancer effects is evaluated by comparing the estimated annual average air concentration (which is equivalent to the average daily air concentration) to the noncancer chronic reference exposure level (cREL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient (HQ). To evaluate the potential for adverse chronic noncancer health effects from simultaneous exposure to multiple chemicals, the chronic HQs for all chemicals are summed, yielding a chronic HI.

$$HQi = Ci / cREL$$

Where:

HQi	=	Chronic hazard quotient for chemical i
HI	=	Hazard index
Ci	=	Annual average concentration of chemical i ($\mu g/m^3$)
cRELi ($\mu g/m^3$)	=	Chronic noncancer reference exposure level for chemical i

Acute HI

The potential for exposure to result in adverse acute effects is evaluated by comparing the estimated one-hour maximum air concentration of chemical to the acute reference exposure level (aREL) for each chemical evaluated in this analysis. When calculated for a single chemical, the comparison yields an HQ. To evaluate the potential for adverse acute health effects from simultaneous exposure to multiple chemicals, the acute HQs for all chemicals are summed, yielding an acute HI.

$$HQi = Ci / aREL$$

Where:

HQi	=	Acute hazard quotient for chemical i
HI	=	Hazard index
Ci	=	One-hour maximum concentration of chemical i (μg/m^3)
aRELi	=	Acute reference exposure level for chemical i (μg/m^3)

4.3 Summary of HRA Results

This section summarizes the results from the construction and operational HRAs as they relate to each of the BAAQMD CEQA thresholds for health risk and hazards. As discussed in **Section 1.3**, the single source significance thresholds for health risks and hazards from construction of Project and operation of PBGF are:

- An excess lifetime cancer risk level of more than 10 in one million;
- A chronic noncancer HI greater than 1.0;
- A noncancer acute HI greater than 1.0; and
- An incremental increase in the annual average $PM_{2.5}$ of greater than 0.3 μg/m^3.

The BAAQMD significance thresholds for cumulative health risk and hazard impacts are:

- An excess lifetime cancer risk level of more than 100 in one million;
- A noncancer chronic HI greater than 10.0; and
- An annual average $PM_{2.5}$ concentration of greater than 0.8 μg/m^3.

4.3.1 Construction HRA

Table 42 shows the excess lifetime cancer risk, chronic noncancer HI, and annual $PM_{2.5}$ concentration at the maximally exposed individual resident (MEIR), maximally exposed individual worker (MEIW), maximally exposed recreational receptor (MERR), and maximally exposed school receptor (MESR) during construction of the Project. Project construction is expected to occur over about 18 months, from November 2025 through May 2027. The risks and health impacts reported here are for the entire duration of construction period. As shown in **Table 42**, the maximum cancer risk impact, chronic HI, and $PM_{2.5}$ concentrations at all receptors are below the BAAQMD single source significance thresholds for health risks and hazards.

4.3.2 Operational HRA

Table 43 shows the excess lifetime cancer risk, chronic noncancer HI, acute noncancer HI and annual $PM_{2.5}$ concentration at the MEIR, MEIW, MERR, and MESR during backup generator operation at 100% load. The health impacts presented in this table are based on an annual maximum operating limit of 34 hours for testing and maintenance operations. As shown in **Table 43**, the maximum cancer risk impact, chronic HI, acute HI and $PM_{2.5}$ concentrations at all receptors are below the thresholds of significance.

4.3.3 Cumulative Health Risk Assessment

The BAAQMD 2022 CEQA Guidelines (2023) require an analysis of all past, present, and foreseeable future sources within 1,000 feet of the fence line for the Project.

Stationary sources contributing health risks and hazard impacts within a 1,000-foot radius of the Project site were determined using BAAQMD's updated CEQA Tool "Stationary Source Screening Map,"[2] a GIS map which provides locations of stationary sources permitted by the District. Appropriate distance multipliers provided by the BAAQMD CEQA Tool "Health Risk Calculator with Distance Multipliers" were applied to represent adjusted risk and hazard impacts that can be expected with farther distances from the sources of emissions. Mobile impacts were determined using BAAQMD's raster tools which provide impacts from major streets, highways, and railroads. The tools developed by the District incorporate risk assessment procedures from the 2015 OEHHA Air Toxics Hot Spots Program Guidance.

Based on the stationary source data available from the BAAQMD's CEQA tool and the mobile source data available from BAAQMD's raster tools, **Table 44** provides a summary of cumulative health risk impacts at the Maximally Exposed Individual Sensitive Receptor (MEISR), which for this Project is the MEIR. Information on the cumulative health risk impacts at the MEIW, MERR, and MESR are provided in **Appendix D**.

The cumulative health risk impact of the proposed Project in combination with stationary and mobile sources within 1,000 ft of the MEISR are below the BAAQMD's cumulative health risk thresholds.

[2] Available at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3. Accessed: January 2024.

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TABLES

Table 1
Project Characteristics
2232 Golf Club Rd
Pittsburg, CA

Characteristic	Description
Location Scope	County
County	Contra Costa
Climate Zone	1
Operational Year	2027
Utility	Pacific Gas & Electric
CO_2 Intensity Factor (lbs CO_2/MWh)[1]	204
CH_4 Intensity Factor (lbs CH_4/MWh)[1]	0.033
N_2O Intensity Factor (lbs N_2O/MWh)[1]	0.004

Notes:

1. Default CO_2, CH_4 and N_2O Intensity Factors for PG&E, forecasted out to 2027, are from CalEEMod® v2022.1.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CO_2 - carbon dioxide
CH_4 - methane
lbs - pounds
MWh - megawatt hour
N_2O - nitrogen dioxide
PG&E - Pacific Gas & Electric

References:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

Table 2
Land Use Characteristics
2232 Golf Club Rd
Pittsburg, CA

Land Use Activity	CalEEMod Land Use Type[1]	Land Use Subtype[1]	Unit Amount[2]	Size Metric	Lot Acreage
Data Halls and Mechanical Galleries	Industrial	Industrial Park	273	1000sqft	2.38
Water Tank[3]	Industrial	Industrial Park	14	1000sqft	0.32
Generator Area	Industrial	Industrial Park	60	1000sqft	1.38
Admin/Office/Storage	Commercial	General Office Building	33	1000sqft	0.29
Parking[4]	Parking	Parking Lot	188	1000sqft	4.31
Landscaping	Recreational	City Park	11	Acre	11.07
Substation	Industrial	Industrial Park	100	1000sqft	2.30

Notes:
1. CalEEMod® land use types were assumed based on data provided by project sponsor.
2. Square footage values for individual land use types were provided by project sponsor.
3. Existing water tank is expected to remain on-site.
4. Parking includes all hardscape on-site, including parking, roadways, and some sidewalks.

Abbreviations:
CalEEMod® - California Emissions Estimator Model
1000sqft - thousand square feet

References:
CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

Table 3
Construction Schedule
2232 Golf Club Rd
Pittsburg, CA

Construction Phase	Start[1]	End	Days[2]
Site Preparation	11/10/2025	11/23/2025	10
Grading	11/24/2025	1/11/2026	35
Building Construction	1/12/2026	3/8/2027	301
Paving	3/9/2027	4/5/2027	20
Architectural Coating	4/6/2027	5/3/2027	20

Notes:

1. The construction schedule was estimated assuming that construction begins November 10, 2025 and ends May 3, 2027, with an estimated operational year of 2027 based on information provided by the Project sponsor.
2. The construction phasing and number of days of construction was determined using CalEEMod® v2022.1 default assumptions based on the anticipated Project acreage, with the building construction phase shortened to align with the approximate start and end dates of construction provided by the Project sponsor.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

References:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

Table 4
Construction Equipment List
2232 Golf Club Rd
Pittsburg, CA

Construction Subphase[1]	Equipment[1]	Construction Equipment Tier[2]	Number[1]	Daily Usage (hours/day)[1]	Horsepower[1]	Load Factor[1]
Site Preparation	Tractors/Loaders/Backhoes	Tier 4 Final	4	8	84	0.37
	Rubber Tired Dozers	Tier 4 Final	3	8	367	0.40
Grading	Excavators	Tier 4 Final	2	8	36	0.38
	Rubber Tired Dozers	Tier 4 Final	1	8	367	0.40
	Tractors/Loaders/Backhoes	Tier 4 Final	2	8	84	0.37
	Scrapers	Tier 4 Final	2	8	423	0.48
	Graders	Tier 4 Final	1	8	148	0.41
Building Construction	Cranes	Tier 4 Final	1	7	367	0.29
	Forklifts	Tier 4 Final	3	8	82	0.20
	Tractors/Loaders/Backhoes	Tier 4 Final	3	7	84	0.37
	Generator Sets	Tier 4 Final	1	8	14	0.74
	Welders	Tier 4 Final	1	8	46	0.45
Paving	Pavers	Tier 4 Final	2	8	81	0.42
	Rollers	Tier 4 Final	2	8	36	0.38
	Paving Equipment	Tier 4 Final	2	8	89	0.36
Architectural Coating	Air Compressors	Tier 4 Final	1	6	37	0.48

Notes:

1. Construction equipment assumptions including number of pieces of equipment, daily hours of usage, horsepower, and load factor are default values from CalEEMod® v2022.1 Appendix G and are based on site acreage.
2. All off-road equipment for construction is assumed to be Tier 4 Final engines. All construction equipment is conservatively assumed to operate 100% of the subphase.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

References:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

Table 5
Construction Trips
2232 Golf Club Rd
Pittsburg, CA

Subphase	Offroad Equipment Count	One Way Trips[1]		
		Worker Trips (trips/day)	Vendor Trips (trips/day)	Hauling Trips (trips/day)
Site Preparation	7	17.5	0	146.7
Grading	8	20.0	0	105.4
Building Construction	9	198.4	78.7	0
Paving	6	15.0	0	0
Architectural Coating	1	39.7	0	0

Notes:
1. Trip rates for worker and vendor haul trips are based on CalEEMod® v2022.1 defaults.

Abbreviations:
CalEEMod® - California Emissions Estimator Model

References:
CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

Table 6
Additional Construction Inputs
2232 Golf Club Rd
Pittsburg, CA

Characteristic[1]		Value	Unit
Demolition Building Size		0	Square Feet
Imported Material Quantity		0	Cubic Yards
Exported Material Quantity		41,232	Cubic Yards
Paving Quantity	Asphalt[2]	187,874	Square Feet

Notes:

1. Project-specific data provided by the project sponsor.
2. Asphalt paving quantity conservatively includes sidewalks.

Table 7
Project Construction Emissions
2232 Golf Club Rd
Pittsburg, CA

Construction Emissions by Year and Phase

Construction Phase	Emissions Year	Source	Total Construction Emissions[1]				GHG Emissions
			ROG	NO_X	PM_{10}	$PM_{2.5}$	CO_2e
			lbs				MT
Site Preparation	2025	On-Site Exhaust	5.0	25.9	1.0	1.0	24.1
		Off-Site Mobile Exhaust	2.8	138.1	1.9	1.3	50.7
		Fugitive Dust	0.0	0.0	105.5	47.2	0.0
Grading	2025	On-Site Exhaust	17.4	120.1	3.4	3.4	81.5
		Off-Site Mobile Exhaust	6.1	269.8	3.8	2.5	99.5
		Fugitive Dust	0.0	0.0	155.3	54.3	0.0
	2026	On-Site Exhaust	5.0	34.8	1.0	1.0	23.6
		Off-Site Mobile Exhaust	1.7	75.4	1.1	0.7	28.3
		Fugitive Dust	0.0	0.0	45.0	15.7	0.0
Building Construction	2026	On-Site Exhaust	58.2	513.5	10.9	10.9	275.9
		Off-Site Mobile Exhaust	163.6	824.7	7.4	7.4	435.2
		Fugitive Dust	0.0	0.0	550.3	134.8	0.0
	2027	On-Site Exhaust	11.0	97.2	2.1	2.1	52.2
		Off-Site Mobile Exhaust	29.9	148.9	1.4	1.4	80.8
		Fugitive Dust	0.0	0.0	104.2	25.5	0.0
Paving	2027	On-Site Exhaust	3.2	38.7	0.6	0.6	13.8
		Off-Site Mobile Exhaust	0.9	0.7	0.0	0.0	1.1
		Fugitive Dust	0.0	0.0	2.5	0.6	0.0
		Paving	11.3	--	--	--	--
Architectural Coating	2027	On-Site Exhaust	0.4	12.9	0.0	0.0	1.2
		Off-Site Mobile Exhaust	2.3	2.0	0.0	0.0	2.9
		Fugitive Dust	0.0	0.0	6.5	1.5	0.0
		Architectural Coating	5,063	--	--	--	--

Summary of Construction Emissions

	Average Daily CAP Emissions[2]				Total GHG Emissions
	ROG	NO_X	PM_{10}	$PM_{2.5}$	
	lb/day				MT CO_2e
Total	14	6.0	0.09	0.08	1171
BAAQMD CEQA Threshold[3]	54	54	82	54	--

Notes:

1. Construction emissions were estimated using CalEEMod® v2022.1.
2. Average daily emissions were calculated by dividing by the number of days of construction.
3. Thresholds are from BAAQMD California Environmental Quality Act Guidelines, which specifies that the PM_{10} and $PM_{2.5}$ quantitative thresholds are for exhaust emissions only. Therefore, fugitive dust emissions have been excluded from the estimate of average daily CAP emissions. The BAAQMD does not have an adopted significance threshold for construction-related GHG emissions.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod® - California Emissions Estimator Model
CAP - criteria air pollutant
CEQA - California Environmental Quality Act
CO_2e - carbon dioxide equivalent
GHG - Greenhouse Gases
MRR - Mandatory Reporting Regulation
MT - metric tons
ROG - reactive organic gases
NO_X - nitrogen oxides
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns

Reference:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

BAAQMD. 2022. California Environmental Quality Act Guidelines. April. Available online at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines.

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Table 8
Emergency Generator Information
2232 Golf Club Rd
Pittsburg, CA

Generator Information

Make	Cummins
Model	QSK95-G9
USEPA Tier Equivalent	2
Generator Output at 100% Load (kilowatt)	3,213
Engine Output at 100% Load (horsepower)	4,309
Make and Model of DPF and SCR	MIRATECH ACIS-3 (M3-80-70-30PF-B-R4)

Pollutant	Uncontrolled Emission Factors by Generator Load[1] (g/bhp-hr)				Controlled Emission Factors by Generator Load[2] (g/bhp-hr)			
	100%	75%	50%	25%	100%	75%	50%	25%
NO_X	6.77	5.33	4.11	4.16	0.5	0.39	0.30	0.31
ROG	0.13	0.20	0.36	0.54	0.13	0.20	0.36	0.54
CO	0.42	0.34	0.56	1.16	0.42	0.34	0.56	1.16
PM	0.08	0.13	0.25	0.48	0.02	0.03	0.07	0.13
$PM_{2.5}$[3]	0.08	0.13	0.25	0.48	0.02	0.03	0.07	0.13
PM_{10}[3]	0.08	0.13	0.25	0.48	0.02	0.03	0.07	0.13
SO_2	0.004	0.005	0.005	0.006	0.004	0.005	0.005	0.006
CO_2[4]	526.2				526.2			
CH_4[5]	0.021				0.021			
N_2O[5]	0.0042				0.0042			
CO_2e[6]	528				528			

Notes:

1. Uncontrolled emissions factors from Cummins QSK95-G9 design criteria exhaust emission data sheet. Safety factors for NO_X, ROG, CO, and PM have been applied to make the nominal emission factors more reflective of potential site variation (i.e., worst-case) emission factors. The safety factors applied to these pollutants are: 1.3, 1.7, 2, and 2.5, respectively.
2. Emissions factors for all pollutants except NOx and PM are considered uncontrolled. 100% load controlled emissions factors for NOx and PM obtained from MIRATECH ACIS-3 (M3-80-70-30PF-B-R4) design criteria outlet emission performance. 25%-75% load controlled emissions factors for NOx and PM are based on their respective control factors for 100% load.
3. Emissions factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emission factor.
4. Emissions factor from AP-42, Vol. I, Section 3.4, Table 3.4-1 for Gaseous Emission Factors for Large Stationary Diesel and All Stationary Dual Fuel Engines.
5. Emissions factors from 40 CFR 98, Subpart C, Table C-2. Petroleum emissions listed as 3 g CH_4/MMBtu and 0.6 g N_2O/MMBtu. Assumed conversion factor of 7000 Btu/hp-hr per AP-42 Vol I, Table 3.3-1.
6. Global warming potential values of 1 for CO_2, 25 for CH_4, and 298 for N_2O from USEPA's Federal Register (FR) final rule published on November 29, 2013 [78 FR 71904] and effective on January 1, 2014, were used to convert emissions to metric tons of carbon dioxide equivalents.

Abbreviations:

CH_4 - methane
CO - carbon monoxide
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalents
DPF - Diesel Particulate Filter
g - gram
hp - horsepower
hr - hour
NO_x - nitrogen oxides
N_2O - nitrous oxide
PM - particulate matter
ROG - reactive organic gases
SCR - selective catalytic reduction
USEPA - United States Environmental Protection Agency

References:

40 CFR Appendix Table C-2 to Subpart C of Part 98. Available online at: https://www.law.cornell.edu/cfr/text/40/appendix-Table_C-2_to_subpart_C_of_part_98

USEPA. 78 FR 71904 Part VI. Revisions to Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements. Available at: https://www.govinfo.gov/content/pkg/FR-2013-11-29/pdf/2013-27996.pdf

USEPA. AP-42 Vol 1, 3.4: Large Stationary Diesel And All Stationary Diesel-Fuel engines. Available at: https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf

Table 9
Daily Emissions - Testing & Maintenance, Emergency Generators
2232 Golf Club Rd
Pittsburg, CA

Engine Make	Engine Model	Engine Horsepower	Emissions by Pollutant			
			Quantity of Engines	Operational Hours per Engine per Year[1]	Pollutant	Average Daily Emissions (lb/day)
Cummins	QSK95-G9	4,309	37	34	NO_x[3]	16
					ROG	4.1
					CO	14
					PM_{10}[2,3]	0.65
					$PM_{2.5}$[2,3]	0.65

Notes:

1. Average daily emissions are based on an annual runtime limit of 34 hours per generator and conservatively assume that the generators are operating at 100% load for each run.
2. Emission factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emission factor.
3. Emission factors for NOx, PM_{10}, and $PM_{2.5}$ are assumed controlled by the proposed control device.

Abbreviations:

CO - carbon monoxide
lb - pounds
NOx - nitrogen oxides
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ROG - reactive organic gases

Table 10
Annual Emissions - Testing & Maintenance, Emergency Generators
2232 Golf Club Rd
Pittsburg, CA

Engine Make	Engine Model	Engine Horsepower	Emissions by Pollutant			
			Quantity of Engines	Operational Hours per Engine per Year[1]	Pollutant	Average Annual Emissions (ton/year)
Cummins	QSK95-G9	4,309	37	34	NOx[3]	3.0
					ROG	0.7
					CO	2.5
					PM_{10}[2,3]	0.12
					$PM_{2.5}$[2,3]	0.12
					CO_2e[4]	2,862

Notes:

1. Facility emission estimate is based on an annual runtime limit of 34 hours per generator for testing and maintenance and conservatively assumes that the generators are operating at 100% load for each run.
2. Emission factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emission factor.
3. Emission factors for NOx, PM_{10}, and $PM_{2.5}$ are assumed controlled by the proposed control device.
4. Annual greenhouse gas emissions are presented in units of MT CO_2e/year.

Abbreviations:

CO - carbon monoxide
CO_2e - carbon dioxide equivalents
MT - metric tons
NOx - nitrogen oxides
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ROG - reactive organic gases

Table 11
Annual Emissions - Testing, Maintenance, & Emergency, Emergency Generators
2232 Golf Club Rd
Pittsburg, CA

Engine Make	Engine Model	Engine Horsepower	Emissions by Pollutant			
			Quantity of Engines	Operational Hours per Engine per Year[1]	Pollutant	Average Annual Emissions (ton/year)
Cummins	QSK95-G9	4,309	37	134	NO_x[2]	12
					ROG	3.0
					CO	9.9
					PM_{10}[3]	0.47
					$PM_{2.5}$[3]	0.47

Notes:

1. Facility emissions estimate is based on an assumed 134 hours of operations per year per generator, consisting of 34 hours for routine generator maintenance and testing and 100 hours for emergency backup use, and conservatively assumes that the generators are operating at 100% load for each run.
2. Emission factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emission factor.
3. Emission factors for NOx, PM_{10}, and $PM_{2.5}$ are assumed controlled by the proposed control device.

Abbreviations:

CO - carbon monoxide
NOx - nitrogen oxides
ROG - reactive organic gases
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns

Table 12
Emergency Generator Ammonia Emissions
2232 Golf Club Rd
Pittsburg, CA

Parameter	Value	Unit
Outlet Concentration Limit[1]	10	ppmv
Outlet Gas Oxygen Content[1]	15	% O_2
Molecular Weight of NH_3	17	lb/lb-mol
NH_3 Emission Factor[1]	0.0144	lb/MMBtu
Diesel Heat Content[2]	19,300	Btu/lb
Diesel Fuel Density[2]	7.1	lb/gal
Generator Fuel Flow[3]	205	gal/hr
Annual Operating Hours[4]	34	hr/year
Number of Generators at Full Buildout	37	--
Emissions per Generator	**0.40**	**lb/hr**
	13.7	**lb/year**
Emissions for Generators at Full Buildout	**509**	**lb/year**

Notes:

1. NH_3 Emission factor is calculated assuming an F factor of 9,190 dscf/MMBtu, using an expected permit limit of 10 ppmv ammonia exhaust concentration at 15% O_2.
2. Heat content and fuel density of diesel fuel are assumed from USEPA AP-42 Emission Factor Guidance for Large Stationary Diesel And All Stationary Dual-fuel Engines, Table 3.4-1, footnote (a).
3. Generator fuel flow was derived from the manufacturer specification sheet and assumes operation at 100% load.
4. Annual generator emissions assume 34 hours per year of generator maintenance and testing.

Abbreviations:

Btu - British thermal units
dscf - dry standard cubic feet
gal - gallon
hr - hour
lb - pound
MMBtu - million British thermal units
mol - mole
NH_3 - ammonia
ppmv - parts per million volume
USEPA - United States Environmental Protection Agency

References:

USEPA. 1996. Air Emissions Factors and Quantification, Chapter 3.4: Large Stationary Diesel And All Stationary Dual-fuel Engines. Available online at: https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf

Table 13
Diesel Storage Tank Emission Estimates
2232 Golf Club Rd
Pittsburg, CA

Parameter Description[1]	Source/Equation	Storage Tank (50% full)
Material Stored	Facility Information	Diesel
Location	Facility Information	Outdoors
Tank Type	Facility Information	Vertical
Roof Type	Facility Information	Flat
Bottom Type	Facility Information	Flat
Tank Color	Facility Information	Aluminum/Diffuse
Roof Color	Facility Information	Aluminum/Diffuse
Paint Condition	Facility Information	Average
Heated	Facility Information	No
Tank Width (W), ft	Facility Information	12
Tank Length (L), ft	Facility Information	47
Tank Dome Roof Radius (R_R), ft	Flat Roof: N/A	N/A
Tank Shell Height (H_S), ft	Facility Information	2.47
Tank Volume (V), ft^3	Rectangular tank: $V = WR_SH_S$	1393
Tank Volume (V), gal	$V = ft^3 * 7.48\ gal/ft^3$	10,417
Liquid Height (H_L), ft	Assumed $H_L = 0.5H_S$	1.2
Vapor Space Outage (H_{VO}), ft	$H_{VO} = H_E/2$	1.2
Vapor Space Volume (V_V), ft^3	$V_V = H_{VO}WL$	696
Ideal Gas Constant (R), psia ft^3/lb-mole R	Constant	10.7
Daily Maximum Ambient Temperature (T_{AX}), R	AP-42, Table 7.1-7 (San Francisco, CA)	524
Daily Minimum Ambient Temperature (T_{AN}), R	AP-42, Table 7.1-7 (San Francisco, CA)	511
Daily Average Ambient Temperature (T_{AA}), R	$T_{AA} = (T_{AX} + T_{AN})/2$	518
Roof Paint Solar Absorptance (α_R), dimensionless	AP-42, Table 7.1-6	0.64
Shell Paint Solar Absorptance (α_S), dimensionless	AP-42, Table 7.1-6	0.64
Paint Solar Absorptance (α), dimensionless	$\alpha = (\alpha_R + \alpha_S)/2$	0.64
Daily Total Solar Insolation Factor (I), Btu/ft^2	Outdoor Tanks: AP-42, Table 7.1-7 (San Francisco, CA)	1,386
Liquid Bulk Temperature (T_B), R	Outdoor Tanks: $T_B = T_{AA} + 0.003\alpha I$	520
Daily Average Liquid Surface Temperature (T_{LA}), R	$T_{LA} = 0.4T_{AA} + 0.6T_B + 0.005\ \alpha I$	524
Vapor Molecular Weight (M_V), lb/lb-mole	AP-42, Table 7.1-2	130
Vapor Pressure at T_{LA} (P_{VA}), psia	$P_{VA} = \exp[A - (B/T_{LA})]$	0.0074
Vapor Density (W_V), lb/ft^3	$W_V = M_VP_{VA}/RT_{LA}$	1.71E-04
Daily Ambient Temperature Range (T_A), R	$T_A = T_{AX} - T_{AN}$	13.7
Daily Vapor Temperature Range (T_V), R	$T_V = 0.7T_A + 0.02\ \alpha I$	27.3
Vapor Pressure at T_{AN} (P_{VN}), psia	$P_{VN} = \exp[A - (B/T_{AN})]$	0.0048
Vapor Pressure at T_{AX} (P_{VX}), psia	$P_{VX} = \exp[A - (B/T_{AX})]$	0.0076
Daily Vapor Pressure Range (P_V), psia	$P_V = P_{VX} - P_{VN}$	0.0028
Breather Vent Pressure Setting Range (P_B), psig	$P_B = P_{BP} - P_{BV}$ (Assumed = 0.06)	0.060
Atmospheric Pressure (P_A), psia	AP-42 Table 7.1-7 (San Francisco, CA)	14.69
Vapor Space Expansion Factor (K_E), dimensionless	Outdoor Tanks: $K_E = T_V/T_{LA} + (P_V - P_B)/(P_A - P_{VA})$	0.048
Vented Vapor Saturation Factor (K_S), dimensionless	$K_S = 1/(1 + 0.053P_{VA}H_{VO})$	1.00
Number of Days/Year in Operation	Constant	365.0
Standing Storage Losses (L_S), lb/year/tank	$L_S = 365\ W_VV_VK_EK_S$	2.10
Maximum Throughput (Q), gal	Assumes fuel rate for 100% load (205 gal/hr) and 34 hr/yr of operation	6,970
Maximum Throughput (Q), bbl	42 gal/bbl	166
Tank Maximum Liquid Volume (V_{LX}), ft^3	Assumed $V_{LX} = V$	1393
Turnovers (N), dimensionless	$N = 5.614Q/V_{LX}$	0.67
Turnover Factor (K_N), dimensionless	For $N \leq 36$, $K_N = 1$	1.0
Working Loss Factor (K_P), dimensionless	For Organic Liquids, $K_P = 1$	1.0
Net Working Loss Throughput (V_Q), ft_3/yr	V_Q=5.614Q	932

Table 13
Diesel Storage Tank Emission Estimates
2232 Golf Club Rd
Pittsburg, CA

Parameter Description[1]	Source/Equation	Storage Tank (50% full)
Vent setting correction factor (K_B), dimensionless	For open vents and vent setting range up to ±0.03 psig, K_B=1	1.0
Working Losses (L_W), lb/year/tank	$L_W = V_Q K_N K_P W_V K_B$	0.16
Total Uncontrolled Losses (L_T), lb/year/tank	$L_T = L_S + L_W$	2.25
Total Uncontrolled Losses (L_T), lb/hr/tank	8,760 hr/yr	2.57E-04
Total Uncontrolled Losses (L_T), ton/year/tank	2,000 lb/ton	1.13E-03
Number of Tanks	Facility Information	19
	Total Uncontrolled Losses (L_T), lb/hr	**0.00489**
	Total Uncontrolled Losses (L_T), ton/year	**0.0214**

Notes:
1. Storage tanks emissions were calculated using methodology consistent with AP-42, Vol. I, Section 7.1 for Liquid Storage Tanks.
2. Emissions were conservatively calculated assuming the storage tanks would remain 50% full, which would result in greater emissions than if the tanks were mostly full, which is the probable scenario.

References:
USEPA. AP-42 Chapter 7.1. Liquid Storage Tanks. Available at: https://www.epa.gov/sites/default/files/2020-10/documents/ch07s01.pdf

Table 14
Diesel Storage Tank TAC Emission Estimates
2232 Golf Club Rd
Pittsburg, CA

Source	VOC Emissions[1]	TAC Species[2]	TAC Weight Fraction[3]	TAC Emissions	BAAQMD Chronic Trigger Level[4]
	ton/yr			lbs/yr	lbs/yr
Diesel Storage Tanks	0.021	Hexane	0.12	5.14	270,000

Notes:

1. VOC emissions from the diesel storage tanks are presented in **Table 13**.
2. Hexane is the only species in the CARB speciation profile for diesel fuel evaporative emissions (Organic Profile 760 - Evaporative Emissions-Distillate Fuel) identified as a TAC by BAAQMD. CARB speciation profile data available online at: https://ww2.arb.ca.gov/speciation-profiles-used-carb-modeling.
3. Hexane weight fraction based on the weight fractions for hexane (0.09) and isomers of hexane (0.03) from CARB speciation profile data for diesel fuel evaporative emissions (Organic Profile 760 - Evaporative Emisisons-Distillate Fuel).
4. BAAQMD Chronic Trigger Level for n-hexane presented in BAAQMD Rule 2-5.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CARB - California Air Resources Board
lbs - pounds
TAC - toxic air contaminant
VOC - volatile organic compounds
yr - year

Table 15
Operational Energy Use Emissions
2232 Golf Club Rd
Pittsburg, CA

Phase	Rating (MW)	Maximum Annual Energy Use (MWh/yr)[1]	CO_2 Intensity Factor[2] (lbs/MWh)	CH_4 Intensity Factor[2] (lbs/MWh)	N_2O Intensity Factor[2] (lbs/MWh)	CO_2e Intensity Factor[3] (lbs/MWh)	Annual CO_2e Emitted[4] (MT/yr)
Full Buildout	98.0	858,480	204	0.033	0.00400	206	80,216

Notes:

1. Estimated maximum annual energy consumption was provided by the project sponsor.
2. Default CO_2, CH_4 and N_2O Intensity Factors for PG&E, forecasted out to 2027, are from CalEEMod® v2022.1.
3. Global warming potential values of 1 for CO_2, 25 for CH_4, and 298 for N_2O from USEPA's Federal Register (FR) final rule published on November 29, 2013 [78 FR 71904] and effective on January 1, 2014, were used to convert emissions to metric tons of carbon dioxide equivalents.
4. Annual emissions are the product of the energy usage and the intensity factor.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
CH_4 - methane
CO_2 - carbon dioxide
CO_2e - carbon dioxide equivalent
FR - Federal Register
lbs - pounds
MW - megawatt
MWh - megawatt-hours
MT - metric tons
N_2O - nitrogen dioxide
PG&E - Pacific Gas & Electric
yr - year

References:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com

USEPA. 78 FR 71904 Part VI. Revisions to Greenhouse Gas Reporting Rule and Final Confidentiality Determinations for New or Substantially Revised Data Elements. Available at: https://www.govinfo.gov/content/pkg/FR-2013-11-29/pdf/2013-27996.pdf

Table 16
Project Operational Trips
2232 Golf Club Rd
Pittsburg, CA

Land Use Activity	Land Use Square Footage[1]	Total Project Trips[2]	Daily Trip Totals[3]			Daily Trip Rate[4]		
			Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
	(1000 sqft)	(trips per day)	(trips per day)			(rate/size/day)		
Data Halls and Mechanical Galleries	273	463	271	271	271	0.99	0.99	0.99
Water Tank	14		0	0	0	0.00	0.00	0.00
Generator Area	60		60	60	60	0.99	0.99	0.99
Admin/Office/Storage	33		33	33	33	0.99	0.99	0.99
Parking	188		0	0	0	0.00	0.00	0.00
Landscaping	11		0	0	0	0.00	0.00	0.00
Substation	100		99	99	99	0.99	0.99	0.99
		Total	**463**	**463**	**463**			

Notes:

1. Land use square footage is summarized in **Table 2**.
2. Total project trips was provided by the project sponsor.
3. The daily trip totals by project element were distributed according to square footage; however, the vaues for water tank, landscaping, and parking lot were set to zero since these land use types will not generate any project trips.
4. Daily trip rates are calculated by dividing the adjusted average daily trips by the land use square footage.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

sqft - square feet

Table 17
Project Water Use Rates
2232 Golf Club Rd
Pittsburg, CA

Land Use Activity	CalEEMod® Land Use Type	Land Use Subtype	Indoor Water Usage[1] (gal/yr)	Outdoor Water Usage (gal/yr)
Data Halls and Mechanical Galleries	Industrial	Industrial Park	15,029,638	0
Water Tank	Industrial	Industrial Park	0	0
Generator Area	Industrial	Industrial Park	0	0
Admin/Office/Storage	Commercial	General Office Building	151,772	0
Parking	Parking	Parking Lot	0	0
Landscaping	Recreational	City Park	0	6,208,744
Substation	Industrial	Industrial Park	0	0

Notes:

1. Water use rates were provided by the project sponsor.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

gal - gallons

yr - year

Table 18
Operational Mass Emissions of Criteria Air Pollutants
2232 Golf Club Rd
Pittsburg, CA

Emissions Source		CAP Emissions[1] [ton/year]				CAP Emissions[1] [lb/day]			
		ROG	NOx	PM_{10} Total	$PM_{2.5}$ Total	ROG	NOx	PM_{10} Total	$PM_{2.5}$ Total
Full Buildout	Architectural Coating	0.25	--	--	--	1.4	--	--	--
	Consumer Products	1.9	--	--	--	10.6	--	--	--
	Landscaping	0.31	0.02	0.003	0.003	1.7	0.09	0.02	0.01
	Building Energy Use[2]	--	--	--	--	--	--	--	--
	Mobile Emissions	0.27	0.21	0.45	0.12	1.5	1.2	2.5	0.64
	Diesel Storage Tanks[3]	0.021	--	--	--	0.12	--	--	--
Emergency Generators[4]		0.7	3.0	0.12	0.12	4.1	16.4	0.65	0.65
Stationary Source Offsets[5]		--	**-3.0**	--	--	--	**-16.4**	--	--
Full Buildout Operational Emissions		**3.5**	**0.23**	**0.57**	**0.24**	**19.4**	**1.2**	**3.1**	**1.3**
BAAQMD Significance Threshold[6]		**10**	**10**	**15**	**10**	**54**	**54**	**82**	**54**

Notes:

1. Operational emissions estimated using CalEEMod® v2022.1 for all sources except building energy use, emergency generator usage, and diesel storage tank emissions.
2. The Project will not feature any natural gas consumption.
3. Diesel storage tanks emissions were calculated using methodology consistent with AP-42, Vol. I, Section 7.1 for Liquid Storage Tanks and are estimated in **Table 13**.
4. Emissions from testing and maintenance of emergency generator emissions are estimated in **Table 9** and **Table 10**.
5. The Project's stationary source NOx emissions are projected to require offsets and as such, would be reduced to zero.
6. Significance thresholds are from BAAQMD California Environmental Quality Act Guidelines.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod® - California Emissions Estimator Model
CAP - Criteria Air Pollutant
lb - pounds
NOx - nitrogen oxides
ROG - reactive organic gases
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns

References:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com

BAAQMD. 2022. CEQA Air Quality Guidelines. Chapter 3 - Thresholds of Significance. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-3-thresholds_final_v2-pdf.pdf?rev=a976830cce0c4a6bb624b020f72d25b3&sc_lang=en

Table 19
Operational Mass Emissions of Greenhouse Gases
2232 Golf Club Rd
Pittsburg, CA

Emissions Source		GHG Emissions[1] MT CO_2e/yr
Full Buildout	Landscaping	7.0
	Data Center Energy Use[2]	80,216
	Water Use	33
	Waste Disposed	183
	Mobile Emissions	433
Total GHG Emissions During Full Buildout (Excluding Emergency Generators)		**80,872**

Emissions Source	GHG Emissions[3] MT CO_2e/yr
Emergency Generators	2,862
BAAQMD Stationary Source Threshold[4]	**10,000**

Notes:

1. Operational emissions estimated using CalEEMod® v2022.1 for all sources except building energy use and emergency generator usage.
2. Data center energy use was calculated based on maximum energy use projections and PG&E carbon intensity estimates for operational year 2027.
3. Calculated based on emission factors from AP-42 Chapter 3.4 Table 3.4-1 (Large Stationary Diesel and All Stationary Dual-fuel Engines) and scaled by engine horsepower, proposed annual operating hours, and number of proposed generators.
4. Significance thresholds are from BAAQMD California Environmental Quality Act Guidelines.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod® - California Emissions Estimator Model
CEQA - California Environmental Quality Act
CO_2e - carbon dioxide equivalent
GHG - greenhouse gas
MT - metric ton
yr - year

References:

CAPCOA. 2017. California Emissions Estimator Model. Available at: http://www.caleemod.com

BAAQMD. 2017. CEQA Air Quality Guidelines. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

USEPA. AP-42 Chapter 3.4. Large Stationary Diesel and All Stationary Dual-fuel Engines. Available at: https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s04.pdf

Table 20
Ambient Air Quality Standards
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Time	California Standards[1]	National Standards[2]
		Concentration[3]	
NO_2 [4]	1-Hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)
CO	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8-Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
SO_2 [5]	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)
	24-Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (for certain areas)
	Annual Arithmetic Mean	--	0.030 ppm (for certain areas)
PM_{10}	24-Hour	50 µg/m^3	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	--
$PM_{2.5}$	24-Hour	--	35 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3

Notes:

1. California standards for carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$), are values that are not to be exceeded. All other standards are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm).
5. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Abbreviations:

CO - carbon monoxide
NO_2 - nitrogen dioxide
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ppb - parts per billion
ppm - parts per million
SO_2 - sulfur dioxide
µg/m^3 - micrograms per cubic meter

Table 21
Summary of Background Ambient Air Concentrations
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period	Units	Calendar Year			3-Year Average (2020-2022)	3-Year Maximum (2020-2022)
			2020	2021	2022		
NO_2	1-Hour (maximum)	ppb	34	29	29	31	34
	1-Hour (98th percentile)	ppb	29	25	26	27	29
	Annual Mean	ppb	5.9	5.2	5.1	5.4	5.9
CO	1-Hour	ppm	3.0	0.9	1.1	1.7	3.0
	8-Hour	ppm	2	0.8	0.7	1.2	2.0
SO_2 [2]	1-Hour	ppb	13	6.8	13.2	10.9	13
	1-Hour (99th percentile)	ppb	7.2	6.1	6.0	6.4	7.2
	3-Hour	ppb	13	6.8	13.2	10.9	13
	24-Hour	ppb	2.7	1.4	1.7	1.9	2.7
	Annual Mean	ppb	0.58	0.36	0.44	0.46	0.58
PM_{10}	24-Hour (maximum)	$\mu g/m^3$	165	25	33	74	165
	Annual Mean	$\mu g/m^3$	18	12	11	14	18
$PM_{2.5}$	24-Hour (98th Percentile)	$\mu g/m^3$	66	21	19	35	66
	Annual Mean	$\mu g/m^3$	11.1	8.1	7.1	8.8	11.1

Notes:

1. Background values were collected from Monitor Site ID 060130002 located at 2956-A Treat Boulevard in Concord, California, as reported by the USEPA.
2. The 1-hour maximum SO_2 background was conservatively used as the background value for the 3-hour SO_2 averaging period.

Abbreviations:

CO - carbon monoxide
NO_2 - nitrogen dioxide
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ppb - parts per billion
ppm - parts per million
SO_2 - sulfur dioxide
$\mu g/m^3$ - micrograms per cubic meter

Table 22
Project Construction Emissions - CAAQS/NAAQS Modeling
2232 Golf Club Rd
Pittsburg, CA

Construction Emissions by Year and Phase

Construction Phase	Emissions Year	Source	Total Construction Emissions[1]					
			ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
			lbs					
Site Preparation	2025	On-Site Exhaust	5.0	25.9	283	0.5	1.0	1.0
		Off-Site Mobile Exhaust[2]	0.0	1.3	1	0.0	0.0	0.0
		Fugitive Dust[2]	0.0	0.0	0	0.0	77.3	39.5
Grading	2025	On-Site Exhaust	17.4	120.1	959	1.7	3.4	3.4
		Off-Site Mobile Exhaust[2]	0.1	2.6	1	0.0	0.0	0.0
		Fugitive Dust[2]	0.0	0.0	0	0.0	98.8	38.9
	2026	On-Site Exhaust	5.0	34.8	278	0.5	1.0	1.0
		Off-Site Mobile Exhaust[2]	0.0	0.7	0	0.0	0.0	0.0
		Fugitive Dust[2]	0.0	0.0	0	0.0	28.6	11.3
Building Construction	2026	On-Site Exhaust	58.2	513.5	3,616	5.9	10.9	10.9
		Off-Site Mobile Exhaust[2]	2.7	17.8	34	0.1	0.2	0.2
		Fugitive Dust[2]	0.0	0.0	0	0.0	9.8	2.4
	2027	On-Site Exhaust	11.0	97.2	684	1.1	2.1	2.1
		Off-Site Mobile Exhaust[2]	0.5	3.2	6	0.0	0.0	0.0
		Fugitive Dust[2]	0.0	0.0	0	0.0	1.9	0.5
Paving	2027	On-Site Exhaust	3.2	38.7	212	0.3	0.6	0.6
		Off-Site Mobile Exhaust[2]	0.0	0.0	0	0.0	0.0	0.0
		Fugitive Dust[2]	0.0	0.0	0	0.0	0.0	0.0
		Paving	11.3	--	--	--	--	--
Architectural Coating	2027	On-Site Exhaust	0.4	12.9	19	0.0	0.0	0.0
		Off-Site Mobile Exhaust[2]	0.0	0.0	0	0.0	0.0	0.0
		Fugitive Dust[2]	0.0	0.0	0	0.0	0.1	0.0
		Architectural Coating	5,063	--	--	--	--	--

Notes:

1. Construction emissions were estimated using CalEEMod® v2022.1.
2. Off-site on-road mobile exhaust and fugitive dust emissions have been limited to those within 1,000 feet of the project boundary.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CAAQS - California Ambient Air Quality Standards
CalEEMod® - California Emissions Estimator Model
CO - carbon monoxide
lbs - pounds
NAAQS - National Ambient Air Quality Standards
NO_X - nitrogen oxides
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ROG - reactive organic gases
SO_2 - sulfur dioxide
yr - year

Reference:

CAPCOA. 2022. California Emissions Estimator Model. Available at: http://www.caleemod.com.

Table 23
Construction 1-hr, 3-hr, 8-hr CAAQS/NAAQS Model Emission Rates
2232 Golf Club Rd
Pittsburg, CA

Subphase	Emission Rate[1] [lb/hr]			Emission Rate[1] [g/s]		
	NO_X	CO	SO_2	NO_X	CO	SO_2
Site Preparation	3.40E-01	3.55E+00	6.19E-03	4.29E-02	4.47E-01	7.80E-04
Grading (2025)	5.48E-01	4.29E+00	7.44E-03	6.90E-02	5.41E-01	9.37E-04
Grading (2026)	6.34E-01	4.97E+00	8.61E-03	7.98E-02	6.26E-01	1.09E-03
Building Construction (2026)	2.61E-01	1.80E+00	2.95E-03	3.29E-02	2.26E-01	3.72E-04
Building Construction (2027)	2.67E-01	1.84E+00	3.02E-03	3.36E-02	2.31E-01	3.80E-04
Paving	2.42E-01	1.33E+00	1.74E-03	3.05E-02	1.67E-01	2.20E-04
Architectural Coating	8.10E-02	1.23E-01	2.16E-04	1.02E-02	1.55E-02	2.72E-05
Maximum Emission Rate	**0.63**	**4.97**	**0.009**	**0.080**	**0.63**	**0.0011**
Modeled Area Emission Rate[2] ($g/s/m^2$)				8.95E-07		

Notes:

1. Emission rates calculated using CalEEMod® emission outputs in pounds, divided by the number of construction working days per year per phase, and 8 hours of assumed construction operation per day.
2. The 1-hour NO_2 runs were conducted with actual emissions, which require units of $g/s/m^2$. The other pollutants were evaluated using unit emission rates (i.e., 1 g/s), where the actual emission rate is applied outside of the model.

Abbreviations:

CO - carbon monoxide
g - gram
hr - hour
lb - pound
m^2 - meter squared
NO_X - nitrogen oxides
SO_2 - sulfur dioxide
s - second

Table 24
Construction 24-hr CAAQS/NAAQS Model Emission Rates
2232 Golf Club Rd
Pittsburg, CA

Subphase	Emission Rate[1] [lb/hr]					Emission Rate[1] [g/s]				
	SO_2	Exhaust PM_{10}	Fugitive PM_{10}	Exhaust $PM_{2.5}$	Fugitive $PM_{2.5}$	SO_2	Exhaust PM_{10}	Fugitive PM_{10}	Exhaust $PM_{2.5}$	Fugitive $PM_{2.5}$
Site Preparation	4.50E-03	9.22E-03	7.03E-01	9.17E-03	3.59E-01	5.67E-04	1.16E-03	8.86E-02	1.15E-03	4.53E-02
Grading (2025)	5.41E-03	1.10E-02	3.21E-01	1.10E-02	1.26E-01	6.82E-04	1.39E-03	4.04E-02	1.39E-03	1.59E-02
Grading (2026)	6.26E-03	1.28E-02	3.71E-01	1.27E-02	1.46E-01	7.89E-04	1.61E-03	4.68E-02	1.61E-03	1.84E-02
Building Construction (2026)	2.15E-03	3.96E-03	3.51E-03	3.96E-03	8.69E-04	2.71E-04	4.99E-04	4.42E-04	4.99E-04	1.09E-04
Building Construction (2027)	2.20E-03	4.05E-03	3.59E-03	4.05E-03	8.88E-04	2.77E-04	5.11E-04	4.52E-04	5.11E-04	1.12E-04
Paving	1.27E-03	2.56E-03	1.81E-04	2.56E-03	4.24E-05	1.60E-04	3.22E-04	2.28E-05	3.22E-04	5.34E-06
Architectural Coating	1.57E-04	2.14E-04	4.78E-04	2.14E-04	1.12E-04	1.98E-05	2.69E-05	6.03E-05	2.69E-05	1.41E-05
Weighted-Average Emission Rate[2]	**0.002**	**0.005**	**0.051**	**0.005**	**0.022**	**0.00030**	**0.00057**	**0.0064**	**0.00057**	**0.0028**
Modeled Area Emission Rate[2,3] ($g/s/m^2$)							6.3807E-09	7.2006E-08	6.3736E-09	3.0828E-08

Notes:

1. Emission rates by phase were calculated using CalEEMod® emission outputs in pounds, divided by the number of construction working days per year per phase, and 11 hours of assumed construction operation per day.
2. The final modeled emission rates were calculated by taking the weighted average of the emission rates by phase according to their individual duration. This approach avoids overestimating impacts from one-time construction phases that are short in duration and unlikely to overlap with worst-case meteorological conditions.
3. The 24-hour PM_{10} and $PM_{2.5}$ runs were conducted with actual emissions, which require units of $g/s/m^2$. The other pollutants were evaluated using unit emission rates (i.e., 1 g/s), where the actual emission rate is applied outside of the model.

Abbreviations:

g - gram
hr - hour
lb - pound
m^2 - meter squared
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
SO_2 - sulfur dioxide
s - second

Table 25
Construction Annual CAAQS/NAAQS Model Emission Rates
2232 Golf Club Rd
Pittsburg, CA

Subphase	Emissions[1] [lb/yr]				
	NO_X	Exhaust PM_{10}	Fugitive PM_{10}	Exhaust $PM_{2.5}$	Fugitive $PM_{2.5}$
Site Preparation	2.72E+01	1.01E+00	7.73E+01	1.01E+00	3.95E+01
Grading (2025)	1.23E+02	3.40E+00	9.88E+01	3.39E+00	3.89E+01
Grading (2026)	3.55E+01	9.85E-01	2.86E+01	9.81E-01	1.13E+01
Building Construction (2026)	5.31E+02	1.11E+01	9.79E+00	1.11E+01	2.43E+00
Building Construction (2027)	1.00E+02	2.10E+00	1.85E+00	2.10E+00	4.59E-01
Paving	3.87E+01	5.63E-01	3.98E-02	5.63E-01	9.32E-03
Architectural Coating	1.30E+01	4.70E-02	1.05E-01	4.70E-02	2.47E-02
Total Emissions	**869**	**19**	**216**	**19**	**93**
Maximum Annual Emissions	**567**	**12**	**176**	**12**	**78**
Maximum Annual Emission Rate (lb/hr)	**0.14**	**0.0030**	**0.044**	**0.0030**	**0.020**
Maximum Annual Emission Rate (g/s)	**0.018**	**0.00038**	**0.0055**	**0.00038**	**0.0025**
Modeled Area Emission Rate[2] ($g/s/m^2$)	1.99E-07	4.242E-09	6.194E-08	4.241E-09	2.761E-08

Notes:

1. Emission rates calculated using CalEEMod® emission outputs in pounds, divided by 365 days of construction per year, and 11 hours of assumed construction operation per day.
2. The annual NO_2, PM_{10}, and $PM_{2.5}$ runs were conducted with actual emissions, which require units of $g/s/m^2$.

Abbreviations:

g - gram
hr - hour
lb - pound
m^2 - meter squared
NO_X - nitrogen oxides
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
s - second
yr - year

Table 26
Modeling Parameters
2232 Golf Club Rd
Pittsburg, CA

Construction

Source	Source Type	Number of Sources	Source Dimension (m^2)	Release Height[2] (m)	Initial Vertical Dimension[2] (m)
Construction Equipment and Trucks On-Site	Area	1	89205.63	5	1.16
Fugitive Dust	Area	1	89205.63	2	0.93

Operations

Source	Source Type	Number of Sources[1]	Load	Release Height (m)	Exit Temperature (K)	Exhaust Vol. Flow Rate (cfm)	Exit Velocity (m/s)	Exit Diameter (m)
Upper Backup Generators	Point	18	25	18.16	611	9,901	10.5	0.75
			50		637	15,626	16.6	0.75
			75		656	19,336	20.5	0.75
			100		715	22,925	24.3	0.75
Lower Backup Generators	Point	19	25	18.16	611	9,901	10.5	0.75
			50		637	15,626	16.6	0.75
			75		656	19,336	20.5	0.75
			100		715	22,925	24.3	0.75

Notes

1. Thirty-seven identical generators will be installed in a double-stacked configuration (nineteen on the bottom and eighteen on the top) at the Project site.
2. Release heights and initial vertical dimensions for construction area sources are based on BAAQMD 2022 CEQA Guidelines, Appendix E, Table 7.

Abbreviations:

cfm - cubic feet per minute
K - Kelvin
m - meter
s - second

Table 27
Operational 1-hr, 3-hr, and 8-hr CAAQS/NAAQS Model Emission Rates
2232 Golf Club Rd
Pittsburg, CA

Load (%)	Load-Specific Emission Rate[1,2,3] (g/hr)				Hourly Emission Rate per Generator[4,5] (g/s)		
	NO_X (Uncontrolled)	NO_X	CO	SO_2	NO_X	CO	SO_2
100	29,185	2,155	1,810	17.24	2.48E+00	5.03E-01	4.79E-03
75	17,227	1,272	1,099	16.16	1.46E+00	3.05E-01	4.49E-03
50	8,853	654	1,207	10.78	7.51E-01	3.35E-01	2.99E-03
25	4,480	331	1,249	6.46	1.24E+00	3.47E-01	1.80E-03

Notes:

1. Emission rates for 100% load from Miratech M3-80-70-30PF-B-R4 design criteria emission performance.
2. Emission rates for 25-75% load from Cummins QSK95-G9 Diesel Generator Specification Sheet with control factors applied.
3. Emissions factors for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emissions factor.
4. Based on 1 hour of operation.
5. Calculation assumes that the Selective Catalytic Reduction (SCR) device takes 15 minutes to warm up. NOX emissions for 50 - 100% loads assume 15 minutes of uncontrolled (Tier 2) emissions and 45 minutes of controlled (Tier 4) emissions. NO_X emissions for 25% load are assumed to be uncontrolled.

Abbreviations:

CO - carbon monoxide
g - grams
hr - hour
s - second
SO_2 - sulfur dioxide
NO_X - nitrogen oxides
ppm - parts per million

Table 28
Operational 24-hr CAAQS/NAAQS Model Emission Rates
2232 Golf Club Rd
Pittsburg, CA

Load (%)	Load-Specific Emission Rate[1,2,3] (g/hr)			24-Hour Emission Rate per Generator[4] (g/s)		
	SO_2	$PM_{2.5}$	PM_{10}	SO_2	$PM_{2.5}$	PM_{10}
100	17.24	86.2	86.2	1.99E-04	9.97E-04	9.97E-04
75	16.16	107.7	107.7	1.87E-04	1.25E-03	1.25E-03
50	10.78	143.7	143.7	1.25E-04	1.66E-03	1.66E-03
25	6.46	136.4	136.4	7.48E-05	1.58E-03	1.58E-03

Notes:
1. Emission rates for 100% load from Miratech M3-80-70-30PF-B-R4 design criteria emission performance.
2. Emission rates for 25-75% load from Cummins QSK95-G9 Diesel Generator Specification Sheet with control factors applied.
3. Emission rates for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emission rate.
4. Based on 1 hour per day of operation and a 24-hour operating day.

Abbreviations:
g - grams
hr - hour
s - second
SO_2 - sulfur dioxide
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ppm - parts per million

Table 29
Operational Annual CAAQS/NAAQS Model Emission Rates
2232 Golf Club Rd
Pittsburg, CA

Load (%)	Load-Specific Emission Rate[1,2,3] (g/hr)				Annual Emission Rate per Generator[4,5] (g/s)		
	NO_X (Uncontrolled)	NO_X	$PM_{2.5}$	PM_{10}	NO_X	$PM_{2.5}$	PM_{10}
100	29,185	2,155	86.2	86.2	9.61E-03	9.29E-05	9.29E-05
75	17,227	1,272	107.7	107.7	5.67E-03	1.16E-04	1.16E-04
50	8,853	654	143.7	143.7	2.91E-03	1.55E-04	1.55E-04
25	4,480	331	136.4	136.4	4.83E-03	1.47E-04	1.47E-04

Notes:

1. Emission rates for 100% load from Miratech M3-80-70-30PF-B-R4 design criteria emission performance.
2. Emission rates for 25-75% load from Cummins QSK95-G9 Diesel Generator Specification Sheet with control factors applied.
3. Emission rates for PM_{10} and $PM_{2.5}$ are conservatively assumed to be equal to the PM emission rate.
4. Based on 34 hours of operation per year per generator and a 24-hour operating day.
5. Calculation assumes that the Selective Catalytic Reduction (SCR) device takes 15 minutes to warm up. Annual NO_X emissions for 50 - 100% loads assume annual operation will consist of 34 individual 1-hour operating periods, each consisting of 15 minutes of uncontrolled (Tier 2) emissions and 45 minutes of controlled (Tier 4) emissions. NO_X emissions for 25% load are assumed to be uncontrolled.

Abbreviations:

g - grams
hr - hour
NOx - nitrogen oxides
s - second
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns

Table 30
Modeled Buildings
2232 Golf Club Rd
Pittsburg, CA

Model ID	Description	UTM Zone 10 Coordinates[1] (m)		Elevation (m)	Height (m)
		X	Y		
MAINBDG	Data Center Building - 1st Tier	595,608.0	4,207,515.8	31.85	7.62
	Data Center Building - 2nd Tier	595,608.0	4,207,515.8	31.85	24.69
	Data Center Building - 3rd Tier	595,608.0	4,207,515.8	31.85	28.65
GEN1	Generator Enclosure	595,575.8	4,207,526.1	31.85	15.39
GEN2	Generator Enclosure	595,573.8	4,207,532.5	31.85	15.39
GEN3	Generator Enclosure	595,571.7	4,207,538.8	31.85	15.39
GEN4	Generator Enclosure	595,569.7	4,207,545.2	31.85	15.39
GEN5	Generator Enclosure	595,567.6	4,207,551.6	31.85	15.39
GEN6	Generator Enclosure	595,565.6	4,207,558.0	31.85	15.39
GEN7	Generator Enclosure	595,563.5	4,207,564.4	31.85	15.39
GEN8	Generator Enclosure	595,561.4	4,207,570.7	31.85	15.39
GEN9	Generator Enclosure	595,559.4	4,207,577.1	31.85	15.39
GEN10	Generator Enclosure	595,557.3	4,207,583.5	31.85	15.39
GEN11	Generator Enclosure	595,555.3	4,207,589.9	31.85	15.39
GEN12	Generator Enclosure	595,553.2	4,207,596.2	31.85	15.39
GEN13	Generator Enclosure	595,551.2	4,207,602.6	31.85	15.39
GEN14	Generator Enclosure	595,549.1	4,207,609.0	31.85	15.39
GEN15	Generator Enclosure	595,547.1	4,207,615.4	31.85	15.39
GEN16	Generator Enclosure	595,545.0	4,207,621.8	31.85	15.39
GEN17	Generator Enclosure	595,543.0	4,207,628.1	31.85	15.39
GEN18	Generator Enclosure	595,540.9	4,207,634.5	31.85	15.39
GEN19	Generator Enclosure	595,538.9	4,207,640.9	31.85	5.03

Notes:

1. UTM coordinates shown here represent the lower left (southwest) corner of each modeled building.

Abbreviations:

m - meters
UTM - Universal Transverse Mercator

Table 31
Modeled Operational Concentrations and NAAQS
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period of Standard	Load (%)	Source Group	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor ($\mu g/m^3$)(g/s)$^{-1}$	Emission rate (g/s)	Modeled Concentrations ($\mu g/m^3$)	3-Year Average Background Concentrations ($\mu g/m^3$) [3]	Total Concentrations	NAAQS ($\mu g/m^3$)	Above NAAQS?
				X	Y							
NO_2 [1,2]	3-year average of 1-Hour Yearly 98th%	100	UGEN14	595,675	4,207,743	--	--	81.4	N/A	81	188	No
		75	UGEN15	595,675	4,207,743	--	--	70.0		70		
		50	LGEN6	595,743	4,207,546	--	--	62.0		62		
		25	UGEN10	595,455	4,207,643	--	--	77.2		77		
	Annual	100	ALL	595,743	4,207,576	492	0.0096	4.7	10	15	100	No
		75	ALL	595,743	4,207,576	527	0.0057	3.0		13		
		50	ALL	595,743	4,207,576	563	0.0029	1.6		12		
		25	ALL	595,743	4,207,576	650	0.0048	3.1		13		
CO	1-Hour	100	UGEN9	595,743	4,207,526	269	0.50	135	1,909	2,044	40,000	No
		75	UGEN9	595,743	4,207,526	328	0.31	100		2,009		
		50	UGEN9	595,743	4,207,526	370	0.34	124		2,033		
		25	UGEN14	595,675	4,207,743	441	0.35	153		2,062		
	8-Hour	100	UGEN11	595,455	4,207,663	79	0.50	40	1,336	1,376	10,000	No
		75	UGEN11	595,455	4,207,663	92	0.31	28		1,364		
		50	UGEN11	595,455	4,207,663	105	0.34	35		1,371		
		25	UGEN7	595,455	4,207,623	143	0.35	50		1,386		
SO_2	3-year average of 1-Hour Yearly 99th%	100	UGEN9	595,743	4,207,526	269	0.0048	1.29	16.8	18.1	196	No
		75	UGEN9	595,743	4,207,526	328	0.0045	1.47		18.3		
		50	UGEN9	595,743	4,207,526	370	0.0030	1.11		18.0		
		25	UGEN14	595,675	4,207,743	441	0.0018	0.79		17.6		
	3-Hour	100	UGEN14	595,675	4,207,743	141	0.0048	0.67	29	29	1,300	No
		75	UGEN14	595,675	4,207,743	158	0.0045	0.71		29		
		50	UGEN8	595,455	4,207,623	193	0.0030	0.58		29		
		25	UGEN8	595,455	4,207,623	276	0.0018	0.50		29		

Table 31
Modeled Operational Concentrations and NAAQS
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period of Standard	Load (%)	Source Group	UTM Zone 10 Coordinates (m) X	UTM Zone 10 Coordinates (m) Y	Max. Dispersion Factor $(\mu g/m^3)(g/s)^{-1}$	Emission rate (g/s)	Modeled Concentrations $(\mu g/m^3)$	3-Year Average Background Concentrations $(\mu g/m^3)$ [3]	Total Concentrations	NAAQS $(\mu g/m^3)$	Above NAAQS?
PM_{10}	24-Hour 4th highest over 3 Years	100	UGEN5	595,743	4,207,566	44	0.0010	0.044	74	74	150	No
		75	LGEN4	595,743	4,207,566	49	0.0012	0.062		74		
		50	LGEN5	595,743	4,207,566	54	0.0017	0.090		74		
		25	UGEN11	595,575	4,207,743	66	0.0016	0.105		74		
$PM_{2.5}$	Annual	100	ALL	595,743	4,207,576	492	0.00009	0.046	8.8	8.8	12	No
		75	ALL	595,743	4,207,576	527	0.00012	0.061		8.8		
		50	ALL	595,743	4,207,576	563	0.00015	0.087		8.9		
		25	ALL	595,743	4,207,576	650	0.00015	0.096		8.9		

Notes:

1. Direct emissions rates for 1-hour NO_2 were used in the dispersion modeling to obtain 1-hour NO_2 concentrations directly. Since unit emission rates were not used, there are no values for NO_2 emission rates in this table.
2. For the 1-hour NO_2 runs, season-by-hour NO_2 background values were incorporated using AERMOD and are already included in the modeled concentrations presented.
3. The 3-year average background concentrations were calculated using 2020-2022 data collected from Monitor Site ID 060130002 located at 2956-A Treat Boulevard in Concord, California, as reported by the USEPA.

Abbreviations:

CO - carbon monoxide
g - grams
NAAQS - National Ambient Air Quality Standard
NO_2 - nitrogen dioxide
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
SO_2 - sulfur dioxide
s - second
$\mu g/m^3$ - micrograms per cubic meter

Table 32
Modeled Operational Concentrations and CAAQS
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period of Standard	Load (%)	Source Group	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor $(\mu g/m^3)(g/s)^{-1}$	Emission rate (g/s)	Modeled Concentrations $(\mu g/m^3)$	3-Year Maximum Background Concentrations $(\mu g/m^3)$ [2]	Total Concentrations	CAAQS $(\mu g/m^3)$	Above CAAQS?
				X	Y							
NO_2 [1]	1-Hour Maximum	100	UGEN9	595,743	4,207,526	--	--	70.3	63.9	134	339	No
		75	LGEN1	595,695	4,207,354	--	--	56.6		121		
		50	LGEN5	595,661	4,207,391	--	--	42.8		107		
		25	LGEN1	595,670	4,207,388	--	--	65.6		130		
	Annual Maximum	100	ALL	595,743	4,207,576	492	0.0096	4.7	11	16	57	No
		75	ALL	595,743	4,207,576	527	0.0057	3.0		14		
		50	ALL	595,743	4,207,576	563	0.0029	1.6		13		
		25	ALL	595,743	4,207,576	650	0.0048	3.1		14		
CO	1-Hour Maximum	100	UGEN9	595,743	4,207,526	269	0.50	135	3,436	3,571	23,000	No
		75	UGEN9	595,743	4,207,526	328	0.31	100		3,536		
		50	UGEN9	595,743	4,207,526	370	0.34	124		3,560		
		25	UGEN14	595,675	4,207,743	441	0.35	153		3,589		
	8-Hour Maximum	100	UGEN11	595,455	4,207,663	79	0.50	40	2,290	2,330	10,000	No
		75	UGEN11	595,455	4,207,663	92	0.31	28		2,318		
		50	UGEN11	595,455	4,207,663	105	0.34	35		2,325		
		25	UGEN7	595,455	4,207,623	143	0.35	50		2,340		
SO_2	1-Hour Maximum	100	UGEN9	595,743	4,207,526	269	0.0048	1.29	34.6	35.9	655	No
		75	UGEN9	595,743	4,207,526	328	0.0045	1.47		36.0		
		50	UGEN9	595,743	4,207,526	370	0.0030	1.11		35.7		
		25	UGEN14	595,675	4,207,743	441	0.0018	0.79		35.4		
	24-Hour Maximum	100	UGEN5	595,743	4,207,566	44	0.00020	0.009	7.1	7.1	105	No
		75	LGEN4	595,743	4,207,566	49	0.00019	0.009		7.1		
		50	LGEN5	595,743	4,207,566	54	0.00012	0.007		7.1		
		25	UGEN11	595,575	4,207,743	66	0.00007	0.005		7.1		

Table 32
Modeled Operational Concentrations and CAAQS
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period of Standard	Load (%)	Source Group	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor ($\mu g/m^3$)$(g/s)^{-1}$	Emission rate (g/s)	Modeled Concentrations ($\mu g/m^3$)	3-Year Maximum Background Concentrations ($\mu g/m^3$) [2]	Total Concentrations	CAAQS ($\mu g/m^3$)	Above CAAQS?
				X	Y							
PM_{10}	Annual Maximum	100	ALL	595,743	4,207,576	492	0.00009	0.046	18.2	18.3	20	No
		75	ALL	595,743	4,207,576	527	0.00012	0.061		18.3		
		50	ALL	595,743	4,207,576	563	0.00015	0.087		18.3		
		25	ALL	595,743	4,207,576	650	0.00015	0.096		18.3		
$PM_{2.5}$	Annual Maximum	100	ALL	595,743	4,207,576	492	0.00009	0.046	11.1	11.1	12	No
		75	ALL	595,743	4,207,576	527	0.00012	0.061		11.2		
		50	ALL	595,743	4,207,576	563	0.00015	0.087		11.2		
		25	ALL	595,743	4,207,576	650	0.00015	0.096		11.2		

Notes:

1. Direct emissions rates for 1-hour NO_2 were used in the dispersion modeling to obtain 1-hour NO_2 concentrations directly. Since unit emission rates were not used, there are no values for NO_2 emission rates in this table.
2. The 3-year maximum background concentrations were calculated using 2020-2022 data collected from Monitor Site ID 060130002 located at 2956-A Treat Boulevard in Concord, California, as reported by the USEPA.

Abbreviations:

CAAQS - California Ambient Air Quality Standard
CO - carbon monoxide
g - grams
NO_2 - nitrogen dioxide
SO_2 - sulfur dioxide
s - second
$\mu g/m^3$ - micrograms per cubic meter

Table 33
Modeled Construction Concentrations and NAAQS
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period of Standard	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor $(\mu g/m^3)(g/s)^{-1}$	Emission rate (g/s)	Modeled Concentration $(\mu g/m^3)$	3-Year Average Background Concentrations $(\mu g/m^3)$ [3]	Total Concentrations	NAAQS $(\mu g/m^3)$	Above NAAQS?
		X	Y							
NO_2 [1,2]	3-year average of 1-Hour Yearly 98th%	595,670	4,207,388	--	--	106	--	106	188	No
	Annual Arithmetic Mean	595,670	4,207,388	16	0.018	0.29	10	10	100	No
CO	1-Hour	595,575	4,207,414	2,302	0.63	1440	1,909	3,349	40,000	No
	8-Hour	595,670	4,207,388	357	0.63	223	1,336	1,559	10,000	No
SO_2	3-year average of 1-Hour Yearly 99th%	595,575	4,207,414	2,302	0.0011	2.5	16.8	19.3	196	No
	3-Hour	595,670	4,207,388	971	0.0011	1.1	29	30	1,300	No
PM_{10} [1]	24-Hour 4th highest over 3 years	595,520	4,207,571	--	--	1.5	74	76	150	No
$PM_{2.5}$ [1]	Annual Arithmetic Mean	595,517	4,207,580	--	--	0.084	8.8	8.9	12	No

Notes:

1. Direct emissions rates for NO_2, PM_{10}, and $PM_{2.5}$ were used in the dispersion modeling to obtain concentrations of these pollutants directly. Since unit emission rates were not used, there are no values for the emission rates of these pollutants in this table.
2. For the 1-hour NO_2 runs, seasonal hour-of-day NO_2 background values were incorporated using AERMOD and are already included in the modeled concentrations presented.
3. The 3-year average background concentrations were calculated using 2020-2022 data collected from Monitor Site ID 060130002 located at 2956-A Treat Boulevard in Concord, California, as reported by the USEPA.

Abbreviations:

CO - carbon monoxide
g - grams
NAAQS - National Ambient Air Quality Standard
NO_2 - nitrogen dioxide
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
SO_2 - sulfur dioxide
s - second
$\mu g/m^3$ - micrograms per cubic meter

Table 34
Modeled Construction Concentrations and CAAQS
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period of Standard	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor $(\mu g/m^3)(g/s)^{-1}$	Emission rate (g/s)	Modeled Concentration $(\mu g/m^3)$	3-Year Maximum Background Concentrations $(\mu g/m^3)$ [2]	Total Concentrations	CAAQS $(\mu g/m^3)$	Above CAAQS?
		X	Y							
NO_2 [1]	1-Hour Maximum	595,575	4,207,414	--	--	165	64	229	339	No
	Annual Maximum	595,670	4,207,388	16	0.018	0.29	11	11	57	No
CO	1-Hour Maximum	595,575	4,207,414	2,302	0.63	1440	3,436	4,876	23,000	No
	8-Hour Maximum	595,670	4,207,388	357	0.63	223	2,290	2,514	10,000	No
SO_2	1-Hour Maximum	595,575	4,207,414	2,302	0.0011	2.50	35	37	655	No
	24-Hour Maximum	595,670	4,207,388	154	0.0003	0.05	7.1	7.1	105	No
PM_{10} [1]	Annual Maximum	595,517	4,207,580	--	--	0.19	18	18.4	20	No
$PM_{2.5}$ [1]	Annual Maximum	595,517	4,207,580	--	--	0.088	11.1	11.2	12	No

Notes:

1. Direct emissions rates for NO_2 , PM_{10}, and $PM_{2.5}$ were used in the dispersion modeling to obtain concentrations of these pollutants directly. Since unit emission rates were not used, there are no values for the emission rates of these pollutants in this table.

2 The 3-year maximum background concentrations were calculated using 2020-2022 data collected from Monitor Site ID 060130002 located at 2956-A Treat Boulevard in Concord, California, as reported by the USEPA.

Abbreviations:

CAAQS - California Ambient Air Quality Standard
CO - carbon monoxide
g - grams
NO_2 - nitrogen dioxide
$PM_{2.5}$ - particulate matter less than 2.5 microns
SO_2 - sulfur dioxide
s - second
$\mu g/m^3$ - micrograms per cubic meter

Table 35
Comparison of Modeled Operational PM2.5 and PM10 Results to Significance Impact Levels
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period	Load (%)	Source Group	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor ($\mu g/m^3$)(g/s)$^{-1}$	Emission rate (g/s)	Modeled Concentrations ($\mu g/m^3$)	SIL ($\mu g/m^3$) [1]	Above SIL?
				X	Y					
$PM_{2.5}$	24-Hour Maximum	100	UGEN5	595,743	4,207,566	44	0.0010	0.04	1.2	No
		75	LGEN4	595,743	4,207,566	49	0.0012	0.06		
		50	LGEN5	595,743	4,207,566	54	0.0017	0.09		
		25	UGEN11	595,575	4,207,743	66	0.0016	0.10		
PM_{10}	24-Hour Maximum	100	UGEN5	595,743	4,207,566	44	0.0010	0.04	5	No
		75	LGEN4	595,743	4,207,566	49	0.0012	0.06		
		50	LGEN5	595,743	4,207,566	54	0.0017	0.09		
		25	UGEN11	595,575	4,207,743	66	0.0016	0.10		

Notes:

1. Significance Impact Level (SIL) value taken from the EPA's "Guidance on Significance Impact Levels for Ozone and Fine Particles in the Prevention of Significance Deterioration Permitting Program" Memorandum dated April 17, 2018.

Abbreviations:

g - grams
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
SIL - Significance Impact Level
s - second
$\mu g/m^3$ - micrograms per cubic meter

Table 36
Comparison of Modeled Construction PM2.5 and PM10 Results to Significance Impact Levels
2232 Golf Club Rd
Pittsburg, CA

Pollutant	Averaging Period	UTM Zone 10 Coordinates (m)		Max. Dispersion Factor $(\mu g/m^3)(g/s)^{-1}$	Emission rate (g/s)[1]	Modeled Concentration $(\mu g/m^3)$	SIL $(\mu g/m^3)$[2]	Above SIL?
		X	Y					
$PM_{2.5}$	24-Hour Maximum	595,545	4,207,495	--	--	0.87	1.2	No
PM_{10}	24-Hour Maximum	595,545	4,207,495	--	--	1.96	5.0	No

Notes:

1. Direct emissions rates for PM_{10} and $PM_{2.5}$ were used in the dispersion modeling to obtain concentrations of these pollutants directly. Since unit emission rates were not used, there are no values for the emission rates of these pollutants in this table.
2. Significance Impact Level (SIL) values taken from the EPA's "Guidance on Significance Impact Levels for Ozone and Fine Particles in the Prevention of Significance Deterioration Permitting Program" Memorandum dated April 17, 2018.

Abbreviations:

g - grams
PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
SIL - Significance Impact Level
s - second
$\mu g/m^3$ - micrograms per cubic meter

Table 37
Modeled Emissions Rate for Health Risk Assessment
2232 Golf Club Rd
Pittsburg, CA

Scenario	Source	Year	Emission Rate (g/s)		
			Yearly		Hourly
			DPM [1]	$PM_{2.5}$ [2]	TOG
Construction	Fugitive Dust	2025	--	7.83E-04	--
		2026	--	1.20E-03	--
		2027	--	2.13E-05	--
Construction	Off-Road and On-Road Diesel Exhaust	2025	1.96E-05	1.96E-05	--
		2026	3.78E-04	3.78E-04	--
		2027	2.88E-05	2.88E-05	--

Scenario	Source	Load	Year	Emission Rate (g/s)		
				Yearly		Hourly
				DPM [3]	$PM_{2.5}$ [4]	TOG
Operations [5]	Diesel Backup Generators	25	All	1.47E-04	1.47E-04	9.60E-02
		50	All	1.55E-04	1.55E-04	1.28E-01
		75	All	1.16E-04	1.16E-04	1.06E-01
		100	All	9.29E-05	9.29E-05	8.97E-02

Notes

1. The DPM emission rate during construction includes exhaust from all onsite off-road construction equipment, and exhaust emissions from vendor and hauling trucks (out to a distance of 1,000 feet from the project site) which are assumed to be diesel vehicles. All exhaust PM_{10} is assumed to be DPM.
2. Construction related $PM_{2.5}$ emissions are from on-site off-road equipment and on-road vehicle exhaust (out to a radius of 1,000 feet from the project site) and on-site fugitive dust sources and on-road fugitive dust (out to a radius of 1,000 feet from the project site).
3. DPM emissions from operations are from diesel generators. DPM emissions from operational traffic are not included since the average number of vehicle trips per day is relatively small.
4. $PM_{2.5}$ emissions from operations are from diesel generators alone. $PM_{2.5}$ emissions from operational traffic are not included since the average number of vehicle trips per day is relatively small.
5. Emission rates for generators are given as the emission rate from a single generator.

Abbreviations

DPM - diesel particulate matter
g - grams
$PM_{2.5}$ - particulate matter less than 2.5 microns
PM_{10} - particulate matter less than 10 microns
s - seconds
TOG - total organic gases

Table 38
Locations and Types of Nearby Sensitive Receptors
2232 Golf Club Rd
Pittsburg, CA

Name	Receptor Type	Address	Latitude	Longitude
Los Medanos Elementary School	School	610 Crowley Ave., Pittsburg, CA 94565	38.01675	-121.90106
Heights Elementary School	School	40 Seeno Ave., Pittsburg, CA 94565	38.00687	-121.89894
Rancho Medanos Junior High School	School	2301 Range Rd., Pittsburg, CA 94565	38.01588	-121.91274
Pittsburg Water Treatment Plant	Worker	300 Olympia Dr., Pittsburg, CA 94565	38.00676	-121.90490
The Church of Jesus Christ of Latter-day Saints	Worker	2201 Golf Club Rd., Pittsburg, CA 94565	38.01389	-121.91083
Discovery Homes Dream Courts	Worker	2225 John Henry Johnson Pkwy., Pittsburg, CA 94565	38.00936	-121.92017

Table 39
Exposure Parameters
2232 Golf Club Rd
Pittsburg, CA

Period[1]	Receptor Type[2]	Year	Receptor Age Group[3]	Exposure Parameters								
				Daily Breathing Rate (DBR)[4,5]	Exposure Duration (ED)[6]	Fraction of Time at Home (FAH)[7]	Exposure Frequency (EF)[8]	Averaging Time (AT)	Modeling Adjustment Factor (MAF)[9]	Age Sensitivity Factor (ASF)[10]	Intake Factor, Inhalation (If_{inh})	Cumulative Intake Factor, Inhalation (If_{inh})
				(L/kg-day)	(years)	(unitless)	(days/year)	(days)	(unitless)	(unitless)	(m^3/kg-day)	(m^3/kg-day)
Construction	Residential	2025	3rd Trimester	361	0.25	1	350	25,550	1	10	0.012	0.12
			Age 0-<2 Years	1,090	0.75	1			1	10	0.11	
		2026	Age 0-<2 Years	1,090	1	1			1	10	0.15	0.15
		2027	Age 2-<16 Years	572	1	1			1	3	0.02	0.02
	Elementary School	2025	Age 2-<16 Years	520	1	1	180		4.2	3	0.046	0.046
		2026	Age 2-<16 Years	520	1	1			4.2	3	0.046	0.046
		2027	Age 2-<16 Years	520	1	1			4.2	3	0.046	0.046
	Junior High School	2025	Age 2-<16 Years	520	1	1	180		4.2	3	0.046	0.046
		2026	Age 2-<16 Years	520	1	1			4.2	3	0.046	0.046
		2027	Age 2-<16 Years	520	1	1			4.2	3	0.046	0.046
	Recreational	2025	Age 0-<2 Years	150	1	1	52		4.2	10	0.013	0.013
		2026	Age 0-<2 Years	150	1	1			4.2	10	0.0128	0.0128
		2027	Age 2-<16 Years	65	1	1			4.2	3	0.0017	0.0017
	Worker	2025	Age 16-30 Years	230	1	1	250		4.2	1	0.0095	0.0095
		2026	Age 16-30 Years	230	1	1			4.2	1	0.0095	0.0095
		2027	Age 16-30 Years	230	1	1			4.2	1	0.0095	0.0095
Operations	Residential	All	3rd Trimester	361	0.25	1	350	25,550	1	10	0.012	0.68
			Age 0-<2 Years	1090	2	1			1	10	0.30	
			Age 2-<16 Years	572	14	1			1	3	0.33	
			Age 16-30 Years	261	14	0.73			1	1	0.037	
	Elementary School		Age 2-<16 Years	520	7	1	180		4.2	3	0.32	0.32
	Junior High School		Age 2-<16 Years	520	3	1	180		4.2	3	0.14	0.14
	Recreational		Age 0-<2 Years	150	2	1	52		4.2	10	0.026	0.053
			Age 2-<16 Years	65	14	1			4.2	3	0.023	
			Age 16-30 Years	30	14	1			4.2	1	0.0036	
	Worker		Age 16-70 Years	230	25	1	250		4.2	1	0.24	0.24

Notes:

1. Construction exposure starts at the assumed start of construction, November 2025. Operational exposure begins at the assumed start of operations, May 2027.
2. Sensitive receptors within a 1,000 meter buffer were analyzed in the HRA. These include residents and workers in the area, as well as recreational receptors, specifically the nearby open space surrounding the project site. To be conservative, additional sensitive receptors outside of the 1,000 meter buffer were included. These include an elementary school and a junior high school.
3. Age bins reflect default age bins from Appendix E of BAAQMD 2022 CEQA Guidelines.
4. Daily breathing rates for residential, elementary school students, junior high school students, and worker receptor types reflect default breathing rates from Appendix E of BAAQMD 2022 CEQA Guidelines.
5. Daily breathing rates for recreational users assume 95th percentile 8-hour daily breathing rates for Moderate Intensity Activities from OEHHA 2015 Guidance, scaled to 1 hour per week.
6. Based on BAAQMD guidance, residential exposure starts in the third trimester for an unborn child and continues for 30 years after birth. Non-residential exposure duration reflects the anticipated, maximum amount of time a receptor would be attending
7. Fraction of time spent at home is conservatively assumed to be 1 (i.e. 24 hours/day) for all age bins except Age 16-30 Years. Fraction of time spent at home is assumed to be 0.73 for Ages 16-30 Years.
8. Exposure frequency was determined as follows:
   Residents: reflects default residential exposure frequency from BAAQMD 2022 CEQA Guidelines.
   Elementary School and Junior High School students: for ages 2 years to 16 years, reflects default number of school days per year.
   Worker: reflects default worker exposure frequency from BAAQMD 2022 CEQA Guidelines.
   Recreational: reflects assumption that receptor will use the open space areas surrounding the project for 1 hour every week.
9. The Modeling Adjustment Factor for all non-residential receptor types in both the construction and operational phases is calculated to adjust from 24 hours/day to 8 hours/day and from 7 days/week to 5 days/week ([24 hours/8 hours] * [7 days/5days] = 4.2).
10. The age sensitive factors reflect default values from Appendix E of BAAQMD 2022 CEQA Guidelines and 2015 OEHHA Guidance.

Abbreviations:

AT - averaging time
Cal/EPA - California Environmental Protection Agency
DBR - daily breathing rate
EF - exposure frequency
FAH - fraction of time at home
kg - kilogram
L - liter

Reference:

BAAQMD. 2022. CEQA Air Quality Guidelines. Appendix E: Recommended Methods For Screening and Modeling Local Risks and Hazards. August 28. Available online at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/appendix-e-recommended-methods-for-screening-and-modeling-local-risks-and-hazards_final-pdf.pdf?la=en

Cal/EPA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 40
Speciation Values
2232 Golf Club Rd
Pittsburg, CA

Source	Emission Type	Fraction	Chemical[1]
Diesel Offroad Equipment (Generators)	**Exhaust PM**	1.0	Diesel PM
	Exhaust TOG	0.0019	1,3-Butadiene
		0.074	Acetaldehyde
		0.020	Benzene
		0.0031	Ethylbenzene
		0.15	Formaldehyde
		0.0016	n-Hexane
		3.0E-04	Methanol
		0.015	Methyl Ethyl Ketone
		9.0E-04	Naphthalene
		0.026	Propylene
		6.0E-04	Styrene
		0.015	Toluene
		0.0061	m-Xylene
		0.0034	o-Xylene
		0.0010	p-Xylene

Notes:

1. Compounds presented in this table are only those air toxic contaminants with toxicity values from Cal/EPA (2015) evaluated in the health risk assessment. Speciation profiles presented in this table are from the following sources:

Diesel offroad exhaust, TOG: CARB 818 / EPA 3161

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
Cal/EPA - California Environmental Protection Agency
CARB - California Air Resources Board
PM - particulate matter
TOG - total organic gases
USEPA - United States Environmental Protection Agency

References:

CARB. Speciation Profiles Used in ARB Modeling. Available online at: http://www.arb.ca.gov/ei/speciate/speciate.htm#specprof. Accessed December 2023.

BAAQMD. 2012. Recommended Methods for Screening and Modeling Local Risks and Hazards. October.

Cal/EPA. 2022. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. October.

USEPA. SPECIATE 5.2. Available online at: https://www.epa.gov/air-emissions-modeling/speciate

Table 41
Toxicity Values
2232 Golf Club Rd
Pittsburg, CA

Chemical[1]	Cancer Potency Factor $(mg/kg\text{-}day)^{-1}$	Chronic REL ($\mu g/m^3$)	Acute REL ($\mu g/m^3$)
Diesel PM	1.1	5.0	--
1,3-Butadiene	0.600	2.0	660
Acetaldehyde	0.01	140.0	470
Benzene	0.10	3.0	27
Ethylbenzene	0.0087	2,000	--
Formaldehyde	0.021	9.0	55
n-Hexane	--	7,000	--
Methanol	--	4,000	28,000
Methyl Ethyl Ketone	--	--	13,000
Naphthalene	0.12	9.0	--
Propylene	--	3,000	--
Styrene	--	900	21,000
Toluene	--	420	5,000
m-Xylene	--	700	22,000
o-Xylene	--	700	22,000
p-Xylene	--	700	22,000

Notes:

1. Chemicals presented in this table reflect air toxic contaminants in the proposed fuel types that are expected from diesel off-road equipment (i.e., generators).

Abbreviations:

- - not available or not applicable
$\mu g/m^3$ - micrograms per cubic meter
Cal/EPA - California Environmental Protection Agency
CARB - Air Resources Board
$(mg/kg\text{-}day)^{-1}$ - per milligram per kilogram-day
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL - reference exposure level

Reference:

Cal/EPA. 2022. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May 13.

Table 42
Construction Health Impacts Summary
2232 Golf Club Rd.
Pittsburg, CA

Receptor Type		Cancer Risk (in a million)	Chronic Hazard Index (unitless)	$PM_{2.5}$ Concentation ($\mu g/m^3$)
Elementary School	**Total Risk**	**0.012**	**0.000042**	**0.00093**
	UTMx	596,595	596,595	596,595
	UTMy	4,207,254	4,207,254	4,207,254
Junior High School	**Total Risk**	**0.028**	**0.00010**	**0.0029**
	UTMx	595,335	595,335	595,435
	UTMy	4,208,134	4,208,134	4,208,074
Worker	**Total Risk**	**0.019**	**0.00032**	**0.014**
	UTMx	595,675	595,675	595,675
	UTMy	4,207,874	4,207,874	4,207,874
Recreational	**Total Risk**	**0.097**	**0.0013**	**0.042**
	UTMx	595,535	595,535	595,495
	UTMy	4,207,514	4,207,514	4,207,594
Residential	**Total Risk**	**0.31**	**0.00036**	**0.015**
	UTMx	595,675	595,675	595,675
	UTMy	4,207,834	4,207,834	4,207,834
BAAQMD Significance Threshold		10	1	0.3

Abbreviations:
BAAQMD - Bay Area Air Quality Management District
$PM_{2.5}$ - particulate matter less than 2.5 microns
$\mu g/m^3$ - micrograms per cubic meter

Table 43
Project-Related Operational Health Impacts Summary
2232 Golf Club Rd.
Pittsburg, CA

Load Scenario			Receptor Type					PMI	BAAQMD Significance Threshold
			Elementary School	Junior High School	Worker	Recreational	Residential		
Cancer Risk (in a million)	100%	Risk	0.89	0.26	1.0	2.3	9.2	9.2	10
		UTMx	596,535	595,655	596,155	595,755	595,995	595,995	
		UTMy	4,208,174	4,208,074	4,207,354	4,207,574	4,207,654	4,207,654	
		RecType	--	--	--	--	--	Residential	
Chronic Risk (unitless)	100%	Risk	0.0005	0.0003	7.7E-04	0.0081	0.0025	0.0081	1
		UTMx	596,535	595,655	596,155	595,755	595,995	595,755	
		UTMy	4,208,174	4,208,074	4,207,354	4,207,574	4,207,654	4,207,574	
		RecType	--	--	--	--	--	Residential	
Acute Risk (unitless)	100%	Risk	0.021	0.028	0.036	0.082	0.041	0.082	1
		UTMx	595,835	595,555	595,675	595,755	595,995	595,755	
		UTMy	4,208,154	4,208,054	4,207,874	4,207,534	4,207,514	4,207,534	
		Worst-Case Generator	LGEN10	UGEN2	UGEN8	UGEN9	UGEN11	UGEN9	
		RecType	--	--	--	--	--	Recreational	
$PM_{2.5}$ Concentration ($\mu g/m^3$)	100%	Risk	0.0025	0.0017	0.0039	0.041	0.012	0.041	0.3
		UTMx	596,535	595,655	596,155	595,755	595,995	595,755	
		UTMy	4,208,174	4,208,074	4,207,354	4,207,574	4,207,654	4,207,574	
		RecType	--	--	--	--	--	Recreational	

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
$PM_{2.5}$ - particulate matter less than 2.5 microns
PMI - point of maximum impact
$\mu g/m^3$ - micrograms per cubic meter

Table 44
Summary of Cumulative Health Impacts at the MEISR
2232 Golf Club Rd.
Pittsburg, CA

Emission Source	Cancer Risk Impact (in one million)	Chronic Non-Cancer Hazard Index	Acute Non-Cancer Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Project Operational Generators (100% Load)	9.2	0.0025	0.041	0.012
Subtotal, Project Impacts	**9.2**	**0.0025**	**0.041**	**0.012**
Existing Stationary Sources[1]				
City of Pittsburg Water Treatment Plant (Facility #13968)	0.28	4.4E-04	NA	3.6E-04
Subtotal, Background Sources	**0.28**	**4.4E-04**	**0**	**3.6E-04**
Existing Rail and Roadway Sources[2]				
Railroad	0.24	6.5E-05	NA	3.1E-04
Major Roadways	2.2	0.0086	NA	0.075
Subtotal, Mobile Sources	**2.4**	**0.0087**	**0**	**0.076**
Subtotal, Background and Mobile Sources	**2.7**	**0.0091**	**0**	**0.08**
Total Cumulative Impact	**11.9**	**0.0116**	**0.041**	**0.09**
BAAQMD Significance Threshold	100	10	10	0.80
Exceed?[3]	No	No	No	No
Receptor Type	Residential	Residential	Residential	Residential
Receptor Location (UTMx)	595,995	595,995	595,995	595,995
Receptor Location (UTMy)	4,207,654	4,207,654	4,207,514	4,207,654

Notes:

1. Health impacts data for stationary sources within 1,000 ft of the MEISR (a residential receptor) were obtained from BAAQMD's Permitted Stationary Source Screening Map.
2. Health impacts data for existing rail and roadway sources were estimated using BAAQMD's source raster files for cancer risks, chronic HI, and $PM_{2.5}$. Impacts were determined based on the maximum impact of a raster cell located at the MEISR.

Abbreviations:

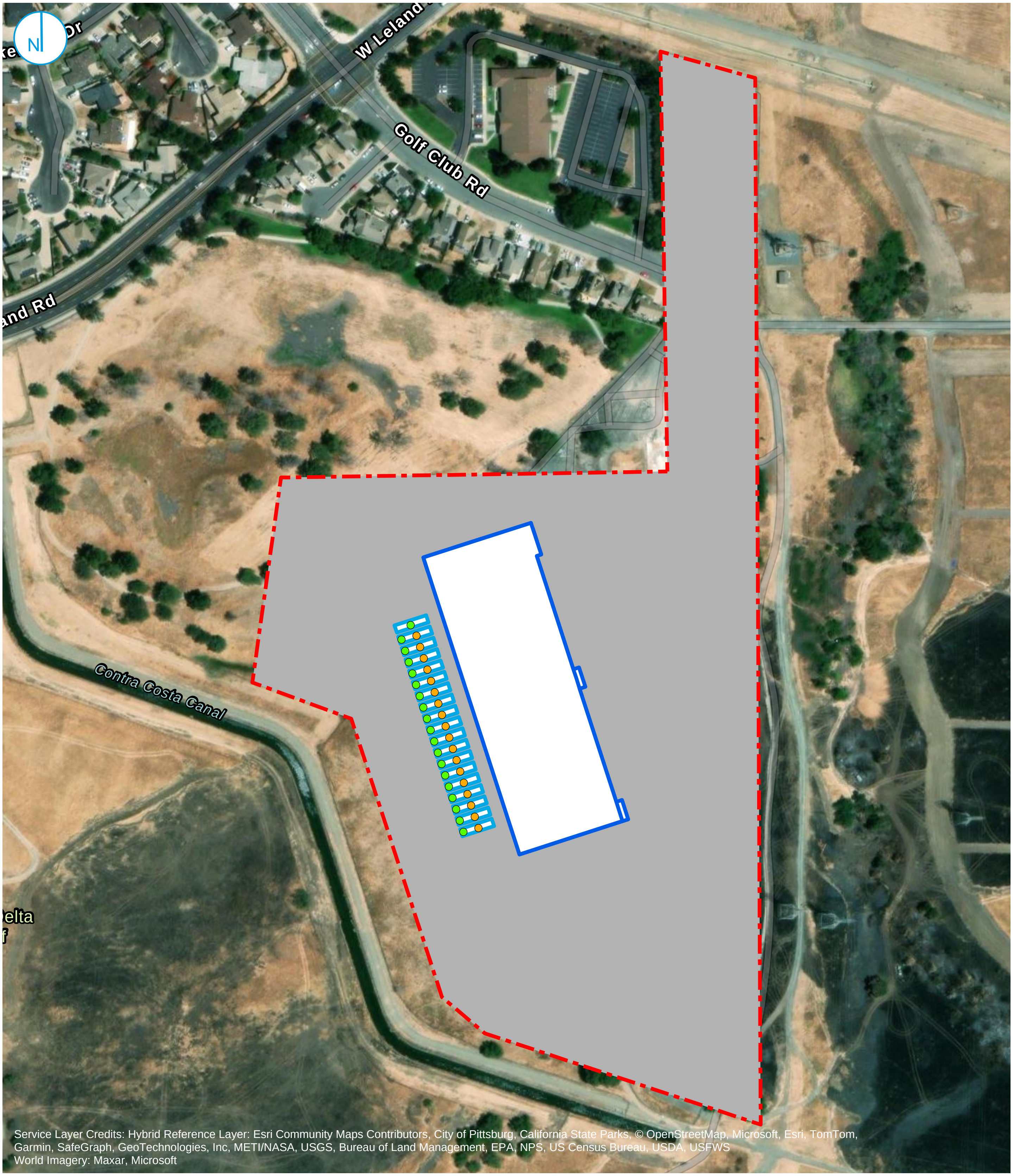
BAAQMD - Bay Area Air Quality Management District
HI - hazard index
MEISR - Maximally Exposed Individual Sensitive Receptor
NA - not applicable
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
$\mu g/m^3$ - micrograms per cubic meter
UTM - Universal Transverse Mercator coordinate system

References:

BAAQMD Permitted Stationary Source Screening Map. Available at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3. Accessed: January 2024.

BAAQMD raster tools available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling. Accessed: January 2024.

FIGURES



C:\Users\SOAUSTIN\Documents\ArcGIS\Projects\WSP_AVAIO_Pittsburg_CA\WSP_AVAIO_Pittsburg_CA\WSP_AVAIO_Pittsburg_CA.aprx\Figure 01 - Facility Layout

Facility Boundary
Data Center Main Building
Generator Enclosures
Upper Generator Stacks
Lower Generator Stacks

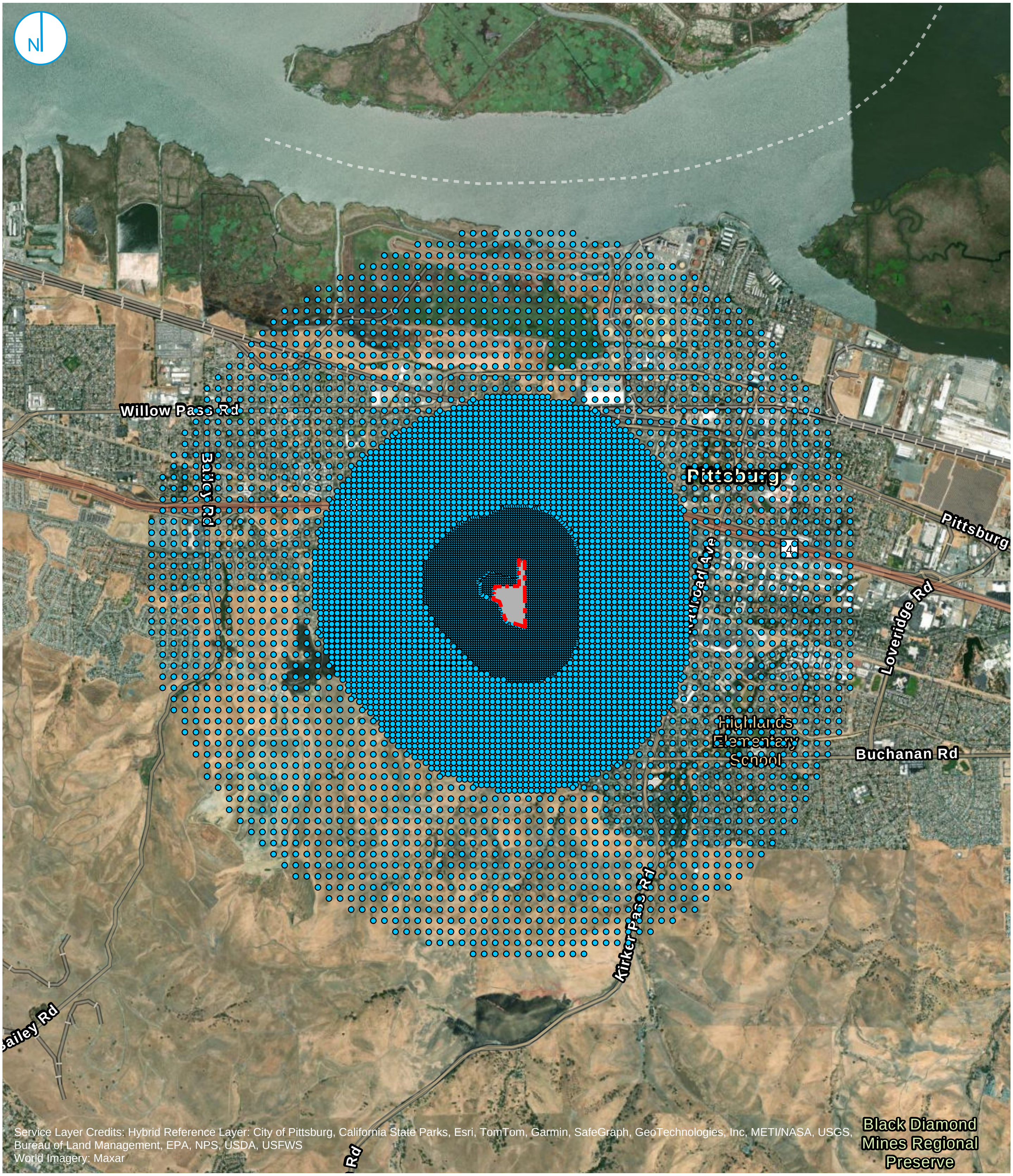
0 125 250 Feet

FACILITY LAYOUT

Pittsburg Data Hub, LLC
Pittsburg, CA

FIGURE 01

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



C:\Users\SOAUSTIN\Documents\ArcGIS\Projects\WSP_AVAIO_Pittsburg_CA\WSP_AVAIO_Pittsburg_CA\WSP_AVAIO_Pittsburg_CA.aprx\Figure 02 - CAAQS/NAAQS Receptor Grid

Facility Boundary

CAAQS/NAAQS Receptor

0 2,000 4,000 Feet

RECEPTOR GRID

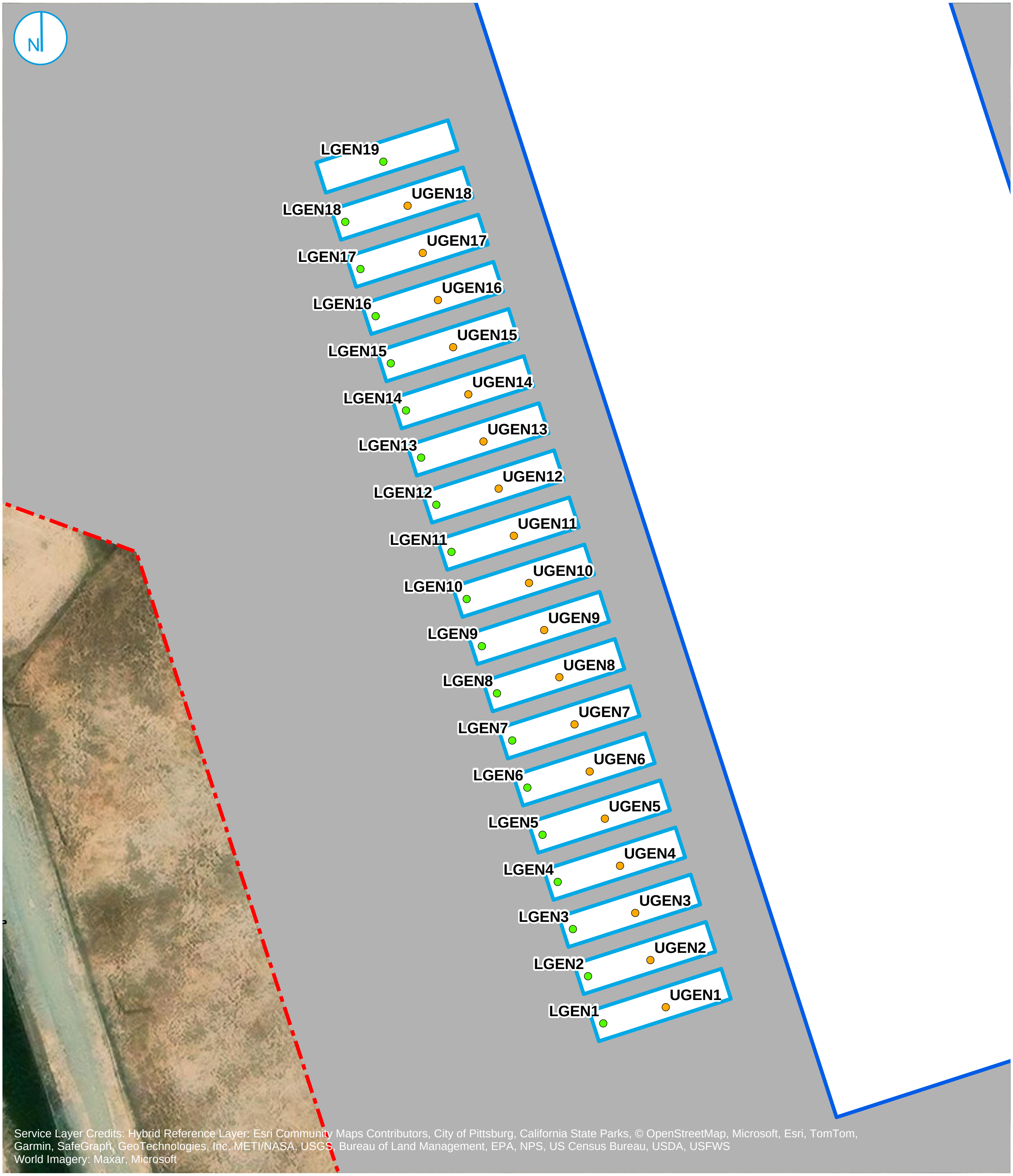
CAAQS/NAAQS ANALYSIS

FIGURE 02

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

Pittsburg Data Hub, LLC
Pittsburg, CA

RAMBOLL



Facility Boundary
Data Center Main Building
Generator Enclosures
Upper Generator Stacks
Lower Generator Stacks

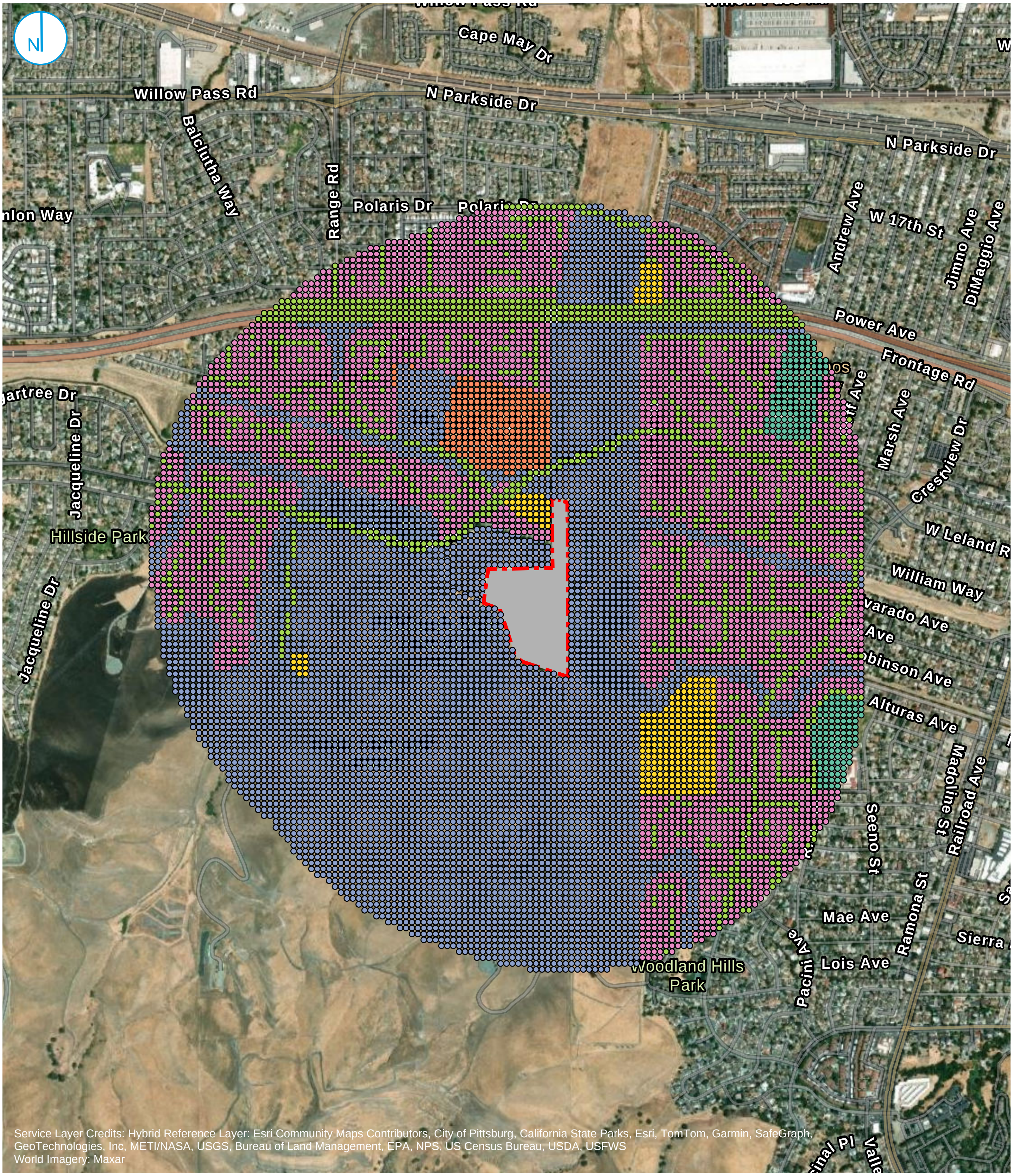
0 30 60 Feet

MODELED GENERATOR SOURCE GROUPS

FIGURE 03

RAMBOLL AMERICAS
ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

Pittsburg Data Hub, LLC
Pittsburg, CA



C:\Users\SOAUSTIN\Documents\ArcGIS\Projects\WSP_AVAIO_Pittsburg_CA\WSP_AVAIO_Pittsburg_CA\WSP_AVAIO_Pittsburg_CA.aprx\Figure 04 - HRA Receptor Grid

Receptor Type
- Elementary School
- Junior High School
- Recreational
- Residential
- Roadway
- Worker

Facility Boundary

0 750 1,500 Feet

RECEPTOR GRID
HEALTH RISK ASSESSMENT

Pittsburg Data Hub, LLC
Pittsburg, CA

FIGURE 04

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL

APPENDIX A
CALEEMOD® CONSTRUCTION AND OPERATIONAL EMISSIONS OUTPUTS

2232 Golf Club Rd_Operation_02-07-2024 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	2232 Golf Club Rd_Operation_02-07-2024
Operational Year	2027
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	13.8
Location	38.0116188, -121.9111766
County	Contra Costa
City	Pittsburg
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1345
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Industrial Park	273	1000sqft	2.38	272,980	0.00	—	—	Data Halls and Mechanical Galleries

Industrial Park	14.0	1000sqft	0.32	14,008	0.00	—	—	Water Tank
Industrial Park	60.1	1000sqft	1.38	60,100	0.00	—	—	Generator Area
General Office Building	33.3	1000sqft	0.29	33,260	0.00	—	—	Admin/Office/Storage
Parking Lot	188	1000sqft	4.31	0.00	0.00	—	—	Parking
City Park	11.1	Acre	11.1	0.00	482,122	482,122	—	Landscaping
Industrial Park	100	1000sqft	2.30	100,006	0.00	—	—	Substation

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-A	Water Exposed Surfaces

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.44	17.0	1.23	32.3	0.03	0.06	2.46	2.51	0.04	0.62	0.67	345	2,892	3,238	34.7	0.18	8.81	4,168
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.63	13.5	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	345	2,622	2,967	34.7	0.19	0.23	3,893

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.45	15.1	1.25	20.7	0.03	0.04	2.44	2.47	0.03	0.62	0.65	345	2,685	3,030	34.7	0.19	3.80	3,958
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.63	2.76	0.23	3.78	< 0.005	0.01	0.44	0.45	0.01	0.11	0.12	57.1	445	502	5.75	0.03	0.63	655

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.72	1.61	1.05	11.4	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,734	2,734	0.12	0.11	8.81	2,779
Area	3.72	15.4	0.18	20.9	< 0.005	0.04	—	0.04	0.03	—	0.03	—	85.9	85.9	< 0.005	< 0.005	—	86.2
Water	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Waste	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Total	5.44	17.0	1.23	32.3	0.03	0.06	2.46	2.51	0.04	0.62	0.67	345	2,892	3,238	34.7	0.18	8.81	4,168
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.63	1.51	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,550	2,550	0.14	0.12	0.23	2,590
Area	—	12.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Water	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Waste	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Total	1.63	13.5	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	345	2,622	2,967	34.7	0.19	0.23	3,893
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.61	1.50	1.16	10.4	0.03	0.02	2.44	2.46	0.02	0.62	0.64	—	2,571	2,571	0.13	0.12	3.80	2,613

Area	1.83	13.6	0.09	10.3	< 0.005	0.02	—	0.02	0.01	—	0.01	—	42.4	42.4	< 0.005	< 0.005	—	42.5
Water	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Waste	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Total	3.45	15.1	1.25	20.7	0.03	0.04	2.44	2.47	0.03	0.62	0.65	345	2,685	3,030	34.7	0.19	3.80	3,958
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.29	0.27	0.21	1.90	< 0.005	< 0.005	0.44	0.45	< 0.005	0.11	0.12	—	426	426	0.02	0.02	0.63	433
Area	0.33	2.49	0.02	1.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.01	7.01	< 0.005	< 0.005	—	7.04
Water	—	—	—	—	—	—	—	—	—	—	—	4.82	11.9	16.7	0.50	0.01	—	32.7
Waste	—	—	—	—	—	—	—	—	—	—	—	52.3	0.00	52.3	5.23	0.00	—	183
Total	0.63	2.76	0.23	3.78	< 0.005	0.01	0.44	0.45	0.01	0.11	0.12	57.1	445	502	5.75	0.03	0.63	655

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.72	1.61	1.05	11.4	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,734	2,734	0.12	0.11	8.81	2,779
Area	3.72	15.4	0.18	20.9	< 0.005	0.04	—	0.04	0.03	—	0.03	—	85.9	85.9	< 0.005	< 0.005	—	86.2
Water	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Waste	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Total	5.44	17.0	1.23	32.3	0.03	0.06	2.46	2.51	0.04	0.62	0.67	345	2,892	3,238	34.7	0.18	8.81	4,168
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.63	1.51	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,550	2,550	0.14	0.12	0.23	2,590
Area	—	12.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Water	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Waste	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105

Total	1.63	13.5	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	345	2,622	2,967	34.7	0.19	0.23	3,893
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.61	1.50	1.16	10.4	0.03	0.02	2.44	2.46	0.02	0.62	0.64	—	2,571	2,571	0.13	0.12	3.80	2,613
Area	1.83	13.6	0.09	10.3	< 0.005	0.02	—	0.02	0.01	—	0.01	—	42.4	42.4	< 0.005	< 0.005	—	42.5
Water	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Waste	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Total	3.45	15.1	1.25	20.7	0.03	0.04	2.44	2.47	0.03	0.62	0.65	345	2,685	3,030	34.7	0.19	3.80	3,958
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.29	0.27	0.21	1.90	< 0.005	< 0.005	0.44	0.45	< 0.005	0.11	0.12	—	426	426	0.02	0.02	0.63	433
Area	0.33	2.49	0.02	1.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.01	7.01	< 0.005	< 0.005	—	7.04
Water	—	—	—	—	—	—	—	—	—	—	—	4.82	11.9	16.7	0.50	0.01	—	32.7
Waste	—	—	—	—	—	—	—	—	—	—	—	52.3	0.00	52.3	5.23	0.00	—	183
Total	0.63	2.76	0.23	3.78	< 0.005	0.01	0.44	0.45	0.01	0.11	0.12	57.1	445	502	5.75	0.03	0.63	655

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	1.60	1.50	0.98	10.6	0.02	0.02	2.28	2.30	0.02	0.58	0.59	—	2,539	2,539	0.11	0.10	8.18	2,581

General Office Building	0.12	0.11	0.08	0.82	< 0.005	< 0.005	0.18	0.18	< 0.005	0.04	0.05	—	195	195	0.01	0.01	0.63	198
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.72	1.61	1.05	11.4	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,734	2,734	0.12	0.11	8.81	2,779
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	1.52	1.40	1.15	10.1	0.02	0.02	2.28	2.30	0.02	0.58	0.59	—	2,368	2,368	0.13	0.11	0.21	2,405
General Office Building	0.12	0.11	0.09	0.77	< 0.005	< 0.005	0.18	0.18	< 0.005	0.04	0.05	—	182	182	0.01	0.01	0.02	185
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.63	1.51	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,550	2,550	0.14	0.12	0.23	2,590
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	0.27	0.25	0.20	1.76	< 0.005	< 0.005	0.41	0.42	< 0.005	0.10	0.11	—	395	395	0.02	0.02	0.58	402
General Office Building	0.02	0.02	0.02	0.14	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	30.4	30.4	< 0.005	< 0.005	0.04	30.8
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.29	0.27	0.21	1.90	< 0.005	< 0.005	0.44	0.45	< 0.005	0.11	0.12	—	426	426	0.02	0.02	0.63	433

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	1.60	1.50	0.98	10.6	0.02	0.02	2.28	2.30	0.02	0.58	0.59	—	2,539	2,539	0.11	0.10	8.18	2,581
General Office Building	0.12	0.11	0.08	0.82	< 0.005	< 0.005	0.18	0.18	< 0.005	0.04	0.05	—	195	195	0.01	0.01	0.63	198
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.72	1.61	1.05	11.4	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,734	2,734	0.12	0.11	8.81	2,779
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	1.52	1.40	1.15	10.1	0.02	0.02	2.28	2.30	0.02	0.58	0.59	—	2,368	2,368	0.13	0.11	0.21	2,405
General Office Building	0.12	0.11	0.09	0.77	< 0.005	< 0.005	0.18	0.18	< 0.005	0.04	0.05	—	182	182	0.01	0.01	0.02	185
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.63	1.51	1.24	10.9	0.03	0.02	2.46	2.48	0.02	0.62	0.64	—	2,550	2,550	0.14	0.12	0.23	2,590
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	0.27	0.25	0.20	1.76	< 0.005	< 0.005	0.41	0.42	< 0.005	0.10	0.11	—	395	395	0.02	0.02	0.58	402
General Office Building	0.02	0.02	0.02	0.14	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	30.4	30.4	< 0.005	< 0.005	0.04	30.8
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.29	0.27	0.21	1.90	< 0.005	< 0.005	0.44	0.45	< 0.005	0.11	0.12	—	426	426	0.02	0.02	0.63	433

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	10.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	3.72	3.43	0.18	20.9	< 0.005	0.04	—	0.04	0.03	—	0.03	—	85.9	85.9	< 0.005	< 0.005	—	86.2
Total	3.72	15.4	0.18	20.9	< 0.005	0.04	—	0.04	0.03	—	0.03	—	85.9	85.9	< 0.005	< 0.005	—	86.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	10.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	12.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consum Products	—	1.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.33	0.31	0.02	1.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.01	7.01	< 0.005	< 0.005	—	7.04
Total	0.33	2.49	0.02	1.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.01	7.01	< 0.005	< 0.005	—	7.04

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	10.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	3.72	3.43	0.18	20.9	< 0.005	0.04	—	0.04	0.03	—	0.03	—	85.9	85.9	< 0.005	< 0.005	—	86.2
Total	3.72	15.4	0.18	20.9	< 0.005	0.04	—	0.04	0.03	—	0.03	—	85.9	85.9	< 0.005	< 0.005	—	86.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	10.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architect Coatings	—	1.39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	12.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	1.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.33	0.31	0.02	1.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.01	7.01	< 0.005	< 0.005	—	7.04
Total	0.33	2.49	0.02	1.88	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.01	7.01	< 0.005	< 0.005	—	7.04

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	28.8	54.4	83.2	2.96	0.07	—	178
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.29	0.55	0.84	0.03	< 0.005	—	1.80
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	17.1	17.1	< 0.005	< 0.005	—	17.3

Total	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	28.8	54.4	83.2	2.96	0.07	—	178
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.29	0.55	0.84	0.03	< 0.005	—	1.80
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	17.1	17.1	< 0.005	< 0.005	—	17.3
Total	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	4.77	9.01	13.8	0.49	0.01	—	29.5
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.05	0.09	0.14	< 0.005	< 0.005	—	0.30
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	2.83	2.83	< 0.005	< 0.005	—	2.86
Total	—	—	—	—	—	—	—	—	—	—	—	4.82	11.9	16.7	0.50	0.01	—	32.7

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Industrial Park	—	—	—	—	—	—	—	—	—	—	—	28.8	54.4	83.2	2.96	0.07	—	178
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.29	0.55	0.84	0.03	< 0.005	—	1.80
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	17.1	17.1	< 0.005	< 0.005	—	17.3
Total	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	28.8	54.4	83.2	2.96	0.07	—	178
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.29	0.55	0.84	0.03	< 0.005	—	1.80
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	17.1	17.1	< 0.005	< 0.005	—	17.3
Total	—	—	—	—	—	—	—	—	—	—	—	29.1	72.1	101	2.99	0.07	—	198
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	4.77	9.01	13.8	0.49	0.01	—	29.5
General Office Building	—	—	—	—	—	—	—	—	—	—	—	0.05	0.09	0.14	< 0.005	< 0.005	—	0.30
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	2.83	2.83	< 0.005	< 0.005	—	2.86
Total	—	—	—	—	—	—	—	—	—	—	—	4.82	11.9	16.7	0.50	0.01	—	32.7

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	299	0.00	299	29.9	0.00	—	1,045
General Office Building	—	—	—	—	—	—	—	—	—	—	—	16.7	0.00	16.7	1.67	0.00	—	58.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.51	0.00	0.51	0.05	0.00	—	1.79
Total	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	299	0.00	299	29.9	0.00	—	1,045
General Office Building	—	—	—	—	—	—	—	—	—	—	—	16.7	0.00	16.7	1.67	0.00	—	58.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.51	0.00	0.51	0.05	0.00	—	1.79
Total	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Industrial Park	—	—	—	—	—	—	—	—	—	—	—	49.5	0.00	49.5	4.94	0.00	—	173
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2.76	0.00	2.76	0.28	0.00	—	9.66
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.08	0.00	0.08	0.01	0.00	—	0.30
Total	—	—	—	—	—	—	—	—	—	—	—	52.3	0.00	52.3	5.23	0.00	—	183

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	299	0.00	299	29.9	0.00	—	1,045
General Office Building	—	—	—	—	—	—	—	—	—	—	—	16.7	0.00	16.7	1.67	0.00	—	58.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.51	0.00	0.51	0.05	0.00	—	1.79
Total	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	299	0.00	299	29.9	0.00	—	1,045

General Office Building	—	—	—	—	—	—	—	—	—	—	—	16.7	0.00	16.7	1.67	0.00	—	58.3
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.51	0.00	0.51	0.05	0.00	—	1.79
Total	—	—	—	—	—	—	—	—	—	—	—	316	0.00	316	31.6	0.00	—	1,105
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Industrial Park	—	—	—	—	—	—	—	—	—	—	—	49.5	0.00	49.5	4.94	0.00	—	173
General Office Building	—	—	—	—	—	—	—	—	—	—	—	2.76	0.00	2.76	0.28	0.00	—	9.66
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.08	0.00	0.08	0.01	0.00	—	0.30
Total	—	—	—	—	—	—	—	—	—	—	—	52.3	0.00	52.3	5.23	0.00	—	183

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipme Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequest	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Industrial Park	271	271	271	98,923	2,039	2,039	2,039	744,402
Industrial Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	59.7	59.7	59.7	21,779	449	449	449	163,890
General Office Building	33.0	33.0	33.0	12,053	248	248	248	90,698
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	99.3	99.3	99.3	36,240	747	747	747	272,711

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Industrial Park	271	271	271	98,923	2,039	2,039	2,039	744,402
Industrial Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	59.7	59.7	59.7	21,779	449	449	449	163,890
General Office Building	33.0	33.0	33.0	12,053	248	248	248	90,698
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	99.3	99.3	99.3	36,240	747	747	747	272,711

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	720,531	240,177	11,272

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Industrial Park	15,029,638	0.00
Industrial Park	0.00	0.00
Industrial Park	0.00	0.00
General Office Building	151,772	0.00
Parking Lot	0.00	0.00
City Park	0.00	6,208,744
Industrial Park	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Industrial Park	15,029,638	0.00
Industrial Park	0.00	0.00
Industrial Park	0.00	0.00
General Office Building	151,772	0.00
Parking Lot	0.00	0.00
City Park	0.00	6,208,744
Industrial Park	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Industrial Park	338	—
Industrial Park	17.4	—
Industrial Park	74.5	—
General Office Building	30.9	—
Parking Lot	0.00	—
City Park	0.95	—
Industrial Park	124	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Industrial Park	338	—
Industrial Park	17.4	—

Industrial Park	74.5	—
General Office Building	30.9	—
Parking Lot	0.00	—
City Park	0.95	—
Industrial Park	124	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	17.4	annual days of extreme heat
Extreme Precipitation	2.70	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	13.7	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score

Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	1	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	1	1	1	2
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	32.1
AQ-PM	33.1
AQ-DPM	65.3
Drinking Water	19.0
Lead Risk Housing	7.28
Pesticides	0.00
Toxic Releases	71.8
Traffic	79.6
Effect Indicators	—
CleanUp Sites	7.71
Groundwater	23.4
Haz Waste Facilities/Generators	4.94
Impaired Water Bodies	0.00
Solid Waste	43.9
Sensitive Population	—
Asthma	97.9
Cardio-vascular	88.4
Low Birth Weights	95.5
Socioeconomic Factor Indicators	—

Education	54.1
Housing	48.1
Linguistic	31.3
Poverty	23.2
Unemployment	74.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	85.83344027
Employed	30.82253304
Median HI	73.79699731
Education	—
Bachelor's or higher	42.51251123
High school enrollment	100
Preschool enrollment	22.76401899
Transportation	—
Auto Access	87.47593995
Active commuting	24.39368664
Social	—
2-parent households	58.51405107
Voting	73.84832542
Neighborhood	—
Alcohol availability	97.0101373
Park access	81.35506224
Retail density	36.21198511

Supermarket access	7.930193764
Tree canopy	53.15026306
Housing	—
Homeownership	87.93789298
Housing habitability	77.76209419
Low-inc homeowner severe housing cost burden	85.75644809
Low-inc renter severe housing cost burden	24.97112794
Uncrowded housing	59.34813294
Health Outcomes	—
Insured adults	51.84139612
Arthritis	0.0
Asthma ER Admissions	1.2
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	29.1
Cognitively Disabled	41.3
Physically Disabled	12.2
Heart Attack ER Admissions	3.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	79.1
Physical Health Not Good	0.0

Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	64.0
Elderly	63.3
English Speaking	56.8
Foreign-born	73.2
Outdoor Workers	22.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	69.4
Traffic Density	85.7
Traffic Access	23.0
Other Indices	—
Hardship	41.2
Other Decision Support	—
2016 Voting	27.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	54.0
Healthy Places Index Score for Project Location (b)	64.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Land use types were assumed based on data provided by project sponsor. Land use square footage for land use types were provided by project sponsor. Existing water tank is expected to remain on-site. Parking includes all hardscape on-site, including parking, roadways, and some sidewalks.
Construction: Construction Phases	Project-specific information.
Construction: Off-Road Equipment	Project-specific information.
Operations: Vehicle Data	Project specific daily trip rates provided by project sponsor.
Operations: Water and Waste Water	Water use rates were provided by the project sponsor.
Operations: Refrigerants	Refrigerant usage calculated outside of CalEEMod.
Operations: Energy Use	Operational energy usage calculated outside of CalEEMod.

2232 Golf Club Rd_Construction_12-15-2023 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	2232 Golf Club Rd_Construction_12-15-2023
Construction Start Date	11/10/2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	13.8
Location	38.0116188, -121.9111766
County	Contra Costa
City	Pittsburg
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1345
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Industrial Park	273	1000sqft	2.38	272,980	0.00	—	—	Data Halls and Mechanical Galleries

Industrial Park	14.0	1000sqft	0.32	14,008	0.00	—	—	Water Tank
Industrial Park	60.1	1000sqft	1.38	60,100	0.00	—	—	Generator Area
General Office Building	33.3	1000sqft	0.29	33,260	0.00	—	—	Admin/Office/Storage
Parking Lot	188	1000sqft	4.31	0.00	0.00	—	—	Parking
City Park	11.1	Acre	11.1	0.00	482,122	482,122	—	Landscaping
Industrial Park	100	1000sqft	2.30	100,006	0.00	—	—	Substation

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-10-A	Water Exposed Surfaces

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.13	253	5.14	23.4	0.04	0.07	2.19	2.27	0.07	0.54	0.61	—	6,200	6,200	0.24	0.39	11.4	6,333
Mit.	1.13	253	5.14	23.4	0.04	0.07	2.19	2.27	0.07	0.54	0.61	—	6,200	6,200	0.24	0.39	11.4	6,333
% Reduced	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	1.59	0.88	16.7	40.7	0.12	0.29	22.6	22.9	0.23	10.9	11.1	—	15,938	15,938	1.03	1.71	0.61	16,473
Mit.	1.59	0.88	16.7	40.7	0.12	0.29	10.6	10.9	0.23	4.72	4.95	—	15,938	15,938	1.03	1.71	0.61	16,473
% Reduced	—	—	—	—	—	—	53%	53%	—	57%	55%	—	—	—	—	—	—	—
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.78	14.0	3.97	16.1	0.03	0.06	1.75	1.81	0.05	0.61	0.64	—	4,511	4,511	0.19	0.30	3.54	4,608
Mit.	0.78	14.0	3.97	16.1	0.03	0.06	1.63	1.69	0.05	0.41	0.47	—	4,511	4,511	0.19	0.30	3.54	4,608
% Reduced	—	—	—	—	—	—	7%	7%	—	33%	27%	—	—	—	—	—	—	—
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.14	2.56	0.72	2.94	0.01	0.01	0.32	0.33	0.01	0.11	0.12	—	747	747	0.03	0.05	0.59	763
Mit.	0.14	2.56	0.72	2.94	0.01	0.01	0.30	0.31	0.01	0.08	0.09	—	747	747	0.03	0.05	0.59	763
% Reduced	—	—	—	—	—	—	7%	7%	—	33%	27%	—	—	—	—	—	—	—

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.13	0.98	5.14	23.4	0.04	0.07	2.19	2.27	0.07	0.54	0.61	—	6,200	6,200	0.24	0.39	11.4	6,333
2027	0.21	253	1.96	11.2	0.01	0.03	0.33	0.33	0.03	0.08	0.08	—	1,638	1,638	0.06	0.02	1.14	1,645
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.59	0.86	16.7	40.7	0.12	0.29	22.6	22.9	0.23	10.9	11.1	—	15,938	15,938	1.03	1.71	0.61	16,473
2026	1.45	0.88	14.2	40.5	0.11	0.26	11.4	11.7	0.22	4.24	4.46	—	14,153	14,153	0.86	1.25	0.42	14,547

2027	1.05	0.86	5.22	21.7	0.04	0.07	2.19	2.27	0.07	0.54	0.61	—	5,983	5,983	0.25	0.39	0.26	6,107
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.15	0.09	1.52	3.99	0.01	0.03	1.47	1.49	0.02	0.61	0.64	—	1,500	1,500	0.09	0.14	0.83	1,545
2026	0.78	0.63	3.97	16.1	0.03	0.06	1.75	1.81	0.05	0.46	0.52	—	4,511	4,511	0.19	0.30	3.54	4,608
2027	0.16	14.0	0.82	3.55	0.01	0.01	0.31	0.32	0.01	0.08	0.09	—	900	900	0.04	0.05	0.61	917
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.03	0.02	0.28	0.73	< 0.005	0.01	0.27	0.27	< 0.005	0.11	0.12	—	248	248	0.02	0.02	0.14	256
2026	0.14	0.11	0.72	2.94	0.01	0.01	0.32	0.33	0.01	0.08	0.09	—	747	747	0.03	0.05	0.59	763
2027	0.03	2.56	0.15	0.65	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.02	—	149	149	0.01	0.01	0.10	152

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	1.13	0.98	5.14	23.4	0.04	0.07	2.19	2.27	0.07	0.54	0.61	—	6,200	6,200	0.24	0.39	11.4	6,333
2027	0.21	253	1.96	11.2	0.01	0.03	0.33	0.33	0.03	0.08	0.08	—	1,638	1,638	0.06	0.02	1.14	1,645
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.59	0.86	16.7	40.7	0.12	0.29	10.6	10.9	0.23	4.72	4.95	—	15,938	15,938	1.03	1.71	0.61	16,473
2026	1.45	0.88	14.2	40.5	0.11	0.26	5.74	6.00	0.22	2.00	2.22	—	14,153	14,153	0.86	1.25	0.42	14,547
2027	1.05	0.86	5.22	21.7	0.04	0.07	2.19	2.27	0.07	0.54	0.61	—	5,983	5,983	0.25	0.39	0.26	6,107
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.15	0.09	1.52	3.99	0.01	0.03	0.71	0.74	0.02	0.28	0.30	—	1,500	1,500	0.09	0.14	0.83	1,545
2026	0.78	0.63	3.97	16.1	0.03	0.06	1.63	1.69	0.05	0.41	0.47	—	4,511	4,511	0.19	0.30	3.54	4,608

2027	0.16	14.0	0.82	3.55	0.01	0.01	0.31	0.32	0.01	0.08	0.09	—	900	900	0.04	0.05	0.61	917
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.03	0.02	0.28	0.73	< 0.005	0.01	0.13	0.14	< 0.005	0.05	0.05	—	248	248	0.02	0.02	0.14	256
2026	0.14	0.11	0.72	2.94	0.01	0.01	0.30	0.31	0.01	0.08	0.09	—	747	747	0.03	0.05	0.59	763
2027	0.03	2.56	0.15	0.65	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.02	—	149	149	0.01	0.01	0.10	152

3. Construction Emissions Details

3.1. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.50	0.50	2.59	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	19.8	19.8	—	10.1	10.1	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.78	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	145	145	0.01	< 0.005	—	146

Dust From Material Movement	—	—	—	—	—	—	0.54	0.54	—	0.28	0.28	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.0	24.0	< 0.005	< 0.005	—	24.1
Dust From Material Movement	—	—	—	—	—	—	0.10	0.10	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.62	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	< 0.005	0.01	0.02	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	1.03	0.21	14.0	6.46	0.07	0.19	2.72	2.91	0.13	0.74	0.87	—	10,502	10,502	0.81	1.66	0.59	11,017
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.91	3.91	< 0.005	< 0.005	0.01	3.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.38	0.18	< 0.005	0.01	0.07	0.08	< 0.005	0.02	0.02	—	288	288	0.02	0.05	0.27	302
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.65	0.65	< 0.005	< 0.005	< 0.005	0.66
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.01	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.6	47.6	< 0.005	0.01	0.04	50.0

3.2. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.50	0.50	2.59	28.3	0.05	0.10	—	0.10	0.10	—	0.10	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	—	7.70	7.70	—	3.95	3.95	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.78	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	145	145	0.01	< 0.005	—	146
Dust From Material Movement	—	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	24.0	24.0	< 0.005	< 0.005	—	24.1

Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.05	0.62	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	141	141	< 0.005	0.01	0.02	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	1.03	0.21	14.0	6.46	0.07	0.19	2.72	2.91	0.13	0.74	0.87	—	10,502	10,502	0.81	1.66	0.59	11,017
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.91	3.91	< 0.005	< 0.005	0.01	3.97
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.03	0.01	0.38	0.18	< 0.005	0.01	0.07	0.08	< 0.005	0.02	0.02	—	288	288	0.02	0.05	0.27	302
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.65	0.65	< 0.005	< 0.005	< 0.005	0.66
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.07	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	47.6	47.6	< 0.005	0.01	0.04	50.0

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	4.43	35.3	0.06	0.12	—	0.12	0.12	—	0.12	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	9.27	9.27	—	3.66	3.66	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.33	2.63	< 0.005	0.01	—	0.01	0.01	—	0.01	—	491	491	0.02	< 0.005	—	492
Dust From Material Movement	—	—	—	—	—	—	0.69	0.69	—	0.27	0.27	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.48	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	81.2	81.2	< 0.005	< 0.005	—	81.5
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.06	0.71	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	161	161	< 0.005	0.01	0.02	163
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.74	0.15	10.1	4.64	0.05	0.14	1.95	2.09	0.09	0.53	0.63	—	7,543	7,543	0.58	1.19	0.43	7,913
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.1	12.1	< 0.005	< 0.005	0.02	12.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.06	0.01	0.74	0.34	< 0.005	0.01	0.14	0.15	0.01	0.04	0.05	—	561	561	0.04	0.09	0.53	589
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.01	2.01	< 0.005	< 0.005	< 0.005	2.04
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.13	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	92.8	92.8	0.01	0.01	0.09	97.5

3.4. Grading (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	4.43	35.3	0.06	0.12	—	0.12	0.12	—	0.12	—	6,599	6,599	0.27	0.05	—	6,622

Dust From Material Movement	—	—	—	—	—	—	3.62	3.62	—	1.43	1.43	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.33	2.63	< 0.005	0.01	—	0.01	0.01	—	0.01	—	491	491	0.02	< 0.005	—	492
Dust From Material Movement	—	—	—	—	—	—	0.27	0.27	—	0.11	0.11	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.48	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	81.2	81.2	< 0.005	< 0.005	—	81.5
Dust From Material Movement	—	—	—	—	—	—	0.05	0.05	—	0.02	0.02	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.07	0.06	0.71	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	161	161	< 0.005	0.01	0.02	163
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.74	0.15	10.1	4.64	0.05	0.14	1.95	2.09	0.09	0.53	0.63	—	7,543	7,543	0.58	1.19	0.43	7,913

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.1	12.1	< 0.005	< 0.005	0.02	12.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.06	0.01	0.74	0.34	< 0.005	0.01	0.14	0.15	0.01	0.04	0.05	—	561	561	0.04	0.09	0.53	589
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.01	2.01	< 0.005	< 0.005	< 0.005	2.04
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.13	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	92.8	92.8	0.01	0.01	0.09	97.5

3.5. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	4.43	35.3	0.06	0.12	—	0.12	0.12	—	0.12	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	9.27	9.27	—	3.66	3.66	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.76	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	142	142	0.01	< 0.005	—	143

Dust From Material Movement	—	—	—	—	—	—	0.20	0.20	—	0.08	0.08	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.5	23.5	< 0.005	< 0.005	—	23.6
Dust From Material Movement	—	—	—	—	—	—	0.04	0.04	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.66	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	158	158	< 0.005	0.01	0.02	160
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.74	0.15	9.68	4.50	0.05	0.14	1.95	2.09	0.09	0.53	0.63	—	7,396	7,396	0.58	1.19	0.40	7,765
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.44	3.44	< 0.005	< 0.005	0.01	3.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.21	0.10	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	159	159	0.01	0.03	0.14	167
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	26.4	26.4	< 0.005	< 0.005	0.02	27.7

3.6. Grading (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.64	4.43	35.3	0.06	0.12	—	0.12	0.12	—	0.12	—	6,599	6,599	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	—	3.62	3.62	—	1.43	1.43	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.76	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	142	142	0.01	< 0.005	—	143
Dust From Material Movement	—	—	—	—	—	—	0.08	0.08	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.14	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.5	23.5	< 0.005	< 0.005	—	23.6

Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	0.66	0.00	0.00	0.17	0.17	0.00	0.04	0.04	—	158	158	< 0.005	0.01	0.02	160
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.74	0.15	9.68	4.50	0.05	0.14	1.95	2.09	0.09	0.53	0.63	—	7,396	7,396	0.58	1.19	0.40	7,765
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.44	3.44	< 0.005	< 0.005	0.01	3.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	< 0.005	0.21	0.10	< 0.005	< 0.005	0.04	0.04	< 0.005	0.01	0.01	—	159	159	0.01	0.03	0.14	167
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.57	0.57	< 0.005	< 0.005	< 0.005	0.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	26.4	26.4	< 0.005	< 0.005	0.02	27.7

3.7. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.23	0.23	2.03	14.3	0.02	0.04	—	0.04	0.04	—	0.04	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.23	0.23	2.03	14.3	0.02	0.04	—	0.04	0.04	—	0.04	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.16	1.41	9.91	0.02	0.03	—	0.03	0.03	—	0.03	—	1,661	1,661	0.07	0.01	—	1,666
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	1.81	< 0.005	0.01	—	0.01	0.01	—	0.01	—	275	275	0.01	< 0.005	—	276
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.70	0.68	0.43	7.78	0.00	0.00	1.64	1.64	0.00	0.38	0.38	—	1,715	1,715	0.03	0.06	6.32	1,741
Vendor	0.20	0.07	2.68	1.30	0.01	0.03	0.55	0.58	0.03	0.15	0.18	—	2,087	2,087	0.12	0.31	5.05	2,186
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.66	0.59	0.56	6.55	0.00	0.00	1.64	1.64	0.00	0.38	0.38	—	1,569	1,569	0.04	0.07	0.16	1,591
Vendor	0.20	0.06	2.81	1.32	0.01	0.03	0.55	0.58	0.03	0.15	0.18	—	2,089	2,089	0.12	0.31	0.13	2,183
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.41	0.35	4.44	0.00	0.00	1.13	1.13	0.00	0.26	0.26	—	1,099	1,099	0.02	0.05	1.89	1,116
Vendor	0.14	0.04	1.91	0.90	0.01	0.02	0.38	0.40	0.02	0.11	0.13	—	1,446	1,446	0.08	0.21	1.50	1,513
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.06	0.81	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	182	182	< 0.005	0.01	0.31	185
Vendor	0.02	0.01	0.35	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	239	239	0.01	0.04	0.25	250
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.23	0.23	2.03	14.3	0.02	0.04	—	0.04	0.04	—	0.04	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.23	0.23	2.03	14.3	0.02	0.04	—	0.04	0.04	—	0.04	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.16	1.41	9.91	0.02	0.03	—	0.03	0.03	—	0.03	—	1,661	1,661	0.07	0.01	—	1,666
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.26	1.81	< 0.005	0.01	—	0.01	0.01	—	0.01	—	275	275	0.01	< 0.005	—	276
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.70	0.68	0.43	7.78	0.00	0.00	1.64	1.64	0.00	0.38	0.38	—	1,715	1,715	0.03	0.06	6.32	1,741
Vendor	0.20	0.07	2.68	1.30	0.01	0.03	0.55	0.58	0.03	0.15	0.18	—	2,087	2,087	0.12	0.31	5.05	2,186
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.66	0.59	0.56	6.55	0.00	0.00	1.64	1.64	0.00	0.38	0.38	—	1,569	1,569	0.04	0.07	0.16	1,591
Vendor	0.20	0.06	2.81	1.32	0.01	0.03	0.55	0.58	0.03	0.15	0.18	—	2,089	2,089	0.12	0.31	0.13	2,183
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.41	0.35	4.44	0.00	0.00	1.13	1.13	0.00	0.26	0.26	—	1,099	1,099	0.02	0.05	1.89	1,116
Vendor	0.14	0.04	1.91	0.90	0.01	0.02	0.38	0.40	0.02	0.11	0.13	—	1,446	1,446	0.08	0.21	1.50	1,513

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.06	0.81	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	182	182	< 0.005	0.01	0.31	185
Vendor	0.02	0.01	0.35	0.16	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	239	239	0.01	0.04	0.25	250
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.23	0.23	2.03	14.3	0.02	0.04	—	0.04	0.04	—	0.04	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.27	1.88	< 0.005	0.01	—	0.01	0.01	—	0.01	—	314	314	0.01	< 0.005	—	315
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.34	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	52.0	52.0	< 0.005	< 0.005	—	52.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.64	0.57	0.50	6.17	0.00	0.00	1.64	1.64	0.00	0.38	0.38	—	1,540	1,540	0.04	0.07	0.15	1,561
Vendor	0.18	0.06	2.68	1.27	0.01	0.03	0.55	0.58	0.03	0.15	0.18	—	2,046	2,046	0.12	0.31	0.12	2,140
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.06	0.79	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	204	204	< 0.005	0.01	0.32	207
Vendor	0.02	0.01	0.34	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	268	268	0.02	0.04	0.25	281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.14	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	33.8	33.8	< 0.005	< 0.005	0.05	34.3
Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	44.4	44.4	< 0.005	0.01	0.04	46.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.23	0.23	2.03	14.3	0.02	0.04	—	0.04	0.04	—	0.04	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.27	1.88	< 0.005	0.01	—	0.01	0.01	—	0.01	—	314	314	0.01	< 0.005	—	315
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.05	0.34	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	52.0	52.0	< 0.005	< 0.005	—	52.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.64	0.57	0.50	6.17	0.00	0.00	1.64	1.64	0.00	0.38	0.38	—	1,540	1,540	0.04	0.07	0.15	1,561
Vendor	0.18	0.06	2.68	1.27	0.01	0.03	0.55	0.58	0.03	0.15	0.18	—	2,046	2,046	0.12	0.31	0.12	2,140
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.06	0.79	0.00	0.00	0.21	0.21	0.00	0.05	0.05	—	204	204	< 0.005	0.01	0.32	207
Vendor	0.02	0.01	0.34	0.16	< 0.005	< 0.005	0.07	0.08	< 0.005	0.02	0.02	—	268	268	0.02	0.04	0.25	281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.01	0.14	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	33.8	33.8	< 0.005	< 0.005	0.05	34.3

Vendor	< 0.005	< 0.005	0.06	0.03	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	44.4	44.4	< 0.005	0.01	0.04	46.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.16	1.93	10.6	0.01	0.03	—	0.03	0.03	—	0.03	—	1,511	1,511	0.06	0.01	—	1,516
Paving	—	0.57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.16	1.93	10.6	0.01	0.03	—	0.03	0.03	—	0.03	—	1,511	1,511	0.06	0.01	—	1,516
Paving	—	0.57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.58	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	82.8	82.8	< 0.005	< 0.005	—	83.1
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	< 0.005	0.02	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.55	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	0.43	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	116	116	< 0.005	0.01	0.01	118
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.54
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.07	1.07	< 0.005	< 0.005	< 0.005	1.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Paving (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.16	1.93	10.6	0.01	0.03	—	0.03	0.03	—	0.03	—	1,511	1,511	0.06	0.01	—	1,516
Paving	—	0.57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.16	1.93	10.6	0.01	0.03	—	0.03	0.03	—	0.03	—	1,511	1,511	0.06	0.01	—	1,516
Paving	—	0.57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.58	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	82.8	82.8	< 0.005	< 0.005	—	83.1
Paving	—	0.03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.11	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.7	13.7	< 0.005	< 0.005	—	13.8
Paving	—	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.03	0.55	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	0.43	129
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	116	116	< 0.005	0.01	0.01	118
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.45	6.45	< 0.005	< 0.005	0.01	6.54
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.07	1.07	< 0.005	< 0.005	< 0.005	1.08
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Architectural Coating (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.02	0.02	0.65	0.96	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	253	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	13.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	—	2.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.08	1.46	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	337	337	0.01	0.01	1.14	342
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.1	17.1	< 0.005	< 0.005	0.03	17.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.82	2.82	< 0.005	< 0.005	< 0.005	2.87
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Architectural Coating (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.65	0.96	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	—	253	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	< 0.005	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	—	13.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	—	2.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.08	1.46	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	337	337	0.01	0.01	1.14	342
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	17.1	17.1	< 0.005	< 0.005	0.03	17.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.82	2.82	< 0.005	< 0.005	< 0.005	2.87

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	11/10/2025	11/23/2025	5.00	10.0	—
Grading	Grading	11/24/2025	1/11/2026	5.00	35.0	—

Building Construction	Building Construction	1/12/2026	3/8/2027	5.00	301	—
Paving	Paving	3/9/2027	4/5/2027	5.00	20.0	—
Architectural Coating	Architectural Coating	4/6/2027	5/3/2027	5.00	20.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Final	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Tier 4 Final	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Tier 4 Final	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Tier 4 Final	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Final	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Final	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 4 Final	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Tier 4 Final	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 4 Final	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	4.00	8.00	84.0	0.37
Grading	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
Grading	Excavators	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Tier 4 Final	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Tier 4 Final	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Tier 4 Final	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Tier 4 Final	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Tier 4 Final	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 4 Final	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Tier 4 Final	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2

Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	147	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	105	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	198	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	78.7	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	39.7	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—

Site Preparation	Worker	17.5	11.7	LDA,LDT1,LDT2
Site Preparation	Vendor	—	8.40	HHDT,MHDT
Site Preparation	Hauling	147	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	11.7	LDA,LDT1,LDT2
Grading	Vendor	—	8.40	HHDT,MHDT
Grading	Hauling	105	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	198	11.7	LDA,LDT1,LDT2
Building Construction	Vendor	78.7	8.40	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	11.7	LDA,LDT1,LDT2
Paving	Vendor	—	8.40	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	39.7	11.7	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	8.40	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	0.00	0.00	720,531	240,177	11,272

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	11,733	15.0	0.00	—
Grading	0.00	29,499	105	0.00	—
Paving	0.00	0.00	0.00	0.00	4.31

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Industrial Park	0.00	0%
Industrial Park	0.00	0%
Industrial Park	0.00	0%
General Office Building	0.00	0%
Parking Lot	4.31	100%
City Park	0.00	0%
Industrial Park	0.00	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005
2027	0.00	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	17.4	annual days of extreme heat
Extreme Precipitation	2.70	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	13.7	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score

Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	1	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	1	1	1	2
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	32.1
AQ-PM	33.1
AQ-DPM	65.3
Drinking Water	19.0
Lead Risk Housing	7.28
Pesticides	0.00
Toxic Releases	71.8
Traffic	79.6
Effect Indicators	—
CleanUp Sites	7.71
Groundwater	23.4
Haz Waste Facilities/Generators	4.94
Impaired Water Bodies	0.00
Solid Waste	43.9
Sensitive Population	—
Asthma	97.9
Cardio-vascular	88.4
Low Birth Weights	95.5
Socioeconomic Factor Indicators	—

Education	54.1
Housing	48.1
Linguistic	31.3
Poverty	23.2
Unemployment	74.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	85.83344027
Employed	30.82253304
Median HI	73.79699731
Education	—
Bachelor's or higher	42.51251123
High school enrollment	100
Preschool enrollment	22.76401899
Transportation	—
Auto Access	87.47593995
Active commuting	24.39368664
Social	—
2-parent households	58.51405107
Voting	73.84832542
Neighborhood	—
Alcohol availability	97.0101373
Park access	81.35506224
Retail density	36.21198511

Supermarket access	7.930193764
Tree canopy	53.15026306
Housing	—
Homeownership	87.93789298
Housing habitability	77.76209419
Low-inc homeowner severe housing cost burden	85.75644809
Low-inc renter severe housing cost burden	24.97112794
Uncrowded housing	59.34813294
Health Outcomes	—
Insured adults	51.84139612
Arthritis	0.0
Asthma ER Admissions	1.2
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	29.1
Cognitively Disabled	41.3
Physically Disabled	12.2
Heart Attack ER Admissions	3.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	79.1
Physical Health Not Good	0.0

Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	64.0
Elderly	63.3
English Speaking	56.8
Foreign-born	73.2
Outdoor Workers	22.8
Climate Change Adaptive Capacity	—
Impervious Surface Cover	69.4
Traffic Density	85.7
Traffic Access	23.0
Other Indices	—
Hardship	41.2
Other Decision Support	—
2016 Voting	27.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	54.0
Healthy Places Index Score for Project Location (b)	64.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Land use types were assumed based on data provided by project sponsor. Existing water tank is expected to remain on-site. Parking includes all hardscape on-site, including parking, roadways, and some sidewalks.
Construction: Construction Phases	The construction schedule was estimated assuming that construction begins November 10, 2025 and ends May 3, 2027, with an estimated operational year of 2027 based on information provided by the Project Sponsor.
Construction: Off-Road Equipment	All off-road equipment for construction is assumed to be Tier 4 Final engines.
Construction: Architectural Coatings	Default values.

APPENDIX B
MANUFACTURER SPECIFICATION SHEETS

Exhaust Emission Data Sheet
C3000 D6e
60 Hz Diesel Generator Set
EPA Tier 2

Engine Information:

Model:	Cummins Inc. QSK95-G9	Bore:	7.48 in. (190 mm)
Type:	4 Cycle, VEE, 16 cylinder diesel	Stroke:	8.27 in. (210 mm)
Aspiration:	Turbocharged and Aftercooled	Displacement:	5816 cu. in. (95.3 liters)
Compression Ratio:	15.5:1		
Emission Control Device:	Turbocharged and Aftercooled		
Emission Level:	Stationary Emergency		

Performance Data	**1/4 Standby**	**1/2 Standby**	**3/4 Standby**	**Full Standby**	**Full Prime**	**Full Continuous**
Engine BHP @ 1800 RPM (60 Hz)	1077	2155	3232	4309	3963	3616
Fuel Consumption L/Hr (US Gal/Hr)	246 (65)	435 (115)	598 (158)	776 (205)	719 (190)	663 (175)
Exhaust Gas Flow m³/min (CFM)	280 (9901)	442 (15626)	548 (19336)	649 (22925)	618 (21829)	587 (20735)
Exhaust Gas Temperature °C (°F)	338 (641)	364 (687)	383 (721)	442 (828)	422 (792)	404 (759)
Exhaust Emission Data						
HC (Total Unburned Hydrocarbons)	0.30 (109)	0.20 (85)	0.11 (50)	0.07 (33)	0.08 (37)	0.09 (42)
NOx (Oxides of Nitrogen as NO_2)	3.20 (1162)	3.16 (1307)	4.10 (1840)	5.21 (2438)	4.81 (2228)	4.34 (1986)
CO (Carbon Monoxide)	0.58 (212)	0.28 (116)	0.17 (75)	0.21 (99)	0.19 (87)	0.18 (82)
PM (Particulate Matter)	0.19 (61)	0.10 (37)	0.05 (21)	0.03 (13)	0.04 (15)	0.05 (19)
SO_2 (Sulfur Dioxide)	0.006 (1.8)	0.005 (1.8)	0.005 (1.8)	0.004 (1.8)	0.004 (1.8)	0.005 (1.8)
Smoke (FSN)	0.84	0.63	0.45	0.34	0.37	0.42

All values (except smoke) are cited: g/BHP-hr (mg/Nm³ @ 5% O2)

Test Conditions

Steady-state emissions recorded per ISO8178-1 during operation at rated engine speed (+/-2%) and stated constant load (+/-2%) with engine temperatures, pressures and emission rates stabilized.

Fuel Specification:	40-48 Cetane Number, 0.0015 Wt.% Sulfur; Reference ISO8178-5, 40 CFR 86, 1313—98 Type 2-D and ASTM D975 No. 2-D. Fuel Density at 0.85 Kg/L (7.1 lbs/US Gal)
Air Inlet Temperature	25 °C (77 °F)
Fuel Inlet Temperature:	40 °C (104 °F)
Barometric Pressure:	100 kPa (29.53 in Hg)
Humidity:	NOx measurement corrected to 10.7 g/kg (75 grains H_2O/lb) of dry air
Intake Restriction:	Set to 18 in of H_2O as measured from compressor inlet
Exhaust Back Pressure:	Set to 1.5 in Hg
Note:	mg/m³ values are measured dry, corrected to 5% O_2 and normalized to standard temperature and pressure (0°C, 101.325 kPa)

The NOx, HC, CO and PM emission data tabulated here are representative of test data taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.

Application & Performance Warranty Data

Project Information

Site Location:	
Project Name:	
Application:	Standby Power
Number Of Engines:	1
Operating Hours per Year:	200

Engine Specifications

Engine Manufacturer:	
Model Number:	
Rated Speed:	1800 RPM
Generator Power:	3000 ekW
Type of Fuel:	Number 2 Diesel
Type of Lube Oil:	1 wt% sulfated ash or less
Lube Oil Consumption:	0.1 % Fuel Consumption
Number of Exhaust Manifolds:	1

Engine Cycle Data

Load	Speed	Power	Exhaust Flow	Exhaust Temp.	Fuel Cons.	NO_x	CO	NMNEHC	PM_{10}	O_2	H_2O
%		*bhp*	*acfm (cfm)*	*° F*	*gal/hr*	*g/bhp-hr*	*g/bhp-hr*	*g/bhp-hr*	*g/bhp-hr*	*%*	*%*
100	Rated	4,307	22,630	825	38.3	5.2	0.2	0.07	0.04	10	12.2

Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	*g/bhp-hr*	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	
NO_x	5.2	4.94	457	844	6.973	15.37	0.5	0.47	44	81	0.671	1.48	90.4%
CO	0.2	0.19	29	53	0.268	0.59	2.6	2.47	375	693	3.487	7.69	
NMNEHC	0.07	0.07	18	33	0.094	0.21	0.14	0.13	35	65	0.188	0.41	
PM_{10}	0.04	0.04	13	25	0.054	0.12	0.02	0.02	7	14	0.03	0.07	45%

System Specifications

DOC/SCR/DPF System Specifications (M3-80-70-30PF-B-R4, ACIS-3, Commissioning & Startup)

SCR Catalyst Space Velocity:	10,958 1/hr
Sound Attenuation:	25-30 dBA insertion loss
Reactant:	Urea
Percent Concentration:	32.5%
Design Exhaust Flow Rate:	22,630 acfm (cfm)
Design Exhaust Temperature[1]:	825° F
Exhaust Temperature Limits:	572° F – 977° F
Minimum Regeneration Temperature[2]:	500° F
SCR Catalyst Volume:	50 ft³
System Dosing Capacity:	60 L/hr
System Pressure Loss:	16.0 inH$_2$O (Clean)
Total Catalyst Volume:	50 ft³
Estimated Reactant Consumption:	12.3 gal/hr (47 L/hr) / Per Engine

Sound Data

	Octave Band Center Frequency (OBCF)											Receiver	
	Hz	*31.5*	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*	*dBA*	*Angle*	*Distance*
Raw Engine Exhaust Sound Levels													
Sound Power A-Weighted	dBA	68.7	99.3	108.4	123.1	122.8	121.8	122.1	121.9	119.0	129.8		
Calculated Sound Power	dB	108.2	125.5	124.6	131.8	126.0	121.8	120.9	120.9	120.1	129.8		
Calculated Sound Pressure	dB	100.2	117.5	116.5	123.7	118.0	113.7	112.8	112.9	112.1	121.7	90°	3.3 ft
Sound Performance Estimations (M3-80-70-30PF-B-R4)													
Estimated Sound Attenuation	dB	12.0	17.5	24.5	31.8	37.5	45.3	56.5	66.8	70.3	36.5		
Estimated Sound Power	dB	96.2	108.0	100.1	100.0	88.5	76.5	64.4	54.1	49.8	93.3		
Estimated Sound Pressure	dB	88.2	100.0	92.0	91.9	80.5	68.4	56.3	46.1	41.8	85.2	90°	3.3 ft

- Computed noise levels at each distance and frequency is based on a *free field condition.*
- Site conditions have *not* been taken into account in acoustic predictions.
- The ambient sound level must be at least 10 dBA below the requested sound target.
- MIRATECH does not warrant Sound Performance Estimations.
- For all distance noise propagation, free field dispersion rule of 6 dB is used every time distance is doubled.

MIRATECH Scope of Supply & Equipment Details

	Model Number	Quantity
DOC/SCR/DPF Housing	**M3-80-70-30PF-B-R4**	**1 / engine**
SCR/DPF Housing	M3-80-70-30PF-B-HSG	1 / engine
• Number of Catalyst Layers	1 OXI / 1 DPF / 2 SCR	
• Number of Catalyst Blocks per Layer	80 DPF / 70 SCR	
• Material	Carbon Steel	
• Paint	High Temperature Dark Gray	
• Inlet Location	Bottom	
• Outlet Location	Top	
• Door Location	Sides	
• Insulation	None	
• Dimensions	H 64.250 in x W 94.000 in x L 210 in	
• Inlet Pipe Size & Connection	30 in FF Flange, 150# ANSI standard bolt pattern	
• Outlet Pipe Size & Connection	30 in FF Flange, 150# ANSI standard bolt pattern	
• Weight Fully Loaded With Catalyst	13,236 lbs	
• Weight Without Catalyst	8,440 lbs	
Tray Set	STS-M3-70	2 / engine
Tray Set	DTS-M3-80	1 / engine
DPF Block	LTR-DPF-Filter-Block	80 / engine
SCR Catalyst	SCRC-044-150-450	140 / engine
Oxidation Catalyst	MECR-OX-SB2269-2400-1650-291	4 / engine
SCR Control System	**ACIS-3**	**1 / engine**
SCR Controller	A3C-60-HMI	1 / engine
• Overall Dimensions	W 24.110 in x H 31.535 in x D 12.442 in	
• Weight	76 lbs	
Dosing Box	SEN60-U-WT	1 / engine
• Overall Dimensions	W 15.75 in x H 15.75 in x D 6.562 in	
• Weight	28 lbs	
Reactant Pump	VPN75.lab	1 / engine
• Overall Dimensions	W 19.685 in x H 15.906 in x D 23.031 in	
• Weight	88 lbs	
Reactant Filter	FILTER115	1 / engine
Injector	DEN75-700-U	1 / engine
• Weight	14 lbs	
Bypass Probe	NP-18	2 / engine
Temperature Sensor	TT-14-FLEX60-32-1112	2 / engine
Air Compressor	CA75.lab	1 / engine
• Overall Dimensions	W 21.445 in x H 26.772 in x D 15.748 in	

	Model Number	Quantity
• Weight	82 lbs	
NOx Sensor	NOX-24V	2 / engine
Wiring Harness	BLU-WH-NOX-24V-50-SL	2 / engine
• Overall Length	600 in	
Commissioning & Startup	**Commissioning & Startup**	**1 / engine**
Analyzer Charges	Analyzer Charges	1 / engine
Expense Charges	Expense Charges	1 / engine
Labor Charges	Labor Charges	1 / engine

Power Products LLC. MIRATECH

Optional Content MIRATECH Scope of Supply & Equipment Details

	Model Number	Quantity
Maintenance Pack	**ACIS-3 Maintenance Pack**	**1 / engine**
Maintenance Pack	VPN75 Maintenance Pack	1 / engine
SCR Parts	601.0015	1 / engine
Maintenance Pack	CA75 Maintenance Pack	1 / engine
SCR Parts	2020.0248	1 / engine
SCR Parts	2020.025	1 / engine
SCR Parts	2020.0249	1 / engine
Maintenance Pack	SEN60 Maintenance Pack	1 / engine
SCR Parts	2020.0234	1 / engine
SCR Parts	902.0021	1 / engine
Maintenance Pack	DEX75.XXX Maintenance Pack	1 / engine
SCR Parts	202.0004	2 / engine
SCR Parts	202.0005	2 / engine
SCR Parts	2070.016	2 / engine
SCR Parts	201.0231	2 / engine
SCR Parts	1304.0007	2 / engine
SCR Parts	1304.0004	2 / engine
Spare Parts	**ACIS-3 Recommended Spare Parts**	**1 / engine**
Recommended Spare Parts	VPN75 Recommended Spare Parts	1 / engine
SCR Parts	2020.001	1 / engine
Recommended Spare Parts	CA75 Recommended Spare Parts	1 / engine
SCR Parts	2020.0237	1 / engine
Recommended Spare Parts	SEN60 Recommended Spare Parts	1 / engine
SCR Parts	2020.0234	1 / engine
Recommended Spare Parts	A3C Recommended Spare Parts	1 / engine
Spare Part	A3C Fuses & Fuse Holders	1 / engine
SCR Reactant Tank	**DW550.ht.ins**	**1 / engine**
Reactant Tank	DW550.ht.ins	1 / engine
• Material	Cross-Linked Polyethylene	
• Wall Construction	Double	
• Insulation	Nominal 2" of Urethane Spray Foam w/ Mastic Coating	
• Heat Trace	Included	
• Seismic Tie Downs	None	
• Capacity	500 gal	
• Tank Dimensions	D 62.5 in x H 73 in	
• Weight	130 lbs	
Reactant Tank Level Indicator	**TLI**	**1 / engine**

	Model Number	Quantity
Reactant Tank Level Indicator	TLI	1 / engine
Level Transmitter	LU20	1 / engine
Level Controller	LI55	1 / engine
Level Controller Enclosure	LM92	1 / engine

Customer Scope Of Supply

- Support Structure
- Attachment to Support Structure (Bolts, Nuts, Levels, etc.)
- Expansion Joints
- Exhaust Piping
- Inlet Pipe Bolts, Nuts, & Gasket
- Outlet Pipe Bolts, Nuts, & Gasket
- Insulation for Exhaust Piping
- Power Input (230 VAC, 60 Hz, Single Phase)
- Component Installation Including External Tubing and Wiring
- Isolated Engine Load Signal to MIRATECH Equipment (4-20 mA)
- Dry Contact (N.O.) for Engine Run Signal to MIRATECH Equipment
- Heat Tracing of Reactant Lines (Required when Ambient Temperatures are Below 40 °F)
- Heat Tracing of Sample Lines (Required when Ambient Temperatures are Below 32 °F)
- Design for Structural Support and Thermal Expansion

Special Notes & Conditions

1. For housings and exhaust components that are insulated, internally or externally, please refer to Section 7.1 of the General Terms and Conditions of Sale to prevent voiding MIRATECH product warranty. - Carbon steel is suitable for temperatures up to 900° F / 482° C continuously, when covered with external insulation or a heat shield. For continuous operation above 900° F / 482° C, where the equipment is externally insulated or has a heat shield, stainless steel should be used.

2. Diesel Particulate Filters depend on exhaust temperature to keep soot regenerated and the filter back pressure within acceptable levels. If the engine will be operated consistently at low loads/low exhaust temperatures, the customer should make provisions to add load via facility operations or a load bank. Refer to the included *Guidelines for Successful Operation of LTR™ DPF*.

- A packed silencer installed upstream of the MIRATECH catalyst system will void MIRATECH's limited warranty.

- Final catalyst housings are dependent on engine output and required emission reductions. Changes may be made to optimize the system design at the time of order.

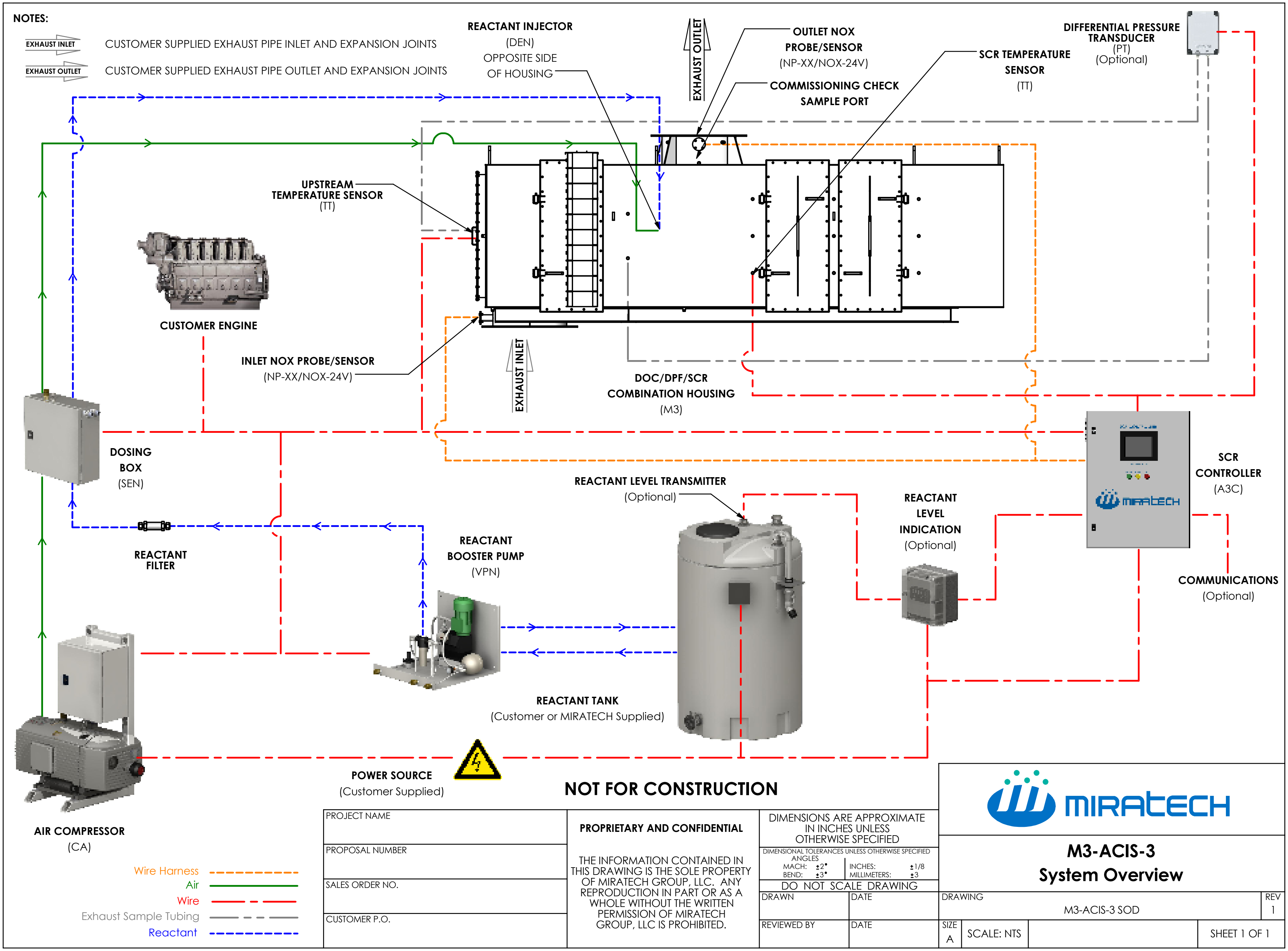
- Any drawings included with this proposal are preliminary in nature and could change depending on final product selection.

- Any sound attenuation listed in this proposal is based on housing with catalyst elements installed.

- MIRATECH Corporation warrants that the emissions reductions requested for this inquiry will be achieved at the design and test load point as outlined in the proposal. Tier 4 is an engine certificate designation, not an actual tons/yr or g/bhp-hr measurement. MIRATECH will utilize the engine manufacturer's emission data at 100% load to provide our warranty. This is the maximum volume potential point for pollutants to be emitted. Permitting is normally done on a mass flow or tons per year basis, therefore the system will be sized accordingly. The MIRATECH design is to achieve the blended Tier 4 emission targets from the D2 test cycle, measured at 100% engine load conditions.

- Any emission reductions listed in this proposal are based on housing with catalyst elements installed.

- MIRATECH will confirm shipping location upon placement of order.


NOTES:
EXHAUST INLET
CUSTOMER SUPPLIED EXHAUST PIPE INLET AND EXPANSION JOINTS
EXHAUST OUTLET
CUSTOMER SUPPLIED EXHAUST PIPE OUTLET AND EXPANSION JOINTS
REACTANT INJECTOR
(DEN)
OPPOSITE SIDE
OF HOUSING
EXHAUST OUTLET
OUTLET NOX
PROBE/SENSOR
(NP-XX/NOX-24V)
COMMISSIONING CHECK
SAMPLE PORT
SCR TEMPERATURE
SENSOR
(TT)
DIFFERENTIAL PRESSURE
TRANSDUCER
(PT)
(Optional)
UPSTREAM
TEMPERATURE SENSOR
(TT)
CUSTOMER ENGINE
INLET NOX PROBE/SENSOR
(NP-XX/NOX-24V)
EXHAUST INLET
DOC/DPF/SCR
COMBINATION HOUSING
(M3)
DOSING
BOX
(SEN)
SCR
CONTROLLER
(A3C)
REACTANT LEVEL TRANSMITTER
(Optional)
REACTANT
LEVEL
INDICATION
(Optional)
REACTANT
FILTER
REACTANT
BOOSTER PUMP
(VPN)
COMMUNICATIONS
(Optional)
REACTANT TANK
(Customer or MIRATECH Supplied)
POWER SOURCE
(Customer Supplied)
AIR COMPRESSOR
(CA)
Wire Harness
Air
Wire
Exhaust Sample Tubing
Reactant
NOT FOR CONSTRUCTION
PROJECT NAME
PROPOSAL NUMBER
SALES ORDER NO.
CUSTOMER P.O.
PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF MIRATECH GROUP, LLC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF MIRATECH GROUP, LLC IS PROHIBITED.
DIMENSIONS ARE APPROXIMATE IN INCHES UNLESS OTHERWISE SPECIFIED
DIMENSIONAL TOLERANCES UNLESS OTHERWISE SPECIFIED
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BEND: ±3°
INCHES: ±1/8
MILLIMETERS: ±3
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System Overview
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APPENDIX C
NO_2 SEASONAL HOUR-OF-DAY ANALYSIS
(ELECTRONIC APPENDIX)

APPENDIX D
SUPPLEMENTAL CUMULATIVE HEALTH RISK ANALYSIS INFORMATION

Table D1
Summary of Cumulative Health Impacts at the MEIW
2232 Golf Club Rd.
Pittsburg, CA

Emission Source	Cancer Risk Impact (in one million)	Chronic Non-Cancer Hazard Index	Acute Non-Cancer Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Project Operational Generators (100% Load)	1.0	0.0008	0.036	0.0039
Subtotal, Project Impacts	**1.0**	**0.0008**	**0.036**	**0.0039**
Existing Stationary Sources[1]				
City of Pittsburg Water Treatment Plant (Facility #13968)	1.0	0.0015	NA	0.0013
Subtotal, Background Sources	**1.0**	**0.0015**	**0**	**0.0013**
Existing Rail and Roadway Sources[2]				
Railroad	0.019	5.0E-06	NA	2.4E-05
Major Roadways	1.5	0.0054	NA	0.044
Subtotal, Mobile Sources	**1.5**	**0.0054**	**0**	**0.044**
Subtotal, Background and Mobile Sources	**2.5**	**0.0069**	**0**	**0.045**
Total Cumulative Impact	**3.5**	**0.0077**	**0.04**	**0.049**
BAAQMD Significance Threshold	100	10	10	0.80
Exceed?	No	No	No	No
Receptor Type	Worker	Worker	Worker	Worker
Receptor Location (UTMx)	596,155	596,155	595,675	596,155
Receptor Location (UTMy)	4,207,354	4,207,354	4,207,874	4,207,354

Notes:

1. Health impacts data for stationary sources within 1,000 ft of the MEIW were obtained from BAAQMD's Permitted Stationary Source Screening Map.
2. Health impacts data for existing rail and roadway sources were estimated using BAAQMD's source raster files for cancer risks, chronic HI, and $PM_{2.5}$. Impacts were determined based on the maximum impact of a raster cell located at the MEIW.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
HI - hazard index
MEIW - Maximally Exposed Individual Worker
NA - not applicable
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
$\mu g/m^3$ - micrograms per cubic meter
UTM - Universal Transverse Mercator coordinate system

References:

BAAQMD Permitted Stationary Source Screening Map. Available at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3. Accessed: January 2024.

BAAQMD raster tools available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling. Accessed: January 2024.

Table D2
Summary of Cumulative Health Impacts at the MESR
2232 Golf Club Rd.
Pittsburg, CA

Emission Source	Cancer Risk Impact (in one million)	Chronic Non-Cancer Hazard Index	Acute Non-Cancer Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Project Operational Generators (100% Load)	0.89	0.0005	0.028	0.0025
Subtotal, Project Impacts	**0.89**	**0.0005**	**0.028**	**0.0025**
Existing Stationary Sources[1]				
9W Halo Western OpCo LP DBA Angelica (Facility #23648)	0.045	0.0004	NA	0.11
Subtotal, Background Sources	**0.045**	**0.0004**	**0**	**0.11**
Existing Rail and Roadway Sources[2]				
Railroad	1.0	0.0003	NA	0.0013
Major Roadways	6.0	0.022	NA	0.18
Subtotal, Mobile Sources	**7.0**	**0.022**	**0**	**0.18**
Subtotal, Background and Mobile Sources	**7.0**	**0.0223**	**0**	**0.29**
Total Cumulative Impact	**7.9**	**0.0228**	**0.028**	**0.29**
BAAQMD Significance Threshold	100	10	10	0.80
Exceed?	No	No	No	No
Receptor Type	School	School	School	School
Receptor Location (UTMx)	596,535	596,535	595,555	596,535
Receptor Location (UTMy)	4,208,174	4,208,174	4,208,054	4,208,174

Notes:

1. Health impacts data for stationary sources within 1,000 ft of the MESR were obtained from BAAQMD's Permitted Stationary Source Screening Map.
2. Health impacts data for existing rail and roadway sources were estimated using BAAQMD's source raster files for cancer risks, chronic HI, and $PM_{2.5}$. Impacts were determined based on the maximum impact of a raster cell located at the MESR.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
HI - hazard index
MESR - Maximally Exposed School Receptor
NA - not applicable
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
$\mu g/m^3$ - micrograms per cubic meter
UTM - Universal Transverse Mercator coordinate system

References:

BAAQMD Permitted Stationary Source Screening Map. Available at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3. Accessed: January 2024.

BAAQMD raster tools available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling. Accessed: January 2024.

Table D3
Summary of Cumulative Health Risk Impacts to the MERR
2232 Golf Club Rd.
Pittsburg, CA

Emission Source	**Cancer Risk Impact (in one million)**	**Chronic Non-Cancer Hazard Index**	**Acute Non-Cancer Hazard Index**	**Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)**
Project Operational Generators (100% Load)	2.3	0.0081	0.082	0.041
Subtotal, Project Impacts	**2.3**	**0.0081**	**0.082**	**0.041**
Existing Stationary Sources[1]				
City of Pittsburg Water Treatment Plant (Facility #13968)	0.28	0.0004	NA	0.0004
Subtotal, Background Sources	**0.28**	**0.0004**	**0**	**0.0004**
Existing Rail and Roadway Sources[2]				
Railroad	0.024	6.0E-06	NA	3.0E-05
Major Roadways	1.2	0.0039	NA	0.032
Subtotal, Mobile Sources	**1.2**	**0.0039**	**0**	**0.032**
Subtotal, Background and Mobile Sources	**1.5**	**0.0044**	**0**	**0.032**
Total Cumulative Impact	**3.8**	**0.013**	**0.082**	**0.073**
BAAQMD Significance Threshold	100	10	10	0.80
Exceed?	No	No	No	No
Receptor Type	Recreational	Recreational	Recreational	Recreational
Receptor Location (UTMx)	595,755	595,755	595,755	595,755
Receptor Location (UTMy)	4,207,574	4,207,574	4,207,534	4,207,574

Notes:

1. Health impacts data for stationary sources within 1,000 ft of the MERR were obtained from BAAQMD's Permitted Stationary Source Screening Map.
2. Health impacts data for existing rail and roadway sources were estimated using BAAQMD's source raster files for cancer risks, chronic HI, and $PM_{2.5}$. Impacts were determined based on the maximum impact of a raster cell located at the MERR.

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
HI - hazard index
MERR - Maximally Exposed Recreational Receptor
NA - not applicable
$PM_{2.5}$ - particulate matter less than 2.5 microns in diameter
$\mu g/m^3$ - micrograms per cubic meter
UTM - Universal Transverse Mercator coordinate system

References:

BAAQMD Permitted Stationary Source Screening Map. Available at: https://baaqmd.maps.arcgis.com/apps/webappviewer/index.html?id=845658c19eae4594b9f4b805fb9d89a3. Accessed: January 2024.

BAAQMD raster tools available at: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling. Accessed: January 2024.

APPENDIX C

Biological Evaluation Technical Report

Arborist Report

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www.vollmarconsulting.com

BIOLOGICAL EVALUATION REPORT

PITTSBURG DATA HUB PROJECT

City of Pittsburg
Contra Costa County, California

Prepared for:

WSP USA
401 B Street, Suite 1650. San Diego, CA 92101
Contact: Stephanie Whitmore | 619/525-8396

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Contact: Eric Smith | 916/758-6928

February 2024

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FIGURES AND TABLES

APPENDICES

1.0 INTRODUCTION

This report presents the methods and results of a biological habitat evaluation conducted within the Pittsburg Data Hub (PDH) project study area (study area), located on the outskirts of the City of Pittsburg, California (**Figure 1**). The report has been prepared by Vollmar Natural Lands Consulting (VNLC) on behalf of WSP USA. The evaluation was conducted to identify and characterize existing conditions within the study area, and to assess the potential for special-status species and sensitive habitats to occur within the study area. Pittsburg Data Hub LLC, a wholly owned subsidiary of Avaio Digital Partners I, LLC (Avaio) is proposing to redevelop a portion of the closed Delta View Golf Course as a data center. The proposed data center may contain facilities used to house information technology equipment including computers, telecommunications, auxiliary power, and storage systems, among other infrastructure.

The study area is approximately 75.9 acres. It comprises three separate parcels totaling 35.7 acres (project area), and a 250-foot buffer of the three parcels totaling 40.2 acres. The project area parcels are owned and managed by the project proponent. Surrounding parcels within the 250-foot buffer are owned and managed by a variety of public and private entities.

Information presented in this report is based on a combination of sources, including a rare plant survey and floristic inventory conducted by VNLC, a wetland delineation conducted by VNLC, additional VNLC reconnaissance-level surveys and database reviews, and on the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP). Relevant sources are cited and/or attached as appendices. Sensitive information (i.e. exact locations of sensitive species occurrences) is provided separately under a confidential cover. This report was prepared to provide the information required by the California Energy Commission (CEC) for processing of a Small Power Plant Exemption (SPPE) application.

1.1 Potentially Occurring Special-status Species

Two special-status animals have been observed within the study area: White-tailed Kite (*Elanus leucurus*), a California Fully Protected bird species, and Cooper's Hawk (*Accipiter cooperii*), a California Department of Fish and Wildlife (CDFW) Watch List species, were each observed foraging in the vicinity of the study area. Based on habitat requirements and distribution, there are 28 other special-status wildlife species and 24 special-status plants with at least low potential to occur within the study area. Among these are three animal species listed as Threatened or Endangered under the Endangered Species Act (ESA) and four animal species listed as Threatened or Endangered under the California Endangered Species Act (CESA). Two of these latter species are also included among the ESA-listed species. In addition, one ESA Candidate animal species and one CESA Candidate Endangered animal species have potential to occur. No ESA- or CESA-listed plant species are expected to occur in the study area. Special-status animals and plants are discussed in detail in **Section 6.1** and **Section 6.2**, respectively. Comprehensive lists of all special-status animals and plants known from the vicinity of the study area are provided as **Tables 2** and **3**, respectively.

Legend

- Highway
- Selected Local Road
- Stream
- Public or Preserved Land
- Urban Area
- County Boundary

Data Sources: TIGER, 2010 | City of Pittsburg, 2018
USGS, Various | | CPAD, 2014 | Landsat Imagery
Gap, 1998 | SFEI, 2015| USFWS, 2014 | VNLC, 2023
GIS/Cartography by R. Miller, Oct. 2023
Map File: 567_PSA_RP_Vicinity_A-P_2024-0212.mxd

FIGURE 1
Regional Vicinity Map

Pittsburg Data Hub Project
City of Pittsburg, California

N
W E
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1:95,040
(1 in. = 1.5 miles, at letter-size layout)

0 0.5 1 2 Km

0 0.5 1 2 Mi

1.2 Designated Critical Habitat

The study area is located within designated critical habitat for Delta smelt (*Hypomesus transpacificus*). However, there is no habitat for this species within the study area, as the drainages are all seasonal to ephemeral. The nearest designated critical habitat for which suitable habitat is present on the study area is for California red-legged frog (*Rana draytonii*), which is approximately eight miles south of the site.

1.3 Sensitive Habitats

A wetland delineation conducted by VNLC identified a total of 1.916 acres of potential jurisdictional Waters within the study area, consisting of 1.909 acres of wetlands and 0.007 acre of other Waters, with habitats including forms of perennial and seasonal wetlands and drainage channels. The delineation also identified 1.597 acres of canal and 1.673 acres of artificial basins that were constructed in upland habitats. In addition to these aquatic resources, the plant survey identified 1.86 acres of riparian habitat which may be subject to jurisdiction of the CDFW. No other sensitive habitats were identified within the study area. Mature trees and other habitats may also provide potential habitat for a variety of bird and bat species, including special-status species.

2.0 PROJECT BACKGROUND INFORMATION

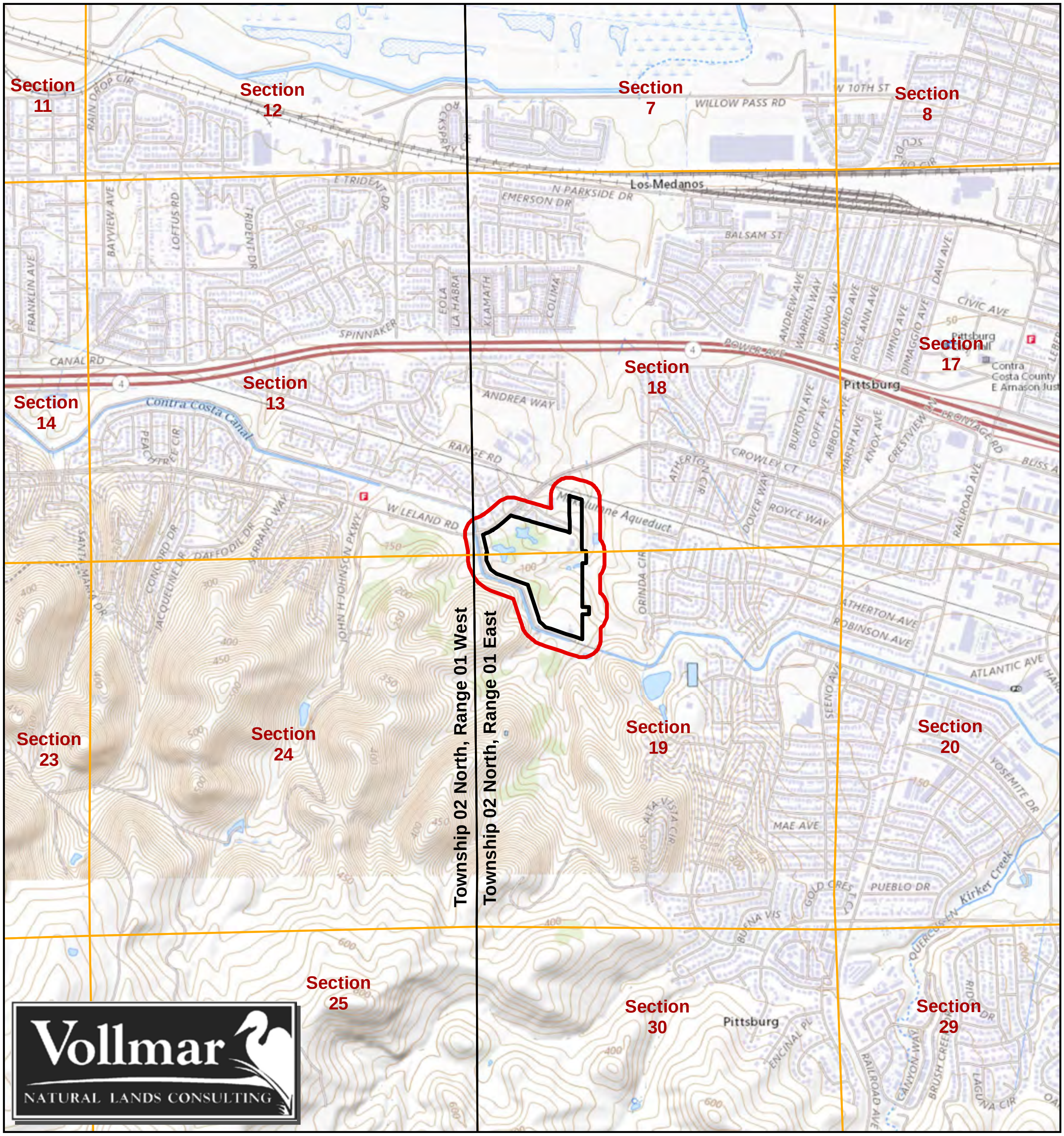
2.1 Study Area Location

The study area is located along the southern edge of the City of Pittsburg, California, and is mapped on the Honker Bay 7.5' United States Geological Survey (USGS) topographic quadrangle (**Figure 2**). The study area is within Sections 18 and 19 of Township 2 North, Range 1 East, and Sections 13 and 14 of Township 2 North, Range 1 West, of the Mount Diablo Base & Meridian; this area is within the Los Medanos land grant. The study area may be accessed from State Highway 4 heading east by exiting at Bailey Road, then turning right (south) on to Bailey Road, then turning left (east) on West Leland Road. Golf Club Road, which heads south from West Leland Road 1.7 miles east of Bailey Road, dead-ends at the former Delta View Golf Course. Much of the study area is accessible via golf cart trails, though some areas have become inaccessible to vehicles because of trees falling onto the trails.

2.2 Physical Description of Study Area

The study area consists of rolling hills along the lower slopes of the eastern Los Medanos Hills, overlooking the City of Pittsburg. Elevation within the study area ranges from approximately 57 feet to 161 feet above sea level (USGS 1997), trending upward in elevation from the northeast to the southwest.

The study area is dominated by silt and clay soils that support annual grassland in undeveloped areas, though extensive areas have been partially leveled and native soils have been replaced by soils suited for golf course landscaping. The fine-textured soils within natural and excavated concave areas support seasonal wetlands.



Legend

- Project Site
- 250-foot Buffer of Project Site
- Public Land Survey Boundary

FIGURE 2
USGS Topographic Map

Pittsburg Data Hub Project
City of Pittsburg, California

N
W E
S

1:24,000
1 inch = 2,000 feet

0 250 500 1,000 M

0 750 1,500 3,000 Ft

Data Sources: VNLC, 2023 | USGS, 2022 | WSP, 2023
City of Pittsburg, 2019 | ESRI/Maxar Aerial Imagery, 2023
GIS/Cartography by: R. Miller, Oct. 2023
Map File: 567_PSA_RP_Topo_A-P_2024-0212.mxd

The study area was formerly owned by the City of Pittsburg and managed as a public golf course for decades. Lands to the south and west of the study area are additional portions of the former golf course (undeveloped as of the writing of this report). Lands to the east consist of open space containing a transmission owned by Pacific Gas and Electric (see **Figure 5**, **Section 5.3**). To the north of the study area is medium-density residential development.

Following the closure of the golf course in 2018, previously managed areas have been colonized by dense and tall stands of invasive weeds. Portions of the study area that were never maintained as golf course grounds are also disturbed, either due to the planting of stands of exotic trees and shrubs, or due to a complete lack of grazing or other forms of management. Grazed areas outside of the fencing that surrounds the golf course, to the southwest, are dominated by non-native grasses and forbs, though localized areas of native wildflowers were observed during 2023 botanical surveys. The remnant intact drainages that flow through the study area support a few riparian tree species, but these are widely scattered and include many exotic trees, and do not form contiguous riparian forest or scrub.

2.3 Regional Setting

The open space to the south consists of grasslands typical of the dry slopes of the Diablo Range, and more generally of Mediterranean California as a whole. This habitat matches the description of “annual grassland” presented in the HCP/NCCP (in contrast to “native grassland”, “alkali grassland”, or “ruderal”) (East Contra Costa County Habitat Conservation Plan Association, 2007). That is, it is dominated by introduced annual grasses, typically wild oats, (*Avena* spp.), brome grasses (*Bromus* spp.), and annual fescues (*Festuca* spp.). Trees are almost entirely absent, and shrubs are rare. The exceptions to this are low-density stands of native oaks (*Quercus* spp.) sheltered along ephemeral drainages, and growing on exposed hilltops. (These are mapped and described as oak savannah or oak woodland in the HCP/NCCP, but are very limited in area) Small unvegetated areas are present, including both rock outcrops, as well as areas denuded by grazing and/or erosion. These grasslands are primarily managed as dryland cattle pasture, though they may historically have been disked for increased productivity (ibid).

Immediately east of the project site is a transmission corridor containing open space. This is made up of a mix of annual grassland, ruderal habitat, and an intermittent stream with associated riparian habitat. The ruderal habitat, as described in the HCP/NCCP, includes a mix of non-native annual grasses and other weedy species (ibid). The riparian corridor supports small patches of riparian woodland/scrub as described in the HCP/NCCP. This is characterized by an open canopy of native riparian trees such as willows (*Salix* spp.) and cottonwoods (*Populus* spp.), with an understory of annual grassland, non-specialized seasonal wetland plants such as knotweed (*Polygonum* spp.) and dock (*Rumex* spp.), and occasional thickets of shrubs such as willows or Himalayan blackberry (*Rubus armeniacus*) (Vollmar Natural Lands Consulting 2024).

Immediately west of the project site is the remainder of the former golf course. Past that golf course lies another narrow riparian corridor, similar to the one east of the project site. Suburban development of medium-density housing lies beyond the riparian corridors to the east and west, and also immediately north of the project site.

3.0 PROJECT DESCRIPTION

The primary goal of the PDH is to be a state-of-the-art data center that provides greater than 99.999 percent reliability (five nines of reliability). The PDH has been designed to reliably meet the increased demand of digital economy, its customers, and the continued growth. The PDH's purpose is to provide its customers with mission critical space to support their servers, including space conditioning and a steady stream of high-quality power supply.

The components of the PDH will include:

- A three-story approximately 347,740 square foot data center building;
- A project substation;
- A PG&E switching station and transmission lines;
- A backup electrical generating facility;
- Site access and surface parking;
- Landscaping;
- Stormwater controls and features; and
- Water and sewer pipeline interconnections.

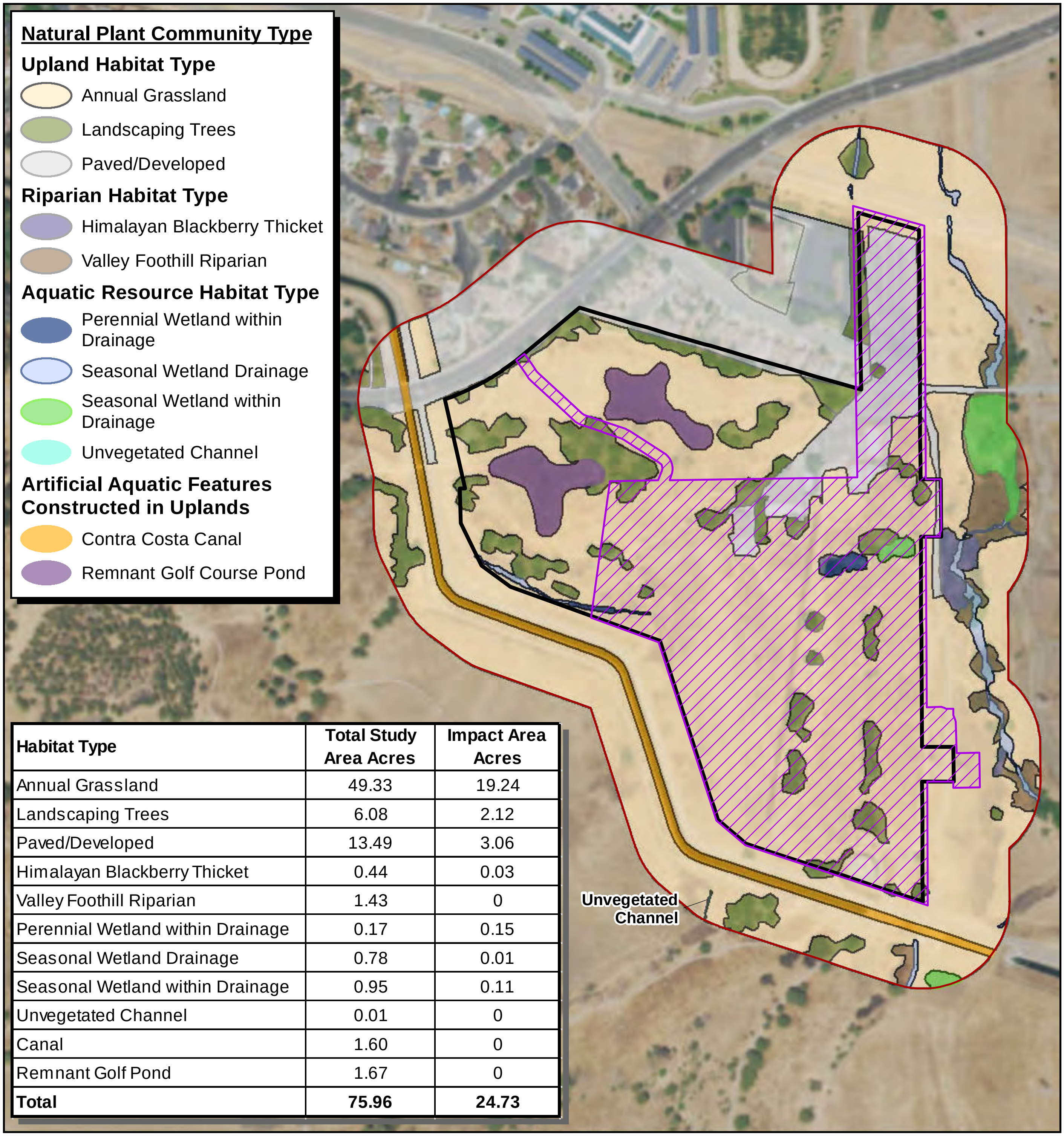
The PDH project's main component will be a three-story 347,740 square foot data center building which will house computer servers for private clients in a secure and environmentally controlled structure and would be designed to provide 60 megawatts (MW) of power to information technology (Critical IT) equipment.

The data center building will consist of two main components; the data center suites that will house client servers, and the administrative facilities including support facilities such as the building lobby, restrooms, conference rooms, landlord office space, customer office space, loading dock and storage.

The data center suite components will consist of three levels of data center space. Each level will contain two data center suites and corresponding electrical/UPS rooms.

The data center is expected to have between 20 and 30 employees and 12-15 visitors (including deliveries) visit the site per day.

Figure 3 depicts the location of planned project activities overlaid on study area habitats, including the acreage of each habitat type to be converted by the proposed project.



Habitat Type	Total Study Area Acres	Impact Area Acres
Annual Grassland	49.33	19.24
Landscaping Trees	6.08	2.12
Paved/Developed	13.49	3.06
Himalayan Blackberry Thicket	0.44	0.03
Valley Foothill Riparian	1.43	0
Perennial Wetland within Drainage	0.17	0.15
Seasonal Wetland Drainage	0.78	0.01
Seasonal Wetland within Drainage	0.95	0.11
Unvegetated Channel	0.01	0
Canal	1.60	0
Remnant Golf Pond	1.67	0
Total	**75.96**	**24.73**

Legend

Impact Area

Project Site

250-foot Buffer of Project Site

Data Sources: VNLC, 2023 | City of Pittsburg, 2019
WSP 2023 | USDA, 2022
GIS/Cartography by R. Miller and T. Hurd, October 2023
Map File: 567_PSA_Impacted_Area_A-P_2024-0222.mxd

Vollmar
NATURAL LANDS CONSULTING

FIGURE 3
Impacted Communities Map

Pittsburg Data Hub Project
City of Pittsburg, California

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1:5,000
1 inch = 417 feet

0 50 100 200 M

0 250 500 1,000 Ft

4.0 METHODS

4.1 Preliminary Review

The California Natural Diversity Database (CNDDB version dated September 2023) was reviewed to identify special-status species and habitat observations in the vicinity of the project area. We conducted a nine-quad search of the CNDDB centered on the Honker Bay quadrangle and including all surrounding quadrangles (Walnut Creek, Clayton, Antioch South, Vine Hill, Fairfield South, Denverton, Birds Landing, Antioch North). Per the CEC SPPE application requirements, we also selected all CNDDB element occurrence polygons within 10 miles of the project area. We requested and reviewed a US Fish and Wildlife Service (USFWS) Information Planning and Consultation list (IPaC) list for the study area. We conducted a nine-quad search for rare and listed plant species through the California Native Plant Society (CNPS) online "Inventory of Rare and Endangered Plants." In addition, we reviewed relevant sections of the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP). We reviewed the California Essential Habitat Connectivity project to identify major habitat corridors (Spencer 2010). Finally, we reviewed site aerial imagery, topographic maps, and soil maps. This information guided the development of field survey strategies for those special-status species with potential to occur in the study area.

4.2 Field Surveys

A reconnaissance-level habitat assessment survey and additional surveys were conducted throughout the study area by VNLC Senior Ecologists Jake Schweitzer and Eric Smith. The initial reconnaissance survey involved traversing the entire site and looking for sensitive habitats and habitats with potential to support special-status plants and animals. Specifically, the site was investigated for bird nests, mammal burrows, and aquatic features. A reconnaissance-level nighttime spotlight survey was conducted for special-status adult amphibians and other wildlife within the deeper ponds. All animal species and dominant plant species observed were recorded and the locations of sensitive habitats (e.g., wetlands and other waters) were recorded as points with professional global positioning systems unit (Trimble GeoXH 6000). Representative photographs of habitat conditions were recorded throughout the study area over the timeframe spanning from April 2022 to July 2023 (**Appendix A**).

A formal wetland delineation survey was conducted in the project area in December 2022, with an additional survey of the 250-foot buffer zone in July 2023. Both surveys were conducted by VNLC Senior Ecologist Eric Smith with assistance by VNLC Staff Ecologist Anton Bokisch. Potentially jurisdictional Waters that were initially documented during the reconnaissance survey were investigated more carefully, and their boundaries were mapped based on the dominance of hydrophytic vegetation as well as the presence of hydrologic indicators and hydric soils. Methods and results of this study are described in detail in **Appendix B**.

VNLC conducted a protocol rare plant survey and floristic inventory in the study area in 2023. Three surveys were scheduled during the peak blooming period (April 12, May 19, and July 12) of all special-status plants with potential to occur within the study area, in order to maximize the potential to detect such species. Methods and results of this study are described in detail in **Appendix C**.

In addition, multiple surveys have been conducted within the study area to document hydrologic conditions within basins that hold ponded water. The purpose of the hydrology surveys was to document ponding depth and duration as well as other parameters (e.g., water temperature and turbidity), in order to determine whether any of the features provide suitable breeding habitat for special-status amphibians. These surveys also included an effort to detect the presence of animal species that could prey upon or compete with special-status amphibians. However, the surveys did not involve the use of aquatic dipnets or seines to capture and confirm the presence of breeding amphibians or other animals. A total of ten rounds of hydrologic surveys were conducted between February 6 and June 25, 2018, with surveys scheduled in a manner that enabled the survey team to document maximum ponding depth (i.e., some surveys conducted following the intense and/or extended rain events) as well as contiguous hydroperiod (i.e., some surveys conducted following extended dry periods) for each basin.

5.0 EXISTING CONDITIONS

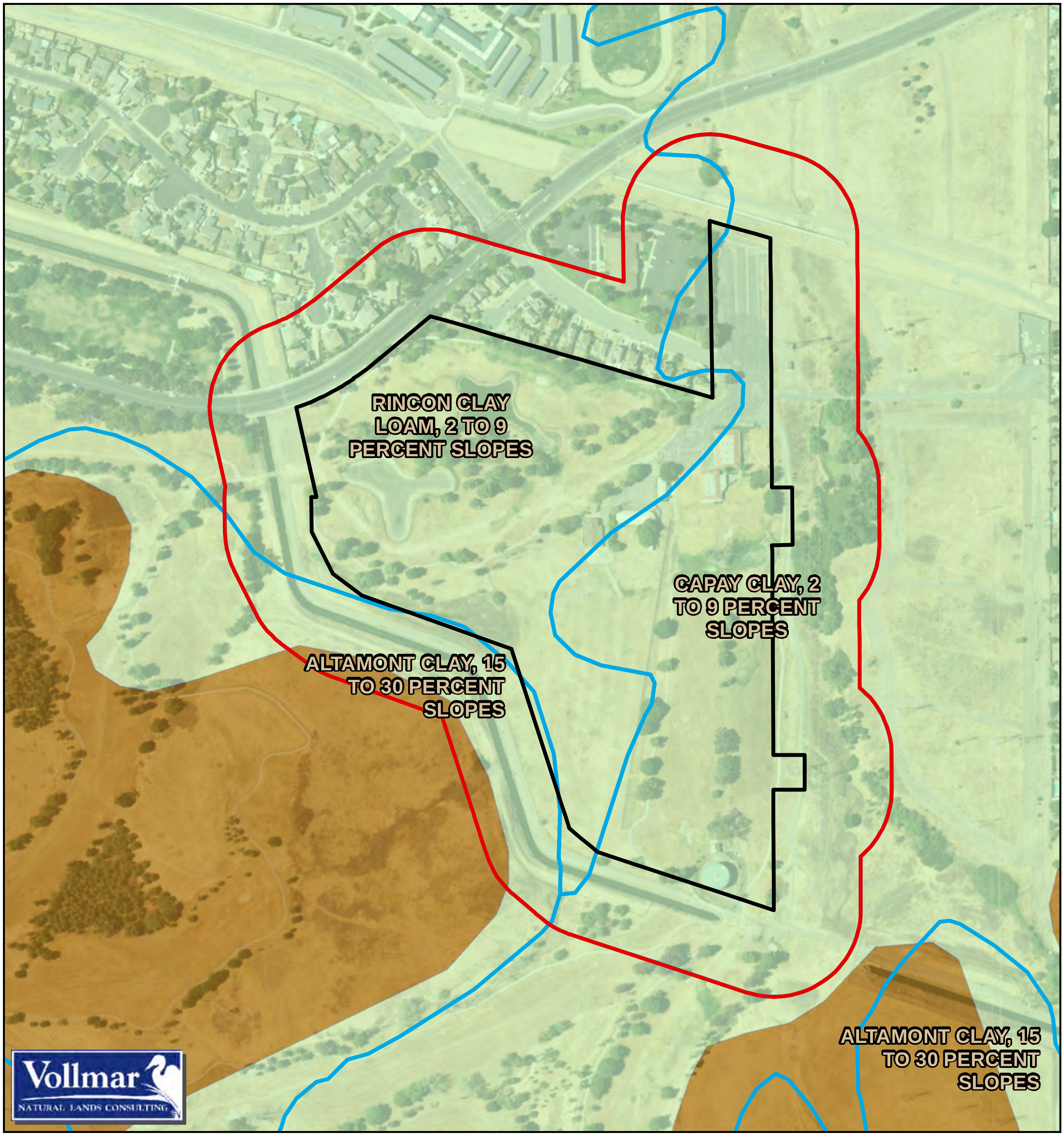
5.1 Climate

The climate of the study area and surrounding vicinity is characterized as "Mediterranean," with cool, wet winters and warm, dry summers as well as high inter- and intra-annual variability in precipitation. On average, nearly 98% of precipitation occurs during the "wet season," from October through May. According to the Parameter-elevation Regression on Independent Slopes Model (PRISM) climate data model (2023), mean annual temperature and precipitation at the study area from 1991 to 2020 are 60.9° Fahrenheit (F) and 17.5 inches, respectively. In contrast, mean precipitation along the coast, at approximately the same latitude and elevation, amounts to over 32 inches, and features a mean temperature of 54° F. Areas of equal distance to the east experience less than half the annual precipitation than at the study area and are hotter on average, due to a complete lack of coastal influence.

The field surveys were conducted during and following a growing season which was wetter than normal, due to the influence of an El Niño-Southern Oscillation (ENSO) weather pattern during the 2022-23 wet season (October-April). According to the PRISM climate data model, the total precipitation for the wet season (October-April) preceding the 2023 field surveys was 30.16 inches, 180% of the normal precipitation for that period. However, most of that precipitation fell during December, January, and March. Despite the erratic precipitation patterns, average temperatures during the same timeframe were quite similar to the mean: 52.3° compared to 54.6° (F). It is expected that the 2022-2023 wet season provided above average conditions for plant growth and persistence, including for most special-status plants with potential to occur in the area.

5.2 Substrates

Three soil units are mapped within the study area: Altamont clay, Capay clay, and Rincon clay loam (**Figure 4**). As **Table 1** below shows, all of these are residuum or alluvium derived from sedimentary rocks, primarily sandstone and shale. The parent geologic formations are Pliocene (~2.5 to 3.6 million years old) Tulare Formation along the hill slopes, and Quaternary (< 2 million years old) surficial deposits along the lowlands. The Tulare Formation consists of poorly consolidated, non-marine sandstone as well as conglomerate and tuff. The surficial deposits are undivided recent materials, including landslide materials (USGS 1994). The pH of the soils is generally neutral to slightly alkaline, with pH values ranging from 6.8 to 7.5 in the top 24 inches



Legend

- Project Site
- 250-foot Buffer of Project Site
- Soil Unit Boundary

Geologic Formation

- Surficial Deposits (Quaternary)
- Tulare Formation (Pliocene)

Data Sources: VNLC, 2023 | City of Pittsburg, 2019
WSP, 2023 | USDA, 2018 | USDA-NRCS, 2005
USGS Open File Report 94-622
GIS/Cartography by: R. Miller, September 2023
Map File: 567_PSA_RP_Soils_A-P_2024-0212.mxd

FIGURE 4
Soil Unit and Geologic Formations Map

Pittsburg Data Hub Project
City of Pittsburg, California

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1:5,000
1 inch = 417 feet

0 50 100 200 M

0 250 500 1,000 Ft

(USDA 2023). Though none of these are rated as hydric soils, all of them consist of high amounts of clay materials, ranging from 35% to 51% clay (ibid), and thus are fairly poorly drained. There are extensive areas where heavy clay soils feature large and deep cracks in the surface. There are very few rock outcroppings and areas of thin, rocky, or sandy soils are limited or absent altogether.

Because the soils are derived from common, unspecialized parent material and are generally fertile, they support primarily generalist, relatively competitive plant species. The areas of heavy clay have moderate potential to support special-status plants, and often do support wetland habitats within concave areas. However, these areas were dominated by introduced plant species. From a wildlife standpoint, the large soil cracks also provide potential aestivation habitat for special-status animals, such as California tiger salamander *(Ambystoma californiense*; CTS).

TABLE 1. Soil Units Mapped within the Study Area

Soil Unit	Parent Material	Surface Texture[1]	pH Rating[2]	Pct of Study Area
Altamont clay, 15-30% slopes	Residuum weathered from sandstone and shale	Clay	7.0	11.3%
Capay clay, 1-15% slopes	Alluvium derived from sedimentary rock	Clay	6.8	45.6%
Rincon clay loam, 2-9% slopes	Clayey alluvium derived from sedimentary rock	Clay loam	7.0	43.1%

1. At least 50% clay in top 24 inches. Dominant Condition.
2. Top 24 inches. Dominant Condition.

Source: USDA Web Soil Survey, 2023

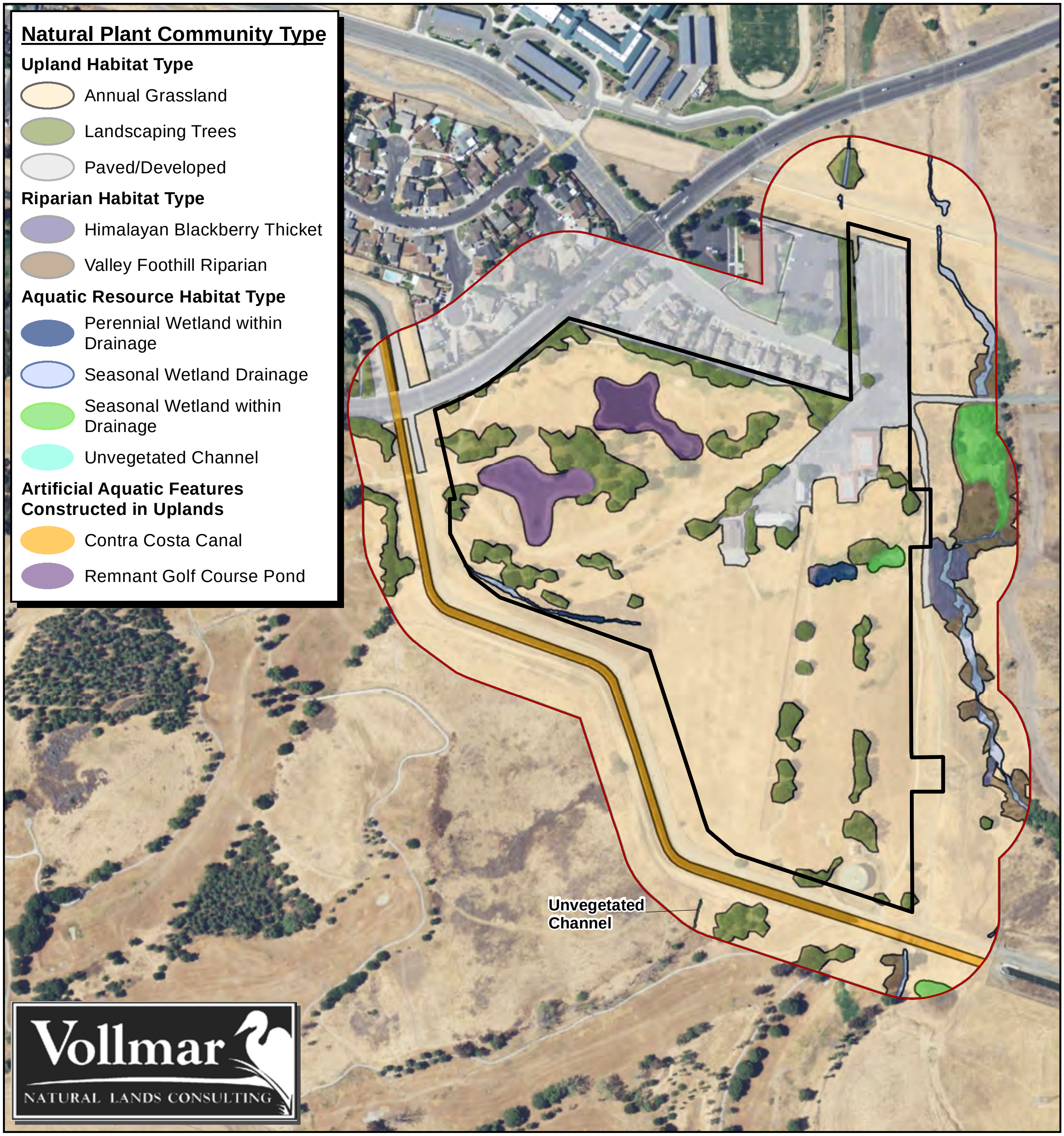
5.3 Study Area Habitats

The study area encompasses a variety of upland and wetland habitat types, including areas formerly managed as the Delta View Golf Course, un-managed (not irrigated or mowed) grasslands and remnant patches of landscaping trees within the golf course, seasonal and perennial wetlands as well as other aquatic habitats, and annual grassland outside of the golf course (**Figure 5**). There are also areas of constructed buildings that are surrounded by paved roads and parking areas. All habitats are described in detail below. Microhabitats are limited within the study area—there are areas of heavy clay soils (including large and deep cracks), but no significant areas of rock outcrops, sandy soils, alkaline soils, or the like. There are moderate numbers of ground squirrel burrow complexes along areas of gentle slopes within the former golf course and surrounding grassland habitats.

Portions of the golf course area are bounded by chain link fencing. The fencing, which spans western and southern portions of the site, prevents larger wildlife from accessing the golf course area.

Upland Habitat

Upland habitat accounts for 68.9 acres of the total 75.9 acres in the study area. Much of the upland area consists of annual grasslands, covering 49.3 acres. Grassland area can be split into 2 categories, areas previously managed as a golf course and those not previously managed as such.



Legend

Project Site

250-foot Buffer of Project Site

FIGURE 5
Natural Communities Map

Pittsburg Data Hub Project
City of Pittsburg, California

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W E
S

1:5,000
1 inch = 417 feet

0 50 100 200 M

0 250 500 1,000 Ft

Data Sources: VNLC, 2023 | City of Pittsburg, 2019
WSP 2023 | USDA, 2018
GIS/Cartography by R. Miller, October 2023
Map File: 567_PSA_RP_Habitats_A-P_2024-0212.mxd

Areas previously part of the Delta View Golf Course were intensively managed as such since the late 1940s. Soils have been replaced or amended, and a wide range of trees, shrubs, and grasses have been imported and maintained via irrigation, mowing, and pruning. Grasslands within the managed golf course areas have undergone dramatic changes following the closure of the golf course. Once intensively managed to maintain turf grass, the herb layer has been colonized by a variety of invasive weeds, which at the time of the delineation and rare plant surveys formed extensive, dense, and tall stands within the study area. Two distinct plant communities have formed within this area, wild oat and brome grasslands, and upland mustards or star-thistle fields. Oat and brome grasslands within the study area was dominated by non-native annuals including Italian rye grass (*Festuca perennis*), ripgut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*), as well as wild oat (*Avena fatua*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), wall barley (*Hordeum murinum*), horseweed (*Erigeron canadensis*), Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), and bristly ox-tongue (*Helminthotheca echioides*). Upland mustard or star-thistle fields were dominated by black mustard (*Brassica nigra*) and some cheeseweed (*Malva parviflora*), or yellow star-thistle (*Centaurea solstitialis*).

Grassland areas not previously managed as a golf course, mostly within the 250-foot buffer zone on the eastern and southwestern edges of the study area, contained a higher diversity of plants. This includes native wildflowers such as several species of lupine (*Lupinus affinis, L. bicolor*, *L. formosus* var. *formosus, L. nanus*), California poppy (*Eschscholzia californica*), purple owl's clover (*Castilleja exserta* ssp. *exserta*), and common fiddleneck (*Amsinckia menziesii*). The previously-described plant communities consisting of primarily non-native species are also present in these areas.

Landscaping trees comprise 6.08 acres of mostly exotic trees. These trees were originally planted as part of the golf course landscaping and have persisted after its closure. This community is dominated by Peruvian pepper tree (*Schinus mole*), with Bishop pine (*Pinus muricata*) and some lodgepole pine (*Pinus contorta* ssp. *murrayana*) and ponderosa pine (*Pinus ponderosa*). Other species of tree likely planted as landscape plants include shamel ash (*Fraxinus uhdei*), Italian stone pine (*Pinus pinea*), deodar cedar (*Cedrus deodara*), and several gum trees (*Eucalyptus camaldulensis* and *E. globulus*). Scattered throughout these exotic species are a few coast live oaks (*Quercus agrifolia* var. *agrifolia*), valley oaks (*Quercus lobata*), and other upland tree species which are native to the region. However, historical aerial photography of the area suggests these species may not have existed in the area prior to the golf course. Many of the planted trees throughout the study area are mature and quite large, particularly the gum trees.

The 13.5 acres of paved area, mostly in the northern part of the study area, includes the now abandoned parking lot, sidewalks, and developed areas included in the study area due to the 250-foot buffer zone surrounding the project area. This area has minimal vegetation, consisting of weedy species that have managed to grow through cracks such as black mustard, rough cat's-ear (*Hypochaeris radicata*), slender wild oat (*Avena barbata*), cheeseweed, yellow star-thistle, Mediterranean barley, and ripgut brome.

Riparian Habitat

Riparian habitat in the study area accounts for 1.87 acres of the total. Of this 0.44 acre is considered Himalayan blackberry thickets. These thickets are dominated (>75% absolute cover) by

Himalayan blackberry. This community is present in the northeast portion of the study area adjacent to a seasonal and perennial wetland drainage.

The remaining 1.43 acres of riparian habitat are considered Valley Foothill Riparian. This area is comprised of riparian trees along the seasonal wetlands and seasonal wetland drainages identified in the 2023 wetland delineation (**Appendix B**)**.** This habitat is located primarily in the eastern portion of the study area and is dominated by Fremont cottonwood (*Populus fremontii*), Siberian elm (*Ulmus pumila*), Mexican fan palm (*Washingtonia robusta*), northern California black walnut (*Juglans hindsii*), olive (*Olea europa*), and occasional Bishop pine. These trees formed only intermittent cover (approximately 30% absolute cover). Riparian areas in the southern portion of the site were primarily composed of Peruvian pepper trees, a remnant landscape plant.

Both the Himalayan blackberry thickets and Valley Foothill Riparian areas are classified as a sensitive habitat due to their status as riparian areas; they may be subject to CDFW jurisdiction under the California Fish and Game Code §1600 *et seq*.

Aquatic Habitats

The study area encompasses a variety of natural, created, and enhanced wetlands and other Waters. Though there are natural drainages, the hydrology in the study area has been significantly altered to support and protect the golf course landscaping. This has resulted in the concentration of water in some areas at the expense of other areas.

Many of the basin and drainage features within the study area were variably vegetated as a function of hydroperiod, amount of scouring from water flow, and/or degree of water turbidity. Some features were sparsely vegetated as result of long ponding duration and/or high water turbidity, while stretches of narrow channel appeared to have limited plant growth as a result of scouring from water flow. Most of the basin features in the study area hold water for only short periods, or have sufficiently clear and/or shallow water that photosynthesis has enabled relatively dense plant growth.

There are a total of 1.91 acres of potentially jurisdictional waters identified by VNLC during the 2023 wetland delineation (**Figure 6-8**). Identified natural aquatic habitats are all considered to be sensitive communities by CDFW. These habitats may be subject to CDFW jurisdiction under the California Fish and Game Code §1600 *et seq* (FGC 1600); they may also be Jurisdictional Waters of the State of California under the Porter-Cologne Water Quality Act (Porter-Cologne) and/or Jurisdictional Waters of the United States under the Clean Water Act (CWA).

Seasonal wetland drainage accounted for 0.79 acre and was concentrated in the eastern portion of the study area. This habitat was dominated by species including Italian rye grass, prickly lettuce (*Lactuca serriola*), tall annual willowherb (*Epilobium brachycarpum*), annual beard grass (*Polypogon monspeliensis*), knotweed (*Polygonum aviculare*), curly dock (*Rumex crispus*), and spiny cocklebur (*Xanthium spinosum*).

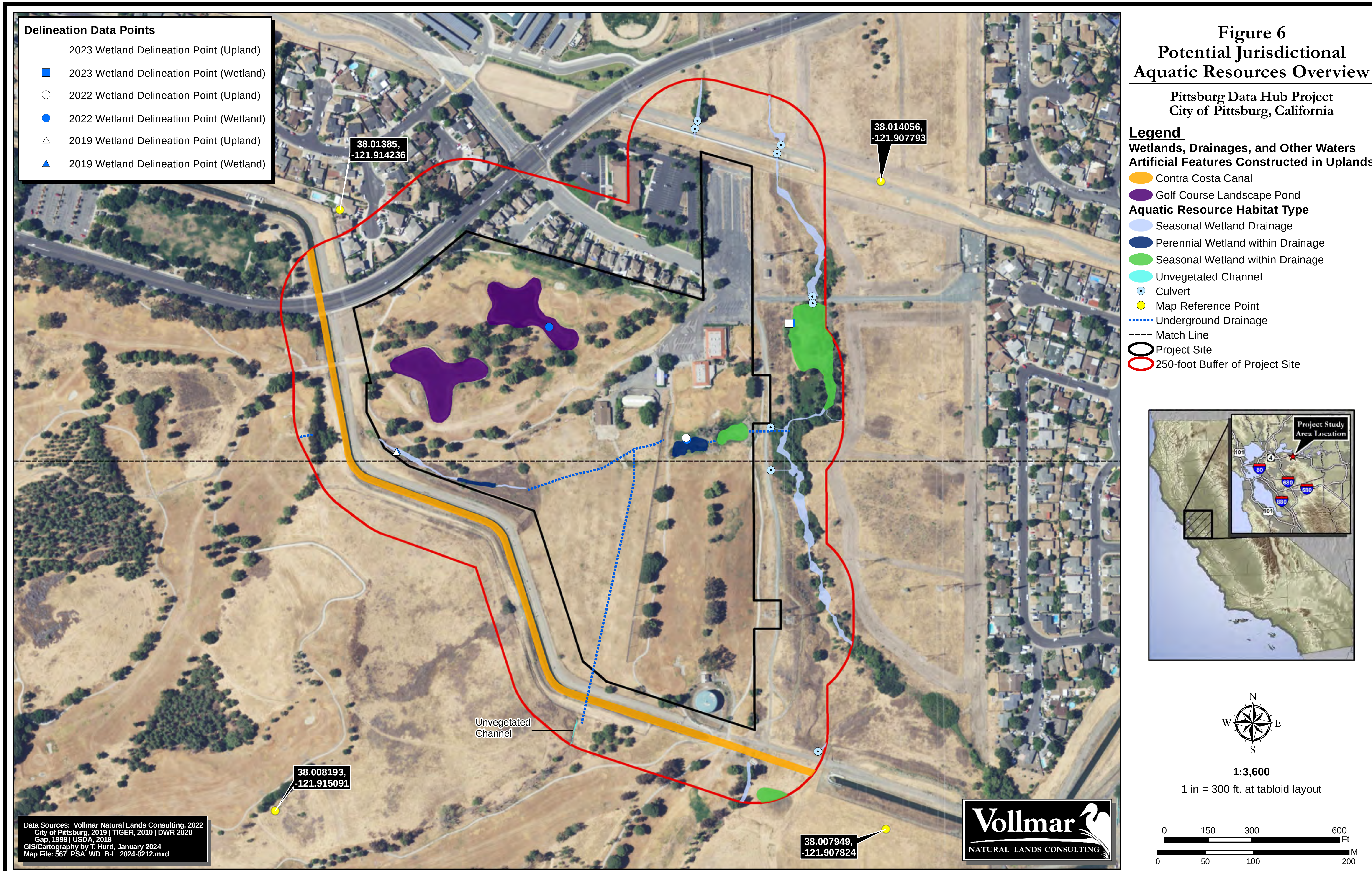
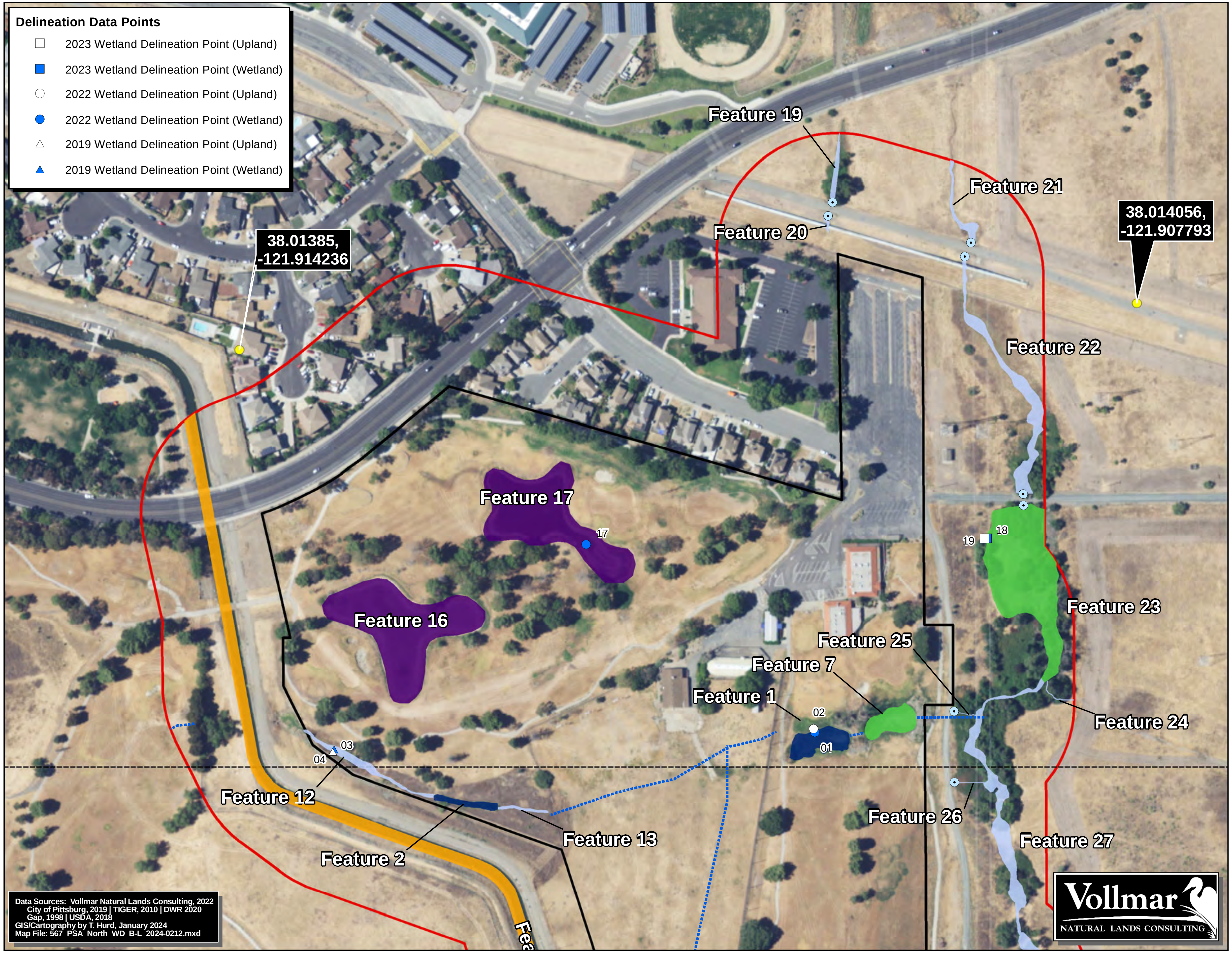


Figure 6
Potential Jurisdictional Aquatic Resources Overview
Pittsburg Data Hub Project
City of Pittsburg, California
Delineation Data Points
2023 Wetland Delineation Point (Upland)
2023 Wetland Delineation Point (Wetland)
2022 Wetland Delineation Point (Upland)
2022 Wetland Delineation Point (Wetland)
2019 Wetland Delineation Point (Upland)
2019 Wetland Delineation Point (Wetland)
Legend
Wetlands, Drainages, and Other Waters
Artificial Features Constructed in Uplands
Contra Costa Canal
Golf Course Landscape Pond
Aquatic Resource Habitat Type
Seasonal Wetland Drainage
Perennial Wetland within Drainage
Seasonal Wetland within Drainage
Unvegetated Channel
Culvert
Map Reference Point
Underground Drainage
Match Line
Project Site
250-foot Buffer of Project Site
38.01385, -121.914236
38.014056, -121.907793
38.008193, -121.915091
38.007949, -121.907824
Unvegetated Channel
Project Study Area Location
1:3,600
1 in = 300 ft. at tabloid layout
0 150 300 600 Ft
0 50 100 200 M
Data Sources: Vollmar Natural Lands Consulting, 2022
City of Pittsburg, 2019 | TIGER, 2010 | DWR 2020
Gap, 1998 | USDA, 2018
GIS/Cartography by T. Hurd, January 2024
Map File: 567_PSA_WD_B-L_2024-0212.mxd
Vollmar
NATURAL LANDS CONSULTING

Figure 7
Potential Jurisdictional Aquatic Resources North

Pittsburg Data Hub Project
City of Pittsburg, California



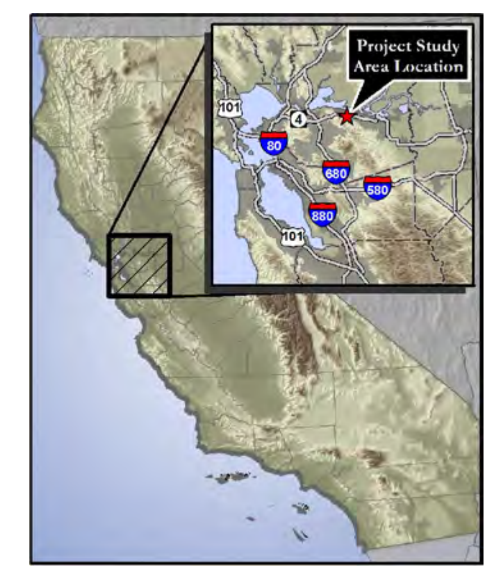
Legend

Wetlands, Drainages, and Other Waters
Artificial Features Constructed in Uplands

- Contra Costa Canal (1.597 ac.)
- Golf Course Landscape Pond (1.673 ac.)

Aquatic Resource Habitat Type

- Seasonal Wetland Drainage (0.787 acs.)
- Perennial Wetland within Drainage (0.169 ac.)
- Seasonal Wetland within Drainage (0.953 ac.)
- Unvegetated Channel (0.007 ac.)
- Culvert
- Map Reference Point
- Underground Drainage
- Match Line with Figure 8
- Project Site
- 250-foot Buffer of Project Site



1:2,400
1 in = 200 ft. at tabloid layout

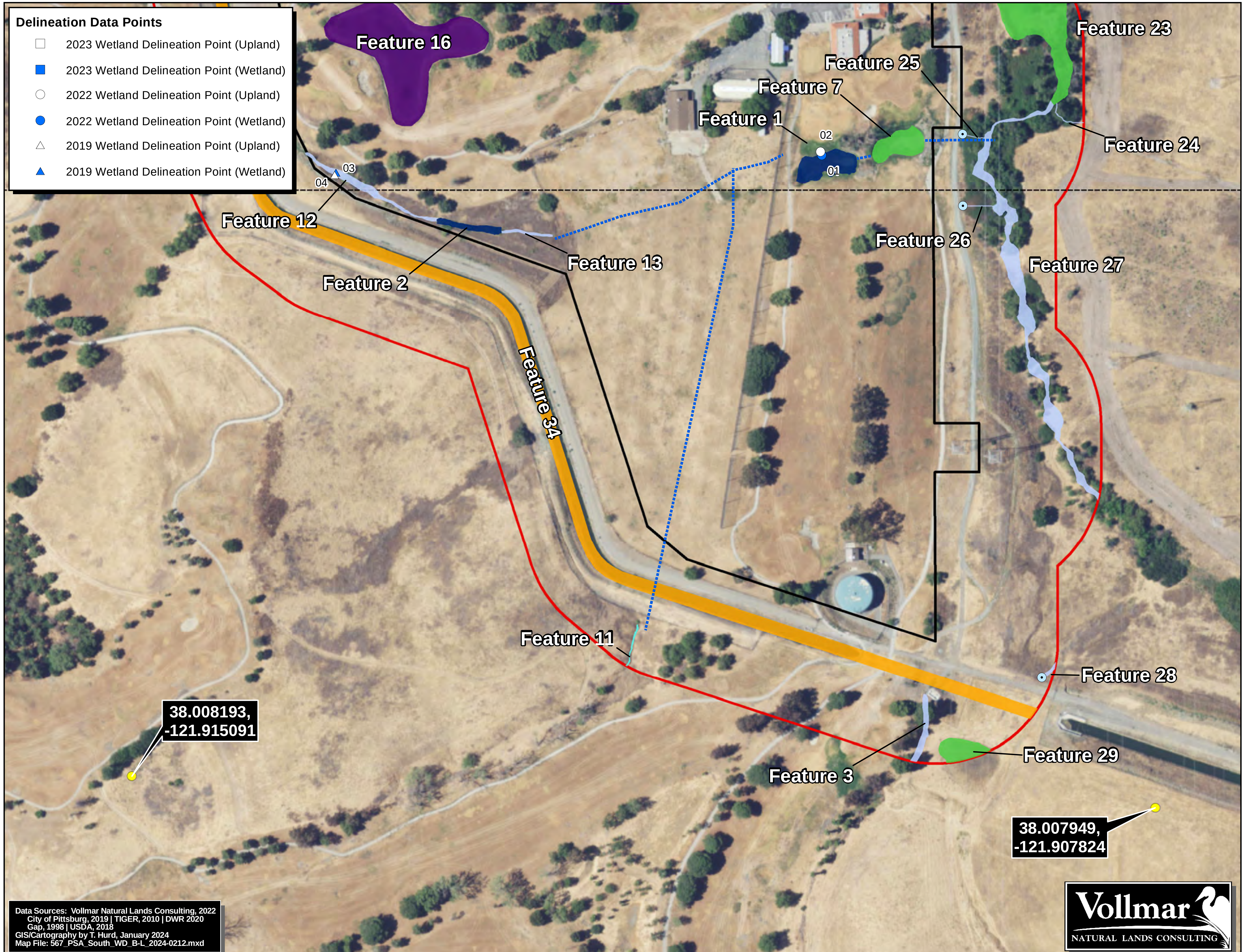


Figure 8
Potential Jurisdictional Aquatic Resources South

Pittsburg Data Hub Project
City of Pittsburg, California

Legend

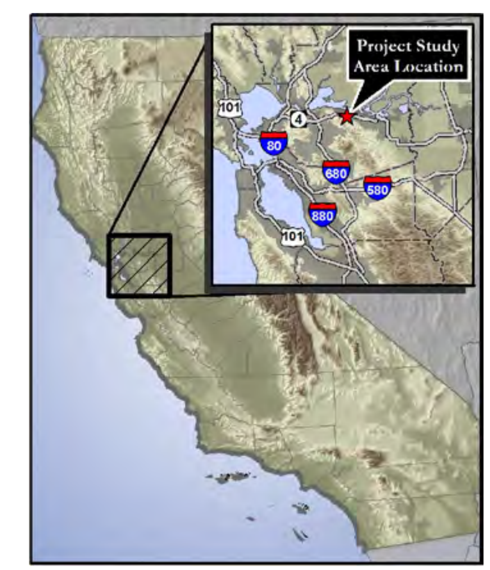
Wetlands, Drainages, and Other Waters

Artificial Features Constructed in Uplands

- Contra Costa Canal (1.597 ac.)
- Golf Course Landscape Pond (1.673 ac.)

Aquatic Resource Habitat Type

- Seasonal Wetland Drainage (0.787 acs.)
- Perennial Wetland within Drainage (0.169 ac.)
- Seasonal Wetland within Drainage (0.953 ac.)
- Unvegetated Channel (0.007 ac.)
- Culvert
- Map Reference Point
- Underground Drainage
- Match Line with Figure 7
- 250-foot Buffer of Project Site
- Project Site



N
W E
S

1:2,400

1 in = 200 ft. at tabloid layout

0 100 200 400 Ft

0 37.5 75 150 M

Perennial wetland within drainages accounted for 0.17 acre and was split between two wetlands both in the northern portion of the study area. These wetlands were dominated by species such as broad-leaved cattail (*Typha latifolia*), curly dock, dallis grass (*Paspalum dilatatum*), alkali mallow (*Malvella leprosa*), and rescue grass (*Bromus catharticus* var. *catharticus*).

Seasonal wetland within drainages accounted for 0.95 acre spread throughout the study area. These wetlands were dominated by species such as lamb's quarters (*Chenopodium album*), curly dock, cocklebur (*Xanthium strumarium*), tall annual willowherb, horseweed, dallis grass, tall flatsedge (*Cyperus eragrostis*), and barnyard grass (*Echinochloa crus-galli*).

Unvegetated channel covered 0.01 acre of the study area and did not contain any vegetation.

In addition to the natural aquatic habitats identified, there are 3.27 acres of artificially constructed aquatic features. These features are not likely to be considered Jurisdictional Waters of the United States as they do not obstruct natural flow of wetlands or waters of the US, or replace the original channel of wetlands or waters. They may be Jurisdictional Waters of the State of California and/or subject to FGC 1600. These aquatic features include the Contra Costa Canal and two golf course landscaping ponds.

The Contra Costal Canal covered 1.60 acres within the study area and was unvegetated.

Two golf course landscape ponds totaling 1.67 acres were constructed in the upland part of the study area. Since closure of the golf course, these have transitioned into seasonal, rain-fed features. Dominant species within the basins include dotted smartweed (*Persicaria punctata*), Mediterranean barley, knotweed, and Italian rye grass. Other common species within the ponds included rattail sixweeks grass (*Festuca myuros*), stinkwort (*Dittrichia graveolens*), and lamb's quarters. The margins of the golf course ponds had been invaded with species common in the annual grassland.

6.0 SPECIAL-STATUS SPECIES

Table 2 and **Table 3,** below, list all species identified in the 9-quad searches, IPaC list, and 10-mile-buffer CNDDB search. In total, occurrences are presented from all of the USGS 1:24,000 Honker Bay, Walnut Creek, Clayton, Antioch South, Vine Hill, Fairfield South, Denverton, Birds Landing, and Antioch North quadrangles, as well as portions of the Brentwood, Diablo, Jersey Island, and Tassajara quadrangles. The potential of these special-status species to occur within the study area is discussed below.

6.1 Regulatory Background

For the purposes of this analysis, special-status animal species include those listed (including proposed or candidate species) under ESA or CESA; species receiving consideration during environmental review under California Environmental Quality Act (CEQA) Guidelines Section 15380; species identified as state Fully Protected; species covered by the Migratory Bird Treaty Act; species and habitats identified by local, state, and federal agencies as needing protection, including but not limited to those identified by the CNDDB, California Fish and Game Code, Title 14 of the California Code of Regulations, or where applicable, in Local Coastal Programs or in relevant decisions of the California Coastal Commission or other responsible agency; locally significant species that are rare or uncommon in a local context such as county or region or is so designated in local or regional plans, policies, or ordinances; and plant species listed as rare under the California Native Plant Protection Act.

Animals listed as Threatened or Endangered under the ESA or CESA are protected from "take", which broadly includes activities which harm individuals of the species or disrupt their life history. Plants listed under the CESA are similarly protected (plants listed under the ESA are protected from take only on public lands, or from actions taken by public entities). Public agencies are required to consider the effects of discretionary actions on listed species. Species which are Candidates or Proposed for listing under the ESA do not receive take protections, though USFWS encourages that they be considered in project analyses. Species which are Candidates for CESA listing receive full CESA take protections while under review.

The listing of "Endangered, Rare, or Threatened" is defined in Section 15380 of the *California Environmental Quality Act* (*CEQA*) *Guidelines*. Section 15380(b) states that a species of animal or plant is "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors. A species is "Rare" when either "(A) although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become Endangered if its environment worsens; or (B) the species is likely to become Endangered within the foreseeable future throughout all or a portion of its range and may be considered "Threatened" as that term is used in the ESA.

Animal species may be designated as "Species of Special Concern" (SSC) by CDFW. This designation does not provide coverage under CESA, but the CDFW recommends their protection as their populations are generally declining and they could be listed as Threatened or Endangered (under CESA) in the future. "Watch List" species are taxa that were previously SSCs but do not currently meet SSC criteria, and for which there is concern and a need for additional information to clarify status.

Species designated as "Fully Protected" by CDFW generally may not be taken or possessed at any time. CDFW may only authorize take for necessary scientific research and may authorize live capture and relocation of "fully protected" birds to protect livestock.

USFWS designates some birds as "Birds of Conservation Concern" (BCC). Although these species have no legal status under ESA, the USFWS recommends their protection as their populations are generally declining, and they could be listed as Threatened or Endangered (under ESA) in the future.

The Migratory Bird Treaty Act (MBTA) (16 U.S.C. 704) and the California Fish and Game Code (Section 3503) prohibit the take of migratory birds as well as disturbance to the active nests of most native birds.

Special-status plants include species that are designated Rare, Threatened, or Endangered as well as candidate species for listing by the USFWS. Special-status plants also include species considered Rare or Endangered under the conditions of Section 15380 of the California Environmental Quality Act (CEQA) Guidelines, such as those plant species identified by the CNPS as California Rare Plant Rank (CRPR) 1A, 1B, and 2 in the Inventory of Rare and Endangered Vascular Plants of California by the CNPS. Finally, special-status plants may include other species that are considered sensitive or of special concern due to limited distribution or lack of adequate information to permit listing or rejection for state or federal status, such as those included as CRPR List 3 or 4 in the CNPS Inventory.

CDFW tracks some species in the CNDDB which do not have any of the special statuses discussed above. This is generally because CDFW is studying them to determine if they merit some special status. These species are also included in our results.

6.2 Special-status Animals

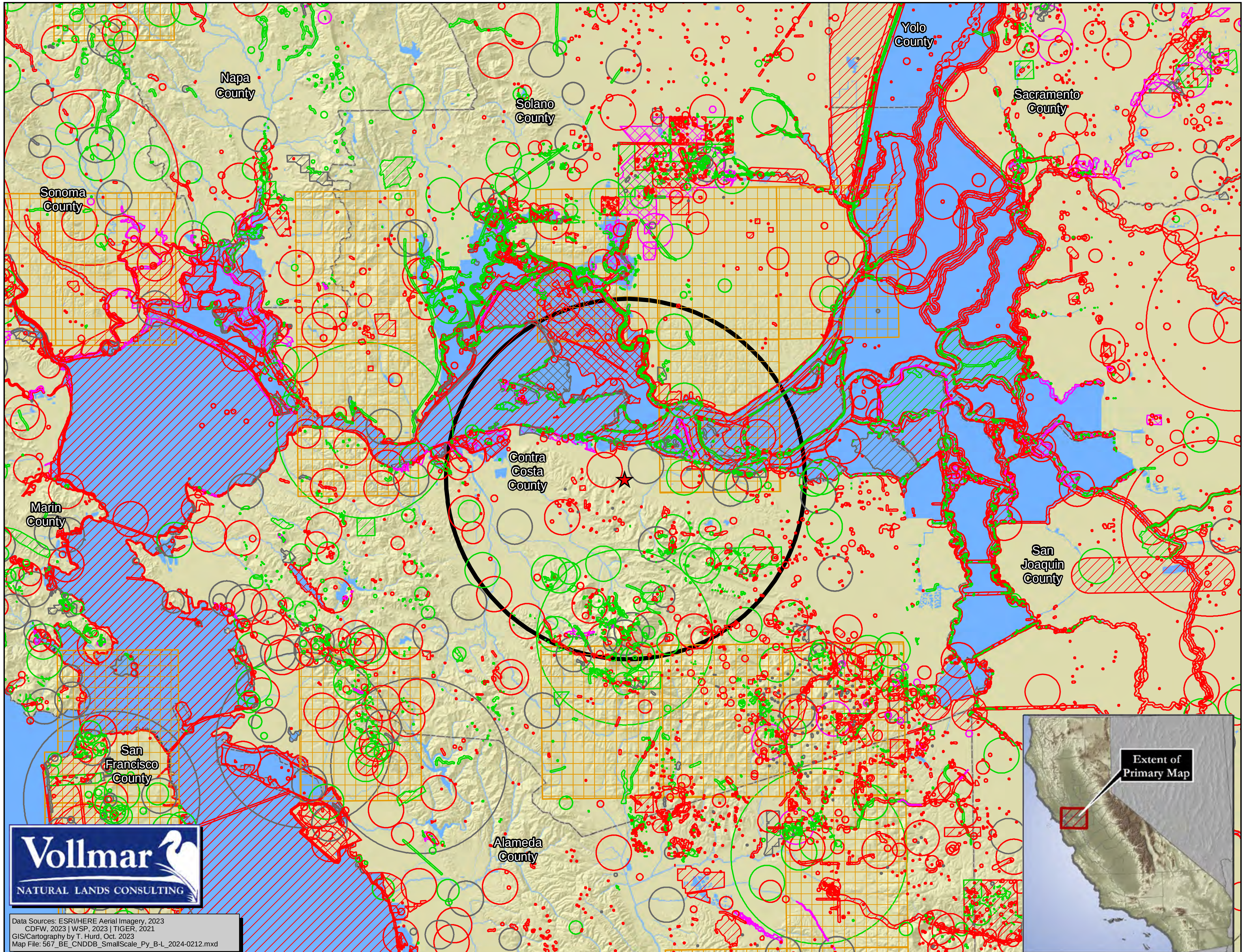
Two special-status animals have been observed within the study area: White-tailed Kite, a California Fully Protected bird species, and Cooper's Hawk, a CDFW Watch List species, were each observed foraging in the vicinity of the study area during VNLC surveys. **Figure 9** shows the location of all occurrences of special-status species and sensitive habitats as documented in the CNDDB at a scale of 1:350,000. **Figure 10** (provided under confidential cover) presents vicinity CNDDB occurrences at a scale of 1:6,000**.** Locations of the White-tailed Kite and Cooper's Hawk occurrences are not depicted, as these were overflights by foraging individuals.

These and other special-status wildlife species documented in the database searches are identified in **Table 2**, which provides a summary of the legal status and habitat requirements of these species, as well as an assessment of the likelihood of occurrence of each species within the study area. The evaluation of the potential for occurrence of each species is based on the distribution of regional occurrences (if any), habitat suitability, and field observations. There is no designated critical habitat within the study area, aside from Delta smelt, a fish species with no potential to occur in the study area.

As noted in **Table 2**, the following special-status animal species have some potential to occur within the study area: Cooper's Hawk, Tricolored Blackbird *(Agelaius tricolor*), Grasshopper Sparrow (*Ammodramus savannarum*), Golden Eagle *(Aquila chrysaetos*), Short-eared Owl *(Asio flammeus*), Burrowing Owl *(Athene cunicularia*), Ferruginous Hawk *(Buteo regalis*), Northern Harrier *(Circus hudsonius*), White-tailed Kite, California Horned Lark *(Eremophila alpestris actia*), Merlin *(Falco columbarius*), Prairie Falcon (*Falco mexicanus*), American Peregrine Falcon (*Falco peregrinus anatum*), Bald Eagle *(Haliaeetus leucocephalus*), Loggerhead Shrike *(Lanius ludovicianus*), California Gull *(Larus californicus*), pallid bat *(Antrozous pallidas*), western red bat *(Lasiurus frantzii*), hoary bat *(Lasiurus cinereus*), San Joaquin pocket mouse *(Perognathus inornatis*), American badger *(Taxidea taxus*), San Joaquin kit fox *(Vulpes macrotis mutica*), California tiger salamander, western pond turtle *(Emys marmorata*), California red-legged frog, obscure bumble bee (*Bombus caliginosus*), crotch bumblebee *(Bombus crotchii*), American bumble bee (*Bombus pensylvanicus*), and monarch butterfly *(Danaus plexippus*). The study area also has potential to support the nesting of protected migratory birds not included in the above list. The potential for these species to occur within the study area, as well as potential impacts to these species from significant disturbances within the study area, are discussed below. Recommended avoidance, minimization, and mitigation measures for project impacts are presented in **Section 11**.

FIGURE 9
Regional Special-status Animals Map

Pittsburg Data Hub Project
City of Pittsburg, California



Legend*

- Project Location
- 10-mile Buffer

CNDDB Occurrences

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (non-specific, circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (non-specific, circular)
- Terrestrial Comm. (80m)
- Terrestrial Comm. (specific)
- Terrestrial Comm. (non-specific)
- Terrestrial Comm. (non-specific, circular)
- Aquatic Comm. (80m)
- Aquatic Comm. (specific)
- Aquatic Comm. (non-specific)
- Aquatic Comm. (non-specific, circular)
- Multiple (80m)
- Multiple (specific)
- Multiple (non-specific)
- Multiple (non-specific, circular)
- Sensitive EO's (commercial only)

*CNDDB polygons have different levels of accuracy based on source data. In order of most to least specific: 80m, specific, non-specific, (non-specific) circular

N W E S

1:350,000

1 in. = 6 mi. at tabloid layout

0 2.5 5 10 Kilometers

0 2.5 5 10 Miles

TABLE 2. Special-status Animals Documented in the Vicinity of the Study Area.

Species	Status[1]	Description of Habitat Requirements	Potential to Occur within the Study Area
Birds			
Cooper's Hawk* *Accipiter cooperii*	WL	Forest, woodlands, and often suburbs with trees. Nest in dense woods of pines, oaks, Douglas firs, beeches, spruces and other trees, often on flat ground.	**Present (foraging).** Species was observed foraging in the vicinity of the study area. Scattered landscaping trees provide limited nesting opportunities. This species is tolerant of suburban development and may nest in the project vicinity, though the nearest CNDDB documentation is more than 10 miles away.
Tricolored Blackbird *Agelaius tricolor*	ST, BCC, SSC	Forages in a variety of open habitats including pastures, agricultural fields, rice fields, feedlots, and grasslands with scattered seasonal wetlands. Nests in large freshwater marshes with tules or cattails, or in other dense thickets of willow, thistle, blackberry, or wild rose in close proximity to open water.	**Low Potential.** Stands of marsh vegetation large enough to support breeding colonies are absent from the site vicinity, but the site is mapped as suitable habitat for the species as modeled in the HCP/NCCP. The nearest CNDDB occurrence considered potentially extant is over 8 miles away.
Grasshopper Sparrow *Ammodramus savannarum*	SSC	Frequents dense, dry or well-drained grassland, especially native grassland with a mix of grasses and forbs for foraging and nesting. Uses scattered shrubs for singing perches.	**Low Potential.** Suitable nesting and foraging habitat present. The nearest CNDDB occurrence is more than 10 miles away.
Golden Eagle *Aquila chrysaetos*	FP, WL	Rolling foothills, mountain areas, sage-juniper flats, desert. Nests are constructed on cliffs or in large trees in open areas.	**Potential.** The site provides suitable foraging habitat. The species has also been observed foraging at the Concord Naval Weapons Station, approximately 4 miles away. The CNDDB does not contain any nesting occurrences in the project area. Potentially suitable nesting habitat is absent. The site is mapped as suitable habitat for the species as modeled in the HCP/NCCP.
Short-eared Owl *Asio flammeus*	BCC, SSC	Breeds in extensive marshes and moist grasslands; forages over wetlands, grasslands, and ruderal habitats.	**Low Potential.** Suitable nesting habitat not present given the absence of moist areas and/or large wetlands. Onsite grasslands provide foraging habitat (though limited). The nearest CNDDB documentations are from 5 miles away, though these date to the 1980s. No recent documentations are present in the region.
Burrowing Owl *Athene cunicularia*	BCC, SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	**Potential.** The on-site grasslands provide potential nesting and wintering habitat. The nearest occurrence of nesting burrowing owls is 2.2 miles west of the site (CNDDB). The site is mapped as suitable habitat for the species as modeled in the HCP/NCCP.
Ferruginous Hawk *Buteo regalis*	WL	Frequents open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats. Roosts in open areas, usually in a lone tree or utility pole. Does not nest in California.	**Potential (wintering only).** This species occurs in the vicinity of the study area as an infrequent winter migrant but does not nest in California. Could forage on the site during the winter. There is one occurrence of this species in the CNDDB, 3.3 miles southwest.

Species	Status[1]	Description of Habitat Requirements	Potential to Occur within the Study Area
Swainson's Hawk *Buteo swainsoni*	ST	Breeds in stands of tall trees in open areas. Requires adjacent suitable foraging habitats such as grasslands or alfalfa fields supporting rodents.	**Not Expected.** There are some potentially suitable nesting trees within the study area, and suitable foraging habitat is present. However, based on the CNDDB, the closest documented occurrence of the species is over 6 miles north and east of the site and the site appears to be along or outside of the extreme western edge of the species' nesting range. Consistent with this finding, the site is not mapped as suitable nesting or foraging habitat for the species as modeled in the HCP/NCCP.
Mountain Plover *Charadrius montanus*	BCC, SSC	Winters in central and southern California.	**Not Expected.** No longer winters in eastern Bay Area, historical occurrences (>100 years ago) exist in Concord. No recent occurrences documented within 10 miles.
Western Snowy Plover *Charadrius nivosus nivosus*	FT, SSC	Coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. along the Pacific Coast.	**Not Expected.** Rare species with no suitable habitat nearby. No documented occurrences within 10 miles.
Northern Harrier *Circus hudsonius*	BCC, SSC	Found throughout California breed and forage in open habitats with sufficient vegetation	**Low Potential.** No native grasslands present in the study area; limited open habitat provides some potential for foraging. Nearest CNDDB occurrence is 4 miles away.
Yellow Rail *Coturnicops noveboracensis*	BCC, SSC	Nests and winters in marshes and wet meadows. Most common along the coast.	**Not Expected.** Rare species with suitable habitat on site. No documented occurrences within 10 miles.
White-tailed Kite *Elanus leucurus*	FP	Undisturbed open grasslands, meadows, farmlands, and emergent wetlands for foraging. Nests near top of dense oak, willow, or other tree stands.	**Present (foraging).** Suitable nesting and foraging habitat present within the study area, and the species was observed foraging on the site during surveys.
California Horned Lark *Eremophila alpestris actia*	WL	Nests in open areas that contain relatively barren ground with short grass and scattered bushes.	**Low Potential.** Limited open habitat provides some potential for nesting and foraging. Not documented in the CNDDB within 10 miles of the study area.
Merlin* *Falco columbarius*	WL	Winter migrant found uncommonly in coastlines, open grasslands, savannahs, wetlands etc.	**Low Potential.** Limited winter habitat on site in the form of grasslands. Not documented in the CNDDB within 10 miles of the study area.
Prairie Falcon* *Falco mexicanus*	WL	Uncommonly found in Central Valley, along inner Coast Ranges and Sierra Nevadas, southeast to desert. Associated with perennial grasslands, savannah, rangeland, agricultural fields, and desert scrub.	**Low Potential.** Open grassland habitat in the study area may provide marginal foraging habitat for the species. Nearest CNDDB occurrences are approximately 9 miles away.
American Peregrine Falcon *Falco peregrinus anatum*	SA (delisted)	Adaptable, and can be seen in a wide range of habitats; often encountered in areas with steep cliffs, as well as around coastal mudflats and open areas with shorebirds.	**Low Potential.** Open grassland habitat in the study area may provide marginal foraging habitat for the species. Nesting habitat is absent. Nearest CNDDB occurrences are approximately 9 miles away.
Saltmarsh Common Yellowthroat *Geothlypis trichas sinuosa*	BCC, SSC	San Francisco Bay fresh and saltwater marshes. Requires thick, continuous cover down to water surface for foraging.	**Not Expected**: The study area does not provide suitable habitat given the absence of salt/brackish marsh habitat.

Species	Status[1]	Description of Habitat Requirements	Potential to Occur within the Study Area
Bald Eagle *Haliaeetus leucocephalus*	SE, FP	Requires large water bodies or rivers, primarily a resident of northern California, scattered nests elsewhere.	**Low Potential.** No large freshwater bodies are present nearby, and there are no CNDDB occurrences within 10 miles.
Yellow-breasted Chat *Icteria virens*	SSC	Frequents dense, brushy thickets and tangles near water, and thick understory in riparian woodland.	**Not Expected.** No appropriate riparian habitat present on site, and there are no CNDDB occurrences within 10 miles.
Loggerhead Shrike *Lanius ludovicianus*	SSC	Habitat consists of open spaces such as grasslands with scattered trees, shrubs, utility lines, and/or fences for perching. Typically nest in densely vegetated trees and shrubs.	**Potential.** Suitable nesting and foraging habitat present. No CNDDB occurrences documented within 10 miles.
California Gull* *Larus californicus*	BCC, WL	Nests on isolated islands. Common along coasts, landfills, and pastures.	**Potential.** No suitable nesting habitat in study area, but species may visit nearby landfills. No CNDDB occurrences documented within 10 miles.
California Black Rail *Laterallus jamaicensis coturniculus*	ST, FP	Occurs in freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Requires permanent water and dense vegetation for nesting. Dependent upon upper zones of saline emergent wetlands, especially with pickleweed, and brackish fresh emergent wetlands.	**Not Expected.** The study area does not provide suitable habitat for this species given the absence of tidal and brackish marshes.
Suisun Song Sparrow *Melospiza melodia maxillaris*	SSC	Resident of brackish water marshes surrounding Suisun Bay. Inhabits cattails, tules, and tangles bordering sloughs.	**Not Expected.** The study area does not provide suitable habitat for this species given the absence of brackish marsh.
Song Sparrow (“Modesto” population) *Melospiza melodia* pop. 1	SSC	Found primarily in wetlands, but can be found along riparian corridors and sufficiently vegetated artificial waterways.	**Not Expected.** No suitable wetland or riparian habitat is present within the study area**.** Nearby occurrences are restricted to bayland edge.
Double-crested Cormorant *Nannopterum auritum*	WL	Found along entire coast of California and inland waters.	**Not Expected.** No suitable habitat in study area. Nearby occurrences are restricted to bayland edge.
Long-billed Curlew *Numenius americanus*	WL	Winters in coastal estuaries, open grasslands, and croplands. Nests in upland shortgrass prairies and wet meadows.	**Not Expected.** Grasslands present on site provide limited habitat. Species is strongly associated with bay margin in the Bay Area. No CNDDB occurrences within 10 miles.
Osprey *Pandion haliaetus*	WL	Large trees in forested habitats, prefers coniferous, with large, fish-bearing waters.	**Not Expected.** No forest ecosystem present within the study area. No CNDDB occurrences within 10 miles. Occurrence in the eastern Bay Area is strongly associated with bayland and forested East Bay hills.
Bryant’s Savannah Sparrow *Passerculus sandwichensis alaudinus*	SSC	Occupies low tidally influenced habitats, adjacent ruderal areas, moist grasslands within and just above the fog belt, and, infrequently, drier grasslands.	**Not Expected.** Study area is not within the fog belt; nearest occurrence is located in Hayward.

Species	Status[1]	Description of Habitat Requirements	Potential to Occur within the Study Area
American White Pelican *Pelecanus erythrorhynchos*	BCC, SSC	Winters in the Pacific coast and lowlands. Breeds primarily in the intermountain west.	**Not Expected.** No suitable habitat in study area. No CNDDB occurrences within 10 miles. Occurrence in the eastern Bay Area is strongly associated with bay margin and forested East Bay hills.
White-faced Ibis *Plegadis chihi*	WL	Shallow, emergent wetlands. Forages in wet meadows, irrigated pasture, pond edges, wet cropland.	**Not Expected.** No suitable habitat is present within the study area. No CNDDB occurrences within 10 miles.
California Ridgway's Rail (formerly California clapper rail) *Rallus obsoletus obsoletus*	FE, SE, FP	Saltwater and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed and cordgrass, but feeds away from cover on invertebrates from mud-bottomed sloughs.	**Not Expected.** The study area does not provide suitable habitat for this species given the absence of tidal or brackish marshes.
California Least Tern *Sternula antillarum browni*	FE, SE, FP	Nests along the coast and around bays/estuaries from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	**Not Expected.** The study area does not provide suitable habitat for this species given its distance from tidal areas.
Mammals			
Pallid bat* *Antrozous pallidus*	SSC	Occurs in mountainous areas, intermontane basins, lowland desert scrub, arid deserts, and grasslands, often near rocky outcrops and water; in some areas, this species also inhabits open coniferous forest and woodland. Prefers open dry lands with rocky areas for roosting.	**Potential.** No cavities within large trees were observed within the study area, though more targeted surveys might reveal such trees. Other roosting habitat is limited given a lack of caves/crevices and accessible buildings. Foraging habitat is present on the site. Nearest documented occurrences are 4.6 miles away, dating to the 1940s. No recent CNDDB occurrences within 10 miles.
Northern California ringtail *Bassariscus astutus raptor*	FP	Chapparal, rocky hillsides and riparian areas. Strongly associated with steep, rocky slopes.	**Not Expected.** No suitable habitat is present within the study area. No CNDDB occurrences within 10 miles.
Townsend's big-eared bat *Corynorhinus townsendii*	SSC	Occurs in a wide variety of habitats including grasslands, shrublands, oak woodlands, and forests. Prefers mesic habitats. Roosts in caves, cliffs, rock ledges, tunnels, mines, and man-made structures.	**Not Expected (roosting).** The site does not contain expected roosting habitat given the absence caves, mines, and abandoned buildings. Nearest CNDDB occurrence is approximately 8 miles away.
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	SA	Bare ridge tops, rocky outcrops, thin soils, scattered chaparral, and small annual grasses.	**Not Expected.** Species is considered extirpated from most of its range; only known populations are in the Ohlone wilderness.
Western red bat* *Lasiurus frantzii* [*L. blossevillii*]	SSC	Roosts in trees in a wide variety of habitats between the coast and western Sierra Nevada mountains. Strongly associated with riparian habitats, particularly mature stands of cottonwood/sycamore.	**Low Potential.** This species is strongly associated with riparian habitats, particularly mature stands of cottonwood/sycamore; suitable habitat is absent from the study area. Nearest CNDDB documentations are approximately 5 miles away, dating to the 1990s. No recent documentations exist in the vicinity.

Species	Status[1]	Description of Habitat Requirements	Potential to Occur within the Study Area
Hoary bat* *Lasiurus cinereus*	SA	Primarily occurs in deciduous and coniferous forests and woodlands, including areas altered by humans, roosting at the edge of clearings. Foraging habitat includes various open areas, including spaces over water and along riparian corridors.	**Low Potential.** This foliage roosting species may fly over, forage, or roost within the study area on occasion. Nearest CNDDB occurrences are 5-8 miles away, dating to more than 20 years ago.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	SSC	Occurs in dense woodlands and chaparral throughout the Santa Cruz Mountains and foothills. Build nests which are often the result of work by several generations of woodrats by piling up sticks, rocks, and other available material.	**Not Expected.** Suitable habitat is absent from the project vicinity. East Bay occurrences are generally restricted to steep, wooded hills, which are not present within the study area.
Big free-tailed bat *Nyctinomops macrotis*	SSC	Rugged, rocky habitats in arid landscapes. Habitats include desert shrub, woodlands, and evergreen forests. Typically associated with lowlands. Primary roosts include cliff crevices, and secondary roosts may include tree cavities, caves, and buildings.	**Not Expected.** Species' range within California limited to the south. Lone occurrence in Alameda County thought to be a vagrant
San Joaquin pocket mouse *Perognathus inornatus*	SA	This species inhabits grasslands and blue oak woodlands with friable soils in the foothills and valley bottoms of the Central Valley	**Low Potential.** The study area lacks characteristic friable soils, but there is some potential the species could occur on the site. CNDDB occurrences are present 3-5 miles southeast of the study area, but date to the 1990s or earlier.
Salt-marsh harvest mouse *Reithrodontomys raviventris*	FE, SE, FP	Restricted to saline emergent wetlands of the San Francisco Bay and its tributaries. Primary habitat is pickleweed, but may occur in other salt and brackish marsh vegetation types and in adjacent upland areas. Does not burrow; builds loosely organized nests. Requires high ground to escape high tides and floods.	**Not Expected.** The study area does not provide suitable tidal marsh habitat.
Suisun shrew *Sorex ornatus sinuosus*	SSC	Occurs in tidal and brackish marshes along northern San Pablo and Suisun bays.	**Not Expected.** No suitable habitat in the study area; only documented occurrences are on the north side of the San Francisco Bay.
American badger* *Taxidea taxus*	SSC	Most abundant in drier, open stages of shrub, forest, and herbaceous habitats with friable soils where they can dig burrows.	**Low Potential.** No badger dens have been observed in the study area vicinity and soils are not particularly friable. The nearest documented occurrence in the CNDDB is nearly 9 miles southeast of the site. However, as the species is known from the region, and general habitat requirements are present, there is potential that a badger could dig a den on the site.
San Joaquin kit fox *Vulpes macrotis mutica*	FE, ST	Inhabits open, dry grasslands and scrublands with loose textured soils. Live in dens in friable soils or enlarge smaller holes created by other animals.	**Low Potential**. The on-site grasslands are mostly steep, but may provide marginal suitable habitat for San Joaquin kit fox. The site is mapped as suitable core habitat for the species as modeled in the HCP/NCCP. The site is either along the extreme northern edge, or just outside of the range of this species. CNDDB occurrences 2.6 miles to the south date to the 1990s.

Reptiles and Amphibians			
California tiger salamander – central California DPS *Ambystoma californiense pop. 1*	FT, ST, WL	Primarily found in annual grasslands. Adults spend most of the year in upland subterranean refugia, especially burrows of California ground squirrels and occasionally man-made structures, migrating during rainy nights to vernal pools, seasonal ponds, or stock ponds for breeding. Aquatic larvae seek cover in turbid water, clumps of vegetation, and other submerged debris.	**Potential**. There are numerous documented occurrences of the species in the project vicinity, including multiple breeding ponds. Potential breeding habitat is present within the study area. Portions of the project site are within the known maximum dispersal distance of the species (1.3 miles) from documented breeding ponds, though the Contra Costa Canal is a barrier between the site and those ponds. The study area is not within designated critical habitat for California tiger salamander. The site is mapped as suitable migration and aestivation habitat for the species as modeled in the HCP/NCCP.
Northern California legless lizard *Anniella pulchra*	SSC	Sandy or loose loamy soils under sparse vegetation.	**Not Expected.** The study area does not provide suitable habitat for the species given the absence of natural sandy and loose soils (sand is present only within golf course sand traps). There are no documented occurrences of this species within 10 miles of the site in the CNDDB. The site is not mapped as suitable habitat for the species as modeled in the HCP/NCCP.
California glossy snake *Arizona elegans occidentalis*	SSC	Most common in desert regions of southern California, but can be found north to Mt. Diablo in a variety of habitats including annual grassland.	**Not Expected.** The study area is just outside of the species' northernmost range. Potential habitat exists on site, but the nearest occurrence is from 1958, 7 miles east of the site in the Antioch Dunes. The nearest populations known to be extant are more than 20 miles to the southeast, in the vicinity of Tracy.
Western pond turtle *Emys marmorata*	SSC	Perennial ponds, deep slow-moving streams, marshes, irrigation ditches, small lakes, and permanent pools along intermittent streams are habitat for this species at 6,000 ft. and below in elevation. Logs, rocks, cattail mats, and exposed banks are required for basking.	**Potential.** Low-quality habitat is present within the study area, in the form of man-made ponds and seasonal stream/swale corridors. Two potential movement corridors are modeled in the HCP/NCCP. Nearest CNDDB occurrences are 3.1 miles away.
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT, ST	Found in chaparral, northern coastal sage scrub, and coastal sage habitats, but also forages in grassland and open woodlands. Grassland habitats are used before and after mating season in the spring. Rock outcrops with deep crevices and abundant rodent burrows are crucial for whipsnakes as overnight dens, as refuges from predators and excessive heat, and for foraging.	**Not Expected.** The study area does not provide optimal habitat for Alameda whipsnake given the absence of chaparral and scrub habitats on or near the study area. In addition, the study area is not located between or near areas of suitable core habitat. The site is not mapped as suitable core or movement habitat for the species as modeled in the HCP/NCCP. The nearest CNDDB documentation is approximately 3.3 miles away.
Coast horned lizard *Phrynosoma blainvillii*	SSC	Inhabits open areas of loose, sandy soil and low vegetation in valleys, foothills, and semiarid mountains. Often found in lowlands along sandy washes with scattered shrubs, along dirt roads, and near ant hills. Occurs in coniferous forest, woodland, riparian, chaparral, and annual grassland habitats in the Sierra Nevada foothills throughout the central and southern California coast.	**Not Expected.** The study area does not provide suitable habitat for the species given the absence of natural sandy and loose soils or significant rock outcrops. The nearest documented CNDDB occurrence of this species is over 6 miles southwest of the study area.

Foothill yellow-legged frog – central coast DPS *Rana boylii pop. 4*	FT, SE	Generally occurs in partially shaded and shallow streams with a rocky substrate in a variety of habitats, including valley-foothill riparian, mixed chaparral, and coastal scrub. Requires aestivation habitat and enough permanent water for larval development.	**Not Expected.** Study Area lacks suitable habitat for the species. The nearest documented CNDDB occurrence of this species is over 6 miles away.
California red-legged frog *Rana draytonii*	FT, SSC	Breeds in perennial and seasonal ponds and quiet pools in slow-moving freshwater streams; shelters in adjacent uplands and shrubby or emergent riparian vegetation. Prefers shorelines with extensive vegetation. Requires permanent or nearly permanent pools for larval development.	**Potential.** There are multiple occurrences of this species documented in the vicinity of the study area, including an occurrence less than one mile southwest of the site (mapped as specific in year 2000). Given the presence of known and potential breeding habitat, and the known maximum dispersal distance of the species (up to 2 miles), much of the study area provides potential upland/aestivation habitat. The study area is not within designated critical habitat for California red-legged frog. The site is mapped as suitable migration and aestivation habitat for the species as modeled in the HCP/NCCP. The nearest documented occurrence is less than one mile away.
Western spadefoot *Spea hammondii*	SSC	Primarily found in grasslands with shallow temporary pools, but sometimes in valley-foothill hardwood woodlands throughout the Central Valley and foothills.	**Not Expected.** The nearest documented occurrences are >10 miles away, and the site is outside of the species' current range.
Giant garter snake *Thamnophis gigas*	FT, ST	Freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches, primarily for dispersal or migration.	**Not Expected.** The study area does not provide suitable aquatic habitat for giant garter snake. The study area is not modeled as habitat for the species in the HCP/NCCP, and the nearest CNDDB occurrences is nearly six miles to the north, across Suisun Bay.
Crustaceans			
Conservancy fairy shrimp *Branchinecta conservatio*	FE	Large, cool-water vernal pools with moderately turbid water located in the Central Valley.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. The only occurrences within 10 miles are on the opposite side of Suisun Bay, at Montezuma Wetlands.
Longhorn fairy shrimp *Branchinecta longiantenna*	FE	Inhabits clear to rather turbid vernal pools. These include clear-water depressions in sandstone outcroppings near Tracy, grass-bottomed pools in Merced County and claypan pools around Soda Lake in San Luis Obispo County.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. There are no documented occurrences within 10 miles of the study area.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	Vernal pools, seasonal wetlands, and stagnant ditches that fill with water during fall and winter rains and dry up in spring and summer.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. The nearest documented occurrence is approximately 3.3 miles to the northeast, in an area that has since been developed.
Midvalley fairy shrimp *Branchinecta mesovallensis*	SA	Vernal pools and other seasonally ponded areas.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. The nearest documented occurrence is 9.9 miles away, on the opposite side of Suisun Bay.
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	Known habitats range from small, clear, well-vegetated vernal pools to highly turbid, alkali scald pools to large winter lakes.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. The nearest documented occurrences are on the other side of Suisun Bay; other documented occurrences are approximately 6.9 miles east of the study area.

California fairy shrimp *Linderiella occidentalis*	SA	Found in a variety of natural and artificial seasonally ponded habitat types.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. The nearest documented occurrences are approximately 3 miles away on Concord Naval Weapons Station.
Insects			
Blennosperma vernal pool andrenid bee *Andrena blennospermatis*	SA	Dried vernal pools and associated flowers.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. Only nearby documentations are from non-specific polygon described only as "Somersville".
Antioch Dunes anthicid beetle *Anthicus antiochensis*	SA	Sand dunes.	**Not Expected.** Only nearby occurrence is extirpated population at Antioch Dunes.
Lange's metalmark butterfly *Apodemia mormo langei*	FE	Antioch dunes along the San Joaquin River.	**Not Expected.** Associated with Antioch Dunes. Only remaining habitat is located in Antioch Dunes National Wildlife Refuge 6 miles to the east.
Obscure bumble bee* *Bombus caliginosus*	SA	Relatively humid and often foggy areas, pollinates plants of the pea, heath, and sunflower families.	**Low Potential.** Nearest documented occurrences are from approximately 9 miles away at Mount Diablo State Park. Some potential pollinator resources are present in study area.
Crotch bumble bee* *Bombus crotchii*	SCE	Open grasslands, shrublands, chaparral, desert margins, and semi-urban habitat.	**Low Potential.** Multiple historical occurrences in present Antioch and Mount Diablo State Park. Closest recent occurrence is at Brentwood Lake in iNaturalist. Some potential pollinator resources are present in study area.
Western bumble bee *Bombus occidentalis*	SCE	High elevation meadows, forests, riparian areas in the Sierra Nevada's and cascades, as well as coastal grasslands of northern California.	**Not Expected.** No suitable habitat present in the study area. All nearby occurrences are historical, with the most recent being from 1979.
American bumble bee* *Bombus pensylvanicus*	SA	Nests in long grass, hay, or underground.	**Low Potential.** Multiple historical occurrences are present around Suisun Bay. Some potential pollinator resources are present in study area.
San Joaquin dune beetle *Coelus gracilis*	SA	Sand dunes (Antioch Dunes).	**Not Expected.** Only nearby occurrence is extirpated population at Antioch Dunes.
Antioch cophuran robberfly *Cophura hurdi*	SA	Sand dunes (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Monarch butterfly – California overwintering population* *Danaus plexippus plexippus pop. 1*	FC	Found in a variety of habitat types wherever flowering plants can be seen. Require milkweed for reproduction.	**Potential.** Many nearby occurrences, one less than a half mile from study area from iNaturalist. Milkweed, the species' larval host plant, is present within the study area and vicinity.

Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	Mature blue elderberry shrubs, particularly in riparian zones.	**Not Expected.** There are no blue elderberry shrubs and no significant riparian habitat present in the study area. No CNDDB documentations exist within 10 miles of project site.
Delta green ground beetle *Elaphrus viridis*	FT	Margins of vernal pools and other seasonal wetlands, especially large 'playa' pools.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. The onsite ponds likely do not provide suitable habitat. No CNDDB documentations exist within 10 miles of project site.
Antioch efferian robberfly *Efferia antiochi*	SA	Sand dunes (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Redheaded sphecid wasp *Eucerceris ruficeps*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	SA	Vernal pools.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. Only nearby documentations are from non-specific polygon described only as "Oakley".
Middlekauff's shieldback katydid *Idiostatus middlekauffi*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Molestan blister beetle *Lytta molesta*	SA	Dried vernal pools and associated flowers.	**Not Expected.** There are no vernal pools or other potentially suitable habitat within the study area. No CNDDB documentations exist within 10 miles of project site.
Hurd's metapogon robberfly *Metapogon hurdi*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Antioch multilid wasp *Myrmosula pacifica*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Yellow-banded andrenid bee *Perdita hirticeps luteocinctabal*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Antioch andrenid bee *Perdita scitula antiochensis*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is population at Antioch Dunes.
Antioch specid wasp *Philanthus nasalis*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is extirpated population at Antioch Dunes.
San Joaquin Valley giant flower-loving fly *Rhaphiomidas trochilus*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Only nearby occurrence is extirpated population at Antioch Dunes.

Callippe silverspot butterfly *Speyeria callippe callippe*	FE	Occurs only in grasslands containing California golden violet (*Viola pedunculata*).	**Not Expected.** No suitable habitat is present nearby; distinct non-listed silverspot butterfly is the only species to currently inhabit Contra Costa County. No CNDDB documentations exist within 10 miles of project site.
Antioch Dunes halcitid bee *Sphecodogastra antiochensis*	SA	Associations poorly known (Antioch Dunes).	**Not Expected.** Species distribution is limited to Antioch Dunes.
Fishes			
Green sturgeon – southern DPS *Acipenser medirostris pop. 1*	FT	Marine waters along the coasts of CA, OR, and WA. Feed in bays or brackish estuaries in summer. Need freshwater rivers to spawn.	**Not Expected.** There is no suitable aquatic habitat within the study area.
White sturgeon *Acipenser transmontanus*	SSC	Coastal waters of western North America. Found in ocean, estuaries, and large rivers.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Sacramento perch *Archoplites interruptus*	SSC	Extirpated from historic range. Currently lives as introduced species in isolated waterbodies throughout the western US.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Pacific lamprey *Entosphenus tridentatus*	SSC	Oceanic and riverine. Nests in gravel or soft sediment dependent on life stage. Requires cold, clear water for spawning.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Delta smelt *Hypomesus transpacificus*	FT, SE	Endemic to the Sacramento–San Joaquin River Delta.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Western river lamprey *Lampetra ayresii*	SSC	Primarily inhabit rivers and their tributaries. Nests in gravel or soft sediment dependent on life stage. Requires cold, clear water for spawning.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Sacramento hitch *Lavinia exilicauda exilicauda*	SSC	Scattered populations in warm, lowland, waters including clear streams, turbid troughs, lakes, and reservoirs.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Hardhead *Mylopharodon conocephalus*	SSC	Low to mid-elevations in mostly undisturbed and high-quality habitats of larger streams. Primarily in the central valley.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Coho salmon – central California coast ESU *Oncorhynchus kisutch pop. 4*	FE, SE	Coastal watersheds of central California north to Alaska.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Steelhead – central California coast DPS *Oncorhynchus mykiss irideus pop. 8*	FT	Found along much of the coast of western North America an associated streams to spawn.	**Not Expected.** There is no suitable aquatic habitat within the study area.

Chinook salmon – Central Valley fall/late fall-run ESU *Oncorhynchus tshawytscha pop. 13*	SSC	Spawn in the Sacramento-San Joaquin River system. Migrate upstream as adults from July through December and spawn from early October through late December.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Chinook salmon – Central Valley spring-run ESU *Oncorhynchus tshawytscha pop. 11*	FT, ST	Spawn in the Sacramento-San Joaquin River system. Enter the Sacramento River from late March through September and spawn in the fall.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Chinook salmon – Sacramento River winter-run ESU *Oncorhynchus tshawytscha pop. 7*	FE, SE	Spawn in the Sacramento-San Joaquin River system. Pass under the Golden Gate Bridge from November through May and pass into the Sacramento River from December through early August.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Sacramento splittail *Pogonichthys macrolepidotus*	SSC	San Francisco Estuary, river-edge and floodplain.	**Not Expected.** There is no suitable aquatic habitat within the study area.
Longfin smelt *Spirinchus thaleichthys*	FC, ST	Coastal lagoons, bays, estuaries, sloughs, tidal areas.	**Not Expected.** There is no suitable aquatic habitat within the study area.

Species marked with "*" have potential to occur but are not covered by the HCP/NCCP.
Species with potential to occur are highlighted

[1] Status definitions:

FT – Federal Threatened;
FE – Federal Endangered;
FC – Federal Candidate;
ST – State Threatened;
SE – State Endangered;
SCE – State Candidate Endangered;

BCC – USFWS Bird of Conservation Concern;
SSC – CDFW Species Special Concern;
FP – CDFW Fully Protected;
WL – CDFW Watch List;
SA – CDFW Special Animals List (2023).

Federally and/or State Listed Species

California Red-legged Frog

California red-legged frog (CRF) is a federally listed Threatened species and a CDFW SSC. This species is covered by the East Contra Costa County HCP/NCCP.

Species Profile

Breeding takes place in streams, deep pools, backwaters within streams and creeks, ponds, marshes, and stock ponds. CRF can occur in ephemeral ponds or permanent streams and ponds; however, populations probably cannot persist in ephemeral streams (Jennings and Hayes 1985). Breeding ponds are typically deep (greater than 2 feet) with still or slow-moving water and dense, shrubby riparian or emergent vegetation (Hayes and Jennings 1988), although CRF have also been observed in shallow sections of streams and ponds that are devoid of vegetative cover. Habitats with the highest densities of CRF are deep-water ponds with dense stands of overhanging willows and a fringe of cattails (Jennings 1988; Rathbun et al. 1993). CRF breeds during the winter and early spring, from as early as late November through April and May. From late November to late April, adult CRF are typically found in or near the breeding ponds (Hayes and Jennings 1989, 1994; Jennings 1988). On rainy nights during this time, however, they may leave the ponds and move up to 300 feet away (Zeiner et al. 1988). Starting in late spring, CRF often move out of the breeding ponds, at first staying nearby but often moving farther away into nearby moist locations, grasslands with squirrel burrows, or similar habitats (under logs, debris, etc.). Generally, these dispersal areas or corridors have mesic (moist) cover, such as would be found in a riparian zone, but CRF have also been documented dispersing through areas with sparse vegetative cover. Dispersal patterns are dependent on habitat availability and environmental conditions (Scott and Rathbun 1998). CRF are likely to remain near the breeding ponds if sufficient moist habitat and cover are available, but may also move significant distances if this habitat is not available or if they are dispersing to other ponds. If water is not available, summer habitat could include spaces under boulders or rocks and organic debris, such as downed trees or logs; industrial debris; and agricultural features, such as drains, watering troughs, abandoned sheds, or hay-ricks. California red-legged frogs also use small mammal burrows and moist leaf litter for refuge habitat (Jennings and Hayes 1994). When the rains begin in late fall, CRF move back into the breeding ponds.

Occurrence in the Vicinity of the Study Area

CRF have been documented at multiple locations in the vicinity of the study area, and the study area is within modeled habitat for the species by the HCP/NCCP. There are three documented occurrences within two miles of the study area, including one occurrence that is less than one mile to the southwest—a CNDDB occurrence from the year 2000 with precision coded as ‘Specific.’ The study area is not within designated critical habitat for California red-legged frog—the nearest critical habitat is approximately eight miles south of the site.

Potential Occurrence within the Study Area

The study area lacks any ponds or pools that hold water long enough to support breeding CRF. During a reconnaissance-level nighttime spotlight survey, no CRF were detected in any features in the study area. Reconnaissance surveys of the nearest ponds to the study area (also on the former golf course, but outside of the 250-foot buffer) detected bullfrogs (*Lithobates catesbeiana*) and mosquito fish (*Gambusia* sp.), which are known to prey upon and compete with CRF.

Given the close proximity of a documented occurrence of CRF, the species could utilize upland habitats within study area for dispersal and/or refugia (i.e., large soil cracks and/or mammal burrows).

Potential Project Impacts

The entire project site is within dispersal distance of a documented breeding pond. The proposed project would eliminate or degrade upland habitat. Should construction activities occur when frogs are present within the study area, individual CRF could be harmed by construction activities. Recommended project design measures (PDMs) to reduce impacts to CRF are provided in **Section 11**. The PDMs are based on the recommendations in the HCP/NCCP.

California Tiger Salamander

California tiger salamander – Central California Distinct Population Segment (DPS) is a federally and state listed Threatened species. This species is covered by the East Contra Costa County HCP/NCCP.

Species Profile

CTS is a relatively large, mostly terrestrial salamander. CTS is restricted to relatively deep vernal pools, stock ponds, or similar habitats. Compared to other amphibians, its larvae take a long amount of time to transform into juvenile adults and thus require relatively lengthy hydroperiods (typically around three months). CTS is relatively secretive and difficult to find outside of the breeding ponds or during its nocturnal breeding migrations, which begin with the first heavy rains of the season in November or December. From late November to early March, sexually mature adults move at night from underground refugia (such as squirrel burrows) to breeding ponds, and individuals may move significant distances—as much as 1.3 miles—from a breeding pool (USFWS 2015). Breeding occurs from late winter into early spring.

After breeding, the adults return to their underground burrows or other refugia. The eggs then hatch and the resulting gilled aquatic larvae metamorphose into juveniles that also move at night into terrestrial habitats (Zeiner et al. 1988). Beginning in late spring and early summer, juveniles migrate from the ponds into refugia where they aestivate (similar to hibernation). Juveniles can travel up to 1 mile from their breeding site to upland refugia (Austin and Shaffer 1992). Juvenile CTS typically spend up to four to five years in their upland burrows before they reach sexual maturity and migrate to breeding ponds for the first time (Trenham et al. 2000).

While the maximum documented dispersal distance of CTS is 1.3 miles (USFWS 2015), this distance is normally less when there are large numbers of refugia sites in close proximity to breeding sites. Trenham and Shaffer (2005) found that 50-95% of adult CTS were trapped between 150 (0.1 mile) to 620 meters (0.4 mile) from a breeding pond, respectively. A more recent study (Orloff 2011), which was conducted in the project vicinity, found that the majority of salamanders were captured at least 800 meters (0.5 mile) from the nearest breeding pond while a smaller number of salamanders were captured as far as 2.2 kilometers (1.4 miles) from the nearest breeding pond.

Occurrence in the Vicinity of the Study Area

CTS have been documented at numerous locations in the vicinity of the study area, and the study area is within modeled habitat for the species by the HCP/NCCP. The documented occurrences are primarily south of the study area, within the undeveloped open grasslands. There is one occurrence within 1.3 miles of the study area, which is listed as a 'Specific' location and includes either larvae or juvenile individuals, suggesting it is a breeding site. These occurrences are separated from the study area by the Contra Costa Canal, which represents a significant barrier to movement.

Potential Occurrence in the Study Area

At least one pond within the study area provides potential breeding habitat for CTS. During hydrologic surveys conducted during the 2019 wet season, a golf course landscape pond located in the northern portion of the study area (**Figure 10**) remained ponded from February to June. This long hydroperiod, combined with other parameters noted within the pond (e.g., potential prey species for CTS and no predators), suggests that the pond could support breeding CTS. The hydrologic surveys did not include targeted surveys for the species, so it is unknown whether the pond is occupied. Other ponded basins within the study area provide sub-optimal breeding conditions for CTS, either because they do not hold water long enough (i.e., well under three months) or because biotic conditions are not typically associated with CTS breeding (e.g., due to dense perennial marsh vegetation and/or the presence of predators such as mosquito fish and bullfrogs—see CRF section above).

Regardless of whether CTS are breeding within ponds in the study area, given the proximity of nearby breeding ponds, and the known maximum dispersal distance of the species (1.3 miles), nearly the entire study area provides potential upland/aestivation habitat. CTS could utilize the study area as dispersal habitat, and could use the mammal burrows and soils cracks throughout much of the study area as aestivation habitat. The study area is not within designated critical habitat for California tiger salamander. The site is mapped as suitable migration and aestivation habitat for the species as modeled in the HCP/NCCP.

Potential Project Impacts

Potential CTS breeding habitat within the study area is fairly limited, though most of the entire study area provides potential upland refuge/aestivation and dispersal habitat. The pond which provides potentially-suitable CTS breeding habitat is not within the proposed project work area; however, development of the study area would reduce upland habitat available to CTS breeding in this other nearby ponds. Individual CTS may be present in subterranean refuge habitat on portions of the study area and could be harmed by construction activities. Following any development of the site, CTS could still move on or off the site during breeding migrations and could be subject to harm or mortality while crossing roads. As with CRF, PDMs based on the HCP/NCCP are provided below.

San Joaquin Kit Fox

San Joaquin kit fox (SJKF) is a federally listed Endangered species and state listed Threatened species. This species is covered by the East Contra Costa County HCP/NCCP.

Species Profile

SJKF is known for its use of and dependence upon dens, which are typically found in enlarged ground squirrel or other species' dens (O'Farrell 1980). However, SJKF may also be found in manmade structures, including abandoned pipelines, banks in roadbeds or sumps, and culverts

(USFWS 1998). Dens are critical for protection from predators, but also provide shelter from inclement weather and thermal regulation. SJKF typically occupies a number of dens at any one time and may change dens often throughout the year. This species forages primarily for small mammals and insects in annual grasslands, pasturelands, cultivated fields, and along the edges of orchards.

Occurrence in the Vicinity of the Study Area

The study area is located just north of the known range of the SJKF. However, the HCP/NCCP identifies the area and vicinity as being suitable core habitat for the species. The closest documented occurrence of this species is approximately 2.6 miles southeast of the study area; though this occurrence was documented in 1992 and its location is listed as ‘Non-specific.’ As discussed in *Conservation of San Joaquin Kit Foxes in Western Merced County, California* prepared by the California State University Stanislaus Endangered Species Recovery Program (May 2009), the current status of SJKF in the northern range is unclear:

> *The status of kit foxes from Santa Nella northward is unclear. This region is commonly referred to as the “northern range”, and even the historical distribution and abundance of kit foxes in this region is uncertain. Grinnell et al. (1937) found little evidence of kit foxes north of Merced County. They speculated that the historic range may have extended further to the north along the west side of the San Joaquin Valley, but offered no information to support this other than the location for the type specimen near Tracy in San Joaquin County (Merriam 1902).*
>
> *An extensive survey was conducted throughout the northern range during May 2001-February 2003. This effort likely constitutes the most comprehensive survey conducted to date in the northern range. Trained scat-detection dogs were used to survey 213 km of transects on 24 different properties. Of 17 fox scats found and genetically identified to species, all were from red foxes (Smith et al. 2006). No kit fox scats were located.*
>
> *Available data offers little support for the presence of resident kit fox populations in the northern range. Currently, kit fox presence in the northern range may consist primarily of occasional dispersing animals from populations to the south of Santa Nella. It is conceivable that such animals might even persist for multiple years resulting in reports of sightings. However, there have been no recent and indeed only two historical records of documented reproduction by kit foxes in the northern range. If self-supporting kit fox populations are not present in the northern range, then this region could be functioning as a dispersal sink, as suggested by Smith et al. (2006).*

Potential Occurrence in the Study Area

The study area is located to the north of the commonly accepted range of the species and there have been no recent documented occurrences in the study area vicinity. Therefore, it is considered unlikely that the species would occur within the study area. However, the potential of a kit fox to occasionally wander outside of its expected range and to occur within the study area cannot be completely ruled out.

Potential Project Impacts

The available evidence indicates that a resident or breeding SJKF population does not occur on or near the study area, and that potential use of the study area and surrounding area by the species would be limited to very occasional dispersal. Should an individual SJKF move through the project area during the construction period, the animal could be harmed. In addition, while considered unlikely, an individual SJKF could also temporarily occupy a den within the study area. In addition to the potential loss of habitat, if the species is present construction activities could result in the loss of one or more kit foxes. PDMs for this species are provided in **Section 11**.

Tricolored Blackbird

Tricolored Blackbird is listed as Threatened under CESA, and is a USFWS BCC and CDFW SSC. This species is covered by the East Contra Costa County HCP/NCCP.

Species Profile

This species typically nests in large colonies in dense stands of cattails or tules in freshwater emergent wetlands. Tricolored Blackbird has also been observed nesting in dense stands of willows, blackberry, wild rose, and tall herbs (Zeiner et al. 1990). It is found throughout the Central Valley and along the south coast of Sonoma, and forages in grasslands, cropland, and along edges of ponds for insects, seeds, and grains. Tricolored Blackbirds have three basic requirements for selecting their breeding colony sites: open accessible water; a protected nesting substrate, including either flooded or thorny or spiny vegetation; and a suitable foraging space providing adequate insect prey within a few miles of the nesting colony (Hamilton et al. 1995; Beedy and Hamilton 1997, 1999). There are no mapped occurrences of Tricolored Blackbird in the vicinity of the study area, though the study area is within mapped primary foraging habitat by the HCP/NCCP.

Occurrence in the Vicinity of the Study Area

The nearest occurrence of Tricolored Blackbird is 7.2 miles north of the study area. This occurrence is from 2014 and is north of the Suisun Bay. The area where the occurrence is located is predominately in a wetland/riparian zone. Though the study area is near the Suisun Bay, there’s marginal wetland/riparian habitat for the species in the study area.

Potential Occurrence in the Study Area

The two perennial wetlands within the study area include small stands of cattails, and there are a few small stands of willows within the study area. However, these stands are too small to provide suitable nesting habitat for Tricolored Blackbird. Open areas within the study area provide potential foraging habitat.

Potential Project Impacts

The study area provides marginal foraging habitat for Tricolored Blackbird. The proposed project would eliminate or degrade this habitat. Should construction activities occur when birds are present within the study area, individual Tricolored Blackbirds could be disturbed by construction activities. PDMs for this species are provided in **Section 11**.

Crotch's Bumble Bee

Species Profile

Crotch's bumble bee is a CESA candidate Endangered species. The bee has a hotter and dryer climactic range than other bee species. Crotch's bumble bee lives in grasslands and shrublands and found predominately in Southern to Central California (LPFW n.d.). There are, however, historical occurrences of the bee near the study area. The bee is a short-tongued bee, meaning the flowers the bee feeds from are specific. Examples include milkweeds, dusty maidens, lupines, medics, phacelias, sages, clarkias, poppies, and wild buckwheats (LPFW n.d.). These bees nest in underground colonies or above ground in tufts of grass, old bird nests, rock piles, and cavities in dead trees (LPFW n.d.). While the grasslands offer marginal habitat for Crotch's bumble bee, the species has potential to be found in the study area and project-related disturbance could impact the species.

Occurrence in the Vicinity of the Study Area

The nearest occurrence of the species according to the CNDDB is 4.8 miles to the east of the study area in Antioch. This occurrence is from 1926. Next closest occurrence is 7.7 miles south of the study area around Mt. Diablo from 1951. Both areas have similar habitat to the study area.

Potential Occurrence in the Study Area

The study area provides suitable grassland habitat for the species and plants accessible to short-tongued bees. Specifically, milkweed and multiple species of lupine provide food for the bee. Though the occurrences in the vicinity are historical, the plant species present could provide enough foraging habitat for the bee.

Potential Project Impacts

With there being loss of grassland habitat, this could impact negatively impact the bee. Crotch's bumble bee is also a ground nester so any ground disturbing activities could negatively impact the species. The bee could also be disturbed by construction activities if they are conducted when the bee is in flying season. PDMs for this species are provided in **Section 11**.

Bald Eagle

Species Profile

Bald Eagle is state listed as Endangered and is a CDFW Fully Protected species. This species is not covered by the East Contra Costa County HCP/NCCP.

Bald Eagles have a wingspan of 168-244 centimeters and have very distinct plumage, with its body a dark brown and head, tail and tail coverts being a stark white (Buehler 2022). The species is found throughout California, predominately near large bodies of water where the bird forages. The species breeds in woodlands and is mainly found near water, though it can be found in more arid areas depending on prey availability. The Bald Eagle roosts in trees at least 50 meters away from their foraging habitat (Buehler 2022).

Occurrence in the Vicinity of the Study Area

Most Bald Eagle occurrences in the state are in northern California; there are no documented nesting occurrences of the species within 10 miles of the project site.

Potential Occurrence in the Study Area

The study area provides limited suitable foraging habitat for the species in the form of grassland. Scattered mature trees provide limited suitable nesting habitat. Nonetheless, a conservative evaluation is that Bald Eagles could forage or nest in the study area.

Potential Project Impacts

Project-related disturbance could potentially impact the onsite foraging and roosting habitat for Bald Eagle. PDMs for this species are provided in **Section 11**.

<u>Other Special-status Species Covered by the HCP/NCCP</u>

Golden Eagle

Golden Eagle is a CDFW Fully Protected species. This species is covered by the East Contra Costa County HCP/NCCP.

Golden Eagle is a resident and migrant throughout California, except for the Central Valley. Its habitat typically includes foothills, mountain areas, sage-juniper flats, and desert, and the species utilizes secluded cliffs with overhanging ledges and large trees for cover (Katzner 2020). Nests are constructed on cliffs and in large trees in open areas.

The study area is within modeled habitat for the species by the HCP/NCCP. The species has been observed foraging nearby at the Concord Naval Weapons Station, approximately 3.8 miles southwest of the study area. The study area provides suitable foraging habitat, and there are a limited number of large, mature trees that could provide nesting habitat. Project-related disturbance could potentially impact the onsite foraging and nesting habitat for Golden Eagle. PDMs for this species are provided in **Section 11**.

Western Pond Turtle

Western pond turtle is a CDFW SSC. This species is covered by the East Contra Costa County HCP/NCCP.

This turtle primarily inhabits aquatic habitats, including ponds, slow moving streams, lakes, marshes, and canals. The species frequently basks on logs or other objects out of the water. Western pond turtles also require upland oviposition (i.e., egg-laying) sites in the vicinity (typically within 200 meters, but as far as 400 meters) of the aquatic site. Mating typically occurs in late April or early May and most oviposition occurs during May and June, although some individuals may deposit eggs as early as late April and as late as early August (Rathbun et al. 1992). Nest sites are most often situated on south or west-facing slopes, are sparsely vegetated with short grasses or forbs, and are scraped in sands or hard-packed, dry, silt or clay soils (Rathbun et al. 1992; Holland 1994; Reese and Welsh 1997).

“Movement Habitat” is documented adjacent to the study area by the HCP/NCCP. However, in reality, there is limited aquatic habitat within the study area, as there are no perennial ponds or streams present. The closest documented occurrence of the species is approximately three miles northeast of the study area. There are no documented occurrences in the hills surrounding the site, and the site is separated by dense urban and suburban development from the documented occurrences within the lowlands north of the study area. Project development could interrupt potential movement habitat for this species, and if present, the species could be harmed or disturbed by construction activities. PDMs for this species are provided in **Section 11**.

Burrowing Owl

Burrowing Owl is a USFWS BCC and CDFW SSC. This species is covered by the East Contra Costa County HCP/NCCP.

Burrowing Owl is a small, ground-dwelling owl that lives in open, dry grasslands, agricultural and range lands, and desert habitats associated with burrowing mammals. Burrowing Owls nest and shelter in ground squirrel and other suitable small mammal burrows or artificial structures (Poulin 2020). The species prefers areas of short grass or bare ground and few trees to reduce the potential for predators to hide near the nest or foraging grounds (Poulin 2020).

The species is known from the vicinity of the study area—the nearest CNDDB occurrence is approximately 2.2 miles west of the study area, and the study area is within modeled habitat for the species by the HCP/NCCP. Furthermore, ground squirrel burrow complexes were observed within the site. However, no evidence of Burrowing Owls was observed during reconnaissance-level habitat and wildlife surveys or other surveys within the study area. Regardless, focused surveys may result in documentation of this species within the study area. Project development would destroy or degrade potential habitat for this species, and if present, the species could be harmed or disturbed by construction activities. PDMs for this species are provided in **Section 11**.

Special-status Species Not Protected by the HCP/NCCP

Other Special-status Birds

The following special-status bird species (which are not covered by the HCP/NCCP) could nest and/or forage within the study area:

- **Cooper's Hawk** is a CDFW Watch List species. Cooper's Hawks are crow-sized raptors that breed in forests throughout North America. Sexes have similar plumage with males being noticeably more colorful (Rosenfield 2020). The hawk is found in deciduous, mixed and conifer forests and suburban and urban areas. The hawk hunts small to medium-sized songbirds and doves, while having a higher proportion of mammals in their diet in western states (Rosenfield 2020). The species is found year-round in California. The study area provides marginally suitable habitat for nesting and suitable habitat for foraging.

- **Grasshopper Sparrow** is a CDFW SSC. The species inhabits grasslands and nests on the ground. The nest is a well-concealed open cup on the ground under vegetation. They forage on the ground in vegetation, mainly eating insects, especially grasshoppers, as well as seeds (Dobkin and Granholm 2008). This species could nest and forage within the study area.

- **Short-eared Owl** is a USFWS BCC and CDFW SSC. Short-eared Owls are a medium-sized owl with a wingspan of 95-110 centimeters with plumage that is dorsally mottled brown and buff (Wiggins 2020). The species is a ground nester that can be found in marshes, grasslands, and tundra throughout North America. Small mammals make up most of the species' diet and population dynamics fluctuate based on their prey (Wiggins 2020). The bird is active both day and night and tends to hunt low to the ground. In California, the species is an uncommon and irregular breeder around the San Francisco Bay Area. The species could nest and forage in the study area.

- **Ferruginous Hawk** is a CDFW Watch List species. The Ferruginous Hawk is a large, narrow-winged hawk. It winters in open habitats, including deserts and grasslands, between September and April in the Modoc Plateau, Central Valley, and Coast Ranges (Zeiner et al. 1990), but it does not nest in California. This hawk prefers low elevations and avoids canyons and forests (Bechard and Schmutz 1995) and forages over open areas for birds, reptiles, amphibians, mice, and ground squirrels. It is an uncommon winter resident and migrant in northern California, and a more common winter resident in southwestern California (Garrett and Dunn 1981). The species does not nest in the project region but could occasionally forage within the study area in the winter.

- **Northern Harrier** is a USFWS BCC and CDFW SSC. Northern Harriers are slender, white-rumped raptors found in tundra, grasslands, and weedy agricultural fields (Smith 2020). The bird can also be found in fresh and saltwater marshes. The species is a ground nesting bird, nesting in dense clumps of vegetation either alone or in loose colonies. It primarily feeds on small to medium sized mammals and birds (Smith 2020). Northern Harrier is most active during dawn and dusk and can also be found in dry upland habitat. The species could nest and forage in the study area.

- **White-tailed Kite** is a CDFW Fully Protected species. White-tailed Kite typically nests in trees, often in isolated stands, surrounded by open foraging habitat. Nests are built on top of oaks, willows, or other dense, broad-leaved deciduous trees within partially cleared or cultivated fields, grasslands, marsh, riparian, woodland, and savanna habitats (Polite 2008). This species was observed foraging within the study area, near the southern edge. The study area also provides suitable nesting habitat for the species.

- **California Horned Lark** is a CDFW Watch List species. The species typically nests in open country, tundra, grassland, and agricultural areas that contain relatively barren ground with short grass and scattered bushes (Green 2008). This subspecies lives year-round throughout most of California, except in the Sierra Nevada and some parts of northwestern California, where it is only a migrant (Green 2008). In the winter, it can be found in large flocks that often include other species of birds. This species could nest and forage in the on-site grasslands.

- **Merlin** is a CDFW Watch List species. Merlins are small falcons with wingspans between 53-73 centimeters (Warkentin 2020). The species can be found in a variety of habitats but tends to avoid dense forests and steep, mountainous areas. The species is most associated with coniferous boreal forests, deciduous parkland, shrub steppe, moorland, and open prairies (Warkentin 2020). During the bird's wintering period, they may also be found in tidal flats and marshes, cultivated areas and urban settings. The species hunts small to medium sized birds, usually under 50 grams (Warkentin 2020). Since the bird winters in California, it is unlikely there will be breeding pairs in or around the study area. The study area, however, does provide suitable foraging habitat for the species.

- **Prairie Falcon** is a CDFW Watch List species. Prairie Falcons are large, pale brown falcons with wingspans of around 90-113 centimeters (Steenhof 2020). The species is found in open areas and nests in cliffs or bluffs. The falcon eats primarily ground squirrels and horned larks, while also eating lizards and other species of passerines, shorebirds, and small rodents (Steenhof 2020). In California, the bird breeds throughout the state and winters in the state. The study area does not provide suitable nesting habitat but does provide suitable foraging habitat for the species.

- **American Peregrine Falcon** is on the CDFW Special Animals list, and was formerly listed as Endangered under ESA and CESA (now delisted)**.** American Peregrine Falcons are medium to large sized falcons with a wingspan of 79-114 centimeters (White 2020). The species is found all over the globe but is a year-round resident in California. The falcon prefers open spaces over confined areas. The species nests on cliffs but may also nest on hillsides and artificial structures. The bird hunts other smaller birds, along with small mammals like bats and rarely amphibians and reptiles (White 2020). The species prefers to forage in open habitat. The study area provides marginal nesting and foraging habitat for the species.

- **Loggerhead Shrike** is a CDFW SSC. Loggerhead Shrike is a predatory passerine bird species. It is a resident in the lowlands and foothills throughout California, where its habitat consists of open spaces such as grasslands with scattered trees, shrubs, utility lines, and/or fences for perching. Loggerhead Shrikes typically nest in densely vegetated trees and shrubs (Granholm 2008). This species could nest and forage within the study area.

- **California Gull** is a USFWS BCC and CDFW Watch List species. California Gulls are medium-sized white-headed gulls with definitive plumage, a combination of dark gray mantle, yellow-green legs, and black and red spots on gonys (Winkler 2020). The species forages in open habitat and nests near natural lakes, rivers, or reservoirs. Foraging habitat can be as far away as 60 km from the nesting colony (Winkler 2020). The species is an opportunistic feeder. Large amounts of California Gulls can be found in the San Francisco Bay. While the study area does not provide suitable nesting habitat, it does provide suitable foraging habitat for the species.

The trees, grasslands, and shrubs within the study area provide nesting habitat for numerous bird species. Should an active nest of these species be present, construction activities could result in the loss or abandonment of the nest. In addition, project-related disturbances would result in the loss of grassland foraging habitat potentially used by these species. Therefore, the loss of a nest of a special-status bird species and associated foraging habitat is considered a potentially significant impact. In addition, the active nests of most native bird species are protected by the Migratory Bird Treaty Act (16 U.S.C. 704) and the California Fish and Game Code (Section 3503). PDMs for these species are provided in **Section 11**.

Other Migratory Birds

Other birds protected under the MBTA have potential to nest in the study area. Tree or vegetation removal could result in direct loss of birds protected by the MBTA. Additionally, construction-related noise could result in the abandonment of an active nest adjacent to the project area. PDMs for these species are provided in **Section 11**.

American Badger

American badger is a CDFW SSC. This species is not covered by the East Contra Costa County HCP/NCCP.

American badgers range throughout California but are most abundant in drier, open stages of shrub, forest, and herbaceous habitats, particularly with friable soils where the badgers can dig burrows. No badger occurrences are documented in the CNDDB in the vicinity of the study area, and no potential dens were observed within the study area. In addition, soils within the study area are not particularly friable—soils are predominantly of clay texture. However, the species is known from the broader vicinity, and based on overall habitats present, there is some potential that a badger could be present in the study area. If present in a den, the species could be harmed by construction activities. In addition, the proposed project would result in the loss of grassland habitat potentially used by the species. PDMs for this species are provided in **Section 11**.

San Joaquin Pocket Mouse

San Joaquin pocket mouse is included on the CDFW Special Animals List. This species is not covered by the East Contra Costa County HCP/NCCP.

This species inhabits grasslands and blue oak woodlands with friable soils in the foothills and valley bottoms of the Central Valley. The study area does not contain the characteristic friable soils required by the species, and therefore, onsite habitat is considered of lower quality. Based on the CNDDB, this species has been documented approximately 3.3 miles southeast of the study area. Given that the species is known from areas with habitat connectivity to the study area, it could occur on the site. PDMs for this species are provided in **Section 11**.

Obscure Bumble Bee

Obscure bumble bee is on the CDFW Special Animals list. The bee is found in grasslands and shrubland. The species is found from southern California to southern British Columbia with most occurrences being found along the coast range (Hatfield 2014). Specifically, the bee inhabits grassy coastal prairies and coast range meadows. The species nests underground and in abandoned bird nests. The species is considered a medium-long tongued species of bee (Hatfield 2014). The bee is seeing a decline in populations and is threatened by habitat loss and extensive development in California. The species is not adaptable to heavy agricultural areas and is also threatened by pesticides, disease, and competition with non-native bees (Hatfield 2014). The study area provides marginal habitat for the species to nest and provides suitable foraging habitat. PDMs for this species are provided in **Section 11**.

American Bumble Bee

American bumble bee is on the CDFW Special Animals list. The bee is found throughout the US, Mexico, and very southern British Columbia. The species is found in open farmlands and fields throughout its range (Hatfield 2015). The species nests on the surface among tall grass but can be an underground nester. The species is also one of the more aggressive bumble bee species, most likely as an adaptation to protect their colonies (Hatfield 2015). Populations of the species are in decline and are threatened by pathogens, low genetic diversity, and pesticide use (Hatfield 2015). The study area provides marginal grassland and foraging habitat for the species. PDMs for this species are provided in **Section 11**.

Monarch Butterfly

Monarch butterfly is an ESA candidate species. The species is found throughout California feeding on various flowers but only lays eggs on milkweed (*Asclepias* sp.) stands. Monarch butterflies can be found roosting in eucalyptus, Monterey pines and Monterey cypress trees (USFWS 2023). In grasslands the species prefers to be in grasslands with predominately grass and forbs. With milkweed present in and around the study area, there is potential for monarch butterflies and their larvae to be present. PDMs for this species are provided in **Section 11**.

Special-status Bats

- **Pallid bat** is a CDFW SSC. Pallid bats are found in various habitats throughout California but are mainly found in dry, open habitats like grasslands. The species has three distinct types of roosts, the day roost, night roost and hibernation roost (Zeiner 1990). The species may also be found in shrublands, mixed conifer forests and woodlands. The species day roosts under bridges, in caves, crevices, mines, and occasionally hollow trees. Night roosts tend to be open sites such as porches or open buildings. The bat forages 1 to 3 miles from its day roost (Zeiner 1990). The bat hunts hard-shelled invertebrates found on the ground or while flying. The species is very susceptible to roost disturbance. The study area provides marginal roosting habitat for the species and provides suitable foraging habitat. While bridges are present in the study area (over the Contra Costa canal), these are low over the water, and thus unsuitable for bat roosting.

- **Western red bat** is a CDFW SSC. Western red bat roosts primarily in trees, but this species forms nursery colonies. The western red bat is strongly associated with riparian habitats, particularly mature stands of cottonwood/sycamore (Pierson et al. 2004). Limited potential roosting habitat for this species is present in the form of a few mature riparian trees.

- **Hoary bat** is included on the CDFW Special Animals List. The hoary bat is a solitary rooster and it roosts exclusively in trees. It could potentially roost within the study area in trees that have potential to be removed. If the species was to occur on the site, it is likely that it would abandon its tree roost at the onset of construction and/or tree removal and relocate to another tree in the area.

PDMs for these species are provided in **Section 11**.

6.3 Special-status Plants

Special-status plant taxa documented in the vicinity of the study area are listed in **Table 3**. The table provides a summary of the listing status and habitat requirements of special-status plant species that have been documented in the project vicinity and also notes whether there is suitable habitat with the potential to support each taxon in the study area. This table also includes an assessment of the likelihood of occurrence of each of these species in the study area. The evaluation of the potential for occurrence of each species is based on the proximity of occurrences (if any), habitat suitability, and, for HCP/NCCP no-take taxa, field observations (the study area was surveyed for these taxa).

As indicated in **Table 3**, the study area provides limited or no habitat for special-status plant species known from the region. The study area is dominated by the former golf course, which features artificial soils over extensive areas and was intensively managed for over seven decades. With the exception of a few planted oaks and remnant cottonwoods and willows, all of the dominant plant species throughout the golf course area are exotic. Once golf course management ceased, nearly all areas where artificial soils predominate have been colonized by invasive weeds, which at the time of habitat surveys, formed tall, dense stands. Steeper slopes within the fenced portion of the study area, which were never managed as part of the golf course, feature semi-natural habitats, with scattered planted trees and un-grazed annual grassland. The grasslands and understory areas are dominated by tall and dense exotic grasses as well as scattered invasive weeds. As with the majority of the study area where native soils remain, there are localized areas of heavy clay soils, but the soils are otherwise unspecialized—they are not derived from serpentine or limestone rock, and are not sandy, gravely, or alkaline. In general, where such areas are not actively managed for habitat values, there is very limited potential for special-status plants to occur. However, the southern portion of the study area that is outside of the fencing supports a moderate cover of native plant species, including a number of showy wildflowers (see **Section 5.3** and **Appendix A**).

Three botanical surveys were conducted on April 12, May 19, and July 12, 2023 throughout the study area, focusing on less disturbed habitats occurring on native soils. The botanical survey was scheduled to optimize the potential to detect HCP/NCCP no-take plants and other special-status plant species. None of the no-take taxa, nor any other special-status plants, were documented within the study area. The potential of each taxon listed in **Table 3** to occur in the study area, taking into consideration factors such as regional distribution, habitat quality, and other factors, is further discussed below.

In general, take of these species is not expected to occur based on the limited habitat availability, and the lack of detections during the surveys. PDMs for these species (including additional surveys, if appropriate) are provided in **Section 11**.

TABLE 3. Special-status Plants Documented in the Vicinity of the Study Area.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Amsinckia grandiflora large-flowered fiddleneck (Boraginaceae)	annual herb	FE/CE/ 1B.1	Cismontane woodland, Valley and foothill grassland; Microhabitat: none; 885-1,805 feet; (March) April-May	**Not Expected.** All natural populations in Contra Costa County have been extirpated. Suitable hill slopes are absent. Not observed during 2023 surveys.
Androsace elongata ssp. *acuta* California androsace* (Primulaceae)	annual herb	--/--/4.2	Chaparral, Cismontane woodland, Coastal scrub, Meadows and seeps, Pinyon and juniper woodland, Valley and foothill grassland; Microhabitat: none; 490-4,280 feet; March-June	**Low Potential.** Suitable habitat on site in from of valley and foothill grassland. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Anomobryum julaceum slender silver moss (Bryaceae)	moss	--/--/4.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest; Microhabitat: damp rock and soil on outcrops, usually on roadcuts, Roadsides (usually); 330-3,280 feet; no bloom period listed	**Not Expected**. No forest habitat occurs on project site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Arabis blepharophylla coast rockcress (Brassicaceae)	perennial herb	--/--/4.3	Broadleafed upland forest, Coastal bluff scrub, Coastal prairie, Coastal scrub; Microhabitat: Rocky; 10-3,610 feet; February-May	**Not Expected.** No suitable forest, scrub, or prairie habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Arctostaphylos auriculata Mt. Diablo manzanita (Ericaceae)	perennial evergreen shrub	--/--/1B.3	Chaparral (sandstone), Cismontane woodland; Microhabitat: none; 445-2,135 feet; January-March	**Not Expected**. No chaparral or cismontane woodland habitats occur within the study area. Nearest CNDDB occurrences are approximately 4 miles away. Not observed during 2023 surveys.
Arctostaphylos manzanita ssp. *laevigata* Contra Costa manzanita (Ericaceae)	perennial evergreen shrub	--/--/1B.2	Chaparral (rocky); Microhabitat: none; 1,410-3,610 feet; January-March (April)	**Not Expected**. No chaparral habitat occurs within the study area. Nearest CNDDB occurrences are approximately 4 miles away. Not observed during 2023 surveys.
Astragalus tener var. *tener* alkali milk-vetch (Fabaceae)	annual herb	--/--/1B.2	Playas, Valley and foothill grassland (adobe clay), Vernal pools; Microhabitat: Alkaline; 5-195 feet; March-June	**Not Expected.** Clays in study area are not adobe and not alkaline. Not observed during 2023 surveys. Only occurrence within 10 miles is on the north side of the bay.
Atriplex cordulata var. *cordulata* heartscale (Chenopodiaceae)	annual herb	--/--/1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland (sandy); Microhabitat: sometimes saline, Alkaline (sometimes); 0-1,835 feet; April-October	**Not Expected**. No suitable habitat occurs within the study area. No saline or alkaline soils. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Atriplex coronata var. *coronata* crownscale* (Chenopodiaceae)	annual herb	--/--/4.2	Chenopod scrub, Valley and foothill grassland, Vernal pools; Microhabitat: Alkaline, Clay (often); 5-1,935 feet; March-October	**Not Expected.** Vernal pools, saline, and alkaline soils absent from site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Atriplex depressa brittlescale (Chenopodiaceae)	annual herb	--/--/1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland, Vernal pools; Microhabitat: Alkaline, Clay; 5-1,050 feet; April-October	**Not Expected**. No suitable habitat occurs within the study area. No saline or alkaline soils. Nearest CNDDB occurrences on the same side of the bay are approximately 8.8 miles away. Not observed during 2023 surveys.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Atriplex persistens vernal pool smallscale (Chenopodiaceae)	annual herb	--/--/1B.2	Vernal pools (alkaline); Microhabitat: none; 35-375 feet; June-October	**Not Expected.** No vernal pool habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Blepharizonia plumosa big tarplant (Asteraceae)	annual herb	--/--/1B.1	Valley and foothill grassland; Microhabitat: Clay (usually); 100-1,655 feet; July-October	**Potential**. Extensive but moderately disturbed valley and foothill grasslands and clay soils occur within the study area. The nearest documented CNDDB occurrence is approximately 1.1 mile from the study area. After a careful protocol-level search, this species was not observed within the study area.
Calandrinia breweri Brewer's calandrinia (Montiaceae)	annual herb	--/--/4.2	Chaparral, Coastal scrub; Microhabitat: Burned areas, Disturbed areas, Loam (sometimes), Sandy (sometimes); 35-4,005 feet; (January) March-June	**Not Expected.** No suitable chaparral or coastal scrub habitat present in the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Calochortus pulchellus Mt. Diablo fairy-lantern (Liliaceae)	perennial bulbiferous herb	--/--/1B.2	Chaparral, Cismontane woodland, Riparian woodland, Valley and foothill grassland; Microhabitat: none; 100-2,755 feet; April-June	**Potential**. Valley and foothill grassland occurs within the study area. The nearest documented CNDDB occurrence is approximately 4 miles from the study area, from 2003. After a careful protocol-level search, this species was not observed within the study area.
Calochortus umbellatus Oakland star-tulip (Liliaceae)	perennial bulbiferous herb	--/--/4.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland; Microhabitat: Serpentinite (often); 330-2,295 feet; March-May	**Not Expected.** No serpentinite soils within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Carex lyngbyei Lyngbye's sedge (Cyperaceae)	perennial rhizomatou s herb	--/--/2B.2	Marshes and swamps (brackish, freshwater); Microhabitat: none; 0-35 feet; April-August	**Not Expected.** No marsh or swamp habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Castilleja ambigua var. *ambigua* johnny-nip* (Orobanchaceae)	annual herb (hemiparasi tic)	--/--/4.2	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools (margins); Microhabitat: none; 0-1,425 feet; March-August	**Low Potential**. Weedy grassland on site offers marginal potential habitat. No occurrences in CNDDB within 10 miles of the study area. Not observed during 2023 surveys.
Centromadia parryi ssp. *congdonii* Congdon's tarplant (Asteraceae)	annual herb	--/--/1B.1	Valley and foothill grassland (alkaline); Microhabitat: none; 0-755 feet; May-October (November)	**Not Expected**: No suitable habitat due to absence of alkaline soils. Nearest CNDDB occurrence is 7 miles away. Not observed during 2023 surveys.
Centromadia parryi ssp. *parryi* pappose tarplant* (Asteraceae)	annual herb	--/--/1B.2	Chaparral, Coastal prairie, Marshes and swamps (coastal salt), Meadows and seeps, Valley and foothill grassland (vernally mesic); Microhabitat: Alkaline (often); 0-1,380 feet; May-November	**Low Potential**. Weedy grassland on site offers marginal potential habitat. No occurrences in CNDDB within 10 miles of the study area. Not observed during 2023 surveys

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Centromadia parryi ssp. *rudis* Parry's rough tarplant* (Asteraceae)	annual herb	--/--/4.2	Valley and foothill grassland, Vernal pools; Microhabitat: Alkaline, Roadsides (sometimes), Seeps, Vernally Mesic; 0-330 feet; May-October	**Low Potential**. Weedy grassland on site offers marginal potential habitat. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Chloropyron molle ssp. hispidum hispid salty bird's-beak (Orobanchaceae)	annual herb (hemiparasitic)	--/--/1B.1	Meadows and seeps, Playas, Valley and foothill grassland; Microhabitat: Alkaline; 5-510 feet; June-September	**Not Expected.** No suitable alkaline soil present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Chloropyron molle ssp. *molle* soft salty bird's-beak (Orobanchaceae)	annual herb (hemiparasitic)	FE/CR/1B.2	Marshes and swamps (coastal salt); Microhabitat: none; 0-10 feet; June-November	**Not Expected**. No coastal marsh/swamp habitats occur within the study area. Nearest CNDDB occurrence is 3 miles away. Not observed during 2023 surveys.
Cicuta maculata var. *bolanderi* Bolander's water-hemlock (Apiaceae)	perennial herb	--/--/2B.1	Marshes and swamps (brackish, coastal, freshwater); Microhabitat: none; 0-655 feet; July-September	**Not Expected**. No coastal marsh/swamp habitats occur within the study area. Nearest CNDDB occurrence is 2.3 miles away. Not observed during 2023 surveys.
Cirsium hydrophilum var. *hydrophilum* Suisun thistle (Asteraceae)	perennial herb	FE/--/1B.1	Marshes and swamps (salt); Microhabitat: none; 0-5 feet; June-September	**Not Expected.** No marsh or swamp habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Collomia diversifolia serpentine collomia (Polemoniaceae)	annual herb	--/--/4.3	Chaparral, Cismontane woodland; Microhabitat: Gravelly (sometimes), Rocky (sometimes), Serpentinite (sometimes); 655-1,970 feet; May-June	**Not Expected.** No suitable chaparral or woodland habitat in the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Convolvulus simulans small-flowered morning-glory* (Convolvulaceae)	annual herb	--/--/4.2	Chaparral (openings), Coastal scrub, Valley and foothill grassland; Microhabitat: Clay, Seeps, Serpentinite; 100-2,430 feet; March-July	**Low Potential**. Weedy grassland on site offers marginal potential habitat. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Cordylanthus nidularius Mt. Diablo bird's-beak (Orobanchaceae)	annual herb (hemiparasitic)	--/CR/1B.1	Chaparral (serpentinite); Microhabitat: none; 1,970-2,625 feet; June-August	**Not Expected**. No chaparral habitat occurs within the study area. Nearest CNDDB occurrence is 7.1 miles away, on Mt. Diablo. Not observed during 2023 surveys.
Cryptantha hooveri Hoover's cryptantha (Boraginaceae)	annual herb	--/--/1A	Inland dunes, Valley and foothill grassland (sandy); Microhabitat: none; 30-490 feet; April-May	**Not Expected**. Marginal suitable habitat occurs within the study area (grassland is not sandy). All CNDDB occurrences within 10 miles are considered extirpated (Antioch dunes). Not observed during 2023 surveys.
Delphinium californicum ssp. *interius* Hospital Canyon larkspur (Ranunculaceae)	perennial herb	--/--/1B.2	Chaparral (openings), Cismontane woodland (mesic), Coastal scrub; Microhabitat: none; 640-3,595 feet; April-June	**Not Expected**. No suitable chaparral, cismontane woodland, or coastal scrub occur within the study area. Nearest CNDDB occurrence is 5.5 miles away. Not observed during 2023 surveys.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Dirca occidentalis western leatherwood (Thymelaeaceae)	perennial deciduous shrub	-/-/1B.2	Broadleafed upland forest, Closed-cone coniferous forest, Chaparral, Cismontane woodland, North Coast coniferous forest, Riparian forest, Riparian woodland; Microhabitat: mesic; 80-1,395 feet; January-March (April)	**Not Expected**. None of the preferred habitats occur within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Downingia pusilla dwarf downingia (Campanulaceae)	annual herb	--/--/2B.2	Valley and foothill grassland (mesic), Vernal pools; Microhabitat: none; 5-1,460 feet; March-May	**Not Expected**. No mesic grassland or vernal pool habitats occur within the study area. Only CNDDB occurrences within 10 miles are on the north side of the bay. Not observed during 2023 surveys.
Eleocharis parvula small spikerush (Cyperaceae)	perennial herb	--/--/4.3	Marshes and swamps; Microhabitat: none; 5-9,910 feet; (April) June-August (September)	**Not Expected.** No suitable marsh or swamp habitat present within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Eriastrum ertterae Lime Ridge eriastrum (Polemoniaceae)	annual herb	--/CC/1B.1	Chaparral (edges, openings); Microhabitat: sometimes semi-alkaline, Alkaline (sometimes), Sandy; 655-950 feet; June-July	**Not Expected**. No chaparral habitat occurs within the study area. Nearest CNDDB occurrence is 6.7 miles away. Not observed during 2023 surveys.
Erigeron biolettii streamside daisy (Asteraceae)	perennial herb	--/--/3	Broadleafed upland forest, Cismontane woodland, North Coast coniferous forest; Microhabitat: Mesic, Rocky; 100-3,610 feet; June-October	**Not Expected.** No suitable forest or woodland habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Eriogonum nudum var. *psychicola* Antioch Dunes buckwheat (Polygonaceae)	perennial herb	--/--/1B.1	Inland dunes; Microhabitat: none; 0-65 feet; July-October	**Not Expected**. No inland dunes habitat occurs within the study area. Nearest CNDDB occurrence is 5.9 miles away. Not observed during 2023 surveys.
Eriogonum truncatum Mt. Diablo buckwheat (Polygonaceae)	annual herb	--/--/1B.1	Chaparral, Coastal scrub, Valley and foothill grassland; Microhabitat: Sandy; 10-1,150 feet; April-September (November-December)	**Low Potential.** The nearest extant CNDDB occurrence of this species is approximately 4.9 miles away, from 2016. Valley and foothill grassland and limited sandy soils occur within the study area. Not observed during 2023 surveys.
Eriogonum umbellatum var. *bahiiforme* bay buckwheat (Polygonaceae)	perennial herb	--/--/4.2	Cismontane woodland, Lower montane coniferous forest; Microhabitat: Rocky, Serpentinite (often); 2,295-7,220 feet; July-September	**Not Expected.** No suitable forest or woodland habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Eriophyllum jepsonii Jepson's woolly sunflower (Asteraceae)	perennial herb	--/--/4.3	Chaparral, Cismontane woodland, Coastal scrub; Microhabitat: Serpentinite (sometimes); 655-3,365 feet; April-June	**Not Expected.** No chaparral, scrub, or woodland habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.

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Eryngium jepsonii Jepson's coyote-thistle* (Apiaceae)	perennial herb	--/--/1B.2	Valley and foothill grassland, Vernal pools; Microhabitat: Clay; 10-985 feet; April-August	**Not Expected.** Valley and foothill grassland and clay soils occur within the study area, however, there is no suitable vernal pool microhabitat within the study area. The nearest documented CNDDB occurrence is approximately 3.5 miles from the study area from 1998. Not observed during 2023 surveys.
Erysimum capitatum var. *angustatum* Contra Costa wallflower (Brassicaceae)	perennial herb	FE/CE/1B.1	Inland dunes; Microhabitat: none; 10-65 feet; March-July	**Not Expected**. No inland dunes habitat occurs within the study area. Nearest CNDDB occurrence is 2.3 miles away. Not observed during 2023 surveys.
Erythranthe inconspicua small-flowered monkeyflower (Phrymaceae)	annual herb	--/--/4.3	Chaparral, Cismontane woodland, Lower montane coniferous forest; Microhabitat: Mesic; 900-2,495 feet; May-June	**Not Expected.** No chaparral, woodland or forest habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Eschscholzia rhombipetala diamond-petaled California poppy (Papaveraceae)	annual herb	--/--/1B.1	Valley and foothill grassland (alkaline, clay); Microhabitat: none; 0-3,200 feet; March-April	**Not Expected**: Marginal habitat occurs within the study area due to absence of alkaline soil conditions. The species is presumed extirpated from Contra Costa County (CNPS 2019). Not observed during 2023 surveys.
Extriplex joaquinana San Joaquin spearscale* (Chenopodiaceae)	annual herb	--/--/1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland; Microhabitat: Alkaline; 5-2,740 feet; April-October	**Not Expected**. Suitable wetland saline/alkaline habitat is absent. Nearest occurrence on the same side of the bay is 5.7 miles away. Not observed during 2023 surveys.
Fritillaria agrestis stinkbells* (Liliaceae)	perennial bulbiferous herb	--/--/4.2	Chaparral, Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland; Microhabitat: Clay, Serpentinite (sometimes); 35-5,100 feet; March-June	**Low Potential.** Some suitable valley and foothill grassland occurs on site (clay soils). Nearest CNDDB record is 9.1 miles away, dating to 1989. Not observed during 2023 surveys.
Fritillaria liliacea fragrant fritillary (Liliaceae)	perennial bulbiferous herb	--/--/1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland; Microhabitat: Serpentinite (often); 10-1,345 feet; February-April	**Not Expected**. Valley and foothill grassland occur within the study area. The only occurrences within 10 miles of the study area are from the north side of the bay. Not observed during 2023 surveys
Galium andrewsii ssp. *gatense* phlox-leaf serpentine bedstraw (Rubiaceae)	perennial herb	--/--/4.2	Chaparral, Cismontane woodland, Lower montane coniferous forest; Microhabitat: Rocky, Serpentinite; 490-4,755 feet; April-July	**Not Expected.** No chaparral, woodland, or forest habitat present within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Grimmia torenii Toren's grimmia (Grimmiaceae)	moss	--/--/1B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest; Microhabitat: boulder and rock walls, Carbonate, Openings, Rocky, Volcanic; 1,065-3,805 feet; no bloom period listed	**Not Expected**. No chaparral, cismontane woodland, or forest habitats occur within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Helianthella castanea Diablo helianthella (Asteraceae)	perennial herb	--/--/1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland; Microhabitat: Azonal soil, often partial Shade, Rocky (usually); 195-4,265 feet; March-June	**Potential**. The nearest documented CNDDB occurrence is approximately 2.4 miles from the study area, from 2012. Disturbed valley and foothill grassland and riparian woodland habitats occur within the study area. However, suitable rocky microhabitats do not occur within the study area. After a careful protocol-level search, this species was not observed within the study area.
Hesperevax caulescens hogwallow starfish* (Asteraceae)	annual herb	--/--/4.2	Valley and foothill grassland (mesic clay), Vernal pools (shallow); Microhabitat: Alkaline (sometimes); 0-1,655 feet; March-June	**Low Potential.** Clay flats and vernal pools are lacking; marginal habitat on site in form of valley and foothill grassland (mesic clay). No vernal pool habitat on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Hesperolinon breweri Brewer's western flax (Linaceae)	annual herb	--/--/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; Microhabitat: Serpentinite (usually); 100-3,100 feet; May-July	**Not Expected**. Marginal habitat occurs within the study area (no serpentinite). Nearest CNDDB occurrence is 4.4 miles away. Not observed during 2023 surveys.
Iris longipetala coast iris (Iridaceae)	perennial rhizomatous herb	--/--/4.2	Coastal prairie, Lower montane coniferous forest, Meadows and seeps; Microhabitat: Mesic; 0-1,970 feet; March-May (June)	**Not Expected.** No forest, prairie, or meadow habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Isocoma arguta Carquinez goldenbush (Asteraceae)	perennial shrub	--/--/1B.1	Valley and foothill grassland (alkaline); Microhabitat: none; 5-65 feet; August-December	**Not Expected**. Marginal suitable habitat occurs within the study area, but soils are not alkaline. Nearest CNDDB occurrence on the same side of the bay is 9.8 miles away. Not observed during 2023 surveys.
Lasthenia conjugens Contra Costa goldfields (Asteraceae)	annual herb	FE/--/1B.1	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools; Microhabitat: Mesic; 0-1,540 feet; March-June	**Not Expected.** All HCP/NCCP inventory areas are extirpated. Only occurrence in the region occurs on a soil type not present in the study area. Mesic habitat is limited to constructed ponds and stream habitats. Not observed during 2023 surveys.
Lasthenia ferrisiae Ferris' goldfields (Asteraceae)	annual herb	--/--/4.2	Vernal pools (alkaline, clay); Microhabitat: none; 65-2,295 feet; February-May	**Not Expected.** No vernal pool habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields (Asteraceae)	annual herb	--/--/1B.1	Marshes and swamps (coastal salt), Playas, Vernal pools; Microhabitat: none; 5-4,005 feet; February-June	**Not Expected.** No suitable marsh, swamp, or vernal pool habitat on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.

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Lathyrus jepsonii var. *jepsonii* Delta tule pea (Fabaceae)	perennial herb	--/--/1B.2	Marshes and swamps (brackish, freshwater); Microhabitat: none; 0-15 feet; May-July (August-September)	**Not Expected**. No coastal marsh/swamp habitat occurs within the study area. The site is above the elevation range. Nearest CNDDB occurrence is from 1.8 miles away, on an island. Not observed during 2023 surveys.
Legenere limosa legenere (Campanulaceae)	annual herb	--/--/1B.1	Vernal pools; Microhabitat: none; 5-2,885 feet; April-June	**Not Expected.** No vernal pools exist within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Leptosiphon ambiguus serpentine leptosiphon (Polemoniaceae)	annual herb	--/--/4.2	Cismontane woodland, Coastal scrub, Valley and foothill grassland; Microhabitat: Serpentinite (usually); 395-3,710 feet; March-June	**Not Expected.** No woodland or scrub habitat present within the study area. Valley and foothill grassland occurs below the elevation range. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Leptosiphon grandiflorus large-flowered leptosiphon (Polemoniaceae)	annual herb	--/--/4.2	Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Valley and foothill grassland; Microhabitat: Sandy (usually); 15-4,005 feet; April-August	**Not Expected.** Valley and foothill grassland present within the study areas but no serpentinite soil. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Lessingia hololeuca woolly-headed lessingia* (Asteraceae)	annual herb	--/--/3	Broadleafed upland forest, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland; Microhabitat: Clay, Serpentinite; 50-1,000 feet; June-October	**Low Potential.** Valley and foothill grassland on site (clay soil). No CNDDB occurrences within 10 miles. Not observed during 2023 surveys
Lilaeopsis masonii Mason's lilaeopsis (Apiaceae)	perennial rhizomatous herb	--/CR/1B.1	Marshes and swamps (brackish, freshwater), Riparian scrub; Microhabitat: none; 0-35 feet; April-November	**Not Expected**. No coastal marsh/swamp habitat occurs within the study area. The site is above the elevation range. Nearest CNDDB occurrence is 1.8 miles away. Not observed during 2023 surveys.
Lilium rubescens redwood lily (Liliaceae)	perennial bulbiferous herb	--/--/4.2	Broadleafed upland forest, Chaparral, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest; Microhabitat: Roadsides (sometimes), Serpentinite (sometimes); 100-6,265 feet; (March) April-August (September)	**Not Expected.** No forest or chaparral habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Limosella australis Delta mudwort (Scrophulariaceae)	perennial stoloniferous herb	--/--/2B.1	Marshes and swamps (brackish, freshwater), Riparian scrub; Microhabitat: Usually mud banks, Streambanks (usually); 0-10 feet; May-August	**Not Expected**. No coastal marsh/swamp habitat or riparian scrub habitats occur within the study area. The site is above the elevation range. Nearest CNDDB occurrence is 3.1 miles away, on an island. Not observed during 2023 surveys.
Lupinus albifrons var. *abramsii* Abrams' lupine (Fabaceae)	perennial herb	--/--/3.2	Broadleafed upland forest, Chaparral, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland; Microhabitat: Serpentinite (sometimes); 410-6,560 feet; April-June	**Not Expected.** No forest, chaparral, or scurb habitat within the study area. Valley and foothill grassland is below the elevation range. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.

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Madia radiata showy golden madia (Asteraceae)	annual herb	--/--/1B.1	Cismontane woodland, Valley and foothill grassland; Microhabitat: none; 80-3,985 feet; March-May	**Low Potential**. The only documented CNDDB occurrence within 5 miles is a historical occurrence approximately 2.8 miles from the study area, from 1938. No recent documentations within 10 miles. Valley and foothill grassland occurs within the study area. After a careful protocol-level search, this species was not observed within the study area.
Malacothamnus hallii Hall's bush-mallow (Malvaceae)	perennial deciduous shrub	--/--/1B.2	Chaparral, Coastal scrub; Microhabitat: none; 35-2,495 feet; (April) May-September (October)	**Not Expected**. No chaparral or coastal scrub habitats occurs within the study area. Nearest CNDDB documentation is 2.9 miles away, from 1931. Nearest recent documentation is 6.5 miles away. Not observed during 2023 surveys.
Meesia triquetra three-ranked hump moss (Meesiaceae)	moss	--/--/4.2	Bogs and fens, Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest (mesic); Microhabitat: soil; 4,265-9,690 feet; July	**Not Expected.** No wetland, meadow, or forest habitat occurs within the study area. Site is outside the species' elevation range. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Microseris paludosa marsh microseris (Asteraceae)	perennial herb	--/--/1B.2	Cismontane woodland, Closed-cone coniferous forest, Coastal scrub, Valley and foothill grassland; Microhabitat: none; 15-1,165 feet; April-June (July)	**Not Expected.** No suitable marsh or wetland habitat on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Microseris sylvatica sylvan microseris* (Asteraceae)	perennial herb	--/--/4.2	Chaparral, Cismontane woodland, Great Basin scrub, Pinyon and juniper woodland, Valley and foothill grassland; Microhabitat: Serpentinite (rarely); 150-4,920 feet; March-June	**Low Potential.** Valley and foothill grassland habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys
Monolopia gracilens woodland woollythreads (Asteraceae)	annual herb	--/--/1B.2	Broadleafed upland forest (openings), Chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), Valley and foothill grassland; Microhabitat: Serpentinite; 330-3,935 feet; (February) March-July	**Not Expected**. No serpentinite. Nearest CNDDB record is 6.5 miles away. Not observed during 2023 surveys.
Myosurus minimus ssp. *apus* little mousetail (Ranunculaceae)	annual herb	--/--/3.1	Valley and foothill grassland, Vernal pools (alkaline); Microhabitat: none; 65-2,100 feet; March-June	**Low Potential.** Vernal pools absent, valley and foothill grassland habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Navarretia gowenii Lime Ridge navarretia (Polemoniaceae)	annual herb	--/--/1B.1	Chaparral; Microhabitat: none; 590-1,000 feet; May-June	**Not Expected**. No suitable habitat occurs within the study area. Nearest CNDDB record is 6.6 miles away. Not observed during 2023 surveys.
Navarretia heterandra Tehama navarretia* (Polemoniaceae)	annual herb	--/--/4.3	Valley and foothill grassland (mesic), Vernal pools; Microhabitat: none; 100-3,315 feet; April-June	**Low Potential.** Vernal pools absent, valley and foothill grassland habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Navarretia leucocephala ssp. *bakeri* Baker's navarretia* (Polemoniaceae)	annual herb	--/--/1B.1	Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Valley and foothill grassland, Vernal pools; Microhabitat: Mesic; 15-5,710 feet; April-July	**Low Potential.** Vernal pools absent, valley and foothill grassland habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Navarretia nigelliformis ssp. *nigelliformis* adobe navarretia (Polemoniaceae)	annual herb	-/-/4.2	Valley and foothill grassland (vernally mesic), Vernal pools (sometimes); Microhabitat: clay, sometimes serpentinite; 330-3,280 feet; April-June	**Low Potential.** Vernal pools absent, valley and foothill grassland habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Navarretia nigelliformis ssp. *radians* shining navarretia* (Polemoniaceae)	annual herb	--/--/1B.2	Cismontane woodland, Valley and foothill grassland, Vernal pools; Microhabitat: Clay (sometimes); 215-3,280 feet; (March) April-July	**Low Potential**. The nearest CNDDB occurrence is approximately 5.5 miles from the study area, from 2008. Disturbed valley and foothill grassland and mesic areas occur within the study area.
Neostapfia colusana Colusa grass (Poaceae)	annual herb	FT/CE/1B.1	Vernal pools (adobe clay); 15-655 feet; May-August	**Not Expected**. No vernal pool habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Oenothera deltoides ssp. *howellii* Antioch Dunes evening-primrose (Onagraceae)	perennial herb	FE/CE/1B.1	Inland dunes; Microhabitat: none; 0-100 feet; March-September	**Not Expected**. No dune habitat occurs within the study area. Nearest CNDDB record is 2.3 miles away, on an island. Not observed during 2023 surveys.
Phacelia phacelioides Mt. Diablo phacelia (Hydrophyllaceae)	annual herb	--/--/1B.2	Chaparral, Cismontane woodland; Microhabitat: Rocky; 1,640-4,495 feet; April-May	**Not Expected**. No chaparral or cismontane habitats occur within the study area. Nearest CNDDB record is 6.9 miles away. Not observed during 2023 surveys.
Piperia michaelii Michael's rein orchid (Orchidaceae)	perennial herb	--/--/4.2	Chaparral, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal scrub, Lower montane coniferous forest; Microhabitat: none; 10-3,000 feet; April-August	**Not Expected.** No chaparral, scrub, woodland, or forest habitat occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Plagiobothrys hystriculus bearded popcornflower (Boraginaceae)	annual herb	--/--/1B.1	Valley and foothill grassland (mesic), Vernal pools (margins); Microhabitat: often vernal swales; 0-900 feet; April-May	**Not Expected**. No mesic grasslands, vernal pools, or vernal swales. Nearest CNDDB record is 7.6 miles away. Not observed during 2023 surveys.
Puccinellia simplex California alkali grass* (Poaceae)	annual herb	--/--/1B.2	Chenopod scrub, Meadows and seeps, Valley and foothill grassland, Vernal pools; Microhabitat: sinks, Alkaline, Flats, Lake Margins, Vernally Mesic; 5-3,050 feet; March-May	**Low Potential.** Vernal pools, chenopod, meadows, and seeps absent, valley and foothill grassland habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Ranunculus lobbii Lobb's aquatic buttercup* (Ranunculaceae)	annual herb (aquatic)	--/--/4.2	Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools; Microhabitat: Mesic; 50-1,540 feet; February-May	**Low Potential.** Limited area of seasonal wetland (within) drainage present in valley and foothill grassland within study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Ravenella exigua chaparral harebell (Campanulaceae)	annual herb	--/--/1B.2	Chaparral (rocky, usually serpentinite); Microhabitat: none; 900-4100 feet; May-June	**Not Expected.** No suitable chaparral habitat present in the study area. Nearest CNDDB record is 7.2 miles away. Not observed during 2023 surveys.
Sanicula saxatilis rock sanicle (Apiaceae)	perennial herb	--/CR/1B.2	Broadleafed upland forest, Chaparral, Valley and foothill grassland; Microhabitat: Rocky, Scree, Talus; 2,035-3,855 feet; April-May	**Not Expected**. Marginal habitat occurs within the study area. Dominated by tall, dense grass cover. No rocky soils. Nearest CNDDB record is 6.6 miles away. Not observed during 2023 surveys.
Senecio aphanactis chaparral ragwort (Asteraceae)	annual herb	--/--/2B.2	Chaparral, Cismontane woodland, Coastal scrub; Microhabitat: Alkaline (sometimes); 50-2,625 feet; January-April (May)	**Not Expected**. No chaparral, cismontane woodland, or coastal scrub habitats. Nearest CNDDB record is 2.9 miles away. Not observed during 2023 surveys.
Senecio hydrophiloides sweet marsh ragwort (Asteraceae)	perennial herb	--/--/4.2	Lower montane coniferous forest, Meadows and seeps; Microhabitat: Mesic; 0-9,185 feet; May-August	**Not Expected.** No forest or meadow occurs within the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Sidalcea keckii Keck's checkerbloom* (Malvaceae)	annual herb	FE/--/1B.1	Cismontane woodland, Valley and foothill grassland; Microhabitat: Clay, Serpentinite; 245-2,135 feet; April-May (June)	**Low Potential.** Suitable habitat on site in the form of valley and foothill grassland. Only records from within 10 miles are on the north side of the bay. Not observed during 2023 surveys.
Spergularia macrotheca var. *longistyla* long-styled sand-spurrey (Caryophyllaceae)	perennial herb	--/--/1B.2	Marshes and swamps, Meadows and seeps; Microhabitat: Alkaline; 0-835 feet; February-May	**Not Expected.** No suitable marsh, swamp, or meadow habitat present in the study area. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Streptanthus albidus ssp. *peramoenus* most beautiful jewelflower (Brassicaceae)	annual herb	--/--/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; Microhabitat: Serpentinite; 310-3,280 feet; (March) April-September (October)	**Not Expected.** No serpentinite soils present on site. Nearest CNDDB record is 7.5 miles away. Not observed during 2023 surveys.
Streptanthus hispidus Mt. Diablo jewelflower (Brassicaceae)	annual herb	--/--/1B.3	Chaparral, Valley and foothill grassland; Microhabitat: Rocky; 1,200-3,935 feet; March-June	**Low Potential.** Valley and foothill grassland present on site, but no chaparral. Nearest CNDDB record is 7.2 miles away. Not observed during 2023 surveys.
Stuckenia filiformis ssp. *alpina* northern slender pondweed (Potamogetonaceae)	perennial rhizomatous herb (aquatic)	--/--/2B.2	Marshes and swamps (shallow freshwater); Microhabitat: none; 9,85-7055 feet; May-July	**Not Expected.** No marsh or swamp habitat present in the study area. Nearest CNDDB record is 8.5 miles away at base of Mt. Diablo. Not observed during 2023 surveys.
Symphyotrichum lentum Suisun Marsh aster (Asteraceae)	perennial rhizomatous herb	--/--/1B.2	Marshes and swamps (brackish, freshwater); Microhabitat: none; 0-10 feet; (April) May-November	**Not Expected.** No marsh or swamp habitat present in the study area. Study area is above elevation range. Nearest CNDDB record is 2.1 mils away. Not observed during 2023 surveys.

Scientific Name Common Name (Family Name)	Life Form	Status, Federal/ State/ CRPR[1]	Preferred Habitat; Elevation Range; Bloom Period	Potential to Occur within the Study Area
Trifolium hydrophilum saline clover* (Fabaceae)	annual herb	--/--/1B.2	Marshes and swamps, Valley and foothill grassland (mesic, alkaline), Vernal pools; Microhabitat: none; 0-985 feet; April-June	**Low Potential.** Limited habitat present on site in the form of valley grassland. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Triquetrella californica coastal triquetrella (Pottiaceae)	moss	--/--/1B.2	Coastal bluff scrub, Coastal scrub; Microhabitat: soil; 35-330 feet; no bloom period listed	**Not Expected.** No suitable coastal bluff scrub or coastal scrub habitat present on site. No CNDDB occurrences within 10 miles. Not observed during 2023 surveys.
Tropidocarpum capparideum caper-fruited tropidocarpum (Brassicaceae)	annual herb	--/--/1B.1	Valley and foothill grassland (alkaline hills); Microhabitat: none; 5-1,495 feet; March-April	**Not Expected.** Species is presumed extinct, and no alkali soils present within study area. Not observed during 2023 surveys.
Viburnum ellipticum oval-leaved viburnum (Viburnaceae)	perennial deciduous shrub	--/--/2B.3	Chaparral, Cismontane woodland, Lower montane coniferous forest; Microhabitat: none; 705-4,595 feet; May-June	**Not Expected.** No chaparral, cismontane woodland, or lower montane coniferous forest in the study area. Nearest CNDDB record is 8.8 miles away. Not observed during 2023 surveys.

Notes:
Compiled from a CNPS 9-Quad search of the centered on the Honker Bay quadrangle and including all surrounding quadrangles (Walnut Creek, Clayton, Antioch South, Vine Hill, Fairfield South, Denverton, Birds Landing, Antioch North).
Bloom Periods in parentheses indicate that the species *occasionally* blooms during that period.
Species marked with "*" have potential to occur but are not covered by the HCP/NCCP.
Species with potential to occur are highlighted

[1]**Rarity Status Codes**:
E = Federally or State listed as Endangered
T = Federally or State listed as Threatened
R = State listed as Rare
C = State candidate for listing

CRPR Codes:
CRPR 1A: Plants presumed extirpated in California and either rare or extinct elsewhere; CRPR List 1B = Plants rare, threatened or endangered in CA and elsewhere; CRPR 2B = Plants rare, threatened or endangered in California but more common elsewhere; CRPR 3 = More information is needed about plant; CRPR 4 = Plants of limited distribution, a watch list

CRPR: '.1' = Seriously threatened in CA; '.2' = Fairly threatened in CA; '.3' = Not very threatened in CA

California androsace (*Androsace elongata subsp. acuta*) (CRPR 4.2) is an annual herb that is native to California. The plant is found on dry, grassy slopes in the San Francisco Bay Area, Inner South Coast Ranges, and the south Sierra Nevada foothills (Calflora 2023). The plant can also be found in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, valley, and foothill grassland. The species blooms from March to June and is found at elevations less than 1,200 meters (Jepson 2023). The species is possibly threatened by grazing, trampling, non-native plants, alteration of fire regimes, recreational activities, and wind energy development (CNPS 2024).

Big tarplant (*Blepharizonia plumosa*) (CRPR 1B.1): This species is covered by the HCP/NCCP. The onsite annual grassland habitat with heavy clay soils provides suitable habitat for this species. There are several occurrences mapped within the CNDDB in the vicinity of the study area. The species would have been in bloom during the July 12 botanical survey but was not observed.

Mt. Diablo fairy-lantern (*Calochortus pulchellus*) (CRPR 1B.2): This species is covered by the HCP/NCCP. The onsite annual grassland habitat provides suitable habitat for the species. The closest documented occurrence of the species is just under 4 miles southeast of the study area. The species would likely have been in bloom during the April 12 and May 19 botanical surveys by VNLC in the study area but was not observed. Given the negative survey findings, this species is presumed absent from the site.

Johnny-nip (*Castilleja ambigua* var. *ambigua*) (CRPR 4.2) is a hemiparasitic annual herb in the Orobanchaceae family that is found in coastal bluffs and grasslands (Calflora 2023). The species is native to California. The plant can also be found in coastal prairies, coastal scrub, marshes, swamps and the margins of vernal pools. Most occurrences of the species are found in the Central Coast and the North Coast ranges. Johhny-nip blooms from May to August and is found at elevations less than 1640 feet (Jepson 2023). Threats to the species include different types of development (CNPS 2024).

Pappose tarplant (*Centromadia parryi* ssp. *parryi*) (CRPR 1B.2) is an annual herb in the Asteraceae family that is endemic to California. The species is found in grasslands, coastal salt marshes, alkaline springs, and seeps (Calflora 2023). Alkaline soils in general are preferred by the species. Most occurrences of the species are found in the Sacramento Valley and Outer to Inner North Coast Ranges. The plant blooms from May to November and is found at elevations less than 1312 feet (Jepson 2023). Threats to the species include agriculture, competition, development, grazing, foot traffic, habitat disturbance and road maintenance (CNPS 2024).

Parry's rough tarplant (*Centromadia parryi* ssp. *rudis*) (CRPR 4.2) is an annual herb in the Asteraceae family that is endemic to California. The species is found in grasslands, edges of marshes, vernal pools, and disturbed sites (Calflora 2023). The species is predominately found in the Inner North Coast Ranges and the Sacramento Valley. The plant blooms between May and October and is found at elevations less than 500 meters (Jepson 2023). Threats to the species include development, habitat alteration, habitat disturbance, grazing and road maintenance (CNPS 2024).

Small-flowered morning-glory (*Convolvulus simulans*) (CRPR 4.2) is an annual herb in the Convolvulaceae family that is native to California. The species is found in clay substrates, occasionally serpentine, annual grassland, coastal-sage scrub, and chaparral (Calflora 2023). The species is predominately found in the South Coast and Peninsular ranges with some occurrences being found in the San Francisco Bay Area. The plant blooms from March to July and is found at elevations from 30 to 875 meters (Jepson 2023).

Mt. Diablo buckwheat (*Eriogonum truncatum*) (CRPR 1B.1) is an annual herb in the Polygonaceae family that is native to California. The species is found in sand, northern coastal scrub, chaparral and valley grassland (Calflora 2023). All occurrences of the species are found in either the San Francisco Bay Area or the Sacramento Valley. The plant blooms from April to September and is found at elevations between 200-400 meters (Jepson 2023).

Stinkbells (*Fritillaria agrestis*) (CRPR 4.2) is a perennial herb in the Liliaceae family that is endemic to California. The species is found in clay, often vertic, occasionally serpentine soils (Calflora 2023). The species is predominately found in the San Francisco Bay Area as well as the Inner South Coast Ranges. The plant blooms between March to June and is found at elevations less than 500 meters (Jepson 2023). Threats to the species include development, grazing, vehicles, and non-native plants (CNPS 2024). Populations of the species are also small, which may lead to issues like genetic drift.

Diablo helianthella (*Helianthella castanea*) (CRPR 1B.2): This species is covered by HCP/NCCP. The species is known to occur in open annual grassland but as described in the HCP/NCCP, Diablo helianthella is more associated with thin, rocky, well-drained soils, and is found in grassy openings within woodlands, chaparral, and coastal scrub, often at the transition zone between grasslands and woodland or chaparral habitats. The types of habitat transition zones and openings this species is most commonly associated with do not occur in the study area given the dominance of grassland and golf course habitats. The nearest CNDDB occurrence is approximately two miles southeast of the study area. The species would likely have been in bloom during the April 12 and May 19 botanical surveys by VNLC in the study area but was not observed. Given the negative survey findings and the fact that optimal habitat is not present in the study area, this species is presumed absent from the site.

Hogwallow starfish (*Hesperevax caulescens*) (CRPR 4.2) is an annual herb in the Asteraceae family that is native to California. The plant is found in drying shrink-swell clay of vernal pools, flats, and steep slopes, along with being found in serpentine soil (Calflora 2023). The plant is also found around vernal pools and can be found in alkaline soils. Most occurrences of the species are found throughout the Central Valley of California. Hogwallow starfish blooms from March to June and is found at elevations less than 984 feet (Jepson 2023). Threats to the species include agriculture, development, and over-grazing (CNPS 2024).

Woolly-headed lessingia (*Lessingia hololeuca*) (CRPR 3) is an annual herb in the Asteraceae family that is endemic to California. The species is found in coastal scrub, chapparal, grassland, roadsides, as well as serpentine or alkaline soils (Calflora 2023). The species is also found in clay soils. Most occurrences of the plant are found in the San Francisco Bay Area and the Outer South Coast Ranges. The plant blooms from June to October and is found at elevations between 33 and

1969 feet (Jepson 2023). Threats to wooly-headed lessingia include grazing and non-native plants. The species is suspected to be more prevalent in the southern Sacramento Valley, southern North Coast ranges and Northern San Francisco Bay.

Showy golden madia (*Madia radiata*) (CRPR 1B.1): This species is covered by the HCP/NCCP. The onsite annual grassland habitat provides suitable habitat for the species. According to the CNPS Rare and Endangered Plant Inventory, this species is presumed extirpated from Contra Costa County. There is an occurrence mapped within the CNDDB that is just over three miles southeast of the study area, but the occurrence date is 1938 and its location is listed as non-specific. The species would likely have been in bloom during the April 12 botanical survey by VNLC in the study area but was not observed. Given the negative survey findings and that the species is presumed extirpated from Contra Costa County, it is presumed absent from the site.

Sylvan microseris (*Microseris sylvatica*) (CRPR 4.2) is a perennial herb, in the Asteraceae family, endemic to California. The species is found in grassland and open woodland (Calflora 2023). Most occurrences of the species are found in the south Sierra Nevada foothills with some occurrences being found in the San Francisco Bay Area. The plant blooms from March to June and is found at elevations less than 1,700 meters (Jepson 2023). The species is threatened by wind energy development, grazing, agriculture, vehicles, recreational activities, and non-native plants (CNPS 2024).

Little mousetail (*Myosurus minimus* ssp. *apus*) (CRPR 3.1) is an annual herb in the Ranunculaceae family, native to California. The species is found in vernal pools and alkali flats (Calflora 2023). Most occurrences of the species are found in the Sacramento and San Joaquin Valley. The plant blooms from March to June and is found at elevations from 3-1,600 meters (Jepson 2023).

Tehama navarretia (*Navarretia heterandra*) (CRPR 4.3) is an annual herb, in the Polemoniacea family, native to California. The species can be found in heavy soils, vernal pools, and wet or drying flats (Calflora 2023). Most occurrences are found in the San Francisco Bay Area as well as the Inner North Coast Ranges. The plant blooms from April to June and is found at elevations less than 1,100 meters (Jepson 2023). The species can also be found in mesic valley and foothill grasslands.

Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*) (CRPR 1B.1) is an annual herb in the Polemoniaceae family that is endemic to California. The plant is found in vernal pools, cismontane woodland, lower montane coniferous forest, meadows, seeps, and valley/foothill grassland, with a preference for mesic areas (Calflora 2023). Most occurrences of the species are found in the San Francisco Bay Area. Baker's Navarretia blooms from April until July and is found at elevations less than 5577 feet (Jepson 2023). The species may be more widespread, but more information is needed (CNPS 2024).

Adobe navarretia (*Navarretia nigelliformis* ssp. *nigelliformis*) (CRPR 4.2): This species is covered by the HCP/NCCP. Adobe navarretia occurs on heavy clay soils of vernal pools and other low, usually seasonally moist areas in grasslands (Baldwin et al. 2012). The species does occasionally occur along clay slopes within grasslands (author's observation). Five occurrences of this species have been documented in HCP/NCCP inventory area, but there are no occurrences in the CNDDB. The species would likely have been in bloom during the April 12 and May 19 botanical surveys by VNLC in the study area but was not observed. Given the negative survey findings, this species is presumed absent from the study area.

Shining navarretia (*Navarretia nigelliformis* ssp. *radians*) (CRPR 1B.2): Shining navarretia occurs in heavy clay soils of vernal pools and other low, usually seasonally moist areas in grasslands (Baldwin et al. 2012). Like the adobe navarretia, the species does occasionally occur along clay slopes within grasslands. Based on the CNDDB, this species was documented about five miles from the study area. The species would likely have been in bloom during all 3 botanical surveys by VNLC in the study area but was not observed. Given the negative survey findings, this species is presumed absent from the study area.

California alkali grass (*Puccinellia simplex*) (CRPR 1B.2) is an annual grasslike herb in the Poaceae family that is native to California. The plant is found in saline flats and mineral springs. The plant can also be found in alkaline soils, lake margins and vernally mesic areas (Calflora 2023). Most occurrences of the species are found in the Central Valley with some occurrences being found in the San Francisco Bay Area. California alkali grass blooms from March to May and is found at elevations less than 900 meters (Jepson 2023). Threats to the species include hydrological alterations, urbanization, agricultural conversion, development, and habitat fragmentation, disturbance, alteration, and loss. The species may also be threatened by solar energy, grazing and proximity to roads (CNPS 2024).

Lobb's aquatic buttercup (*Ranunculus lobbii*) (CRPR 4.2) is an aquatic annual herb in the Ranunculaceae family that is endemic to California. The plant is found in ponds as well as cismontane woodland, North Coast coniferous forest, valley and foothill grassland and vernal pools, with a preference for mesic areas (Calfora 2023). Most occurrences of the species are found in the San Francisco Bay Area. Lobb's aquatic buttercup blooms from February until May and is found at elevations less than 1,640 feet (Jepson 2023). Threats to the species include urbanization, habitat alteration, agriculture, and development (CNPS 2024).

Keck's checkerbloom (*Sidalcea keckii*) (CRPR 1B.1) is an annual herb in the Malvaeceae family that is endemic to California. The plant is found on grassy slopes. The species may also be found in clay or serpentinite soils (Calflora 2023). Most occurrences of the species are found in the Inner North Coast Ranges. Keck's checkerbloom blooms from April to May and is found at elevations between 75-650 meters (Jepson 2023). The species is endangered federally.

Mt. Diablo jewelflower (*Streptanthus hispidus*) (CRPR 1B.3) is an annual herb in the Brassicaceae family that is endemic to California. The species is found in rocky chapparal and grasslands (Calflora 2023). All occurrences of the species are found in the San Francisco Bay Area. Mt. Diablo jewelflower blooms from March until June and is found at elevations between 600 to 1,200 meters (Jepson 2023). Most pressing threat to the species is habitat degradation (Calflora 2023).

Saline clover (*Trifolium hydrophilum*) (CRPR 1B.2) is an annual herb in the Fabaceae family that is native to California. The species is found in salt marshes and open areas in alkaline soils. The plant is also found in swamps, valley/foothill grassland and vernal pools (Calflora 2023). Most occurrences of the plant are found in the San Francisco Bay Area and the San Joaquin Valley. Saline clover blooms from April until June and is found at elevations less than 984 feet (Jepson 2023). Threats to the species include development, trampling, road construction and vehicles, while possibly being threatened by non-native plants. Many sites are extirpated but more information needs to be gathered on the rarity of the species (CNPS 2024).

7.0 AQUATIC AND RIPARIAN RESOURCES

7.1 Regulatory Background

Non-isolated wetlands, streams, and permanent and intermittent drainages are subject to the joint jurisdiction of the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA) under the CWA. The CDFW also generally has jurisdiction over these resources under Porter-Cologne, together with other aquatic features that provide an existing fish and wildlife resource pursuant to FGC 1600. While CWA jurisdiction extends to the ordinary high-water mark, the CDFW asserts FGC 1600 jurisdiction to the top of bank or to outer edge of vegetation associated with a riparian corridor, whichever is greater. Placement of dredge or fill material in jurisdictional waters of the U.S. would require a CWA Section 404 permit. Impacts to Waters of the State of California (which are not Waters of the U.S.) would be subject to Waste Discharge Requirements under Porter-Cologne. Impacts to riparian habitats would require a Lake and Stream Bed Alteration Notification, and possibly a Lake and Streambed Alteration Agreement under FGC 1600. Each of these may be subject to required avoidance, minimization, and mitigation measures.

7.2 Waters and Wetlands

Wetlands are those areas that are periodically or permanently inundated by surface or groundwater, and support vegetation adapted to life in saturated soil. Section 404 jurisdictional wetlands are vegetated areas that meet specific vegetation, soil, and hydrologic criteria defined by the USACE Wetlands Delineation Manual and Regional Supplement. Waters of the U.S. are drainage features or water bodies as described in 33 CFR 328.4.

VNLC conducted an aquatic resources delineation of the study area. The delineation identified a total of 1.916 acres of potential jurisdictional waters and wetlands within the study area. The acreage of each habitat type is listed in **Table 4** below and the habitat types are mapped on **Figure 5**. Of the features described, only a portion are within the proposed project work limits. These include 0.150 acres of perennial wetland within drainage, 0.014 acres of seasonal wetland drainage, and 0.114 acres of seasonal wetland within drainage; for a total of 0.278 acres of aquatic resources. These areas are displayed on **Figure 3**. Not all of these features will necessarily be filled by the proposed project.

The delineation also identified 1.597 acres of canal and 1.673 acres of artificial basins that were constructed in upland habitats. (Note that the study area for this document differs slightly from the study area for the delineation report; the aquatic resource areas reported here differ slightly due to that change in study area boundary). Basin features in the study area include golf course landscape ponds. These basin features are isolated features that are unlikely to be considered jurisdictional as Waters of the United States but may be considered Waters of the State of California. None of the artificial basin or canal features will be filled by the proposed project.

Recommended PDMs to reduce project impacts to aquatic and riparian habitats are presented in **Section 11**.

7.3 Riparian Habitats

As described above, the study area includes 1.87 acres of riparian habitat beyond the edge of CWA/Porter-Cologne jurisdiction. This includes 0.44 acre of Himalayan blackberry thickets and 1.43 acres of Valley Foothill Riparian. Both the Himalayan blackberry thickets and Valley Foothill Riparian areas are classified as a sensitive habitat due to their status as riparian areas; they may be subject to CDFW jurisdiction under the California Fish and Game Code §1600 *et seq*. These habitats occur along the stream in the utility corridor east and south of the project area. None occur within the proposed limits of work for the project area.

TABLE 4. Acreage of Mapped Potential Jurisdictional Waters and Other Features within the Study Area.

Habitat Type	Acreage
Potentially Jurisdictional Wetlands	
Seasonal Wetland Drainage	0.787
Perennial Wetland within Drainage	0.169
Seasonal Wetland within Drainage	0.953
Total	**1.909**
Other Potentially Jurisdictional Features	
Un-vegetated Channels and Basins	0.007
Total	**0.007**
TOTAL	**1.916**
Artificial Basins Constructed in Uplands (presumed non-jurisdictional)	
Canals	1.597
Golf Course Landscape Pond	1.673
Total	**3.270**

Representative photographs of potential jurisdictional Waters are provided in **Appendix A**. Additional information is available in a separate report that documents such habitats.

8.0 SENSITIVE PLANT COMMUNITIES

Sensitive plant communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status species or their habitat. The most current version of the CDFW's *List of California Terrestrial Natural Communities* as well as the Manual of California Vegetation (Sawyer et al. 2009) indicate which natural communities are of special status given the current state of the California classification. As previously discussed, the study area is dominated by annual grasslands and disturbed habitats associated with the golf course development, which are not considered sensitive plant communities. The riparian vegetation types in the study area are considered sensitive; they are discussed above.

Oaks and other native trees have a mosaic of protection in different jurisdictions. Within Contra Costa County, trees meeting the following criteria are considered “protected trees”:

Must occur in one of the following:

1. Unincorporated areas of the County;
2. Developed property within any commercial,sec professional office or industrial district;
3. Any undeveloped property within any district;
4. Any area designated on the general plan for recreational purposes or open space;
5. Any area designated in the county general plan open space element as visually significant riparian or ridge line vegetation and where the tree is adjacent to or part of a riparian, foothill woodland or oak savanna area.

And also must be described by one of:

1. Any tree measuring twenty inches or larger in circumference (approximately six and one-half inches diameter), measured four and one-half feet from ground level;
2. Any multistemmed tree with the sum of the circumferences measuring forty inches or larger, measured four and one-half feet from ground level; or
3. Occurring within any significant grouping of trees, including groves of four or more trees.

Felling, trimming and earthwork within the dripline of these trees is subject to county permitting requirements. A tree survey of the project area has been prepared separately to analyze the applicability of the above to the proposed project.

9.0 WILDLIFE MOVEMENT CORRIDORS AND NURSERY SITES

CEQA requires an analysis of whether projects would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

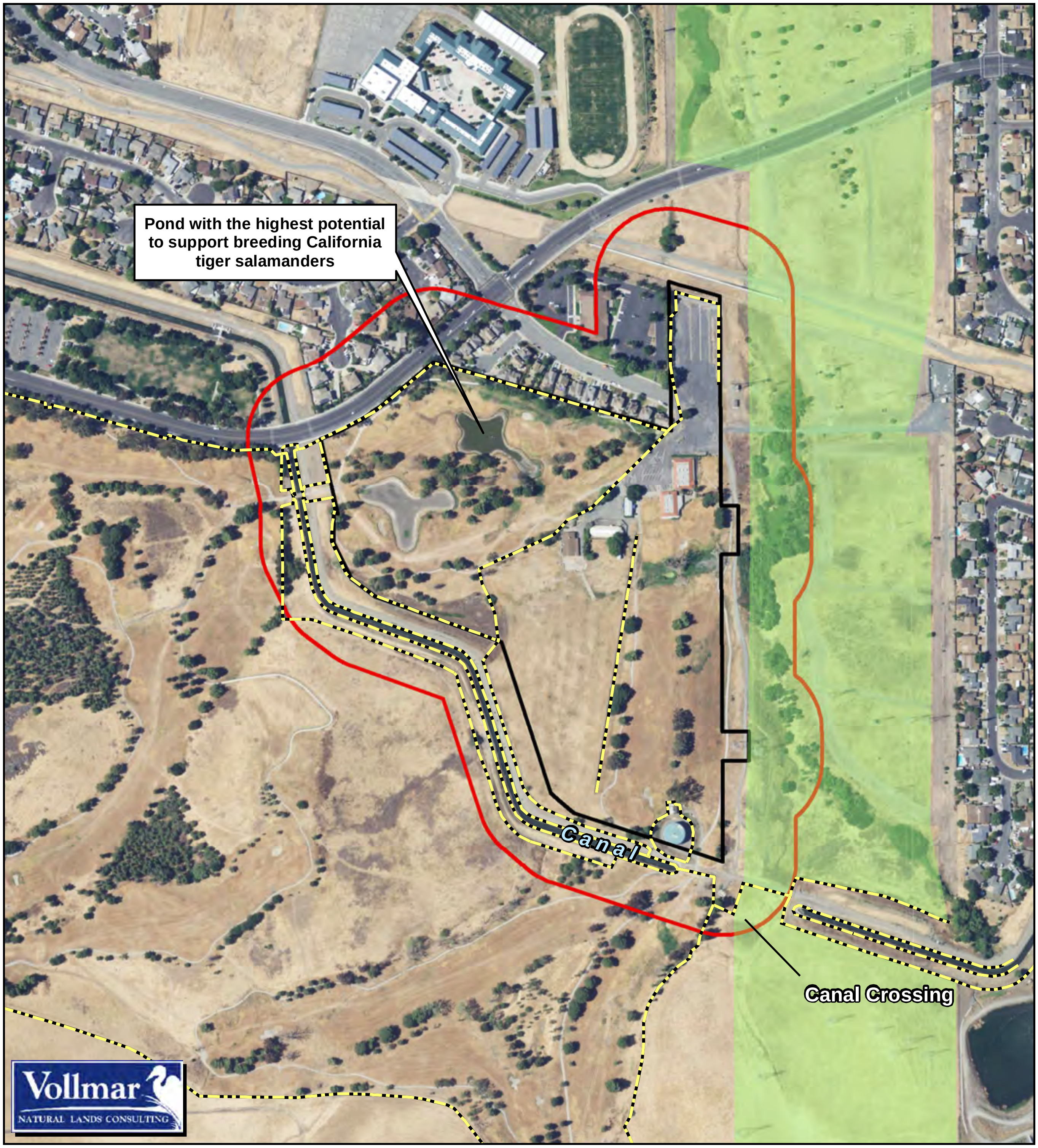
Wildlife corridors are pathways or habitat linkages that connect discrete areas of natural open space otherwise separated or fragmented by topography, changes in vegetation, and other natural or manmade obstacles such as urbanization.

The California Essential Habitat Connectivity project identifies major habitat corridors connecting large areas of open space. None are identified within the study area. The nearest such are on the north side of Suisun Bay, and approximately 10 miles southwest of the study area in the east bay hills.

The HCP/NCCP also emphasizes smaller, local corridors, particularly riparian corridors. The project area is located at the edge of the City of Pittsburg. North of it lies suburban development, and to the west and south lie other portions of the former golf course, separated from the project area by the Contra Costa Canal. In addition, the study area is enclosed in fencing on its western border and the south and southwestern borders along the canal. There is also golf barrier netting along a portion of the eastern part of the study area. To the east lies a generally open power transmission corridor, containing a stream. This corridor provides direct connectivity from the Diablo Range hills directly to the bayland edge. As such, it represents a potentially significant wildlife movement corridor. Other than this corridor, the project area itself provides little opportunity for wildlife to move due to the barriers along the north, west, and south edges. **Figure 11** is a map of the wildlife corridors and barriers on and around the study area.

North-south habitat connectivity in the project vicinity (including along the corridor described above) is partially fragmented by the Contra Costa Canal, which has relatively few crossings accessible to wildlife. One of the largest such crossings is present at the southeast corner of the study area. This location may represent an important location along the corridor. Construction of barriers to wildlife movement in this location could significantly impact the habitat value of the entire corridor. The project as designed avoids new structures or barriers to movement near this crossing.

Nursery sites may include sites where animals breed, lay eggs, or rear young. These can include features as diverse as nesting trees, estuaries, ponds, caves, and structures. Trees in the study area provide potential nesting habitat for birds and bats; these values and mitigation are discussed in **Section 6.1**, above. Similarly, the ability of ponds and wetlands on the site to support amphibian breeding is discussed above. No other special nursery sites are present within the study area.



Legend

- Golf Course/Canal Border Fencing
- Wildlife Corridor
- Project Site
- 250-foot Buffer of Project Site

FIGURE 11
Nurseries and Corridors Map

Pittsburg Data Hub Project
City of Pittsburg, California

N
W E
S

1:6,000
(1 in. = 500 ft. at letter-size layout)

0 75 150 300 M

0 300 600 1,200 Ft

Data Sources: USDA, 2018 | CDFW, 2023
WSP, 2023 | TIGER, 2021
GIS/Cartography by T. Hurd, Oct. 2023
Map File: 567_BE_Corridors_A-P_2024-0212.mxd

10.0 REGIONAL EFFECTS

The Project's effects are generally expected to be restricted to the study area as defined above. The CEC SPPE application requires an analysis of the effects of atmospheric nitrogen deposition caused by the project on sensitive habitats within six miles of the source.

10.1 Effects of Atmospheric Nitrogen Deposition

The proposed project would have 37, 2.75-MW diesel fired backup generators. Operation of these generators would result in the emission of several air pollutants, including nitrogen oxides (NOx) and ammonia (NH_3). California ecosystems are typically nitrogen limited (Weiss 2006), leading to increased productivity and competition by invasive species when high nitrogen deposition increases available supply (Fenn et al. 2003).

VNLC staff analyzed sensitive habitats (defined for the purpose of this analysis as all special habitats mapped in the CNDDB, and all Designated Critical Habitat identified by USFWS) within a six-mile buffer of the project area. However, due to the small generation capacity and low stacks of proposed on site generators, nearly all nitrogen deposition is expected to occur in the immediate vicinity of the project area. Other reports on similar projects have similarly found that any nitrogen plume produced would quickly dilute and become indistinguishable from background levels by the time it reached 6 miles from site (CEC 2022).

Conservative modeling using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), performed by CEC staff for similar facilities, estimated very low contributions of those projects. The CA3 project's 47, 2.75 MW diesel fired backup generators' estimated contributions to existing nitrogen deposition were between 0.02 and 0.20 kg N/ha/yr at 2 miles from the project site (CEC 2022). The McLaren Data Center (47, 2.75 MW diesel fired backup generators) and Laurelwood Data Center (56, 3.0-MW diesel fired backup generators) had estimated contributions to existing nitrogen deposition of between 0.01 and 0.03 kg N/ha/yr at approximately 4 to 5 miles distance (CEC 2021). Each of these were found to have less-than-significant impacts on sensitive habitats at those distances.

Coastal brackish marsh and Antioch dunes are CDFW designated sensitive habitats, located 1.8 miles and 5.9 miles from the site respectively (**Figure 11**). USFWS designated critical habitat exists within the 6-mile buffer of the project area for Delta smelt, Alameda whipsnake (*Masticophis lateralis euryxanthus*), Antioch dunes evening primrose (*Oenothera deltoides* ssp. *howelii*), and Contra Costa wallflower (*Erysimum capitatum* var. *angustatum*) (USFWS 2023). Both Antioch dunes evening primrose and Contra Costa wallflower critical habitat is coincident with the Antioch dunes sensitive habitat. Alameda whipsnake does not inhabit any CDFW sensitive habitat within 6 miles, preferring chaparral, scrub, grassland, and woodlands. The nearest critical habitat for this species is 5.6 miles southwest of the project site. Delta smelt may potentially inhabit all suitable aquatic habitat within the buffer zone, including coastal brackish marsh.

Critical load is one tool for quantifying nitrogen deposition, defined as "the input of a pollutants below which no detrimental ecological effects occur over the long term" (Fenn et al. 2010). Estuarine intertidal wetlands critical loads are higher than terrestrial ecosystems due to having an open nutrient cycle (Pardo et al. 2011). Additionally, nitrogen loads from other sources are typically much higher than atmospheric deposition in aquatic ecosystems (ibid). Early successional coastal brackish marsh has an estimated critical load of 30-40 kg N/ha/yr (Bobbink et al. 2002), 50-100 kg N/ha/yr for intertidal marsh and 63-400 kg N/ha/yr for intertidal salt marsh (Pardo et al. 2011). Antioch dunes were historically a shifting coastal dune habitat, but are classified as "stabilized" by CDFW (USFWS n.d., CNDDB 2023). Critical load for stabilized dunes is estimated at 10-20 kg N/ha/yr (Bobbink et al. 2002). Woodlands and chaparrals have critical loads ranging from 10-14 kg N/ha/yr (Pardo et al. 2010). Scrub habitat critical load is estimated to be 7.8-10 kg N/ha/y (ibid). Sensitive nutrient-limited grasslands such as serpentine grasslands, desert grasslands, and alpine grasslands have low critical loads (6 kg N/ha/yr, 3-8.4 kg N/ha/yr, and 4-10 kg N/ha/yr, respectively, Fenn et al. 2010). None of these specialized grasslands occur in the project vicinity. Non-specialized grasslands such as those that do occur in the project vicinity are less well studied. No critical loads are available for these habitats. However, these habitats are significantly more productive than serpentine, desert, or alpine grasslands, and likely have a much higher critical threshold.

Potentially significant impacts could occur if nitrogen deposition resulting from the proposed project exceeded the critical load when in conjunction with baseline deposition. Baseline atmospheric nitrogen deposition within the project area and 6-mile buffer is estimated to range from 5.16 kg N/ha/yr to 7.41 kg N/ha/yr (Bay Area Open Space Council 2019). The addition of project-related deposition of up to 0.2 kg N/ha/yr would result in a combined nitrogen deposition rate of 5.36-7.61 kg N/ha/yr. This is far below the conservative critical load estimates (with minimum values of 30-63 kg N/ha/yr) of any of the sensitive aquatic habitats in the region.

The sensitive habitats with the lowest critical thresholds are scrublands, woodlands, or grasslands within Alameda whipsnake critical habitat. Alameda whipsnake critical habitat occurs approximately 5.6 miles southwest of the project site. In this area, background nitrogen deposition rates are less than 6 kg N/ha/yr. At this distance from the project site, project-related, nitrogen deposition is expected to be below 0.03 kg N/ha/yr, approximately 0.5% of the background rate.

The resultant rate will remain below 6 kg N/ha/yr, below documented critical load thresholds for woodland, scrub, and even some of the specialized and nutrient-limited grasslands.

The stabilized dune habitats at Antioch Dunes also have a relatively low critical load threshold. However, these habitats occur at the edge of the analysis radius, 5.9 miles away. At this distance, nitrogen deposition is expected to be below 0.03 kg N/ha/yr, approximately 0.4% of the background rate. This addition will not exceed critical load thresholds for the habitat.

Overall, the project is only expected to have immediate impacts to the project specific area and not nearby critical habitats or listed species. The nitrogen deposition levels are minimal in areas near the boundary of the analysis radius and even areas closer to the project specific area are still low. There is expected to be minimal impact to the surrounding environment.

11.0 SUMMARY OF POTENTIAL IMPACTS

Figure 3 depicts the location of project activities that will result in direct destruction or modification of existing habitats. These activities are planned in approximately 24.73 acres, composed of 19.25 acres of annual grassland, 3.06 acres of paved/developed, 2.12 acres of landscaping trees, 0.03 acres of Himalayan blackberry thicket, 0.15 acres of perennial wetland within drainage, 0.01 acres of seasonal wetland drainage, and 0.11 acres of seasonal wetland within drainage. Not all these habitats will necessarily be destroyed or directly modified.

Construction

Habitat destruction or modification within this area will result in the loss of potential habitat for special-status species. Compensatory mitigation is recommended to ensure the continued availability of habitat for those species. The project may also result in direct impacts to individuals of special-status species, if they occur in the project area. Project design measures are recommended which, if implemented, would minimize that risk.

The project may also result in direct impacts on sensitive aquatic and riparian habitats. Appropriate permits should be obtained for any direct impacts, and the required mitigation implemented.

Operation and Maintenance

Operation and maintenance of the proposed project are expected to result in extremely low levels of atmospheric nitrogen deposition to sensitive habitats, below the critical load threshold for those habitats. Operation and maintenance may result in indirect impacts on sensitive aquatic and riparian habitats through improperly controlled runoff. Mitigation measures to minimize indirect impacts are recommended above.

Potentially significant impacts could occur if nitrogen deposition resulting from the proposed project exceeded the critical load when in conjunction with baseline deposition. Atmospheric nitrogen deposition within the project area and 6-mile buffer was estimated to range from 5.16 kg N/ha/yr and 7.41 kg N/ha/yr by the Conservation Lands Network's 2019 San Francisco Bay Area conservation plan. Nitrogen deposition contribution for the similarly sized Sequoia Data Center in Santa Clara County was estimated to be between 0.02 kg N/ha/yr and 0.20 kg N/ha/yr.

Decommissioning

No additional impacts to sensitive biological resources are likely to occur as a result of closure and decommissioning.

Project Design Measures

We recommend the following measures be incorporated into the project design to minimize the project's impacts to biological resources. These measures are primarily based on the HCP/NCCP, for those resources which the HCP/NCCP directly addresses. For resources not directly addressed by the HCP/NCCP, we have recommended measures based on the best available science, and on measures shown to be successful on other projects.

PDM BIO-1: Project Coverage under ECC HCP/NCCP

The Project Owner shall obtain coverage for the project under the ECC HCP/NCCP. This shall include submittal of all required application materials per HCP/NCCP Section 6.2.1 and payment of a Development Fee consistent with current HCP/NCCP requirements. Alternatively, the project Project Owner may, in accordance with the terms of PMC Chapter 15.108, offer to dedicate land in lieu of some or all of the HCP/NCCP Development Fee.

All applicable fees shall be paid, and/or an "in-lieu-of-fee" agreement fully executed, prior to the issuance of a grading permit for the project. If a grading permit is not required, fee payment and/or an "in-lieu-of-fee" agreement shall be fully executed prior to issuance of the project's building permit. Proof of applicable fees and/or "in-lieu-of-fee" agreement shall be provided to the City of Pittsburg Community Development Director.

PDM BIO-2: Worker Awareness Training for Biological Resources

Because of the potential for nesting birds and other protected wildlife to be present on the project site, the Project Owner shall prepare and ensure delivery of a Worker Environmental Awareness Program (WEAP). The WEAP shall include the following information.

- The sensitive habitats on the project site.
- Special-status species known or potentially present on the site, including their
    - listing status and causes of decline,
    - habitat preferences, and
    - distinguishing physical characteristics.
- The measures (PDMs and ECC HCP/NCCP measures) required to protect sensitive habitats and special-status species, including next steps and notifications in the event of a special-status species sighting.

The WEAP shall include a hard copy handout that summarizes information presented in the training and includes photographs of habitat resources and species to facilitate identification in the field by construction personnel.

The Project Owner shall ensure that all construction personnel undergo WEAP training before they begin work. Training shall be delivered by a qualified biologist approved by the City of Pittsburg Community Development Director and shall be provided bilingually in English and Spanish if appropriate.

PDM BIO-3: Adherence to ECC HCP/NCCP Requirements

The Project Owner shall ensure that the project adheres to all applicable ECC HCP/NCCP requirements.

Planning surveys per HCP/NCCP Section 6.3.1 were completed in 2018 – 2023 (see Section 4.4.2.1 of this application). Based on the outcomes of the planning surveys, preconstruction surveys by USFWS- and DFW-approved biologists shall be conducted for the following species per HCP/NCCP Sections 6.3.2 and 6.3.4.

- Golden Eagle
- Burrowing Owl
- Swainson’s Hawk
- San Joaquin kit fox

If preconstruction surveys determine that any of the above species is present on the site (or, for the bird species, within a distance where they could be disturbed by construction activity), the biologist may recommend construction monitoring; if so, the Project Owner shall ensure that monitoring is conducted per HCP/NCCP Section 6.3.3. This will include submittal of a Construction Monitoring Plan (CMP) to the East Contra Costa County Habitat Conservancy for approval; the CMP must be submitted and approved prior to issuance of the grading permit (or, if no grading permit is required, the building permit) for the project.

Based on results of the planning surveys, which indicate that no suitable habitat is available on the project site, preconstruction surveys and construction monitoring are not required for the following species.

- Covered shrimp species
- Giant garter snake
- Townsend’s big-eared bat

The Project Owner shall also comply with all applicable provisions of ECC HCP/NCCP Section 6.4, Specific Conditions on Covered Activities, as follows.

- **Section 6.4.1: Landscape-Level Measures**
    - Conservation Measure 1.10 – Maintain Hydrologic Conditions and Minimize Erosion
    - Conservation Measure 1.11 – Avoid Direct Impacts on Extremely Rare Plants, Fully Protected Wildlife Species [and] Covered Migratory Birds
    - Conservation Measure 1.7 – Establish Stream Setbacks
- **Section 6.4.2: Natural Community–Level Measures**
    - Conservation Measure 2.12 – Wetland, Pond, and Stream Avoidance and Minimization
- **Section 6.4.3: Species-Level Measures for the following species**
    - California tiger salamander
    - Burrowing Owl
    - Golden Eagle
    - Swainson’s Hawk
    - San Joaquin kit fox

<u>PDM BIO-4: Rare Plant Survey & Protection</u>

Protocol-level rare plant surveys were conducted in 2023; rainfall and temperature conditions were good that year, surveys were conducted during the peak blooming period for the species potentially present, and survey results were negative. Thus, if project construction occurs before 2025, no further action is required.

If project construction begins in 2025 or later, an updated protocol-level rare plant survey shall be conducted by a qualified biologist/botanist who is familiar with the rare plants of the project region and has been approved by the City of Pittsburg Community Development Director. Surveys shall be conducted prior to construction, with enough lead time to allow for the follow-up actions described below, if they are warranted. Surveys shall be conducted during the peak blooming periods of the target species and shall cover all potentially suitable habitats within the project site and surrounding 250-foot-wide buffer. Target species and blooming periods are listed in the matrix below; the matrix is highlighted to group species with similar blooming periods.

Table 5. Rare Plant Survey Periods

Species	Blooming Period
Lobb's aquatic buttercup (*Ranunculus lobbii*)	February – May
Johnny-nip (*Castilleja ambigua* var. *ambigua*)	March – August
Showy golden madia (*Madia radiata*)	March – May
California alkali grass (*Puccinellia simplex*)	March – May
California androsace (*Androsace elongata* ssp. *acuta*)	March – June
Stinkbells (*Fritillaria agrestis*)	March – June
Diablo helianthella (*Helianthella castanea*)	March – June
Hogwallow starfish (*Hesperevax caulescens*)	March – June
Stinkbells (*Fritillaria agrestis*)	March – June
Mt. Diablo jewelflower (*Streptanthus hispidus*)	March – June
Sylvan microseris (*Microseris sylvatica*)	March – June
Little mousetail (*Myosurus minimus* ssp. *apus*)	March – June
Small-flowered morning-glory (*Convolvulus simulans*)	March – July
Keck's checkerbloom (*Sidalcea keckii*)	April – May, sometimes into June
Mt. Diablo fairy-lantern (*Calochortus pulchellus*)	April – June
Tehama navarretia (*Navarretia heterandra*)	April – June
Adobe navarretia (*Navarretia nigelliformis* ssp. *nigelliformis*)	April – June
Saline clover (*Trifolium hydrophilum*)	April – June
Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*)	April – July
Shining navarretia (*Navarretia nigelliformis* ssp. *radians*)	April – July
Pappose tarplant (*Centromadia parryi* ssp. *parryi*)	May – November
Parry's rough tarplant (*Centromadia parryi* ssp. *rudis*)	May – October
Woolly-headed lessingia (*Lessingia hololeuca*)	June – October
Big tarplant (*Blepharizonia plumosa*)	July – October
Mt. Diablo buckwheat (*Eriogonum truncatum*)	September, sometimes into November/December

If no special-status plants are documented within the area to be disturbed for project construction (including staging and access), no further action is required.

If special-status plants covered by the ECC HCP/NCCP, or plants designated as "no take" by the ECC HCP/NCCP, are present on the site, the relevant survey report(s) shall be submitted to the East Contra Costa Habitat Conservancy per HCP/NCCP Section 6.3.1 (see page 6-9).

If any of the following species covered by the ECC HCP/NCCP is found to be present, the Project Owner shall promptly notify the East Contra Costa County Habitat Conservancy of the species' presence and the planned construction schedule, to enable the East Contra Costa County Habitat

Conservancy to salvage the occurrence(s) in accordance with HCP/NCCP Conservation Measure 3.10 (Plant Salvage when Impacts Are Unavoidable). The Project Owner shall confirm with the East Contra Costa County Habitat Conservancy that the take limits established by the HCP/NCCP for the species in question have not been breached.

- Big tarplant
- Mount Diablo fairy lantern
- Diablo helianthella
- Showy golden madia
- Adobe navarretia

Under no circumstance shall any of the following HCP/NCCP "no-take" plants be harmed.

- Large-flowered fiddleneck
- Alkali milkvetch
- Mt. Diablo buckwheat
- Diamond-petaled poppy
- Contra Costa goldfields
- Caper-fruited tropidocarpum

Due to their extreme rarity, none of these species is expected to be present on the project site, but if any of them are found, the applicant shall notify the East Contra Costa County Habitat Conservancy immediately and shall work with the Conservancy to determine and execute the appropriate course of action.

If any special-status plant not covered by the ECC HCP/NCCP is found to be present, the occurrence(s) shall be avoided and protected in place to the extent feasible. If the occurrence(s) cannot be entirely avoided, then a Plant Salvage and Mitigation Plan shall be prepared and implemented. The Plan shall be prepared by a qualified biologist/botanist who is familiar with the rare plants of the project region and has experience conducting rare plant salvage operations. Plant salvage techniques shall be consistent with those outlined in HCP/NCCP Conservation Measure 3.10. The plan shall, at a minimum, include the following.

- Quantity and species of plants to be planted or transplanted
- Location of the mitigation/transplant site(s)
- Salvage methods, such as relocation/transplantation, seed collection, etc., including storage locations and methods to preserve the plants
- Procedures for propagating collected seed, including storage methods
- Planting procedures, including the use of soil preparation and irrigation
- Schedule and action plan to maintain and monitor the mitigation/transplant site for a minimum 3-year period
- Interim and final success criteria and corrective action thresholds (e.g., growth, plant cover, survivorship)
- Potential corrective actions/contingency measures in the event interim success criteria are not being met (e.g.., weed removal, supplemental irrigation, supplemental plantings, etc.).
- Reporting requirements and procedures, including the contents of annual progress reports, report submittals, review/approval responsibilities, etc.

The Project Owner shall implement the Plant Salvage and Mitigation Plan. The Plan shall be implemented under the oversight of the biologist/botanist who prepared it or another individual with equivalent qualifications. The biologist shall be approved by the City of Pittsburg Community Development Director.

PDM BIO-5: Special-Status Bumble Bee Surveys & Protection

No more than 1 year prior to the initiation of vegetation removal and grading at the project site, the Project Owner shall retain an appropriately qualified biologist (see next paragraph) who has been approved by the City of Pittsburg Community Development Director to conduct surveys for Crotch bumble bee, obscure bumble bee, and American bumble bee. As of this writing, no survey protocol has been published, although DFW has issued preliminary survey guidance for candidate bumble bee species (California Department of Fish and Wildlife 2023). Consequently, there are no official requirements for bumble bee surveyor qualifications. Biologist qualifications for bumble bee surveys will conform to current guidance prevailing at the time surveys are performed.

Surveys shall be performed by a qualified entomologist familiar with the species' behavior and life history and shall include both habitat evaluations and foraging bee surveys consistent with the recommendations in Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species (California Department of Fish and Wildlife 2023). Surveys shall be conducted during each species' peak worker activity period, detailed in the matrix below. Surveys shall cover all areas of onsite habitat determined by the biologist to be suitable for any of the three target bumble bee species, based on habitat mapping conducted for the project to date. A minimum of 3 – 4 surveys shall be conducted, spaced 2 weeks apart; the total number, timing, and duration of surveys performed shall depend on the biologist's judgment, in consideration of weather, site conditions, and protocol requirements. Surveys shall be designed to identify all foraging bumble bee species; a single survey may be used to detect all species with peak activity periods including the survey date.

Table 6. Bumblebee Survey Periods

Species	Peak Activity
Crotch bumble bee	April 1 – July 31
Obscure bumble bee	April 20 – August 20
American bumble bee	June 1 – October 1

Source: Williams et al. (2014)

If Crotch bumble bee, obscure bumble bee, or American bumble bee is observed onsite during the surveys, an additional survey or surveys shall be conducted to determine whether a nest or colony is present, unless the biologist is satisfied that the initial survey(s) were sufficient to rule out the presence of nests/colonies.

If a nest or colony is present onsite, the biologist shall establish an appropriate avoidance buffer determined in consideration of site conditions, the species involved, and the construction activities planned prior to the close of the nesting season. No entry into the buffer shall be permitted. The buffer shall be delineated in the field using orange construction fencing or another appropriate medium, under the biologist's oversight, and shall remain in place until the end of the nesting species' gyne flying season, or until the qualified biologist determines that the nest has been abandoned

If no nest/colony is present onsite, no further action will be taken. However, all workers shall be required to avoid injury and mortality to bumble bees they may encounter; this requirement shall be discussed during the WEAP training (PDM BIO-2) and shall be reiterated to all workers if special-status bumble bees are confirmed onsite.

To support improved understanding and conservation of all three bumble bee species, survey results, including negative findings, shall be submitted to CDFW prior to implementing project-related ground-disturbing activities. At a minimum, the survey report shall include the following information.

(1) A description and map of the survey area, focusing on areas that could provide suitable habitat for Crotch bumble bee, obscure bumble bee, or American bumblebee
(2) Field survey conditions, including name(s) of qualified entomologist(s) and brief qualifications; date(s) and time(s) of survey; survey duration; general weather conditions; survey goals; and species searched
(3) Map(s) showing the location of nests/colonies, if any
(4) A description of physical (e.g., soil, moisture, slope) and biological (e.g., plant composition) conditions where each nest/colony is found, including native plant composition (e.g., density, cover, and abundance) within impacted habitat (e.g., species list separated by vegetation class; density, cover, and abundance of each species)
(5) The measures that will be implemented to avoid adverse effects on the bumble bee species present
(6) An assessment of potential project effects on special-status bumble bees during project construction and project operation/maintenance, with avoidance and minimization measures in place

PDM BIO-6: Monarch Butterfly Protection

No more than 2 days prior to the initiation of vegetation trimming or removal for construction, the Project Owner shall ensure that a qualified biologist approved by the City of Pittsburg Community Development Director surveys all areas of potentially suitable habitat for monarch butterfly larval host plants. If host plants are found, the biologist shall survey all host plants for monarch eggs, larvae, and pupae. If no eggs, larvae, or pupae are found, plants may be removed within 2 days. If eggs, larvae, or pupae are present, host plants shall be protected in place until the biologist has determined that no more eggs, larvae, or pupae are present.

PDM BIO-7. Western Pond Turtle Protection

Prior to the start of construction or O&M activities, The Project Owner shall ensure that a qualified biologist approved by the City of Pittsburg Community Development Director conducts a pedestrian preconstruction survey of the project site and adjacent suitable habitat for western pond turtle. The survey shall be conducted no more than 24 hours prior to start of work, and shall include walking the work area limits and interior and investigating all areas that could be used by the species. If western pond turtle individuals are found, the biologist shall relocate them to suitable habitat outside the disturbance area and far enough away that they would not be expected to return. If the biologist determines that it is warranted, exclusion measures shall be implemented to prevent individuals returning to the active work site.

PDM BIO-8: Nesting Bird Protection (General)

If project-related disturbance (e.g., vegetation removal or trimming, clearing/grubbing, grading) commences any time during the nesting/breeding season of native bird species potentially nesting in or near the study area (February 1 – August 31 for most species; January 1 through August 31 for Golden Eagle; March 15 – September 15 for Swainson's Hawk), a preconstruction survey for nesting birds shall be conducted by a qualified biologist approved by the City of Pittsburg Community Development Director, using binoculars. The survey shall take place no more than 2 weeks prior to the initiation of work.

If active nests are found in areas that could be directly affected or are within 300 feet of disturbance activities and would be subject to prolonged construction-related noise, a no-disturbance buffer zone shall be created around active nests for the remainder of the breeding season or until the biologist determines that all young have fledged or that the nest has been abandoned. No entry into the no-activity buffer shall be permitted. The no-activity buffer shall be delineated in the field by or under the supervision of the biologist, using temporary construction fencing or another suitable low-impact medium. The size of the buffer zone(s) shall be determined by the biologist based on the species involved, the amount of vegetative and other screening between the nest and areas where construction activity shall take place, and, if appropriate, other site-specific factors. The minimum buffer width shall be 50 feet for species other than raptors, and a minimum of 500 feet for raptor species, and may be enlarged by taking into account factors such as the following.

- Noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity.
- Sensitivity of nesting species and behaviors of the individual nesting birds.

If nesting Swainson's Hawk or Golden Eagle are observed, buffers and other avoidance measures shall conform to Species-Level Measures for these species as laid out in ECC HCP/NCCP Section 6.4.3.

PDM BIO-9: Nesting Bird Protection (Bald Eagle)

Bald Eagle nests may be built throughout the year. Consequently, the Project Owner shall retain a qualified biologist approved by the City of Pittsburg Community Development Director to conduct a preconstruction survey for nesting Bald Eagles prior to the initiation of work at the site (including vegetation removal or trimming, clearing/grubbing, grading, etc.). The survey shall be conducted using binoculars and shall take place no more than 2 weeks prior to the initiation of work.

If an occupied or active nest is present, construction-related activity shall be prohibited within 0.5 mile of the nest unless site-specific conditions or the nature of the construction activity (e.g., dense vegetation, limited noise generation, limited activities) indicate that a smaller buffer could be appropriate or that a larger buffer should be implemented. The biologist shall coordinate with the East Contra Costa County Habitat Conservancy, DFW, and USFWS to determine the appropriate buffer size.

The nest buffer shall be delineated in the field using temporary construction fencing or another suitable low-impact medium. Buffer fencing shall be placed only on the project site; the buffer shall not be put in place on neighboring properties not involved in project construction and staging Construction shall be monitored by a qualified biologist to ensure that the buffer remains in place and that no construction activities occur within the buffer zone until the biologist has determined that the young have fledged or that the nest has been abandoned.

PDM BIO-10: Special-Status Bat Survey & Protection

Prior to the initiation of any activity that could disturb roosting bats (including vegetation trimming/removal, surveys involving the use of lasers that produce high-frequency sounds, drilling, or other activity producing high-frequency sounds, a qualified biologist (as stipulated in Section 5 of H.T. Harvey & Associates 2019, and subject to approval by the City of Pittsburg Community Development Director) shall conduct a habitat evaluation for special-status bats, focusing on the needs of pallid bat, western red bat, and hoary bat, the species identified by planning surveys as having potential to be present on the site. For purposes of this PDM, high-frequency sound is defined as sound in the 20 kHz – 50 kHz frequency range, based on bat disturbance information in California Department of Transportation (Caltrans) bat mitigation guidelines (H.T. Harvey & Associates 2019). If Caltrans guidance is updated, or if frequency sensitivity information relevant to the bat species with potential to occur becomes available prior to project construction, this definition shall be updated accordingly.

Surveys shall include the entirety of the project site plus a 400-foot-wide buffer. If no roosting habitat suitable for these species is present on the project site, no further action is required. If roosting habitat is present, the following additional requirements shall apply. Any potential roost trees/other potential roosting habitat shall also be considered potential bat maternity roosts.

- Before any activities with the potential to disturb roosting bats begin, the approved biologist(s) shall conduct focused surveys for roost occupancy. These shall be conducted at least 2 weeks prior to the start of work and shall include:
    - Daytime visual surveys for bats and evidence of bat presence such as guano or urine staining
    - Evening emergence and acoustic surveys

  If bat presence is confirmed, the species, number of individuals, and roost type (maternity/non-maternity) shall be documented and reported to the CNDDB. Bats shall not be disturbed or relocated during the surveys.

- Confirmed non-maternity roosts shall be protected by buffers as laid out in the matrix that follows. Buffers shall be delineated in the field with temporary construction fencing or another suitable measure, installed under biologist oversight. Note that buffer distances vary depending on the species and the type of noise/disturbance involved. (If bat species other than those addressed here are encountered, buffer distances shall be consistent with H.T. Harvey & Associates 2019; see Table 7-1). The biologist shall coordinate with construction staff to determine the appropriate buffer width; if there is uncertainty, the more conservative buffer width shall prevail.

Table 7. Bat Disturbance Buffers

Disturbance Source	Pallid Bat	Other Bat Species
Construction trucks and heavy equipment	120 feet	100 feet
Smaller vehicles	90 feet	65 feet
Drilling, trenching, and small equipment	150 feet	150 feet
Unshielded light source	400 feet	300 feet
Pedestrian traffic	65 feet	65 feet
Stationary source of diesel/gasoline exhaust operating for more than 2 minutes	250 feet	250 feet
Any equipment generating high-frequency (20 kHz – 50 kHz) sound (laser survey transits, drilling, etc.), as identified by the biologist	Buffer shall be determined on a case-by-case basis by identifying the distance at which high-frequency sound generated by the equipment becomes indistinguishable from background levels, using one of the acoustic methods described on pp. 7-16 – 7-18 of the California Department of Transportation bat mitigation guidelines (H.T. Harvey & Associates 2019), or updated equivalent	

Source: H.T. Harvey and Associates 2019

If a confirmed roost must be removed or trimmed for construction, or if work must occur within the buffers laid out above, work shall be restricted to daylight hours when the DFW-approved biologist has confirmed that it the roost is not occupied, and shall be overseen by the biologist to prevent injury or mortality. The biologist shall have authority to divert or stop work in the event of excessive risk to bats

- Confirmed maternity roosts shall be protected by the same buffers identified above. Maternity roosts shall not be removed unless removal cannot be avoided, and in no case shall a confirmed maternity roost be removed during the breeding/non-volant season (April – August). If removal of a maternity roost is necessary, the Project Owner shall consult with DFW to determine appropriate compensatory mitigation such as the provision of bat boxes and shall submit a Bat Habitat Mitigation Plan for DFW approval. Consultation and submittal of the Mitigation Plan shall occur prior to the removal, and the removal shall not take place until DFW has approved the Plan. The Project Owner shall then be responsible for implementing DFW-approved mitigation for removal of bat maternity roost habitat

PDM BIO-11: San Joaquin Pocket Mouse Protection

Vegetation removal, clearing/grubbing, and grading activities for each work phase shall be conducted in a uniform direction to allow mobile animals such as San Joaquin pocket mouse the ability to escape the disturbance area into adjacent undisturbed habitat. Project construction shall also avoid the creation of fragmented islands of habitat where individuals may become trapped, isolated from resources, and at risk from eventual clearing/grading operations.

PDM BIO-12: American Badger Survey & Protection

No more than 4 weeks before the commencement of ground disturbance at the site, a qualified biologist approved by the City of Pittsburg Community Development Director shall conduct a survey for American badger den sites.

If an occupied den is found, and young are not present, then any badgers present shall be removed from the den either by the use of appropriate exclusionary devices or by trapping and relocation. The removal method shall be approved by DFW prior to implementation; if trapping and relocation are used, it shall be carried out by biologist(s) with all required permits for badger handling. Any trapped badgers shall be relocated to other suitable habitat at least 500 feet outside the project site boundary. Once any badgers are excluded or trapped and relocated, den(s) shall be excavated by hand and backfilled to prevent reoccupation. Exclusion shall continue until the badgers are successfully removed from the site, as determined by the biologist.

Badgers shall not be excluded or relocated if it is determined by the biologist that young are or may be present. Any occupied dens shall be protected with a 50-foot-wide no-activity buffer. The buffer shall be delineated in the field by a qualified biologist, using temporary construction fencing or another appropriate low-impact medium, and shall remain in place until the biologist has determined that the young are no longer dependent on their mother and the den site. No entry into the buffer area shall be permitted.

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APPENDIX A

REPRESENTATIVE PHOTOGRAPHS OF THE STUDY AREA

(Recorded 11/2018 to 06/2019)

Representative Photographs of the Study Area

Photo 1. Representative photo of Study Area, annual grassland dominated by non-native annual grasses and large patches of black mustard (*Brassica nigra*). (4/12/2023)

Photo 2. Remnant golf cart path covered by overgrown black mustard. (4/12/2023)

Representative Photographs of the Study Area

Photo 3. Representative view of landscaping trees, dominated by Peruvian pepper tree (*Schinus molle*) and Bishop pine (*Pinus muricata*). (5/31/2023)

Photo 4. Representative view of the paved areas with weedy species growing in asphalt cracks. (5/19/2023)

<u>Representative Photographs of the Study Area</u>

Photo 5. Valley foothill riparian habitat in corridor on east edge of study area.

Photo 6. Perennial wetland dominated by broad-leaved cattail (*Typha latifolia*), with Himalayan blackberry (*Rubus armeniacus*) thickets behind. (4/12/2023)

<u>**Representative Photographs of the Study Area**</u>

Photo 7. Remnant golf pond with margins dominated by upland species including wall barley (*Hordeum murinum*) and short pod mustard (*Hirschfeldia incana*). (7/12/2023)

Photo 8. Seasonal wetland near eastern edge of project area, 2019.

Photo 9. Perennial wetland near eastern edge of project area, 2019.

Photo 10. Perennial wetland in seasonal drainage near southern edge of project area, 2019.

Representative Photographs of the Study Area

Photo 11. Native wildflowers within grazed annual grassland outside of former golf course, southwestern edge of study area. 2019.

Photo 12. Ruderal habitat in formerly irrigated/mowed golf course green, 2019.

Representative Photographs of the Study Area

Photo 13. Ground Squirrel Burrow Complex, 2019.

Photo 14. Cracking within clay soils, 2019.

APPENDIX B

WETLAND DELINEATION REPORT

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Delineation of Potential Jurisdictional Waters Pittsburg Technology Park Project

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August 22 2023

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ACRONYMS AND ABBREVIATIONS

APN	Assessor's Parcel Number
CWA	Clean Water Act
CDFW	California Department of Fish and Wildlife
EPA	U.S. Environmental Protection Agency
FAC	facultative; 33%-67% probability of occurring in a wetland
FACU	facultative upland; 1%-33% probability of occurring in a wetland
FACW	facultative wetland; 67%-99% probability of occurring in a wetland
GIS	Geographic Information System
HCP	East Contra Costa County Habitat Conservation Plan/ Natural Community Conservation Plan
NL	not listed
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWP	Nationwide Permit
NWPL	National Wetland Plant List
OBL	obligate wetland; >99% probability of occurring in a wetland
OHWM	ordinary high water mark
PEM	palustrine emergent
PGE	Pacific Gas & Electric Company
RHA	Rivers and Harbors Act
RWQCB	Regional Water Quality Control Board
SR	State Route
TNW	Traditional Navigable Water
UPL	obligate upland; <1% probability of occurring in a wetland
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator coordinate system
WDR	Waste Discharge Requirements

Executive Summary

The aquatic resources delineation was conducted in accordance with the 1987 "Corps of Engineers Wetland Delineation Manual", Arid West Supplement, Version 2.0 (September 2008). The results of this delineation are preliminary and must be reviewed and verified in writing by the U.S. Army Corps of Engineers (USACE) to be considered an official delineation.

The delineation identified 1.990 acres of potentially jurisdictional aquatic resources within the 78.7-acre Delta View Technology Park study area. The aquatic resources consisted of the following habitats and Cowardin classifications:

- 0.714 acre of Seasonal Wetland Drainages (R4 and R6)
- 0.169 acre of Perennial Wetland within Drainage (PEM)
- 1.027 acre of Seasonal Wetland within Drainage (PEM)
- 0.712 acre of Unvegetated Drainages (R4)

The delineation also identified 3.312 acres of artificial features constructed in uplands. The constructed features consisted of the following habitats and Cowardin classifications:

- 1.673 acres of Golf Course Landscaping Ponds (PUB)
- 1.639 acres of Artificial Canal (R4)

Delineated features within the Study Area may be subject to federal jurisdiction by the USACE through Section 404 of the Clean Water Act and may also be subject to State jurisdiction by the Regional Water Quality Control Board (RWQCB), and/or the California Department of Fish and Wildlife (CDFW) through State regulations.

1.0 INTRODUCTION

This report summarizes the methods and results of the updated delineation of potential jurisdictional Waters of the United States and/or State of California within the Delta View Technology Park Project study area (study area), located in the hills above the City of Pittsburg, in northern Contra Costa County, California (**Figure 1**). The study area is the site of a proposed project, which would allow redevelopment of portions of the recently closed golf course as a technology park. Vollmar Natural Lands Consulting (VNLC) ecologists conducted an updated delineation during December 2022. The study area was modified in 2023 to include a 250-foot buffer around the project area, per the standards of the East Contra Costa Habitat Conservation Plan/Natural Community Conservation Plan (ECCHCP/NCCP, or "HCP"). The proposed project area is approximately 38.0 acres. The Study Area, including the project area and the 250-foot buffer, is approximately 78.7 acres.

The purpose of the delineation was to identify, map, and document potential jurisdictional Waters of the United States and of the State of California within the study area. The updated delineation identified a total of 1.990 acres of potentially jurisdictional aquatic resources within the study area, as well as an additional 3.312 acres of artificial features constructed in uplands (see **Section 5.0**).

All Waters delineated within the study area may be subject to federal jurisdiction by the USACE through Section 404 of the Clean Water Act and may also be subject to state jurisdiction by CDFW, and/or RWQCB through state regulations. The results of this delineation are preliminary and must be reviewed and verified in writing by the USACE to be considered an official delineation.

2.0 PROJECT BACKGROUND INFORMATION

2.1 Study Area Location

The approximately 78.7-acre study area is comprised of a single parcel and a 250-foot buffer around it. The parcel is comprised of a portion of the former Delta View Golf Club. The 250-foot buffer includes additional portions of the former golf club, the Contra Costa Canal, residential development to the north of the Project parcel, and undeveloped land east of the parcel (**Figure 2**). The study area is located along the southern edge of the City of Pittsburg, California, and is mapped on the Honker Bay 7.5' United States Geological Survey (USGS) topographic quadrangle. The study area is within Sections 18 and 19 of Township 2 North, Range 1 East, and Sections 13 and 14 of Township 2 North, Range 1 West, of the Mount Diablo Base & Meridian; this area is within the Los Medanos land grant. The study area may be accessed from State Highway 4 heading east by exiting at Bailey Road, then turning right (south) on to Bailey Road, then turning left (east) on West Leland Road. Golf Club Road, which heads south from West Leland Road 1.7 miles east of Bailey Road, dead ends at the Delta View Golf Course. Much of the study area is accessible via golf cart trails, though some areas have become inaccessible as a result of trees falling onto the trails.

2.2 General Setting of Study Area

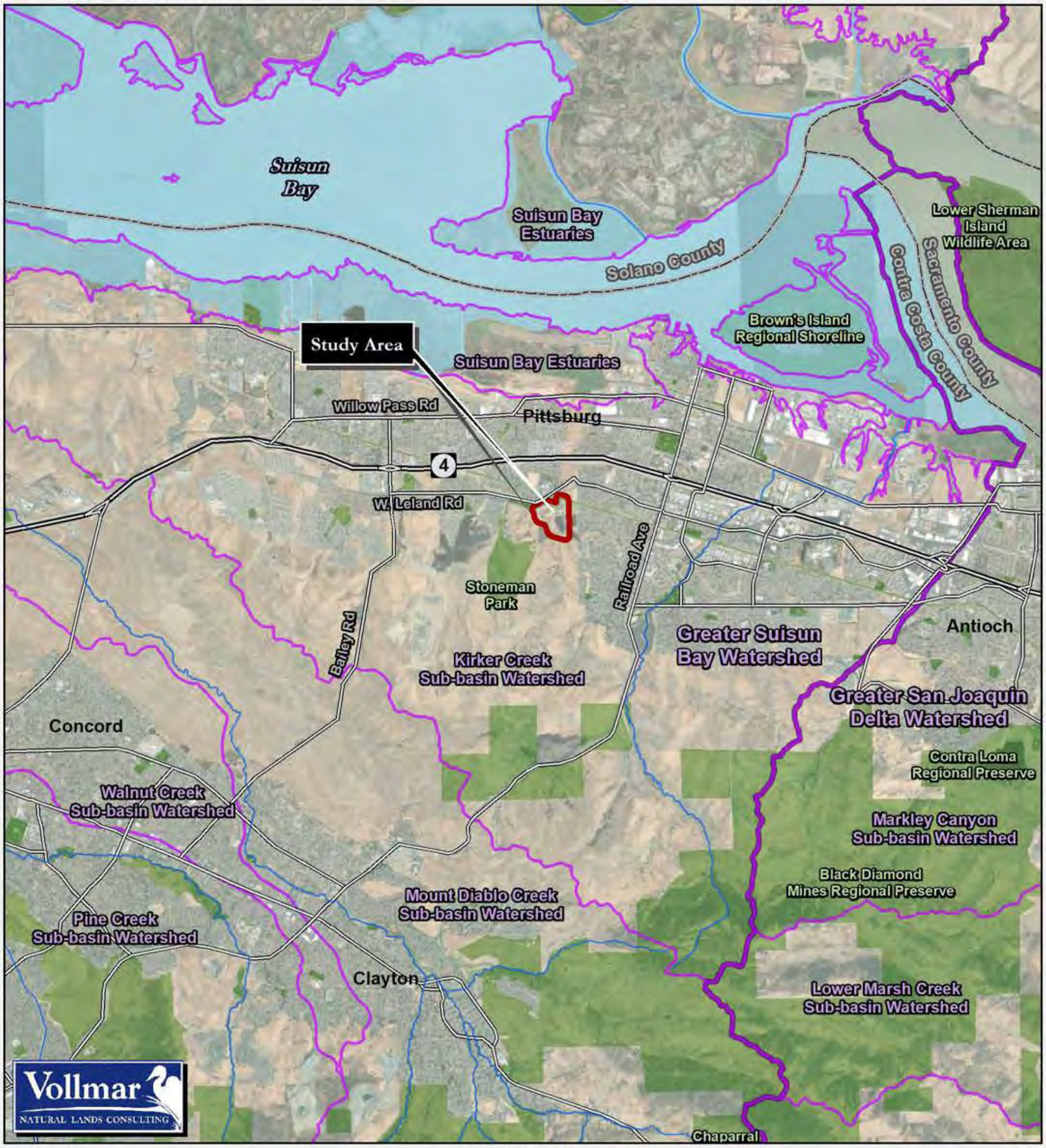
The study area consists of rolling hills along the lower slopes of the eastern Los Medanos Hills, overlooking the City of Pittsburg. Elevation within the study area ranges from approximately 57 feet to 164 feet above sea level (USGS 1997), trending upward in elevation from the northeast to the southwest.

The study area is dominated by silt and clay soils that support annual grassland in undeveloped areas, though extensive areas have been partially leveled and native soils have been replaced by soils suited for golf course landscaping. The fine-textured soils within natural and excavated concave areas support seasonal wetlands.

Lands to the north of the Study Area are mostly comprised of suburban residential development. To the east of the Study Area lies a corridor of open land owned by Pacific Gas and Electric Company (PGE). The property south and west of the study area includes more of the original golf course.

2.2.1 Site Conditions

Following the closure of the golf course in 2018, previously managed areas have been colonized by dense and tall stands of invasive weeds. Portions of the study area that were never maintained as golf course grounds are also fairly disturbed, either due to the planting of stands of exotic trees and shrubs, or due to a complete lack of grazing or other forms of management. The remnant intact drainages that flow through the golf course itself support a few riparian tree species, but these are



Legend

- Highway
- Road
- Stream
- Preserved Land or Public Property
- Water Body or Bayland
- Sub-basin Watershed (HUC08)*
- Major Watershed (HUC12)*

* HUC=Hydrologic Unit Code (from USGS GIS database, 2013))

Data Sources: TIGER, 2010 | City of Pittsburg, 2018
USGS, Various | | CPAD, 2014 | Landsat Imagery
Gap, 1998 | SFEI, 2015| USFWS, 2014 | VNLC, 2019
GIS/Cartography by R. Miller, January 2023
Map File: Vicinity_567_A-P_2023_0822.mxd

FIGURE 1
Regional Vicinity Map

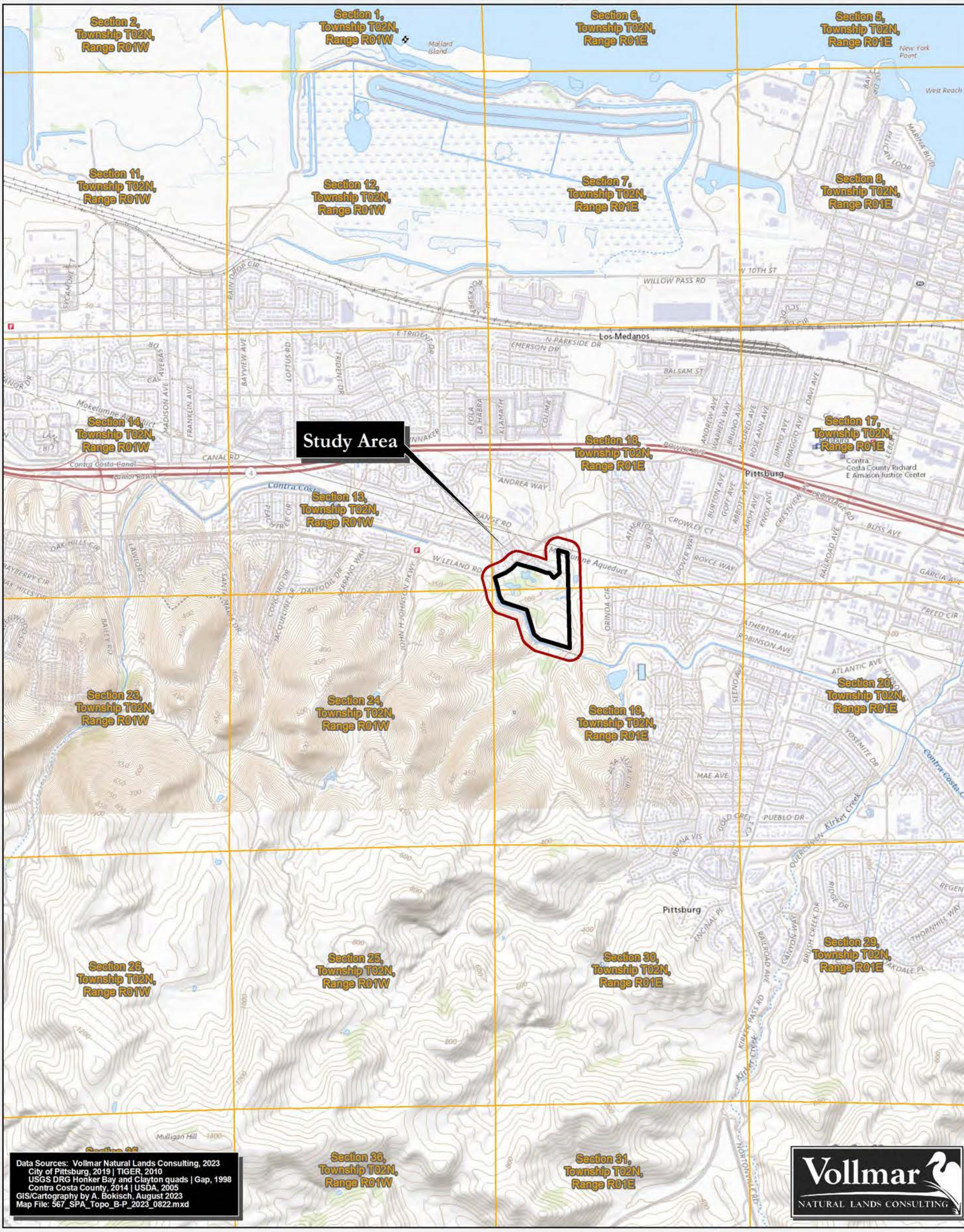
Pittsburg Technology Park Project Area
City of Pittsburg, California

N
W E
S

1:95,040
(1 in. = 1.5 miles, at letter-size layout)

0 0.5 1 2 Km

0 0.5 1 2 Miles



Vollmar
NATURAL LANDS CONSULTING

Legend

- Study Area (78.7 ac.)
- Project Area (38.0 ac.)
- Public Land Survey Boundary

FIGURE 2
USGS Topographic Map

Pittsburg Technology Park Project Area
City of Pittsburg, California

1:24,000
(1 in. = 2,000 ft. at tabloid layout)

0 500 1,000 Meters
0 1,000 2,000 4,000 Feet

widely scattered, include many exotic trees, and do not form contiguous riparian habitat. The drainage in the PGE land in the eastern portion of the Study Area (outside of the Project area) is a more developed stream corridor, with more evidence of active streamflow, and a better-developed riparian community (described in **Section 5**, below).

A vegetation fire occurred during the summer of 2022. The area that was burned is now coming back as non-native grasses and invasive weeds.

2.2.2 Site Hydrology

The study area is within the Kirker Creek-Frontal Suisun Bay Estuaries sub-basin watershed, which in turn is within the greater Suisun Bay watershed (USGS 2013) (**Figure 1**). There are no named streams within or immediately adjacent to the study area, but all drainages in the area discharge into the unnamed stream in the eastern portion of the Study Area, which in turn discharges into Suisun Bay. The Contra Costa Canal flows through the study area, bringing water to the East Bay from the Sierra Nevada Mountains (**Figure 1**).

2.2.3 Climate Conditions

The climate of the study area and surrounding vicinity is characterized as "Mediterranean," with cool, wet winters and warm, dry summers as well as high inter- and intra-annual variability in precipitation. On average, nearly 98% of precipitation occurs during the "wet season," from October through May. According to the Parameter-elevation Regression on Independent Slopes Model (PRISM) climate data model (2023), mean annual temperature at the study area from 1991 to 2020 is 60.2° Fahrenheit (F) and the mean annual precipitation is 18.1 inches. In contrast, mean precipitation along the coast, at approximately the same latitude and elevation, amounts to over 36 inches, and features a mean temperature of 56°. Areas of equal distance to the east experience less than half the annual precipitation than at the study area and are hotter on average, due to a complete lack of coastal influence.

The study area experienced higher than normal rainfall during the 2018-2019 wet season, with precipitation amounting to 21.7 inches—122% of normal. Based on the preceding three-month period, the 2019 fieldwork was conducted at a time where the prior period was normal, as indicated in **Table 1**.

Table 1. WETS Table Analysis for the April 2019 Survey

Precipitation Data from the Last 30 Years (1989 - 2019)[1]			Recent Field Conditions Compared to Precipitation Data from the Last 30 Years, and Analysis[1]					
Date	30th Percentile (inches)	70th Percentile (inches)	Date	Recorded Rainfall (inches)	Rainfall Condition Compared to Previous 30 Years[2]	Numeric Condition Value[3]	Weighting Factor[4]	Product of Condition Value and Weighting Factor[5]
Mar	0.79	2.27	Mar 2019	1.69	Normal	2	3	6
Feb	1.05	2.96	Feb 2019	3.82	Wet	3	2	6
Jan	1.03	3.57	Jan 2019	2.93	Normal	2	1	2
[1] Precipitation data was obtained from the Antioch Pumping Station #3 and Mt. Diablo Weather Stations. [2] Below 30th percentile = dry; between 30th and 70th percentile = normal; above 70th percentile = wet. [3] Relative rainfall conditions are then translated to a numeric condition value, as follows: dry = 1, normal = 2, wet = 3. [4] Greater weight is given to the most recent month as this would most likely influence what hydrologic or vegetative characteristics are observed. [5] The numeric condition value is then multiplied by the weighting factor, then the subtotals are added to get the total value. Total value equivalents: 6-9 = dry; 10-14 = normal; 15-18 = wet.							**TOTAL[5]**	14 or NORMAL

According to the PRISM climate data model, the total annual 2022 precipitation at the study area was 10.7 inches (59% of the 30-year normal precipitation). However, field conditions during the three months leading up to the 2022 field survey were considered wetter than normal due to above average precipitation in November, as indicated in **Table 2**.

Table 2. WETS Table Analysis for the December 2022 Survey

Precipitation Data from the Last 30 Years (1991 - 2022)[1]			Recent Field Conditions Compared to Precipitation Data from the Last 30 Years, and Analysis[1]					
Date	30th Percentile (inches)	70th Percentile (inches)	Date	Recorded Rainfall (inches)	Rainfall Condition Compared to Previous 30 Years[2]	Numeric Condition Value[3]	Weighting Factor[4]	Product of Condition Value and Weighting Factor[5]
Nov	0.51	1.41	Nov 2022	1.87	Wet	3	3	9
Oct	0	0.39	Oct 2022	0	Normal	2	2	4
Sep	0	0	Sep 2022	1.02	Wet	3	1	3
[1] Precipitation data was obtained from the Antioch Pumping Station #3 and Mt. Diablo Weather Stations. [2] Below 30th percentile = dry; between 30th and 70th percentile = normal; above 70th percentile = wet. [3] Relative rainfall conditions are then translated to a numeric condition value, as follows: dry = 1, normal = 2, wet = 3. [4] Greater weight is given to the most recent month as this would most likely influence what hydrologic or vegetative characteristics are observed. [5] The numeric condition value is then multiplied by the weighting factor, then the subtotals are added to get the total value. Total value equivalents: 6-9 = dry; 10-14 = normal; 15-18 = wet.							**TOTAL[5]**	16 or WET

According to the PRISM climate data model, the total precipitation for the wet season (October-April) preceding the 2023 field survey was 30.17 inches, 180% of the normal precipitation for that period. However, most of that precipitation fell during December, January, and March. Field conditions during the three months leading up to the 2023 field survey (April-June) were considered normal, as indicated in **Table 3**.

Table 3. WETS Table Analysis for the July 2023 Survey

Precipitation Data from the Last 25 Years (1999 – 2023)[1]			Recent Field Conditions Compared to Precipitation Data from the Last 30 Years, and Analysis[1]					
Date	30th Percentile (inches)	70th Percentile (inches)	Date	Recorded Rainfall (inches)	Rainfall Condition Compared to Previous 30 Years[2]	Numeric Condition Value[3]	Weighting Factor[4]	Product of Condition Value and Weighting Factor[5]
Jun	0	0.04	Jun 2023	trace	Normal	2	3	6
May	0.10	0.34	May 2023	0.46	Wet	3	2	6
Apr	0.33	1.36	Apr 2023	0.04	Dry	1	1	1
[1] Precipitation data was obtained from the Concord Buchanan Field Weather Station, due to the closure of the Antioch Pumping Station #3 Weather Station. [2] Below 30th percentile = dry; between 30th and 70th percentile = normal; above 70th percentile = wet. [3] Relative rainfall conditions are then translated to a numeric condition value, as follows: dry = 1, normal = 2, wet = 3. [4] Greater weight is given to the most recent month as this would most likely influence what hydrologic or vegetative characteristics are observed. [5] The numeric condition value is then multiplied by the weighting factor, then the subtotals are added to get the total value. Total value equivalents: 6-9 = dry; 10-14 = normal; 15-18 = wet.							**TOTAL**[5]	13 or NORMAL

2.3 Project Personnel

The initial wetland delineation in spring 2019 was conducted by VNLC Senior Ecologist Jake Schweitzer with assistance by VNLC Staff Ecologist Kristen Chinn, who conducted hydrologic studies in the study area. The updated wetland delineation in December 2022 was conducted by VNLC Senior Ecologist Eric Smith with assistance by VNLC Staff Ecologist Anton Bokisch. The delineation of the 250-foot buffer zone in July of 2023 was also conducted by VNLC Senior Ecologist Eric Smith and Staff Ecologist Anton Bokisch.

3.0 REGULATORY BACKGROUND

3.1 Federal Regulatory Framework

The federal government, through Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA), has jurisdiction over all Waters of the United States. Waters of the United States are divided into four subsets – territorial seas and traditional navigable waters (TNWs); tributaries to TNWs; lakes, ponds, and impoundments of TNWs; and wetlands adjacent to territorial seas and TNWs. Section 404 of the CWA regulates the discharge of dredged or fill material into Waters of the United States. The CWA grants dual regulatory authority of Section 404 to the U.S. Environmental Protection Agency (EPA) and USACE. The USACE is responsible for issuing and enforcing permits for activities in jurisdictional Waters in conjunction with prior permitting authorities in navigable Waters under the RHA of 1899. The EPA is responsible for providing oversight of the permit program. In this capacity, the EPA has developed guidelines for permit review (Section 404 [b][1] Guidelines) and has the authority to veto permits by designating certain sites as non-fill areas (Section 404[c] of the CWA). The EPA also has enforcement authority under Section 404. The USACE generally extends its jurisdiction to all areas meeting the criteria for Waters of the United States.

On May 25th, 2023, the U.S. Supreme Court issued a decision in *Sackett v. U.S. Environmental Protection Agency* which holds that the CWA extends only to wetlands that have a continuous surface connection with Waters of the United States. As of the date of this report, USACE has not yet issued new guidance for determining jurisdiction.

Projects which propose activities that fall under the jurisdiction of Section 404 of the CWA and/or Section 10 of the RHA must obtain approval from the USACE through the individual or nationwide permit (NWP) process. Individual permits entail a full public interest review that includes consultation with other federal and state agencies.

3.2 California State and Regional Regulatory Framework

<u>California Department of Fish and Wildlife</u>

The CDFW regulates river, stream, and lake habitats through Fish and Game Code section 1600 *et seq*. Fish and Game Code section 1602 requires an entity to notify the CDFW prior to commencing any activity that may do one or more of the following:

- Substantially divert or obstruct the natural flow of any river, stream, or lake;
- Substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or
- Deposit debris, waste, or other materials that could pass into any river, stream, or lake.

A “river, stream, or lake” includes those that are episodic (i.e., they are dry for periods of time) as well as those that are perennial. This definition includes ephemeral streams, desert washes, and watercourses with a subsurface flow (CDFW 2016). It may also apply to work undertaken within the floodplain of a body of water, the boundary of which may be identified as a topographic feature or as riparian vegetation. In addition, the CDFW does not distinguish between a “pond” and a “lake,” such that relatively small bodies of water, including both natural and artificial features, may be regulated under section 1600.

The CDFW requires a Lake and Streambed Alteration (LSA) Agreement when it determines that the activity, as described in a complete LSA Notification, may substantially adversely affect existing fish or wildlife resources (ibid). A LSA Agreement includes measures necessary to protect existing fish and wildlife resources. The CDFW may suggest ways to modify a project that would eliminate or reduce harmful impacts to fish and wildlife resources. Before issuing a LSA Agreement, CDFW must comply with the California Environmental Quality Act (CEQA).

Regional Water Quality Control Board

The study area is located within the San Francisco Bay (Region 2) Regional Water Quality Control Board, which has authority to regulate projects that could potentially impact wetlands and/or other Waters. According to the California State Water Resources Control Board (2006), this authority derives from the following:

- The state’s Porter-Cologne Water Quality Control Act through Waste Discharge Requirements to protect Waters of the state;
- The CWA under Section 4013;
- Governor’s Executive Order W-59-93 (i.e., the “California Wetland’s Policy” which requires “No Net Loss of Wetlands”);
- Senate Concurrent Resolution No. 28; and
- California Water Code Section 13142.5 (applies to coastal marine wetlands).

In addition to the state directives to protect wetlands, for individual permits (but not NWPs), the Basin Plan also directs the Water Board staff to use the EPA’s CWA 404(b)(1) guidelines to determine circumstances under which the filling of wetlands may be permitted and requires that attempts be made to avoid, minimize, and only lastly to mitigate for adverse impacts (ibid).

California’s jurisdiction to regulate its water resources is much broader than that of the federal government. While the U.S. Supreme Court’s 2001 decision in SWANCC vs. U.S. Army Corps of Engineers (the “SWANCC” Decision) called into question the extent to which the federal government may regulate isolated, intrastate, non-navigable waters as “Waters of the United States” under the CWA, state law is unaffected by that decision. The State Water Resource Control Board’s (State Water Board’s) Executive Director issued a memorandum directing the Regional Water Boards to regulate such waters under Porter-Cologne authorities. Porter-Cologne extends to “Waters of the State,” which is broadly defined as “any surface water or groundwater, including saline waters, within the boundaries of the state.” This definition includes isolated wetlands and any action that may impact isolated wetlands is subject to the Water Board's jurisdiction, which may include the issuance of Statewide General Waste Discharge Requirements (WDRs). For projects that will impact less than 0.2 acres of "isolated" wetlands, the State Water Board issues Order No. 2004-004-DWQ, WDRs for Dredged or Fill Discharges to Waters Deemed by the U.S. Army Corps of Engineers to be Outside of Federal Jurisdiction (General WDRs). These General WDRs streamline the permitting process for low impact projects in isolated wetlands (ibid).

Activities or discharges from a project that could affect California's surface, coastal, or ground waters, require a permit from the local RWQCB. Discharging pollutants (or proposing to) into surface water requires the applicant to file a complete National Pollutant Discharge Elimination System permit application form with the RWQCB. Other types of discharges, such as those affecting groundwater or from diffused sources (e.g., erosion from soil disturbance or waste discharges to land) are handled by filing a Report of Waste Discharge with the RWQCB in order to obtain WDRs. For specified situations, some permits may be waived, and some discharge activities can be handled through enrollment in an existing general permit (ibid). The State is currently in the process of adopting updated Dredge and Fill procedures, which became effective May 28, 2020. These changes modify the current State definition and jurisdictional determination of State wetlands.

3.3 Local Regulatory Framework

The proposed Project is within the coverage area of the ECCHCP/NCCP. The HCP is a regional Habitat Conservation Plan/Natural Community Conservation Plan. The function of the HCP is to provide a coordinated process for projects within its coverage area to obtain biological resource permit coverage and mitigate for their impacts. The HCP is administered by the East Contra Costa County Habitat Conservancy, a Joint Powers Authority created for this purpose. Contra Costa County, and the Cities of Brentwood, Clayton, Oakley, and Pittsburg, have all passed ordinances requiring development projects to comply with the HCP.

The HCP provides projects with CWA Section 404 permit coverage via Regional General Permit 1 for Minimal Impact Activities in East Contra Costa County, California ("RGP-1", SPK-2001-00147). The HCP also provides projects with coverage for incidental take of species listed under the Endangered Species Act and California Endangered Species Acts by way of programmatic permits issued by USFWS and CDFW.

RGP-1 applies to many types of projects within the Urban Limit Line of Contra Costa County or inside the City Limits of the Cities of Brentwood, Clayton, Oakley, and Pittsburg, including, but not limited to, residential, commercial, industrial, institutional, and other urban developments. The loss of waters of the US (including wetlands) resulting from individual projects under RGP-1 may not exceed a total of 1.5 acres or more than 300 linear feet of perennial, intermittent or 3rd or higher order ephemeral streams, unless the linear foot limit is waived in writing by the Corps.

Covered projects must be a single and complete project. Other conditions and requirements also apply.

The Project Area is entirely within the City and County urban limit lines, and within the Initial Urban Development Area defined by the HCP (ECCHC 2007). This places it within the coverage area for HCP permits.

4.0 METHODS

4.1 Preliminary Review and Field Preparation

Prior to conducting the initial and updated field delineation, the VNLC project ecologists reviewed site aerial photography, topographic data, existing preliminary wetland and watershed mapping, geology maps, and soil survey maps of the study area and surrounding areas. This information was used to help characterize the study area, identify any potential Waters of the United States on a preliminary basis, and guide the on-site survey. Background imagery and a project boundary map were loaded on to a professional GPS (Trimble GeoXH 6000 or Geo7x) for use in navigation and mapping in the field.

4.2 Field Survey

The initial delineation field survey was conducted on April 19, 2019. The updated delineation field survey was conducted on December 2, 2022. The final delineation was conducted on July 10, 2023. During the initial survey, the ecologists walked the entire study area, established delineation data points, recorded additional notes on plant community and site characteristics, and took representative photographs of habitats and features of interest. During the updated survey, ecologists walked the entire study area, re-sampled a subset of the original delineation points, recorded notes on plant community changes and updated site characteristics, and took representative photographs of habitats and features of interest. The 2022 survey focused on previously established delineation points which fell within the burned portion of the study area. During the 2023 survey, ecologists established new delineation points within the 250-foot buffer around the boundary of the study area, took photos of habitats and features of interests, and recorded notes on the changes within the plant community and site characteristics.

Section 5.0 below presents summaries of the notes recorded during the field surveys. A total of 11 delineation data points (seven wetland delineation data points and four Ordinary High Water Mark, or OHWM, delineation data points) were established in the study area within representative wetland habitat types. Four of these data points were established during the initial field survey. Two of these points were re-sampled during the 2022 survey, and one data point was additionally established during the 2022 field survey in order to characterize the wetland feature conditions. Two wetland delineation data points, and four OHWM data forms were added in 2023 to delineate new wetland features. Copies of wetland delineation data and OHWM forms are provided in **Appendix D**.

At each data point, data were collected on soils, hydrology, and plant cover following the Routine Wetland Determination Method developed by the USACE and described in the 1987 USACE Wetlands Delineation Manual (Environmental Laboratory 1987) and the Interim regional supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Delineation points were established as pairs, with one in the wetland or other Water habitat, and one in the adjacent upland habitat. If a given point established that a habitat type was upland, no additional point was established, because there was no need to delineate a habitat boundary. All potential jurisdictional Waters that were identified were mapped using a professional GPS unit (Trimble GeoXH 6000 or Trimble Geo 7x) with sub-meter precision.

The specific methods for collecting data on soils, hydrology, and plant cover at delineation data points are described below.

4.2.1 Soils

Prior to the site surveys, the U.S. Department of Agriculture (USDA) Soil Conservation Service database was consulted to identify soil map units found within the Study Area. During site surveys, soil profiles were taken at each data point using a tile spade shovel and/or a mattock (for difficult digging situations). Soils were examined for positive hydric soil indicators such as low matrix chromas, redox features, gleys, and iron and manganese concretions. The color and texture of the soil layers encountered were recorded on the delineation forms. A standardized soil texture chart used by the California Native Plant Society (CNPS) for assessing soils (adapted from Brewer and McCann 1982) was used to determine texture (e.g., clay versus clay loam, etc.). Soil color was identified using a Munsell soil color chart (Kollmorgen 2000). All soil samples were moistened before determining the color. Soil map units were cross-referenced with the California hydric soils list (SCS 1993) and the national hydric soils list (SCS 1991). Determination of whether or not the hydric soil criterion was met was based upon the criteria specified by the National Technical Committee for Hydric Soils (ibid), and informed by additional information provided by the US Department of Agriculture Natural Resource Conservation Service (USDA-NRCS 2018).

4.2.2 Hydrology

Indicators of wetland hydrology were noted, such as the presence of drainage patterns, surface soil cracks, saturated soil, water-stained leaves or vegetation, and deep cattle hoof prints. Hydrological connectivity was investigated throughout the study area and surrounding habitats. It should be noted that some wetlands in the Arid West region periodically lack indicators of wetland hydrology. If a given theoretical location is in a geomorphic position where a wetland could occur, but the site visit was during the dry season (i.e., June to October), followed by a period of 2-3 months of below-normal rainfall, or was during a year of an unusually low winter snowpack, indicators of wetland hydrology might not be present. According to the Arid West Supplement, “under these conditions, a given theoretical location that contains hydric soils and hydrophytic vegetation and no evidence of hydrologic manipulation should be considered a wetland" (USACE 2008). Part of the delineation was conducted during the late spring season during a wet season that resulted in normal wetland habitat conditions (see **Section 2.2** above).

4.2.3 Vegetation

At each delineation data point, all herbaceous plant species within a five-foot radius were identified and a visual estimate of percent coverage for each species was recorded. The nearest trees and shrubs were accounted for at distances of 25 and 15 feet, respectively. Plant species and strata cover estimations were calibrated using CNPS percent cover templates—see the following website: http://www.cnps.org/cnps/vegetation/pdf/percent_cover_diag-cnps.pdf.

The indicator status of each species was then checked using the most recent USACE National Wetland Plant List—Version 3.5 (Lichvar et al. 2020). Indicator status categories are as follows:

OBL = obligate wetland; >99% probability of occurring in a wetland
FACW = facultative wetland; 67%-99% probability of occurring in a wetland
FAC = facultative; 33%-67% probability of occurring in a wetland
FACU = facultative upland; 1%-33% probability of occurring in a wetland
UPL = obligate upland; <1% probability of occurring in a wetland
NI = no indicator, insufficient information available to determine indicator status
NL = not listed (plants not listed in Lichvar et al. [2020], including some known to occur occasionally or primarily in wetlands)

The wetland plant cover criterion is met when the vegetation passes the dominance test: greater than 50 percent of the dominant plants are designated as OBL, FACW, or FAC wetland indicators. The USACE defines dominant plant species as those that, when included in descending order of their percent cover, together sum up to 50 percent of the total cover in their stratum (tree, sapling/shrub/subshrub, herb, or woody vine). In addition, all species with at least 20 percent coverage of the total canopy within a stratum are always counted as dominants. All scientific and common plant names correspond to Baldwin et al. (2012) and/or the Calflora database (2023).

If the dominance test is not passed, vegetation can be considered hydrophytic if it meets the requirements of the prevalence index, morphological adaptations, or problematic wetland situations (USACE 2008).

5.0 RESULTS

5.1 Overview

The delineation identified a total of 1.990 acres of potentially jurisdictional aquatic resources within the 78.7-acre study area. Additionally, the delineation identified 3.312 acres of artificial features constructed within uplands within the study are, including the Contra Costa Canal and golf course ponds. **Table 4**, below, lists the habitat types, Cowardin code, location, and acreage of each feature mapped within the study area. **Figure 3**, below, display the mapped aquatic resources within the study area. Representative photographs of study area habitats and features taken during the initial field study on April 19, 2019, are provided in **Appendix A**. Representative photographs taken during the updated field survey on December 2, 2022, are provided in **Appendix B**. Representative photographs taken during the field study on July 10, 2023 are provided in **Appendix C**. Copies of all wetland delineation data and OHWM forms, of which there are 11, are provided in **Appendix D**. A list of all plant species identified within the study area is provided in **Appendix E.**

5.2 Wetland Ecology of the Study Area

The soils, hydrology, and vegetation of the potentially jurisdictional aquatic features and the uplands found within the study area are described below. Artificial features constructed entirely in uplands are described in **Section 5.3**.

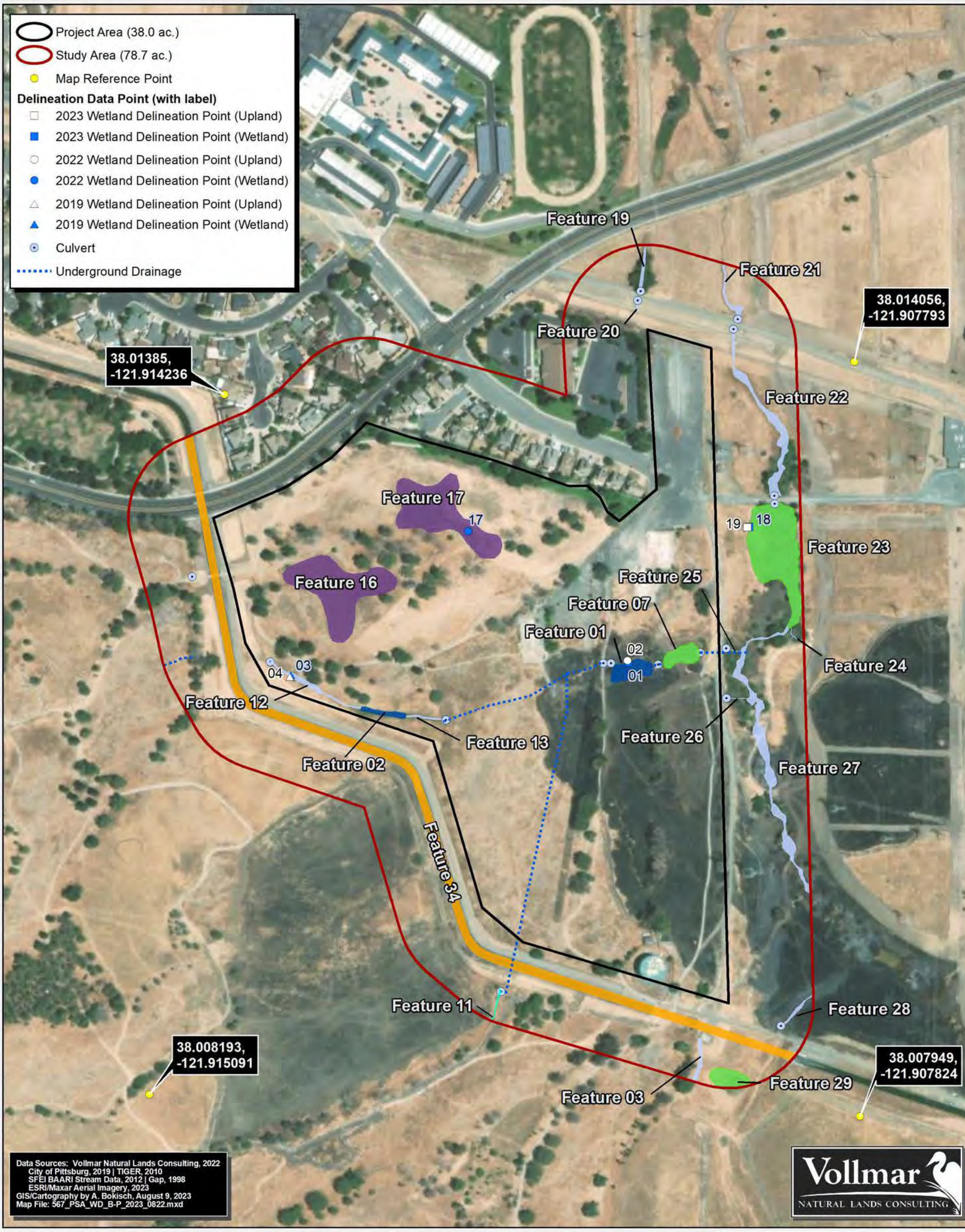
5.2.1 Soils

Soil Map Unit Types: Three soil units are mapped within the study area, including Capay clay (45.6% of the study area), Altamont clay (11.3%), and Rincon clay loam (43.1%). All of these are residuum or alluvium derived from sedimentary rocks, primarily sandstone and shale. The pH of the soils is generally neutral to slightly alkaline, with pH values ranging from 6.8 to 7.5 in the top 24 inches (USDA-NRCS 2023). Though none of these are rated as hydric soils, all of them consist of high amounts of clay materials, ranging from 35% to 51% clay (ibid). Clay soils are fairly poorly drained and concave areas within the study area tend to support at least some hydrophytic vegetation.

Figure 4, below, displays the soil map units found in the study area, and their . **Table 5**, below, displays the soil map units identified within the study area.

Table 4. Potential Jurisdictional Waters and Other Features within Study Area

Aquatic Resource Name	Cowardin Code	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)	Aquatic Resource Size (Acre)	Aquatic Resource Size (Linear Feet)
Seasonal Wetland Drainage					
Feature 3	R4	38.005955	-121.910255	0.036	1,953
Feature 12	R4	38.011491	-121.913394	0.069	498
Feature 13	R4	38.011220	-121.912240	0.014	308
Feature 22	R4	38.013529	-121.908691	0.213	561
Feature 24	R6	38.012536	-121.908612	0.003	67
Feature 25	R6	38.011846	-121.908432	0.002	43
Feature 26	R6	38.011734	-121.909060	0.003	59
Feature 27	R4	38.011344	-121.909037	0.353	951
Feature 28	R6	38.010883	-121.908724	0.021	132
Seasonal Wetland Drainage Total				**0.714**	**4,573**
Perennial Wetland within Drainage					
Feature 1	PEM	38.011581	-121.910111	0.129	N/A
Feature 2	PEM	38.011259	-121.912637	0.040	N/A
Perennial Wetland within Drainage Total				**0.169**	**N/A**
Seasonal Wetland within Drainage					
Feature 7	PEM	38.011693	-121.909588	0.114	N/A
Feature 23	PEM	38.012536	-121.908612	0.789	N/A
Feature 29	PEM	38.008226	-121.909148	0.124	N/A
Seasonal Wetland within Drainage Total				**1.027**	**N/A**
Other Waters (unvegetated channel)					
Feature 11	R4	38.008849	-121.911560	0.008	134.3
Feature 19	R4	38.014814	-121.909945	0.028	136.1
Feature 20	R4	38.014536	-121.910010	0.006	42.9
Feature 21	R4	38.014573	-121.909040	0.040	190.0
Other Waters (unvegetated channel) Total				**0.081**	**503**
Potentially Jurisdictional Aquatic Resources Total				**1.990**	**5,076**
Artificial Features Constructed in Uplands					
Golf Course Landscape Pond					
Feature 16	PUB	38.012259	-121.913092	0.874	N/A
Feature 17	PUB	38.012862	-121.912026	0.799	N/A
Golf Course Landscape Pond Total				**1.673**	**N/A**
Canals					
Feature 34	R4	38.010423	-121.912141	1.639	2,889
Canals Total				**1.639**	**2,889**
Artificial Features Constructed in Uplands Total				**3.312**	**2,889**
Grand Total				**5.302**	**7,965**



Legend

Wetlands, Drainages, and Other Waters (2023)

Aquatic Resource Habitat Type

- Seasonal Wetland Drainage (0.714 ac.)
- Perennial Wetland within Drainage (0.169 ac.)
- Seasonal Wetland within Drainage (1.027 ac.)
- Unvegetated Channel (0.081 ac.)

Artificial Features Constructed in Uplands

- Golf Course Landscape Pond (1.673 ac.)
- Canals (1.639 ac.)

FIGURE 3
Potential Jurisdictional Aquatic Resources

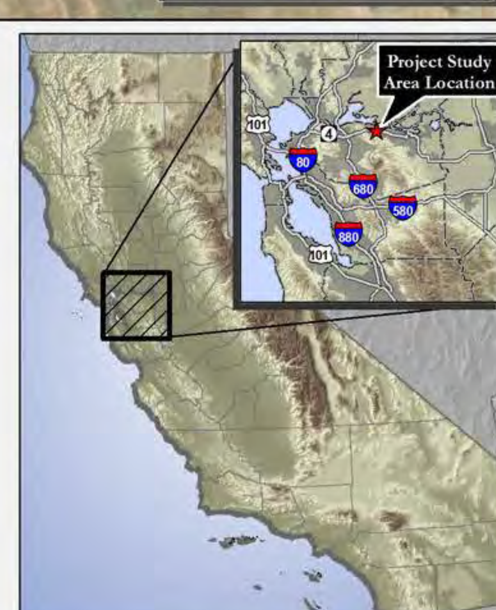
Pittsburg Technology Park Project Area
City of Pittsburg, California

N W E S

1:3,500
(1 in. = 292 ft. at tabloid layout)

0 100 200 Meters

0 200 400 800 Feet



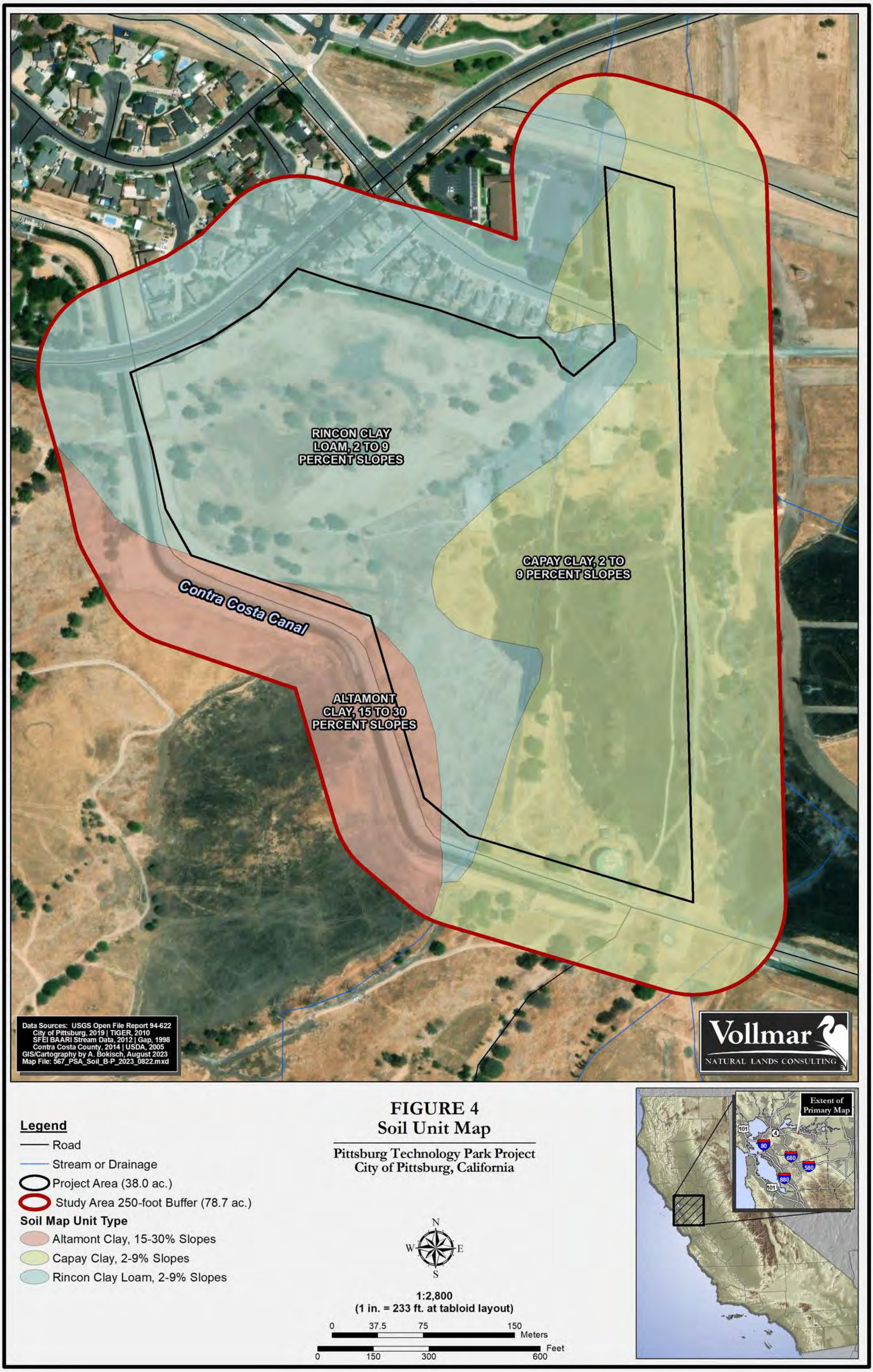


FIGURE 4
Soil Unit Map

Pittsburg Technology Park Project
City of Pittsburg, California

Table 5. Soil Map Units Identified Within the Study Area

Soil Map Unit Name	Hydric Rating	Acres Within Study Area	Percent of Study Area
Altamont clay, 15 to 30 percent slopes	Not Hydric	8.9	11.3%
Capay clay, 2 to 9 percent slopes	Not Hydric	35.9	45.6%
Rincon clay loam, 2 to 9 percent slopes	Not Hydric	33.9	43.1%

Source: USDA Web Soil Survey (USDA-NRCS 2023).

Hydric Soil Indicators: During the initial delineation in 2019, soils observed at wetland soil pits were consistently within the fairly yellow 10YR and 2.5Y hues and were generally dark or with a depleted matrix, and with low chromas (of 1 or 2) within the Munsell soil color chart (2000). Redox features were present and with high contrast. Upland habitat soils were similar but often slightly less dark, with values between 1-2. Significant soil cracking was noted across much of the study area, but particularly within the wetland habitats. As noted above, soils throughout portions of the study area that were developed as the golf course consist of imported soils overlain on top of the native soil. The imported soils include sandy materials and were imported to support turf grass, and apparently do not readily support native hydrophytic plant species.

During the 2022 field survey, typical wetland soils consisted of clay or clay loam with matrix values ranging from 10YR 2/1, 10YR 3/1-3/2, or 10YR 4/1-4/2 with 2-10% prominent redox concentrations ranging from 2.5YR 5/4, 7.5YR 5/8, 5YR 3/4-5/8, or 10YR 5/6. Wetland soil textures also included silty clay loam, sandy loam, and silty clay. Redox features occurred as concentrations within the pore linings. In contrast, the upland soils consisted of loam, silt loam, or clay loam with matrix values of 10YR 2/1, 3/1, or 3/2. In upland soils, redox features were absent or at low concentrations which did not qualify for hydric soil indicators.

During the 2023 field survey wetland soils consisted of clay with a matrix value of 10YR 3/2 and 5% prominent redox concentrations of 5YR 4/6. Wetland soil textures were a fine clay. Redox features occurred as pore linings. The upland soil was recorded as clay with a matrix value of 10YR 3/1. Redox features were absent in the upland point, not qualifying it as a hydric soil indicator.

Some unvegetated channel features lacked hydric soil indicators; these features were treated as other waters (unvegetated channel) due to the presence of an OHWM, and indications that the features convey water for significant intervals throughout the wet season. Features which lacked hydric soil or other wetland indicators, and also lacked indicators of significant flow, were treated as non-wetland swales, and not delineated as aquatic resources.

5.2.2 Hydrology

The study area is situated along the lower slopes of the Los Medanos Hills. The general hydrologic pattern of the study area is that of drainage from the hills into the third-order stream at the eastern edge of the study area, and thence north, toward the Suisun Bay. The Suisun Bay, in turn, drains into San Pablo Bay via the Carquinez Strait, which ultimately drains into the Pacific Ocean through the Golden Gate.

Drainages: Several drainages that conduct water from the surrounding hill slopes run through the study area. The drainages are second or third order (Strahler), but for the most part do not feature bed and bank topography. Four small drainages (**Features 11**, **19**, **20**, and **21**), however, do feature bed and bank topography, but lack vegetation. Several natural and artificial basins retain water from the drainages, forming seasonal wetlands (**Features 7**, **23**, and **29**) or perennial wetlands (**Features 1** and **2**).

Underground Drainages: Long stretches of several low-order drainages have been re-routed underground, and had their surface topography leveled to suit the needs of the golf course (**Figure 3**). Several surface water drainage inlet features were observed within areas of concave topography that appeared to be altered swales, and water flow has been carefully managed via a system of pipes and culverts that conduct most of the flow underground. Because of their condition as undergrounded pipes, it is impossible to accurately map these features, or characterize their hydrology.

Hydrology Indicators: During the 2019 field study, indicators of wetland hydrology within wetlands included soil cracks, drainage patterns, water-stained vegetation and thatch, and surface water presence. During the 2022 field survey, surface soil cracks were the only wetland hydrology indicators present within wetlands. Most of the upland delineation points had no hydrology indicators present. One upland delineation point (09) contained remnant clam shells from the area’s former use as a golf course pond; this upland delineation point did not contain hydrophytic vegetation or hydric soil indicators. During the 2023 field survey, indicators of wetland hydrology included soil cracks, drainage patterns, and racking/deposited vegetation. No other hydrology indicators were observed outside of wetlands and other Waters.

5.2.2.1 Artificial Features Constructed Entirely Within Uplands

Three aquatic features are present in the study area which were constructed entirely within uplands, do not impound the flow of a natural Water, and do not replace the original channel of a natural water. Because of these conditions, we do not consider these features to meet the criteria for jurisdictional waters of the U.S.

Golf Course Ponds: Two golf course landscape ponds (**Features 16** and **17**) were excavated within uplands in the study area. Following the closure of the course, these ponds appear to have transitioned into seasonal, rain-fed features.

Contra Costa Canal: The Contra Costa Canal is an aqueduct constructed in the 1930s and 1940s as part of the Bureau of Reclamation's Central Valley Project. The Bureau of Reclamation uses it to deliver Central Valley Project water from the Sacramento-San Joaquin Delta near Knightsen to the Contra Costa Water District, which delivers the water to customers in the east bay. This east-west flow along the southern edge of the Delta and Suisun Bay is not characteristic of any historical flow regime; it represents artificial delivery of water through a system of created canals and pumps.

5.2.3 Vegetation

A list of all plant species identified within the study area is provided in **Appendix E**. Descriptions of dominant vegetation within the survey area habitats is provided below. During the 2019 field survey, the vegetation within mapped features generally varied as a function of ponding duration, amount of scouring from water flow, and/or degree of water turbidity.

Unvegetated or Sparsely Vegetated Features: The golf course landscaping ponds (**Features 16-17**, **Figure 3**) were sparsely vegetated during the 2019 field surveys as result of long ponding duration and/or high water turbidity. **Features 11**, **19**, **20**, and **21** (mapped as other Waters, **Figure 3**) were narrow channels where scouring had limited plant growth. Most of the remaining features held water for only short periods or had sufficiently clear and/or shallow water that enabled relatively dense plant growth.

During the 2022 field survey, the golf course landscaping ponds were again sparsely vegetated with hydrophytic vegetation, including common knotweed (*Persicaria lapathifolia*) [FACW] and Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*) [FAC] (see delineation point 17, taken within **Feature 17**). No substantial changes to **Feature 11** (mapped as other Waters) were noted during the 2022 field survey updates.

Seasonally Inundated Features: Most of the vegetated basins and drainages mapped within the study area were dominated by seasonal wetland vegetation during the 2019 field survey. Seasonal wetland features were mapped within isolated basins and seasonal wetland swales occurred within drainage corridors. Dominant plant species recorded within seasonal wetlands and seasonal wetland swales consisted of Italian ryegrass (*Festuca perennis*) [FAC], Mediterranean barley [FAC], bristly ox-tongue (*Helminthotheca echioides*) [FAC], and green dock (*Rumex conglomeratus*) [FACW]. Native species observed during the 2019 field survey were limited to small stands of generalist species such as tall nutsedge (*Cyperus eragrostis*) [FACW], cocklebur (*Xanthium strumarium*) [FAC], and beardless wild rye (*Elymus triticoides*) [FAC].

During the 2022 field survey, seasonally inundated features were dominated by facultative wetland species and invading upland species. Dominant species observed in seasonally inundated features included Italian ryegrass [FAC], Mediterranean barley [FAC], and black mustard (*Brassica nigra*) [NL], with some ripgut brome (*Bromus diandrus*) [NL]. Grass cotyledons which were too immature for a positive identification were also observed. The dry conditions on site during 2022 likely decreased inundation periods within the seasonal wetlands and seasonal wetland swales and allowed the invasion of the upland species.

During the 2023 field survey, seasonally inundated features were dominated mostly by the same set of species that were observed during the 2022 field survey. These species include Italian ryegrass [FAC], Mediterranean barley [FAC], black mustard (*Brassica nigra*) [NL], and ripgut brome.

Perennially Inundated Features: **Features 1** and **2** supported wetland vegetation characteristic of perennially saturated soils during the 2019 field surveys. These two features supported dense stands of broadleaf cattail (*Typha latifolia*) [OBL] and, along the basin edges, many of the same plants occurring within the seasonal wetland features. As noted above in **Section 5.2.2**, the hydrology of the swale in which both of these two features occur appeared to be enhanced by a leak in the Contra Costa Canal.

During the 2022 field survey, **Features 1** and **2** were dominated by facultative wetland vegetation, including dallis grass (*Paspalum dilatatum*) [FAC], with some curly dock (*Rumex crispus*) [FAC] and Himalayan blackberry (*Rubus armeniacus*) [FAC]. The dry conditions on site during 2022 likely favored the shift within the vegetation community towards facultative wetland species. These features remain classified as perennial wetlands because they would be perennially inundated during a non-drought year.

Intermittently Flowing Features: The stream along the eastern edge of the study area supported a mix of mostly facultative wetland vegetation such as curly dock, Himalayan blackberry, and cocklebur during the 2023 survey, while narrower and deeper portions of the channel were occasionally scoured and unvegetated.

Tree Species: Tree species occurring within and along the edges of the basins and drainages during the 2019 field survey were limited to a few scattered Fremont cottonwood (*Populus fremontii*) [FACW], willows (*Salix* spp.) [FACW], Mexican fan palm (*Washingtonia robusta*) [FACW], and gum trees (*Eucalyptus* spp.) [NL]. Mexican fan palm were again observed during the 2022 field surveys within a seasonal wetland. The intermittent stream at the eastern edge of the study area supports occasional Fremont cottonwood, boxelder (*Acer negundo*) [FACW], though they showed signs of drought stress during the 2023 survey (**Feature 3**, **Figure 4**; see **Appendix B**).

Upland Habitats: Upland habitats within the study area were dominated by a mix of non-native plant species and more localized native species. A wide variety of horticultural plants had been propagated and maintained as part of the golf course development. Horticultural woody species observed during the 2019 delineation survey included weeping willow (*Salix babylonica*) [FAC], shamel ash (*Fraxinus uhdei*) [NL], Italian stone pine (*Pinus pinea*) [NL], deodar cedar (*Cedrus deodara*) [NL], and several species of gum tree (*Eucalyptus* spp.) [NL]. Some native woody species were also observed, including a few interior live oaks (*Quercus wislizeni*) [NL] and valley oaks (*Q. lobata*) [FACU]. However, early aerial photography of the area suggests these species may not have existed in the area prior to the golf course.

During the 2019 field surveys, the upland herb layer of the study area had undergone dramatic changes following the closure of the golf course. Imported soils that were once intensively managed to maintain turf grass had been colonized by a variety of invasive weeds, including Italian thistle (*Carduus pycnocephalus*) [NL], prickly wild lettuce (*Lactuca serriola*) [FACU], black mustard [NL], and common sow-thistle (*Sonchus oleraceus*) [UPL]. At the time of the 2019 delineation survey these invasive species had formed extensive dense and tall stands within the study area. Along the hill slopes adjacent to the golf course, where native soils remained intact, many of these same invasive species were present along with high covers of annual grasses. Hill slopes outside of the golf course within the study area were grazed by cattle and thus supported notable stands of native wildflowers along with annual grasses during the 2019 field survey.

During the 2022 and 2023 field surveys, upland habitats were again dominated by upland species and invasive weeds. Dominant species observed in upland habitats in both 2022 and 2023 included black mustard [NL], foxtail barley (*Hordeum murinum*) [FACU], cheeseweed (*Malva parviflora*) [NL], mustard (*Hirschfeldia incana*) [NL], milk thistle (*Silybum marianum*) [NL], and ripgut brome [NL].

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APPENDIX A:

REPRESENTATIVE PHOTOGRAPHS OF THE STUDY AREA

(Recorded during the initial field survey, April 19, 2019)

Appendix A: Representative Photographs (April 19, 2019)

Feature 7. Seasonal Wetland within swale, facing northwest.

Feature 1. Perennial Wetland within Swale. Facing Northwest

Appendix A: Representative Photographs (April 19, 2019)

Feature 2. Perennial Wetland within Swale. Enhanced by leak in canal. Facing Southwest

Feature 12. Seasonal Wetland Swale (Delineation Point 03). Facing Southeast

Appendix A: Representative Photographs (April 19, 2019)

Hydric Clay Soils from **Feature 12**

Feature 16. Golf Course Landscape Pond. Facing North

Appendix A: Representative Photographs (April 19, 2019)

Feature 11. Un-vegetated Channel (other Waters). Facing Northeast

Feature 3. Seasonal Wetland Swale. Facing North

Appendix A: Representative Photographs (April 19, 2019)

Representative Upland Habitat—Planted Trees and Ruderal Grassland. Facing North

APPENDIX B:

REPRESENTATIVE PHOTOGRAPHS OF THE STUDY AREA

(Recorded during the field survey updates, December 2, 2022)

Appendix B: Representative Photographs (December 2, 2022)

Photo 1. Representative photo of study area conditions.

Photo 2. Aerial drone photo showing burned area, facing east.

Appendix B: Representative Photographs (December 2, 2022)

Photo 3. Aerial drone photo showing burned area, facing southeast.

Photo 4. Representative wetland soil at data point 17 showing prominent redox features.

Appendix B: Representative Photographs (December 2, 2022)

Photo 5. View of **Feature 1**, Perennial Wetland within drainage, facing west.

Photo 6. View of **Feature 1**, Perennial Wetland within drainage, facing north.

Appendix B: Representative Photographs (December 2, 2022)

Photo 7. Representative view of Mexican fan palms within **Feature 3**.

Photo 8. View of burned area, facing east.

APPENDIX C:

REPRESENTATIVE PHOTOGRAPHS OF THE STUDY AREA

(Recorded during the field survey, July 10, 2023)

Appendix C: Representative Photographs (July 10, 2023)

Photo 1. OHWM at **Feature 22** (southern extent). Facing North

Photo 2. Pulaski tool at OHWM at **Feature 23**. Facing South

Appendix C: Representative Photographs (July 10, 2023)

Photo 3. OHWM at **Feature 22** (northern extent). Facing North

Photo 4. Tools along OHWM of **Feature 22**. Facing South

APPENDIX D:

WETLAND DELINEATION AND OHWM DATA FORMS

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: P tts ur t Ce ter   City/County: P tts ur Co tr Cost   Sampling Date: [illegible]

Applicant/Owner: P   State: C   Sampling Point: d ted

Investigator(s): r c t LC   Section, Township, Range: Los ed os L d r t

Landform (hillslope, terrace, etc.): d e o w e   Local relief (concave, convex, none): Co e   Slope (%): [illegible]

Subregion (LRR): C ed terr e C or   Lat: [illegible]   Long: [illegible]   Datum: [illegible]

Soil Map Unit Name: C C to erce t s o es   NWI classification: [illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [X] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )
Is the Sampled Area within a Wetland?	**Yes** (●)	**No** ( )

Remarks:

e s e o wet d d t o t co ected e c we t er LC. Pur ose s to co r co d t o s.
e et t o d stur ce re ur ed ro te o t s o.

EGETATION - Use scientific names of plants.

Tree Stratum Plot size: 25 feet	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum Plot size: 5 feet			
1. *Paspalum dilatatum*		es	c
2. *Rumex crispus*		o	c
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum Plot size:			
1. *Rubus armeniacus*		es	c
2.			
Total Cover:			

% Bare Ground in Herb Stratum 63   % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: (A)

Total Number of Dominant Species Across All Strata: (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic egetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic egetation Present? Yes (●) No ( )

Remarks:

e et t o s dro t c.

SOIL

Sampling Point: [illegible]

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	PL	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	PL	[illegible]	[illegible]

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [X] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: [illegible]

Depth (inches): [illegible]

Hydric Soil Present? Yes (●) No (○)

Remarks:

[illegible]
Pro[illegible]e[illegible]t redo[illegible]e[illegible]tures o[illegible]ser[illegible]ed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [X] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes (○) No (●) Depth (inches): [illegible]

Water Table Present? Yes (○) No (●) Depth (inches): [illegible]

Saturation Present? (includes capillary fringe) Yes (○) No (●) Depth (inches): [illegible]

Wetland Hydrology Present? Yes (●) No (○)

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

[illegible]

Remarks:

[illegible]ur[illegible]ce so[illegible]cr[illegible]c[illegible]s o[illegible]ser[illegible]ed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: P tts ur t Ce ter   City/County: P tts ur Co tr Cost   Sampling Date: [illegible]

Applicant/Owner: P [illegible]   State: C   Sampling Point: d ted

Investigator(s): r c t LC   Section, Township, Range: Los ed os L d r t

Landform (hillslope, terrace, etc.): o e w e   Local relief (concave, convex, none): Co c e   Slope (%): [illegible]

Subregion (LRR): C ed terr e C or   Lat: [illegible]   Long: [illegible]   Datum: [illegible]

Soil Map Unit Name: C C to erce t s o es   NWI classification: [illegible]

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☒ Soil ☐ or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	○	◉
Hydric Soil Present?	○	◉
Wetland Hydrology Present?	○	◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:

e s e o wet d d t o t co ected e c we t er LC. Pur ose s to co r co d t o s.
e et t o d stur ce re ur ed ro te o t s o.

VEGETATION - Use scientific names of plants.

Tree Stratum Plot size: 25 feet	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
Total Cover:	[illegible]		
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	[illegible]		
Herb Stratum Plot size: 5 feet			
1. *Brassica nigra*	[illegible]	es	ot L sted
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	[illegible]		
Woody Vine Stratum Plot size:			
1. *N/A*			
2.			
Total Cover:	[illegible]		

% Bare Ground in Herb Stratum 97 %   % Cover of Biotic Crust 0 %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: [illegible] (A)

Total Number of Dominant Species Across All Strata: [illegible] (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: [illegible] (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

dro t c e et t o s ot rese t.

SOIL

Sampling Point: [illegible]d[illegible]

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]t Lo[illegible]	[illegible]o redo[illegible]e[illegible]tures
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	PL	[illegible]t Lo[illegible]	Pro[illegible]e[illegible]t redo[illegible]e[illegible]tures

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: [illegible]

Depth (inches): [illegible]

Hydric Soil Present? Yes ○ No ●

Remarks:

Pro[illegible]e[illegible]t redo[illegible]e[illegible]tures o[illegible]ser[illegible]ed [illegible]e ow [illegible]c[illegible]es [illegible]t [illegible]ow co[illegible]ce[illegible]tr[illegible]t[illegible]o[illegible]s t[illegible]t do [illegible]ot [illegible]u[illegible]or [illegible]dr[illegible]c so[illegible]d[illegible]c[illegible]tors.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches): [illegible]

Water Table Present? Yes ○ No ● Depth (inches): [illegible]

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches): [illegible]

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

[illegible]

Remarks:

[illegible]o [illegible]dro[illegible]o[illegible]d[illegible]c[illegible]tors o[illegible]ser[illegible]ed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Delta View Technology Park   City/County: Contra Costa County   Sampling Date: 4/19/2019

Applicant/Owner: City of Pittsburgh   State: CA   Sampling Point: 03

Investigator(s): Jake Schweitzer, VNLC   Section, Township, Range: Los Medanos Landgrant

Landform (hillslope, terrace, etc.): seasonal drainage   Local relief (concave, convex, none): concave   Slope (%): 1-5%

Subregion (LRR): C - Mediterranean California   Lat: UTM: 4207656   Long: UTM: 595370   Datum: NAD83

Soil Map Unit Name: Rincon clay loam, 2 to 9 percent slopes   NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed?   Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic?   (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland? **Yes** ◉ **No** ○

Remarks:

Seasonal swale, adjacent to P04

VEGETATION - Use scientific names of plants.

Tree Stratum Plot size: 25 feet	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
	%		
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum Plot size: 5 feet			
1. *Festuca perennis*	75	Yes	FAC
2. *Rumex conglomeratus*	5	No	FACW
3. *Bromus diandrus*	3	No	Not Listed
4. *Helminthotheca echioides*	3	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	86 %		
Woody Vine Stratum Plot size: 15 feet			
1. *N/A*			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 14 %   % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	5	x 2 =	10
FAC species	78	x 3 =	234
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	83 (A)		244 (B)

Prevalence Index = B/A = 2.94

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** ◉ **No** ○

Remarks:

Seasonal wetland vegetation present

SOIL

Sampling Point: 03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-3	10YR 2/2	100					silty clay loam	moist
3-12	10YR 4/1	60	7.5YR 5/8	10	C	M	silt	moist
3-12	2.5Y	30					silt	moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☒ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ◉ No ○

Remarks:

Dark hydric soils present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☒ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water-stained vegetation present

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Delta View Technology Park | City/County: Contra Costa County | Sampling Date: 4/19/2019

Applicant/Owner: City of Pittsburgh | State: CA | Sampling Point: 04

Investigator(s): Jake Schweitzer, VNLC | Section, Township, Range: Los Medanos Landgrant

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): convex | Slope (%): 20-30%

Subregion (LRR): C - Mediterranean California | Lat: UTM: 4207655 | Long: UTM: 595369 | Datum: NAD83

Soil Map Unit Name: Rincon clay loam, 2 to 9 percent slopes | NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes ( )	No (●)
Wetland Hydrology Present?	Yes ( )	No (●)

Is the Sampled Area within a Wetland? Yes ( ) No (●)

Remarks:

Hillslope above P03

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum Plot size: 25 feet			
1. *Populus fremontii*	2	Yes	Not Listed
2.			
3.			
4.			
	2 %		
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/A*			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum Plot size: 5 feet			
1. *Bromus diandrus*	60	Yes	Not Listed
2. *Avena barbata*	15	No	Not Listed
3. *Sinapis arvensis*	10	No	Not Listed
4. *Festuca perennis*	5	No	FAC
5. *Carduus pycnocephalus*	3	No	Not Listed
6. *Helminthotheca echioides*	1	No	FAC
7.			
8.			
Total Cover:	94 %		
Woody Vine Stratum Plot size: 15 feet			
1. *N/A*			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 6 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0 %	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	6	x 3 =	18
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	6 (A)		18 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

Seasonal wetland vegetation present

SOIL

Sampling Point: 04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture[3]	Remarks
0-18	10YR 2/2	100					silty clay loam	moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: N/A

Depth (inches): N/A

Hydric Soil Present? Yes ○ No ●

Remarks:

Hydric soil indicators not present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ **No** ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators of wetland hydrology present

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: P□tts□ur□□□t□Ce□ter City/County: P□tts□ur□□Co□tr□Cost□ Sampling Date: □□□□□□□□

Applicant/Owner: □ □P□□□ State: C□ Sampling Point: □□

Investigator(s): □r□c□□□t□□□LC Section, Township, Range: Los□□ed□os□L□d□r□t

Landform (hillslope, terrace, etc.): □□dw□□dow□□o□d□otto□ Local relief (concave, convex, none): Co□c□e Slope (%): □□

Subregion (LRR): C□□□ed□terr□e□□C□□or□□ Lat: □□.□□□□□□ Long: □□□□.□□□□□□ Datum: □□□□□

Soil Map Unit Name: □□□co□C□□□Lo□□□□to□□erce□t□s□o□es NWI classification: P□□□□□res□w□ter□Po□d

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○
Hydric Soil Present?	Yes ◉	No ○
Wetland Hydrology Present?	Yes ◉	No ○

Is the Sampled Area within a Wetland□ **Yes** ◉ **No** ○

Remarks:

□e□ture□s□or□er□o□□course□o□d. Po□□t co□ected to c□□r□cter□e□e□ture co□d□t□o□s□□ot due to dou□t□□out wet□□□d st□tus.

□EGETATION - Use scientific names of plants.

Tree Stratum Plot size: 25 feet	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
	□		
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/A*			□□
2.			□□
3.			□□
4.			□□
5.			□□
Total Cover:	□		
Herb Stratum Plot size: 5 feet			
1. *Persicaria lapathifolia*	□	□es	□□C□
2. *Hordeum marinum ssp. gussoneanum*	□	□o	□□C
3.		□□□	□□
4.		□□□	□□
5.		□□□	□□
6.		□□□	□□
7.		□□□	□□
8.		□□□	□□
Total Cover:	□ □		
Woody Vine Stratum Plot size:			
1. *N/A*		□□□	□□
2.			
Total Cover:	□		

% Bare Ground in Herb Stratum 94 □ % Cover of Biotic Crust 0 □

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	□	(A)
Total Number of Dominant Species Across All Strata:	□	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	□□□.□□	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	□
FACW species	□	x 2 =	□□
FAC species	□	x 3 =	□
FACU species		x 4 =	□
UPL species		x 5 =	□
Column Totals:	□ (A)		□□ (B)

Prevalence Index = B/A = □.□□

Hydrophytic □egetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic □egetation Present□ **Yes** ◉ **No** ○

Remarks:

□e□et□t□o□□s□□dro□□□t□c.

SOIL

Sampling Point: [illegible]

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	PL	C[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	PL	C[illegible]	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [X] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [X] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: [illegible]

Depth (inches): [illegible]

Hydric Soil Present? **Yes** (●) **No** ( )

Remarks:

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [X] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [ ] Sediment Deposits (B2) (**Riverine**)
- [ ] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ( )	No (●)	Depth (inches): [illegible]
Water Table Present?	Yes ( )	No (●)	Depth (inches): [illegible]
Saturation Present? (includes capillary fringe)	Yes ( )	No (●)	Depth (inches): [illegible]

Wetland Hydrology Present? **Yes** (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

[illegible]

Remarks:

[illegible]

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: P□tts□ur□□□□t□Ce□ter City/County: P□tts□ur□□Co□tr□Cost□ Sampling Date: □□□□□□□□□

Applicant/Owner: □ □P□□□ State: C□ Sampling Point: □□

Investigator(s): □□to□□o□sc□□□□LC Section, Township, Range: Los□□ ed□os□L□□d□r□t

Landform (hillslope, terrace, etc.): □□□□ Local relief (concave, convex, none): Slope (%): □□

Subregion (LRR): C□□□ ed□terr□□e□□C□□□or□□ Lat: □□.□□□□□□ Long: □□□□.□□□□□□ Datum: □□□□□

Soil Map Unit Name: C□□□□c□□□□□to□□□erce□t□s□o□es NWI classification: □□□

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )
Hydric Soil Present?	Yes (●)	No ( )
Wetland Hydrology Present?	Yes (●)	No ( )

Is the Sampled Area within a Wetland□ **Yes** (●) **No** ( )

Remarks:

□EGETATION - Use scientific names of plants.

Tree Stratum Plot size: 25 feet	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
	□		
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/a*			□□
2.			□□
3.			□□
4.			□□
5.			□□
Total Cover:	□		
Herb Stratum Plot size: 5 feet			
1. *Rumex crispus*	□□	□es	□□
2. *Festuca perennis*	□□	□o	□□
3. *Xanthium strumarium*	□	□o	□□
4.		□□□	□□
5.		□□□	□□
6.		□□□	□□
7.		□□□	□□
8.		□□□	□□
Total Cover:	□□ □		
Woody Vine Stratum Plot size:			
1.			
2.			
Total Cover:	□		

% Bare Ground in Herb Stratum 72 □ % Cover of Biotic Crust 0 □

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: □ (A)

Total Number of Dominant Species Across All Strata: □ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: □.□ □ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	□
FACW species		x 2 =	□
FAC species		x 3 =	□
FACU species		x 4 =	□
UPL species		x 5 =	□
Column Totals:	(A)		□ (B)

Prevalence Index = B/A =

Hydrophytic □egetation Indicators:

- (●) Dominance Test is >50%
- (●) Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic □egetation Present□ **Yes** (●) **No** ( )

Remarks:

SOIL

Sampling Point:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
					C	PL	c	
							c	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [ ] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5) (**LRR C**)
- [ ] 1 cm Muck (A9) (**LRR D**)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [x] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Vernal Pools (F9)

Indicators for Problematic Hydric Soils

- [ ] 1 cm Muck (A9) (**LRR C**)
- [ ] 2 cm Muck (A10) (**LRR B**)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (TF2)
- [ ] Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present **Yes** (●) **No** ( )

Remarks:

edo e tures rese t

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1) (**Nonriverine**)
- [ ] Sediment Deposits (B2) (**Nonriverine**)
- [ ] Drift Deposits (B3) (**Nonriverine**)
- [ ] Surface Soil Cracks (B6)
- [x] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Salt Crust (B11)
- [ ] Biotic Crust (B12)
- [ ] Aquatic Invertebrates (B13)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- [ ] Water Marks (B1) (**Riverine**)
- [x] Sediment Deposits (B2) (**Riverine**)
- [x] Drift Deposits (B3) (**Riverine**)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ( ) No (●) Depth (inches):

Water Table Present? Yes ( ) No (●) Depth (inches):

Saturation Present? (includes capillary fringe) Yes ( ) No (●) Depth (inches):

Wetland Hydrology Present **Yes** (●) **No** ( )

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

r t de os ts rese t

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: P□tts□ur□□□□t□Ce□ter City/County: P□tts□ur□□Co□tr□Cost□ Sampling Date: □□□□□□□□□

Applicant/Owner: □ □P□□□ State: C□ Sampling Point: □□

Investigator(s): □□to□□o□sc□□□□LC Section, Township, Range: Los□□ ed□os□L□□d□r□t

Landform (hillslope, terrace, etc.): □□□s□o□e Local relief (concave, convex, none): Co□c□□e Slope (%): □□

Subregion (LRR): C□□□ ed□terr□□e□□C□□□or□□ Lat: □□.□□□□□□ Long: □□□□.□□□□□□ Datum: □□□□□

Soil Map Unit Name: C□□□□c□□□□□to□□□erce□t□s□o□es NWI classification: □□□

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ◯ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ◯

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ◯
Hydric Soil Present?	Yes ◯	No ◉
Wetland Hydrology Present?	Yes ◯	No ◉

Is the Sampled Area within a Wetland□ **Yes** ◯ **No** ◉

Remarks:

□EGETATION - Use scientific names of plants.

Tree Stratum Plot size: 25 feet	Absolute % Cover	Dominant Species?	Indicator Status
1. *N/A*			
2.			
3.			
4.			
	□		
Sapling/Shrub Stratum Plot size: 15 feet			
1. *N/A*			□□
2.			□□
3.			□□
4.			□□
5.			□□
Total Cover:	□		
Herb Stratum Plot size: 5 feet			
1. *Festuca perennis*	□□	□es	□□
2. *Lactuca serriola*	□	□o	□□
3. *Centaurea solstitialis*	□□	□o	□□
4. *Avena barbata*	□	□o	□□
5.		□□□	□□
6.		□□□	□□
7.		□□□	□□
8.		□□□	□□
Total Cover:	□□ □		
Woody Vine Stratum Plot size:			
1. *N/A*			
2.			
Total Cover:	□		

% Bare Ground in Herb Stratum 40 □ % Cover of Biotic Crust 0 □

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: □ (A)

Total Number of Dominant Species Across All Strata: □ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: □.□ □ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	□
FACW species		x 2 =	□
FAC species		x 3 =	□
FACU species		x 4 =	□
UPL species		x 5 =	□
Column Totals:	(A)		□ (B)

Prevalence Index = B/A =

Hydrophytic □egetation Indicators:

- ◉ Dominance Test is >50%
- ◯ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic □egetation Present□ **Yes** ◉ **No** ◯

Remarks:

SOIL

Sampling Point: [illegible]

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
[illegible]	[illegible]				[illegible]	[illegible]	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2] CS=Covered or Coated Sand Grains. Location: PL=Pore Lining, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

No redox features present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: 567	Site Name: Feature 22	Date and Time: 7/10/2023, 0943

Location (lat/long): 38.014573 -121.909040	Investigator(s): Eric Smith, VNLC

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [x] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [ ] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: ______

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?

High flows spring 2023

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Dry, unvegetated, showing clear line on bank with change in grain size.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below 'b', at 'x', or just above 'a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** x
  - [x] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: ______
- [x] **Shelving:**
  - [x] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* ______
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [x] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [x] **Mudcracks:** b
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* ______ to ______
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:** x

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs)*. ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***
  - [x] *vegetation absent to:* forbs
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:
Culvert sizing and rusting

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: 567

Step 5 Describe rationale for location of OHWM

Change in slope and vegetation near valley bottom. Transition from FAC herbs to unvegetated. Matches nearby culvert.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not:

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
4	Channel center, looking south (upstream), tools laid at OHWM.

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: 567	Site Name: Feature 22	Date and Time: 7/10/2023, 1006
Location (lat/long): 38.013529 -121.908691	Investigator(s): Eric Smith, VNLC	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [x] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [ ] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [ ] topographic maps
- [ ] Other: ______

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?

Major flows spring 2023

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Stream is dry, with obvious destruction of terrestrial vegetation and change in grain size at OHWM. Location is just downstream of where stream overflowed a dirt road (possibly with blocked culverts).

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below 'b', at 'x', or just above 'a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [ ] *on the bank:*
  - [ ] *undercut bank:*
  - [x] *valley bottom:*
  - [ ] Other: ______
- [x] **Shelving:**
  - [x] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* ______
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [x] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* ______ to ______
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [ ] **Change in vegetation type and/or density:**

  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs)*. ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

  - [ ] *vegetation absent to:*
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [x] *woody shrubs to:* forbs
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:**
- [x] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: 567

Step 5 Describe rationale for location of OHWM

Abrupt change in slope and material

Additional observations or notes

Location where stream overflowed road, cut sharp channel for short distance below road.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☐ Yes ☐ No If no, explain why not: ______

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
1	Anton at OHWM

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: 567	Site Name: Feature 22	Date and Time: 7/10/2023, 1017
Location (lat/long): 38.013529 -121.908691	Investigator(s): Eric Smith, VNLC	

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [x] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [ ] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [ ] topographic maps
- [ ] Other: ______

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?

Step 2 Site conditions during field assessment
First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Stream is dry. Site is downstream of incised area where stream overtopped road, but still shows a channel, flattened vegetation, and a change in vegetation.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.
OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below 'b', at 'x', or just above 'a' the OHWM.
OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [ ] **Break in slope:**
  - [ ] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: ______
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* ______
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., pools, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [x] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* ______ to ______
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**
  Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs)*. ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***
  - [ ] *vegetation absent to:*
  - [ ] *moss to:*
  - [ ] *forbs to:*
  - [ ] *graminoids to:*
  - [ ] *woody shrubs to:*
  - [ ] *deciduous trees to:*
  - [ ] *coniferous trees to:*
- [x] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:**
- [x] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: 567

Step 5 Describe rationale for location of OHWM

Change in vegetation from Juncus to Lepidium latifolium. Stream banks flatten and become indistinct after incised portion below road overflow.

Additional observations or notes

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? ☒ Yes ☐ No If no, explain why not:

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
3	Anton standing at OHWM

APPENDIX E:

PLANT LIST

Appendix E: Plant List

Table D-1. Plant Species Identified Within the Study Area

Scientific Name	Common Name	Wetland Indicator Status[1]
Abies sp. (horticultural variety)	Fir	FACU
Acer negundo	Box Elder	FACW
Acmispon americanus var. americanus	Spanish Lotus	UPL
Amaranthus albus	Tumbleweed	FACU
Amaranthus blitoides	Procumbent Pigweed	FACU
Amsinckia lycopsoides	Bugloss-Flowered Fiddleneck	NL
Amsinckia menziesii	Common Fiddleneck	NL
Asclepias fascicularis	Narrow-Leaf Milkweed	FAC
Avena barbata	Slender Wild Oat	NL
Bellardia trixago	Mediterranean Linseed	NL
Bolboschoenus maritimus ssp. paludosus	Saltmarsh Bulrush, Alkali Bulrush	OBL
Brachypodium distachyon	annual false-brome	NL
Brassica nigra	Black Mustard	NL
Bromus catharticus var. catharticus	Rescue Grass	NL
Bromus diandrus	Ripgut Brome	NL
Bromus hordeaceus	Soft Chess	FACU
Bromus madritensis	compact brome	UPL
Capsella bursa-pastoris	shepherd's purse	FACU
Carduus pycnocephalus ssp. pycnocephalus	Italian Thistle	NL
Castilleja exserta ssp. exserta	exserted Indian paintbrush	NL
Cedrus deodara	Deodar Cedar	NL
Centaurea melitensis	Tocalote	NL
Centaurea solstitialis	Yellow Star-Thistle	NL
Chenopodium album	Lamb's Quarters	FACU
Chlorogalum pomeridianum	wavyleaf soap plant	NL
Claytonia perfoliata ssp. perfoliata	miner's lettuce	NL
Convolvulus arvensis	Bindweed, Orchard Morning-Glory	NL
Cotula australis	Australian Cotula	FAC
Cotula australis	Australian Cotula	FAC
Croton setigerus	Turkey-Mullein	NL
Crypsis schoenoides	Swamp Prickle Grass	FACW
Cuscuta campestris	Field Dodder	NL
Cyclospermum leptophyllum	marsh parsley	FACU
Cynara cardunculus ssp. cardunculus	Artichoke	NL
Cynara cardunculus ssp. flavescens	Artichoke	NL
Cynodon dactylon	Bermuda Grass	FACU
Cyperus eragrostis	tall flatsedge	FACW
Dipterostemon capitatus	bluedicks	NL

Appendix E: Plant List

Scientific Name	Common Name	Wetland Indicator Status[1]
Distichlis spicata	Salt Grass	FAC
Dittrichia graveolens	Stinkwort	NL
Echinochloa crus-galli	barnyardgrass	FACW
Elymus triticoides	Beardless Wild Rye	FAC
Epilobium brachycarpum	tall annual willowherb	FAC
Erigeron canadensis	Horseweed	FACU
Erodium cicutarium	Redstem Filaree	NL
Erodium moschatum	Greenstem Filaree	NL
Eschscholzia californica	California Poppy	NL
Eucalyptus camaldulensis	Red Gum, River Red Gum	FAC
Eucalyptus globulus	Blue Gum	NL
Festuca bromoides	Brome Fescue	FACU
Festuca myuros	Rattail Sixweeks Grass	FACU
Festuca perennis	Rye Grass	FAC
Ficus carica	Edible Fig	FACU
Foeniculum vulgare	Fennel	NL
Fraxinus uhdei	Shamel ash	NL
Geranium dissectum	cutleaf geranium	NL
Grindelia camporum	Great Valley gumweed	FACW
Hedera canariensis	Canary Islands Ivy	NL
Helminthotheca echioides	Bristly Ox-Tongue	FAC
Heterotheca grandiflora	Telegraph Weed	NL
Hirschfeldia incana	summer mustard	NL
Hordeum marinum ssp. gussoneanum	Mediterranean Barley	FAC
Hordeum murinum	Wall Barley	FACU
Hypochaeris glabra	Smooth Cat's-Ear	NL
Hypochaeris radicata	Rough Cat's-Ear	FACU
Juncus bufonius var. bufonius	toad rush	FACW
Juncus bufonius var. congestus	Clustered Toad Rush	FACW
Kickxia elatine	sharpleaf cancerwort	UPL
Lactuca serriola	Prickly Lettuce	FACU
Lepidium didymum	Lesser Swine Cress	NL
Lupinus affinis	fleshy lupine	NL
Lupinus bicolor	Miniature Lupine	NL
Lupinus formosus var. formosus	summer lupine	NL
Lupinus microcarpus var. microcarpus	whitewhorl lupine	NL
Lupinus nanus	sky lupine	NL
Lysimachia arvensis	Scarlet Pimpernel	FAC

Appendix E: Plant List

Scientific Name	Common Name	Wetland Indicator Status[1]
Lythrum hyssopifolia	hyssop loosestrife; grass poly; hyssop lythrum	OBL
Malva parviflora	Cheeseweed, Little Mallow	NL
Marah fabacea	California Man-Root	NL
Medicago polymorpha	Burclover	FACU
Melica californica	California Melic	NL
Melilotus albus	White Sweetclover	NL
Melilotus indicus	Sourclover	FACU
Myoporum laetum	Myoporum, Ngaio Tree	FACU
Nicotiana glauca	Tree Tobacco	FAC
Olea europaea	olive	NL
Paspalum dilatatum	Dallis Grass	FAC
Persicaria lapathifolia	Willow Weed	FACW
Persicaria maculosa	Lady's Thumb	FACW
Persicaria punctata	Doted Smartweed	OBL
Phalaris aquatica	Harding Grass	FACU
Phalaris aquatica	Harding Grass	FACU
Phoenix canariensis	Canary Island Palm	NL
Pinus contorta ssp. murrayana	Lodgepole Pine	FAC
Pinus muricata	Bishop Pine	NL
Pinus ponderosa	Ponderosa Pine	FACU
Pinus ponderosa var. pacifica	Pacific Ponderosa Pine	FACU
Pittosporum tobira	Mock Orange	NL
Plantago major	Common Plantain	FAC
Poa annua	Annual Blue Grass	FAC
Poa secunda	Nevada Blue Grass	FACU
Polygonum aviculare	Knotweed, Knotgrass	FAC
Polypogon monspeliensis	Annual Beard Grass, Rabbitfoot Grass	FACW
Populus fremontii ssp. fremontii	Alamo Or Fremont Cottonwood	NL
Portulaca oleracea	Purslane	FAC
Prunus caroliniana	Carolina cherry laurel	FACU
Prunus cerasifera	Cherry Plum	NL
Prunus domestica	Common Plum	NL
Prunus dulcis	Almond	NL
Prunus emarginata	Bitter Cherry	FACU
Pseudognaphalium californicum	ladies' tobacco	NL
Quercus agrifolia var. agrifolia	California live oak	NL
Quercus lobata	Valley Oak	FACU

Appendix E: Plant List

Scientific Name	Common Name	Wetland Indicator Status[1]
Robinia pseudoacacia	Black Locust	FACU
Robinia pseudoacacia	Black Locust	FACU
Rubus armeniacus	Himalayan Blackberry	FAC
Rumex crispus	Curly Dock	FAC
Salix gooddingii	Goodding's Black Willow	FACW
Salix lasiandra var. lasiandra	Pacific Willow	FACW
Schinus molle	Pepper Tree	FACU
Senecio vulgaris	Common Groundsel	FACU
Sequoia sempervirens	redwood	NL
Silybum marianum	milk thistle	NL
Sinapis arvensis	Charlock	NL
Solanum nigrum	Black Nightshade	FACU
Sonchus asper ssp. asper	Prickly Sow Thistle	FAC
Sonchus oleraceus	Common Sow Thistle	UPL
Spergularia marina	Saltmarsh Sand-Spurrey	OBL
Spergularia rubra	Red Sand-Spurrey	FAC
Stellaria media	Common Chickweed	FACU
Tamarix parviflora	Smallflower Tamarisk	FAC
Torilis arvensis	Tall Sock-Destroyer	NL
Tragopogon dubius	Yellow Salsify	NL
Trifolium hirtum	Rose Clover	NL
Triteleia laxa	Ithuriel's Spear	NL
Typha latifolia	Broad-Leaved Cattail	OBL
Ulmus pumila	Siberian Elm	UPL
Ulmus pumila	Siberian Elm	UPL
Urtica urens	Dwarf Nettle	NL
Vicia sativa ssp. sativa	Spring Vetch	FACU
Xanthium spinosum	Spiny Cocklebur	FACU
Xanthium strumarium	Cocklebur	FAC

[1] Wetland Indicator Status (Lichvar et al. 2020):
OBL = obligate wetland; >99% probability of occurring in a wetland
FACW = facultative wetland; 67%-99% probability of occurring in a wetland
FAC = facultative; 33%-67% probability of occurring in a wetland
FACU = facultative upland; 1%-33% probability of occurring in a wetland
UPL = obligate upland; <1% probability of occurring in a wetland
NI = no indicator, insufficient information available to determine indicator status
NL = not listed (plants not listed in Lichvar et al. [2020], including some known to occur occasionally or primarily in wetlands)

APPENDIX C

RARE PLANT SURVEY REPORT

SACRAMENTO OFFICE
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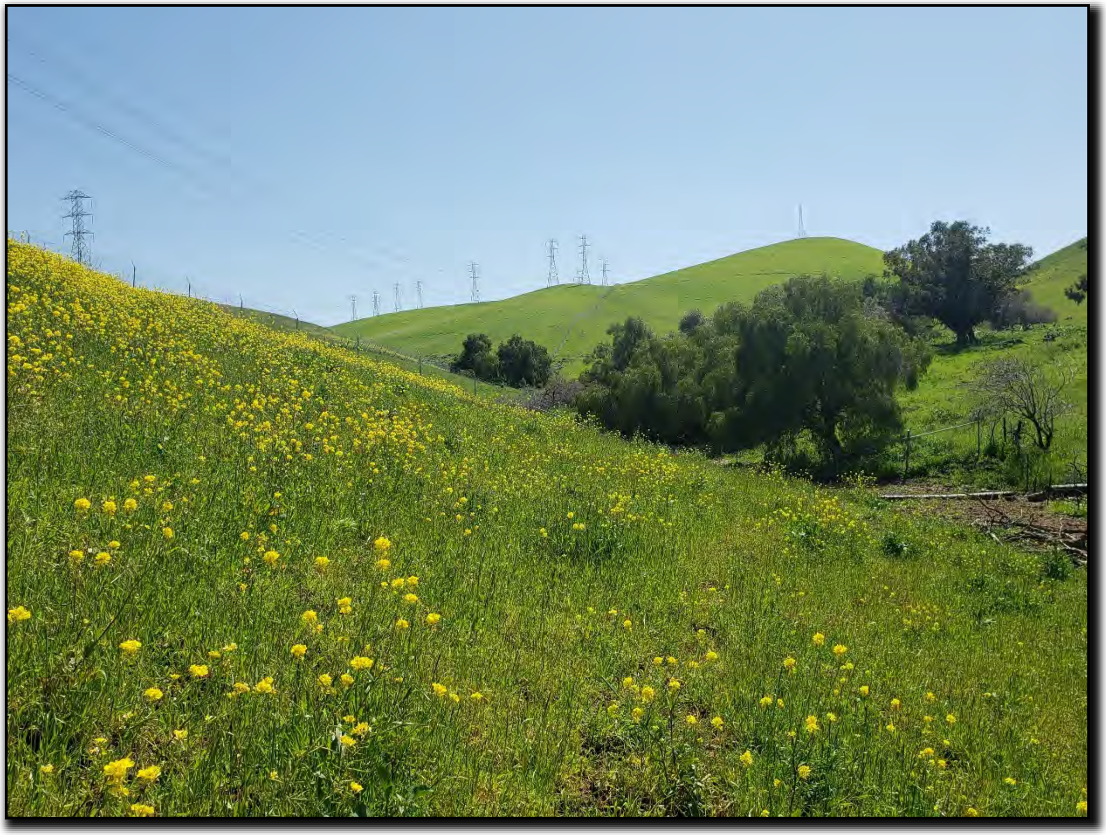
Rare Plant Survey Report
Pittsburg Data Center Project



City of Pittsburg
Contra Costa County, California

Prepared for:

WSP USA
401 B Street, Suite 1650
San Diego, CA 92101
Contact: Stephanie Whitmore

Prepared by:

Vollmar Natural Lands Consulting
2401 Capitol Avenue, Sacramento, CA 95816
Contact: Rachel Miller
916/758-6928

October 2023

TABLE OF CONTENTS

FIGURES, TABLES, and APPENDICES

1.0 INTRODUCTION

This report summarizes the methods and results for focused rare plant surveys and a floristic inventory conducted within the Pittsburg Data Center Project study area (Study Area), located in the hills above the City of Pittsburg, in northern Contra Costa County, California (**Figures 1** and **2**). The Study Area includes the entirety of the Pittsburg Data Center Project (Project Specific Area, or "PSA"), as well as a 250-foot buffer around the Project Specific Area, per the standards of the East Contra Costa Habitat Conservation Plan/Natural Community Conservation Plan (ECCHCP/NCCP, or "HCP"). This project would redevelop portions of the recently closed Delta View Golf Course as a data center. The proposed Project Specific Area covers approximately 38.0 acres; the Study Area (including the 250-foot buffer) is approximately 78.7 acres.

This report documents existing or potentially occurring rare plant species and sensitive plant communities for review by regulatory agencies. It is intended to support permitting for the Project. This rare plant survey and floristic inventory was completed by Vollmar Natural Lands Consulting on behalf of WSP USA. Vollmar Natural Lands Consulting (VNLC) previously prepared a separate wetland delineation in the Study Area in 2019, as well as an updated delineation in 2023 (VNLC 2023).

The purpose of the rare plant surveys and floristic inventory was to document any sensitive botanical resources that could potentially be impacted by Project activities. The surveys were protocol in nature, and were scheduled to coincide with early spring, peak spring, and summer botanical seasons for the region, during the blooming periods of special-status plants with potential to occur in the Study Area.

No special-status plant species were detected during the surveys. A total of 1.90 acres of riparian habitats occur within the Study Area, including Himalayan blackberry thicket (0.44 acre), and Valley Foothill Riparian habitats (1.46 acres). Separately delineated aquatic resources cover 1.99 acres of the Study Area. Aquatic resource habitat types include seasonal wetland drainages (0.71 acres), perennial wetlands within a drainage (0.17 acre), seasonal wetlands within a drainage (1.03 acres), and unvegetated channel (0.71 acre).

Legend

- Highway
- Selected Local Road
- Stream
- Public or Preserved Land
- Urban Area
- County Boundary

Data Sources: TIGER, 2010 | City of Pittsburg, 2018
USGS, Various | | CPAD, 2014 | Landsat Imagery
Gap, 1998 | SFEI, 2015| USFWS, 2014 | VNLC, 2023
GIS/Cartography by R. Miller, Oct. 2023
Map File: 567_PSA_RP_Vicinity_A-P_2023_1006.mxd

FIGURE 1
Regional Vicinity Map

Pittsburg Technology Park Project
City of Pittsburg, California

N
W E
S

1:95,040
(1 in. = 1.5 miles, at letter-size layout)

0 0.5 1 2 Km

0 0.5 1 2 Mi

FIGURE 2
Regional Special-status Plant Species Map

Pittsburg Technology Park Project
City of Pittsburg, California

Legend

250-foot Buffer of Project Specific Area
Project Specific Area

N W E S

1:95,040
(1 in. = 1.5 miles, at letter-size layout)

0 0.5 1 2 Km
0 0.5 1 2 Mi

Data Sources: ESRI/HERE Aerial Imagery, 2023
CDFW, 2023 | WSP, 2023 | TIGER, 2021
GIS/Cartography by R. Miller, Oct. 2023
Map File: 567_PSA_RP_CNDDB_A-P_2023_1024.mxd

2.0 TARGETED BOTANICAL RESOURCES

For the purposes of this report, special-status plants include all taxa appearing on the Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2023a). This includes all species listed under the Endangered Species Act and/or California Endangered Species Act, species of concern, and species included within an inventory maintained by the California Native Plant Society (CNPS), including taxa of all ranks.

Sensitive natural communities include those designated as such by the California Department of Fish and Wildlife (CDFW), either in the List of California Sensitive Natural Communities (CDFW 2023b) or as alliances classified in the Manual of California Vegetation Online (MCV) (CNPS 2023a). MCV alliances designated with a global rank of G1-G3 or a state rank of S1-S3 are designated as “rare or threatened” and are considered sensitive. In addition, wetland and riparian habitats are considered sensitive and are regulated by environmental regulatory agencies.

All plant taxa are identified using the nomenclature listed in the Jepson eFlora (2023). Natural communities which are not considered sensitive are classified using the California Wildlife Habitat Relationships (CWHR) system used by the California Department of Fish and Wildlife (CDFW) for the Vegetation Classification and Mapping Program (VegCAMP) (Mayer and Laudenslayer 1998).

3.0 METHODS

3.1 Preliminary Review and Field Preparation

Prior to field surveys, the botanists reviewed site aerial photography, topographic data, existing wetland delineation mapping, previous biological reports, and soil survey maps for the Study Area and vicinity to develop a list of special-status plant species with potential to occur in the Study Area. A map of documented occurrences of special-status plant species within approximately 5 miles of the Study Area was compiled from the most recent data available from the California Natural Diversity Database (CNDDB) (CDFW 2023c).

The botanists also compiled a list of known occurrences of special-status plant species from a nine-quadrangle search using the CNPS’s online Rare Plant Inventory (CNPS 2023b). Specifically, the search centered on the Honker Bay 7.5-minute quadrangle and included the eight surrounding quadrangles (Fairfield South, Denverton, Birds Landing, Vine Hill, Antioch North, Walnut Creek, Clayton, and Antioch South).

The project botanists compiled information on each target plant species, including preferred habitat, microhabitat, elevation range, and blooming period. This information guided the timing and strategies of the field surveys to detect special-status plants with potential to occur in the Study Area. **Appendix B** provides the target list of special-status plant taxa with potential to occur in the Study Area. **Figure 2** displays the CNDDB occurrences of special-status plant species in the Project vicinity.

3.2 Field Surveys

The botanical field surveys were conducted by VNLC botanist Rachel Miller on April 12, May 19, and July 12, 2023. The survey dates were scheduled to coincide with the blooming periods of all special-status plants for which potentially suitable habitats occur in the Study Area (**Appendix B**). During each field survey, the botanist walked the entire Study Area, searching for special-status plant species and recording all plant species observed within the Study Area.

The rare plant surveys conformed to the CNPS 'Intuitive Controlled' method as well as the CDFW guidelines for conducting protocol-level botanical surveys (2018). The surveys also satisfy the U.S. Fish and Wildlife Service guidelines for conducting and reporting botanical inventories for federally listed, proposed, and candidate plants (USFWS 2000). The entirety of the Study Area was investigated, and areas with higher potential to support special-status or otherwise unique plants were surveyed with greater intensity. Examples of such areas include more localized plant community types, the stream corridor, and areas generally supporting a notably high proportion of native plants. All plant taxa present were recorded according to the lowest taxonomic level necessary to determine their regulatory status (i.e., species, subspecies, or variety as applicable) and dominant species as well as general habitat conditions were noted throughout each habitat type (see below). Project maps and GPS background files depicting the project boundaries, soil unit boundaries, and other features were used to navigate throughout the survey areas. Field manuals, particularly the "Jepson eFlora" (Jepson 2023), were used to confirm the taxonomy of plant taxa in the field.

Within each primary habitat and microhabitat, the most prevalent plant species from each stratum (tree, shrub/sapling/vine, and herb) were recorded in order of dominance, with an effort to classify the habitat types according to the CWHR system (Mayer and Laudenslayer 1998). Other habitat parameters, such as the extent of canopy cover, soil conditions, and level of disturbance, were also noted as applicable. If necessary for the identification of sensitive natural communities (i.e., alliances ranked in the MCV as S1-3 and/or G1-3), visual cover estimates of dominant plant species were also recorded.

During the field surveys, representative photographs were taken of onsite plant communities, general habitat conditions, and plant species of interest. Representative photos are included in **Appendix A**.

3.3 Remote Mapping

Field data were overlaid onto aerial photography and topographic data in ESRI ArcGIS software in order to map natural communities observed during the field surveys. Natural communities were typically classified according to CWHR habitat type classification (Mayer and Laudenslayer 1998); any potential sensitive natural communities were classified according to the MCV Alliance level.

As stated in **Section 2.0**, MCV alliances with a global rank of G1-G3 or a state rank of S1-S3 are considered sensitive. Wetland and riparian habitats are considered sensitive and are regulated by environmental regulatory agencies.

4.0 ENVIRONMENTAL SETTING

4.1 Study Area Location

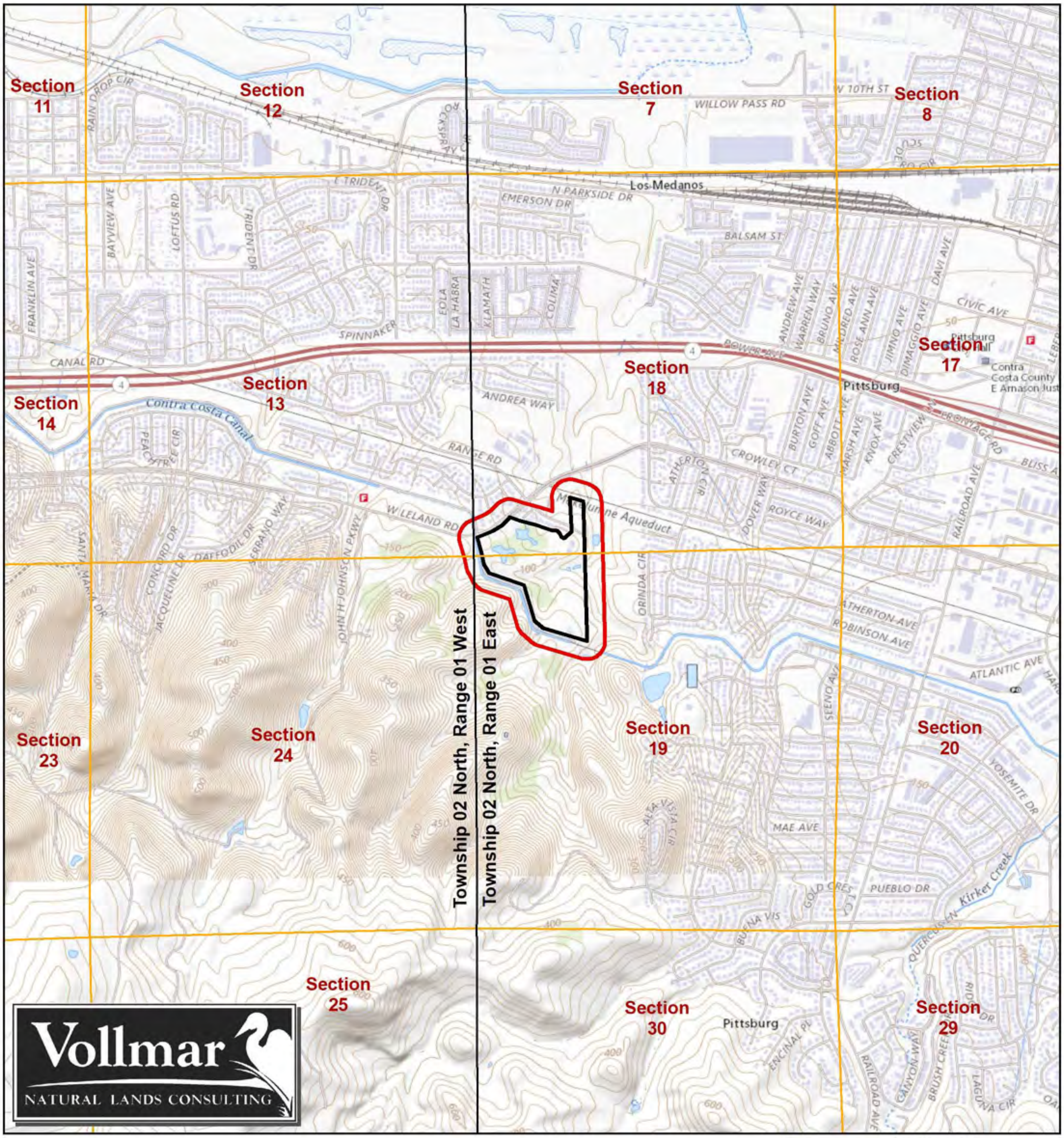
The Study Area consists of approximately 78.7 acres, which includes the approximately 38.0-acre Project Specific Area, as well as the 250-foot buffer, per the HCP standards. The Project Specific Area is comprised of a portion of the former Delta View Golf Club. The 250-foot buffer includes additional portions of the former golf club, the Contra Costa Canal, residential development to the north of the Project parcel, and undeveloped land containing a utility transmission corridor east of the parcel (**Figure 3**). The Study Area is located along the southern edge of the City of Pittsburg, California, and is mapped on the Honker Bay 7.5’ United States Geological Survey (USGS) topographic quadrangle. The Study Area is within Sections 18 and 19 of Township 2 North, Range 1 East, and Sections 13 and 24 of Township 2 North, Range 1 West, of the Mount Diablo Base & Meridian (**Figure 3**).

Lands to the north of the Study Area are mostly comprised of suburban residential development. To the east of the Study Area lies a corridor of open land owned by Pacific Gas and Electric Company (PG&E). The property south and west of the Study Area includes more of the original golf course. The Study Area may be accessed from State Highway 4 heading east by exiting at Bailey Road, then turning right (south) on to Bailey Road, then turning left (east) on West Leland Road. Golf Club Road, which heads south from West Leland Road 1.7 miles east of Bailey Road, dead ends at the Delta View Golf Course. Some of the Study Area is accessible via golf cart trails, though many of these have become inaccessible due to an overgrowth of black mustard (*Brassica nigra*).

4.2 Current Conditions

The study area consists of rolling hills along the lower slopes of the eastern Los Medanos Hills, overlooking the City of Pittsburg. Elevation within the Study Area ranges from approximately 57 feet to 164 feet above sea level (USGS 1997), trending upward in elevation from the northeast to the southwest. The Study Area is dominated by silt and clay soils (see **Section 4.4**) that support annual grassland in undeveloped areas, though extensive areas have been partially leveled and native soils have been replaced by soils suited for golf course landscaping.

Following the closure of the golf course in 2018, previously managed areas have been colonized by dense and tall stands of invasive weeds and non-native annual grasses, including black mustard, yellow star-thistle (*Centaurea solstitialis*), Italian rye grass (*Festuca perennis*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), wall barley (*H. murinum*), ripgut brome (*Bromus diandrus*), and soft chess (*Bromus hordeaceus*). Additionally, a series of vegetation fires occurred



Legend

Project Specific Area

250-foot Buffer of Project Specific Area

Public Land Survey Boundary

FIGURE 3
USGS Topographic Map

Pittsburg Data Center
City of Pittsburg, California

N
W E
S

1:24,000
1 inch = 2,000 feet

0 250 500 1,000 M
0 750 1,500 3,000 Ft

Data Sources: VNLC, 2023 | USGS, 2022 | WSP, 2023
City of Pittsburg, 2019 | ESRI/Maxar Aerial Imagery, 2023
GIS/Cartography by: R. Miller, Oct. 2023
Map File: 567_PSA_RP_Topo_A-P_2023_1024.mxd

during 2022-23, and the area that was burned is regrowing with the same non-native grasses and invasive weeds. Remnant landscaping trees, primarily stands of Bishop pine (*Pinus muricata*) and Peruvian pepper tree (*Schinus molle*), occur throughout the Study Area. The entire Study Area shows evidence of a complete lack of grazing, though some mowing occurred during 2023.

The remnant intact drainages that flow through most of the Study Area support a few riparian species, but these are widely scattered, and include many non-native trees and shrubs such as Peruvian pepper tree and Mexican fan palm (*Washingtonia robusta*). The drainage in the eastern portion of the 250-foot buffer is a more developed stream corridor, with more evidence of active streamflow, and a better-developed riparian community. The riparian corridor here includes riparian scrub dominated by Himalayan blackberry (*Rubus armeniacus*), as well as riparian trees forming a fairly open canopy. Common riparian tree species in the eastern drainage include Fremont cottonwood (*Populus fremontii*), coast live oak (*Quercus agrifolia* var. *agrifolia*), Pacific willow (*Salix lasiandra* var. *lasiandra*), Siberian elm (*Ulmus pumila*), Mexican fan palm, northern California black walnut (*Juglans hindsii*), and olive trees (*Olea europaea*).

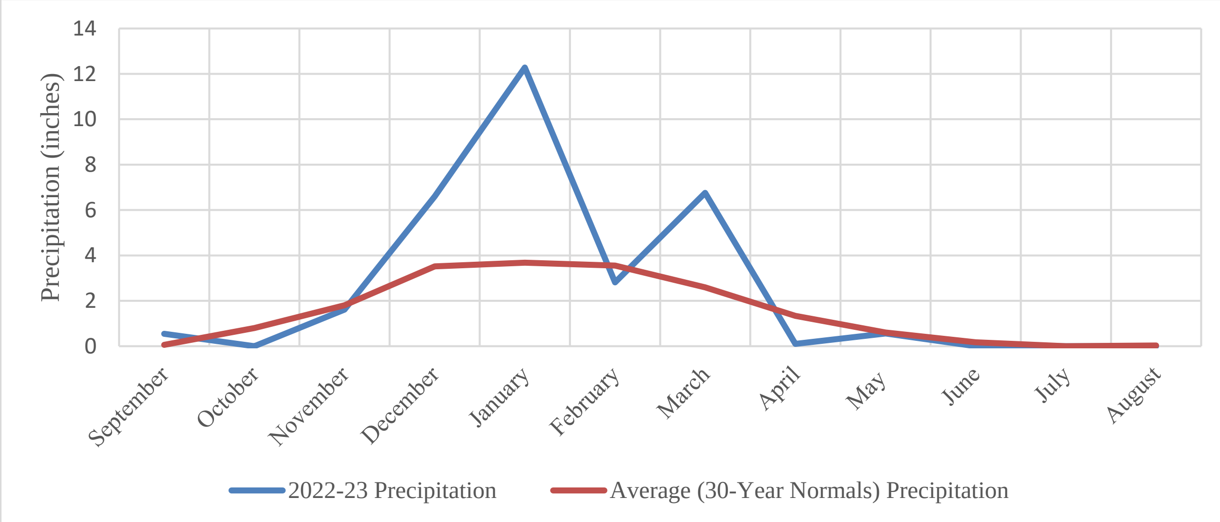
4.3 Climate

The Study Area is located within a Mediterranean climate, which is characterized by cool, wet winters and warm, mostly rainless summers as well as high intra- and inter-annual variability in precipitation.

The field surveys were conducted during and following a growing season which was wetter than normal, due to the influence of an El Nino-Southern Oscillation (ENSO) weather pattern during the 2022-23 wet season (October-April). According to the PRISM climate data model, the total precipitation for the wet season (October-April) preceding the 2023 field surveys was 30.17 inches, 180% of the normal precipitation for that period. However, most of that precipitation fell during December, January, and March. **Figure 4**, below, displays the total monthly precipitation for September 2022 through July 2023 as well as the average monthly precipitation for 1991-2020 in Contra Costa County.

The timing of the precipitation during 2022-23 wet season was generally conducive to plant germination and growth, in a manner that supported early, vigorous growth. Precipitation was generally earlier and much higher than normal, and field surveys were timed earlier than normal to accommodate for the early-season rainfall and subsequent early growth and blooming periods.

Figure 4. Monthly Precipitation Recorded in 2022-2023 in Contra Costa County, CA



Data Provided by PRISM (2023).

4.4 Soils and Geology

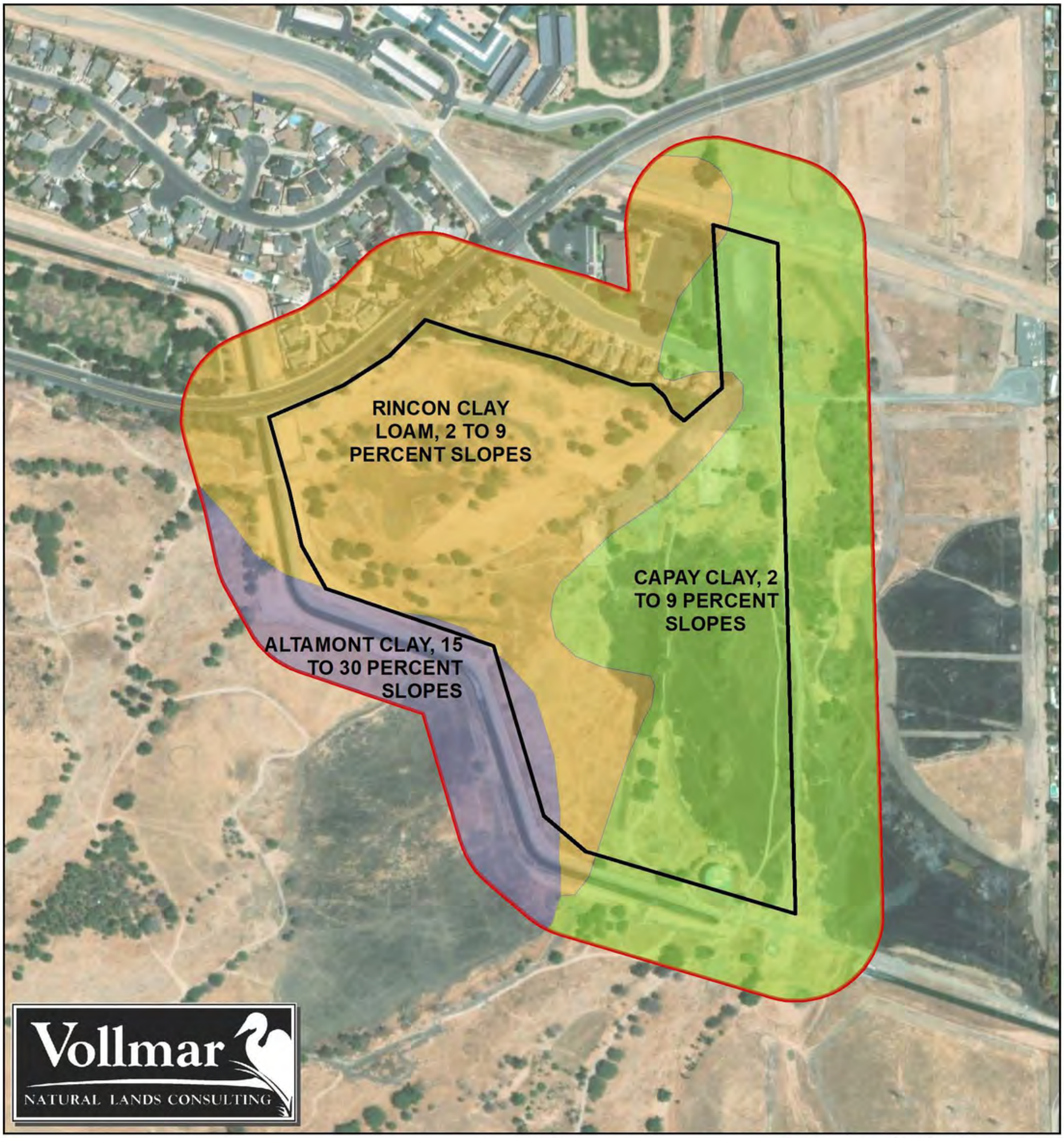
Prior to the site surveys, the U.S. Department of Agriculture (USDA) Soil Conservation Service (USDA-NRCS 2023) database was consulted to identify soil map units found within the Study Area. **Figure 5**, below, displays the soil map units found in the Study Area. The soil map units found within the Study Area are displayed in **Table 1** below.

Table 1. Soil Map Units Within Study Area

Soil Map Unit Name	Hydric Rating	Acres Within Study Area	Percent of Study Area
Altamont clay, 15 to 30 percent slopes	Not Hydric	8.9	11.3%
Capay clay, 2 to 9 percent slopes	Not Hydric	35.9	45.6%
Rincon clay loam, 2 to 9 percent slopes	Not Hydric	33.9	43.1%

Source: USDA Web Soil Survey (USDA-NRCS 2023).

The Altamont clay and Capay clay soil units are characterized by surface texture of clay, while the Rincon clay loam has a surface texture of clay loam. None of these soil units are composed of hydric soil. Two geological formations occur within the Study Area: the northern portion of the Study Area occurs within Qpc: Nonmarine (continental) sedimentary rocks (Pleistocene-Holocene) and the southern portion by the Qrv: Volcanic rocks (Holocene) – Recent (Holocene) volcanic flow rocks (CGS 2013). These geologic formations and soil map units are not associated with particular special-status plant species.



Legend

- Project Specific
- 250-foot Buffer of Project Specific
- Altamont Clay, 15-30% Slopes
- Capay Clay, 2-9% Slopes
- Rincon Clay Loam, 2-9% Slopes

FIGURE 5
Soil Unit Map

Pittsburg Data Center
City of Pittsburg, California

N W E S

1:5,000
1 inch = 417 feet

0 50 100 200 M
0 250 500 1,000 Ft

Data Sources: VNLC, 2023 | City of Pittsburg, 2019
WSP, 2023 | ESRI/Maxar Aerial Imagery, 2023
USDA-NRCS, 2005
GIS/Cartography by: R. Miller, September 2023
Map File: 567_PSA_RP_Soils_A-P_2023_1024.mxd

5.0 RESULTS

5.1 Summary of Results

No special-status plant species were observed during the 2023 field surveys. **Figure 6**, below, displays the natural communities identified within the Study Area and separately-delineated aquatic resources within the Study Area. **Appendix A** provides representative photographs of the Study Area. **Appendix B** provides a table of special-status plant species documented in the vicinity of the Study Area, along with information on the preferred habitat, microhabitat, elevation range, blooming period of each species, and an assessment of their potential to occur in the Study Area. **Appendix C** provides a list of all plant taxa identified within the Study Area.

5.2 Plant Species Observed

A total of 131 plant taxa were identified within the Study Area, none of which are special-status taxa. A summary of the plant taxa observed within the Study Area during the 2023 field surveys appears below in **Table 2**. A complete list of all plant taxa observed during the 2023 surveys is provided in **Appendix C**.

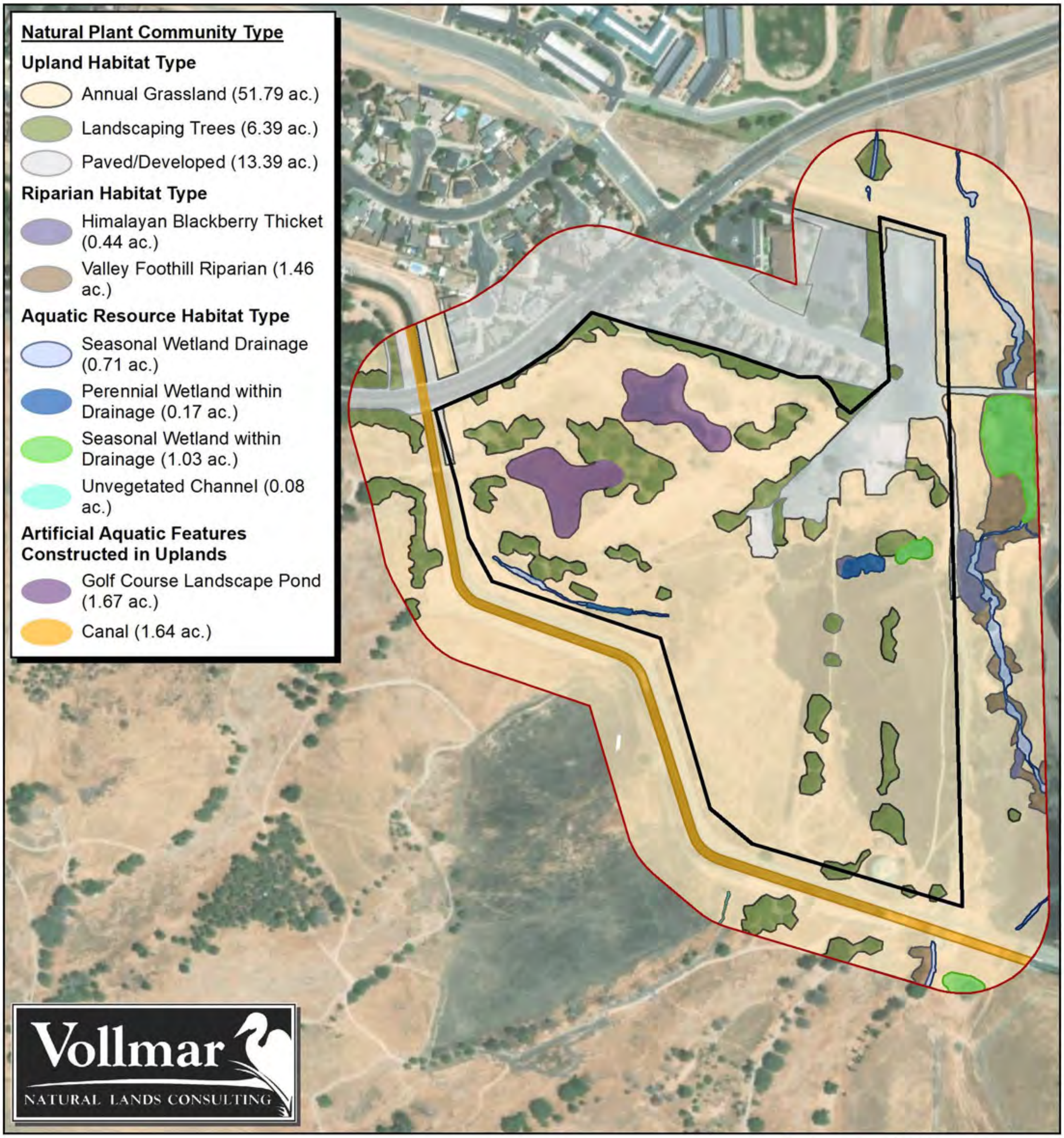
Table 2. Summary of Species Observed Within the Study Area

Species Status	Number of Species Observed in Study Area
Native Species	47
Non-native Species	84
Cal-IPC High Invasive	5
Cal-IPC Moderate Invasive	18
Cal-IPC Limited Invasive	18
Special-Status Species	0
Total Species Observed Within Study Area	131

Of the 131 plant taxa identified, 36% (47 species) were classified as native species, and 64% (84 species) were non-native species. Twenty-three of the non-native species (18% of all observed species) are rated by the California Invasive Plant Council as “moderate” or “high”.

5.2 Natural Communities

Natural communities documented within the Study Area are mapped in **Figure 6** below and described in **Sections 5.2.1-5.2.7**. Natural communities documented within the Study Area are listed in **Table 3**, also below.



Legend

Project Specific Area

250-foot Buffer of Project Specific Area

FIGURE 6
Natural Communities Map

Pittsburg Data Center
City of Pittsburg, California

N
W E
S

1:5,000
1 inch = 417 feet

0 50 100 200 M

0 250 500 1,000 Ft

Data Sources: VNLC, 2023 | City of Pittsburg, 2019
WSP 2023 | ESRI/HERE Aerial Imagery, 2023
GIS/Cartography by R. Miller, October 2023
Map File: 567_PSA_RP_Habitats_A-P_2023_1024.mxd

Table 3. Summary of Natural Communities Within Study Area

Natural Community	Acres Within Study Area	Percent of Study Area
Upland Habitat Type		
Annual Grassland	51.79	66%
Landscaping Trees	6.39	8%
Paved/Developed	13.39	17%
Riparian Habitat Type		
Himalayan Blackberry Thicket	0.44	1%
Valley Foothill Riparian	1.46	2%
Aquatic Resource Habitat Type		
Seasonal Wetland Drainage	0.71	1%
Perennial Wetland within Drainage	0.17	<1%
Seasonal Wetland within Drainage	1.03	1%
Unvegetated Channel	0.08	<1%
Artificial Aquatic Features Constructed in Uplands		
Golf Course Landscape Pond	1.67	2%
Canal	1.64	2%

Sensitive natural communities are described at the alliance level and include alliances designated as such by CDFW in the List of California Sensitive Natural Communities (2023) or as MCV alliances with a state rank of S1-S3 or global rank of G1-G3. Wetland and riparian habitats are also classified as sensitive and are regulated by environmental regulatory agencies. Other natural communities are classified using the CWHR system used by the CDFW for the VegCAMP program, unless noted otherwise.

5.2.1 Annual Grassland (Upland Habitat)

Annual grasslands are open habitats composed primarily of annual plant species, and are typically dominated by introduced, annual grass species (Mayer and Laudenslayer 1998). Shrubs and trees are absent in this natural habitat type. Annual grassland is not classified as sensitive.

Within the Study Area, annual grassland covers 51.79 acres. This natural community occurred as a mixture of two alliances: the wild oats and brome grasslands (*Avena* spp. – *Bromus* spp. herbaceous semi-natural alliance) intermixed with thick stands of upland mustards or star-thistle fields (*Brassica nigra* – *Centaurea* [*solstitialis*, *melitensis*] herbaceous semi-natural alliance) (CNPS 2023a). Both of these alliances have a state rank of SNA and global rank of GNA and are not considered sensitive.

Wild oats and brome grasslands are defined by their herbaceous layer, which is open to continuous as well as by having over 30% relative cover of wild oat, false brome (*Brachypodium*), quaking grass (*Briza*), brome, filaree (*Erodium*) and/or cat's ear (*Hypochaeris*) species. Within the Study Area, this alliance was dominated by non-native annual grasses and herbs, including Italian rye grass, ripgut brome, and soft chess. Wild oat (*Avena barbata*), Mediterranean barley, wall barley, horseweed (*Erigeron canadensis*), Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), and bristly ox-tongue (*Helminthotheca echioides*) were also common.

The upland mustards or star-thistle fields alliance is defined by the dominance of mustard species (*Brassica* spp., *Raphanus* spp., and/or *Hirschfeldia incana*), star-thistle (*Centaurea* spp.), and/or other non-native forbs at over 80% relative cover. Within the Study Area, the upland mustard fields were characterized by the dominance of black mustard with some cheeseweed (*Malva parviflora*). Additionally, stands of yellow star-thistle occurred along the eastern portion of the Study Area. The MCV notes that black mustard is common in dense stands in coastal to inland grassland with mild winter climates, especially in areas that have been left fallow, as the closed golf course has been (CNPS 2023a).

Higher diversity annual grasslands were present outside of the former golf course, along the previously undeveloped eastern and western edges of the Study Area. Several species of wildflowers were observed in these border areas during the April 2023 survey, including several species of lupine (*Lupinus affinis*, *L. bicolor*, *L. formosus* var. *formosus*, *L. nanus*), California poppy (*Eschscholzia californica*), purple owl's clover (*Castilleja exserta* ssp. *exserta*), and common fiddleneck (*Amsinckia menziesii*).

5.2.2. Landscaping Trees (Upland Habitat)

Stands of remnant, planted landscaping trees occur throughout the study area, covering a total of 6.39 acres. These trees were originally planted as part of the golf course landscaping and have persisted after its closure. This community aligns with the pepper tree or myoporum groves alliance (*Schinus* [*molle*, *terbinthifolius*] – *Myoporum laetum* forest and woodland semi-natural alliance) (CNPS 2023a). This alliance is defined by having trees less than 18 meters tall with an open to continuous canopy dominated by pepper tree (60%-80% relative cover). This alliance has a state rank of SNA and a global rank of GNA, and it is not classified as sensitive.

Within the Study Area, the landscaping trees are dominated by Peruvian pepper tree, with Bishop pine and some lodgepole pines (*Pinus contorta* ssp. *murrayana*) and ponderosa pine (*P. ponderosa*). Peruvian pepper tree is ranked as a limited invasive species by Cal-IPC (2023).

5.2.3 Paved Areas (Upland Habitat)

A total of 13.39 acres of paved areas occur within the Study Area, concentrated in the northern parcel. Paved areas include the defunct golf course parking lot, large sidewalks and concrete slabs adjacent to the parking lot and developed areas within the 250-foot buffer. Narrow concrete golf cart paths throughout the previous golf course are not mapped as paved areas in this report, as most of these have been overgrown with thick stands of black mustard (**Section 5.2.1**).

The paved areas are largely unvegetated, other than weedy species growing through cracks in the asphalt (approximately 5% absolute cover). Common invasive species in the paved areas include black mustard (Cal-IPC Moderate), rough cat's-ear (*Hypochaeris radicata*, Cal-IPC Moderate), slender wild oat (Cal-IPC Moderate), cheeseweed (*Malva parviflora*), yellow star-thistle (Cal-IPC High), Mediterranean barley (Cal-IPC Moderate), and ripgut brome (Cal-IPC Moderate). This collection of weeds is not classified as sensitive.

5.2.4 Himalayan Blackberry Thicket (Riparian Habitat)

A total of 0.44 acre of the Study Area is covered with Himalayan blackberry thickets. This is a riparian scrub habitat composed of Himalayan blackberry at over 75% absolute cover. Himalayan blackberry thickets are located in the northeast portion of the Study Area, adjacent to a seasonal wetland drainage and a perennial wetland within a drainage (**Figure 6**).

Himalayan blackberry is an invasive species ranked highly invasive by Cal-IPC (2023). Natural communities dominated by invasive species are not typically considered sensitive; however, this is a riparian habitat adjacent to seasonal and perennial wetlands. Riparian habitats are classified as sensitive and are regulated by environmental regulatory agencies.

5.2.5 Valley Foothill Riparian (Riparian Habitat)

A total of 1.46 acres of Valley Foothill Riparian habitat occur within the Study Area. This habitat is described in the CWHR as having a canopy cover of 20-80%, composed of winter-deciduous trees (Mayer and Laudenslayer 1998). This habitat is described as having cottonwood (*Populus* sp.), California sycamore (*Platanus racemosa*), and valley oak (*Quercus lobata*) as common dominant species.

Within the Study Area, Valley Foothill Riparian habitat was composed of riparian trees along the seasonal wetlands and seasonal wetland drainages. This habitat is concentrated in the eastern portion of the Study Area (**Figure 7**). Dominant species included Fremont cottonwood, Siberian elm, Mexican fan palm, northern California black walnut, olive, and occasional Bishop pine. These trees occur at fairly low cover (approximately 30% absolute cover) and form an intermittent canopy. In the southern parcel of the Study Area, the Valley Foothill Riparian habitat is dominated by Peruvian pepper trees which are remnant landscaping trees. These trees are included in the Valley Foothill Riparian habitat because they are adjacent to the seasonal wetland drainage and contribute allochthonous material to the stream.

As a riparian habitat, the Valley Foothill Riparian areas are classified as a sensitive natural community.

5.2.6 Aquatic Resource Habitat Types

Several types of aquatic resource habitats were separately delineated by VNLC within the Study Area. Aquatic resources are all classified as sensitive and are regulated by environmental regulatory agencies. Summaries of the vegetation communities within aquatic resource habitats are provided below.

Seasonal Wetland Drainage. Several seasonal wetland drainages totaling 0.71 acres are located in the eastern portion of the Study Area. Dominant species in this habitat include Italian rye grass, prickly lettuce (*Lactuca serriola*), tall annual willowherb (*Epilobium brachycarpum*), annual beard grass (*Polypogon monspeliensis*), knotweed (*Polygonum aviculare*), curly dock (*Rumex crispus*), and spiny cocklebur (*Xanthium spinosum*).

Perennial Wetland Within Drainage. Two perennial wetlands (a total of 0.17 acres) are located in the northern parcel of the Study Area. Dominant species include broad-leaved cattail (*Typha latifolia*), curly dock, dallis grass (*Paspalum dilatatum*), alkali mallow (*Malvella leprosa*), and rescue grass (*Bromus catharticus* var. *catharticus*).

Seasonal Wetland Within Drainage. Seasonal wetlands within drainages cover 1.03 acres of the Study Area (**Figure 7**). Dominant herbaceous species included lamb's quarters (*Chenopodium album*), curly dock, cocklebur (*Xanthium strumarium*), tall annual willowherb, horseweed, dallis grass, tall flatsedge (*Cyperus eragrostis*), and barnyard grass (*Echinochloa crus-galli*).

Unvegetated Channel. A 0.08-acre unvegetated channel occurs south of the canal. This habitat is unvegetated.

5.2.7 Artificial Aquatic Features Constructed in Uplands

Several aquatic features are present in the Study Area which were constructed entirely within uplands. Because these features do not impound the flow of natural wetlands or Waters of the US (Waters), and do not replace the original channel of natural wetlands or Waters, these artificial features likely do not meet the criteria for jurisdictional Waters. These artificial habitats were separately delineated by VNLC within the Study Area. Summaries of the vegetation communities within artificial features are provided below.

Contra Costa Canal. The Contra Costa Canal is an aqueduct constructed in the 1930s and 1940s as part of the Bureau of Reclamation's Central Valley Project. The Bureau of Reclamation uses it to deliver Central Valley Project water from the Sacramento-San Joaquin Delta near Knightsen to the Contra Costa Water District, which delivers the water to customers in the east bay. This feature covers 1.64 acres of the Study Area, and it is unvegetated.

Golf Course Landscape Ponds. Two golf course landscape ponds (totaling 1.67 acres) were excavated within uplands in the study area. Following the closure of the course, these ponds appear to have transitioned into seasonal, rain-fed features. Dominant species within the basins included dotted smartweed (*Persicaria punctata*), Mediterranean barley, knotweed, Italian rye gras. Other common species within the ponds included rattail sixweeks grass (*Festuca myuros*), stinkwort (*Dittrichia graveolens*), and lamb's quarters. The margins of the golf course ponds had been invaded with species common in the annual grassland (**Section 5.2.1**). Dominant margin species included wall barley, short-pod mustard, ripgut brome, Italian rye grass, and rattail sixweeks grass.

5.3 Potential for Special-Status Plant Species Occurrences

The majority of the Study Area is composed of moderately- to highly-disturbed habitat. The former golf course is an area of higher disturbance, while the undeveloped grasslands surrounding the golf course are areas of lower disturbance. In total, there are three special-status plant taxa that may be considered to have at least a moderate potential to occur in the Study Area: big tarplant (*Blepharizonia plumosa*, CRPR 1B.1), Mt. Diablo fairy-lantern (*Calochortus pulchellus*, CRPR 1B.2), and Diablo helianthella (*Helianthella castanea*, CRPR 1B.2). These species are shaded in **Appendix B**.

Species listed in **Appendix B** are deemed to have a low potential to occur or not expected based on one or more of the following:

- Absence of suitable habitat within the Study Area.
- Absence of documented occurrences within the Project vicinity (approximately 5 miles).
- All of the documented occurrences in the Project vicinity are historical and/or are presumed extirpated.
- Suitable microhabitats (such as rocky outcroppings, gabbroic soils, serpentine soils, etc.) to support the species are absent or very minimal within the Study Area.
- The Study Area is well outside of the known elevation range for the plant taxa.

The natural community associated with the largest number of special-status plant species with potential to occur in the Study Area is annual grassland, which is known to support 15 target taxa listed in **Appendix B**. However, much of the annual grassland within the Study Area occurs within the former golf course. This disturbed / previously-developed area is unlikely to support special-status plant taxa. The undeveloped annual grasslands outside of the former golf course display a higher diversity of native species – these areas are more likely to support special-status plant taxa.

After thorough, protocol-level surveys, no special status plant species were observed within the Study Area. A total of 1.90 acres of riparian habitats occur within the Study Area, including Himalayan blackberry thicket (0.44 acre) and Valley Foothill Riparian habitats (1.46 acres). Separately delineated aquatic resources cover 1.99 acres of the Study Area. Aquatic resource habitat types include seasonal wetland drainages (0.71 acres), perennial wetlands within a drainage (0.17 acre), seasonal wetlands within a drainage (1.03 acres), and unvegetated channel (0.71 acre).

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APPENDIX A

Representative Photographs of the Study Area

Photo 1. Representative photo of Study Area, annual grassland dominated by non-native annual grasses and large patches of black mustard (*Brassica nigra*). (4/12/2023)

Photo 2. Remnant golf cart path covered by overgrown black mustard. (4/12/2023)

Photo 3. Representative view of landscaping trees, dominated by Peruvian pepper tree (*Schinus molle*) and Bishop pine (*Pinus muricata*). (5/31/2023)

Photo 4. Representative view of the paved areas with weedy species growing in asphalt cracks. (5/19/2023)

Photo 5. Valley foothill riparian habitat with Pacific willow (*Salix lasiandra* var. *lasiandra*), Fremont cottonwood (*Populus fremontii*), coast live oak (*Quercus agrifolia* var. *agrifolia*), and cocklebur (*Xanthium strumarium*). (7/12/2023)

Photo 6. Perennial wetland dominated by broad-leaved cattail (*Typha latifolia*), with Himalayan blackberry (*Rubus armeniacus*) thickets behind. (4/12/2023)

Photo 7. Remnant golf pond with margins dominated by upland species including wall barley (*Hordeum murinum*) and short pod mustard (*Hirschfeldia incana*). (7/12/2023)

APPENDIX B

Special-Status Plant Taxa Documented in the Study Area Vicinity

Table B-1. Special-Status Plant Taxa Documented in the Study Area Vicinity

Scientific Name Common Name (Family)	FESA/CESA/ CRPR[1]	Habitat; Microhabitat: Microhabitat Details, Microhabitat; Elevation (feet); Blooming Period[2]	Potential to Occur Within the Study Area
Amsinckia grandiflora Large-flowered fiddleneck (Boraginaceae)	FE/CE/1B.1	Cismontane woodland, Valley and foothill grassland; Microhabitat: none; 855-1,805 feet; (March) April-May	**Not Expected.** The Study Area is outside the elevation range of this species.
Arctostaphylos auriculata Mt. Diablo manzanita (Ericaceae)	--/--/1B.3	Chaparral (sandstone), Cismontane woodland; Microhabitat: none; 445-2,135 feet; January-March	**Not Expected.** The Study Area does not contain suitable habitat for this species. The nearest documented CNDDB occurrence is approximately 3.6 miles from the Study Area.
Arctostaphylos manzanita ssp. *laevigata* Contra Costa manzanita (Ericaceae)	--/--/1B.2	Chaparral (rocky); Microhabitat: none; 1,410-3,610 feet; January-March (April)	**Not Expected.** The Study Area is outside the elevation range of this species.
Astragalus tener var. *tener* Alkali milk-vetch (Fabaceae)	--/--/1B.2	Playas, Valley and foothill grassland (adobe clay), Vernal pools; Microhabitat: Alkaline; 5-195 feet; March-June	**Low Potential.** Valley and foothill grassland and moderately alkaline soils occur within the Study Area. The nearest documented CNDDB occurrence is approximately 5.7 miles from the study area in 2013.
Blepharizonia plumosa Big tarplant (Asteraceae)	--/--/1B.1	Valley and foothill grassland; Microhabitat: Clay (usually); 100-1,655 feet; July-October	**Moderate Potential.** Extensive but moderately disturbed valley and foothill grasslands and clay soils occur within the Study Area. The nearest documented CNDDB occurrence is approximately 1.1 mile from the Study Area. After a careful protocol-level search, this species was not observed within the Study Area.

Scientific Name Common Name (Family)	FESA/CESA/ CRPR[1]	Habitat; Microhabitat: Microhabitat Details, Microhabitat; Elevation (feet); Blooming Period[2]	Potential to Occur Within the Study Area
Calochortus pulchellus Mt. Diablo fairy-lantern (Liliaceae)	--/--/1B.2	Chaparral, Cismontane woodland, Riparian woodland, Valley and foothill grassland; Microhabitat: none; 100-2,755 feet; April-June	**Moderate Potential.** Valley and foothill grassland occurs within the Study Area. The nearest documented CNDDB occurrence is approximately 3.6 miles from the Study Area, from 2003. After a careful protocol-level search, this species was not observed within the Study Area.
Chloropyron molle ssp. *molle* Soft salty bird's-beak (Orobanchaceae)	FE/CR/1B.2	Marshes and swamps (coastal salt); Microhabitat: none; 0-10 feet; June-November	**Not Expected.** The Study Area is outside the elevation range of this species.
Cicuta maculata var. *bolanderi* Bolander's water-hemlock (Apiaceae)	--/--/2B.1	Marshes and swamps (brackish, coastal, freshwater); Microhabitat: none; 0-655 feet; July-September	**Not Expected.** No suitable marsh habitat occurs within the Study Area. The nearest documented CNDDB occurrence is approximately 2.9 miles from the Study Area.
Delphinium californicum ssp. *interius* Hospital Canyon larkspur (Ranunculaceae)	--/--/1B.2	Chaparral (openings), Cismontane woodland (mesic), Coastal scrub; Microhabitat: none; 640-3,595 feet; April-June	**Not Expected.** The Study Area does not contain suitable habitat for this species, and there are no documented CNDDB occurrences within 5 miles.
Downingia pusilla Dwarf downingia (Campanulaceae)	--/--/2B.2	Valley and foothill grassland (mesic), Vernal pools; Microhabitat: none; 5-1,460 feet; March-May	**Not Expected.** Valley and foothill grassland occurs within the Study Area; however, there is no suitable vernal pool microhabitat within the Study Area and there are no documented CNDDB occurrences within 5 miles.
Eriastrum ertterae Lime Ridge eriastrum (Polemoniaceae)	--/CC/1B.1	Chaparral (edges, openings); Microhabitat: sometimes semi-alkaline, Alkaline (sometimes), Sandy; 655-950 feet; June-July	**Not Expected.** The Study Area does not contain suitable habitat for this species, and there are no documented CNDDB occurrences within 5 miles.

Scientific Name Common Name (Family)	FESA/CESA/ CRPR[1]	Habitat; Microhabitat: Microhabitat Details, Microhabitat; Elevation (feet); Blooming Period[2]	Potential to Occur Within the Study Area
Eriogonum truncatum Mt. Diablo buckwheat (Polygonaceae)	--/--/1B.1	Chaparral, Coastal scrub, Valley and foothill grassland; Microhabitat: Sandy; 10-1,150 feet; April-September (November-December)	**Low Potential.** The nearest documented CNDDB occurrence of this species is approximately 5.6 miles away, from 2016. Valley and foothill grassland and limited sandy soils occur within the Study Area; however, there are no documented CNDDB occurrences within 5 miles.
Eryngium jepsonii Jepson's coyote-thistle (Apiaceae)	--/--/1B.2	Valley and foothill grassland, Vernal pools; Microhabitat: Clay; 10-985 feet; April-August	**Not Expected.** Valley and foothill grassland and clay soils occur within the Study Area, however, there is no suitable vernal pool microhabitat within the Study Area. The nearest documented CNDDB occurrence is approximately 3.2 miles from the Study Area from 1998.
Erysimum capitatum var. *angustatum* Contra Costa wallflower (Brassicaceae)	FE/CE/1B.1	Inland dunes; Microhabitat: none; 10-65 feet; March-July	**Not Expected.** The Study Area does not contain suitable habitat for this species and almost all of the Study Area is outside the elevation range of this species.
Extriplex joaquinana San Joaquin spearscale (Chenopodiaceae)	--/--/1B.2	Chenopod scrub, Meadows and seeps, Playas, Valley and foothill grassland; Microhabitat: Alkaline; 5-2,740 feet; April-October	**Not Expected.** Valley and foothill grassland as well as sandy soils and moderately alkaline soils occur within the Study Area; however, there are no documented CNDDB occurrences within 5 miles. The nearest occurrence is a historical occurrence 6.4 miles from the Study Area, from 1946.
Fritillaria liliacea Fragrant fritillary (Liliaceae)	--/--/1B.2	Cismontane woodland, Coastal prairie, Coastal scrub, Valley and foothill grassland; Microhabitat: Serpentinite (often); 10-1,345 feet; February-April	**Not Expected.** Valley and foothill grassland occurs within the Study Area; however, there are no documented CNDDB occurrences within 5 miles. The nearest occurrence is a historical occurrence 6.7 miles from the Study Area, from 1993.

Scientific Name Common Name (Family)	FESA/CESA/ CRPR[1]	Habitat; Microhabitat: Microhabitat Details, Microhabitat; Elevation (feet); Blooming Period[2]	Potential to Occur Within the Study Area
Helianthella castanea Diablo helianthella (Asteraceae)	--/--/1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland; Microhabitat: Rocky (usually); 195-4,265 feet; March-June	**Moderate Potential.** The nearest documented CNDDB occurrence is approximately 2.0 miles from the Study Area, from 2012. Disturbed valley and foothill grassland and riparian woodland habitats occur within the Study Area. However, suitable rocky microhabitats do not occur within the Study Area. After a careful search protocol-level search, this species was not observed within the Study Area.
Hesperolinon breweri Brewer's western flax (Linaceae)	--/--/1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland; Microhabitat: Serpentine (usually); 100-3,100 feet; May-July	**Low Potential.** The nearest documented CNDDB occurrence is approximately 4.0 miles from the Study Area from 2009. Valley and foothill grassland occurs within the Study Area; however, serpentine microhabitat does not occur within the Study Area.
Lasthenia conjugens Contra Costa goldfields (Asteraceae)	FE/--/1B.1	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools; Microhabitat: Mesic; 0-1,540 feet; March-June	**Low Potential.** Valley and foothill grassland and mesic areas occur within the Study Area; however, there are no documented CNDDB occurrences within 5 miles. The nearest occurrence is a historical occurrence 5.8 miles away, from 1895.
Lathyrus jepsonii var. *jepsonii* Delta tule pea (Fabaceae)	--/--/1B.2	Marshes and swamps (brackish, freshwater); Microhabitat: none; 0-15 feet; May-July (August-September)	**Not Expected.** The Study Area is outside the elevation range of this species.
Lilaeopsis masonii Mason's lilaeopsis (Apiaceae)	--/CR/1B.1	Marshes and swamps (brackish, freshwater), Riparian scrub; Microhabitat: none; 0-35 feet; April-November	**Not Expected.** The Study Area is outside the elevation range of this species.

Scientific Name Common Name (Family)	FESA/CESA/ CRPR[1]	Habitat; Microhabitat: Microhabitat Details, Microhabitat; Elevation (feet); Blooming Period[2]	Potential to Occur Within the Study Area
Lilium rubescens Redwood lily (Liliaceae)	--/--/4.2	Broadleafed upland forest, Chaparral, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest; Microhabitat: Roadsides (sometimes), Serpentinite (sometimes); 100-6,265 feet; (March) April-August (September)	**Not Expected.** The Study Area does not contain suitable habitat for this species. There are no documented CNDDB occurrences of this species within 5 miles.
Limosella australis Delta mudwort (Scrophulariaceae)	--/--/2B.1	Marshes and swamps (brackish, freshwater), Riparian scrub; Microhabitat: Usually mud banks, Streambanks (usually); 0-10 feet; May-August	**Not Expected.** The Study Area is outside the elevation range of this species.
Madia radiata Showy golden madia (Asteraceae)	--/--/1B.1	Cismontane woodland, Valley and foothill grassland; Microhabitat: none; 80-3,985 feet; March-May	**Low Potential.** The only documented CNDDB occurrence within 5 miles is a historical occurrence approximately 3.4 miles from the Study Area, from 1938. Valley and foothill grassland occurs within the Study Area. After a careful search protocol-level search, this species was not observed within the Study Area.
Malacothamnus hallii Hall's bush-mallow (Malvaceae)	--/--/1B.2	Chaparral, Coastal scrub; Microhabitat: none; 35-2,495 feet; (April) May-September (October)	**Not Expected.** The Study Area does not contain suitable habitat for this species. The only documented CNDDB occurrence within 5 miles is a historical occurrence approximately 3.4 miles from the Study Area, from 1931.
Navarretia gowenii Lime Ridge navarretia (Polemoniaceae)	--/--/1B.1	Chaparral; Microhabitat: none; 590-1,000 feet; May-June	**Not Expected.** The Study Area does not contain suitable habitat for this species and the Study Area is outside the elevation range of this species.

Scientific Name Common Name (Family)	FESA/CESA/ CRPR[1]	Habitat; Microhabitat: Microhabitat Details, Microhabitat; Elevation (feet); Blooming Period[2]	Potential to Occur Within the Study Area
Navarretia nigelliformis ssp. *radians* Shining navarretia (Polemoniaceae)	--/--/1B.2	Cismontane woodland, Valley and foothill grassland, Vernal pools; Microhabitat: Clay (sometimes); 215-3,280 feet; (March) April-June	**Low Potential.** The nearest CNDDB occurrence is approximately 5.5 miles from the Study Area, from 2008. Disturbed valley and foothill grassland and mesic areas occur within the Study Area.
Oenothera deltoides ssp. *howellii* Antioch Dunes evening-primrose (Onagraceae)	FE/CE/1B.1	Inland dunes; Microhabitat: none; 0-100 feet; March-September	**Not Expected.** The Study Area does not contain suitable habitat for this species. The nearest documented CNDDB occurrence is approximately 2.4 miles from the Study Area, recorded in 2001.
Senecio aphanactis chaparral ragwort (Asteraceae)	--/--/2B.2	Chaparral, Cismontane woodland, Coastal scrub; Microhabitat: Alkaline (sometimes); 50-2,625 feet; January-April (May)	**Not Expected.** The only documented CNDDB occurrence within 5 miles is a historical occurrence approximately 3.4 miles from the Study Area, from 1933. The Study Area does not contain suitable habitat for this species.
Symphyotrichum lentum Suisun Marsh aster (Asteraceae)	--/--/1B.2	Marshes and swamps (brackish, freshwater); Microhabitat: none; 0-10 feet; (April) May-November	**Not Expected.** The Study Area is outside the elevation range of this species.
Tropidocarpum capparideum Caper-fruited tropidocarpum (Brassicaceae)	--/--/1B.1	Valley and foothill grassland (alkaline hills); Microhabitat: none; 5-1,495 feet; March-April	**Not Expected.** Valley and foothill grassland and moderately alkaline soils occur within the Study Area. The only documented CNDDB occurrence within 10 miles of the Study Area is a historical collection from 1896, approximately 4.1 miles away.

Footnotes:

1 Rankings from CNDDB (September 2023) and CNPS (2023). See Column Header Categories and Abbreviations Below.

2 Habitat information from CNPS Rare Plan Program (CNPS 2023), Calflora (Calflora 2023) and the Jepson eFlora Project (Jepson 2023).

Column Header Categories and Abbreviations:

FESA: Listing status under the federal Endangered Species Act (ESA)

FE = Federal Endangered; FT = Federal Threatened; FC = Federal Candidate; FD = Federally Delisted

CESA: Listing status under the California state Endangered Species Act (CESA)

SE = State Endangered; SD = State Delisted; ST = State Threatened.

CRPR: CNPS rankings for rare plants (CNPS 2023) **–**

1A = Plants presumed extinct in California

1B = Plants rare, threatened or endangered in California and elsewhere

2 = Plants rare, threatened, or endangered in California, but more common elsewhere

3 = Plants about which more information is needed (a review list)

4 = Plants of limited distribution (a watch list); n/a = not applicable

CRPR Threat Code extensions and their meanings:

1 - Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

2 – Moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat)

3 – Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)" (CNPS 2022).

Potential to Occur:

Not Expected: Habitat in and adjacent to the Study Area is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Low Potential: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found in the Study Area.

Moderate Potential: Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found in the Study Area.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on in the Study Area

Present: Detected or documented on-site.

APPENDIX C

List of All Vascular Plant Taxa Identified Within the Study Area

Table C-1. List of All Vascular Plant Taxa Identified Within the Study Area

Scientific Name	Common Name	Family	Native Or Naturalized	Cal-IPC Rank	CRPR	State Status	Federal Status
Amaranthus albus	Tumbleweed	Amaranthaceae	Naturalized	N/A	N/A	N/A	N/A
Amaranthus blitoides	Procumbent pigweed	Amaranthaceae	Native	N/A	N/A	N/A	N/A
Schinus molle	Peruvian pepper tree	Anacardiaceae	Naturalized	Limited	N/A	N/A	N/A
Foeniculum vulgare	Fennel	Apiaceae	Naturalized	High	N/A	N/A	N/A
Torilis arvensis	Tall sock-destroyer	Apiaceae	Naturalized	Moderate	N/A	N/A	N/A
Asclepias fascicularis	Narrow-leaf milkweed	Apocynaceae	Native	N/A	N/A	N/A	N/A
Hedera canariensis	Canary Islands ivy	Araliaceae	Naturalized	High	N/A	N/A	N/A
Phoenix canariensis	Canary Island palm	Arecaceae	Naturalized	Limited	N/A	N/A	N/A
Aloe sp.	Aloe	Asphodelaceae	Naturalized	N/A	N/A	N/A	N/A
Carduus pycnocephalus ssp. *pycnocephalus*	Italian thistle	Asteraceae	Naturalized	Moderate	N/A	N/A	N/A
Centaurea solstitialis	Yellow star-thistle	Asteraceae	Naturalized	High	N/A	N/A	N/A
Cynara cardunculus	Artichoke	Asteraceae	Naturalized	N/A	N/A	N/A	N/A
Dittrichia graveolens	Stinkwort	Asteraceae	Naturalized	Moderate	N/A	N/A	N/A
Erigeron canadensis	Horseweed	Asteraceae	Native	N/A	N/A	N/A	N/A
Grindelia camporum	Great Valley gumweed	Asteraceae	Native	N/A	N/A	N/A	N/A
Helminthotheca echioides	Bristly ox-tongue	Asteraceae	Naturalized	Limited	N/A	N/A	N/A
Hypochaeris glabra	Smooth cat's-ear	Asteraceae	Naturalized	Limited	N/A	N/A	N/A
Hypochaeris radicata	Rough cat's-ear	Asteraceae	Naturalized	Moderate	N/A	N/A	N/A
Lactuca serriola	Prickly lettuce	Asteraceae	Naturalized	N/A	N/A	N/A	N/A
Pseudognaphalium californicum	Ladies' tobacco	Asteraceae	Native	N/A	N/A	N/A	N/A
Senecio vulgaris	Common groundsel	Asteraceae	Naturalized	N/A	N/A	N/A	N/A
Silybum marianum	Milk thistle	Asteraceae	Naturalized	Limited	N/A	N/A	N/A
Sonchus asper ssp. *asper*	Prickly sow thistle	Asteraceae	Naturalized	N/A	N/A	N/A	N/A
Sonchus oleraceus	Common sow thistle	Asteraceae	Naturalized	N/A	N/A	N/A	N/A
Xanthium spinosum	Spiny cocklebur	Asteraceae	Naturalized	N/A	N/A	N/A	N/A

Scientific Name	Common Name	Family	Native Or Naturalized	Cal-IPC Rank	CRPR	State Status	Federal Status
Xanthium strumarium	Cocklebur	Asteraceae	Native	N/A	N/A	N/A	N/A
Amsinckia menziesii	Common fiddleneck	Boraginaceae	Native	N/A	N/A	N/A	N/A
Brassica nigra	Black mustard	Brassicaceae	Naturalized	Moderate	N/A	N/A	N/A
Capsella bursa-pastoris	Shepherd's purse	Brassicaceae	Naturalized	N/A	N/A	N/A	N/A
Hirschfeldia incana	Short-pod mustard	Brassicaceae	Naturalized	Moderate	N/A	N/A	N/A
Lepidium didymum	Lesser swine cress	Brassicaceae	Naturalized	N/A	N/A	N/A	N/A
Sinapis arvensis	Charlock	Brassicaceae	Naturalized	Limited	N/A	N/A	N/A
Spergularia marina	Saltmarsh sand-spurrey	Caryophyllaceae	Native	N/A	N/A	N/A	N/A
Spergularia rubra	Red sand-spurrey	Caryophyllaceae	Naturalized	N/A	N/A	N/A	N/A
Stellaria media	Common chickweed	Caryophyllaceae	Naturalized	N/A	N/A	N/A	N/A
Chenopodium album	Lamb's quarters	Chenopodiaceae	Naturalized	N/A	N/A	N/A	N/A
Convolvulus arvensis	Bindweed	Convolvulaceae	Naturalized	N/A	N/A	N/A	N/A
Cuscuta campestris	Field dodder	Convolvulaceae	Native	N/A	N/A	N/A	N/A
Marah fabacea	California man-root	Cucurbitaceae	Native	N/A	N/A	N/A	N/A
Sequoia sempervirens	Coast redwood	Cupressaceae	Native	N/A	N/A	N/A	N/A
Bolboschoenus maritimus ssp. *paludosus*	Alkali bulrush	Cyperaceae	Native	N/A	N/A	N/A	N/A
Cyperus eragrostis	Tall flatsedge	Cyperaceae	Native	N/A	N/A	N/A	N/A
Croton setigerus	Turkey-mullein	Euphorbiaceae	Native	N/A	N/A	N/A	N/A
Acmispon americanus var. *americanus*	Spanish lotus	Fabaceae	Native	N/A	N/A	N/A	N/A
Lupinus affinis	Fleshy lupine	Fabaceae	Native	N/A	N/A	N/A	N/A
Lupinus bicolor	Miniature lupine	Fabaceae	Native	N/A	N/A	N/A	N/A
Lupinus formosus var. *formosus*	Summer lupine	Fabaceae	Native	N/A	N/A	N/A	N/A
Lupinus microcarpus var. *microcarpus*	Chick lupine	Fabaceae	Native	N/A	N/A	N/A	N/A
Lupinus nanus	Sky lupine	Fabaceae	Native	N/A	N/A	N/A	N/A

Scientific Name	Common Name	Family	Native Or Naturalized	Cal-IPC Rank	CRPR	State Status	Federal Status
Medicago polymorpha	Burclover	Fabaceae	Naturalized	Limited	N/A	N/A	N/A
Melilotus albus	White sweetclover	Fabaceae	Naturalized	N/A	N/A	N/A	N/A
Melilotus indicus	Sourclover	Fabaceae	Naturalized	N/A	N/A	N/A	N/A
Trifolium hirtum	Rose clover	Fabaceae	Naturalized	Limited	N/A	N/A	N/A
Vicia sativa ssp. *sativa*	Spring vetch	Fabaceae	Naturalized	N/A	N/A	N/A	N/A
Quercus agrifolia var. *agrifolia*	Coast live oak	Fagaceae	Native	N/A	N/A	N/A	N/A
Quercus ilex (cultivated)	Holly oak	Fagaceae	Naturalized	N/A	N/A	N/A	N/A
Quercus lobata	Valley oak	Fagaceae	Native	N/A	N/A	N/A	N/A
Erodium cicutarium	Redstem filaree	Geraniaceae	Naturalized	Limited	N/A	N/A	N/A
Erodium moschatum	Greenstem filaree	Geraniaceae	Naturalized	N/A	N/A	N/A	N/A
Geranium dissectum	Cutleaf geranium	Geraniaceae	Naturalized	Limited	N/A	N/A	N/A
Juglans hindsii	Northern California black walnut	Juglandaceae	Native	N/A	N/A	N/A	N/A
Juncus bufonius var. *bufonius*	Toad rush	Juncaceae	Native	N/A	N/A	N/A	N/A
Juncus bufonius var. *congestus*	Clustered toad rush	Juncaceae	Naturalized	N/A	N/A	N/A	N/A
Lythrum hyssopifolia	Hyssop loosestrife	Lythraceae	Naturalized	Limited	N/A	N/A	N/A
Malva parviflora	Cheeseweed	Malvaceae	Naturalized	N/A	N/A	N/A	N/A
Malvella leprosa	Alkali mallow	Malvaceae	Native	N/A	N/A	N/A	N/A
Claytonia perfoliata ssp. *perfoliata*	Miner's lettuce	Montiaceae	Native	N/A	N/A	N/A	N/A
Ficus carica	Edible fig	Moraceae	Naturalized	Moderate	N/A	N/A	N/A
Lysimachia arvensis	Scarlet pimpernel	Myrsinaceae	Naturalized	N/A	N/A	N/A	N/A
Eucalyptus camaldulensis	Red gum	Myrtaceae	Naturalized	Limited	N/A	N/A	N/A
Eucalyptus globulus	Blue gum	Myrtaceae	Naturalized	Moderate	N/A	N/A	N/A
Fraxinus uhdei	Shamel ash	Oleaceae	Naturalized	N/A	N/A	N/A	N/A
Olea europaea	Olive	Oleaceae	Naturalized	Limited	N/A	N/A	N/A

Scientific Name	Common Name	Family	Native Or Naturalized	Cal-IPC Rank	CRPR	State Status	Federal Status
Epilobium brachycarpum	Tall annual willowherb	Onagraceae	Native	N/A	N/A	N/A	N/A
Bellardia trixago	Mediterranean linseed	Orobanchaceae	Naturalized	Limited	N/A	N/A	N/A
Castilleja exserta ssp. exserta	Purple owl's clover	Orobanchaceae	Native	N/A	N/A	N/A	N/A
Eschscholzia californica	California poppy	Papaveraceae	Native	N/A	N/A	N/A	N/A
Abies sp. (horticultural variety)	Fir	Pinaceae	Naturalized	N/A	N/A	N/A	N/A
Cedrus deodara (cultivated)	Deodar cedar	Pinaceae	Naturalized	N/A	N/A	N/A	N/A
Pinus contorta ssp. *murrayana*	Lodgepole pine	Pinaceae	Native	N/A	N/A	N/A	N/A
Pinus muricata	Bishop pine	Pinaceae	Native	N/A	N/A	N/A	N/A
Pinus ponderosa	Ponderosa pine	Pinaceae	Native	N/A	N/A	N/A	N/A
Pseudotsuga menziesii var. *menziesii* (cone only)	Douglas-fir	Pinaceae	Native	N/A	N/A	N/A	N/A
Pittosporum tobira	Mock orange	Pittosporaceae	Naturalized	N/A	N/A	N/A	N/A
Kickxia elatine	Sharpleaf cancerwort	Plantaginaceae	Naturalized	N/A	N/A	N/A	N/A
Plantago major	Common plantain	Plantaginaceae	Naturalized	N/A	N/A	N/A	N/A
Avena barbata	Slender wild oat	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Brachypodium distachyon	False brome	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Bromus catharticus var. *catharticus*	Rescue grass	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Bromus diandrus	Ripgut brome	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Bromus hordeaceus	Soft chess	Poaceae	Naturalized	Limited	N/A	N/A	N/A
Bromus madritensis	Compact brome	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Crypsis schoenoides	Swamp prickle grass	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Cynodon dactylon	Bermudagrass	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Distichlis spicata	Salgrass	Poaceae	Native	N/A	N/A	N/A	N/A
Echinochloa crus-galli	Barnyardgrass	Poaceae	Naturalized	N/A	N/A	N/A	N/A

Scientific Name	Common Name	Family	Native Or Naturalized	Cal-IPC Rank	CRPR	State Status	Federal Status
Elymus triticoides	Beardless wild rye	Poaceae	Native	N/A	N/A	N/A	N/A
Festuca bromoides	Brome fescue	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Festuca myuros	Rattail sixweeks grass	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Festuca perennis	Italian rye grass	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Hordeum marinum ssp. *gussoneanum*	Mediterranean barley	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Hordeum murinum	Wall barley	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Melica californica	California melic	Poaceae	Native	N/A	N/A	N/A	N/A
Paspalum dilatatum	Dallis grass	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Phalaris aquatica	Harding grass	Poaceae	Naturalized	Moderate	N/A	N/A	N/A
Poa annua	Annual blue grass	Poaceae	Naturalized	N/A	N/A	N/A	N/A
Poa secunda	Nevada blue grass	Poaceae	Native	N/A	N/A	N/A	N/A
Polypogon monspeliensis	Annual beard grass	Poaceae	Naturalized	Limited	N/A	N/A	N/A
Persicaria lapathifolia	Willow weed	Polygonaceae	Native	N/A	N/A	N/A	N/A
Persicaria maculosa	Lady's thumb	Polygonaceae	Naturalized	N/A	N/A	N/A	N/A
Persicaria punctata	Doted smartweed	Polygonaceae	Native	N/A	N/A	N/A	N/A
Polygonum aviculare	Knotweed	Polygonaceae	Naturalized	N/A	N/A	N/A	N/A
Rumex crispus	Curly dock	Polygonaceae	Naturalized	Limited	N/A	N/A	N/A
Portulaca oleracea	Purslane	Portulacaceae	Naturalized	N/A	N/A	N/A	N/A
Prunus caroliniana	Carolina laurelcherry	Rosaceae	Naturalized	N/A	N/A	N/A	N/A
Prunus cerasifera	Cherry plum	Rosaceae	Naturalized	Limited	N/A	N/A	N/A
Prunus domestica	European plum	Rosaceae	Naturalized	N/A	N/A	N/A	N/A
Prunus emarginata	Bitter cherry	Rosaceae	Native	N/A	N/A	N/A	N/A
Rubus armeniacus	Himalayan blackberry	Rosaceae	Naturalized	High	N/A	N/A	N/A
Galium aparine	Goose grass	Rubiaceae	Native	N/A	N/A	N/A	N/A
Populus fremontii ssp. *fremontii*	Fremont cottonwood	Salicaceae	Native	N/A	N/A	N/A	N/A

Scientific Name	Common Name	Family	Native Or Naturalized	Cal-IPC Rank	CRPR	State Status	Federal Status
Salix gooddingii	Goodding's black willow	Salicaceae	Native	N/A	N/A	N/A	N/A
Salix lasiandra var. *lasiandra*	Pacific willow	Salicaceae	Native	N/A	N/A	N/A	N/A
Myoporum laetum	Myoporum	Scrophulariaceae	Naturalized	Moderate	N/A	N/A	N/A
Nicotiana glauca	Tree tobacco	Solanaceae	Naturalized	Moderate	N/A	N/A	N/A
Solanum nigrum	Black nightshade	Solanaceae	Naturalized	N/A	N/A	N/A	N/A
Tamarix parviflora	Smallflower tamarisk	Tamaricaceae	Naturalized	High	N/A	N/A	N/A
Dipterostemon capitatus	Bluedicks	Themidaceae	Native	N/A	N/A	N/A	N/A
Triteleia laxa	Ithuriel's spear	Themidaceae	Native	N/A	N/A	N/A	N/A
Typha latifolia	Broad-leaved cattail	Typhaceae	Native	N/A	N/A	N/A	N/A
Ulmus pumila	Siberian elm	Ulmaceae	Naturalized	N/A	N/A	N/A	N/A

APPENDIX D

ANIMALS SPECIES IDENTIFIED WITHIN THE STUDY AREA

Appendix D. Wildlife Species Documented within the Delta View Golf Course Project Specific Area. Raptor and other Surveys Conducted by VNLC, April 2022 to July 2023

Scientific Name	Common Name	Notes
Birds		
Accipiter cooperii	Cooper's Hawk	
Agelaius phoeniecus	Red-winged Blackbird	Territorial display
Anas platyrynchos	Mallard	
Aphelocoma californica	California Scrub-Jay	
Bubo virgianus	Great Horned Owl	2 fledglings and adults
Buteo jamaicensis	Red-tailed Hawk	Possible nest
Calypte anna	Anna's Hummingbird	
Cathartes aura	Turkey Vulture	
Charadrius vociferus	Killdeer	
Columba livia	Rock Pigeon	
Corvus brachyrhynchos	American Crow	Nesting
Corvus corax	Common Raven	
Elanus leucurus	White-tailed Kite	
Falco sparverius	American Kestrel	Possible nest
Haemorhos mexicanus	House Finch	
haemorhous purpureus	Purple Finch	
Icterus bullockii	Bullock's Oriole	
Meleagris gallopavo	Wild Turkey	
Melozone crissalis	California Towhee	
Mimus polyglottos	Northern Mockingbird	
Molothrus ater	Brown-headed Cowbird	
myiarchus cinerascens	Ash-throated Flycatcher	
Patagionas fasciata	Band-tailed Pigeon	
Pipilo maculatus	Spotted Towhee	
Psaltriparus minimus	Bushtit	
Sayornis nigricans	Black Phoebe	
Sayornis saya	Say's Phoebe	
Setophaga coronata	Yellow-rumped Warbler	
Sialia mexicana	Western bluebird	Possible nest
Streptopelia decaocto	Eurasian-collared Dove	
Sturnella neglecta	Western Meadowlark	
Sturnus vulgaris	European Starling	
Tachycineta bicolor	Tree Swallow	
Turdus migratorius	American Robin	
Tyrannus verticalis	Western Kingbird	
Zenaida macroura	Mourning Dove	
Zonotrichia atricapilla	Golden-crowned Sparrow	
Zonotrichia leucophrys	White-crowned Sparrow	

*Listed animal species may have been seen or heard outside of the Project Specific Area, but within 1 mile.

APPENDIX E

USFWS INFORMATION FOR PLANNING AND CONSULTATION LIST

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: December 22, 2023
Project Code: 2024-0029722
Project Name: 567 WSP Pittsburg Golf Course

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

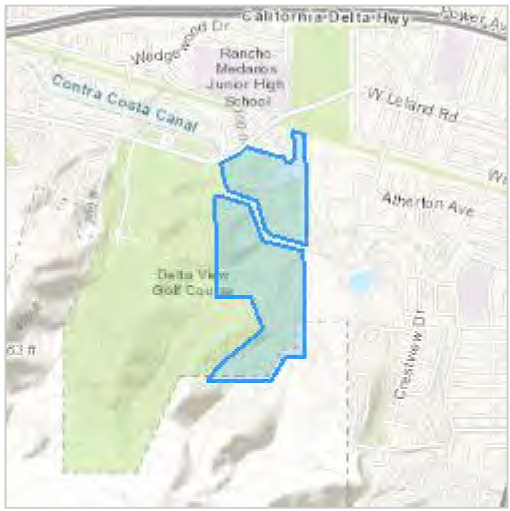
This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

PROJECT SUMMARY

Project Code: 2024-0029722
Project Name: 567 WSP Pittsburg Golf Course
Project Type: New Constr - Above Ground
Project Description: Development of a data center.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.0066341,-121.91195324584879,14z



Counties: Contra Costa County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

BIRDS

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

REPTILES

NAME	STATUS
Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

AMPHIBIANS

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened
Foothill Yellow-legged Frog *Rana boylii* Population: Central Coast Distinct Population Segment (Central Coast DPS) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5133	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRUSTACEANS

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

FLOWERING PLANTS

NAME	STATUS
Soft Bird's-beak *Cordylanthus mollis ssp. mollis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8541	Endangered

CRITICAL HABITATS

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Final

NAME	STATUS
For information on why this critical habitat appears for your project, even though Delta Smelt is not on the list of potentially affected species at this location, contact the local field office. https://ecos.fws.gov/ecp/species/321#crithab	

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Samantha Maners
Address: 5121 Newbold Lane
City: Salida
State: CA
Zip: 95368
Email samanthamaners122@gmail.com
Phone: 9259635964

Tree Protection and Preservation Report
for
Kimley-Horn

Prepared by: Dave Laczko PN #1233A

<u>Project Address</u>

2232 Golf Club Road

Pittsburg, CA 94565

<u>Anderson's Tree Care Specialists, Inc.</u>

121 N. 27th Street

San Jose, CA 95116

(408) 226-8733

info@andersonstreecare.com

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2/5/2024

Kimley-Horn
Attn: Ryan Bernal
100 W. San Fernando Street
San Jose, CA 95113
(925) 876-5812
ryan.bernal@kimley-horn.com

Re: Development impacts on existing trees.
2232 Golf Club Road
Pittsburg, CA 94565

Greetings Ryan,

At your request I have visited the above referenced address to assess the effects upon existing trees related to your plans to re-develop the property. This letter will serve to summarize my observations and recommendations.

SUMMARY

Anderson's Tree Care Specialists, Inc. (ATC) was asked by Kimley-Horn to assess the effects upon existing trees related to their plans to construct an approximately 350,000 square feet data center with its supporting infrastructure. The trees that were inventoried are located in the northernmost portion of the now closed Delta View Golf Course in Tract 1 and Tract 3.

- Seventy-five living and dead standing trees were inventoried. Only three native trees were present in the areas that were inventoried; one living Valley Oak, and two dead Cottonwoods. Of the seventy-five trees inventoried, nearly one quarter are dead standing trees.
- All seventy-five trees are requested for removal. Criteria for removal: *18.84.850 Tree removal permit procedure and requirements (E), (1), (a), (b), and (c).*

Summary continued.

- Two-hundred thirty-two (232) 24-inch boxed specimen trees are required to be planted based on the removal of fifty-eight (58) living trees. The final number of required replacement trees is subject to *18.84.855 Replacement trees (A), (B), (C), and (D).*
- Some portion of the fifty-eight living trees requested for removal may prove to be suitable for preservation. Suitability for preservation will be determined for individual trees after impacts are reviewed by ATC. More specifically, after review of the final plan set depicting beginning and finished grade elevations, changes to existing drainage characteristics, as well as the exact location of proposed structures with their associated infrastructure.
- Standardized tree protection and preservation recommendations are provided herein. See *Defining the Tree Protection Zone* and Appendices C & D.
    - Should particular trees indeed be deemed suitable for preservation at a later date, an addendum to this report recommending specific tree protection and preservation efforts will likely be required.

ASSIGNMENT

Prepare a tree protection and preservation plan consistent with Pittsburg planning requirements for the project located 2232 Golf Club Road, Pittsburg, CA 94565. Present finding in written format.

BACKGROUND

I conducted my first site visit on or about February 10, 2023 to assess the scope of work and to familiarize myself with the areas and trees to be inspected.

I returned to the site on Tuesday, November 28, 2023 to survey and inventory the trees. During the time between the two visits numerous trees depicted on the original plan set had died, or failed and were on the ground.

Additionally, parties unknown to me masticated weeds throughout the site and chainsaws were used to buck-up some of the failed trees.

Numerous other trees depicted along the western edge of the parking lot in Tract 2, Parcel 1 were removed, presumably by the adjacent property owner.

Only the living and dead standing trees that measured 15.6 inches in diameter at breast height (DBH) or greater were inventoried. Trees not included in the inventory include:

1. Trees depicted on ALTA/NSPS MAP, sheets 4-6 of 8, dated 12/24/2022 that have suffered a catastrophic failure,
2. trees that were bucked-up, and
3. trees that were previously removed by unknown parties.

LIMITS OF ASSIGNMENT

All observations were made from the ground. No Architectural or Grading and Drainage plans were reviewed by me.

PURPOSE & USE OF REPORT

This report is purposed for use by Kimley-Horn and its agents as the arborist report of record for the project located at 2232 Golf Club Road, Pittsburg, CA 94565. This report is valid for a period of eighteen months.

OBSERVATIONS

Pittsburg Municipal Code: Title 18 Zoning – Chapter 18.84 Special Land Use Regulations Applicable to Specific Uses – Article XIX Tree Preservation and Protection:

18.84.835 Definitions
F. "Protected tree" is defined as any of the following:

1. A California native tree, as identified in the Calflora online database of wild California plants, that measures at least 50 inches in circumference (15.6 inches diameter) at four and one-half feet above grade, regardless of location or health; or
2. A tree of a species other than a California native that measures at least 50 inches in circumference at four and one-half feet above grade and is either on an undeveloped property, located on public property or within the right-of-way, or located on private property and is found to provide benefits to the subject property as well as neighboring properties, subject to determination by the city planner; or
3. A tree required to be planted, relocated, or preserved as a condition of approval of a tree removal permit or other discretionary permit, and/or as environmental mitigation for a discretionary permit.

18.84.850 Tree removal permit procedure and requirements.
E. Standards for Reviewing Applications.

1. Required Findings. Prior to the issuance of a tree removal permit, the applicable decision-making body must find that:
   a. The condition of the tree or trees with respect to disease, danger of falling and the potential for endangering other nearby trees warrants removal and such condition represents a risk to public health and safety and cannot be reasonably remedied through less drastic measure; or
   b. The burden to the applicant in preserving the tree or trees greatly outweighs the tree's or trees' benefit to the public or environment; or
   c. If part of a development plan, subdivision or other discretionary project, preservation of the tree or trees would severely reduce the scale or feasibility of the development.

2. Factors to Be Considered. In making the foregoing determinations, the zoning administrator shall consider the following aspects of each application to the extent that they are applicable to the proposal:

a. Whether the tree or trees act as host or habitat for plants or animals;
b. The proximity to, or potential to interfere with, existing utilities or buildings;
c. The necessity to remove the tree or trees in order to allow economic enjoyment of the property;
d. Topography of the land and the effect of removal of the tree or trees on erosion, soil retention, and diversion or increased flow of surface waters;
e. Whether a tree is part of an important grove of trees;
f. Whether a tree has particular historical or heritage value;
g. The number, size, and type of replacement trees to be provided;
h. The visibility and value of the tree or trees to the neighborhood and the public;
i. The contribution of the tree or trees to the character of the site and the neighborhood.

F. Conditions. In approving the tree removal permit, the applicable reviewing body may impose such conditions considered necessary to ensure compliance with the intent and purpose of this article, in line with the standards prescribed in this article and with the general plan. If a permit is denied, the decision-making body shall state in writing the reasons for said denial based on the above findings and factors.

G. Approval Term. The permit shall be effective for a period no longer than 120 days after issuance. [Ord. 15-1390 § 3 (Exh. A), 2015.]

18.84.855 Replacement trees.
A. Where it has been determined that preservation of protected trees associated with a construction or development project is infeasible, replacement plantings shall be required as part of the tree removal permit. Subject to the discretion of the decision-making body, replacement options shall include:

1. Replacement of the removed tree(s) at a four-to-one ratio with 24-inch box trees;
2. Replacement of the tree(s) at a 12-to-one ratio with 15-gallon trees;
3. Payment of in-lieu fees equal to the replacement trees’ value, installation costs and one year of maintenance costs, as calculated with a 12-to-one ratio of 15-gallon trees; or
4. A combination of replacement and payment of in-lieu fees.

B. If any replacement tree fails to survive for a period of one year from the date of installation, then the applicant shall replace the tree at the applicant’s sole expense.

C. Location and Specifications.

1. Replacement trees shall be planted on site, except in instances where on-site planting and future tree survival is shown to be infeasible, in which case the decision-making body shall consider authorizing other off-site locations where maintenance will be guaranteed;

2. If California native trees are removed, all replacement trees shall be of the same species as the trees being replaced, except when a replacement tree is approved in a location that is not suitable for the native species;

3. Replacement trees shall be in addition to any trees required by any other provisions of this title, as a condition of approval of another discretionary permit, or as environmental mitigation for a discretionary permit.

D. Any in-lieu fees collected by the city pursuant to this section shall be used only for the installation or replacement of trees in city parks, open space or other areas of benefit to the city, and for any associated maintenance. [Ord. 15-1390 § 3 (Exh. A), 2015.]

End of cited municipal codes.

Project Scope
Kimley-Horn proposes to perform mass grading and drainage operations in the area north and east of the Contra Costa Canal to accommodate the construction of an approximately 350,000 square feet data center and its supporting infrastructure.

Site Plan Review

The latest set of site plans reviewed by me were drawn by UNICO Engineering which included: ALTA/NSPS MAP, sheets 1-6 of 8, dated 12/24/2022; a.k.a. 2023.11.06-Pittsburg-ArboristScopeMarkup_supplemental.pdf.

Site Characteristics
Closed and dilapidated golf course. All golf course structures have been demolished and the debris removed. The fairways, greens, beaches and lakes have been overgrown with mustard weed and various other weeds. Trees throughout the surveyed areas are in varying degrees of decline, are dead, or are overgrown. Fire damage and water deprivation have caused distress and/or death to a vast number of trees. Some attempts have been made to suppress the weeds using a masticator and there is evidence someone is bucking-up tree debris.

Tree Characteristics
One-inch blue anodized numbered tree tags #1-75 were placed on each living and dead standing tree that measured 15.6 inches in diameter or greater at or about fifty-four inches above level grade. See Appendix B: Site Map.

Seventy-five living and dead standing trees were inventoried, they include: 15 Aleppo Pine (***Pinus halepensis***), 9 Stone Pine (***Pinus pinea***), 1 Monterey Pine (***Pinus radiata***), 1 Canary Island Pine (***Pinus canariensis***), 14 Shamel Ash (***Fraxinus uhdei***), 3 Raywood Ash (***Fraxinus angustifolia 'Raywood'***), 2 Ash (***Fraxinus spp.***), 8 Peruvian Pepper (***Schinus molle***), 6 Silver Dollar Eucalyptus (***Eucalyptus polyanthemos***), 6 Eucalyptus (***Eucalyptus spp***.), 4 Mexican Fan Palm (***Washingtonia robusta***), 1 Blackwood Acacia (***Acacia melanoxylon***), 1 Deodar Cedar (***Cedrus deodara***), 1 Fig (***Ficus carica***), 2 Black Cottonwood (***Populus trichocarpa***), and 1 Valley Oak (***Quercus lobata***). See Appendix A: Tree Table for individual tree characteristics and Appendix E: Supporting Photographs.

Percentages of Tree Species that were inventoried:
34.6 percent Pine (*Pinus spp*.) – 26 trees; many with bark beetles.
25.3 percent Ash (*Fraxinus spp*.) – 19 trees; multiple dead trees.
16 percent Eucalyptus (*Eucalyptus spp*.) – 12 trees; multiple fire damaged trees.
10.6 percent Pepper (*Schinus molle*) – 8 trees in varying degrees of health and condition.
5.3 percent Palm (*Washingtonia robusta*) – 4 trees, some with fire damage.
2.6 percent Cottonwood (*Populus trichocarpa*) – 2 dead native trees.
1.3 percent Acacia (*Acacia melanoxylon*) – 1 tree in good condition.
1.3 percent Fig (*Ficus carica*) – 1 multi-stemmed tree engulfing a chained-link fence.
1.3 percent Cedar (*Cedrus deodara*) – 1 tree in good health and condition.
1.3 percent Oak (*Quercus lobata*) – 1 living native tree in good health and condtion.

Percentages of Living and Dead Standing Trees:
77.3 percent living trees (58).
22.6 percent dead standing trees (17).

Percentage of Native Species:
3.9 percent native species (1 living Valley Oak, 2 dead Black Cottonwoods).

Trees Requested for Removal:
Fifty-eight living trees and seventeen dead standing trees are requested for removal. Criteria for removal: *18.84.850 Tree removal permit procedure and requirements (E), (1), (a), (b), and (c).*

Replacement Trees

Two-hundred thirty-two (232) 24-inch boxed specimen trees are required to be planted based on the removal of fifty-eight (58) living trees. The total number of required replacement trees are subject to *18.84.855 Replacement trees (A), (B), (C), and (D).*

ADDITIONAL OBSERVATIONS

Some portion of the fifty-eight living trees requested for removal may prove to be suitable for preservation. Suitability for preservation will be determined for individual trees after impacts are reviewed by ATC. More specifically, after review of the final plan set depicting beginning and finished grade elevations, changes to existing drainage characteristics, as well as the exact location of proposed structures with their associated infrastructure.

Should retention and preservation efforts be deemed applicable and required for any living tree discussed herein, an addendum to this report will suffice to ensure proper tree protection and preservation efforts are applied adhering to industry best management practices.

TESTING & ANALYSIS

The site and trees were surveyed and inventoried on foot using a diameter tape and camera.

DISCUSSION

Contrary to common depictions of how and where tree roots grow, tree roots are generally found growing in the upper 18 to 24 inches of soil sprouting out laterally and perpendicular from the base of the tree's trunk.

Defining the Tree Protection Zone

"A tree's critical root zone is the area immediately adjacent to the trunk where roots essential for tree health and stability are located. The CRZ is subjective: there is no accepted formula to biologically define it. However, there may be regulations that define it." (Fite pg. 10)

A Tee Protection Zone (TPZ) is an arborist-defined area surrounding the trunk intended to protect roots and soil within the critical root zone and beyond…There are many methods for determining the size of a TPZ. (Fite pg. 10) Determining the effect of root loss upon a particular tree is based mostly on the species of tree, its age, its health and condition, and the species relative tolerance to withstand development impacts.

The optimal TPZ radius is in most circumstances is equal to the tree's dripline which coincidentally is in many cases equal to 12x trunk diameter. Erecting a TPZ zone fence at distance equal 12x the tree's trunk diameter can sometimes impede construction activities and most times the TPZ radius can be reduced to 6x trunk diameter (on one side of the tree); with 3x trunk diameter having proved feasible in certain circumstances as well. There are times when there is not enough room to erect a tree protection zone fence. Tree wrap can be used in this case but will only prevent damages from direct strikes. See Appendices: C & D.

Selective Root Pruning v. Non-Selective Root Pruning
Selective root pruning consists of soil excavation (exploratory trenching) prior to root pruning to determine the best places to make cuts. This can make it possible to cut as few roots as possible or to make several smaller cuts instead of a single larger diameter cut.

Non-selective root cutting is less targeted, usually causing root damage as the result of trenching or soil excavation that does not intentionally target tree roots. The tools used for root pruning are usually hand pruners, loppers, hand saws, reciprocating saw, oscillating saws, or small chain saws. (Costello pg. 18)

Pitch Moths
Conifers are attacked by several *Synanthedon* species. The Sequoia Pitch Moth (***Synanthedon sequoiae***) is found in Pines throughout California. Pitch moth infestations are recognized by the unsightly masses of gummy white, yellow, or pink pitch on the trunk and limbs. People unfamiliar with the damage sometimes confuse pitch moth masses with bark beetle pitch tubes. See tree #39 pictured right.

Pines vary greatly in their susceptibility to sequoia pitch moth. If conifers must be pruned, prune only from October through January so that injuries begin closing before the egg-laying female pitch moths appear in the spring. Scraping away or prying off resinous pitch is the only direct method of controlling pitch masses and larvae, except possibly for pruning off smaller branches. If resin masses are carefully excised, larvae or pupae can be found and killed. Properly removing pitch masses from all nearby tree can reduce reinfestations and control local moth populations. Once the borer is removed, sap flow will slow and the wound will close. (Dreistadt pg. 191)

Red Turpentine Bark Beetle
The Red Turpentine Bark Beetle (RTB) pictured below right, occurs in the Midwest and western United States. RTB is usually not a serious pest. Vigorous trees can

survive a few RTB, and only a small area of the tree cambium may die. Weakened trees attacked by this beetle may die, especially Monterey Pines, usually because they are under stress from a combination of other factors in addition to beetles. They usually attack the trunk no more than 6 to 8 feet above ground. (Dreistadt pg. 174)

Tree Construction Tolerance

Healthy trees are generally better able to withstand construction stressors than are unhealthy trees, as they have stored nutrients available to use for recovery. A tree's roots grow in unpredictable patterns, generally within the top two feet of soil and the root systems of mature trees may extend much farther than the dripline. The tolerance of disturbance varies widely among species**.**

Soil Compaction

Most soil compaction results from vehicle and equipment traffic, although foot traffic and rainwater impacts may also contribute to a lesser extent. The severity of compaction depends on the force per area unit applied to the soil, frequency of application, surface cover, soil texture, and soil moisture. Soils with a clay or loam texture, high moisture content, or low levels of organic matter are more susceptible to compaction than are dry or frozen, coarse-textured soils, and those high in organic matter. (Fite pg. 3)

Pruning Specifications

All tree pruning activities shall be performed prior to beginning development activities by a qualified Arborist with a C-61/D-49 California Contractors License. Tree maintenance and care shall be specified in writing according to American National Standard (ANSI) for Tree Care Operations: Tree, Shrub and Other woody Plant Management: Standard Practices parts 1 through 10, adhering to ANSI Z133.1 safety standards and local regulations. Work shall be performed according to the most recent edition of the International Society of Arboriculture© Best Management Practices for each subject matter (Tree Pruning etc.) *The use of spikes and/or gaffs when climbing is strictly prohibited unless the tree is being removed*.

- *Elevate Crown* (a.k.a. raise crown)-The selective removal of lower growing or low hanging limbs to gain vertical clearance. Do not remove living stems greater than 4" in diameter without the approval of the Project Arborist.
- *Reduce end-weight*-Cut the offending stem[s] back to a lateral that is ⅓ the diameter or more of the parent stem and capable of maintaining apical

dominance. Remove no more than 25 percent of the living tissue from the offending stem[s]. Remove all existing dead stubs and/or damaged branches per occurrence. Do not cut back into living stems that are 4" or greater in diameter without the approval of the Project Arborist.

Root Pruning Specifications
Root pruning is the process of cleanly cutting roots prior to mechanical excavation to minimize damage to the tree's root system. Root pruning and root damage from excavation can cause great harm to a tree, especially if structural roots are affected. Damage to these roots can reduce tree health and/or structural stability…Air, water, [or hand excavation] prior to root pruning allows the arborist to examine the roots and determine the best places to make cuts, preferably beyond sinker roots or outside root branch unions. (Fite pg. 17)

The principles of **Compartmentalization of Decay in Trees (CODIT)** apply to roots as well as to stems. Because root injuries are common in nature, roots have evolved to be strong compartmentalizers. Small root cuts do not usually lead to extensive decay. Decay development because of root cutting can take years or decades to develop in temperate climates.
Just as flush cutting branches is no longer an acceptable practice, a pruning cut that removes a root at its point of origin should not cut into the parent root. The final cut should result in a flat surface with adjacent bark firmly attached. Smaller pruning cuts are preferred. (Costello pg. 17)

Should roots 2" in diameter or greater be unearthed near protected trees, root pruning may prove necessary. Halt activities and contact the project arborist to advise. The following guidelines should be adhered to with the project Arborist on site to advise work crews.

- Pruning roots 2" in diameter or greater requires the use of a commercial grade 15-amp reciprocating saw with at least 3 new unused wood cutting blades available while on-site.
- Cleanly sever the root without ripping or tearing the root tissue. It is preferable to cut back to a lateral root, much like when reducing the length of a stem or branch.
- Exposed pruning wounds left more than 24 hours should be covered with burlap and wetted and kept wet until area is backfilled. If pour cement against exposed pruning wounds, cover end of root with plastic with a rubber band before pouring cement.
- A new unused Arborist hand saw will also be allowed i.e. Fanno™ Tri-Edge Blade Hand Saw.

Rating the trees suitability for preservation.

High:

- Trees with good health and structural stability that have the potential for long-term survivability at the site.
- Species that have good to moderate tolerance for root loss

Moderate:

- Trees with somewhat declining health and/or structural defects than can be abated with treatment.
- Species that have moderate tolerance for root loss

Low:

- Trees dead, in poor health or with significant structural defects that cannot be mitigated.
- Tree is expected to continue to decline.
- Species that have poor tolerance for root loss

Type I Tree Protection Zone

- Is a fenced area erected around a tree or group of trees prior to beginning any demolition, grading, excavation, or other construction activities to protect the roots and soil from compaction, and to keep the tree trunk and branches clear from damage by construction activities.
- A typical TPZ consists of a six-foot-high chained link fence that is securely installed in the ground with 2" posts driven 24" below grade to surround the tree[s] with a radius equal to or as close as possible to the drip line. A sign stating, "Tree Protection Zone-No Entry" is placed in clear view on the fence visible from all points of ingress and egress and left in place for the duration of the construction phase.
- Mulch to a depth of six inches is placed within the TPZ to further protect the tree[s] critical root zone and soil (if needed)—do not cover the base of the trunk with the mulch. Storage of construction materials within the TPZ is strictly prohibited, and physical entry is limited to designated personnel (one or two people preferably). If any work is required with the TPZ, all work is to be done by hand with the project arborist present. No self-propelled equipment may enter the TPZ. The contractor is responsible for contacting the project arborist in a timely manner to have the project arborist present for all work performed within the TPZ of significant trees.

Type III Tree Protection Zone

- Alternate form of tree protection by wrapping the tree when sufficient room for a Type I TPZ is unavailable.
- Wooden slats at least one inch thick at least 6 feet long are bound securely, edge to edge, around the trunk. A single layer or more of orange plastic construction fencing is then wrapped and secured around the outside of the wooden slats.
- Alternatively, straw wattle can be used as a tree wrap by coiling the wattle around the trunk to a minimum height of 6 feet above grade. A single layer or more of orange plastic construction fencing is then wrapped and secured around the straw wattle.
- No portion of the tree wrap is to be affixed directly to the tree with nails, lag bolts, spikes, etc. The purpose of Type III tree protection is to protect the trunk from damage by

direct impacts of equipment, vehicles, tools, etc. and nailing the wrap directly to the tree will cause the exact type of damage we are trying to avoid.

- The removal of any tree protection fencing authorized only after an on-site inspection by the City Arborist.

CONCLUSIONS

The subject property is dilapidated and the vast majority of the living trees are in a fair to poor state of structural and physiological well-being. All seventy-five trees are requested for removal and are proper candidates for removal based on the following conditions:

1. The poor health and condition of the tree or trees with respect to neglected maintenance, being dead standing trees, water deprivation and fire damage; and/or
2. the burden to the applicant in preserving the tree or trees greatly outweighs the tree's or trees' benefit to the public or environment; and/or
3. the preservation of the tree or trees would severely reduce the scale or feasibility of the development.

Should retention and preservation efforts be deemed applicable and required for any living tree discussed herein, an addendum to this report will suffice to ensure proper tree protection and preservation efforts are applied adhering to industry standard best management practices.

RECOMMENDATIONS

1. Submit this report accompanied by a tree removal permit application with your development plans to the City of Pittsburg for review.
2. With the permits in hand, remove all seventy-five trees discussed herein.
3. Replace the fifty-eight living trees that were removed with two-hundred thirty-two (232) twenty-four (24) inch boxed specimen trees after construction activities and during the final landscape phase. Tree Genus/species and planting locations to be determined.

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Appendix A: Tree Table

Tree #	Common Name	Botanical Name	Native	Protected	DBH (in.)	Spread (ft.)	Condition (0-5)	Disposition	Notes
1	Balckwood Acacia	***Acacia Melanoxylon***	No	Yes	19.7	40	4	Remove	
2	Mexican Fan Palm	***Washingtonia robusta***	No	Yes	17	10	4	Remove	
3	Mexican Fan Palm	***Washingtonia robusta***	No	Yes	19	10	4	Remove	
4	Italian Stone Pine	***Pinus pinea***	No	Yes	35[1]	50	4	Remove	
5	Italian Stone Pine	***Pinus pinea***	No	Yes	47[1]	60	4	Remove	Utility side trimmed.
6	Mexican Fan Palm	***Washingtonia robusta***	No	Yes	25	15	4	Remove	Fire damage lower trunk.
7	Black Cottonwood	***Populus trichocarpa***	Yes	Yes	45[2]	30	Dead	Remove	Fire damage.
8	Mexican Fan Palm	***Washingtonia robusta***	No	Yes	18.7	15	4	Remove	Fire damage lower trunk.
9	Aleppo Pine	***Pinus halepensis***	No	Yes	17.9	30	2	Remove	Fire damage lower trunk.
10	Aleppo Pine	***Pinus halepensis***	No	Yes	24.5[2]	50	4	Remove	
11	Aleppo Pine	***Pinus halepensis***	No	Yes	19.7	35	2	Remove	Fire damage lower trunk.
12	Aleppo Pine	***Pinus halepensis***	No	Yes	18.8[1]	30	2	Remove	Fire damage lower trunk.
13	Italian Stone Pine	***Pinus pinea***	No	Yes	32.7	60	2	Remove	Fire damage.
14	Italian Stone Pine	***Pinus pinea***	No	Yes	23.3, 13	60	2	Remove	Fire damage.
15	Italian Stone Pine	***Pinus pinea***	No	Yes	19	40	3	Remove	Heavy infestation Sequoia Pitch Moth.
16	Italian Stone Pine	***Pinus pinea***	No	Yes	32[1]	70	4	Remove	Previous failures, poor structure.
17	Italian Stone Pine	***Pinus pinea***	No	Yes	25	70	3	Remove	Previous failures, poor structure.
18	Italian Stone Pine	***Pinus pinea***	No	Yes	32	60	3	Remove	Previous failures, poor structure.
19	Silver Dollar Eucalyptus	***Eucalyptus polyanthemos***	No	Yes	14.8	20	3	Remove	Fire damage, water deprivation.
20	Silver Dollar Eucalyptus	***Eucalyptus polyanthemos***	No	Yes	18.7	30	3	Remove	Fire damage, water deprivation.
21	Silver Dollar Eucalyptus	***Eucalyptus polyanthemos***	No	Yes	21.2	30	Dead	Remove	Fire damage, water deprivation.
22	Silver Dollar Eucalyptus	***Eucalyptus polyanthemos***	No	Yes	12.3, 15	30	3	Remove	Fire damage, water deprivation.
23	Silver Dollar Eucalyptus	***Eucalyptus polyanthemos***	No	Yes	25.5	45	3	Remove	Fire damage, water deprivation.
24	Stone Pine	***Pinus pinea***	No	Yes	31.3[1]	60	4	Remove	
25	Silver Dollar Eucalyptus	***Eucalyptus polyanthemos***	No	Yes	Multi-stemmed	60	4	Remove	
26	Eucalyptus	***Eucalyptus spp.***	No	Yes	26	40	4	Remove	
27	Eucalyptus	***Eucalyptus spp.***	No	Yes	19.3	40	3	Remove	Previous co-dominant stem failure.
28	Eucalyptus	***Eucalyptus spp.***	No	Yes	23.4	40	4	Remove	
29	Eucalyptus	***Eucalyptus spp.***	No	Yes	14.3	30	4	Remove	
30	Eucalyptus	***Eucalyptus spp.***	No	Yes	29.2	45	4	Remove	

Tree #	Common Name	Botanical Name	Native	Protected	DBH (in.)	Spread (ft.)	Condition (0-5)	Disposition	Notes
31	Peruvian Pepper	***Schinus molle***	No	Yes	16.5[3]	30	4	Remove	
32	Peruvian Pepper	***Schinus molle***	No	Yes	14, 16.5[2]	35	4	Remove	
33	Deodar Cedar	***Cedrus deodara***	No	Yes	19.2	40	4	Remove	
34	Aleppo Pine	***Pinus pinea***	No	Yes	35.5[2]	75	4	Remove	
35	Monterey Pine	***Pinus radiata***	No	Yes	26[1]	30	Dead	Remove	
36	Fig	***Ficus carica***	No	Yes	Multi-stemmed	40	3	Remove	Growing around a chained link fence.
37	Canary Island Pine	***Pinus canariensis***	No	Yes	17.6	25	4	Remove	
38	Aleppo Pine	***Pinus halepensis***	No	Yes	25.2	40	4	Remove	
39	Aleppo Pine	***Pinus halepensis***	No	Yes	17	35	3	Remove	Heavy lean
40	Valley Oak	***Quercus lobata***	Yes	Yes	17	35	4	Remove	
41	Aleppo Pine	***Pinus halepensis***	No	Yes	21.7	35	3	Remove	Heavy infestation Sequoia Pitch Moth and Red Turpentine Bark Beetle.
42	Aleppo Pine	***Pinus halepensis***	No	Yes	16.5[1]	45	3	Remove	Previous large limb failures.
43	Aleppo Pine	***Pinus halepensis***	No	Yes	30[2]	40	3	Remove	Heavy infestation Sequoia Pitch Moth.
44	Aleppo Pine	***Pinus halepensis***	No	Yes	18.3	35	3	Remove	Heavy lean
45	Peruvian Pepper	***Schinus molle***	No	Yes	19.8	45	4	Remove	
46	Shamel Ash	***Fraxinus uhdei***	No	Yes	22.5	40	Dead	Remove	
47	Shamel Ash	***Fraxinus uhdei***	No	Yes	22	45	Dead	Remove	
48	Aleppo Pine	***Pinus halepensis***	No	Yes	26.5	50	3	Remove	Previeous large limb failures.
49	Peruvian Pepper	***Schinus molle***	No	Yes	23	40	3	Remove	Water deprivation
50	Shamel Ash	***Fraxinus uhdei***	No	Yes	22	30	Dead	Remove	
51	Aleppo Pine	***Pinus halepensis***	No	Yes	30[1]	30	Dead	Remove	
52	Peruvian Pepper	***Schinus molle***	No	Yes	27	60	3	Remove	Water deprivation
53	Shamel Ash	***Fraxinus uhdei***	No	Yes	14	40	Dead	Remove	
54	Peruvian Pepper	***Schinus molle***	No	Yes	27.3	70	4	Remove	
55	Shamel Ash	***Fraxinus uhdei***	No	Yes	18.6	45	Dead	Remove	
56	Shamel Ash	***Fraxinus uhdei***	No	Yes	15.6	35	Dead	Remove	
57	Aleppo Pine	***Pinus halepensis***	No	Yes	16.1, 16.2	40	Dead	Remove	
58	Aleppo Pine	***Pinus halepensis***	No	Yes	27.5[1]	60	3	Remove	Heavy infestation Sequoia Pitch Moth.
59	Shamel Ash	***Fraxinus uhdei***	No	Yes	21.3	45	Dead	Remove	
60	Eucalyptus	***Eucalyptus spp.***	No	Yes	16.5	15	Dead	Remove	
61	Shamel Ash	***Fraxinus uhdei***	No	Yes	20.7	50	3	Remove	Water deprivation
62	Shamel Ash	***Fraxinus uhdei***	No	Yes	21.2[4]	35	4	Remove	
63	Shamel Ash	***Fraxinus uhdei***	No	Yes	20.9	45	Dead	Remove	
64	Shamel Ash	***Fraxinus uhdei***	No	Yes	15.7	20	Dead	Remove	

A2: Page 3

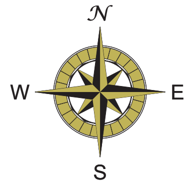
Tree #	Common Name	Botanical Name	Native	Protected	DBH (in.)	Spread (ft.)	Condition (0-5)	Disposition	Notes
65	Shamel Ash	***Fraxinus uhdei***	No	Yes	15.8	20	Dead	Remove	
66	Shamel Ash	***Fraxinus uhdei***	No	Yes	14.4	30	3	Remove	Water deprivation
67	Ash	***Fraxinux spp.***	No	Yes	19.8	60	3	Remove	Water deprivation
68	Ash	***Fraxinux spp.***	No	Yes	23.4	75	3	Remove	Water deprivation
69	Black Cottonwood	***Populus trichocarpa***	Yes	Yes	48	45	Dead	Remove	
70	Peruvian Pepper	***Schinus molle***	No	Yes	32[4]	35	4	Remove	
71	Raywood Ash	***Fraxinus angustifolia 'Raywood'***	No	Yes	18.1	40	4	Remove	
72	Raywood Ash	***Fraxinus angustifolia 'Raywood'***	No	Yes	18.1	30	4	Remove	
73	Raywood Ash	***Fraxinus angustifolia 'Raywood'***	No	No	11.7	35	4	Remove	
74	Shamel Ash	***Fraxinus uhdei***	No	Yes	20	35	4	Remove	
75	Peruvian Pepper	***Schinus molle***	No	Yes	25.5	55	4	Remove	

[1]: Measured at 36 inches above level grade.
[2]: Measured at 24 inches above level grade.
[3]: Measured at near grade.
[4]:Measured at 12 inches above level grade.

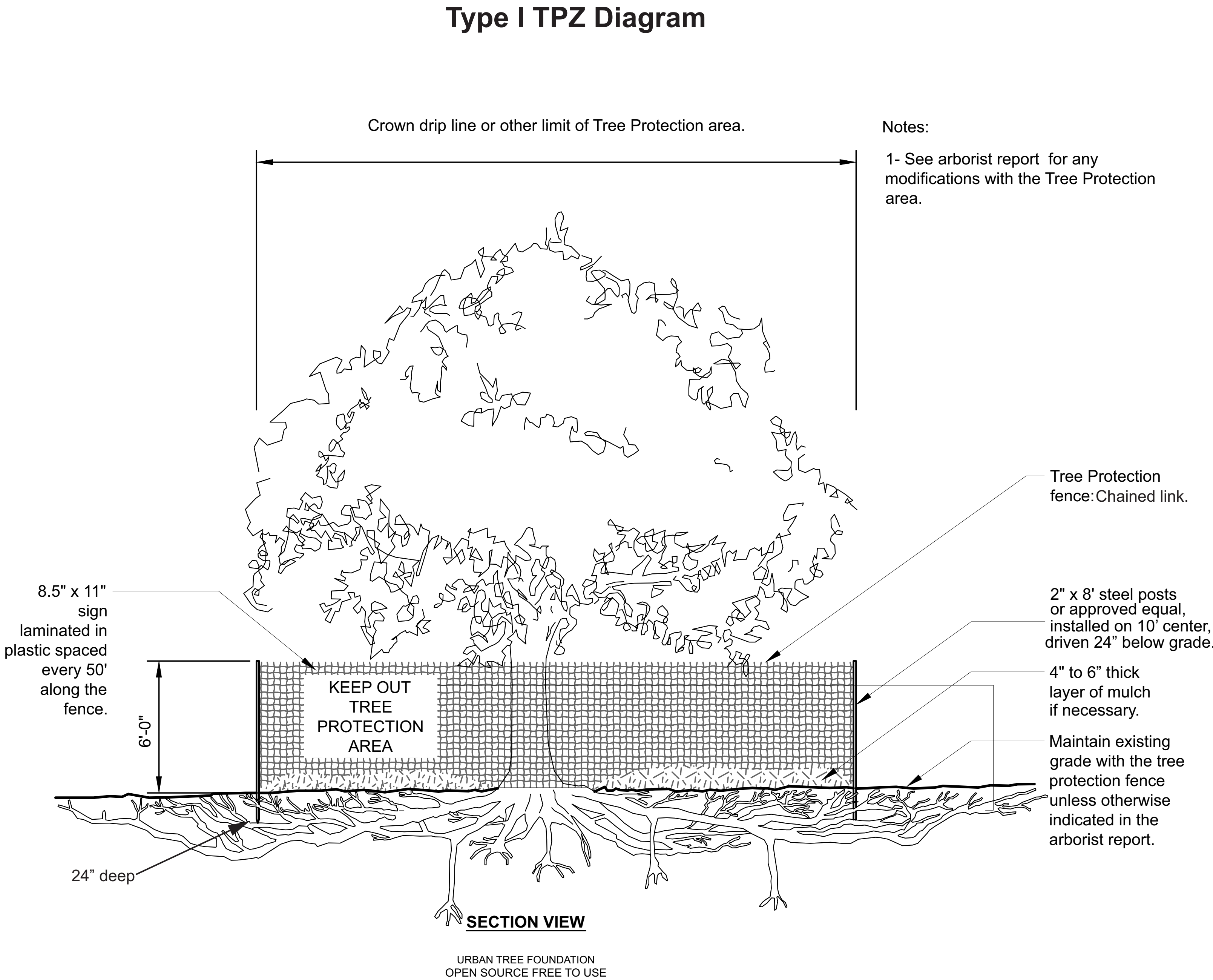
Appendix B: Site Map

SITE MAP WITH TREE LOCATIONS

2232 Golf Club Road
Pittsburg, CA 94565

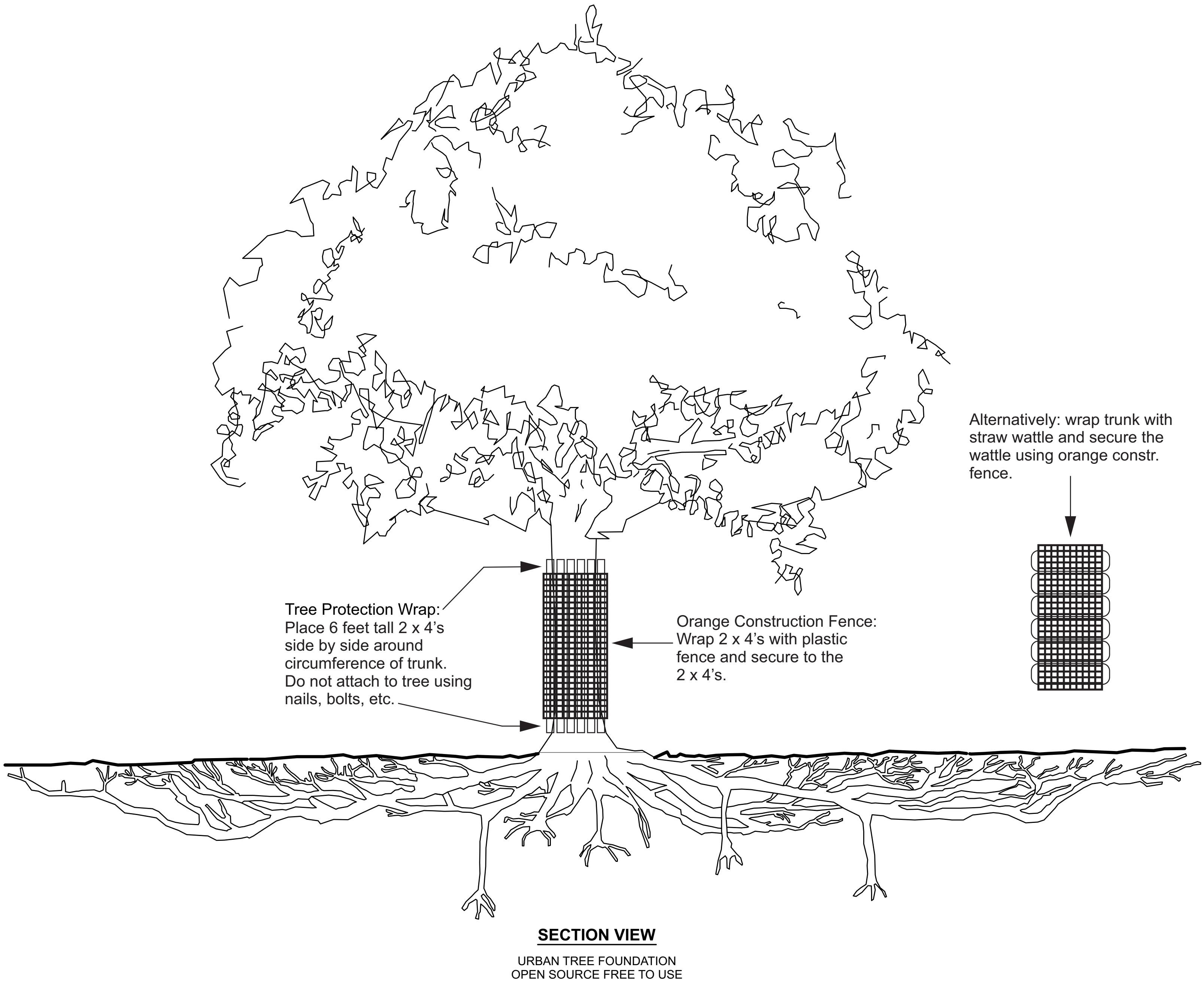


Appendix C: Type I TPZ Diagram



Appendix D: Type III TPZ Diagram

Type III TPZ Diagram



Appendix E: Supporting Photographs - Image 1

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Image 2

Image 3


#3 Mexican Fan Palm
(Washingtonia robusta)
#4 Stone Pine
(Pinus pinea)
#5 Stone Pine
(Pinus pinea)

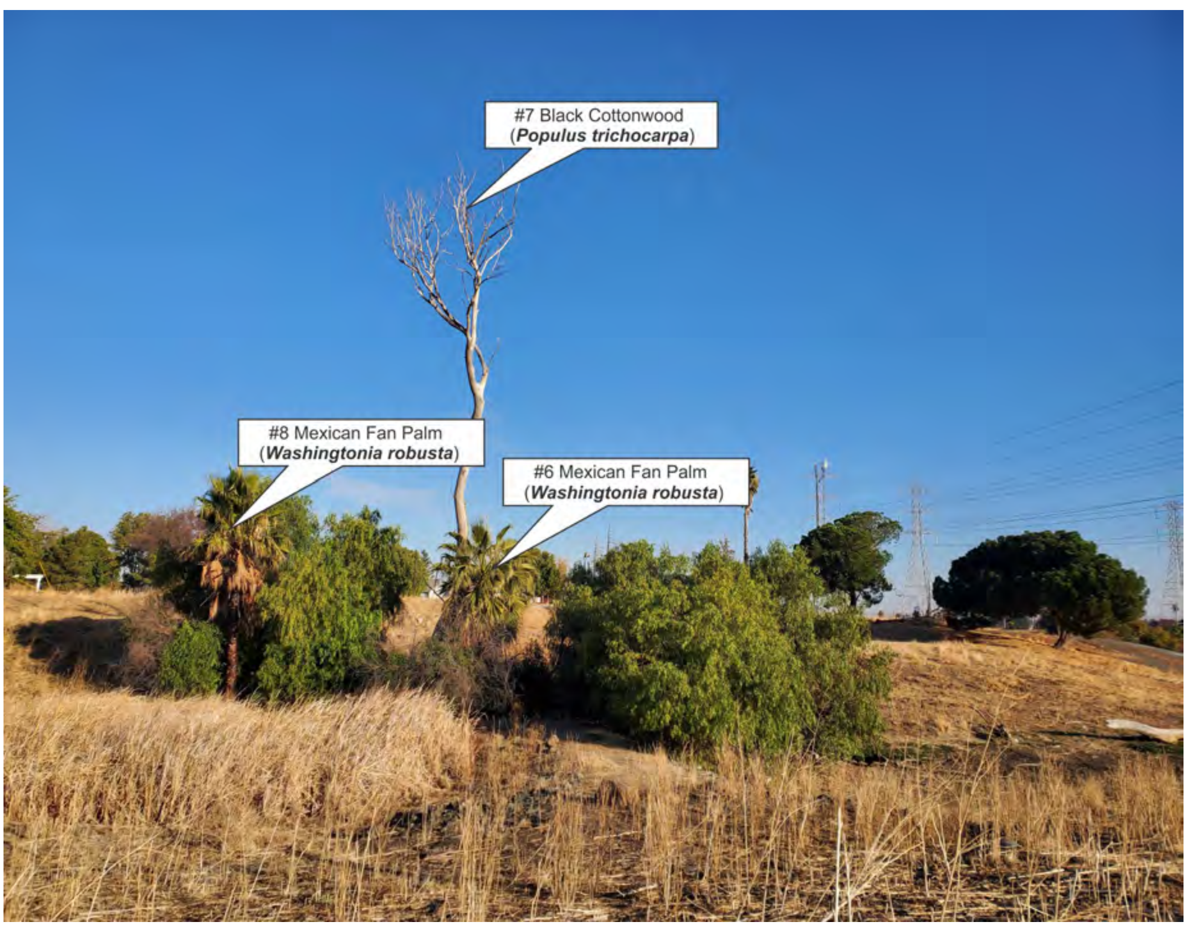
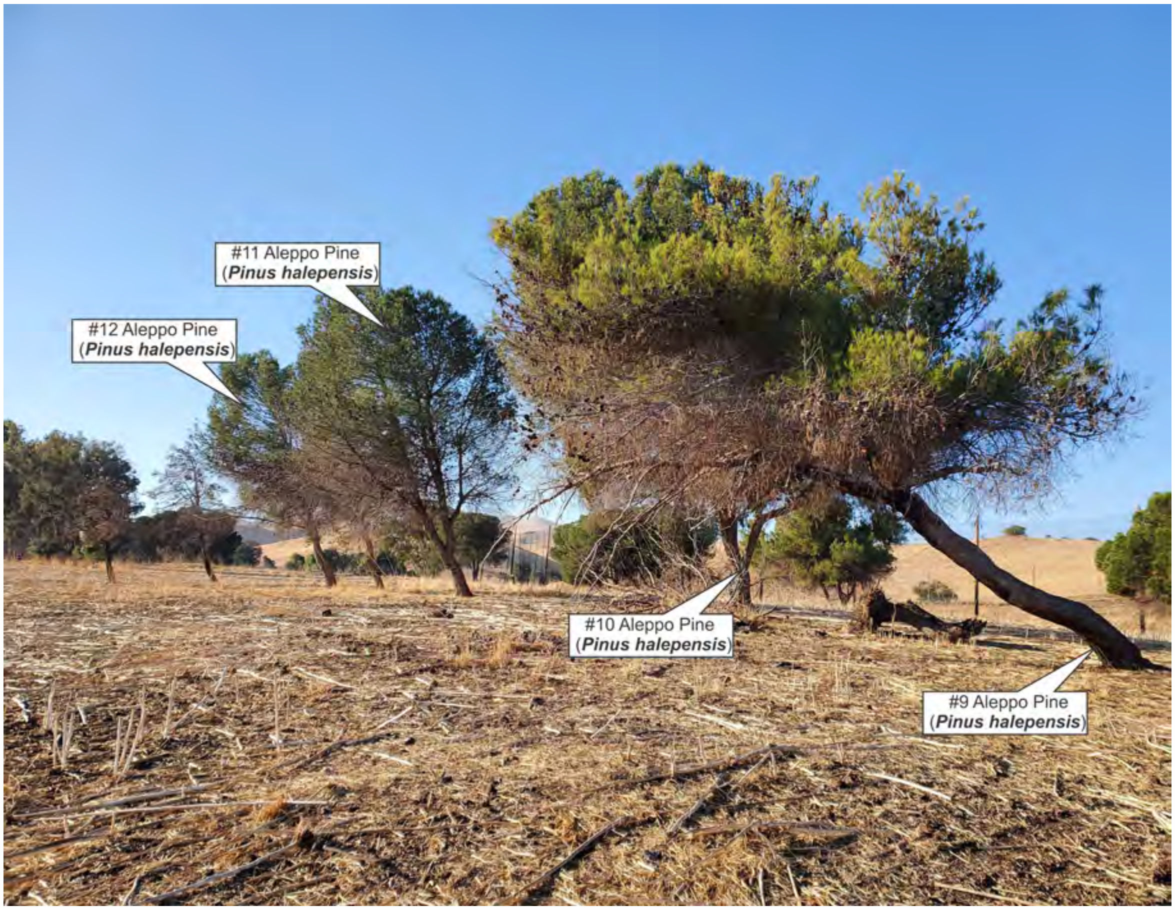

#7 Black Cottonwood
(Populus trichocarpa)
#8 Mexican Fan Palm
(Washingtonia robusta)
#6 Mexican Fan Palm
(Washingtonia robusta)

Image 4


#11 Aleppo Pine
(*Pinus halepensis*)
#12 Aleppo Pine
(*Pinus halepensis*)
#10 Aleppo Pine
(*Pinus halepensis*)
#9 Aleppo Pine
(*Pinus halepensis*)


#14 Stone Pine
(*Pinus pinea*)
#13 Stone Pine
(*Pinus pinea*)

Image 5


#18 Stone Pine
(Pinus pinea)
#17 Stone Pine
(Pinus pinea)
#15 Stone Pine
(Pinus pinea)
#16 Stone Pine
(Pinus pinea)

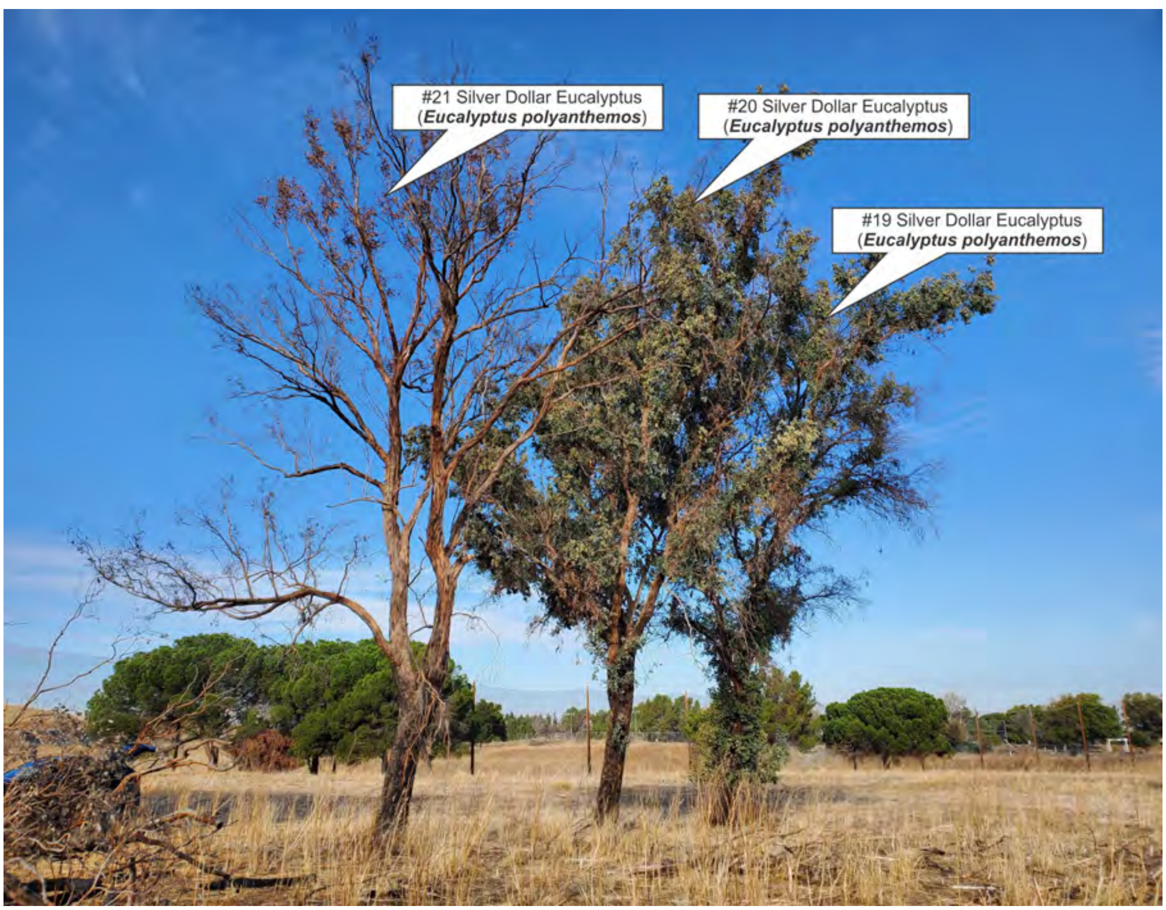

#21 Silver Dollar Eucalyptus
(Eucalyptus polyanthemos)
#20 Silver Dollar Eucalyptus
(Eucalyptus polyanthemos)
#19 Silver Dollar Eucalyptus
(Eucalyptus polyanthemos)

Image 5


#23 Silver Dollar Eucalyptus
(*Eucalyptus polyanthemos*)
#22 Silver Dollar Eucalyptus
(*Eucalyptus polyanthemos*)


#25 Silver Dollar Eucalyptus
(*Eucalyptus polyanthemos*)
#24 Stone Pine
(*Pinus pinea*)

Image 6

Image 7

#32 Peruvian Pepper
(Schinus molle)
#31 Peruvian Pepper
(Schinus molle)

#34 Stone Pine
(Pinus pinea)
#33 Deodar Cedar
(Cedrus deodara)

Image 8

Image 9


#37 Canary Island Pine
(*Pinus canariensis*)
#38 Aleppo Pine
(*Pinus halepensis*)
#39 Aleppo Pine
(*Pinus halepensis*)

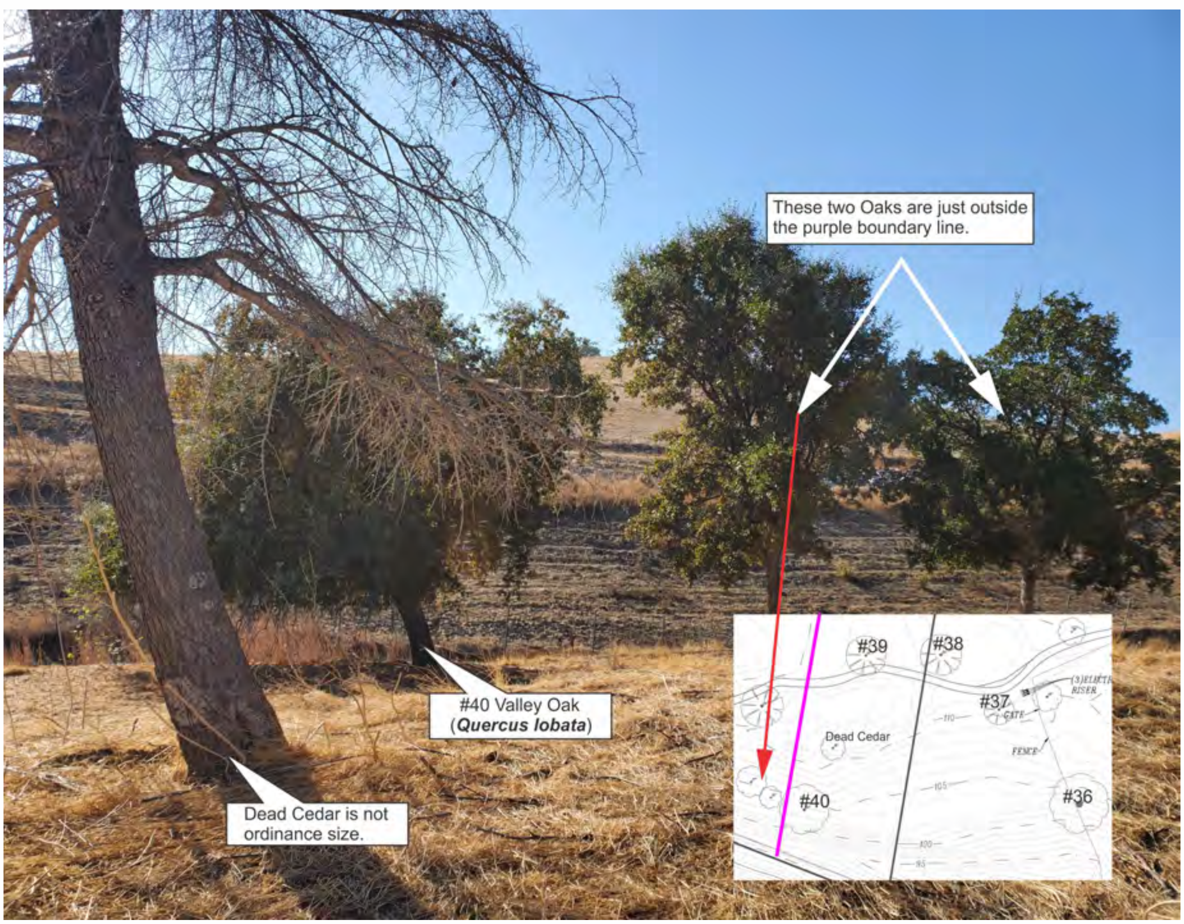
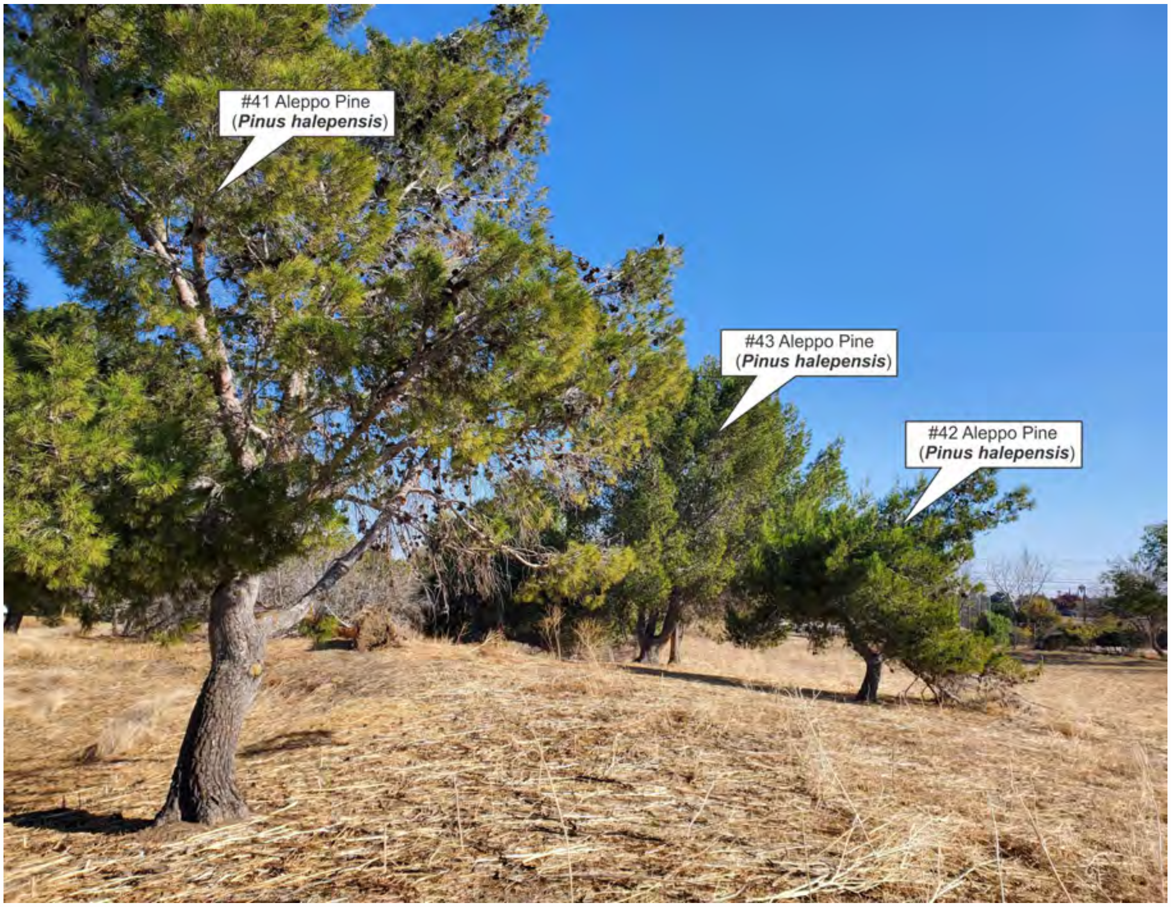

These two Oaks are just outside the purple boundary line.
#40 Valley Oak
(*Quercus lobata*)
Dead Cedar is not ordinance size.
#39
#38
#37
Dead Cedar
#40
#36

Image 10


#41 Aleppo Pine
(Pinus halepensis)
#43 Aleppo Pine
(Pinus halepensis)
#42 Aleppo Pine
(Pinus halepensis)

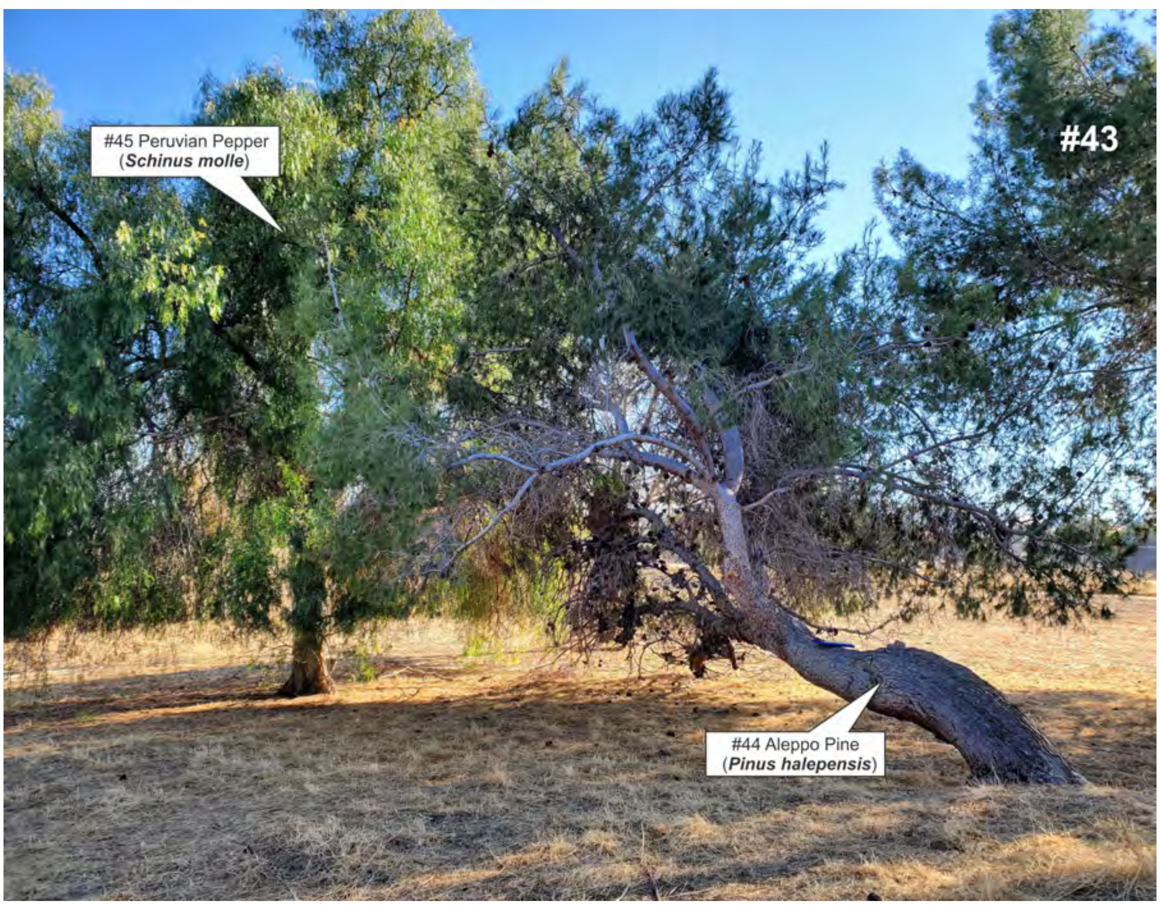

#45 Peruvian Pepper
(Schinus molle)
#43
#44 Aleppo Pine
(Pinus halepensis)

Image 11


#46 Shamel Ash
(*Fraxinus uhdei*)
#43
#44
#45


#47 Shamel Ash
(*Fraxinus uhdei*)

Image 12


#48 Aleppo Pine
(***Pinus halepensis***)
#49 Peruvian Pepper
(***Schinus molle***)
Neglected to get a full
picture of the tree.

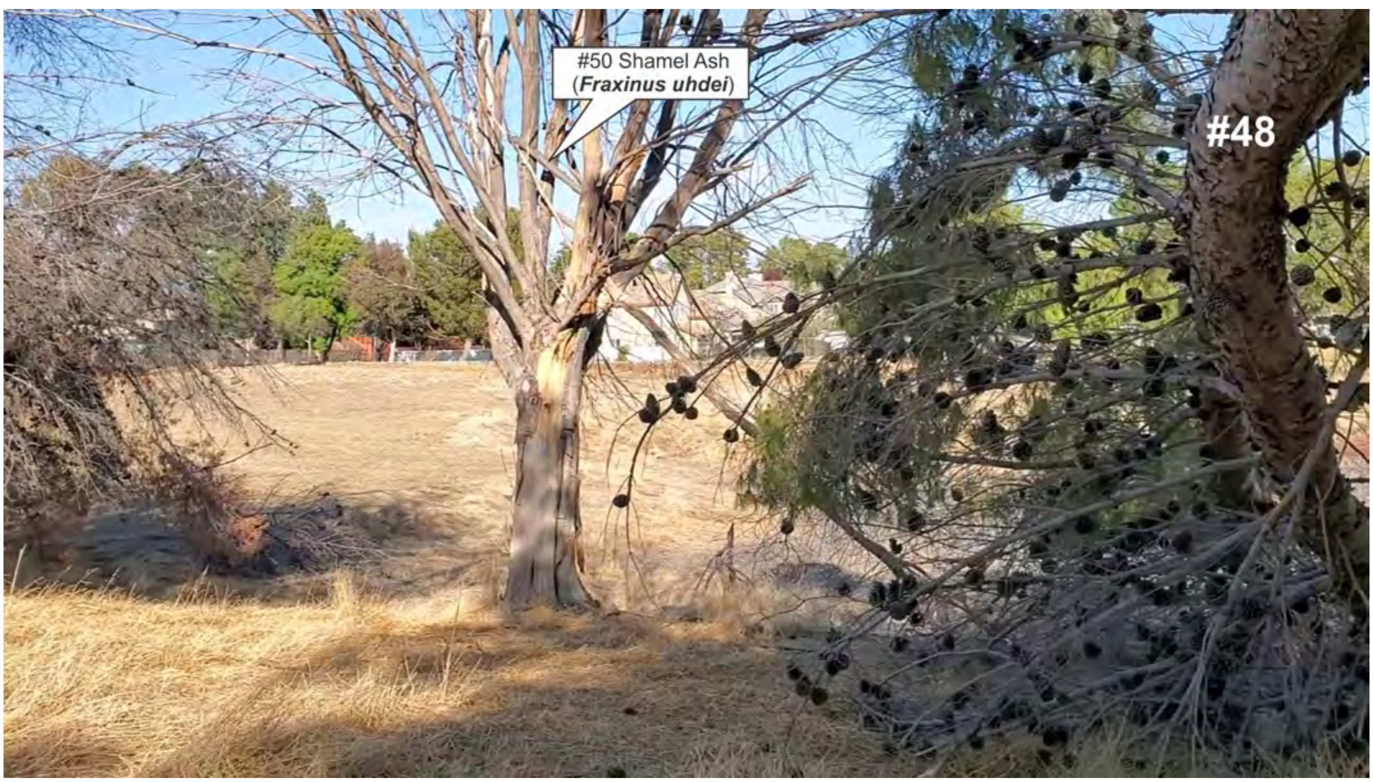
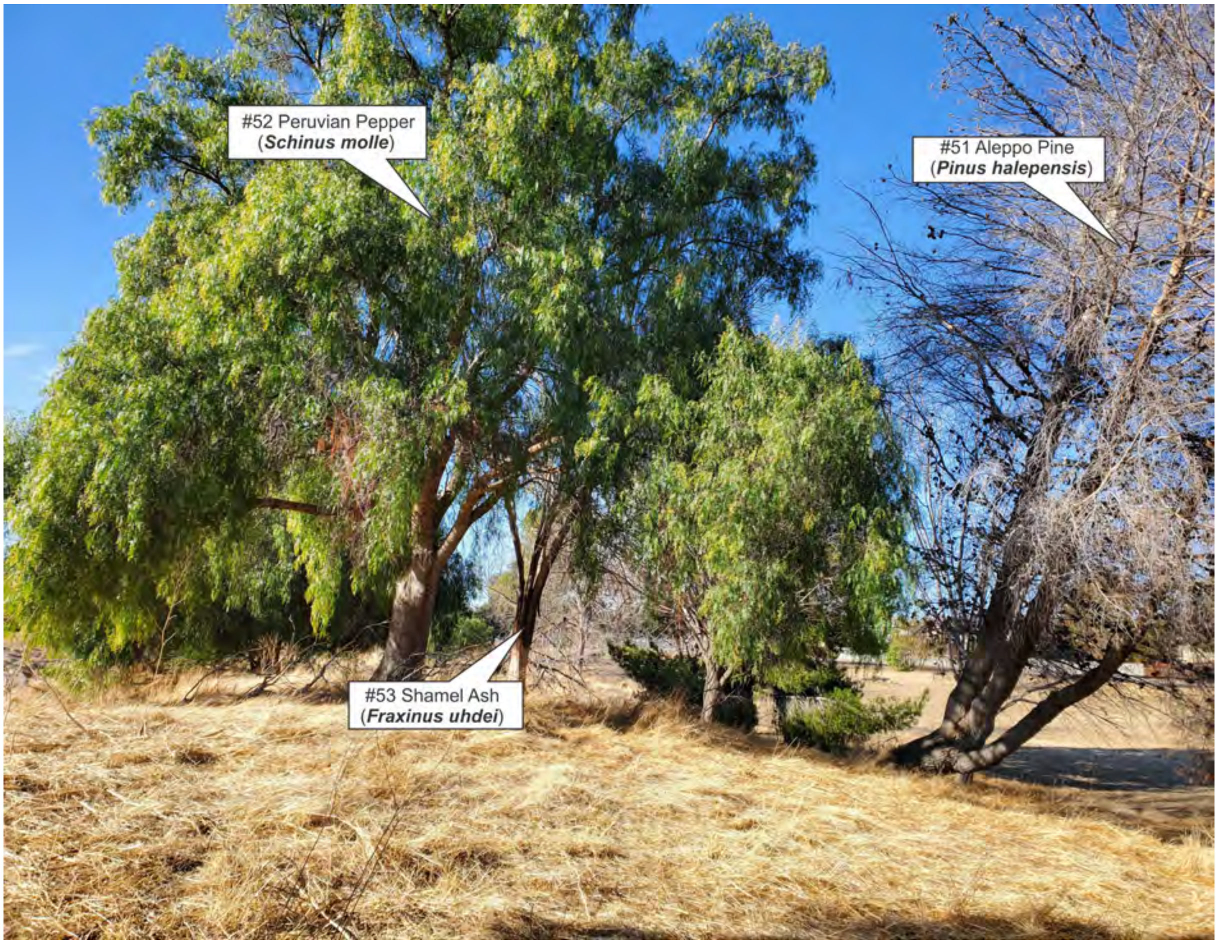
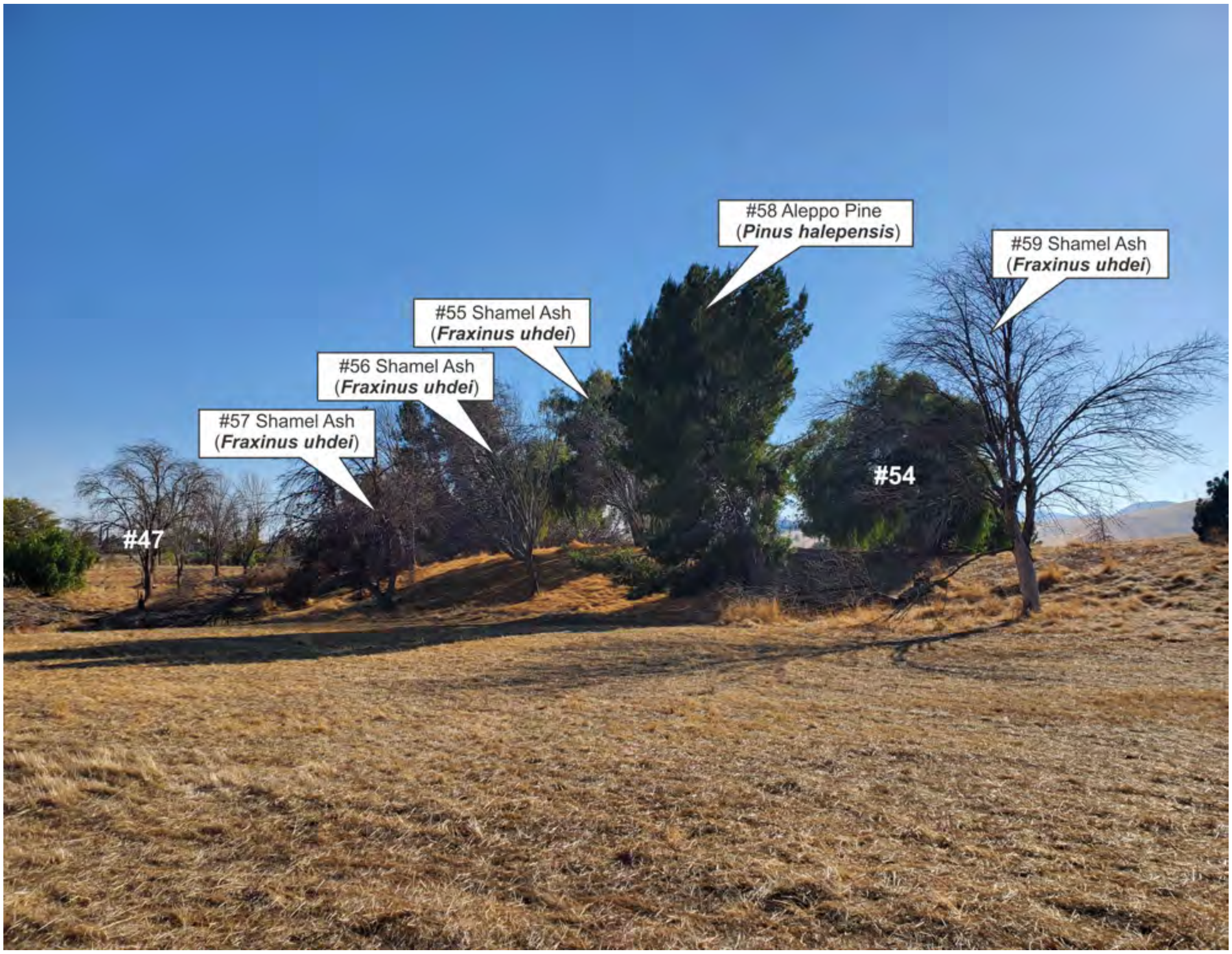

#50 Shamel Ash
(***Fraxinus uhdei***)
#48

Image 13


#52 Peruvian Pepper
(Schinus molle)
#51 Aleppo Pine
(Pinus halepensis)
#53 Shamel Ash
(Fraxinus uhdei)


#54 Peruvian Pepper
(Schinus molle)

Image 14


#58 Aleppo Pine
(***Pinus halepensis***)
#59 Shamel Ash
(***Fraxinus uhdei***)
#55 Shamel Ash
(***Fraxinus uhdei***)
#56 Shamel Ash
(***Fraxinus uhdei***)
#57 Shamel Ash
(***Fraxinus uhdei***)
#54
#47


#60 ***Eucalyuptus spp.***
#60
Not ordinance size.
WALL

Image 15


#61 Shamel Ash
(*Fraxinus uhdei*)
#63 Shamel Ash
(*Fraxinus uhdei*)
#62 Shamel Ash
(*Fraxinus uhdei*)

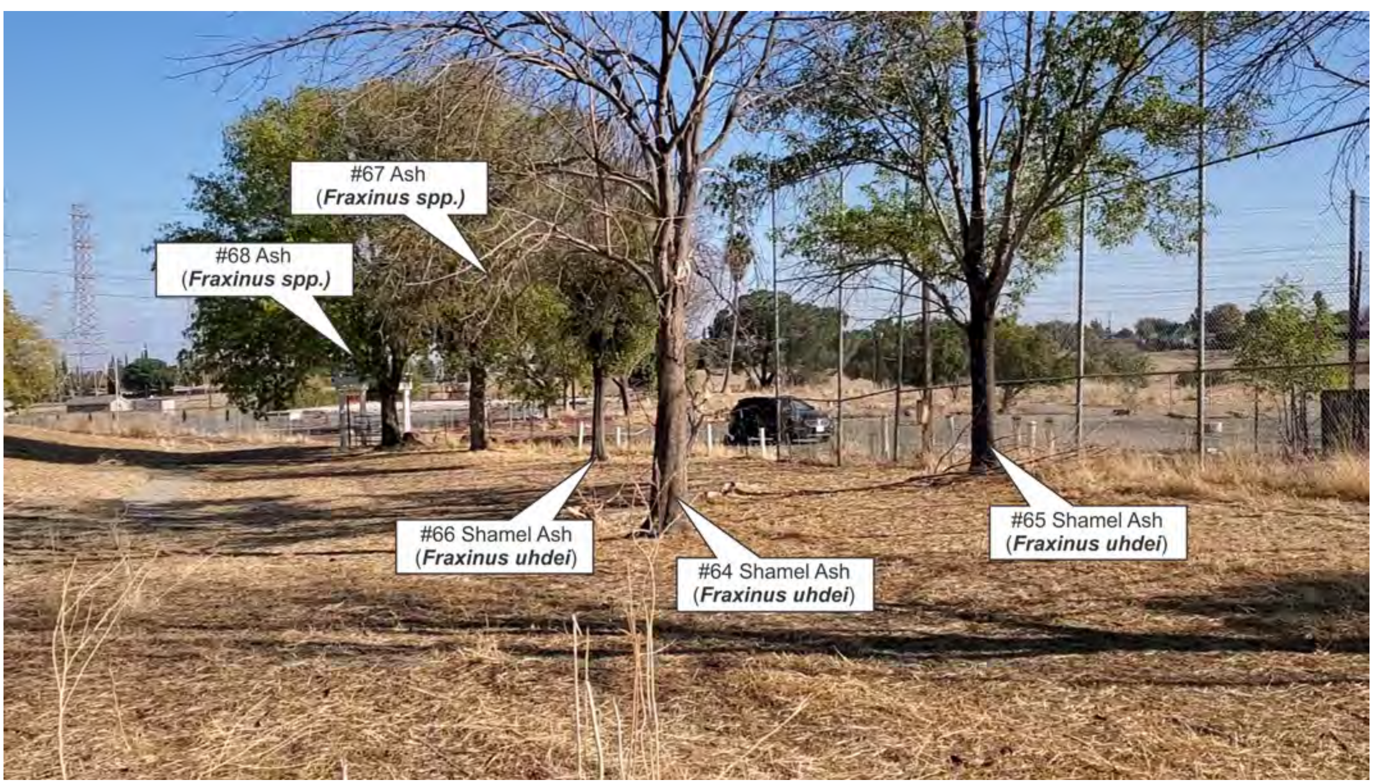

#67 Ash
(*Fraxinus spp.*)
#68 Ash
(*Fraxinus spp.*)
#66 Shamel Ash
(*Fraxinus uhdei*)
#64 Shamel Ash
(*Fraxinus uhdei*)
#65 Shamel Ash
(*Fraxinus uhdei*)

Image 16

Image 17


#70 Peruvian Pepper
(*Schinus molle*)

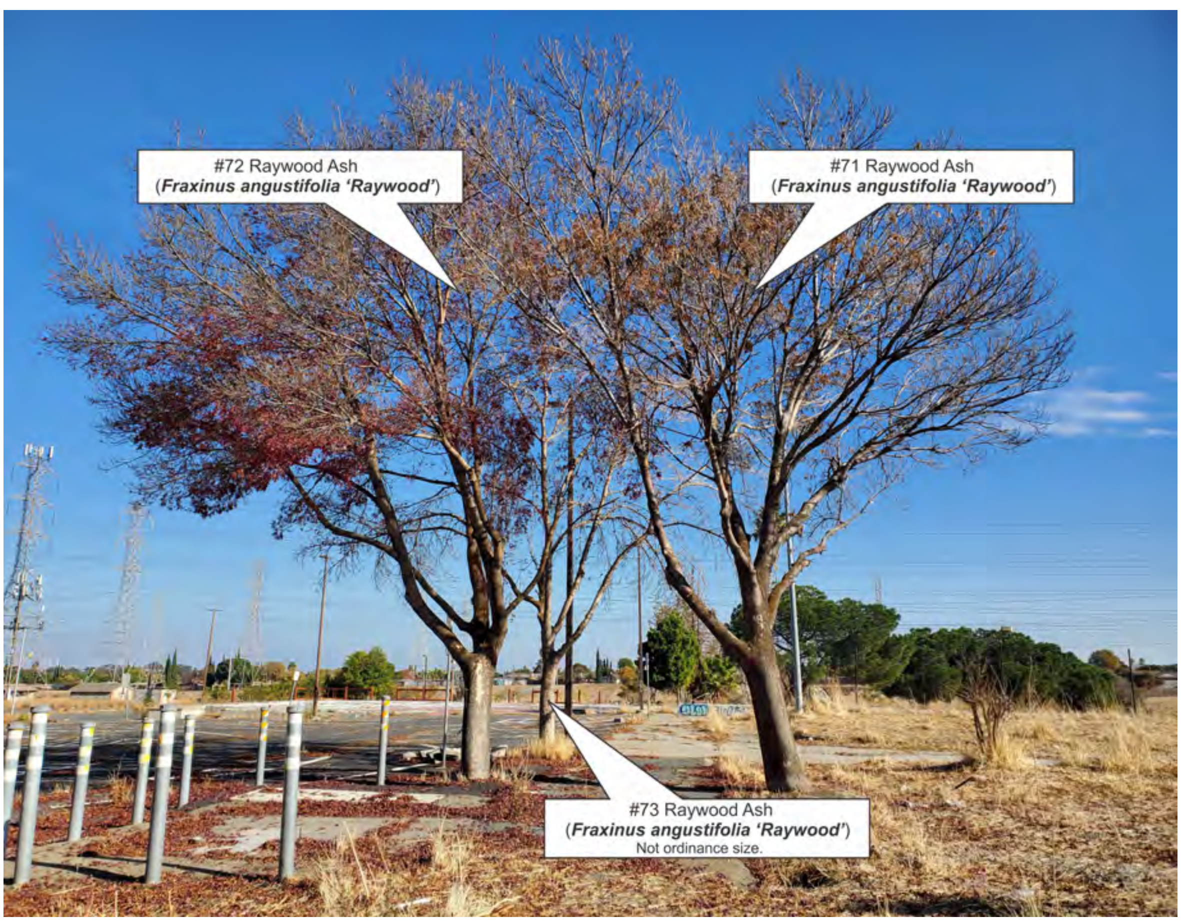

#72 Raywood Ash
(*Fraxinus angustifolia 'Raywood'*)
#71 Raywood Ash
(*Fraxinus angustifolia 'Raywood'*)
#73 Raywood Ash
(*Fraxinus angustifolia 'Raywood'*)
Not ordinance size.

Image 18

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ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other government regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.
4. The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
5. Loss, alteration, or reproduction of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.
7. Neither all nor any part of this report, nor any copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or initialed designation conferred upon the consultant/appraiser as stated in his qualification.
8. This report and the values expressed herein represent the opinion of the consult/appraiser, and the consult/appraiser’s fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs, and photographs in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys.
10. Unless expressed otherwise: 1) information in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in future.

Certification of Performance

I, Dave Laczko, certify that:

I have personally inspected the trees and the property referred to in this report and have stated my findings accurately. The extent of the evaluation or appraisal is stated in the attached report.

- I have no current or prospective interest in the vegetation or the property that is the subject of this report and have no personal interest or bias with respect to the parties involved.
- The analysis opinions and conclusions stated herein are my own and are based on current scientific procedures and facts.
- My analysis, opinions, and conclusions were developed, and this report has been prepared according to commonly accepted arboricultural practices.
- No one provided significant professional assistance to me, except as indicated within the report.
- My compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any subsequent events.

I further certify that I am a member in good standing of the American Society of Consulting Arborists, the International Society of Arboriculture, and the Tree Care Industry Association. I have been involved in the field of Arboriculture in a full-time capacity for a period of more than thirty years.

Respectfully submitted,

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Anderson's Tree Care Specialists, Inc.
A TCIA Accredited Company
ISA Certified Arborist #1233A PN
TRAQ Qualified
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