INLAND FEEDER – FOOTHILL PUMP STATION INTERTIE PROJECT

Initial Study/Mitigated Negative Declaration
APPENDIX

The Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, CA 90012

Report Number ER 1694

May 2024

Appendix A
Metropolitan Standard Practices

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Metropolitan Standard Practices

The following are Metropolitan standard practices that are carried out as part of Section 01065 (Environmental Requirements) and Section 01565 (Noise Control) of the construction contractor specifications for all projects (Metropolitan 2022).

General

1. The Contractor shall obtain necessary local, state and federal environmental permits and shall comply with the requirements of all such permits and laws, regulations, acts, codes and ordinances.
2. The Contractor shall perform all construction activities only within the construction boundaries shown on the drawings. The construction boundaries shall be fenced, unless otherwise directed by the Engineer. Any request to use any area outside the construction boundaries for any activity will require review and approval by the Engineer.

Air Quality

1. The Contractor shall not discharge smoke, dust, or other air contaminants into the atmosphere in a quantity that exceeds the legal limit.
2. The Contractor shall use low sulfur fuels (0.5 percent by weight) for all construction vehicles and equipment.
3. The Contractor shall shut-off all idling vehicles when not in use.
4. Construction equipment shall be maintained, and properly tuned and operated in a manner so as to reduce peak emission levels.
5. Construction methods shall include dust reduction activities, including the use of water trucks in construction areas. The Contractor shall spray water on all unpaved roads as often as required to minimize dust and particulates, and as determined by Engineer. Paved streets shall be swept if silt is carried over to these roads from construction activities.
6. The Contractor shall use low emission mobile construction equipment during site preparation, grading, excavation, and construction of the project.
7. The Contractor shall use existing on-site power sources (e.g., power poles) rather than portable generators when feasible and as directed by the Engineer; or clean fuel generators shall be used rather than temporary power generators when feasible.
8. All off-road diesel-fueled construction equipment greater than 25 horsepower (hp) shall be compliant with federally mandated clean diesel engines (USEPA Tier 4), where available, in accordance with the California Air Resources Board's (CARB) In-use Off-road Diesel-fueled Fleet Regulation (Title 13 California Code of Regulations, Division 3, Chapter 9, Article 4.8). The Contractor shall provide a current copy of each unit's certified tier specifications, best available control technology

documentation, and CARB Registrations or SCAQMD operating permit, or the CARB Certificate of Reported Compliance Validation, at the time of mobilization of each unit of equipment.

9. The Contractor shall cover all trucks transporting earthen material or maintain at least two feet of freeboard.
10. The Contractor shall implement the Best Available Control Measures listed in Table 1 of the SCAQMD Rule 403 (Fugitive Dust).
11. When wind speeds, including instantaneous gusts, exceed 25 miles per hour, the Contractor shall implement and record Contingency Control Measures listed in Table 3 in SCAQMD Rule 403.

Biological Resources

1. As part of the project, the following procedures will be implemented to avoid adverse impacts to trees located within the project work limits:
   a. Impacts to any trees located within the project work limits shall be avoided, when possible.
   b. No trees within project work limits shall be removed, cut, or trimmed unless identified for removal on project drawings.
      i. If trees must be removed, cut or trimmed, this activity shall be conducted per any applicable local tree ordinances and any required permits must be obtained prior to any tree removal, cutting or trimming.
   c. The Contractor shall avoid stockpiling of materials, and driving or parking vehicles and equipment under the canopy of existing trees to protect tree root systems and avoid damage to the trees.
2. No physical disturbance of vegetation, operational structures, buildings, or other potential habitat (e.g., open ground, gravel, construction equipment or vehicles, etc.) that may support nesting birds protected by the federal Migratory Bird Treaty Act and California Fish and Game Code shall occur in the breeding season, except as necessary to respond to public health and safety concerns, or otherwise authorized by the Engineer. The breeding season extends from February 15 through August 31 for passerines and general nesting and from January 1 through August 31 for raptors.
   a. If nesting habitat must be cleared or project activities must occur in the vicinity of nesting habitat within the breeding season as defined above, a qualified biologist shall perform a nesting bird survey no more than three days prior to clearing or removal of nesting habitat or start of project activities.
   b. If active nests for sensitive species, raptors and/or migratory birds are observed, an adequate buffer zone or other avoidance and minimization measures, as appropriate, shall be established, as identified by a qualified biologist and approved by the Engineer. The buffer shall be clearly marked in the field by the Contractor, as directed by the Engineer, and construction or clearing shall not be conducted within this zone until the young have fledged and are no longer reliant on the nest.
   c. A qualified biologist shall monitor active nests or nesting bird habitat within or immediately adjacent to project construction areas, and the Engineer shall provide necessary recommendations to the Contractor to minimize or avoid impacts to protected nesting birds.

Biological Resources – Desert

1. Metropolitan conducts Desert Tortoise Awareness Training for all Metropolitan staff and contractors working at Metropolitan's desert facilities or on the CRA. Desert Tortoise Awareness Training consists of a presentation and handout discussing the protected status of the desert tortoise and its habitat, predators, and avoidance measures. Avoidance measures include, but are not limited to the following:
    a. Work areas shall be delineated with flagging if determined necessary by the qualified staff person.
    b. Access to project sites shall be restricted to designated existing routes of travel.
    c. Workers shall inspect for tortoises under vehicles and equipment prior to use. If a tortoise is present, workers would only move the vehicle when the tortoise would not be injured by the vehicle or would wait for the tortoise to move out from under the vehicle.
2. Work areas shall be limited to previously disturbed ground and boundaries delineated with flagging or other marking to minimize surface disturbance associated with vehicle straying. Special habitat features such as burrows, identified by the qualified biologist, shall be avoided.
3. Access to the project sites shall be restricted to existing routes of travel as shown on the drawings, or as designated by the Engineer in the field. A qualified biologist will select and flag any access way in addition to established roads, to avoid burrows and to minimize disturbance of vegetation. Driving off-road is prohibited at all times.
4. Prior to commencing construction or mobilization activities, a qualified biologist will survey for desert tortoise burrows or other desert tortoise sign at each of the work sites and laydown areas. Surveys shall be conducted according to the U.S. Fish and Wildlife Service document "Preparing for Any Action that May Occur Within the Range of the Mojave Desert Tortoise. Any desert tortoise burrows located during these surveys will be flagged and fenced to ensure avoidance during construction activities.
5. Immediately prior to commencing any dewatering operations, the Contractor shall arrange a survey of the dewatering route with Metropolitan's biological monitors to ensure that no desert tortoises are at risk along the dewater route.
6. All workers shall inspect for tortoises under vehicles or stationary equipment prior to moving them. If a desert tortoise is present, the worker shall carefully move the vehicle or equipment only when the desert tortoise would not be injured or shall wait for the desert tortoise to move away on its own.
7. The Contractor shall cover all open trenches when not in use at the end of each workday, where feasible and necessary.
8. Dogs or any other pets or animals shall not be allowed in any work area.
9. All trash and food items shall be promptly contained within closed, raven-proof containers. These shall be regularly removed from the site to reduce the attractiveness of the area to ravens and other tortoise predators.
10. The Contractor and the Engineer shall review the rough grading plans, fencing, and staking to ensure that the grading is within the project footprint as described in the drawings. All temporary fencing or other markers shall be clearly visible to construction personnel.
11. The monitor will be empowered to temporarily halt construction activities and make recommendations to ensure impact minimization, compliance with the relevant provisions of all environmental permits, and that work does not take place in habitat areas outside the clearing limits.

12. Traffic speed limit shall be 20 miles per hour on all unpaved roads. The purpose of this speed limit is to enable drivers sufficient time to identify and to avoid striking and killing desert tortoises. Metropolitan will issue the Contractor a warning for the first violation of the speed limit by any of his/her employees, subcontractors, and/or suppliers. Subsequently, Metropolitan reserves the rights to expel from the project repeat speeding offenders, or a first-time offender depending on the severity of the violation as determined by Metropolitan.

Cultural Resources, Paleontological Resources, and Human Remains

1. If archaeological or paleontological resources are encountered at the project site, the Contractor shall not disturb the resources and shall immediately cease all work within 50 feet of the discovery, notify the Engineer, and protect the discovery area, as directed by the Engineer. The Engineer, with the qualified architectural historian, archaeologist and/or paleontologist, shall make a decision of validity of the discovery and designate an area surrounding the discovery as a restricted area. The Contractor shall not enter or work in the restricted area until the Engineer provides written authorization.
2. In the event that human remains are discovered during excavation/construction activity, Health and Safety Code Section 7050.5, CEQA Guidelines Section 15064.5(e), and Public Resources Code (PRC) Section 5097.98 will apply. The Contractor shall notify the Engineer at once and not enter or work in the restricted area until the Engineer provides written authorization.

Hazardous Materials

1. The Contractor shall clean up all spills in accordance with all applicable environmental laws and regulations and notify the Engineer immediately in the event of a spill.
2. Stationary equipment such as motors, pumps, and generators, shall be equipped with drip pans.
3. The Contractor shall handle, store, apply, and dispose of chemicals and/or herbicides consistent with all applicable federal, state and local regulations.
4. The Contractor shall dispose of all contaminated materials in a manner consistent with all applicable local, state and federal environmental laws and regulations.
5. Hazardous materials shall be stored in covered, leak-proof containers when not in use, away from storm drains and heavy traffic areas, and shall be protected from rainfall infiltration. Hazardous materials shall be stored separately from non-hazardous materials on a surface that prevents spills from permeating the ground surface, and in an area secure from unauthorized entry at all times. Incompatible materials shall be stored separately from each other.

Hydrology and Water Quality

1. The Contractor shall not allow any equipment or vehicle storage within any drainage course or channels.
2. Any material placed in areas where it could be washed into a drainage course or channel shall be removed prior to the rainy season.
3. The Contractor shall not create a nuisance or pollution as defined in the California Water Code. The Contractor shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Water Quality Control Board or the SWRCB, as required by the Clean Water Act (CWA).

4. Dewatering activities shall not affect any vegetation outside of the construction limits. The Contractor shall submit proposed dewatering plans to the Engineer for approval prior to any dewatering activities.

Lighting

1. The Contractor shall exercise special care to direct floodlights to shine downward. These floodlights shall also be shielded to avoid a nuisance to the surrounding areas. No lighting shall include a residence or native area in its direct beam. The Contractor shall correct lighting nuisance whenever it occurs.

Noise

1. The Contractor shall locate all noise-generating and stationary construction equipment as far as feasible from near-site residential and sensitive receivers and situated so that emitted noise is directed away from the sensitive receivers.
2. To the extent feasible, noise-generating equipment shall be oriented such that the source of noise is facing away from the nearest sensitive receivers.
3. Equipment idling time shall be reduced to five minutes on cranes and construction equipment.
4. Areas where workers gather (e.g., break areas, shift-change areas, meeting areas, and sanitary stations) will be located a minimum of 100 feet away from any residence, if feasible.
5. Parking areas shall be located a minimum of 150 feet from sensitive receivers. Parking areas within 500 feet of sensitive receivers will be posted with signs to prohibit workers from gathering during nighttime hours and to prohibit radios and music at any time.
6. Fuel deliveries shall be a minimum of 500 feet from residences or to the greatest extent feasible.
7. The Contractor shall perform all work without undue noise and shall make every effort to alleviate or prevent noise nuisances.
8. The Contractor's construction vehicles and equipment shall have mufflers. The Contractor shall equip all construction equipment, fixed and mobile, with properly operating and maintained noise mufflers and intake silencers, consistent with the manufacturer standards. Equipment shall be maintained to a minimum standard that includes engine noise baffles and mufflers that meet or exceed the original manufacturer requirements.
9. The Contractor shall utilize the following types of equipment whenever possible: electrical instead of diesel-powered equipment, hydraulic tools instead of pneumatic tools, and use of electric welders powered by remote generators.

Traffic

1. The Contractor shall prepare a traffic control plan. This plan shall address temporary traffic control for each construction site in public roadways. The requirements and procedures described in the California Department of Transportation (Caltrans) “Manual of Traffic Controls for Construction and Maintenance Work Zones” or local requirements and procedures that meet or exceed the Caltrans’ Manual shall be used in the plan. If required, the Contractor shall submit the plan for review and approval by local and State traffic authorities, as appropriate.
2. As appropriate, the Contractor shall provide flagmen at intersections to assist trucks entering/exiting the work limits.

3. The Contractor shall provide appropriate advance warning signage to alert motorists or pedestrians to the potential for cross construction vehicle traffic from work limits in accordance with Caltrans standards.

Wildfire

1. Gasoline-powered or diesel-powered machinery used during construction shall be equipped with standard exhaust controls and muffling devices that shall also act as spark arrestors.
2. Fire containment and extinguishing equipment shall be located on site and shall be accessible during construction activities. Construction workers shall be trained in use of the fire suppression equipment.

Appendix B

Air Quality and Greenhouse Gas Emissions Calculations and Modeling

This appendix contains highly detailed technical information which is difficult to translate for screen reading software; therefore, the appendix has not been translated into an auditory format. If you have a disability and/or have difficulty accessing any material in this document, please contact us by mail, email, or telephone, and we will work with you to make all reasonable accommodations. Please indicate 1) the nature of the accessibility need; 2) your preferred format; 3) the material you are trying to access and its location within this document; and 4) how to reach you if questions arise while fulfilling your request. You can direct your requests to:

B1 Assumptions

Inland Feeder 3/11/2024
Assumptions

Project Land Uses

Land Use Type	CalEEMod LandUse Type	CalEEMod LandUse Subtype	Amount	Unit	Acres	Landscaping SF	Additional Notes
Project Land Uses							
Other Non-asphalt Surface	Parking	Condo/Townhouse High Rise	6.615	acres	6.615		provided by GIS team

Construction Data[1]

	Construction Phase	CalEEMod Phase Type	Start Date	End Date	Workdays (5 days/week)	Worker Vehicles/Day	Workers Trips (In/Out)/Day	Vendor/Material Truck /Day (In/Out)	Vendor/Material Truck Trips/Day (In/Out)	Soil Export (CY)	Soil Import (CY)	Total Debris or Concrete Amount	Daily Debris or Concrete Amount	Total Haul (or Concrete) Trips (In/Out)	Total Haul (or Concrete) Trucks/Day	Haul (or Concrete) Trips/Day (In/Out)	Total Onsite Truck Trips	On-site Haul Truck Travel Miles	Days of Hauling	Notes
Supply Connection Components	Pipeline Trenching and Installation	Trenching	1/1/2025	1/31/2025	23	9	18	3	6	1820	1680	3,500	153		0	0	6	0.25	23	
	Vault Structure Excavation	Grading/Excavation	2/1/2025	2/28/2025	20	4	8			1470	500	1,970	99		0	0	0	0.25	20	
	Vault Structure Installation	Building Construction	3/1/2025	3/31/2025	21	5	10	4	8								8	0.25		
	Vault Structure Installation-Concrete	Building Construction	3/1/2025	3/20/2025	14							2,078	149	462	17	34	34	0.25	14	From data needs
	Surge Tank Excavation	Grading/Excavation	4/1/2025	4/30/2025	22	3	6											0.25		
	Surge Tank Excavation-Haul	Grading/Excavation	4/1/2025	4/2/2025	2					45	45	90	45		0	0	0	0.25	2	Adjusted haul to 2 days
	Surge Tank Installation	Building Construction	5/1/2025	6/30/2025	43	5	10	4	8								8	0.25		
	Surge Tank Installation-Concrete	Building Construction	5/1/2025	5/20/2025	14							2,078	149	462	17	34	34	0.25	14	From data needs
Discharge Connection Components	Pipeline Trenching and Installation	Trenching	7/1/2025	7/31/2025	23	9	18	3	6	3700	3100	6800	296		0	0	6	0.25	23	
	Vault Structure Excavation	Grading/Excavation	10/1/2026	10/31/2026	22	4	8			1470	1000	2470	113		0	0	0	0.25	22	
	Vault Structure Installation	Building Construction	11/1/2026	11/30/2026	21	5	10	4	8								8	0.25		
	Vault Structure Installation-Concrete	Building Construction	11/1/2026	11/19/2026	14							2,078	149	462	17	34	34	0.25	14	From data needs
	Surge Tank Excavation	Grading/Excavation	10/1/2025	10/31/2025	23	9	18											0.25		
	Surge Tank Excavation-Haul	Grading/Excavation	10/1/2025	10/2/2025	2					175	175	350	175		0	0	0	0.25	2	Adjusted haul to 2 days
	Surge Tank Installation	Building Construction	11/1/2025	12/31/2025	43	5	10	4	8								8	0.25		
	Surge Tank Installation-Concrete	Building Construction	11/1/2025	11/20/2025	14							2,078	149	462	17	34	34	0.25	14	From data needs
				Total Work Days	261															
						58	116	22												

1 From Client Construction Data Needs

Inland Feeder last updated: 3/11/2024
Air Quality and Greenhouse Gas Assessment - Construction Assumptions

Off-Road Heavy-Duty Construction Equipment - Maximum Day

Supply Connection Components

Construction Phase	Heavy-Duty Equipment	No. of Heavy-Duty Equipment	No. of hours/day	Hours of Operation/Week Per Equipment	Emissions Tier Rating or Fuel (After Mitigation if needed)	Notes/Comments
Pipeline Trenching and Installation	Cement Morter Mixer	1	8	48		
	Excavator	1	8	48	Tier 4	
	Generator Set	1	8	48		
	Plate Compactor	2	8	48		
	Sweeper/Scrubber	1	8	48	Tier 4	
	Tractor/Loader/Backhoe	2	8	48	Tier 4	
	Welder	1	8	48	Tier 4	
Vault Structure Excavation						
	Excavator	1	8	48	Tier 4	
	Sweeper/Scrubber	1	8	48	Tier 4	
	Tractor/Loader/Backhoe	2	8	48	Tier 4	
Vault Structure Installation	Air Compressor	1	8	48	Tier 4	
	Crane	1	8	48	Tier 4	
	Forklift	1	8	48	Tier 4	
	Generator	1	8	48	Tier 4	
	Plate Compactor	2	8	48		
	Sweeper/Scrubber	1	8	48	Tier 4	
Surge Tank Excavation	Excavator	1	8	48	Tier 4	
	Sweeper/Scrubber	1	8	48	Tier 4	
	Tractor/Loader/Backhoe	2	8	48	Tier 4	
Surge Tank Installation	Air Compressor	1	8	48	Tier 4	
	Crane	1	8	48	Tier 4	
	Generator	1	8	48		
	Grader	1	8	48	Tier 4	
	Plate Compactor	2	8	48		
	Sweeper/Scrubber	1	8	48	Tier 4	
	Welder	1	8	48	Tier 4	

Discharge Connection Components

Pipeline Trenching and Installation	Cement Morter Mixer	1	8	48		
	Excavator	1	8	48	Tier 4	
	Generator Set	1	8	48		
	Plate Compactor	2	8	48		
	Sweeper/Scrubber	1	8	48	Tier 4	
	Tractor/Loader/Backhoe	2	8	48	Tier 4	
	Welder	1	8	48	Tier 4	
Vault Structure Excavation						
	Excavator	1	8	48	Tier 4	
	Sweeper/Scrubber	1	8	48	Tier 4	
	Tractor/Loader/Backhoe	2	8	48	Tier 4	
Vault Structure Installation	Air Compressor	1	8	48	Tier 4	
	Crane	1	8	48	Tier 4	
	Forklift	1	8	48	Tier 4	
	Generator	1	8	48	Tier 4	
	Plate Compactor	2	8	48		
	Sweeper/Scrubber	1	8	48	Tier 4	
Surge Tank Excavation	Excavator	1	8	48	Tier 4	
	Sweeper/Scrubber	1	8	48	Tier 4	
	Tractor/Loader/Backhoe	2	8	48	Tier 4	
Surge Tank Installation	Air Compressor	1	8	48	Tier 4	
	Crane	1	8	48	Tier 4	
	Generator	1	8	48		
	Grader	1	8	48	Tier 4	
	Plate Compactor	2	8	48		
	Sweeper/Scrubber	1	8	48	Tier 4	
	Welder	1	8	48	Tier 4	

Inland Feeder Intertie
Air Quality Assessment

Localized Significance Thresholds
(SCAQMD, Final Localized Significance Threshold Methodology, Appendix C (2008))

Source Receptor Area 34
25 meters to Sensitive Receptor

	Screening Values			Project Site
Acres	1	2	5	6.615
Construction LSTs				
NOX	118	170	270	**270.0**
CO	667	972	1,746	**1,746.0**
PM10	4	7	14	**14.0**
PM2.5	3	4	8	**8.0**

B2 Construction Air Quality and Greenhouse Gas Calculations and Modeling

Inland Feeder
Air Quality Construction Analysis
Unmitigated

Phase	Regional Maximums Source	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
						lb/day					
Supply Connection Components	Pipeline Trenching and Installation	0.48	7.10	11.55	0.03	0.11	3.30	3.41	0.11	0.44	0.55
	Vault Structure Excavation	0.17	3.42	7.66	0.02	0.03	1.89	1.92	0.03	0.25	0.29
	Vault Structure Installation	0.45	7.46	12.25	0.04	0.11	4.84	4.96	0.11	0.62	0.73
	Surge Tank Excavation	0.15	2.56	7.18	0.01	0.02	0.97	0.99	0.02	0.13	0.16
	Surge Tank Installation	0.53	8.48	16.78	0.04	0.13	4.73	4.85	0.12	0.61	0.73
Discharge Connection Components	Pipeline Trenching and Installation	0.54	9.12	13.17	0.04	0.13	5.75	5.88	0.12	0.76	0.88
	Vault Structure Excavation	0.16	3.56	7.73	0.02	0.03	2.11	2.14	0.03	0.28	0.32
	Vault Structure Installation	0.43	7.30	12.15	0.04	0.11	4.73	4.84	0.11	0.61	0.72
	Surge Tank Excavation	0.23	4.48	8.84	0.02	0.04	3.13	3.17	0.04	0.43	0.47
	Surge Tank Installation	0.52	8.65	16.62	0.04	0.13	4.73	4.85	0.12	0.61	0.73
	Project Daily Maximum Emissions	**0.54**	**9.12**	**16.78**	**0.04**	**0.13**	**5.75**	**5.88**	**0.12**	**0.76**	**0.88**
	Threshold	**75.0**	**100.0**	**550.0**	**150.0**	**None**	**None**	**150.0**	**None**	**None**	**55.0**
	Exceed Threshold (Y/N)?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Phase	Localized Maximum Source	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
						lb/day					
Supply Connection Components	Pipeline Trenching and Installation	0.37	4.89	9.36	0.02	0.09	2.60	2.69	0.08	0.26	0.34
	Vault Structure Excavation	0.11	1.99	6.44	0.01	0.02	1.49	1.50	0.02	0.15	0.17
	Vault Structure Installation	0.35	4.18	9.92	0.02	0.08	4.01	4.09	0.08	0.40	0.48
	Surge Tank Excavation	0.11	1.87	6.34	0.01	0.02	0.74	0.76	0.02	0.07	0.09
	Surge Tank Installation	0.43	5.34	14.27	0.02	0.09	3.90	3.99	0.09	0.39	0.48
Discharge Connection Components	Pipeline Trenching and Installation	0.39	5.19	9.61	0.02	0.09	4.65	4.73	0.08	0.46	0.55
	Vault Structure Excavation	0.11	2.02	6.47	0.01	0.02	1.67	1.69	0.02	0.17	0.18
	Vault Structure Installation	0.35	4.15	9.90	0.02	0.08	3.90	3.98	0.08	0.39	0.47
	Surge Tank Excavation	0.12	2.15	6.57	0.01	0.02	2.42	2.43	0.02	0.24	0.26
	Surge Tank Installation	0.42	5.37	14.29	0.02	0.09	3.90	3.99	0.09	0.39	0.48
	Project Daily Maximum Emissions	**0.43**	**5.37**	**14.29**	**0.02**	**0.09**	**4.65**	**4.73**	**0.09**	**0.46**	**0.55**
	Threshold	**None**	**270.0**	**1746.0**	**None**	**None**	**None**	**14.0**	**None**	**None**	**8.0**
	Exceed Threshold (Y/N)?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Inland Feeder

Air Quality Construction Analysis

Unmitigated

Phase	Summer / Source	Onsite Emissions										Offsite Emissions									
		ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
		lb/day										lb/day									
Supply Connection Components	Pipeline Trenching and Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Vault Structure Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Vault Structure Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Surge Tank Excavation	0.108	1.868	6.340	0.008	0.016	0.743	0.760	0.016	0.074	0.091	0.039	0.689	0.840	0.004	0.007	0.227	0.234	0.007	0.059	0.066
	Surge Tank Installation	0.426	5.340	14.274	0.025	0.092	3.897	3.989	0.087	0.390	0.477	0.103	3.135	2.509	0.018	0.034	0.830	0.863	0.034	0.222	0.256
Discharge Connection Components	Pipeline Trenching and Installation	0.386	5.192	9.614	0.016	0.089	4.645	4.734	0.083	0.465	0.548	0.153	3.930	3.561	0.022	0.041	1.102	1.144	0.041	0.293	0.334
	Vault Structure Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Vault Structure Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Surge Tank Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Surge Tank Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Phase	Regional Emissions	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
Supply Connection Components	Pipeline Trenching and Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vault Structure Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vault Structure Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Surge Tank Excavation	0.15	2.56	7.18	0.01	0.02	0.97	0.99	0.02	0.13	0.16
	Surge Tank Installation	0.53	8.48	16.78	0.04	0.13	4.73	4.85	0.12	0.61	0.73
Discharge Connection Components	Pipeline Trenching and Installation	0.54	9.12	13.17	0.04	0.13	5.75	5.88	0.12	0.76	0.88
	Vault Structure Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vault Structure Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Surge Tank Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Surge Tank Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Project Daily Maximum Emissions	**0.54**	**9.12**	**16.78**	**0.04**	**0.13**	**5.75**	**5.88**	**0.12**	**0.76**	**0.88**

Inland Feeder

Air Quality Construction Analysis

Unmitigated

Winter — Onsite Emissions (lb/day)

Phase	Source	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
Supply Connection Components	Pipeline Trenching and Installation	0.371	4.892	9.355	0.015	0.088	2.601	2.690	0.083	0.260	0.343
	Vault Structure Excavation	0.111	1.994	6.442	0.009	0.016	1.487	1.503	0.016	0.149	0.165
	Vault Structure Installation	0.352	4.180	9.917	0.018	0.080	4.014	4.095	0.076	0.401	0.477
	Surge Tank Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Surge Tank Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Discharge Connection Components	Pipeline Trenching and Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Vault Structure Excavation	0.112	2.022	6.466	0.009	0.016	1.672	1.689	0.016	0.167	0.184
	Vault Structure Installation	0.350	4.151	9.897	0.018	0.080	3.897	3.977	0.076	0.390	0.465
	Surge Tank Excavation	0.117	2.146	6.567	0.009	0.017	2.416	2.433	0.017	0.242	0.258
	Surge Tank Installation	0.423	5.368	14.287	0.025	0.092	3.897	3.989	0.087	0.390	0.477

Winter — Offsite Emissions (lb/day)

Phase	Source	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
Supply Connection Components	Pipeline Trenching and Installation	0.113	2.206	2.199	0.012	0.022	0.694	0.717	0.022	0.181	0.203
	Vault Structure Excavation	0.057	1.424	1.219	0.007	0.014	0.401	0.415	0.014	0.106	0.120
	Vault Structure Installation	0.098	3.278	2.329	0.018	0.034	0.830	0.863	0.034	0.222	0.256
	Surge Tank Excavation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Surge Tank Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Discharge Connection Components	Pipeline Trenching and Installation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Vault Structure Excavation	0.050	1.536	1.262	0.008	0.016	0.438	0.454	0.016	0.116	0.132
	Vault Structure Installation	0.078	3.151	2.249	0.018	0.034	0.830	0.863	0.034	0.222	0.256
	Surge Tank Excavation	0.114	2.338	2.275	0.012	0.023	0.717	0.740	0.023	0.187	0.210
	Surge Tank Installation	0.098	3.278	2.329	0.018	0.034	0.830	0.863	0.034	0.222	0.256

Phase	Regional Emissions	ROG	NOX	CO	SO2	Exhaust PM10	Fugitive PM10	Total PM10	Exhaust PM2.5	Fugitive PM2.5	Total PM2.5
Supply Connection Components	Pipeline Trenching and Installation	0.48	7.10	11.55	0.03	0.11	3.30	3.41	0.11	0.44	0.55
	Vault Structure Excavation	0.17	3.42	7.66	0.02	0.03	1.89	1.92	0.03	0.25	0.29
	Vault Structure Installation	0.45	7.46	12.25	0.04	0.11	4.84	4.96	0.11	0.62	0.73
	Surge Tank Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Surge Tank Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discharge Connection Components	Pipeline Trenching and Installation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vault Structure Excavation	0.16	3.56	7.73	0.02	0.03	2.11	2.14	0.03	0.28	0.32
	Vault Structure Installation	0.43	7.30	12.15	0.04	0.11	4.73	4.84	0.11	0.61	0.72
	Surge Tank Excavation	0.23	4.48	8.84	0.02	0.04	3.13	3.17	0.04	0.43	0.47
	Surge Tank Installation	0.52	8.65	16.62	0.04	0.13	4.73	4.85	0.12	0.61	0.73
	Project Daily Maximum Emissions	**0.52**	**8.65**	**16.62**	**0.04**	**0.13**	**4.84**	**4.96**	**0.12**	**0.62**	**0.73**

Inland Feeder

Construction Annual GHG

	Metric Tons/Year			
Year	**CalEEMod On-Road Mobile Sources**	**CalEEMod Construction Equipment and Onsite Trucks**	**Water + Construction Office**	**Total**
2025	142	165	12	319
2026	33	26	4	63
Total	**175**	**192**	16	**383**
Amortized - 30 years	**6**	**6**	**1**	**13**

Inland Feeder
Construction GHG
Construction Water Energy Estimates

	Source	Acreage/Day	Number of Days	Total Construction Water Use (Mgal)	Electricity Demand from Water Conveyance (MWh)	Annual Electricity Demand from Water Conveyance (MWh)
Supply Connection Components	Pipeline Trenching and Installation	6.615	23	0.456	3.1	1.2
	Vault Structure Excavation	6.615	20	0.397	2.7	1.1
	Surge Tank Excavation	6.615	22	0.437	3.0	1.2
Discharge Connection Components	Pipeline Trenching and Installation	6.615	23	0.456	3.1	1.2
	Vault Structure Excavation	6.615	21	0.417	2.8	1.1
	Surge Tank Excavation	6.615	23	0.456	3.1	1.2
	Total			**2.620**	**17.8**	**7.2**

CalEEMod Water Electricity Factors	Electricity Intensity Factor To Supply (kWh/Mgal)	Electricity Intensity Factor To Treat (kWh/Mgal)	Electricity Intensity Factor To Distribute (kWh/Mgal)	Electricity Intensity Factor For Wastewater Treatment (kWh/Mgal)
	3044	725	1537	1501

Electricity Emission Factor	Electricity Emission Factor	Total GHG Emissions Per Year
(MT CO2/MWh)	**(lbs CO2/MWh)**	1.73
2.41E-01	531.98	
(MT CH4/MWh)	**(lbs CH4/MWh)**	
1.50E-05	0.033	
(MT N2O/MWh)	**(lbs N2O/MWh)**	
1.81E-06	0.004	

Sources and Assumptions:
CalEEMod Appendix G, Table G-32
-Electricity Intensity Factors - California Emissions Estimator Model (CalEEMod).
-Estimated construction water use assumed to be generally equivalent to landscape irrigation, based on a factor of 20.94 gallons per year per square foot of landscaped area within the Los Angeles area (Mediterranean climate), which assumes high water demand landscaping materials and an irrigation system efficiency of 85%.
Factor is therefore (20.94 GAL/SF/year) x (43,560 SF/acre) / (365 days/year) / (0.85) = 2,940 gallons/acre/day, rounded up to 3,000 gallons/acre/day.
(U.S. Department of Energy, Energy Efficiency & Renewable Energy, Federal Energy Management Program. "Guidelines for Estimating Unmetered Landscaping Water Use." July 2010. Page 12, Table 4 - Annual Irrigation Factor – Landscaped Areas with High Water Requirements).

Inland Feeder
Construction GHG Analysis

Temporary Construction Trailer - Electricity

Land Use	Square Feet	Energy Use per year (kWh)	Total Energy Use (kWh)	Energy Use per SF
General Office	2,000	40,936	40,936.20	20.5
Note: Energy use per sf is derived from CalEEMod User Guide, Appendix G, Table G-28 for the Statewide average for General Office Building land use				

Electricity Emission Factor	Electricity Emission Factor	Total GHG Emissions Per Year	Year	Proportion of Year Worked	GHG Emissions Per Construction Year
(MT CO2/MWh)	**(lbs CO2/MWh)**	9.92	2025	1.00	9.92
0.24	531.98		2026	0.25	2.48
(MT CH4/MWh)	**(lbs CH4/MWh)**				
1.50E-05	0.033				
(MT N2O/MWh)	**(lbs N2O/MWh)**				
1.81E-06	0.004				

Inland Feeder-Con-T4 Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Inland Feeder-Con-T4
Construction Start Date	1/1/2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	11.2
Location	8650 Cone Camp Rd, Highland, CA 92346, USA
County	San Bernardino-South Coast
City	Highland
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5168
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
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
Other Non-Asphalt Surfaces	6.62	Acre	6.62	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

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

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.99	0.54	9.12	16.8	0.04	0.13	5.75	5.88	0.12	0.76	0.88	—	5,136	5,136	0.46	0.57	8.02	5,291
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.88	0.52	8.65	16.6	0.04	0.13	4.73	4.85	0.12	0.61	0.73	—	5,127	5,127	0.41	0.46	0.16	5,276
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.34	0.23	3.32	7.11	0.02	0.05	1.39	1.44	0.05	0.19	0.23	—	1,815	1,815	0.13	0.13	0.87	1,859
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.06	0.04	0.61	1.30	< 0.005	0.01	0.25	0.26	0.01	0.03	0.04	—	300	300	0.02	0.02	0.14	308

2.2. Construction Emissions by Year, Unmitigated

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

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

2025	0.99	0.54	9.12	16.8	0.04	0.13	5.75	5.88	0.12	0.76	0.88	—	5,136	5,136	0.46	0.57	8.02	5,291
2026	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.88	0.52	8.65	16.6	0.04	0.13	4.73	4.85	0.12	0.61	0.73	—	5,127	5,127	0.41	0.46	0.16	5,276
2026	0.79	0.43	7.30	12.1	0.04	0.11	4.73	4.84	0.11	0.61	0.72	—	4,452	4,452	0.37	0.44	0.15	4,593
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.34	0.23	3.32	7.11	0.02	0.05	1.39	1.44	0.05	0.19	0.23	—	1,815	1,815	0.13	0.13	0.87	1,859
2026	0.06	0.03	0.57	1.13	< 0.005	0.01	0.32	0.33	0.01	0.04	0.05	—	347	347	0.03	0.03	0.18	357
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.06	0.04	0.61	1.30	< 0.005	0.01	0.25	0.26	0.01	0.03	0.04	—	300	300	0.02	0.02	0.14	308
2026	0.01	0.01	0.10	0.21	< 0.005	< 0.005	0.06	0.06	< 0.005	0.01	0.01	—	57.4	57.4	< 0.005	0.01	0.03	59.1

3. Construction Emissions Details

3.1. SC-Vault Structure Excavation (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	0.10	0.10	1.75	6.24	0.01	0.02	—	0.02	0.02	—	0.02	—	894	894	0.04	0.01	—	897

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.03	0.01	0.24	0.20	< 0.005	< 0.005	1.48	1.48	< 0.005	0.15	0.15	—	42.0	42.0	0.02	0.01	< 0.005	44.6
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.34	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	2.29	2.29	< 0.005	< 0.005	< 0.005	2.43
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.11	8.11	< 0.005	< 0.005	—	8.14
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.38	0.38	< 0.005	< 0.005	< 0.005	0.40
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.04	0.47	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	103	103	< 0.005	< 0.005	0.01	105
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	0.14	0.02	1.38	0.75	0.01	0.01	0.30	0.31	0.01	0.08	0.10	—	1,107	1,107	0.12	0.18	0.06	1,164

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.74	5.74	< 0.005	< 0.005	0.01	5.82
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	0.08	0.04	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	60.6	60.6	0.01	0.01	0.06	63.8
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.95	0.95	< 0.005	< 0.005	< 0.005	0.96
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	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.0	10.0	< 0.005	< 0.005	0.01	10.6

3.3. SC-Surge Tank Excavation (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.10	1.75	6.24	0.01	0.02	—	0.02	0.02	—	0.02	—	894	894	0.04	0.01	—	897
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.38	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	53.9	53.9	< 0.005	< 0.005	—	54.1

Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.92	8.92	< 0.005	< 0.005	—	8.95
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.47	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	84.5	84.5	< 0.005	< 0.005	0.31	85.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
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	—	4.74	4.74	< 0.005	< 0.005	0.01	4.81
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	—	0.78	0.78	< 0.005	< 0.005	< 0.005	0.80
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. SC-Surge Tank Excavation-Haul (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.12	0.10	< 0.005	< 0.005	0.74	0.74	< 0.005	0.07	0.07	—	20.8	20.8	0.01	< 0.005	0.01	22.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.11	0.11	< 0.005	< 0.005	< 0.005	0.12
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.02	0.02	< 0.005	< 0.005	< 0.005	0.02

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.07	0.01	0.66	0.37	< 0.005	0.01	0.15	0.16	0.01	0.04	0.05	—	553	553	0.06	0.09	1.18	583
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.03	3.03	< 0.005	< 0.005	< 0.005	3.19
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.50	0.50	< 0.005	< 0.005	< 0.005	0.53

3.7. DC-Vault Structure Excavation (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	0.10	0.10	1.75	6.24	0.01	0.02	—	0.02	0.02	—	0.02	—	894	894	0.04	0.01	—	897
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.03	0.01	0.27	0.22	< 0.005	< 0.005	1.67	1.67	< 0.005	0.17	0.17	—	46.5	46.5	0.02	0.01	< 0.005	49.3
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.38	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	53.9	53.9	< 0.005	< 0.005	—	54.1
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.10	0.10	< 0.005	0.01	0.01	—	2.79	2.79	< 0.005	< 0.005	< 0.005	2.95
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.92	8.92	< 0.005	< 0.005	—	8.95
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.46	0.46	< 0.005	< 0.005	< 0.005	0.49
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.04	0.44	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	101	101	< 0.005	< 0.005	0.01	102

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	0.15	0.02	1.50	0.83	0.01	0.02	0.33	0.35	0.02	0.09	0.11	—	1,222	1,222	0.12	0.20	0.06	1,284
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.19	6.19	< 0.005	< 0.005	0.01	6.27
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.09	0.05	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	73.7	73.7	0.01	0.01	0.06	77.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.02	1.02	< 0.005	< 0.005	< 0.005	1.04
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	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.2	12.2	< 0.005	< 0.005	0.01	12.8

3.9. DC-Surge Tank Excavation (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	0.10	0.10	1.75	6.24	0.01	0.02	—	0.02	0.02	—	0.02	—	894	894	0.04	0.01	—	897
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.11	0.39	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	56.3	56.3	< 0.005	< 0.005	—	56.5
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.07	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.33	9.33	< 0.005	< 0.005	—	9.36
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.09	1.06	0.00	0.00	0.24	0.24	0.00	0.06	0.06	—	233	233	0.01	0.01	0.02	235
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.9	14.9	< 0.005	< 0.005	0.03	15.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.46	2.46	< 0.005	< 0.005	< 0.005	2.50
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. DC-Surge Tank Excavation-Haul (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.05	0.01	0.39	0.32	< 0.005	< 0.005	2.41	2.41	< 0.005	0.24	0.24	—	68.2	68.2	0.03	0.01	< 0.005	72.4
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dust From Material Movemen	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.37	0.37	< 0.005	< 0.005	< 0.005	0.39
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.06	0.06	< 0.005	< 0.005	< 0.005	0.07
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.23	0.04	2.25	1.22	0.01	0.02	0.48	0.50	0.02	0.13	0.15	—	1,798	1,798	0.19	0.29	0.10	1,891
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.85	9.85	< 0.005	< 0.005	0.01	10.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.63	1.63	< 0.005	< 0.005	< 0.005	1.72

3.13. SC-Vault Structure Installation (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	0.36	0.33	3.52	9.38	0.02	0.08	—	0.08	0.08	—	0.08	—	1,665	1,665	0.07	0.01	—	1,671
Onsite truck	0.01	< 0.005	0.12	0.10	< 0.005	< 0.005	0.74	0.74	< 0.005	0.07	0.07	—	21.0	21.0	0.01	< 0.005	< 0.005	22.3
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.20	0.54	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	95.8	95.8	< 0.005	< 0.005	—	96.1
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	1.20	1.20	< 0.005	< 0.005	< 0.005	1.28
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.04	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.9	15.9	< 0.005	< 0.005	—	15.9
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.20	0.20	< 0.005	< 0.005	< 0.005	0.21
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.05	0.59	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	129	129	0.01	< 0.005	0.01	131
Vendor	0.02	0.01	0.29	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	247	247	0.02	0.04	0.02	259
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.54	7.54	< 0.005	< 0.005	0.01	7.64
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.2	14.2	< 0.005	< 0.005	0.02	14.9
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.25	1.25	< 0.005	< 0.005	< 0.005	1.27
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.35	2.35	< 0.005	< 0.005	< 0.005	2.46
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. SC-Vault Structure Installation-Concrete (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.06	0.02	0.51	0.42	< 0.005	< 0.005	3.15	3.16	< 0.005	0.32	0.32	—	89.2	89.2	0.04	0.02	< 0.005	94.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.12	0.12	< 0.005	0.01	0.01	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.60
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.30	0.05	2.94	1.59	0.02	0.03	0.63	0.66	0.03	0.17	0.20	—	2,352	2,352	0.25	0.39	0.13	2,473
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.06	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	90.2	90.2	0.01	0.01	0.08	94.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.9	14.9	< 0.005	< 0.005	0.01	15.7

3.17. SC-Surge Tank Installation (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.43	0.40	4.73	13.8	0.02	0.09	—	0.09	0.09	—	0.09	—	2,289	2,289	0.09	0.02	—	2,296
Onsite truck	0.01	< 0.005	0.12	0.10	< 0.005	< 0.005	0.74	0.74	< 0.005	0.07	0.07	—	20.8	20.8	0.01	< 0.005	0.01	22.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.56	1.62	< 0.005	0.01	—	0.01	0.01	—	0.01	—	270	270	0.01	< 0.005	—	271
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	2.46	2.46	< 0.005	< 0.005	< 0.005	2.61
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.30	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.6	44.6	< 0.005	< 0.005	—	44.8
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.41	0.41	< 0.005	< 0.005	< 0.005	0.43
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.04	0.78	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	141	141	0.01	< 0.005	0.52	143
Vendor	0.02	0.01	0.27	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	247	247	0.02	0.04	0.69	259
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	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.4	15.4	< 0.005	< 0.005	0.03	15.7
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.1	29.1	< 0.005	< 0.005	0.04	30.5
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.56	2.56	< 0.005	< 0.005	< 0.005	2.59
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.81	4.81	< 0.005	< 0.005	0.01	5.05
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

3.19. SC-Surge Tank Installation-Concrete (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.06	0.02	0.49	0.41	< 0.005	< 0.005	3.15	3.16	< 0.005	0.32	0.32	—	88.3	88.3	0.04	0.01	0.06	93.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.12	0.12	< 0.005	0.01	0.01	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.60
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.30	0.05	2.82	1.58	0.02	0.03	0.63	0.66	0.03	0.17	0.20	—	2,351	2,351	0.25	0.38	4.99	2,477
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.06	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	90.2	90.2	0.01	0.01	0.08	94.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.9	14.9	< 0.005	< 0.005	0.01	15.7

3.21. DC-Vault Structure Installation (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	0.36	0.33	3.52	9.38	0.02	0.08	—	0.08	0.08	—	0.08	—	1,665	1,665	0.07	0.01	—	1,670
Onsite truck	0.01	< 0.005	0.12	0.10	< 0.005	< 0.005	0.74	0.74	< 0.005	0.07	0.07	—	20.7	20.7	0.01	< 0.005	< 0.005	21.9
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.02	0.20	0.54	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	95.8	95.8	< 0.005	< 0.005	—	96.1
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.04	0.04	< 0.005	< 0.005	< 0.005	—	1.18	1.18	< 0.005	< 0.005	< 0.005	1.25
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.04	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.9	15.9	< 0.005	< 0.005	—	15.9

Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	0.20	0.20	< 0.005	< 0.005	< 0.005	0.21
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.54	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	127	127	< 0.005	< 0.005	0.01	128
Vendor	0.02	< 0.005	0.27	0.14	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	243	243	0.02	0.04	0.02	254
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	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	7.39	7.39	< 0.005	< 0.005	0.01	7.48
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.0	14.0	< 0.005	< 0.005	0.02	14.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.22	1.22	< 0.005	< 0.005	< 0.005	1.24
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.31	2.31	< 0.005	< 0.005	< 0.005	2.42
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

3.23. DC-Vault Structure Installation-Concrete (2026) - Unmitigated

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

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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.06	0.02	0.51	0.42	< 0.005	< 0.005	3.15	3.16	< 0.005	0.32	0.32	—	87.9	87.9	0.04	0.01	< 0.005	93.1
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.12	0.12	< 0.005	0.01	0.01	—	3.35	3.35	< 0.005	< 0.005	< 0.005	3.55
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.59
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.28	0.03	2.83	1.56	0.02	0.03	0.63	0.66	0.03	0.17	0.20	—	2,309	2,309	0.23	0.37	0.12	2,425
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.06	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	88.5	88.5	0.01	0.01	0.08	93.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.7	14.7	< 0.005	< 0.005	0.01	15.4

3.25. DC-Surge Tank Installation (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	0.43	0.40	4.73	13.8	0.02	0.09	—	0.09	0.09	—	0.09	—	2,289	2,289	0.09	0.02	—	2,296
Onsite truck	0.01	< 0.005	0.12	0.10	< 0.005	< 0.005	0.74	0.74	< 0.005	0.07	0.07	—	21.0	21.0	0.01	< 0.005	< 0.005	22.3
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.05	0.56	1.62	< 0.005	0.01	—	0.01	0.01	—	0.01	—	270	270	0.01	< 0.005	—	271
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.08	0.08	< 0.005	0.01	0.01	—	2.46	2.46	< 0.005	< 0.005	< 0.005	2.61
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.30	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	44.6	44.6	< 0.005	< 0.005	—	44.8
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.41	0.41	< 0.005	< 0.005	< 0.005	0.43
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.05	0.04	0.05	0.59	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	129	129	0.01	< 0.005	0.01	131
Vendor	0.02	0.01	0.29	0.15	< 0.005	< 0.005	0.07	0.07	< 0.005	0.02	0.02	—	247	247	0.02	0.04	0.02	259
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.4	15.4	< 0.005	< 0.005	0.03	15.7
Vendor	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	29.1	29.1	< 0.005	< 0.005	0.04	30.5
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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.56	2.56	< 0.005	< 0.005	< 0.005	2.59
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.81	4.81	< 0.005	< 0.005	0.01	5.05
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

3.27. DC-Surge Tank Installation-Concrete (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)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.06	0.02	0.51	0.42	< 0.005	< 0.005	3.15	3.16	< 0.005	0.32	0.32	—	89.2	89.2	0.04	0.02	< 0.005	94.7
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.12	0.12	< 0.005	0.01	0.01	—	3.40	3.40	< 0.005	< 0.005	< 0.005	3.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	< 0.005	—	0.56	0.56	< 0.005	< 0.005	< 0.005	0.60
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.30	0.05	2.94	1.59	0.02	0.03	0.63	0.66	0.03	0.17	0.20	—	2,352	2,352	0.25	0.39	0.13	2,473
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	< 0.005	0.11	0.06	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	90.2	90.2	0.01	0.01	0.08	94.9
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	14.9	14.9	< 0.005	< 0.005	0.01	15.7

3.29. SC-Pipeline Trenching and Installation (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	0.40	0.36	4.47	9.01	0.01	0.09	—	0.09	0.08	—	0.08	—	1,331	1,331	0.05	0.01	—	1,335
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.05	0.02	0.42	0.35	< 0.005	< 0.005	2.60	2.60	< 0.005	0.26	0.26	—	73.5	73.5	0.03	0.01	< 0.005	78.0
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.28	0.57	< 0.005	0.01	—	0.01	0.01	—	0.01	—	83.8	83.8	< 0.005	< 0.005	—	84.1
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.03	0.02	< 0.005	< 0.005	0.16	0.16	< 0.005	0.02	0.02	—	4.60	4.60	< 0.005	< 0.005	< 0.005	4.89
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.05	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.9	13.9	< 0.005	< 0.005	—	13.9
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	< 0.005	—	0.76	0.76	< 0.005	< 0.005	< 0.005	0.81
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.09	1.06	0.00	0.00	0.24	0.24	0.00	0.06	0.06	—	233	233	0.01	0.01	0.02	235
Vendor	0.02	< 0.005	0.21	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	185	185	0.01	0.03	0.01	194
Hauling	0.19	0.03	1.90	1.03	0.01	0.02	0.41	0.43	0.02	0.11	0.13	—	1,522	1,522	0.16	0.25	0.08	1,600
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.9	14.9	< 0.005	< 0.005	0.03	15.1
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.7	11.7	< 0.005	< 0.005	0.01	12.2
Hauling	0.01	< 0.005	0.12	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	95.9	95.9	0.01	0.02	0.09	101
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.46	2.46	< 0.005	< 0.005	< 0.005	2.50
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.93	1.93	< 0.005	< 0.005	< 0.005	2.02
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	15.9	15.9	< 0.005	< 0.005	0.01	16.7

3.31. DC-Pipeline Trenching and Installation (2025) - Unmitigated

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

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.40	0.36	4.47	9.01	0.01	0.09	—	0.09	0.08	—	0.08	—	1,331	1,331	0.05	0.01	—	1,335
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.09	0.03	0.72	0.61	< 0.005	< 0.005	4.64	4.64	< 0.005	0.46	0.46	—	130	130	0.06	0.02	0.09	138

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.28	0.57	< 0.005	0.01	—	0.01	0.01	—	0.01	—	83.8	83.8	< 0.005	< 0.005	—	84.1
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.01	< 0.005	0.05	0.04	< 0.005	< 0.005	0.28	0.28	< 0.005	0.03	0.03	—	8.22	8.22	< 0.005	< 0.005	< 0.005	8.73
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.05	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	13.9	13.9	< 0.005	< 0.005	—	13.9
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	1.36	1.36	< 0.005	< 0.005	< 0.005	1.45
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.08	1.40	0.00	0.00	0.24	0.24	0.00	0.06	0.06	—	254	254	0.01	0.01	0.94	257
Vendor	0.02	0.01	0.21	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	185	185	0.01	0.03	0.52	194
Hauling	0.39	0.06	3.65	2.05	0.02	0.04	0.82	0.85	0.04	0.22	0.26	—	3,042	3,042	0.32	0.50	6.46	3,205
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.9	14.9	< 0.005	< 0.005	0.03	15.1
Vendor	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.7	11.7	< 0.005	< 0.005	0.01	12.2
Hauling	0.02	< 0.005	0.24	0.13	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	192	192	0.02	0.03	0.18	202
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.46	2.46	< 0.005	< 0.005	< 0.005	2.50
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.93	1.93	< 0.005	< 0.005	< 0.005	2.02
Hauling	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.7	31.7	< 0.005	0.01	0.03	33.4

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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
SC-Vault Structure Excavation	Grading	2/1/2025	2/28/2025	5.00	20.0	—
SC-Surge Tank Excavation	Grading	4/1/2025	4/30/2025	5.00	22.0	—
SC-Surge Tank Excavation-Haul	Grading	4/1/2025	4/2/2025	5.00	2.00	—

DC-Vault Structure Excavation	Grading	10/1/2026	10/31/2026	5.00	22.0	—
DC-Surge Tank Excavation	Grading	10/1/2025	10/31/2025	5.00	23.0	—
DC-Surge Tank Excavation-Haul	Grading	10/1/2025	10/2/2025	5.00	2.00	—
SC-Vault Structure Installation	Building Construction	3/1/2025	3/31/2025	5.00	21.0	—
SC-Vault Structure Installation-Concrete	Building Construction	3/1/2025	3/20/2025	5.00	14.0	—
SC-Surge Tank Installation	Building Construction	5/1/2025	6/30/2025	5.00	43.0	—
SC-Surge Tank Installation-Concrete	Building Construction	5/1/2025	5/20/2025	5.00	14.0	—
DC-Vault Structure Installation	Building Construction	11/1/2026	11/30/2026	5.00	21.0	—
DC-Vault Structure Installation-Concrete	Building Construction	11/1/2026	11/19/2026	5.00	14.0	—
DC-Surge Tank Installation	Building Construction	11/1/2025	12/31/2025	5.00	43.0	—
DC-Surge Tank Installation-Concrete	Building Construction	11/1/2025	11/20/2025	5.00	14.0	—
SC-Pipeline Trenching and Installation	Trenching	1/1/2025	1/31/2025	5.00	23.0	—
DC-Pipeline Trenching and Installation	Trenching	7/1/2025	7/31/2025	5.00	23.0	—

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
SC-Vault Structure Excavation	Excavators	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
SC-Vault Structure Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37

SC-Vault Structure Excavation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
SC-Surge Tank Excavation	Excavators	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
SC-Surge Tank Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
SC-Surge Tank Excavation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
DC-Vault Structure Excavation	Excavators	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
DC-Vault Structure Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
DC-Vault Structure Excavation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
DC-Surge Tank Excavation	Excavators	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
DC-Surge Tank Excavation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
DC-Surge Tank Excavation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
SC-Vault Structure Installation	Forklifts	Diesel	Tier 4 Final	1.00	8.00	82.0	0.20
SC-Vault Structure Installation	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
SC-Vault Structure Installation	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
SC-Vault Structure Installation	Air Compressors	Diesel	Tier 4 Final	1.00	8.00	37.0	0.48
SC-Vault Structure Installation	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
SC-Vault Structure Installation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
SC-Surge Tank Installation	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74

SC-Surge Tank Installation	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
SC-Surge Tank Installation	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45
SC-Surge Tank Installation	Air Compressors	Diesel	Tier 4 Final	1.00	8.00	37.0	0.48
SC-Surge Tank Installation	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41
SC-Surge Tank Installation	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
SC-Surge Tank Installation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
DC-Vault Structure Installation	Forklifts	Diesel	Tier 4 Final	1.00	8.00	82.0	0.20
DC-Vault Structure Installation	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
DC-Vault Structure Installation	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
DC-Vault Structure Installation	Air Compressors	Diesel	Tier 4 Final	1.00	8.00	37.0	0.48
DC-Vault Structure Installation	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
DC-Vault Structure Installation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
DC-Surge Tank Installation	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
DC-Surge Tank Installation	Cranes	Diesel	Tier 4 Final	1.00	8.00	367	0.29
DC-Surge Tank Installation	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45
DC-Surge Tank Installation	Air Compressors	Diesel	Tier 4 Final	1.00	8.00	37.0	0.48
DC-Surge Tank Installation	Graders	Diesel	Tier 4 Final	1.00	8.00	148	0.41

DC-Surge Tank Installation	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
DC-Surge Tank Installation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
SC-Pipeline Trenching and Installation	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
SC-Pipeline Trenching and Installation	Excavators	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
SC-Pipeline Trenching and Installation	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
SC-Pipeline Trenching and Installation	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
SC-Pipeline Trenching and Installation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
SC-Pipeline Trenching and Installation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
SC-Pipeline Trenching and Installation	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45
DC-Pipeline Trenching and Installation	Cement and Mortar Mixers	Diesel	Average	1.00	8.00	10.0	0.56
DC-Pipeline Trenching and Installation	Excavators	Diesel	Tier 4 Final	1.00	8.00	36.0	0.38
DC-Pipeline Trenching and Installation	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
DC-Pipeline Trenching and Installation	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
DC-Pipeline Trenching and Installation	Sweepers/Scrubbers	Diesel	Tier 4 Final	1.00	8.00	36.0	0.46
DC-Pipeline Trenching and Installation	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	2.00	8.00	84.0	0.37
DC-Pipeline Trenching and Installation	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
SC-Vault Structure Excavation	—	—	—	—
SC-Vault Structure Excavation	Worker	8.00	18.5	LDA,LDT1,LDT2
SC-Vault Structure Excavation	Vendor	—	10.2	HHDT,MHDT
SC-Vault Structure Excavation	Hauling	16.0	20.0	HHDT
SC-Vault Structure Excavation	Onsite truck	16.0	0.25	HHDT
SC-Surge Tank Excavation	—	—	—	—
SC-Surge Tank Excavation	Worker	6.00	18.5	LDA,LDT1,LDT2
SC-Surge Tank Excavation	Vendor	—	10.2	HHDT,MHDT
SC-Surge Tank Excavation	Hauling	0.00	20.0	HHDT
SC-Surge Tank Excavation	Onsite truck	—	—	HHDT
SC-Surge Tank Excavation-Haul	—	—	—	—
SC-Surge Tank Excavation-Haul	Worker	0.00	18.5	LDA,LDT1,LDT2
SC-Surge Tank Excavation-Haul	Vendor	—	10.2	HHDT,MHDT
SC-Surge Tank Excavation-Haul	Hauling	8.00	20.0	HHDT
SC-Surge Tank Excavation-Haul	Onsite truck	8.00	0.25	HHDT
DC-Vault Structure Excavation	—	—	—	—
DC-Vault Structure Excavation	Worker	8.00	18.5	LDA,LDT1,LDT2
DC-Vault Structure Excavation	Vendor	—	10.2	HHDT,MHDT
DC-Vault Structure Excavation	Hauling	18.0	20.0	HHDT
DC-Vault Structure Excavation	Onsite truck	18.0	0.25	HHDT
DC-Surge Tank Excavation	—	—	—	—
DC-Surge Tank Excavation	Worker	18.0	18.5	LDA,LDT1,LDT2
DC-Surge Tank Excavation	Vendor	—	10.2	HHDT,MHDT

DC-Surge Tank Excavation	Hauling	0.00	20.0	HHDT
DC-Surge Tank Excavation	Onsite truck	—	—	HHDT
DC-Surge Tank Excavation-Haul	—	—	—	—
DC-Surge Tank Excavation-Haul	Worker	0.00	18.5	LDA,LDT1,LDT2
DC-Surge Tank Excavation-Haul	Vendor	—	10.2	HHDT,MHDT
DC-Surge Tank Excavation-Haul	Hauling	26.0	20.0	HHDT
DC-Surge Tank Excavation-Haul	Onsite truck	26.0	0.25	HHDT
SC-Vault Structure Installation	—	—	—	—
SC-Vault Structure Installation	Worker	10.0	18.5	LDA,LDT1,LDT2
SC-Vault Structure Installation	Vendor	8.00	10.2	HHDT,MHDT
SC-Vault Structure Installation	Hauling	0.00	20.0	HHDT
SC-Vault Structure Installation	Onsite truck	8.00	0.25	HHDT
SC-Vault Structure Installation-Concrete	—	—	—	—
SC-Vault Structure Installation-Concrete	Worker	0.00	18.5	LDA,LDT1,LDT2
SC-Vault Structure Installation-Concrete	Vendor	0.00	10.2	HHDT,MHDT
SC-Vault Structure Installation-Concrete	Hauling	34.0	20.0	HHDT
SC-Vault Structure Installation-Concrete	Onsite truck	34.0	0.25	HHDT
SC-Surge Tank Installation	—	—	—	—
SC-Surge Tank Installation	Worker	10.0	18.5	LDA,LDT1,LDT2
SC-Surge Tank Installation	Vendor	8.00	10.2	HHDT,MHDT
SC-Surge Tank Installation	Hauling	0.00	20.0	HHDT
SC-Surge Tank Installation	Onsite truck	8.00	0.25	HHDT
SC-Surge Tank Installation-Concrete	—	—	—	—
SC-Surge Tank Installation-Concrete	Worker	0.00	18.5	LDA,LDT1,LDT2

SC-Surge Tank Installation-Concrete	Vendor	0.00	10.2	HHDT,MHDT
SC-Surge Tank Installation-Concrete	Hauling	34.0	20.0	HHDT
SC-Surge Tank Installation-Concrete	Onsite truck	34.0	0.25	HHDT
DC-Vault Structure Installation	—	—	—	—
DC-Vault Structure Installation	Worker	10.0	18.5	LDA,LDT1,LDT2
DC-Vault Structure Installation	Vendor	8.00	10.2	HHDT,MHDT
DC-Vault Structure Installation	Hauling	0.00	20.0	HHDT
DC-Vault Structure Installation	Onsite truck	8.00	0.25	HHDT
DC-Vault Structure Installation-Concrete	—	—	—	—
DC-Vault Structure Installation-Concrete	Worker	0.00	18.5	LDA,LDT1,LDT2
DC-Vault Structure Installation-Concrete	Vendor	0.00	10.2	HHDT,MHDT
DC-Vault Structure Installation-Concrete	Hauling	34.0	20.0	HHDT
DC-Vault Structure Installation-Concrete	Onsite truck	34.0	0.25	HHDT
DC-Surge Tank Installation	—	—	—	—
DC-Surge Tank Installation	Worker	10.0	18.5	LDA,LDT1,LDT2
DC-Surge Tank Installation	Vendor	8.00	10.2	HHDT,MHDT
DC-Surge Tank Installation	Hauling	0.00	20.0	HHDT
DC-Surge Tank Installation	Onsite truck	8.00	0.25	HHDT
DC-Surge Tank Installation-Concrete	—	—	—	—
DC-Surge Tank Installation-Concrete	Worker	0.00	18.5	LDA,LDT1,LDT2
DC-Surge Tank Installation-Concrete	Vendor	0.00	10.2	HHDT,MHDT
DC-Surge Tank Installation-Concrete	Hauling	34.0	20.0	HHDT
DC-Surge Tank Installation-Concrete	Onsite truck	34.0	0.25	HHDT
SC-Pipeline Trenching and Installation	—	—	—	—

SC-Pipeline Trenching and Installation	Worker	18.0	18.5	LDA,LDT1,LDT2
SC-Pipeline Trenching and Installation	Vendor	6.00	10.2	HHDT,MHDT
SC-Pipeline Trenching and Installation	Hauling	22.0	20.0	HHDT
SC-Pipeline Trenching and Installation	Onsite truck	28.0	0.25	HHDT
DC-Pipeline Trenching and Installation	—	—	—	—
DC-Pipeline Trenching and Installation	Worker	18.0	18.5	LDA,LDT1,LDT2
DC-Pipeline Trenching and Installation	Vendor	6.00	10.2	HHDT,MHDT
DC-Pipeline Trenching and Installation	Hauling	44.0	20.0	HHDT
DC-Pipeline Trenching and Installation	Onsite truck	50.0	0.25	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
SC-Vault Structure Excavation	1,470	500	6.62	0.00	—
SC-Surge Tank Excavation	—	—	0.00	0.00	—

SC-Surge Tank Excavation-Haul	45.0	45.0	6.62	0.00	—
DC-Vault Structure Excavation	1,470	1,000	6.62	0.00	—
DC-Surge Tank Excavation	—	—	0.00	0.00	—
DC-Surge Tank Excavation-Haul	175	175	6.62	0.00	—
SC-Pipeline Trenching and Installation	1,820	1,680	6.62	0.00	—
DC-Pipeline Trenching and Installation	3,700	3,100	6.62	0.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Non-Asphalt Surfaces	6.62	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	532	0.03	< 0.005
2026	0.00	532	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. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

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

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

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

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	27.8	annual days of extreme heat
Extreme Precipitation	4.35	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	24.9	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	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	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	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
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	100
AQ-PM	53.1
AQ-DPM	20.0
Drinking Water	85.2
Lead Risk Housing	1.49
Pesticides	65.6
Toxic Releases	39.4
Traffic	12.6
Effect Indicators	—
CleanUp Sites	40.8
Groundwater	0.00
Haz Waste Facilities/Generators	35.6
Impaired Water Bodies	33.2

Solid Waste	0.00
Sensitive Population	—
Asthma	61.5
Cardio-vascular	77.6
Low Birth Weights	59.3
Socioeconomic Factor Indicators	—
Education	8.99
Housing	14.7
Linguistic	17.3
Poverty	6.73
Unemployment	78.3

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	76.41473117
Employed	79.81521879
Median HI	79.66123444
Education	—
Bachelor's or higher	62.03002695
High school enrollment	100
Preschool enrollment	21.73745669
Transportation	—
Auto Access	96.70216861
Active commuting	3.721288336
Social	—

2-parent households	68.31772103
Voting	80.48248428
Neighborhood	—
Alcohol availability	76.9665084
Park access	35.82702425
Retail density	12.48556397
Supermarket access	33.02964199
Tree canopy	13.92275119
Housing	—
Homeownership	92.2751187
Housing habitability	53.70204029
Low-inc homeowner severe housing cost burden	81.45771847
Low-inc renter severe housing cost burden	0.51328115
Uncrowded housing	76.50455537
Health Outcomes	—
Insured adults	85.66662389
Arthritis	0.0
Asthma ER Admissions	27.1
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	76.7
Cognitively Disabled	29.3
Physically Disabled	94.1

Heart Attack ER Admissions	24.0
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	19.6
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	45.3
SLR Inundation Area	0.0
Children	79.8
Elderly	81.3
English Speaking	58.4
Foreign-born	17.5
Outdoor Workers	47.5
Climate Change Adaptive Capacity	—
Impervious Surface Cover	71.1
Traffic Density	13.5
Traffic Access	23.0
Other Indices	—
Hardship	27.1
Other Decision Support	—
2016 Voting	84.8

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	43.0
Healthy Places Index Score for Project Location (b)	71.0
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
Construction: Construction Phases	see construction assumptions
Construction: Off-Road Equipment	see construction assumptions
Construction: Dust From Material Movement	see construction assumptions
Construction: Trips and VMT	see construction assumptions

Appendix C
Biological Resources

C1 Biological Resources Technical Report

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March 18, 2024

Ms. Michelle Morrison
Environmental Planning Section
The Metropolitan Water District of Southern California
700 North Alameda Street,
Los Angeles, California 90012

Subject: Inland Feeder - Foothill Pump Station Intertie Project Biological Resources Technical Report

Dear Ms. Michelle Morrison:

This letter report documents the findings of a reconnaissance-level biological resources survey conducted by Environmental Science Associates (ESA) for the Metropolitan Water District of Southern California's (Metropolitan) Inland Feeder Foothill Pump Station Intertie Project (project). This report provides an overview of the proposed project, survey methodology, applicable regulatory framework, existing conditions, conclusions and impact assessments, and recommended avoidance and minimization measures.

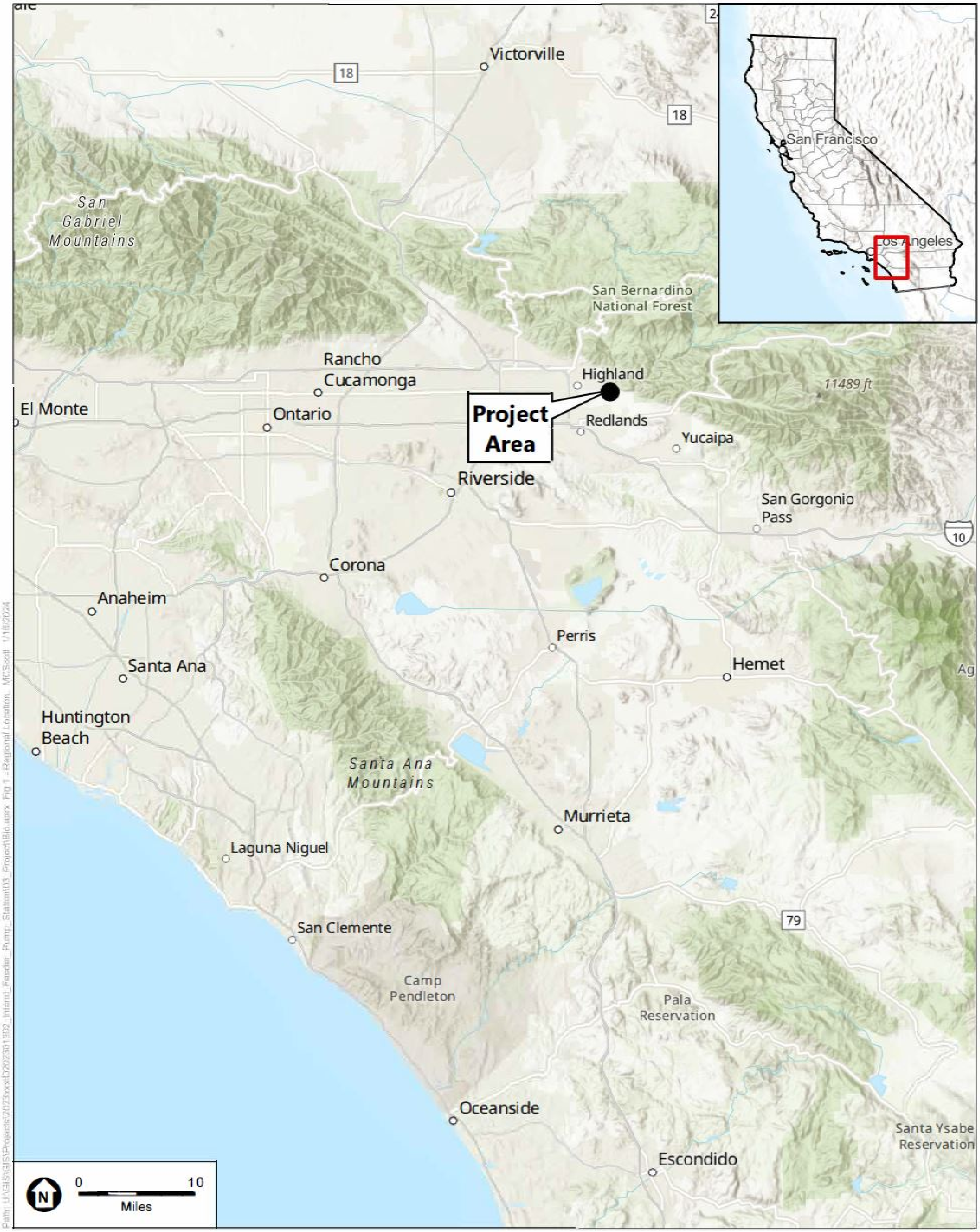
Project Location/Study Area

The approximately 6.61-acre project area is generally located north of the Santa Ana River, south of Greenspot Road, east of State Route 210, and west of State Route 38 in the City of Highland, San Bernardino County, California. More specifically, the project area is bounded by Greenspot Road and residential development to the north, the Santa Ana River and open space to the south, and large-lot, single family residences and open space to the east and west (**Figure 1, Regional Location**). The project area includes an existing fenced and graded triangular property that encompasses Metropolitan and San Bernardino Valley Municipal Water District (SBVMWD) facilities. The 59.96-acre study area includes the project area and a 500-ft buffer surrounding the project area (**Figure 2, Project Location**).

Project Description

To enhance Metropolitan's water delivery flexibility in response to drought conditions and limited State Water Project (SWP) allocations, Metropolitan is proposing two new pipeline connections between the Inland Feeder and the SBVMWD-Inland Feeder Interconnection Line 1 and SBVMWD's Foothill Pump Station (FPS).

Two new underground pipelines (supply connection and discharge connection), two underground vaults, four aboveground hydropneumatic surge tanks (HST), and associated appurtenant structures would be constructed (Figure 2) in two stages as outlined below.

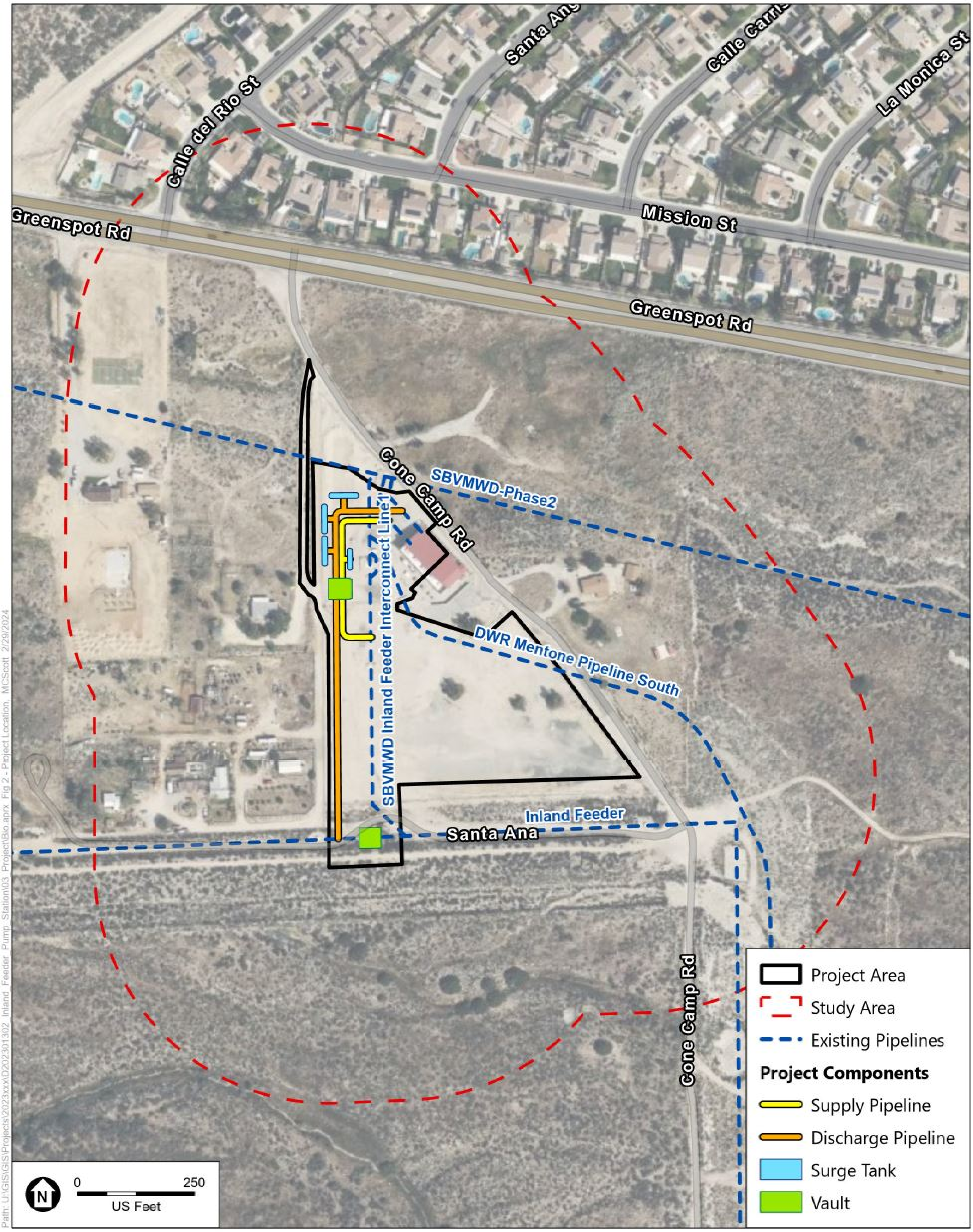


SOURCE: ESA, 2024

Inland Feeder - Foothill Pump Station Intertie Project

Figure 1
Regional Location

ESA



SOURCE: ESA, 2024

Inland Feeder - Foothill Pump Station Intertie Project

Figure 2
Project Location

ESA

Stage 1 would include construction of the components mainly located within the existing fenced facility. This would include construction of an approximately 400-foot long, 54-inch supply connection pipeline, an approximately 750-foot long, 54-inch discharge connection pipeline, a 50-foot by 40-foot underground vault, four aboveground HSTs on concrete pads, and appurtenant structures. Additionally, the proposed project would include installation of a new fence-line along the western boundary of the project area to accommodate the supply and discharge connection components.

Stage 2 construction activities would occur along the southern portion of the project area, located mainly outside of the fenced facility, and would include a 45-foot by 40-foot underground vault, a portion of the 54-inch discharge connection pipeline, all associated appurtenant structures, and final connections to the existing Inland Feeder pipeline.

Most of the construction activities would occur during daylight hours, occasional nighttime construction activities may be required to shutdown the Inland Feeder and install the tie-in connection. Operation and maintenance activities at the FPS and Inland Feeder would be similar to existing conditions.

Background

In October 2022, ECORP conducted a protocol-level San Bernardino kangaroo rat (SBKR; *Dipodomys merriami parvus*) trapping survey within portions of the proposed project area, and five rodent species were captured: SBKR, San Diego pocket mouse (*Chaetodipus fallax*), Bryant's woodrat (*Neotoma bryanti*), northern Baja deer mouse (*Peromyscus fraterculus*), and deer mouse (*Peromyscus maniculatus*) (ECORP 2022). SBKR is federally listed as endangered, state candidate for listing as endangered, and a species of special concern. As a result, the project team, in coordination with U.S. Fish and Wildlife Service (USFWS), performed additional biological surveys described below.

In March 2023, ESA conducted a SBKR burrow survey to determine if potential SBKR burrows occur within the project area (ESA 2023a). Based on the findings of the SBKR burrow survey conducted within the southern portion of the project area and in coordination with USFWS, subsequent motion-detecting cameras were recommended to identify kangaroo rat presence within the updated temporary and permanent impact areas. Thus, the nighttime activity survey was designed to confirm where exclusionary fencing should be installed within the southern extent of the project site.

The nighttime small mammal activity surveys were conducted in March and July 2023 using nighttime-vision equipment to determine nighttime small mammal activity in the project area (ESA 2023b; **Attachment A, Results of the 2023 Nighttime Small Mammal Activity Surveys**). The March 2023 nighttime small mammal activity survey was conducted within the exclusion fencing areas previously proposed for the project, while the July 2023 nighttime small mammal activity survey was conducted within a larger area and includes burrows where previous SBKR were captured to serve as a control. Although two small mammals, California ground squirrel and desert cottontail, were frequently detected by cameras in the nighttime activity survey area during the

March 2023 nighttime small mammal activity survey effort, no rodent species were observed. The July 2023 nighttime activity survey effort resulted in the detection of four rodent genus including: deer mouse (*Peromyscus* sp.), kangaroo rat (*Dipodomys* sp.), pocket mouse (*Chaetodipus* sp.), and woodrat (*Neotoma* sp.). Kangaroo rat individuals were confirmed at six of the 15 camera locations. There is no way to confirm the kangaroo rat to species level during the photo captures. Both SBKR and Dulzura kangaroo rat (*Dipodomys simulans*) ranges overlap with the project area and study area. Therefore, additional trapping efforts would be required to confirm the species of kangaroo rat detected during the nighttime small mammal activity survey. However, it should be noted that the 2022 protocol-level SBKR trapping survey captured SBKR individuals (ECORP 2022).

Methodology

Database Review

Prior to visiting the site, ESA conducted a query of the following resource inventory databases to analyze the potential for sensitive resources to occur within the study area:

- California Department of Fish and Wildlife (CDFW). 2023a. California Natural Diversity Data Base (CNDDB). Database was queried for special status species records in the Redlands USGS 7.5-minute quadrangle and eight surrounding quadrangles including San Bernadino North, Harrison Mtn, Keller Peak, Yucaipa, El Casco, Sunnymead, Riverside East, and San Bernardino South. Accessed December 21, 2023.

- California Department of Fish and Wildlife (CDFW). 2023b. California Sensitive Natural Communities List. Sacramento, CA: CDFW, Natural Heritage Division, July 5, 2022. Accessed December 21, 2023. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline.

- California Native Plant Society (CNPS). 2023. Inventory of Rare and Endangered Vascular Plants of California. Database was queried for special status species records in the Redlands USGS 7.5-minute quadrangle and eight surrounding quadrangles including San Bernardino North, Harrison Mtn, Keller Peak, Yucaipa, El Casco, Sunnymead, Riverside East, and San Bernadino South. Accessed December 21, 2023.

- ECORP. 2022. Results of a Focused San Bernardino Kangaroo Rat Trapping Survey Conducted for the Metropolitan Water District of Southern California's Foothill Pump Station Project, Highland, San Bernardino, California. November 18, 2022.

- ESA. 2023a. Results of a San Bernardino Kangaroo Rat Burrow Survey for Metropolitan's Inland Feeder Foothill Pump Station Intertie Phase 1 Project, City of Highland, San Bernardino County, California. April 13, 2023.

- ESA. 2023b. Results of Nighttime Small Mammal Activity Surveys for Metropolitan's Inland Feeder Foothill Pump Station Intertie Phase 1 Project, City of Highland, San Bernardino County, California. November 16, 2023.

- Natural Resource Conservation Service (NRCS). 2023. Web Soil Survey. Accessed December 21, 2023.https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.
- U.S. Fish and Wildlife Service (USFWS). 2023a. Critical Habitat Portal. Accessed December 21, 2023. https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265 ad4fe09893cf75b8dbfb77.
- USFWS (U.S. Fish and Wildlife Service). 2023. National Wetland Inventory. Accessed December 21, 2023. https://www.fws.gov/wetlands/data/Mapper.html.

Biological Resources Assessment

The reconnaissance-level biological resources survey was conducted by ESA biologists Brandon Mukogawa and Amanda French on December 22, 2023. Weather conditions were overcast and included a low of 64º Fahrenheit (F) and high of 64ºF with wind speeds between 0-7 miles per hour. The survey was conducted within the project area and a surrounding 500-foot buffer, collectively referred to as the study area (Figure 2). The survey consisted of meandering transects throughout the study area to characterize and map plant communities and land use, and to determine the potential for special-status plants and wildlife to occur. All incidental, visual observations of flora and fauna, including sign (i.e., presence of scat) as well as any audible detections, were noted during the site visit and are discussed in the Existing Conditions section, below.

Natural communities and land use were characterized to map their extent and quantify their amounts within the study area using ArcGIS software. Plant taxonomy followed Hickman (1993), as updated in *The Jepson Manual: Vascular Plants of California, Second Edition* (Baldwin et al. 2012), and plant community descriptions were characterized using *A Manual of California Vegetation* (Sawyer et al. 2009). Plant communities, land uses, and habitats not identified within the manuals were characterized based on species dominance. Representative photographs were taken during the survey and are provided in **Attachment B, Representative Photographs**.

Regulatory Framework

Federal and State Endangered Species Acts

The Federal Endangered Species Act (FESA) provides guidance for conserving federally listed species and the ecosystems upon which they depend. Section 9 of the FESA and its implementing regulations prohibit the “take” of any federally-listed endangered or threatened plant or animal species, unless otherwise authorized by federal regulations. “Take” includes the destruction of a listed species’ habitat. Section 9 also prohibits several specified activities with respect to endangered and threatened plants.

The California Endangered Species Act (CESA) mandates that state agencies do not approve a project that would jeopardize the continued existence of species if reasonable and prudent alternatives are available that would avoid a jeopardy finding. CESA also prohibits the take of any fish, wildlife, or plant species listed as endangered or threatened, or designated as candidates for listing, under CESA. Similar to the FESA, CESA contains a procedure for the CDFW to issue an incidental take permit authorizing the take of listed and candidate species incidental to an otherwise lawful activity, subject to specified conditions.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) prohibits the take of native birds "by any means or manner to pursue, hunt, take, capture (or) kill" any migratory birds except as permitted by regulations issued by the USFWS. The term "take" is defined by USFWS regulation to mean to "pursue, hunt, shoot, wound, kill, trap, capture or collect" any migratory bird or any part, nest, or egg of any migratory bird covered by the conventions, or to attempt those activities.

Clean Water Act

In accordance with Section 404 of the Clean Water Act (CWA), the United States Army Corps of Engineers (USACE) regulates discharge of dredged or fill material into waters of the U.S. Waters of the U.S. and their lateral limits are defined in 33 CFR 328.3(a) and includes navigable waters of the U.S., interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Any activity resulting in the placement of "fill" material within waters of the U.S. requires a permit from USACE; "fill" is defined as any material that replaces any portion of a water of the U.S. with dry land or that changes the bottom elevation of any portion of a water of the U.S. In accordance with Section 401 of the CWA, projects that apply for a Section 404 permit for discharge of dredged or fill material must obtain water quality certification from the Regional Water Quality Control Board (RWQCB).

Porter-Cologne Water Quality Control Act

In the absence of waters of the U.S., waters may be regulated under the Porter-Cologne Water Quality Control Act if project activities, discharges, or proposed activities or discharges could affect California's surface, coastal, or ground waters. The permit submitted by the applicant and issued by RWQCB is a Waste Discharge Requirement (WDR) in the absence of waters of the U.S.

Native Plant Protection Act

The Native Plant Protection Act (NPPA) includes measures to preserve, protect, and enhance rare and endangered native plants. The list of native plants afforded protection pursuant to the NPPA includes those listed as rare and endangered under the CESA. The NPPA provides limitations on take as follows: "No person will import into this state, or take, possess, or sell within this state" any rare or endangered native plant, except in compliance with provisions of the act. Individual landowners are required to notify the CDFW at least 10 days in advance of changing land use to allow the CDFW to salvage any rare or endangered native plant material.

Section 15380 of the California Environmental Quality Act Guidelines

Although threatened and endangered species are protected by specific federal and state statutes, State CEQA Guidelines Section 15380(b) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in FESA and the section of the California Fish and Game Code (i.e., CESA) dealing with rare or endangered plants or animals. This section was included in CEQA primarily to deal with situations in which a public agency must review a project that may have a significant effect on, for example, a species that has not been formally listed by either USFWS or CDFW; CEQA provides such an agency with the ability to protect the non-listed species from the potential impacts of a project. CEQA also calls for the protection of other significant resources, such as certain natural communities, for example. Although these resources are not currently protected, CEQA calls for an assessment of whether they would be affected and requires findings of significance regarding potential losses.

Sections 3503 and 3513 of the California Fish and Game Code

Section 3503 of the Fish and Game Code (FGC) prohibits the killing of birds or the destruction of bird nests. Birds of prey are protected under Section 3503.5 of the FGC, which provides that it is “unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Section 3513 of the FGC prohibits any take or possession of birds that are designated by the MBTA as migratory nongame birds except as allowed by federal rules and regulations promulgated pursuant to the MBTA. Migratory birds include all native birds in the United States, except those non-migratory game species, such as quail and turkey, which are managed by individual states.

Section 1602 of the California Fish and Game Code

Section 1602 of the FGC requires submittal of a Notification of Lake or Streambed Alteration for any activity that may alter the bed and/or bank of a lake, stream, river, or channel. Typical activities that require a Streambed Alteration Agreement may include, but are not limited to, excavation or “fill” placed within a channel, vegetation clearing, installation of culverts and bridge supports, and bank reinforcement.

City of Highland Municipal Codes

Chapter 8.36 of the City of Highland Municipal Code prevents the removal, relocation, or destruction of any heritage tree within City of Highland’s city limits without a proper tree removal permit and associated environmental review (Chapter 8.36, Heritage Trees). Section 8.36.020 of the City of Highland Municipal Code defines heritage trees as any tree that meets the following criteria:

A. All woody plants in excess of 15 feet in height and having a single trunk circumference of 24 inches or more, as measured four and one-half feet above ground level; or

B. Multi-trunk tree(s) having a total circumference of 30 inches or more, measured four and one-half feet from ground level; or

C. A stand of trees, the nature of which makes each dependent upon the others for survival; or

D. Any other tree as may be deemed historically or culturally significant by the community development director or designees because of size, condition, location, or aesthetic qualities.

The definition of historic landmark includes any tree designated as an historic landmark by city council action. Trees which bear fruit or nuts (with the exemption of trees planted in a grove) and trees planted, grown, and/or held for sale by licensed nurseries and/or tree farms are exempt from the provisions of the City's code.

Tree removal is defined by the City's code as a an act which will cause a heritage tree to die, as determined by a tree expert, including, acts that inflict damage upon root systems, bark or other parts of tree by fire, application of toxic substances or operation of equipment or machinery, improper watering, changing the natural grade of the drip line area around the trunk, or attachment of signs or artificial material piercing the bark of the tree by means of nails, spikes, or other piercing objects. A Tree Removal Permit is required for the removal of all heritage trees within the city limits. A Landmark Alteration Permit is required, in addition to a Tree Removal Permit, for the removal of all trees designated as historic landmarks. The permit requirement may be waived in the case that the tree is determined to be a public health, safety, and welfare concern. Chapter 16.64.040 (Heritage Tree Preservation Requirements) further outlines the requirements of this provision, including the protection of existing trees. No trees are proposed to be removed or impacted during project activities.

Chapter 16.64.050 (Riparian Plant Conservation) establishes regulations to promote healthy and abundant riparian habitats within the City of Highland and works alongside existing regulations enforced by CDFW. This ordinance generally prohibits the removal of any riparian vegetation within 25 feet of the dripline of riparian vegetation adjacent to a "blueline stream" as indicated by the USGS Quadrangle (topographic map) or identified as a protected riparian area in a community or specific plan. The removal of any vegetation within 25 feet of the drip line of riparian vegetation along a blueline stream requires a tree removal permit and shall be subject to environmental review. The provisions of this section apply to both private and public lands within the City limits, with exceptions for emergency flood control operations and authorized water conservation measures established and authorized by an appropriate independent special district with such responsibility. No riparian vegetation is proposed to be removed during project activities.

Existing Conditions

Topography and Soils

Topography within the study area generally slopes in an east-west orientation, ranging between an elevation of 1,570 feet above mean sea level (amsl) and 1,500 feet amsl. A total of two soil types were mapped within the study area (see **Figure 3, Soils**), including Hanford coarse sandy loam, 2-9% slopes, and Soboba stony loamy sand, 2-9% slopes (NRCS 2023). A brief description of each soil type is provided below:

Hanford coarse sandy loam, 2-9% slopes

This soil type was mapped in the northern corner of the study area. It consists of well drained soils consisting of alluvium derived from granite. The depth to duripan is more than 80 inches, and the typical soil profile consists of sandy loam 0–12 inches and fine sandy loam 12–60 inches.

Soboba stony loamy sand, 2-9% slopes

This soil type was mapped in the majority of the study area. It consists of excessively drained soils consisting of alluvium derived from granite. The depth to duripan is more than 80 inches, and the typical soil profile consists of stony loamy sand 0–10 inches, very stony loamy sand 10–24 inches, and very stony sand 24–60 inches.

Natural Communities and Land Cover Types

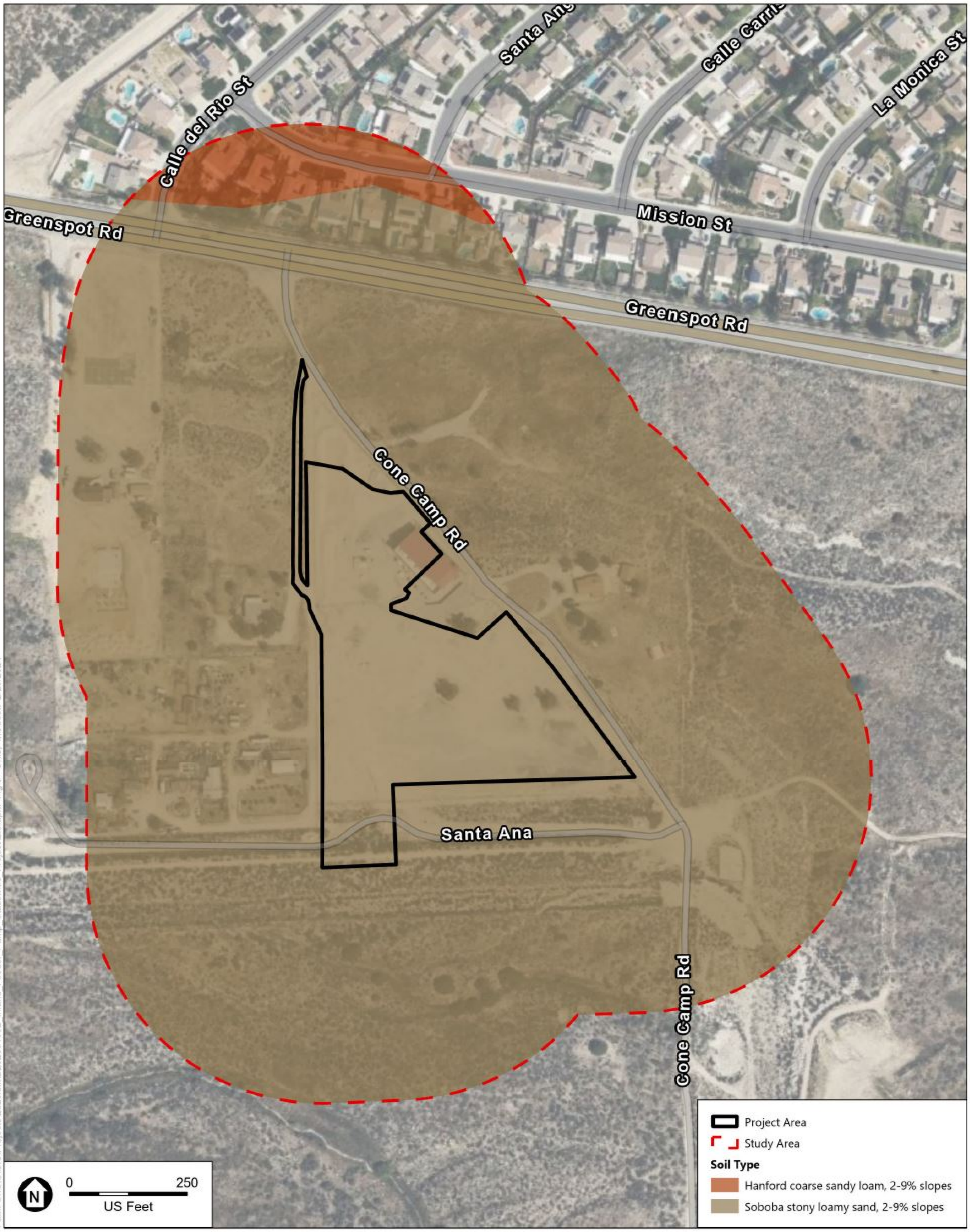
The natural communities and land cover types characterized and mapped within the study area are depicted in **Figure 4, Natural Communities and Land Cover Types,** and their respective acreages are provided in **Table 1, Natural Communities and Land Cover Types**. A complete list of plant species observed within the study area is provided in **Attachment C, Floral and Faunal Compendia**. Each natural community and land cover type is described in detail below.

Annual Grasses and Forbs

Annual grasses and forbs occur in two sections of the study area: the northeastern and western portions of the 500-ft buffer outside of the project area. This community is characterized by substantial disturbance including over excavation and grading and exists in a successional state due to regular mowing activities that stopped in 2014. It supports a dense herbaceous layer primarily comprised of non-native grasses and forbs such as wild oats (*Avena sp*.), ripgut brome (*Bromus diandrus*), and short-podded mustard (*Hirschfeldia incana*), interspersed with native shrub and forb species such as dove weed (*Croton setiger*) and slender buckwheat (*Eriogonum gracile* var. *gracile*).

Brittle Bush Scrub

Brittle bush scrub (*Encelia farinosa* shrubland alliance) was mapped within the eastern portion of the study area. This natural community is characterized by dense brittle bush (*Encelia farinosa*) with an understory of various grasses and forbs such as deerweed (*Acmispon glaber*), wild oats, brome (*Bromus* spp.), and short-podded mustard.

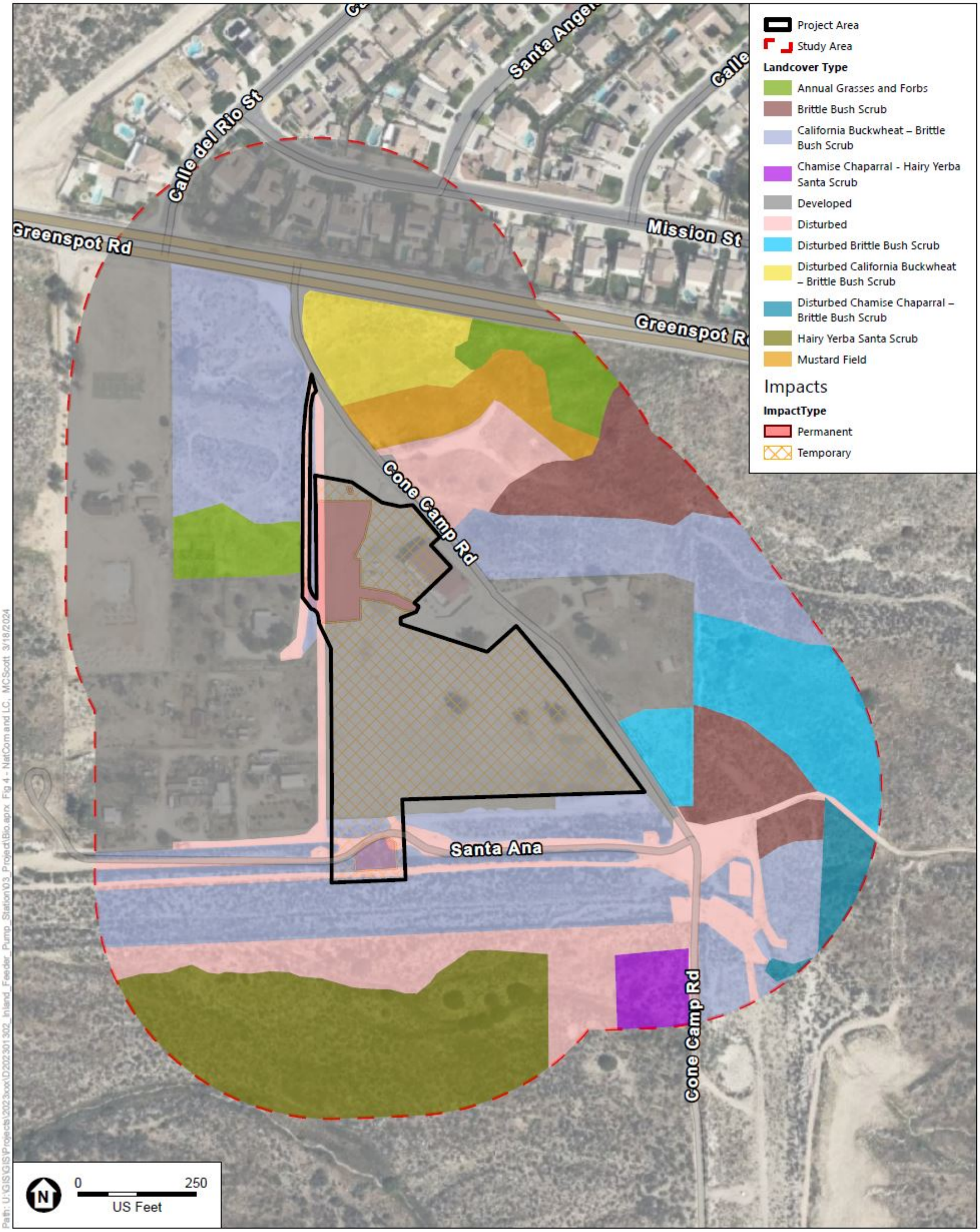


SOURCE: ESA, 2024; USGS Web Soil Survey, 2024

Inland Feeder - Foothill Pump Station Intertie Project

Figure 3
Soils

ESA



SOURCE: ESA, 2024

Inland Feeder - Foothill Pump Station Intertie Project

Figure 4
Natural Communities and
Land Cover Types

TABLE 1
NATURAL COMMUNITIES AND LAND COVER TYPES

Natural Community/Land Cover Type	Project Area (acres)	500-foot Buffer (acres)	Total Study Area (acres)
Terrestrial Natural Communities			
Annual Grasses and Forbs	--	1.66	1.66
Brittle Bush Scrub	--	2.79	2.79
Disturbed Brittle Bush Scrub	--	2.70	2.70
California Buckwheat – Brittle Bush Scrub	0.37	12.18	12.55
Disturbed California Buckwheat – Brittle Bush Scrub	--	1.40	1.40
Chamise Chaparral – Hairy Yerba Santa Scrub	--	0.57	0.57
Disturbed Chamise Chaparral – Brittle Bush Scrub	--	0.55	0.55
Hairy Yerba Santa Scrub	--	5.37	5.37
Mustard Fields	--	1.19	1.19
Developed/Disturbed Land Cover Types			
Developed	5.84	18.67	24.51
Disturbed	0.40	6.27	6.67
TOTAL	**6.61**	**53.35**	**59.96**

SOURCE: ESA 2024

Disturbed Brittle Bush Scrub

Disturbed brittle bush scrub was mapped within the eastern portion of the study area. This natural community is also characterized by brittle bush; however, it appeared as though a disturbance, such as a fire, has decreased the density of brittle bush individuals and increased the dominance of non-native grasses and forbs including wild oats and bromes.

California Buckwheat – Brittle Bush Scrub

California buckwheat – brittle bush scrub was mapped throughout much of the study area, including the southern portion of the project area and surrounding areas in the 500-ft buffer outside the facility. This natural community was co-dominated by California buckwheat (*Eriogonum fasciculatum*) and brittle bush shrubs. There is a sparse herbaceous layer with wild oat, bromes and filarees such as broad leaf filaree (*Erodium botrys*).

Disturbed California Buckwheat – Brittle Bush Scrub

Disturbed California buckwheat – brittle bush scrub was mapped in the northern portion of the study area. This natural community is also co-dominated by California buckwheat and brittle bush shrubs but appears disturbed (likely from historic grading due to its proximity to the road and active construction sites). This disturbance has increased the non-native herbaceous layer of wild oats and bromes relative to the shrub layer.

Chamise Chaparral – Hairy Yerba Santa Scrub

Chamise chaparral – hairy yerba santa scrub was mapped in the southern portion of the 500-ft buffer outside of the project area. This natural community has a shrub layer co-dominated by chamise (*Adenostoma fasciculatum*) and hairy yerba santa (*Eriodictyon trichocalyx*). These dense shrubs were accompanied by brittle bush, California buckwheat, and deerweed with a sparse grass layer of bromes and oats.

Disturbed Chamise Chaparral – Brittle Bush Scrub

Disturbed chamise chaparral – brittle bush scrub was mapped in the eastern corner of the 500-ft buffer outside of the project area. This natural community is co-dominated by chamise and brittle bush, but has a higher relative abundance of non-native herbaceous species such as bromes, oats, and filarees due to historic disturbance. This community appears to have been previously graded allowing non-natives to proliferate amongst existing shrubs.

Hairy Yerba Santa Scrub

Hairy yerba santa scrub was mapped in the southern portion of the 500-ft buffer outside of the project area. This natural community is dominated by hairy yerba santa with sparse brittle bush, California buckwheat, California cholla (*Cylindropuntia californica*), and sugar bush (*Rhus ovata*) throughout. There is a sparse herbaceous layer of bromes and wild oats.

Mustard Fields

Mustard fields were mapped in the northern section of the 500-ft buffer outside of the project area. This natural community is dominated by black mustard (*Brassica nigra*) with accompanying dove weed, filarees (*Erodium* sp.), and short-podded mustard. This community appeared to have historic disturbance, likely grading as it was present next to existing dirt roads and ornamentally planted vegetation.

Developed

Developed land cover types represent the heavily trafficked areas including the majority of the project area, paved portion of Cone Camp Road, and residential development to the north, east, and west of the project area. These areas are either entirely or largely devoid of vegetation except for weedy non-native growth (oats and bromes) and ornamentally planted trees such as tree of heaven (*Ailanthus altissima*), citrus trees (*Citrus* sp.), eucalyptus (*Eucalyptus* sp.), and Peruvian pepper tree (*Schinus molle*).

Disturbed

Disturbed land cover types represent dirt access roads that traverse the study area as well as areas that were recently graded due to active construction. These areas are largely devoid of vegetation except minimal shrubs (e.g. California buckwheat and brittle bush), ornamental trees (e.g. black poui [*Jacaranda mimosifolia*], Italian cypress [*Cupressus sempervirens*], and olive [*Olea europaea*]), and non-native herbaceous species (e.g. oats, bromes, filarees).

Sensitive Natural Communities

"Sensitive" natural communities and habitats are defined by CDFW as those natural communities that have a reduced range and/or are imperiled because of various forms of development and other anthropogenic stressors, including residential and commercial expansion, various forms of agriculture, energy production, mining, etc. These communities are evaluated using NatureServe's Heritage Methodology (NatureServe 2022), which is based on the knowledge of range and distribution of a specific vegetation type and the proportion of occurrences that are of good ecological integrity. Evaluation is done at both a global (natural range within and outside of California [G]) and subnational (State level for California [S]) level, each ranked from 1 ("critically imperiled" or very rare and threatened) to 5 (demonstrably secure). A community or habitat with a State rank of S1 through S3 are considered "sensitive" natural communities and may require review when evaluating environmental impacts (CDFW 2023a,b).

The study area is mapped by CNDDB as occurring within Riversidean alluvial fan sage scrub habitat with a State rank of S1.1. However, the Riversidean alluvial fan sage scrub habitat indicator species, scale broom (*Lepidospartum squamatum*), was not observed as a dominant species within any of the observed natural communities. Only one scale broom individual was observed within the study area. Therefore, no natural communities present within the study area meet the criteria for Riversidean alluvial fan sage scrub. In addition, based on review of CDFW's California Sensitive Natural Communities List, there are no sensitive natural communities within the study area (CDFW 2023b).

Special-Status Plants

Special-status plants are defined as those that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as imperiled in some way. Some of these species receive specific protection that is defined by federal or state endangered species legislation and others have been designated as special-status based on adopted policies (e.g., counties and cities) and/or the expertise of state resource agencies or non-profit organizations (e.g., CNPS). For purposes of this report, special-status plants are defined as follows:

- Plants that are listed or proposed for listing as threatened or endangered or are candidates for possible future listing as threatened or endangered, under the FESA or the CESA.

- Plants that meet the definitions of rare or endangered under State CEQA Guidelines Section 15380.
- Plants considered by the CNPS to be rare, threatened, or endangered (Rank 1A, 1B, 2A and 2B plants) in California.
- Plants considered by the CNPS to be plants about which more information is needed and plants of limited distribution (Rank 3 and 4 plants) that may be significant locally and are recommended for consideration under CEQA.
- Plants listed as rare under the California Native Plant Protection Act (Fish and Game Code 1900 et seq.).

A review of the CNDDB (CDFW 2023a) and the CNPS Inventory of Rare and Endangered Plants (CNPS 2023) revealed that many special-status plant species have been recorded within the USGS quadrangle search area (see **Attachment D, CNDDB and CNPS Results)**. The potential for special-status plant species to occur is based on existing vegetation and habitat quality, topography, elevation, soils, surrounding land uses, habitat preferences and geographic ranges. It was determined that many of the plant species generated in the database do not have the potential to occur within the study area due to the lack of suitable habitat. Such species are therefore omitted from further discussion in this report. Based on the criteria defined below, it is determined that suitable habitat for nine species occurs within or immediately adjacent to the project area (see **Table 2, Special-Status Species with Potential to Occur**).

Low Potential: Limited habitat exists for a particular species. For example, the appropriate vegetation assemblage may be present while the substrate preferred by the species may be absent, or the preferred habitat may be present, but has undergone substantial disturbance, such that the species is not expected to occur.

Moderate Potential: Marginal habitat for a particular species is present. For example, the available habitat may be somewhat disturbed, however, still supports important components, such as a particular soil or community type.

High Potential: The study area provides suitable habitat conditions for a particular species and/or known populations occur in the immediate vicinity.

Present: The species was observed during the biological resources assessment.

A total of five species, including Plummer's mariposa lily (*Calochortus plummerae*), Parry's spineflower (*Chorizanthe parryi var. parryi*), slender-horned spineflower (*Dodecahema leptoceras*), Santa Ana River woollystar (*Eriastrum densifolium ssp. sanctorum*), and Robinson's pepper-grass (*Lepidium virginicum var. robinsonii*) have a moderate to high potential to occur within the study area. Santa Ana River woollystar and slender-horned spineflower are federally and state endangered species with a high potential to occur within the study area. The remaining four species were determined to have a low potential to occur based on the lack of suitable habitat.

TABLE 2
SPECIAL-STATUS PLANT SPECIES WITH POTENTIAL TO OCCUR

Common Name Scientific Name	Sensitivity Status[1]	Flowering Period	Preferred Habitat/Known Elevation and Distribution[2]	Presence/Potential to Occur
Berberidaceae (Barberry Family)				
Nevin's barberry *Berberis nevinii*	Federal: FE State: SE Other: 1B.1	Mar.-Jun.	Sandy soils in low-gradient washes, alluvial terraces, and canyon bottoms, along gravelly wash margins, or on coarse soils on steep, generally north-facing slopes in alluvial scrub, cismontane (e.g., chamise) chaparral, coastal sage scrub, oak woodland, and/or riparian scrub or woodland. Elevation range extends from 70-825 meters. Found in Los Angeles, Riverside, San Bernardino, San Diego counties.	**Low Potential.** Suitable chaparral and coastal scrub habitat are present throughout the study area; however, the study area lacks the steep topography the species is commonly found in. The closest known occurrence is located over 5 miles away from the project area.
Brassicaceae (Cabbage Family)				
Robinson's pepper-grass *Lepidium virginicum* var. *robinsonii*	Federal: None State: None Other: 4.3	Jan.-Jul.	Chaparral and coastal scrub. Elevation range extends from 1-885 meters. Found in Los Angeles, Orange, Riverside, San Bernardino, San Diego, Ventura counties.	**Moderate Potential.** Suitable California buckwheat – brittle bush scrub habitat and sandy soils are present within the project area. However, it is more commonly observed in dry, exposed areas rather than under shrub canopy. Additionally, known occurrences of the species are present approximately one mile east of the project area.
Nyctaginaceae (Four O'clock Family)				
chaparral sand-verbena *Abronia villosa* var. *aurita*	Federal: None State: None Other: 1B.1	Jan.-Sep.	Chaparral, coastal scrub, and desert dunes/sandy areas. Elevation range extends from 0-1,600 meters. Found in Los Angeles, Riverside, San Diego, San Bernardino, possibly Orange counties.	**Low Potential.** Marginal suitable coastal scrub habitat is present adjacent to the project area within the study area and the study area lacks dune habitat. Additionally, known occurrences of the species are present within Riverside County approximately 15 miles south of the project area.

Common Name Scientific Name	Sensitivity Status[1]	Flowering Period	Preferred Habitat/Known Elevation and Distribution[2]	Presence/Potential to Occur
Polemoniaceae (Phlox Family)				
Santa Ana River woollystar *Eriastrum densifolium* ssp. *sanctorum*	Federal: FE State: SE Other: 1B.1	Apr.–Sep.	Chaparral, coastal scrub (alluvial fan)/sandy or gravelly. Elevation range extends from 91-610 meters. Found in Riverside, San Bernardino, possibly Orange counties.	**High Potential.** Suitable California buckwheat – brittle bush scrub habitat and sandy soils are present within the project area. Additionally, known occurrences of the species are present throughout the alluvial fan scrub associated with the Santa Ana River approximately 0.4 mile west and south of the project area.
Polygonaceae (Buckwheat Family)				
Parry's spineflower *Chorizanthe parryi* var. *parryi*	Federal: None State: None Other: 1B.1	Apr.–Jun.	Openings/clearings in coastal or desert sage scrub, chaparral or interface; dry slopes or flat ground; sandy soils. Elevation range extends from 275–1,220 meters. Found in Los Angeles, Riverside, San Bernardino counties.	**High Potential.** Suitable California buckwheat – brittle bush scrub habitat and sandy soils are present within the project area. Additionally, one known occurrence of the species is present within the southern portion of the study area.
white-bracted spineflower *Chorizanthe xanti* var. *leucotheca*	Federal: None State: None Other: 1B.2	Apr.-Jun.	Sandy or gravelly soils in coastal scrub (alluvial fans); Mojavean desert scrub; Pinyon and juniper woodland. Elevation range extends from 300-1,200 meters. Found in Los Angeles, Riverside, San Bernardino, San Diego counties.	**Low Potential.** Marginal suitable coastal scrub habitat is present immediately adjacent to the project area within the study area. Additionally, one known occurrence of the species is present along Mill Creek approximately 4.6 miles southeast of the study area.
slender-horned spineflower *Dodecahema leptoceras*	Federal: FE State: SE Other: 1B.1	Apr.–Jun.	Scrub and chaparral in sandy soils and alluvial fans. Elevation range extends from 200-760 meters. Found in Los Angeles, Riverside, San Bernardino counties.	**High Potential.** Suitable California buckwheat – brittle bush scrub habitat and sandy soils are present within the project area. Additionally, known occurrences of the species are present throughout the alluvial fan scrub associated with the Santa Ana River approximately 0.7 mile south of the project area.
Liliaceae (Lily Family)				
Plummer's mariposa lily *Calochortus plummerae*	Federal: None State: None Other: 4.2	May-Jul.	Chaparral (openings), cismontane woodland, coastal scrub, valley and foothill grassland, granitic/rocky. Elevation range extends from 100-1,700 meters. Found in Los Angeles, Orange, Riverside, San Bernardino, Ventura counties.	**High Potential.** Suitable California buckwheat – brittle bush scrub habitat and granitic/rocky soils are present within the project area. Additionally, known occurrences of the species are present within the southern portion of the study area.

Common Name Scientific Name	Sensitivity Status[1]	Flowering Period	Preferred Habitat/Known Elevation and Distribution[2]	Presence/Potential to Occur
Poaceae (True Grass Family)				
California satintail *Imperata brevifolia*	Federal: None State: None Other: 2B.1	Sep.–May	Chaparral, coastal sage scrub, Mojavean desert scrub, meadows and seeps (often alkali), riparian scrub/mesic. Elevation range extends from 0–1,215 meters. Found in Kern, Los Angele, Riverside, San Bernardino, Ventura, Orange counties.	**Low Potential.** Marginal suitable coastal scrub habitat is present immediately adjacent to the project area within the study area. Additionally, one known occurrence of this species is present within the City of Redlands approximately 1.6 miles south of the study area.

NOTES:

1. Sensitivity Status

Federal/State/Local Status: FE = Federally Endangered; SE = State Endangered; ST = State Threatened; California Rare Plant Rank (CRPR) 1B = rare, threatened, or endangered in California and elsewhere; CRPR 2B = rare, threatened, or endangered in California but common elsewhere; CRPR 4 = plants of limited distribution. Rank 3 and 4 plants listed by the CNPS and CDFW as plants in which more information is needed to determine their status and plants of limited distribution that are not significant locally are excluded from this analysis.

2. Sources for Preferred Habitat: Calflora 2024; CDFW 2023a.

SOURCE: ESA 2024

Special-Status Wildlife

Special-status wildlife are defined as those that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as imperiled in some way. Some of these species receive specific protection that is defined by federal or state endangered species legislation and others have been designated as special-status based on adopted policies (e.g., counties and cities) and/or the expertise of state resource agencies or non-profit organizations (e.g., Western Bat Working Group). Special-status wildlife are defined as follows:

- Wildlife listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the FESA or the CESA.
- Wildlife that meet the definitions of rare or endangered under California Environmental Quality Act (CEQA) Guidelines Section 15380.
- Wildlife designated by CDFW as species of special concern, CDFW Watch List species, or have a state rank of S1-S3 on CDFW's Special Animals List (CNDDB 2024).
- Wildlife "fully protected" in California (FGC Sections 3511, 4700, and 5050).
- Bird species protected by the MBTA.
- Bat species considered priority by the Western Bat Working Group (WBWG).

The potential for special-status wildlife species to occur within the study area was assessed according to on-site vegetation and habitat quality, topography, elevation, soils, surrounding land uses, habitat preferences and geographic ranges. A review of the CNDDB (CDFW 2023a) revealed that many special-status wildlife species have been recorded within the USGS quadrangle search area (see Attachment D) containing the study area; however, based on habitat preference, geographic distributions, and/or range restrictions, it was determined that a number of the species do not have the potential to occur due to the lack of suitable habitat, and are therefore omitted from further discussion in this report. Based on the criteria defined below, it is determined that 30 species have a low to high potential to occur within the study area or were observed during the biological assessment or previous studies (see **Table 3, Special-Status Wildlife Species with Potential to Occur**).

Low Potential: The study area supports limited habitat for a particular species. For example, the appropriate vegetation assemblage may be present while the substrate preferred by the species may be absent.

Moderate Potential: Marginal habitat for a particular species may exist. For example, the habitat may be heavily disturbed and/or may not support all stages of a species' life cycle; or may not fit all preferred habitat characteristics.

High Potential: The study area provides suitable habitat conditions for a particular species and/or known populations occur in the immediate vicinity.

Present: The species was observed within the study area during the site assessment.

Two listed species were present during the site assessment or previous studies conducted within the study area: coastal California gnatcatcher (*Polioptila californica californica*; federally threatened and state species of special concern) and SBKR (federally endangered, state endangered, and state species of special concern). Two non-listed special-status wildlife species were present during the site assessment or previous studies conducted within the study area: coastal western whiptail (*Aspidoscelis tigris* ssp. *stejnegeri*) and northwestern San Diego pocket mouse (*Chaetodipus fallax* ssp. *fallax*). The two listed species identified within the study area are depicted in **Figure 5, Sensitive Biological Resources**.

Based on the condition of the vegetation and habitats that were characterized during the site visit, it was determined that 14 non-listed special-status wildlife species, of the 30 species identified by CNDDB, were determined to have a moderate to high potential to occur, including southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), southern California legless lizard (*Anniella stebbinsi*), California glossy snake (*Arizona elegans occidentalis*), Bell's sparrow (*Artemisiospiza belli belli*), Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), burrowing owl (*Athene cunicularia*), red-diamond rattlesnake (*Crotalus ruber*), California horned lark (*Eremophila alpestris* ssp. *actia*), loggerhead shrike (*Lanius ludovicianus*), San Diego black-tailed jackrabbit (*Lepus californicus* ssp. *bennettii*), San Diego desert woodrat (*Neotoma lepida* ssp. *intermedia*), southern grasshopper mouse (*Onychomys torridus ramona*), Los Angeles pocket mouse (*Perognathus longimembris* ssp. *brevinasus*), and coast horned lizard (*Phrynosoma blainvillii*). Additional species determined to have a moderate potential to occur include: Crotch bumble bee (*Bombus crotchii*; state candidate endangered) and western spadefoot (*Spea hammondii*; federal candidate as threatened). Wildlife species determined to have a low potential to occur in the study area are not further evaluated in this report beyond Table 3.

TABLE 3
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR

Common Name Scientific Name	Status[1] (Federal/State/ Other)	Preferred Habitat[2]	Presence/Potential to Occur within the Study Area
Amphibians			
western spadefoot *Spea hammondii*	Federal: FCT State: SSC Other: S3S4	Mixed woodland, grasslands, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Prefers washes and other sandy areas with patches of brush and rocks. Rain pools or shallow temporary pools, which do not contain bullfrogs, fish, or crayfish are necessary for breeding. Perennial plants necessary for its major food-termites.	**Moderate Potential.** Suitable upland habitat, such as grasslands and chaparral, is present throughout the study area. The study area contains constructed basins with seasonal ponding. Additionally, multiple constructed basins are present adjacent to the east of the study area. This species has been previously observed within one mile to the east of the project area.
Birds			
Cooper's hawk *Accipiter cooperii*	Federal: None State: WL Other: S4	Inhabits cismontane woodland, riparian forest, riparian woodland, upper montane coniferous forest, or other forest habitats near water. Nests and forages near open water or in riparian vegetation.	**Low Potential (Foraging).** The study area contains limited woodland areas to support nesting and roosting, but this species may use the area for foraging. This species has been previously observed within San Timoteo Wash approximately 6.8 miles south of the project area.
southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	Federal: None State: WL Other: S4	Known to frequent relatively steep, often rocky hillsides with grass and forb species. Resident in southern California coastal sage scrub and mixed chaparral habitats.	**Moderate Potential.** Suitable habitat is present throughout the annual grasses and forbs and coastal sage scrub habitats; however, no sloped, rocky habitat is present within the study area. The nearest known occurrence is located in the San Bernardino Mountains and Yucaipa approximately 5.5 miles north and south of the project area, respectively.
golden eagle *Aquila chrysaetos*	Federal: BGEPA State: FP, WL Other: S3	Known to live in open and semi-open country featuring native vegetation across most of the Northern Hemisphere. They avoid developed areas and uninterrupted stretches of forest. They are found primarily in mountains up to 12,000 feet, Canyonlands, rimrock terrain, and riverside cliffs and bluffs. Nest on cliffs and steep escarpments in grassland, chaparral, shrubland, forest, and other vegetated areas. Forages for mammalian prey in grasslands, coastal sage scrub, chaparral, oak savannahs, open coniferous forest, and over open areas	**Low Potential (Foraging).** Suitable foraging habitat is present in the coastal sage scrub and open areas within the study area. However, the study area lacks steep cliffs suitable for nesting. This species has been previously observed within San Timoteo Canyon approximately 9.2 miles southeast of the project area.

Common Name Scientific Name	Status[1] (Federal/State/ Other)	Preferred Habitat[2]	Presence/Potential to Occur within the Study Area
Bell's sparrow *Artemisiospiza belli belli*	Federal: None State: WL Other: S3	Inhabits large, unfragmented blocks of coastal sage scrub, southern mixed chaparral habitats.	**Moderate Potential.** Suitable large, unfragmented blocks of coastal scrub and chaparral vegetation are present within the study area; however, this species was previously observed 10.3 miles southwest of the project area within Moreno Valley.
burrowing owl *Athene cunicularia*	Federal: BCC State: SSC Other: S2	Various open habitat types including grasslands and low scrub communities and is known to utilize heavily disturbed areas for roosting and nesting purposes.	**Moderate Potential**. Suitable foraging and nesting habitat is present throughout the annual grasses and forbs and scrub habitats within the study area. Limited suitable burrows were observed within the study area outside of the project site. This species has been previously observed within San Bernardino International Airport approximately 4.1 miles west of the project area.
white-tailed kite *Elanus leucurus*	Federal: None State: FP Other: S3S4	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	**Low Potential (Foraging).** There is suitable foraging habitat throughout the coastal scrub habitat within the study area. However, this species is unlikely to nest within the study area due to lack of marsh and woodland habitats.
California horned lark *Eremophila alpestris actia*	Federal: None State: WL Other: S4	Found from grasslands along the coast and deserts near sea level to alpine dwarf-shrub habitat above the treeline. During the winter, this species typically flocks in desert lowlands.	**Moderate Potential.** Marginal suitable grassland habitat is present within the study area. This species has been previously observed within an industrial part of the city of Redlands approximately 5.8 miles southwest of the project area.
merlin *Falco columbarius*	Federal: None State: WL Other: S3S4	Occupies seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, farms, and ranches. Clumps of trees or windbreaks are required for roosting in open country.	**Low Potential (Foraging).** Suitable open grasslands surrounding residential areas may support foraging within the study area. However, the site lacks clumps of trees that are suitable for roosting.
loggerhead shrike *Lanius ludovicianus*	Federal: None State: SSC Other: S4	Found in broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub and washes. Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	**High Potential.** Suitable open scrub habitat for foraging with dense shrubs and bushes required for nesting is present within the study area. This species has been previously observed within San Timoteo Canyon approximately 9.2 miles southeast of the project area.

Common Name Scientific Name	Status[1] (Federal/State/ Other)	Preferred Habitat[2]	Presence/Potential to Occur within the Study Area
coastal California gnatcatcher *Polioptila californica californica*	Federal: FT State: SSC Other: S2	Species is an obligate, permanent resident of coastal sage scrub habitats dominated by California sagebrush and flat-topped buckwheat, mainly on cismontane slopes below 1,500 feet in elevation. Low coastal sage scrub in arid washes, on mesas and slopes.	**Present.** Suitable coastal sage scrub habitat with California buckwheat is present within and surrounding the project area. An individual was visually and audibly identified within the study area during the biological field reconnaissance, approximately 0.2 miles south of the project area.
Mammals			
pallid bat Antrozous pallidus	Federal: None State: SSC Other: S3	Occurs in a wide variety of habitats including chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran Desert scrub, upper montane coniferous forest, valley and foothill grasslands. Most common in open, dry habitats with rocky areas for roosting. For roosting, prefers rocky outcrops, cliffs and crevices with access to open habitats for foraging. Roosts must protect species from high temperatures. Very sensitive to disturbance of roosting sites.	**Low Potential (Foraging).** Marginal foraging habitat is present within the coastal sage scrub communities present within the study area; however, rocky areas and/or various infrastructure necessary for roosting is not available.
northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	Federal: None State: None Other: S3S4	Moderate canopy coverage of coastal scrub, sagebrush, chaparral, grasslands, pinyon-juniper, and desert wash and scrub. Found in sandy, herbaceous areas with nearby shrubs for cover. Burrows are typically dug within gravelly or sandy soil.	**Present.** Suitable habitat is present throughout the scrub habitat with herbaceous areas and accompanying shrubs. This species was present during small-mammal trapping in 2022 (ECORP 2022).
San Bernadino kangaroo rat *Dipodomys merriami parvus*	Federal: FE State: SSC, SE Other: S1	Inhabits coastal sage scrub vegetation in alluvial fans and floodplains.	**Present.** Suitable habitat is present throughout the coastal scrub with burrow surveys and nighttime activity surveys suggesting presence of species (ESA 2023). Additionally, this species was present during small-mammal trapping in 2022 (ECORP 2022).
Stephen's kangaroo rat *Dipodomys stephensi*	Federal: FT State: ST Other: S3	Inhabits annual and perennial grassland habitats, but may occur in coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas. Known to occur in sparse perennial vegetation with firm soil, "neither hard nor sandy."	**Low Potential.** Suitable habitat is present throughout the annual grasses and forbs and coastal scrub habitats within the study area; however, appropriate soils are not present. Additionally, the species is considered extirpated in Redlands quad.
western mastiff bat *Eumops perotis californicus*	Federal: None State: SSC Other: S3S4	Known to occur in habitat consisting of extensive open areas within dry desert washes, flood plains, chaparral, cismontane oak woodland, coastal scrub, open ponderosa pine forest, and grasslands. Roosts primarily in crevices in rock outcrops and buildings.	**Low Potential (Foraging).** This species may forage throughout the study area; however, rock outcrops are not available for roosting and limited infrastructure is available within and surrounding the project area.

Common Name Scientific Name	Status[1] (Federal/State/ Other)	Preferred Habitat[2]	Presence/Potential to Occur within the Study Area
western yellow bat *Lasiurus xanthinus*	Federal: None State: SSC Other: S3	Known only in Los Angeles and San Bernardino Counties south to the Mexican border. This species has been recorded below 600 m (2000 ft) in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts primarily in trees, including under palm trees, and forages for insects over water and among trees.	**Low Potential (Foraging).** This species may forage throughout the study area; however, limited trees are available for roosting within and surrounding the project area.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	Federal: None State: None Other: S3S4	Inhabits open grasslands, agricultural fields, and sparse coastal scrub where they occur primarily in arid regions with short grass.	**High Potential.** This species has a high likelihood of occurring within the study area due to suitable coastal scrub habitat with short grasses present.
San Diego desert woodrat *Neotoma lepida intermedia*	Federal: None State: SSC Other: S3S4	Found in a variety of coastal scrub, desert scrub, chaparral, cactus, and rocky habitats. Nests primarily against rock outcroppings, boulders, cacti, or areas of dense undergrowth.	**High Potential.** Suitable coastal scrub and chaparral habitat is available within the study area; rock outcrops from berm construction are present for nest building. This species has been observed approximately 1.16 miles east of the project area.
pocketed free-tailed bat *Nyctinomops femorosaccus*	Federal: None State: SSC Other S3	Inhabits pinyon-juniper woodlands, riparian scrub, Sonoran desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree woodland, and palm oasis. Typically roosts in caves and rocky outcrops; prefers cliffs in order to obtain flight speed. Feeds on insects flying over bodies of water or arid desert habitats to capture prey.	**Low Potential (Foraging).** This species may forage throughout the Santa Ana River floodplain, but the study area lacks suitable caves and rocky outcrops for roosting.
southern grasshopper mouse *Onychomys torridus ramona*	Federal: None State: SSC Other: S3	Alkali desert scrub and desert scrub habitats are preferred, with somewhat lower densities expected in other desert habitats, including succulent shrub, wash, and riparian areas. Also occurs in coastal scrub, mixed chaparral, sagebrush, low sage, and bitterbrush habitats. Uncommon in valley foothill and montane riparian, and in a variety of other habitats.	**High Potential.** Suitable coastal scrub and chaparral habitat is present throughout much of the study area. This species has been observed within Loma Linda approximately 8.8 miles southwest of the project area.
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	Federal: None State: SSC Other: S1S2	Found in lower elevation grasslands and coastal sage scrub communities.	**High Potential.** Suitable habitat is present throughout the annual grasses and forbs and coastal scrub habitats within the study area. Additionally, suitable burrows were observed within the western portion of the project area. This species has been observed within the Santa Ana River floodplain approximately 3.9 miles west of the project area.

Common Name Scientific Name	Status[1] (Federal/State/ Other)	Preferred Habitat[2]	Presence/Potential to Occur within the Study Area
American badger *Taxidea taxus*	Federal: None State: SSC Other: S3	Found in a variety of habitats, including alkali marsh, desert wash, Great Basin scrub, marsh and swamp, meadow and seep, Mojavean desert scrub, riparian scrub, riparian woodland, valley and foothill grassland. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground to dig burrows. Preys on burrowing rodents.	**Low Potential.** Suitable habitat and evidence of an available prey base (i.e., gophers, ground squirrels, kangaroo rats, and deer mice) are present throughout the annual grasses and forbs; however, no suitable burrows (i.e., appropriately-sized) were observed.
Reptiles			
southern California legless lizard *Anniella stebbinsi*	Federal: None State: SSC Other: S3	Occurs in moist warm loose soil with plant cover. Moisture is essential. Occurs in sparsely vegetated areas of beach/coastal dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas and dunes stabilized with bush lupine and mock heather often indicate suitable habitat. Often can be found under surface objects such as rocks, boards, driftwood, and logs. Can also be found by gently raking leaf litter under bushes and trees. Sometimes found in suburban gardens in Southern California.	**High Potential.** Suitable habitat for this species is present throughout the sparsely vegetated chaparral habitat present within the study area. The species was observed along adjacent to the south of Greenspot Road approximately 0.7 mile east and 1.7 miles west of the project area.
California glossy snake *Arizona elegans occidentalis*	Federal: None State: SSC Other: S2	Inhabits arid scrub, rocky washes, and grasslands, and chaparral habitats. Appears to prefer microhabitats of open areas with friable soils for burrowing.	**High Potential.** Appropriate vegetation is present throughout the annual grasses and forbs, scrub, and chaparral habitats. Multiple known occurrences of this species are present within one mile east and west of the project area.
Belding's orange-throated whiptail *Aspidoscelis hyperythra beldingi*	Federal: None State: WL Other: S2S3	Species requires intact habitat within chaparral, cismontane woodland, and coastal scrub plant communities. Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food-termites.	**Moderate Potential.** Appropriate vegetation is available throughout the chaparral and coastal scrub habitats that contain sandy areas with brush and rocks. This species has been observed within the city of Mentone approximately 3.6 miles southeast of the project area.
coastal western whiptail *Aspidoscelis tigris* ssp. *stejnegeri*	Federal: None State: SSC Other: S3	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland and riparian areas. Ground may be firm soil, sandy, or rocky.	**Present.** Suitable habitat is present within the open area throughout the study area. Additionally, this species was observed during nighttime small mammal activity surveys (ESA 2023).

Common Name Scientific Name	Status[1] (Federal/State/ Other)	Preferred Habitat[2]	Presence/Potential to Occur within the Study Area
red-diamond rattlesnake *Crotalus ruber*	Federal: None State: SSC Other: S3	Known to occur in chaparral, Mojavean desert scrub, and Sonoran Desert scrub communities. Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks, or surface cover objects.	**High Potential.** Appropriate vegetation is present within the chaparral habitat. There are ample rocky areas with dense vegetation and presence of prey species. This species has been observed 0.3-mile northwest of the project area along Greenspot Road.
coast horned lizard *Phrynosoma blainvillii*	Federal: None State: SSC Other: S4	Prefers sandy riparian and sage scrub habitats but also occurs in valley-foothill hardwood, conifer, pine-cypress, juniper and annual grassland habitats below 6,000 feet, open country, especially sandy areas, washes, flood plains, and windblown deposits. Requires open areas for sunning, bushes and loose soil for cover and abundant supply of harvester ants.	**High Potential.** Suitable scrub and annual grass/forb habitat with sandy deposits is present within the project area. This species has been observed 1.3 miles east of the project area.
Invertebrates			
Crotch bumble bee *Bombus crotchii*	Federal: None State: SCE Other: S2	Open grassland and scrub habitats that support potential nectar sources such as plants within the Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Boraginaceae families.	**Moderate Potential.** The annual grasses and forbs and coastal scrub habitats support potential nectar sources for the species, especially plants within the Asteraceae and Boraginaceae families. This species has been observed within Loma Linda approximately 6.9 miles southwest of the project area.

NOTES:

1. Sensitivity Status

Federal/State/Local Status: FE = Federally Endangered; FT = Federally Threatened; FCT = Federal Candidate as Threatened; BCC = Federal Bird of Conservation Concern; SCE = State Candidate as Endangered; SE = State Endangered; ST = State Threatened; SSC = State Species of Special Concern; FP = Fully Protected; WL = State Watch List

The California Natural Diversity Database (CNDDB) uses the same ranking methodology originally developed by The Nature Conservancy and now maintained and recently revised by NatureServe. The state rank (S-rank) refers to the imperilment status only within California's state boundaries. It is a reflection of the overall status of an element through its state range. The state rank represents a letter + number score that reflects a combination of Rarity, Threat, and Trend factors, with weighting being heavier on Rarity than the other two.

S1 = Critically Imperiled – At very high risk of extirpation in the state due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

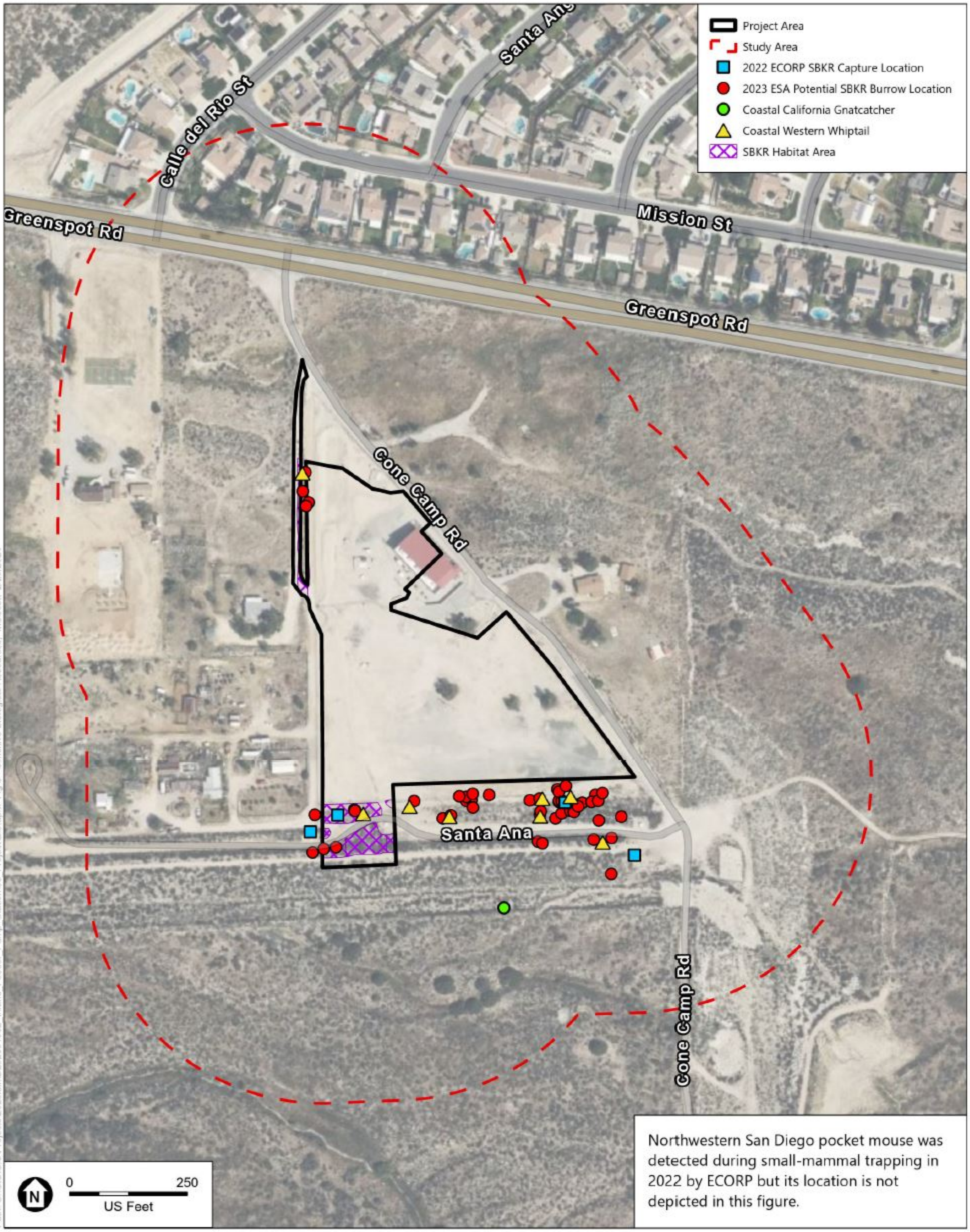
S2 = Imperiled – At high risk of extirpation in the state due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3 = Vulnerable – At moderate risk of extirpation in the state due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

S4 = Apparently Secure – At a fairly low risk of extirpation in the state due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

2. Sources for Preferred Habitat: CDFW 2023a; Cornell Lab of Ornithology 2024.

SOURCE: ESA 2024



SOURCE: ESA, 2023b; ECORP, 2022

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Figure 5
Sensitive Biological Resources

ESA

Critical Habitat

Under the FESA, to the extent feasible, the USFWS and National Marine Fisheries Service (NMFS) are required to designate critical habitat for endangered and threatened species. Critical habitat is defined as areas of land, water, and air space containing the physical and biological features essential for the survival and recovery of endangered and threatened species. Designated critical habitat includes sites for breeding and rearing, movement or migration, feeding, roosting, cover, and shelter that are essential to the survival and recovery of the species, whether the habitat is currently occupied by the species or not. Designated critical habitats require special management and protection of existing resources, including water quality and quantity, host animals and plants, food availability, pollinators, sunlight, and specific soil types.

The entire project area and the majority of the study area aside from the residential development to the north is located within designated Critical Habitat Unit 1 (Santa Ana River Wash) for San Bernardino kangaroo rat (USFWS 2023a, 2008). Critical habitat designations are identified based on habitat areas that provide essential life cycle needs of the species (i.e., areas on which the primary constituent elements or PCEs are found) that include, but are not limited to: (1) space for individual and population growth and behavior; (2) essential resources such as food, water, air, light, minerals, or other nutrition or physiological requirements; (3) cover or shelter; (4) breeding and rearing sites; (5) representative habitats that are protected and represent the historical, geographical, and ecological range of the subspecies.

Specific PCEs required for SBKR include: alluvial fans, washes, and floodplains with suitable soils (i.e., sand, loamy sand, sandy loam, and loam) and burrows for cover and shelter; upland areas adjacent to alluvial fans, washes, and associated floodplain areas that support alluvial sage scrub and/or associated vegetation (i.e., coastal sage scrub and chamise chaparral) with up to approximately 50% canopy cover for protection from predators; and upland areas adjacent to alluvial fans, washes, and associated floodplain areas that include marginal habitat (e.g., alluvial sage scrub with greater than 50% canopy cover) with patches of suitable soils. The brittle bush scrub, disturbed brittle bush scrub, California buckwheat – brittle bush scrub, disturbed California buckwheat – brittle bush scrub, chamise chaparral – hairy yerba santa scrub, and disturbed chamise chaparral – hairy yerba santa scrub habitats within the project area and remainder of the study area provide suitable habitat for SBKR.

Wildlife Movement

Migration corridors are navigable pockets or strips of land that connect larger tracts of open space together, allowing them to function as a greater habitat complex. These “passages” can exist on a small scale, allowing wildlife to pass through or under an otherwise uninhabitable area including a roadway, housing development, or city through drainage culverts, green belts and waterways; or on a larger scale, providing an opportunity for wildlife to skirt large topographical features (e.g., mountains, lakes, streams) by utilizing adjacent canyons, valleys and upland swaths when migrating.

Chain-link fencing is present along the perimeter of the majority of the developed portion of the project area which blocks access to the project area. Rural residential development also surrounds the project area to the north, east, and west, likely deterring wildlife movement. The land surrounding the project area to the south is undeveloped land that wildlife likely utilizes to forage and breed, and to some extent, travel locally and regionally. Numerous species of birds, reptiles, invertebrates, and small mammals would be expected in the study area, as well as larger mammals such as the coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*) and grey fox (*Urocyon cinereoargenteus*), who likely utilize the area for hunting and movement. While the project area provides some refuge for wildlife, it does not provide linkages to other habitats and is not expected to function as an important migration corridor. The project area and study area do not overlap with designated or recognized wildlife corridors.

Aquatic Resources

A formal aquatic resources delineation was not conducted as part of the biological field reconnaissance. However, five aquatic resource features (Features 1-5) were identified within the study area (**Figure 6, Aquatic Resources**). One constructed basin with associated drainage is located in the project area, while three ephemeral drainages and one constructed drainage are located outside the project area, within the surrounding study area.

Feature 1: Constructed Basin

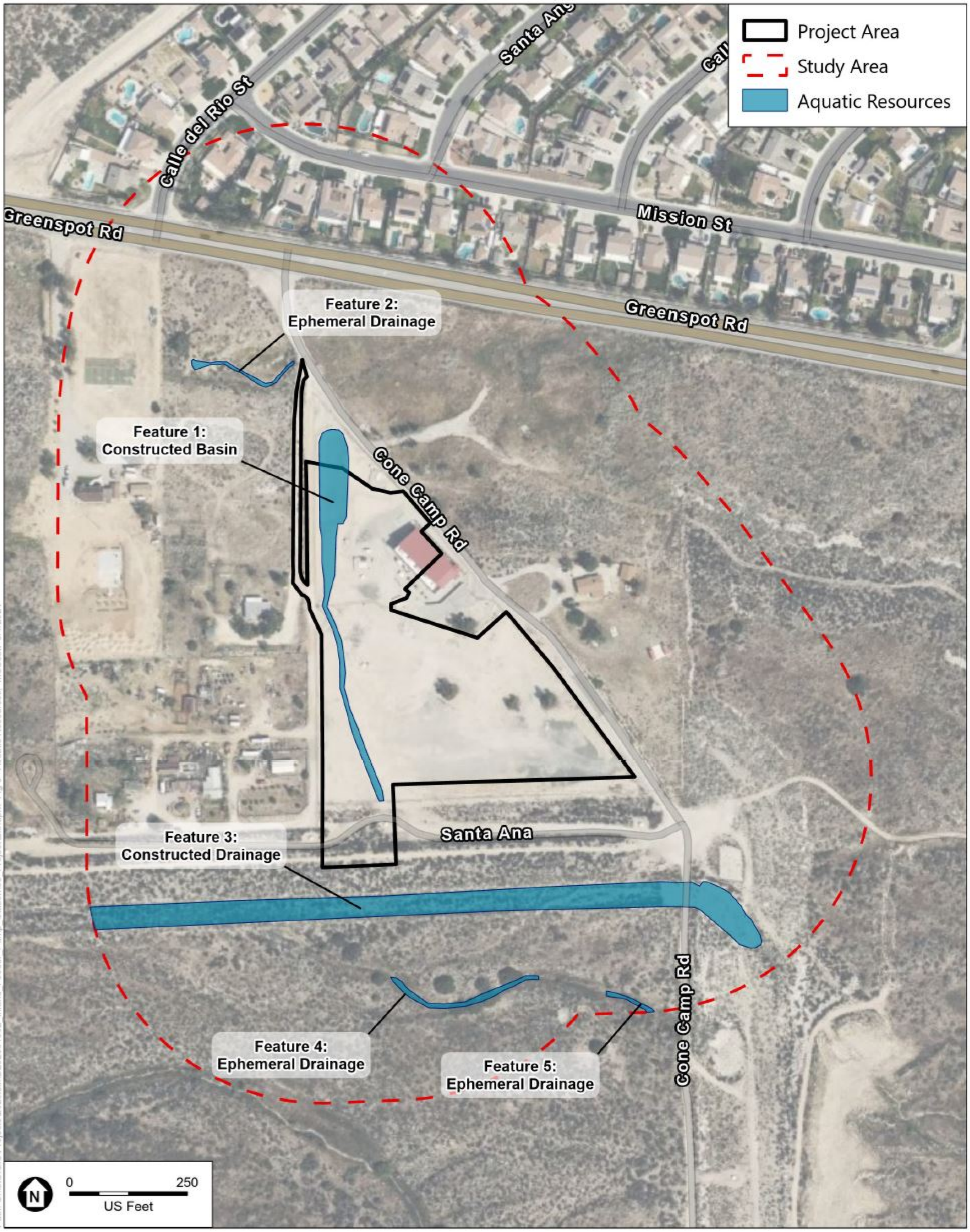
Feature 1 is a constructed basin located within the northwestern extent of the project area. This feature is unvegetated and created within an upland area. An existing access road crosses Metropolitan's fee parcel from a gate on the southern fence line to a gate along the western fence line. This road, which crosses the parcel from south to north, appears to capture surface water runoff flowing from the existing access road and likely functions as an unintended stormwater pathway due to its regular use. As a result, concentrated stormwater flows along the road ultimately drain northward into the constructed basin located on the northwestern extent of the project area.

Feature 2: Ephemeral Drainage

Feature 2 is an ephemeral drainage located within the northern portion of the study area just west of the northernmost corner of the project area, and is dominated by upland vegetation (California buckwheat – brittle bush scrub). This drainage receives and captures surface water runoff from the surrounding landscape, including Cone Camp Road, and flows to the west for approximately 245 feet before dissipating into the ground. The existing topography, specifically the higher elevation of the adjoining property, acts as a natural barrier preventing the flow from continuing or connecting with any other aquatic features downstream.

Feature 3: Constructed Drainage

Feature 3 is a constructed drainage within the southern portion of the study area, outside of the project area, north of Features 4 and 5. It is dominated by upland vegetation, including California buckwheat – brittle bush scrub, in addition to one individual sandbar willow (*Salix exigua*) and sparse mulefat (*Baccharis salicifolia*) within the



SOURCE: ESA, 2024

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Figure 6
Aquatic Resources

ESA

eastern portion of the drainage. This drainage appears to have been constructed in an upland area and receives flows through a culvert located at the easternmost end of the feature. During high flows, water travels east to west through the constructed drainage, and converging with Plunge Creek, which ultimately connects to the Santa Ana River further west and outside of the study area.

Feature 4: Ephemeral Drainage

Feature 4 is an ephemeral drainage located within the southern portion of the study area and outside of the project area. This ephemeral drainage is comprised of upland vegetation, specifically chamise chaparral-hairy yerba santa scrub. Feature 4 dissipates into the ground at its western extent and does not appear to connect with any other aquatic features at its downstream extent.

Feature 5: Ephemeral Drainage

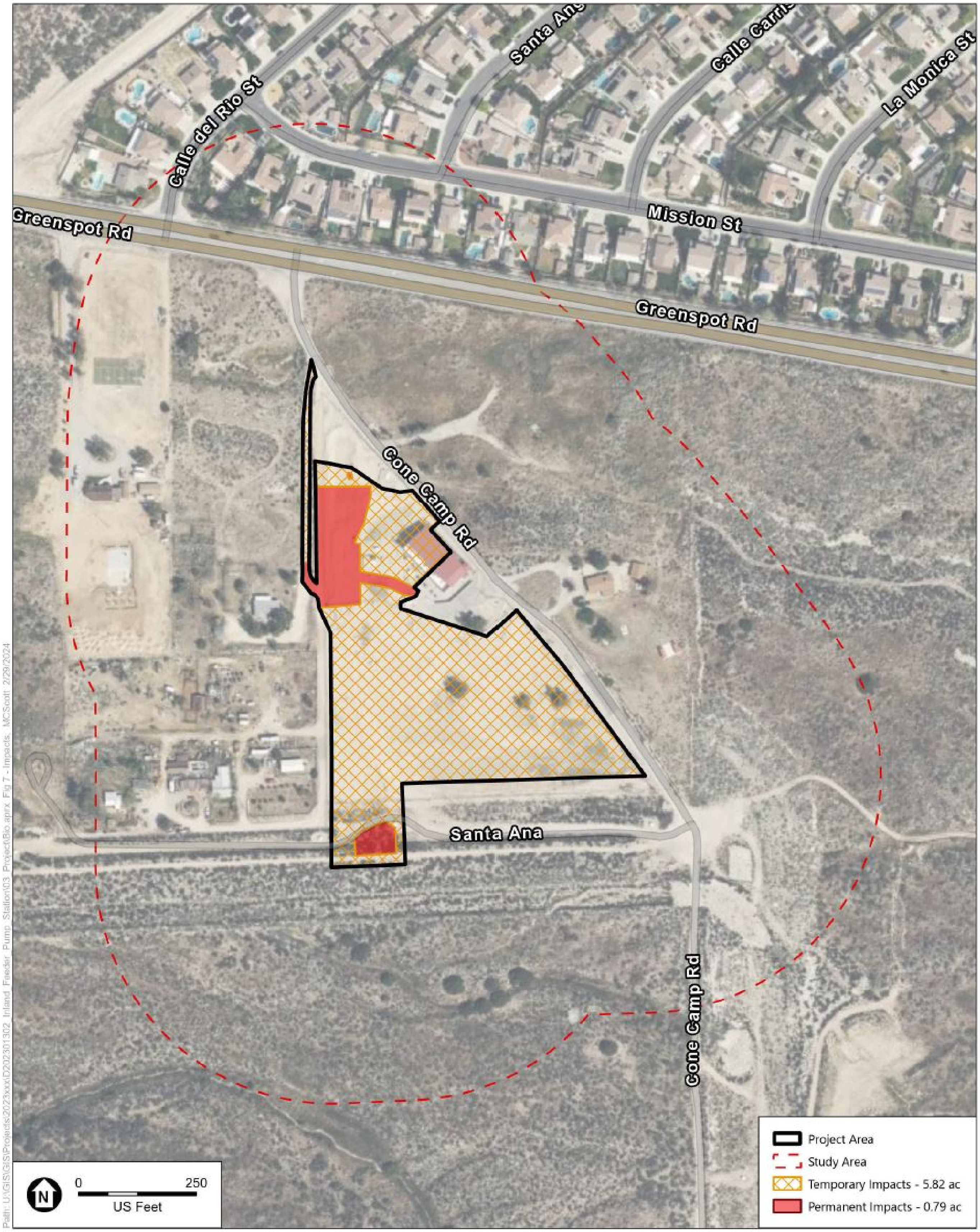
Feature 5 is an ephemeral drainage located within the southern portion of the study area and outside of the project area. It contains upland vegetation, specifically hairy yerba santa scrub. Based on aerial review, Features 4 and 5 appear to have once formed a single, ephemeral aquatic feature. However, recent disturbances in the area have caused a separation, severing the connection between them. Consequently, due to the surrounding higher elevation, drainage from this feature dissipates into the ground at its western extent.

Conclusions and Potential Impacts

The project is proposing to install two new underground pipelines (supply connection and discharge connection), two underground vaults, four aboveground HSTs, and associated appurtenant structures which would be updated in two stages. Stage 1 includes construction of the supply and discharge pipelines, an underground vault, four HSTs on concrete pads, and appurtenant structures within the existing graded triangular fenced area and the area immediately west of the fenced area. Stage 2 includes construction of a vault, portion of the discharge connection pipeline, associated appurtenant structures, and final connections to the existing Inland Feeder pipeline within the southern portion outside of the existing fenced area. The proposed project would result in 0.79 acres of permanent impacts and 5.82 acres of temporary impacts to developed and disturbed land cover and California buckwheat – brittle bush scrub natural community (**Figure 7, Project Impact Areas**).

Sensitive Natural Communities

Direct permanent and temporary impacts to natural communities and land covers within the proposed project development footprint are summarized in **Table 4, Project Impacts to Natural Communities and Land Cover Types**, and shown in Figure 7. Direct impacts to natural communities and land covers are proposed as a result of vegetation removal and construction activities and were quantified by overlaying the project boundaries with the vegetation communities mapped in the study area. The majority of the direct impacts would occur primarily within developed (5.84 acres) and disturbed (0.40 acres) areas. The only natural community within the project area is California buckwheat – brittle bush scrub natural community, which is not considered a sensitive natural



SOURCE: ESA, 2024

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Figure 7
Project Impact Areas

ESA

TABLE 4
PROJECT IMPACTS TO NATURAL COMMUNITIES AND LAND COVER TYPES

Natural Community/Land Cover Type	Permanent Project Impact (acres)	Temporary Project Impact (acres)	Total Project Impact (acres)	Remaining Acreage in the Study Area (acres)
Terrestrial Natural Communities				
Annual Grasses and Forbs	--	--	--	1.66
Brittle Bush Scrub	--	--	--	2.79
Disturbed Brittle Bush Scrub	--	--	--	2.70
California Buckwheat – Brittle Bush Scrub	0.12	0.25	0.37	12.18
Disturbed California Buckwheat – Brittle Bush Scrub	--	--	--	1.40
Chamise Chaparral – Hairy Yerba Santa Scrub	--	--	--	0.57
Disturbed Chamise Chaparral – Brittle Bush Scrub	--	--	--	0.55
Hairy Yerba Santa Scrub	--	--	--	5.37
Mustard Fields	--	--	--	1.19
Developed/Disturbed Land Cover Types				
Developed	0.54	5.30	5.84	18.67
Disturbed	0.13	0.27	0.40	6.27
TOTAL	**0.79**	**5.82**	**6.61**	**53.35**

SOURCE: ESA 2024

community. Only 0.37 acre of California buckwheat – brittle bush scrub natural community is proposed to be permanently (0.12 acre) or temporarily (0.25 acre) impacted by the proposed project activities. No sensitive natural communities occur within the study area (CDFW 2023b).

Federally and State Listed Species

Appropriate authorization from USFWS under FESA or CDFW under CESA may include an Incidental Take Permit (ITP) or a Consistency Determination in certain circumstances, among other options (FGC, §§ 2080.1, 2081, subds. [b] and [c]) for impacts to federally and state listed species. Early consultation is encouraged, as significant modification to the project and mitigation measures may be required to obtain an ITP.

Special-Status Plants

Five special-status plant species have a moderate to high potential to occur within the California buckwheat – brittle bush scrub habitat within the project area, as well as within the natural communities within the surrounding study area: Parry's spineflower, Plummer's mariposa lily, Robinson's pepper-grass, Santa Ana River woollystar, and slender-horned spineflower. While these five special-status plants have the potential to occur within the coastal sage scrub and chaparral habitats mapped in the study area (i.e., brittle bush scrub, disturbed brittle bush scrub, California buckwheat – brittle bush scrub, disturbed California buckwheat – brittle bush scrub, chamise chaparral – hairy yerba santa scrub, disturbed chamise chaparral – brittle bush scrub, and hairy yerba santa scrub), Plummer's mariposa lily also has the potential to occur within the annual grasses and forbs habitat mapped in the study area.

The project would result in the permanent removal of 0.12 acre and temporary removal of 0.25 acre of California buckwheat – brittle bush scrub habitat present within the project area. Focused rare plant surveys are recommended to confirm presence or absence of these species within 50 feet of the project area wherever suitable habitat occurs. Direct impacts to these species may occur in the form of habitat loss and mortality if the individual plants are present and crushed or removed during ground disturbing activities. Indirect impacts may occur in the form of excessive dust and introduction of nonnative plant species. Although these species may be present in the project area, the project would not be expected to result in the loss of individuals or adversely affect local or regional populations of these species with the implementation of **Standard Metropolitan Practices (SMP)-1**, **SMP-2**, and **SMP-3**, as well as **Avoidance and Minimization Measures (AMM)-1** and **AMM-2**, and **Mitigation Measure BIO-1** listed below.

Special-Status Wildlife

Coastal California Gnatcatcher, Crotch Bumble Bee, Western Spadefoot, San Bernardino Kangaroo Rat

Coastal California gnatcatcher may forage and nest within the California buckwheat – brittle bush scrub habitat present within the project area and remainder of the study area. Additionally, the species may use the brittle bush scrub, disturbed brittle bush scrub, disturbed California buckwheat – brittle bush scrub, chamise chaparral – hairy yerba santa scrub, and disturbed chamise chaparral – brittle bush scrub, and hairy yerba santa scrub habitat for nesting and foraging within the remainder of the study area. The project would result in the permanent removal of 0.12 acre and temporary removal of 0.25 acre of California buckwheat – brittle bush scrub habitat present within the project area. Ground disturbance and vegetation clearing activities during nesting season may result in "take' of this species through the disruption of breeding/nesting behavior, such as copulation, nest building or incubation. Although this species is known to occur in the project vicinity, the project would not be expected to result in the loss of individuals or adversely affect local or regional populations of coastal California gnatcatcher with implementation of **SMP-1**, **AMM-1**, **AMM-3**, and **Mitigation Measure BIO-1**.

Crotch bumble bee may forage and/or nest within the California buckwheat – brittle bush scrub habitat in the project area and remainder of the study area. The project would result in the permanent removal of 0.12 acre and temporary removal of 0.25 acre of California buckwheat – brittle bush scrub habitat present within the project area. Additionally, this species may use all of the natural communities, aside from the disturbed and developed land cover types, for nesting and foraging within the remainder of the study area. Ground disturbance and vegetation clearing activities may result in direct and indirect impacts to this species through the removal of the species' preferred plants for nectaring and removal of nest burrows. Although this species has a potential to occur in the project vicinity, the project would not be expected to result in the loss of individuals or adversely affect local or regional populations of Crotch bumble bee with the implementation of Metropolitan's Standard Practices as outlined in **SMP-1** and **SMP-2**. In addition, **AMM-1** and **AMM-4** would reduce the potential for direct and indirect impacts; therefore, the project is not likely to adversely affect Crotch bumble bee.

Western spadefoot may use small mammal burrows within the California buckwheat – brittle bush scrub present within the project area and remainder of the study area. The project would result in the permanent removal of 0.12 acre and temporary removal of 0.25 acre of California buckwheat – brittle bush scrub habitat present within the project area. Additionally, this species may use all of the natural communities, aside from the disturbed and developed land cover types, for estivating and foraging within the remainder of the study area. The species is not expected to use the project area for breeding since it is disturbed and there are limited suitable breeding pools present. Although this species has a potential to occur in the project vicinity, the project would not be expected to result in the loss of individuals or adversely affect local or regional populations of western spadefoot with the implementation of Metropolitan's Standard Practices as outlined in **SMP-1**, **SMP-2**, and **SMP-3**, as well as avoidance and minimization measures **AMM-1** and **AMM-5**.

San Bernardino kangaroo rats may burrow, forage, and breed within the California buckwheat – brittle bush scrub habitat within the project area and remainder of the study area. This species was present during small-mammal trapping surveys conducted in 2022 (ECORP 2022). The project would result in the permanent removal of 0.12 acre and temporary removal of 0.25 acre of California buckwheat – brittle bush scrub habitat present within the project area. The proposed project may result in a direct impact to this species through the killing of an individual(s) or the removal of a nest or burrows or may indirectly prevent normal breeding and/or foraging through noise generation from project activities. Indirect impacts may result from human presence, ground vibration and noise generated by heavy equipment, artificial lighting and increased predation. Implementation of Metropolitan's Standard Practices outlined in **SMP-1**, **SMP-2**, and **SMP-4**. In addition, **AMM-1**, **AMM-6**, **AMM-7**, **AMM-8**, and **Mitigation Measure BIO-1** would reduce the potential for direct and indirect impacts; therefore, the project is not likely to adversely affect local or regional populations of SBKR.

Other Special-Status Wildlife

The Bell's sparrow, burrowing owl, California horned lark, loggerhead shrike, and southern California rufous-crowned sparrow may forage and/or breed within the annual grasses and forbs, brittle bush scrub, California buckwheat – brittle bush scrub , chamise chaparral – hairy yerba santa scrub, and hairy yerba santa scrub habitats, as well as the disturbed land cover type, of the project area and remainder of the study area. However, the project area is heavily compacted and provides very limited suitable foraging habitat along its southern boundary. Additionally, there is ample, suitable foraging habitat present in the surrounding area. Thus, the permanent loss of up to 0.12 acre and temporary loss of up to 0.25 acre of potentially suitable foraging habitat due to the proposed project activities is not considered a likely adverse impact to Bell's sparrow, California horned lark, loggerhead shrike, and southern California rufous-crowned sparrow if present during construction. Implementation of standard measures such as limiting the area of disturbance would further contribute toward avoiding any potential impacts to foraging species and their habitat.

The study area provides suitable nesting habitat for a variety of native resident and migratory bird and raptor species (including Bell's sparrow, burrowing owl, California horned lark, loggerhead shrike, and southern California rufous-crowned sparrow) protected under the MBTA and CFGC Sections 3503.5, 3505, and 3511. The project may result in the direct and/or indirect impacts to these migratory bird and raptor species through the removal of active nests or disruption of breeding/nesting behavior such as copulation, nest building, or incubation if present during construction activities. Metropolitan would implement their Standard Metropolitan Practices as outlined in **SMP-1**. In addition, implementation of **AMM-1**, **AMM-3**, and **AMM-10** would reduce the potential for direct and indirect impacts; therefore, the project is not likely to adversely affect protected nesting birds or raptors.

The Belding's orange-throated whiptail, burrowing owl, California glossy snake, coast horned lizard, coastal western whiptail, Los Angeles pocket mouse, northwestern San Diego pocket mouse, red-diamond rattlesnake, San Diego black-tailed jackrabbit, San Diego desert woodrat, southern California legless lizard, and southern grasshopper mouse may occupy annual grasses and forbs, brittle bush scrub, California buckwheat – brittle bush scrub , chamise chaparral – hairy yerba santa scrub, and/or hairy yerba santa scrub habitats, as well as the disturbed land cover type, of the project area and remainder of the study area. The proposed project may result in a direct impact to these species through the killing of an individual or the removal of a nest or burrow. Indirect impacts may result from human presence, ground vibration and noise generated by heavy equipment, and increased predation. Implementation of Metropolitan's Standard Practices outlined in **SMP-1**, **SMP-2**, and **SMP-4**, as well as avoidance and minimization measures **AMM-1**, **AMM-9**, and **AMM-10** would reduce the potential for direct and indirect impacts; therefore, the project is not likely to adversely affect these special-status ground dwelling species.

Critical Habitat

Critical habitat for SBKR is located within the study area, and the project would result in the permanent removal of 0.12 acre of designated critical habitat associated with California buckwheat – brittle bush scrub and 0.25 acre of temporary impacts to critical habitat from construction activities. The project would not be expected to result in the adverse modification of critical habitat for SBKR with the implementation of Metropolitan's Standard Practices outlined in **SMP-1** and **SMP-2**, and the implementation of measures **AMM-1**, **AMM-6**, **AMM-7**, **AMM-8**, and **Recommended Measure BIO-1**.

Wildlife Movement

While wildlife likely uses the study area to forage, breed, and to some extent, for local and regional movement, the project area does not link large areas of contiguous, intact habitat together, and is not expected to function as an important migration corridor. The proposed project may result in both direct and indirect impacts to nesting migratory and special-status birds and small mammals that may utilize the study area for foraging and/or nesting. Ground disturbance and vegetation clearing activities may disrupt foraging and breeding/nesting behavior, such as copulation, nest building or incubation, or result in the removal of an active nest or burrow. The project would not be expected to adversely impact the movement of wildlife with the implementation of Metropolitan's Standard Practices outlined in **SMP-1** through **SMP-4**, and measures **AMM-1**, **AMM-3** through **AMM-10**, and **Recommended Measure BIO-1**.

Aquatic Resources

Feature 1 consists of a constructed basin and an associated drainage feature/road which captures stormwater runoff along an existing access road. Feature 1 is the only aquatic resource identified within the project area. The basin was constructed in an upland area within the northwestern portion of the project area to capture surface water runoff allowing it to infiltrate into the ground within the basin. Feature 1 is less than one acre in size and is used and maintained for the detention, retention, and infiltration of stormwater runoff. This feature does not meet the definition of a water of the state and does not contain or support wetland or riparian habitat, and therefore, would likely not be considered jurisdictional by the CDFW and RWQCB.

Although Feature 3 (the constructed drainage located south of the project area) has a continuous surface connection to the Santa Ana River, a non-wetland water of the U.S., it is an ephemeral feature that does not meet the relatively permanent standard; thus, is likely not considered a water of the U.S. The remaining ephemeral drainage features within the surrounding study area (Features 2, 4, and 5) have no continuous surface connection to waters of the U.S.; therefore, do not meet the definition of a non-wetland water of the U.S. While Features 2 through 5 are located outside the project area and do not support riparian habitat, they may still be regulated by the CDFW and RWQCB. However, the proposed project has no planned impacts to these features as they are situated outside of the project area.

Standard Metropolitan Practices and Recommended Avoidance, Minimization, and Recommended Measures

The following lists standard Metropolitan practices and recommended avoidance, minimization, and mitigation measures to avoid, minimize, and/or mitigate the project's effects on biological resources.

Standard Metropolitan Practices

Standard Metropolitan Practice (SMP)-1: General Avoidance and Minimization Measures

- **Permits.** The Contractor shall obtain necessary local, state, and federal environmental permits and shall comply with the requirements of all such permits and laws, regulations, acts, codes, and ordinances.

- **Construction Boundaries.** The Contractor shall perform all construction activities only within the construction boundaries shown on the drawings. The construction boundaries shall be fenced, unless otherwise directed by the Engineer. Any request to use any area outside the construction boundaries for any activity will require review and approval by the Engineer.

- **Worker Environmental Awareness Protections Training.** Metropolitan routinely conducts pre-construction Worker Environmental Awareness Protections Training (WEAP) for both capital projects and operations and maintenance activities. WEAP trainings are project-specific and cover potential environmental concerns or considerations including, but not limited to, awareness of biological resources, special status species near project sites, jurisdictional waters, cultural resources, paleontological resources, environmentally sensitive areas, and/or avoidance areas.

- **Environmental Assessment.** As an internal practice, Metropolitan conducts Environmental Assessments or similar studies prior to project commencement to determine if any sensitive resources have the potential to be present at a project site. Resources assessed typically include biological, cultural, paleontological resources, noise sensitivity, and sensitive receptors in the vicinity of the project area.

SMP-2: Hazardous Materials

- The Contractor shall clean up all spills in accordance with all applicable environmental laws and regulations and notify the Engineer immediately in the event of a spill.

- Stationary equipment such as motors, pumps, and generators, shall be equipped with drip pans.

- The Contractor shall handle, store, apply, and dispose of chemicals and/or herbicides consistent with all applicable federal, state and local regulations.

- The Contractor shall dispose of all contaminated materials in a manner consistent with all applicable local, state and federal environmental laws and regulations.

- Hazardous materials shall be stored in covered, leak-proof containers when not in use, away from storm drains and heavy traffic areas, and shall be protected from rainfall infiltration. Hazardous materials shall be stored separately from non-hazardous materials on a surface that prevents spills from permeating the ground surface, and in an area secure from unauthorized entry at all times. Incompatible materials shall be stored separately from each other.

SMP-3: Hydrology and Water Quality

- The Contractor shall not allow any equipment or vehicle storage within any drainage course or channels.

- Any material placed in areas where it could be washed into a drainage course or channel shall be removed prior to the rainy season.

- The Contractor shall not create a nuisance or pollution as defined in the California Water Code. The Contractor shall not cause a violation of any applicable water quality standards for receiving waters adopted by the Regional Water Quality Control Board or the SWRCB, as required by the Clean Water Act (CWA).

- Dewatering activities shall not affect any vegetation outside of the construction limits. The Contractor shall submit proposed dewatering plans to the Engineer for approval prior to any dewatering activities.

SMP-4: Lighting

- The Contractor shall exercise special care to direct floodlights to shine downward. These floodlights shall also be shielded to avoid a nuisance to the surrounding areas. No lighting shall include a residence or native area in its direct beam. The Contractor shall correct lighting nuisance whenever it occurs.

Recommended Avoidance and Minimization Measures

Avoidance and Minimization Measure (AMM)-1: Best Management Practices

- **Prevention of Inadvertent Entrapment.** To prevent inadvertent entrapment of common and special-status wildlife during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered with tarp, plywood or similar materials at the close of each working day and will be inspected visually to confirm animals would be excluded, to prevent animals from being trapped. Ramps may be constructed of earth fill or wooden planks within deep walled trenches to allow animals to escape, if necessary. Before such holes or trenches are backfilled, they should be thoroughly inspected for trapped animals. If trapped wildlife is observed, escape ramps or structures will be installed immediately to allow escape.

- **Construction Contractor Specifications.** AMM-1 through AMM-9 will be incorporated into the construction contractor specifications.

- **Trash/Debris Removal.** During project construction activities, all trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following construction, all spoils, trash, or any debris will be removed off-site to an approved disposal facility or stored appropriately.

- **Speed Limits.** Vehicles will be restricted to existing access roads and approved work areas and will maintain speed limits of no greater than 15 miles per hour on unpaved roads.

AMM-2: Special-Status Plants

Prior to construction that could potentially remove special-status plants, a qualified botanist shall conduct a pre-construction floristic inventory and focused rare plant survey to determine and map the location and extent of special-status plant species populations within disturbance areas within suitable habitat. This survey shall occur during the typical blooming periods of special-status plants with the potential to occur: Parry's spineflower (*Chorizanthe parryi* var. *parryi*; CRPR 1B.1; blooming period April – June), Plummer's mariposa lily (*Calochortus plummerae*; CRPR 4.2; blooming period May – July), Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*; CRPR 4.3; blooming period January – July), Santa Ana River woollystar (*Eriastrum* *densifolium* ssp. *sanctorum*; FE, SE, CRPR 1B.1; blooming period April – September), and slender-horned spineflower (*Dodecahema leptoceras*; FE, SE, CRPR 1B.1; blooming period April – June). The plant survey shall follow the CDFW Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2018).

If special-status plants are not identified within the project impact area, then ground-disturbing activities may commence. If special-status plants are detected and project-related impacts are unavoidable, then the preparation and implementation of a special-status species salvage, seed collection, and replanting plan would be required, and consultation with the regulatory agencies would be required to address potential take of listed plant species. The salvage, seed collection, and replanting plan shall include measures to salvage, collect seed, replant, and monitor the disturbance area until native vegetation is re-established.

Pre-construction special-status plant surveys are scheduled to be conducted in 2024. If construction does not begin by 2027, a qualified botanist shall conduct an additional pre-construction floristic inventory and focused rare plant survey in accordance with the guidance above during the appropriate blooming period the year prior to the commencement of project activities.

AMM-3: Nesting Birds/Raptors and Special-Status Birds

Project activities could negatively impact nesting birds that are protected in accordance with the MBTA and FGC, as well as other special-status avian species, such as the Bell's sparrow, burrowing owl, California horned lark, coastal California gnatcatcher, loggerhead shrike, and southern California rufous-crowned sparrow. No physical disturbance of vegetation, operational structures, buildings, or other potential habitat (e.g., open ground, gravel, construction equipment or vehicles, etc.) that may support nesting birds protected by the MBTA and FGC shall occur in the breeding season, except as necessary to respond to public health and safety concerns, or otherwise authorized by the Engineer. The breeding season extends from February 15 through August 31 for passerines and general nesting and from January 1 through August 31 for raptors.

- If nesting habitat (including annual grasses and forbs, brittle bush scrub, California buckwheat – brittle bush scrub, chamise chaparral – hairy yerba santa scrub, and hairy yerba santa scrub habitats, as well as the disturbed land cover types within the study area) must be cleared or project activities must occur within 500 feet of nesting habitat within the breeding season as defined above, a qualified biologist shall perform a nesting bird survey no more than three days prior to clearing or removal of nesting habitat or start of project activities. Surveys will be performed in all Metropolitan accessible areas (fee property and easements) and inaccessible areas will be visually surveyed to their full extent without trespassing.

- If active nests for sensitive species, raptors and/or migratory birds are observed, an adequate buffer zone or other avoidance and minimization measures, as appropriate, shall be established, as identified by a qualified biologist and approved by the Engineer. Construction avoidance buffers are generally 300 feet for non-listed passerines and 500 feet for listed avian species (i.e., coastal California gnatcatcher) and raptors; however, avoidance buffers may be modified at the discretion of the biologist, depending on the species, location of the nest and species tolerance to human presence and construction-related noises and vibrations. The buffer shall be clearly marked in the field by the Contractor, as directed by the Engineer, and construction or clearing shall not be conducted within this zone until the young have fledged and are no longer reliant on the nest.

- Additional measures may include (but are not limited to): construction avoidance, until the nest is no longer active, noise attenuation measures to reduce construction noise levels to below 60 dBA Leq (an hourly measurement of A-weighted decibels) or ambient (if existing ambient levels are above 60 dBA), and biological monitoring during construction activities to ensure the species is not harmed during Project implementation.

- A qualified biologist shall monitor active nests or nesting bird habitat within or immediately adjacent to project construction areas, and the Engineer shall provide necessary recommendations to the Contractor to minimize or avoid impacts to protected nesting birds.

AMM-4: Crotch Bumble Bee

Project activities could negatively impact suitable Crotch bumble bee foraging and/or nesting habitat within the California buckwheat – brittle bush scrub planned for removal in the project area. Therefore, the following measures are recommended to avoid impacts to this species.

- A qualified entomologist familiar with the species' behavior and life history shall conduct surveys to determine presence/absence of the Crotch bumble bee within the year prior to vegetation removal and/or grading in areas that provide suitable habitat for this species. A minimum of three surveys, ideally 2-4 weeks apart, should also be conducted during peak flying season when the species is most likely to be detected above ground, between March 1 to September 1 and during peak bloom of nectaring resources (Thorp et al. 1983; CDFW 2023c). At minimum, a survey report should provide the following:

  – A description and map of the survey area, focusing on areas that could provide suitable habitat for Crotch bumble bee.

  – Field survey conditions that should include name(s) of qualified entomologist(s) and brief qualifications; date and time of survey; survey duration; general weather conditions; survey goals, and species searched.

  – Map(s) showing the location of nests/colonies.

  – A description of physical (e.g., soil, moisture, slope) and biological (e.g., plant composition) conditions where each nest/colony is found. A sufficient description of biological conditions, primarily impacted habitat, should include 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).

- If Crotch bumble bee is detected, the qualified entomologist should identify the location of all nests within and adjacent to the project site. A 15-meter (50-foot) no disturbance buffer zone should be established around any identified nest(s) to reduce the risk of disturbance or accidental take. A qualified entomologist should expand the buffer zone as necessary to prevent disturbance or take.

- If Crotch bumble bee is detected and impacts to Crotch bumble bee cannot be feasibly avoided, Metropolitan should consult with CDFW and obtain appropriate take authorization from CDFW (pursuant to FGC, § 2080 et seq).

- Any floral resource associated with Crotch bumble bee that will be removed or damaged by the project should be replaced at no less than 1:1, as determined in consultation with CDFW.

AMM-5: Western Spadefoot

Although limited suitable breeding habitat is present within the constructed basin and associated drainage located in the project area, project activities could negatively impact suitable western spadefoot upland habitat, including all of the natural communities and excluding the disturbed and developed land cover, within the small mammal burrows located in the project area. Therefore, the following measures are recommended to avoid impacts to this species.

- A qualified biologist shall survey areas of suitable habitat for western spadefoot in the project area, including ruts, small pools, and the constructed basin and associated drainage. The survey shall be conducted during the active season of western spadefoot (which corresponds with the rainy season).

- If surveys result in the observation of western spadefoot within project impact areas, observed individuals and/or eggs shall be removed from project impact areas and be relocated to pre-determined suitable habitat in an appropriate area that will not be impacted.

- For work during the western spadefoot toad migration and breeding season (November 1 to May 31), a qualified biologist will survey the active work areas (including access roads) in the mornings following measurable precipitation events. Construction may commence upon confirmation from the biologist that no western spadefoot toads are in the work area.

- When feasible, a 50-foot avoidance buffer will be maintained around burrows that provide suitable upland habitat for western spadefoot toad, as identified by a qualified biologist. The biologist will delineate and mark the no-disturbance buffer.

- If western spadefoot toad is found within the construction footprint, it will be allowed to move out of harm's way on its own accord or a qualified biologist will relocate it to the nearest suitable burrow outside of the construction impact area.

- Prior to beginning work, a qualified biologist will inspect underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter for western spadefoot toad. If found, they will be allowed to move out of the construction area on their own accord.

AMM-6: San Bernardino Kangaroo Rat Pre-Construction Presence/Absence Trapping Surveys

Prior to ground disturbing activities within areas with potential habitat for SBKR or other sensitive small mammals, a qualified SBKR biologist with a required Section 10(a) permit will conduct pre-construction presence/absence trapping surveys. These surveys will follow protocols and trapping methods approved by the regulatory agencies to determine the presence/absence of SBKR and other sensitive small mammals on site.

- If pre-construction presence/absence trapping surveys within the Stage 1 area are negative, then exclusionary fencing (AMM-6) will be installed.
- If SBKR are determined to be present within the Stage 1 project area resulting from the trapping surveys an ITP will need to be obtained. Construction within occupied habitat areas will not proceed until appropriate authorization (i.e., FESA and/or CESA ITP) is obtained.
- Stage 2 construction will not commence until appropriate authorization (i.e., FESA and/or CESA ITP) is obtained. Implementation of protection measures and compensatory mitigation for SBKR, in addition to those identified in this document, will be required as conditions of federal and state take permits.

AMM-7: San Bernardino Kangaroo Rat Exclusionary Fencing

Exclusionary fencing will be erected in construction areas with potential to be occupied by SBKR or containing kangaroo rat sign (e.g., burrows, scat, tail drag, or dust baths) as determined by a preconstruction survey conducted by a qualified biologist.

- A qualified biologist or approved biological monitor will be present on site when the fence is installed to minimize disturbance of SBKR burrows from fence installation.
- The integrity of the fencing will be checked by a qualified biologist at the end of each workday. Any gaps will be repaired immediately.
- Construction access openings will be closed and secured at the end of each workday using the at-grade fencing method.
- The fence will remain in place for the duration of construction activities and removed at the completion of the relevant project activity.
- Stage 1 exclusionary fencing will be installed at grade to minimize the risk of unauthorized take.

AMM-8: San Bernardino Kangaroo Rat and General Construction Monitoring

- **SBKR Biologist.** A qualified biologist or approved biological monitor will visually inspect trenches and steep-walled holes before the onset of daily construction for presence of SBKR. If SBKR are discovered, the biologist will supervise the movement or relocation of the equipment until the animal has left the area on its own.
  - To the extent feasible, soil stockpiles in SBKR habitat will be located within the construction area inside the exclusionary fence or within the existing facility in areas devoid of vegetation.
  - Nighttime work shall be avoided as much as possible. If nighttime work is necessary, all lighting shall be directed exclusively at the work area to avoid areas that support local wildlife movement, such as ephemeral drainages, to the greatest extent practical. Any nighttime lighting shall be shielded downward as to avoid light spillage into the surrounding areas.
- **Limits of Disturbance.** Prior to construction in or adjacent to habitats for special-status species, and under the direction of a qualified biologist, Metropolitan will clearly delineate the construction right-of-way (stake, flag, fence, etc.) that restricts the limits of construction to the minimum necessary to implement the project.
- **Biological Monitoring.** Prior to the start of construction, Metropolitan will retain a qualified biological monitor(s) to be onsite during the initial ground disturbance and during construction activities to monitor habitat conditions and impacts. The biological monitor will ensure compliance with the AMMs and will have the authority to halt or suspend all activities until appropriate corrective measures have been taken. The biological monitor will be a qualified biologist with species expertise appropriate for this project.
- **On Site Overnight Storage.** All construction pipes, culverts, or similar structures that are stored at a construction site for one or more overnight periods should be thoroughly inspected for birds and other wildlife before the pipe is subsequently buried, capped, or otherwise used or moved.

AMM-9: Special-Status Ground-Dwelling Wildlife

Project activities could negatively impact special-status ground-dwelling wildlife that are protected in accordance with the CESA and FGC, such as Belding's orange-throated whiptail, California glossy snake, coast horned lizard, coastal western whiptail, Los Angeles pocket mouse, northwestern San Diego pocket mouse, red-diamond rattlesnake, San Diego black-tailed jackrabbit, San Diego desert woodrat, southern California legless lizard, and southern grasshopper mouse. Therefore, the following measure is recommended to avoid impacts to these species.

- A qualified biologist shall conduct a preconstruction clearance survey throughout the project area. If any of these species are observed during the survey, a qualified biologist should relocate the individual to suitable habitat adjacent to the project area.

AMM-10: Burrowing Owl

Prior to the initiation of any ground disturbing activities within 500 feet of suitable burrowing owl habitat, including all of the natural communities and land cover types within the study area, focused protocol surveys for burrowing owl will be conducted by a qualified biologist throughout the study area following the protocol outlined in the CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012). If the qualified biologist finds evidence of burrowing owls during the burrowing owl breeding season (February 1 through August 31), all project-related activities shall avoid nest sites during the remainder of the breeding season or while the nest remains occupied by adults or young (nest occupation includes individuals or family groups foraging on or near the site following fledging). Avoidance includes establishment of a minimum 300-foot buffer zone around nests. Construction and other project-related activities may occur outside of the 300-foot buffer zone. Construction and other project-related activities may be allowed inside of the 300-foot avoidance buffer during the breeding season if the nest is not disturbed, and the project activities are monitored by a qualified biologist.

Recommended Mitigation Measures

Mitigation Measure BIO-1: Compensation for Impacts to Federally and State-Listed Species Habitat.

Direct temporary and permanent impacts to suitable habitat for federally or state-listed species shall be mitigated through purchase of credits from an approved mitigation bank, payment to an in-lieu fee program, or in another form of mitigation approved by the regulatory agencies.

- **Temporary Impacts.** Mitigation for direct temporary impacts to suitable habitat for federally or state-listed species shall be provided through on-site restoration. Areas temporarily impacted shall be returned to similar conditions to those that existed prior to grading and/or ground-disturbing activities.

- **Permanent Impacts.** Metropolitan shall purchase credits from an approved mitigation bank, payment to an in-lieu fee program, or in another form of mitigation approved by the regulatory agencies to compensate for all permanent loss of suitable habitat for federally or state-listed species (including critical habitat), if available, at a 1:1 ratio. Direct impacts to federally listed species' occupied habitat shall be addressed through either the Section 7 or Section 10(a)(1)(B) process under the federal Endangered Species Act (ESA) of 1973, as amended. Additionally, direct impacts to federally designated critical habitat that cannot be avoided shall be addressed through either the ESA Section 7 or Section 10(a)(1)(B) process. Direct impacts to state-listed species shall be addressed through the California Fish and Game Code Section 2081(b) incidental take permit process. The two permits and authorization by the agencies with jurisdiction over these resources may require additional measures (e.g., avoidance, conservation, etc.) beyond what is being proposed under this CEQA analysis.

If you have any questions regarding this letter report, please do not hesitate to contact Amanda French (afrench@esassoc.com) at (530) 966-4294 or Johanna Page (jpage@esassoc.com) at (626) 677-7680.

Sincerely,

Amanda French
Biologist

Johanna Page
Principal Biologist

List of Attachments

Attachment A: Results of the 2023 Nighttime Small Mammal Activity Surveys
Attachment B: Representative Photographs
Attachment C: Floral and Faunal Compendia
Attachment D: CNDDB and CNPS Results
Attachment E: Exclusionary Fence Design

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Attachment A

Results of the 2023 Nighttime Small Mammal Activity Survey

ESA

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memorandum

date November 16, 2023

to Alfredo Aguirre, Environmental Specialist – Metropolitan Water District of Southern California (Metropolitan)

from Johanna Page, Principal Biologist – Environmental Science Associates (ESA)

subject Results of Nighttime Small Mammal Activity Surveys for Metropolitan's Inland Feeder Foothill Pump Station Intertie Phase 1 Project, City of Highland, San Bernardino County, California

Environmental Science Associates (ESA) conducted nighttime small mammal activity surveys for the Metropolitan Water District of Southern California's (Metropolitan) Inland Feeder Foothill Pump Station Intertie Phase 1 Project (project). The project requires work in areas that are adjacent to occupied San Bernardino kangaroo rat (SBKR; *Dipodomys merriami parvus*) habitat and suitable SBKR burrows were identified within the project site. SBKR is federally listed as endangered, state candidate for listing as endangered and a species of special concern. Based on the findings of previous focused SBKR surveys and SBKR burrow surveys conducted in the survey area in 2022 and 2023, motion-detecting cameras were recommended to determine kangaroo rat presence within the project site. The surveys were conducted in March and July 2023 using nighttime-vision equipment to determine nighttime small mammal activity in the project area, with particular emphasis focused on whether the small mammals are accessing the site from neighboring areas or using burrows within the proposed exclusion fencing areas planned for the project. The March 2023 nighttime small mammal activity survey area corresponds with the future exclusion fencing areas proposed for the project, while the July 2023 nighttime small mammal activity survey corresponds with a larger area and includes burrows where previous SBKR were captured to serve as a control.

Project Site

The project site is generally located north of the Santa Ana River, south of Greenspot Road, east of State Route 210, and west of State Route 38 in San Bernardino County, California. More specifically, the project site is located southwest of the terminus of Cone Camp Road, north of Weaver Street, within the U.S. Geological Survey (USGS) Redlands 7.5-minute quadrangle (**Figure 1, Regional Vicinity and Project Location**). The project site includes an existing fenced and graded triangular area that encompasses Metropolitan and San Bernardino Valley Municipal Water District (SBVMWD) facilities, as well as the area immediately south and northwest of the existing facility where existing graded maintained roads with California buckwheat – brittle bush scrub (*Eriogonum fasciculatum – Encelia farinosa* shrubland) habitat is present interspersed between the existing roads.

Background

In October 2022, ECORP conducted a protocol-level SBKR trapping survey, which included five nights of consecutive trapping with a total of 135 baited collapsible Sherman live-traps placed in areas of suitable SBKR habitat in the southern portion of the project site (ECORP 2022). Five rodent species were captured during the protocol-level trapping survey: SBKR, San Diego pocket mouse (*Chaetodipus fallax*), Bryant's woodrat (*Neotoma bryanti*), northern Baja deer mouse (*Peromyscus fraterculus*), and deer mouse (*Peromyscus maniculatus*) (ECORP 2022). The 2022 trapping effort yielded a total of three SBKR adult male individuals, captured in four different locations during seven captures, as well as a total of 76 captures of San Diego pocket mouse, 45 captures of northern Baja deer mouse, 18 captures of deer mouse, and 16 Bryant's woodrat captures in the southern extent of the project site. As a result, the project team, in coordination with USFWS, refined the project footprint to avoid areas where SBKR individuals were trapped in 2022 and performed additional biological surveys.

In March 2023, ESA conducted a SBKR burrow survey to determine if potential SBKR burrows occur within the project site, with a focus on the newly proposed project impact areas that were redesigned to avoid take of SBKR (ESA 2023). Based on the findings of the SBKR burrow survey conducted within the southern portion of the project site, subsequent motion-detecting cameras were recommended to identify kangaroo rat presence within the updated temporary and permanent impact areas, also referred to as impact areas in this report. Thus, the nighttime activity survey was designed to confirm where exclusionary fencing should be installed within the southern extent of the project site. The potential SBKR burrows were detected within the northwestern extent of the project site following the installation of the camera installation; thus, were not incorporated in the March 2023 nighttime small mammal activity survey. However, this northwestern portion of the project site was encompassed within the subsequent July 2023 nighttime small mammal activity survey.

Methodology

March 2023 Nighttime Small Mammal Activity Survey Area

The March 2023 nighttime small mammal activity survey area (March 2023 survey area) focused on areas with potentially suitable SBKR habitat and SBKR burrows concentrated in the southern portion of the project site, north and south of the existing unnamed dirt access road and southern entrance to the site, and north of Weaver Street (a dirt road). The March 2023 survey area generally overlapped with the proposed exclusion fencing area along the southern extent of the project site, and was identified by overlaying the temporary and permanent impact area boundaries, north and south of the existing graded road to the southern entrance to the existing MWD and SBVMWD facility on site, with the results of the protocol-level SBKR surveys conducted by ECORP in 2022 and subsequent SBKR burrow surveys conducted by ESA in 2023 for the project site (ECORP 2022; ESA 2023) (**Figure 2, SBKR Captures, Potential Burrows, and Camera Locations**). The project was designed to avoid impacts to habitat where SBKR individuals were trapped during protocol-level trapping surveys conducted in 2022 for the project (ECORP 2022). Therefore, the nighttime activity survey was focused on determining small mammal activity within the proposed exclusion fencing areas with suitable SBKR burrows to ensure avoidance.

July 2023 Nighttime Small Mammal Activity Survey Area

Based on the minimal detection of small mammals captured during the March 2023 nighttime small mammal activity survey, ESA conducted an additional nighttime small mammal activity survey to determine the project area in July 2023. The July 2023 nighttime small mammal activity survey area (July 2023 survey area) focused on a slightly larger area than accounted for during the March 2023 survey area to include surrounding areas where SBKR were previously captured in 2022 to serve as a control (**Figure 2**). As a result, the July 2023 survey area focused on all suitable SBKR habitat within the project site, including suitable SBKR habitat identified outside of the proposed exclusion fencing area and suitable SBKR habitat in the northwestern extent of the project site. The July 2023 survey was focused on determining use of potential kangaroo rat burrows in the project site (not just within the proposed project impact areas) to gain a better understanding of their use to ensure avoidance.

Nighttime Small Mammal Activity Camera Survey

The camera direction and location were selected according to the burrow locations identified during focused surveys and SBKR burrow survey locations mapped in 2022 and 2023, as well as based on the best line of sight to capture movement in the area (e.g., along dirt areas devoid of vegetation, through breaks in the vegetation, where the exclusion fencing was proposed, and where suitable SBKR burrows occur). Vegetation in the survey area was dense in locations so the biologists focused on installing camera locations in shrub patches that contained open areas with suitable SBKR burrows and bare ground (when possible) to maximize species photo captures. To the extent feasible, cameras were locked inside specialized security boxes to prevent vandalism and theft. Wildlife cameras were either bolted to 4-foot-tall steel posts or cabled to a chain-link fence or vegetation and angled toward the line of sight of the burrow location positioned approximately 1 to 4 feet off the ground. The cameras were oriented away from the sun (to the extent practical) to protect the lens from over-exposure and positioned to capture photographs and short video clips of wildlife walking within the camera's line of sight. Bait was not used as to not attract species from outside of the survey area into the survey area, since the survey's intention was to determine what small mammal species are using the area and where they are travelling in the project area and SBKR were captured outside of the survey area.

Once installed, all wildlife cameras were set to capture images throughout a 24-hour period. Each motion trigger was set to capture three consecutive photographs and a 20-second video clip, also considered a unique camera detection in this report, at intervals of at least 30 seconds between each unique camera detection. The wildlife cameras were placed on site for a minimum of five days. During the July 2023 nighttime activity survey, four of the cameras (8A, 12A, 13A, and 14A) that did not appear to function as well were switched with known functioning cameras and were placed on site for an additional three days, for a total of eight days. Upon removal, photographs and videos were reviewed and categorized based on the camera location and species detected. Videos and photographs of human activity, dogs, and/or vehicles were categorized as well to make general assumptions regarding the amount of anthropogenic disturbance in the survey area.

<u>March 2023 Camera Survey</u>

During the March 2023 nighttime small mammal activity survey, a total of six infrared motion detection wildlife cameras (Bushnell Trophy Cam) were installed within the March 2023 survey area to capture areas where potentially suitable SBKR burrows were abundant in the project area or in areas within the exclusion fencing area closest to where SBKR captures occurred in 2022 during protocol-level surveys (ECORP 2022). The wildlife cameras were installed on March 24, 2023, and removed on March 28, 2023. Specific data on the location and duration of monitoring at each remote wildlife camera is provided in **Table 1** and the camera locations are depicted in **Figure 2**. The target species for this study were small mammals, with a focus on rodent species such as mice, woodrats, and kangaroo rat species known to occur in the project site based on previous trapping surveys.

TABLE 1
MARCH 2023 REMOTE NIGHTTIME ACTIVITY SURVEY CAMERA LOCATIONS

Camera	Deployment Dates	Camera Duration	Location	Camera Direction
C-01	3/24/2023–3/28/2023	5 days	Lat: 34.106352° Long: -117.140944°	Facing east toward burrow 30 (north of graded road).
C-02	3/24/2023–3/28/2023	5 days	Lat: 34.106385° Long: -117.140441°	Facing southwest toward the general area of burrows 7 and 8 (north of graded road).
C-03	3/24/2023–3/28/2023	5 days	Lat: 34.106304° Long: -117.139997°	Facing north toward burrow 13, with burrows 10 and 12 in the background (north of graded road).
C-04	3/24/2023–3/28/2023	N/A	Lat: 34.106362° Long: -117.139756°	Facing east toward burrows 21, 22, and 26, with burrow 25 in the background (north of graded road).
C-05	3/24/2023–3/28/2023	5 days	Lat: 34.106264° Long: -117.139912°	Facing north toward burrow 14 (north of graded road).
C-06	3/24/2023–3/28/2023	5 days	Lat: 34.106116° Long: -117.139955°	Facing northwest toward burrows 42 and 43 (south of graded road and north of Weaver Street).

July 2023 Camera Survey

During the July 2023 nighttime small mammal activity survey, a total of 15 infrared motion detection wildlife cameras (Bushnell Trophy Cam, Browning, and Reconyx) were installed within the July 2023 survey area to capture photos in areas where potentially suitable SBKR burrows were abundant in the project area or in areas within the exclusion fencing area closest to where SBKR captures occurred in 2022 during protocol-level surveys (ECORP 2022). The majority of the wildlife cameras were installed on July 5, 2023, and removed on July 10, 2023. However, some cameras appeared to not function well in the field and were switched out with better cameras on July 10, 2023, and left on site until July 13, 2023 (these cameras are labelled with "A" next to their number value in **Table 2** below). Specific data on the location and duration of monitoring at each remote wildlife camera is provided in **Table 2** and the camera locations are depicted in **Figure 2**. Similarly, the target species for this study were small mammals, with a focus on rodent species such as mice, woodrats, and kangaroo rat species known to occur in the project site based on previous trapping surveys.

TABLE 2
JULY 2023 REMOTE NIGHTTIME ACTIVITY SURVEY CAMERA LOCATIONS

Camera	Deployment Dates	Camera Duration	Location	Camera Direction
C-1*	7/5/2023–7/10/2023	5 days	Lat: 34.106352° Long: -117.140944°	Facing northeast toward burrow 30 (north of graded road).
C-2*	7/5/2023–7/10/2023	5 days	Lat: 34.106291° Long: -117.140665°	Facing east toward burrow 6 (immediately W of SCE pole #254468E and north of graded road).
C-3*	7/5/2023–7/10/2023	5 days	Lat: 34.106380° Long: -117.140609°	Facing northeast toward burrows 7 and 8 (north of graded road).
C-4*	7/5/2023–7/10/2023	5 days	Lat: 34.106385° Long: -117.140033°	Facing west toward burrows 10 and 12 (north of graded road).
C-5*	7/5/2023–7/10/2023	5 days	Lat: 34.106289° Long: -117.140028°	Facing southwest toward burrow 11 (north of graded road).

Camera	Deployment Dates	Camera Duration	Location	Camera Direction
C-6*	7/5/2023–7/10/2023	5 days	Lat: 34.106116° Long: -117.139955°	Facing northwest toward burrows 42 and 43 (south of graded road and north of Weaver Street).
C-7	7/5/2023–7/10/2023	5 days	Lat: 34.106402° Long: -117.139813°	Facing southwest toward burrows 15, 16, and 17 (north of graded road and east of exclusion fencing area).
C-8*	7/5/2023–7/10/2023	5 days	Lat: 34.108153° Long: -117.141675°	Facing southeast toward burrows 47 and 48 (northwestern portion of project site).
C-8A*	7/10/2023–7/13/2023	3 days	Lat: 34.108153° Long: -117.141675°	Facing southeast toward burrows 47 and 48 (northwestern portion of project site; new camera).
C-9	7/5/2023–7/10/2023	5 days	Lat: 34.106286° Long: -117.139893°	Facing north toward burrow 14 (north of graded road and east of exclusion fencing area).
C-10	7/5/2023–7/10/2023	5 days	Lat: 34.106134° Long: -117.139592°	Facing east toward burrows 45 and 46 (south of graded road, north of Weaver Street, and east of exclusion fencing area).
C-11	7/5/2023–7/10/2023	5 days	Lat: 34.106294° Long: -117.139600°	Facing north toward burrow 28 (north of graded road and east of exclusion fencing area).
C-12	7/5/2023–7/10/2023	5 days	Lat: 34.106313° Long: -117.141269°	Facing west toward burrows 1, 2, and 3 (north of graded road and west of exclusion area).
C-12A	7/10/2023–7/13/2023	3 days	Lat: 34.106313° Long: -117.141269°	Facing west toward burrows 1, 2, and 3 (north of graded road and west of exclusion area; new camera).
C-13	7/5/2023–7/10/2023	5 days	Lat: 34.106136° Long: -117.141465°	Facing south toward burrows 41 (south of graded road and west of exclusion area).
C-13A	7/10/2023–7/13/2023	3 days	Lat: 34.106136° Long: -117.141465°	Facing south toward burrows 41 (south of graded road and west of exclusion area; new camera).
C-14*	7/5/2023–7/10/2023	5 days	Lat: 34.108311° Long: -117.141672°	Facing east toward burrow 49 (northwestern portion of project site).
C-14A*	7/10/2023–7/13/2023	3 days	Lat: 34.108311° Long: -117.141672°	Facing east toward burrow 49 (northwestern portion of project site; new camera).
C-15	7/5/2023–7/10/2023	5 days	Lat: 34.106395° Long: -117.139750°	Facing northeast tower burrows near 22-26 (north of graded road and east of exclusion fencing area)

* Camera locations located within the proposed project impact areas.

Results

March 2023 Nighttime Small Mammal Activity Survey Results

During the March 2023 nighttime small mammal activity survey, five of the six wildlife cameras captured data during the survey effort spanning over five days. Wildlife camera 4 (C-04) malfunctioned and did not capture any photos during the survey. Species detected at the five functioning wildlife camera locations (C-01, C-02, C-03, C-05, and C-06) included coyote (*Canis latrans*), California ground squirrel (*Otospermophilus douglasii*), desert cottontail (*Sylvilagus audubon*), various bird species (i.e., swallows (*Hirundo* spp.), common ravens (*Corvus corax*), and American crows (*Corvus brachyrhynchos*)), western fence lizard (Sceloporus occidentalis), invertebrates (i.e., flies, bees, moths, and butterflies), and domesticated dog. Vehicles also accounted for a number of the photo captures within March 2023 survey area. A summary of the results of the wildlife camera data from March 24, 2023, to March 28, 2023, can be found in **Table 3**.

TABLE 3
MARCH 2023 REMOTE NIGHTTIME ACTIVITY SURVEY DATA (UNIQUE CAMERA DETECTIONS)

Camera Station No.	Coyote	Domesticated Dog	California Ground Squirrel	Desert Cottontail	Swallow, Crow, Raven	Fence Lizard	Fly, Bee, Moth, Butterfly	Car, Truck
	Mammals				Birds	Reptiles	Invertebrates	Vehicle
C-01	4	0	0	0	0	0	0	0
C-02	6	0	0	10	0	0	0	0
C-03	2	0	0	0	8	0	4	8
C-04	Camera Malfunctioned (No Data)							
C-05	0	0	0	14	0	1	14	10
C-06	0	2	46	13	0	0	1	8
Total	**12**	**2**	**46**	**37**	**8**	**1**	**19**	**26**

The most common wildlife species detected during the March 2023 nighttime small mammal activity survey was California ground squirrel (46 unique camera detections) and desert cottontail (37 unique camera detections), followed by invertebrates (19 unique camera detections), coyote (12 unique camera detections), birds (8 unique camera detections), domesticated dog (2 unique camera detections), and fence lizard (1 unique camera detections). Many of the photos taken of these species are likely of the same individuals recurring through the photograph frame and captured numerous times. Thus, the total unique camera detections captured are not representative of these species' population size in the area. Additionally, California ground squirrel observations were most prevalent during the daytime, while desert cottontail was captured primarily in the early mornings and evenings. Although coyotes triggered 12 unique camera detections across three camera locations (C-1, C-2, and C-3), based on the time stamp of the detection and the sightings, these detections are from one or two coyote individuals captured across multiple cameras based on the view from camera 1 which shows the coyote going through the line of sight of other cameras located in the survey area. No Rodentia species were detected during the March 2023 nighttime activity survey. Representative photographs of wildlife species detected in March 2023 are included in **Attachment A**, **Representative Photographs of Wildlife Detected during the Nighttime Activity Survey**.

July 2023 Nighttime Small Mammal Activity Survey Results

During the subsequent July 2023 nighttime small mammal activity survey, all 15 wildlife cameras captured data during the survey effort spanning a minimum of five days. Four of the wildlife cameras (C-8, C-12, C-13, and C-14) were not working to their fullest extent (e.g., were capturing only video, minimal images were captured, etc.) and were replaced with known functioning cameras and were left on site for an additional three days; thus, cameras at these camera locations captured images for a total of eight days. Species detected at the 15 wildlife camera locations included coyote, California ground squirrel, desert cottontail, deer mouse (*Peromyscus* sp.), kangaroo rat (*Dipodomys* sp.), pocket mouse (*Chaetodipus* sp.), rodent (unknown) (Rodentia that could not be determined to genus from the photo capture), woodrat (*Neotoma* sp.), various birds (swallow, crow, raven, and towhee (*Pipilo* spp.)), herptiles (i.e., fence lizard, whiptail (*Aspidoscelis* sp.), and toad), invertebrates (i.e., flies, bees, moths, butterflies, unknown), and vehicles. A summary of the results of the wildlife camera data from July 5, 2023, to July 13, 2023, can be found in **Table 4**. Eight of the camera locations (C-1 through C-6, C-8, and C-14) occurred within the proposed project impact area, while the remaining seven camera locations (C-7, C-9 through C-13, and C-15) were installed outside of the proposed project impact area. The eight camera locations installed within the project impact area are highlighted in brown in **Table 4** below.

TABLE 4
JULY 2023 REMOTE NIGHTTIME ACTIVITY SURVEY DATA (UNIQUE CAMERA DETECTIONS)

Camera Station No.	Coyote	California Ground Squirrel	Desert Cottontail	Deer Mouse	Kangaroo Rat	Pocket Mouse	Rodent (Unknown)	Woodrat	Swallow, Crow, Raven, Towhee	Fence Lizard	Whiptail	Toad	Fly, Bee, Moth, Butterfly	Car, Truck
	Mammals								**Birds**	**Herptiles**			**Invertebrates**	**Vehicle**
C-1	0	0	0	4	0	0	0	0	0	4	7	0	17	14
C-2*	1	0	4	2	**8**	0	2	10	2	3	4	0	2	1
C-3*	0	0	1	0	**1**	0	0	0	0	0	0	0	4	54
C-4*	0	0	7	0	**1**	0	0	0	0	0	2	1	0	0
C-5	0	0	0	4	0	0	0	0	0	0	2	3	5	0
C-6	0	0	1	0	0	0	0	0	0	0	0	0	15	5
C-7*	2	1	7	11	**2**	0	5	0	0	0	4	0	2	0
C-8	0	0	0	0	0	0	0	0	0	0	0	0	18	3
C-8A	0	0	0	0	0	6	0	0	0	0	0	0	0	0
C-9*	0	1	13	0	**6**	0	0	4	1	0	0	0	2	0
C-10	0	0	1	0	0	0	0	2	0	0	1	0	34	0
C-11	0	0	0	0	0	0	3	0	0	0	0	0	22	0
C-12*	0	0	1	1	**4**	0	0	0	0	0	0	0	1	0
C-12A*	0	1	0	0	**4**	0	0	0	0	0	1	0	63	0
C-13	0	0	0	0	0	0	0	0	0	0	0	0	3	0
C-13A	0	0	0	0	0	0	0	0	0	0	0	0	58	0
C-14	0	0	0	0	0	0	0	0	0	0	0	0	1	0
C-14A	0	0	2	3	0	0	0	0	0	0	1	1	1	0
C-15	0	0	1	0	0	0	0	0	0	0	0	0	2	2
Total	**3**	**3**	**38**	**25**	**26**	**6**	**10**	**16**	**3**	**7**	**22**	**5**	**250**	**79**

* Camera locations with kangaroo rat detection(s).

The most common wildlife species detected during the July 2023 nighttime small mammal activity survey were invertebrates (250 unique camera detections), followed by desert cottontail (38 unique camera detections), kangaroo rat (26 unique camera detections), deer mouse (25 unique camera detections), and whiptail (22 unique camera detections). Other species observed less frequently include woodrat (16 unique camera detections), unknown Rodentia (10 unique camera detections), fence lizard (7 unique camera detections), pocket mouse (6 unique camera detections), toad (5 unique camera detections), California ground squirrel (3 unique camera detections), and coyote (3 unique camera detections). During July 2023, Rodentia species accounted for a total of 83 unique camera detections and may have been of the same individuals recurring through the photograph frame and captured numerous times. Thus, the total unique camera detections captured are not representative of their population size in the area. Representative photographs of wildlife species detected in July 2023 are included in **Attachment A**.

Weather

Weather likely played a role in the lack of Rodentia activity detected during the March 2023 nighttime activity small mammal activity survey effort, which resulted in additional nighttime small mammal activity surveys being warranted in July 2023. During the March 2023 nighttime small mammal activity survey, temperatures ranged from a low of 34.5° Fahrenheit (F) to a high of 71.4° F with most nighttime temperatures occurring between 37° F and 50° F during the time when kangaroo rats would be most active. During the July 2023 nighttime small mammal activity survey, temperatures ranged from a low of 54.3° F to a high of 101.8° F with most nighttime temperatures occurring between 57° F and 75° F during the time when kangaroo rats would be most active. Weather data for the March and July 2023 survey dates are summarized in **Tables 5** and **6**.

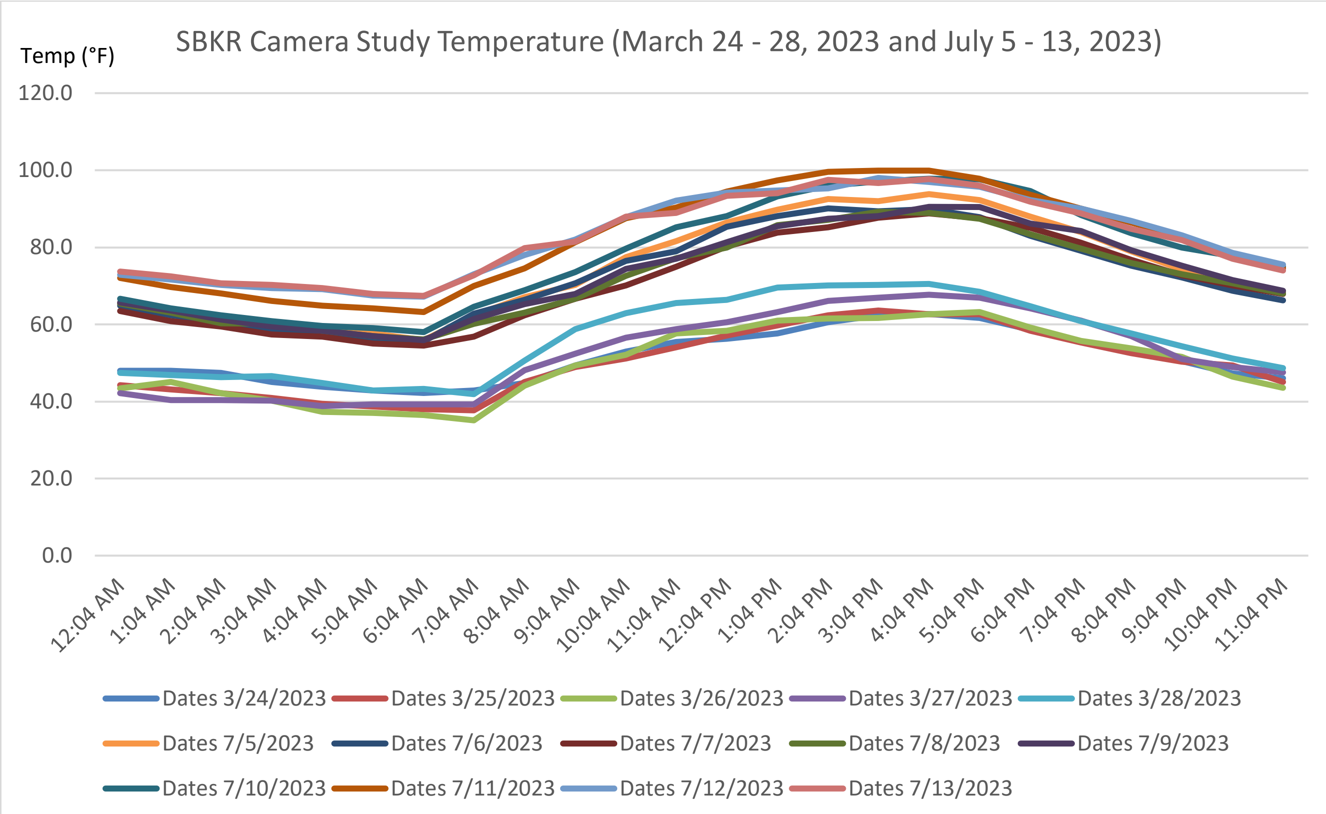
TABLE 5
MARCH AND JULY 2023 REMOTE NIGHTTIME ACTIVITY SURVEY WEATHER DATA

Average Weather Conditions	March 2023 Dates					July 2023 Dates								
	3/24	3/25	3/26	3/27	3/28	7/5	7/6	7/7	7/8	7/9	7/10	7/11	7/12	7/13
Temperature Low (°F)	41.7	37.4	34.5	38.3	41.7	55.8	54.7	54.3	55.8	55.8	57.4	63.0	66.9	66.7
Temperature High (°F)	63.3	64.0	63.5	68.5	71.4	94.8	91.8	89.8	91.2	91.2	99.1	101.8	98.8	98.8
Temperature Average (°F)	51.3	50.0	49.8	52.4	56.1	74.6	72.5	71.2	72.1	73.2	77.9	81.8	82.7	82.3
Wind Low (MPH)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wind High (MPH)	9.8	12.5	8.5	8.5	8.1	10.1	7.4	8.1	8.5	7.2	7.2	6.9	7.4	7.4
Wind Average (MPH)	0.9	1.3	1.2	0.7	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8
Wind Direction	WNW	SSE	NNW	SE	WNW	NW	WNW	W	WNW	WNW	WNW	WNW	WNW	WNW
Precipitation Average (in.)	0.0	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Moon Phase	WC	WC	WC	WC	FQ	WG	WG	WG	LQ	LQ	LQ	WC	WC	WC
Moon Visibility (%)	11.7	19.3	28.0	37.4	50.0	88.6	79.9	69.8	28.8	47.7	37.0	27.1	18.5	11.3

Legend:

°F = degrees Fahrenheit FQ = First Quarter
MPH = miles per hour LQ = Last Quarter
in. = inches WC = Waxing Crescent
% = percent WG = Waning Gibbous

TABLE 6
MARCH AND JULY 2023 REMOTE NIGHTTIME ACTIVITY SURVEY TEMPERATURE GRAPH



Discussion

The March 2023 nighttime small mammal activity survey focused on the small mammal movement in the southern portion of the project site where the exclusion fencing was proposed. Although two small mammals, California ground squirrel and desert cottontail, were frequently detected in the survey area during the March 2023 nighttime small mammal activity survey effort, no rodent species were observed. Based on the results of the previous SBKR trapping efforts conducted in the project site in 2022, five rodent species are known to occur in the general project area: SBKR (3 individuals over 7 captures outside the survey area), San Diego pocket mouse (76 total captures), Bryant's woodrat (45 total captures), northern Baja deer mouse (16 total captures), and deer mouse (18 total captures) (ECORP 2022). Thus, ESA anticipated capturing unique camera detections for rodent species known to occur in the survey area during the nighttime activity survey. Cameras were placed in a manner that should have captured rodent activity if present on site, and cameras detected species of similar size or smaller and less detectable than rodents (i.e., invertebrates and fence lizards). Thus, weather was thought to have played a major role in why other rodent species that were likely to be present in the survey area were not detected during the March 2023 nighttime activity survey.

During the March 2023 survey effort, the weather dropped below 50° Fahrenheit (F) and was documented as low as 34.5°F on March 26, 2023, during the time that these species would have been active in the nighttime if present (see **Tables 5** and **6**). Based on literature review, San Diego pocket mouse is active year-round, but are known to have reduced activity during cold spells (Zeiner 1990). Likewise, although deer mice do not hibernate, they may become dormant (torpid) when weather is especially severe (University of California Agriculture and

Natural Resources 2012). While it was unclear whether the cold weather experienced during the nighttime activity survey may have influenced kangaroo rat or woodrat movement in the area, it is likely that the movement of San Diego pocket mouse, northern Baja deer mouse, and deer mouse known to occur in the area was affected by the cold spell experienced during the nighttime activity survey. As a result of the lack of Rodentia species identified during the March 2023 nighttime activity survey effort, it was recommended that an additional nighttime activity survey be conducted when weather conditions are more suitable for rodent detection, that additional cameras be installed throughout the southern portion of the project site to get a better understanding of all small mammal movement in the southern portion of the project site, and the more recently documented suitable SBKR burrows in the northwestern portion of the project site also be included in the survey to gain a more thorough understanding of rodent activity throughout the project site. Thus, an additional nighttime activity survey was conducted in July 2023.

The July 2023 nighttime small mammal activity survey was conducted in summer when temperatures were more conducive to capturing photos of rodent activity in the project area and included a slightly larger area to cover all areas with suitable SBKR habitat (i.e., within the northwestern portion of the project site and areas outside of project impact areas). The July 2023 nighttime activity survey effort resulted in the detection of four rodent genus including: 25 unique camera detections for deer mouse (*Peromyscus* sp.), 26 unique camera detections for kangaroo rat (*Dipodomys* sp.), 6 unique camera detections for pocket mouse (*Chaetodipus* sp.), and 16 unique camera detections for woodrat (*Neotoma* sp.). Additionally, 10 unique camera detections were confirmed to be rodents but could not be determined to genus based on the photo captures; thus, is represented as unknown rodent in the data. A total of 83 unique camera detections were captured for rodent species during the July 2023 nighttime activity survey. Kangaroo rat individuals were confirmed at six camera locations, including C-2, C-3, and C-4 within the proposed work areas and C-7, C-9, and C-12/12A outside of proposed work areas. Although there is no way to confirm the kangaroo rat to species level during the photo captures, it is assumed that these photo detections may be SBKR based on species known to occur in the area; however, Dulzura kangaroo rat (*Dipodomys simulans*) range also overlaps with the project site and survey areas. Therefore, additional trapping efforts would be required to confirm the species of kangaroo rat present on site.

Recommendations

We recommend small mammal trapping be conducted in the project area to confirm the presence of kangaroo rat species on the project site. Alternatively, Metropolitan could assume the presence of SBKR on the project site and obtain take permits under the state and federal Endangered Species Acts (ESAs). This would ensure that the project is covered for incidental take if SBKR is found on the site in the future.

References

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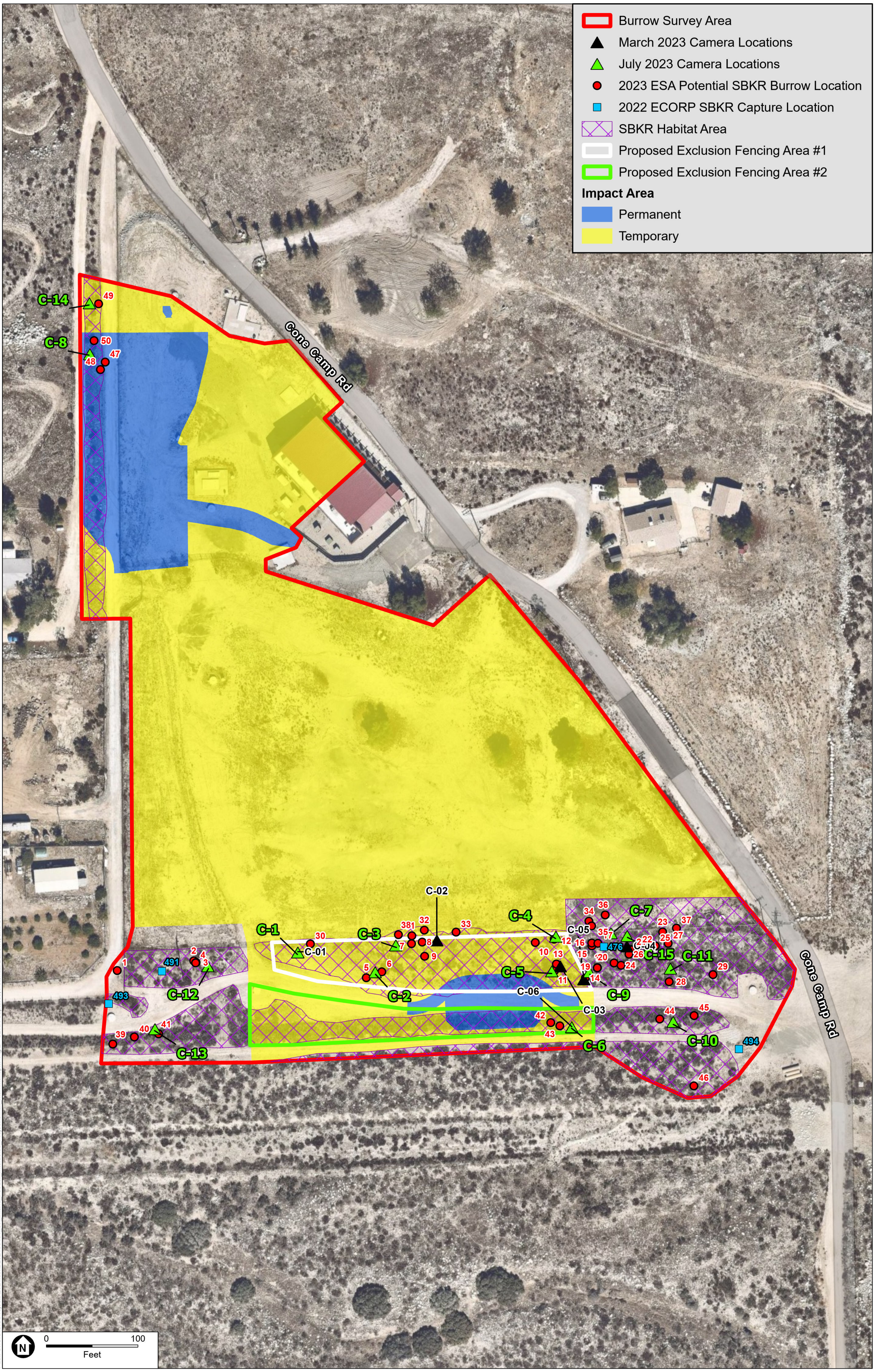
SOURCE: ESA, 2023

Inland Feeder Foothill Pump Station Intertie Phase 1 Project

Figure 1

Regional Vicinity and Project Location

ESA



SOURCE: ESA, 2023

Inland Feeder Foothill Pump Station Intertie Phase 1 Project

Figure 2
SBKR Captures, Potential Burrows, and Camera Locations

ESA

Attachment A
Representative Photographs of Wildlife Detected during the Nighttime Activity Surveys

ESA

Coyote detected at Camera 1 in March 2023.

Coyote at Camera 1 in March 2023 (Camera 2 light triggered in background).

Desert cottontail detected at Camera 2 in March 2023.

Coyote detected at Camera 2 in March 2023.

Desert cottontail detected at Camera 5 in March 2023.

California ground squirrel detected at Camera 6 in March 2023.

Domesticated dog detected at Camera 6 in March 2023.

Desert cottontail detected at Camera 6 in March 2023.

Deer mouse detected at Camera 1 in July 2023.

Deer mouse detected at Camera 1 in July 2023.

Whiptail detected at Camera 1 in July 2023.

Deer mouse detected at Camera 2 in July 2023.

Kangaroo rat detected at Camera 2.

Kangaroo rat detected at Camera 2 in July 2023.

Kangaroo rat detected at Camera 2 in July 2023.

Coyote detected at Camera 2 in July 2023.

Whiptail detected at Camera 2 in July 2023.

Desert cottontail detected at Camera 2 in July 2023.

Woodrat detected at Camera 2 in July 2023.

Kangaroo rat detected at Camera 3 in July 2023.

Desert cottontail detected at Camera 3 in July 2023.

Two desert cottontails detected at Camera 4 in July 2023.

Kangaroo rat detected at Camera 4 in July 2023.

Whiptail detected at Camera 4 in July 2023.

Desert cottontail detected at Camera 4 in July 2023.

Deer mouse detected at Camera 5 in July 2023.

Toad detected at Camera 5.

Desert cottontail detected at Camera 6 in July 2023.

Desert cottontail detected at Camera 7 in July 2023.

Deer mouse detected at Camera 7 in July 2023.

Deer mouse detected at Camera 7 in July 2023.

Coyote detected at Camera 7 in July 2023.

Whiptail detected at Camera 7 in July 2023.

Deer mouse detected at Camera 7 in July 2023.

Kangaroo rat detected at Camera 7 in July 2023.

California ground squirrel detected at Camera 7 in July 2023.

Kangaroo rat detected at Camera 7 in July 2023.

Pocket mouse detected at Camera 8A in July 2023.

Desert cottontail detected at Camera 9.

Kangaroo rat detected at Camera 9 in July 2023.

Woodrat detected at Camera 9 in July 2023.

Whiptail detected at Camera 10 in July 2023.

Desert cottontail detected at Camera 10 in July 2023.

Woodrat detected at Camera 10 in July 2023.

Kangaroo rat detected at Camera 12 in July 2023.

Kangaroo rat detected at Camera 12 in July 2023.

Kangaroo rat detected at Camera 12A in July 2023.

California ground squirrel detected at Camera 12A in July 2023.

Kangaroo rat detected at Camera 12A in July 2023.

Kangaroo rat detected at Camera 12A in July 2023.

Foraging kangaroo rat detected at Camera 12A in July 2023.

Deer mouse detected at Camera 14 in July 2023.

Desert cottontail detected at Camera 14 in July 2023.

Juvenile toad detected at Camera 14 in July 2023.

Deer mouse detected at Camera 14 in July 2023.

Desert cottontail detected at Camera 15 in July 2023.

Attachment B
Representative Photographs

Photo 1 (N). Photograph depicts the annual grasses and forbs habitat located northeast of the project area within the study area.

Photo 2 (N). Photograph depicts the brittle bush scrub habitat located east of the project area within the study area.

Photo 3 (E). Photograph depicts the brittle bush-California buckwheat scrub habitat present within and surrounding the constructed drainage located south of the project area within the study area.

Photo 4 (W). Photograph depicts the chamise chaparral-brittle bush scrub habitat within the southeastern portion of the study area outside of the project area.

Photo 5 (W). Photograph depicts the southern portion of the project area.

Photo 6 (N). Photograph depicts the potentially suitable SBKR habitat present along the west side of the project area.

Photo 7 (S). Photograph depicts the hairy yerba santa scrub habitat present within the southern portion of the study area outside of the project area.

Photo 8 (W). Photograph depicts Ephemeral Drainage 1 located within the northern portion of the study area outside of the project area.

Photo 9 (W). Photograph depicts Ephemeral Drainage 2 located within the southern portion of the study area outside of the project area.

Photo 10 (W). Photograph depicts Ephemeral Drainage 3 located within the southern portion of the study area outside of the project area.

Attachment C
Floral and Faunal Compendia

Scientific Name	Common Name	Comment
Flora		
Angiosperms		
Eudicots		
Anacardiaceae	**Cashew Family**	
Rhus ovata	sugar bush	
*Schinus molle**	Peruvian pepper tree	
Asteraceae	**Aster Family**	
Ambrosia psilostachya	western ragweed	
Artemisia californica	California sagebrush	
Baccharis salicifolia	mule fat	
Centaurea melitensis	Maltese star thistle	
Encelia farinosa	brittlebush	
Gutierrezia californica	California matchweed	
Helianthus annuus	common sunflower	
Heterotheca grandiflora	telegraphweed	
Bigoniaceae	**Bigonia Family**	
*Jacaranda mimosifolia**	black poui	
Boraginaceae	**Forget-me-not Family**	
Amsinckia menziesii	small flowered fiddleneck	
Brassicaceae	**Mustard Family**	
*Brassica nigra**	black mustard	
*Brassica tournefortii**	Saharan mustard	
*Hirschfeldia incana**	short-podded mustard	
Cactaceae	**Cactus Family**	
Cylindropuntia californica	California cholla	
Convolulaceae	**Bindweed Family**	
Cuscuta californica	California dodder	
Cucurbitaceae	**Gourd Family**	
Marah macrocarpa	chilicothe	
Cupressaceae	**Cypress Family**	
*Cupressus sempervirens**	Italian cypress	
Fabaceae	**Pea Family**	
Acmispon glaber	deerweed	
Fagaceae	**Beech, Chestnut, and Oak Family**	
Quercus sp.	scrub oak	
Geraniaceae	**Geranium Family**	
*Erodium botys**	broad leaf filaree	

Scientific Name	Common Name	Comment
Erodium sp.*	filaree	
Hydrophyllaceae	**Waterleaf Family**	
Phacelia distans	common phacelia	
Malvaceae	**Mallow Family**	
*Malva parviflora**	cheeseweed mallow	
Myrtaceae	**Myrtle Family**	
Eucalyptus sp.*	eucalyptus	
Namaceae	**Nama Family**	
Eriodictylon trichocalyx	hairy yerba santa	
Nyctaginaceae	**Four O'Clock Family**	
Mirabilis laevis	desert wishbone bush	
Oleaceae	**Olive Family**	
*Olea europaea**	olive	
Polygonaceae	**Buckwheat Family**	
Eriogonum fasciculatum	California buckwheat	
Eriogonum gracile	slender buckwheat	
Rosaceae	**Rose Family**	
Adenostoma fasciculatum	chamise	
Rutaceae	**Citrus Family**	
Citrus x sinesis	orange	
Salicaceae	**Willow Family**	
Populus fremontii	Fremont cottonwood	
Salix exigua	sandbar willow	
Simaroubaceae	**Quassia Family**	
*Ailanthus altissisma**	tree of heaven	
Solanaceae	**Nightshade Family**	
Datura wrightii	sacred datura	
*Nicotiana glauca**	tree tobacco	
*Solanum xanti**	purple nightshade	
Tamaricaceae	**Tamarisk Family**	
*Tamarix sp.**	tamarisk	

Gymnosperms

Pinaceae	**Pine Family**	
*Cedrus deodara**	deodar cedar	

Monocots

Agavaceae	**Agave Family**	
Hesperoyucca whipplei	chaparral yucca	

Scientific Name	Common Name	Comment
Arecaceae	**Palm Family**	
*Syagrus romanzoffiana**	queen palm	
Poaceae	**Grass Family**	
*Arundo donax**	giant reed	
Avena sp.*	oat	
Bromus sp.*	brome	
*Bromus diandrus**	ripgut brome	
*Pennisetum setaceum**	fountaingrass	

Ferns

Pteridaceae	**Brake Family**	
Pellaea andromedifolia	coffee fern	

Scientific Name	Common Name	Comment
Fauna		
Birds		
Phasianidae	**Pheasants**	
*Pavo cristatus**	Indian peafowl	
Columbidae	**Pigeons and Doves**	
*Streptopelia decaocto**	Eurasian collared dove	
Zenaida macroura	mourning dove	
Trochillidae	**Hummingbirds**	
Calypte anna	Anna's hummingbird	
Corvidae	**Jays and Crows**	
Corvus corax	common raven	
Fringillidae	**Finches**	
Haemorhous mexicanus	House finch	
Sturnella neglecta	western meadowlark	
Aegithalidae	**Bushtits**	
Psaltriparus minimus	bushtit	
Troglodytidae	**Wrens**	
Thryomanes bewickii	Bewick's wren	
Parulidae	**New World Warblers**	
Setophaga coronata	yellow-rumped warbler	
Tyrannidae	**Tyrant Flycatchers**	
Sayornis nigricans	black phoebe	
Sayornis saya	Say's phoebe	
Polioptilidae	**Gnatcatchers and Gnatwrens**	
Polioptila caerulea	blue-gray gnatcatcher	
Polioptila californica californica	coastal California gnatcatcher	Federally threatened; CDFW species of special concern
Passerellidae	**New World Sparrows**	
Melozone crissalis	California towhee	
Zonotrichia leucophrys	white-crowned sparrow	

Attachment D
CNDDB and CNPS Results

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE RareFind

Query Summary:
Quad IS (Redlands (3411712) OR San Bernardino North (3411723) OR Harrison Mtn. (3411722) OR Keller Peak (3411721) OR Yucaipa (3411711) OR El Casco (3311781) OR Sunnymead (3311782) OR Riverside East (3311783) OR San Bernardino South (3411713))

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Accipiter cooperii	Cooper's hawk	Birds	ABNKC12040	118	3	None	None	G5	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Cismontane woodland, Riparian forest, Riparian woodland, Upper montane coniferous forest
Agelaius tricolor	tricolored blackbird	Birds	ABPBXB0020	960	9	None	Threatened	G1G2	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered, USFWS_BCC-Birds of Conservation Concern	Freshwater marsh, Marsh & swamp, Swamp, Wetland
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	Birds	ABPBX91091	235	18	None	None	G5T3	S4	null	CDFW_WL-Watch List	Chaparral, Coastal scrub
Allium howellii var. clokeyi	Mt. Pinos onion	Monocots	PMLIL02161	25	1	None	None	G4T2	S2	1B.3	SB_SBBG-Santa Barbara Botanic Garden, USFS_S-Sensitive	Great Basin scrub, Meadow & seep, Pinon & juniper woodlands
Allium marvinii	Yucaipa onion	Monocots	PMLIL02330	47	2	None	None	G1	S1	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral
Anniella stebbinsi	Southern California legless lizard	Reptiles	ARACC01060	427	34	None	None	G3	S3	null	CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Broadleaved upland forest, Chaparral, Coastal dunes, Coastal scrub
Antrozous pallidus	pallid bat	Mammals	AMACC10010	420	1	None	None	G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive	Chaparral, Coastal scrub, Desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Riparian woodland, Sonoran desert scrub, Upper montane coniferous forest, Valley & foothill grassland
Aquila chrysaetos	golden eagle	Birds	ABNKC22010	332	1	None	None	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, CDFW_WL-Watch List, IUCN_LC-Least Concern	Broadleaved upland forest, Cismontane woodland, Coastal prairie, Great Basin grassland, Great Basin scrub, Lower montane coniferous forest, Pinon & juniper woodlands, Upper montane coniferous forest, Valley &

												foothill grassland
Arenaria paludicola	marsh sandwort	Dicots	PDCAR040L0	19	1	Endangered	Endangered	G1	S1	1B.1	SB_SBBG-Santa Barbara Botanic Garden	Freshwater marsh, Marsh & swamp, Wetland
Arizona elegans occidentalis	California glossy snake	Reptiles	ARADB01017	260	11	None	None	G5T2	S2	null	CDFW_SSC-Species of Special Concern	null
Artemisiospiza belli belli	Bell's sparrow	Birds	ABPBX97021	61	2	None	None	G5T2T3	S3	null	CDFW_WL-Watch List	Chaparral, Coastal scrub
Aspidoscelis hyperythra	orange-throated whiptail	Reptiles	ARACJ02060	369	24	None	None	G5	S2S3	null	CDFW_WL-Watch List, IUCN_LC-Least Concern, USFS_S-Sensitive	Chaparral, Cismontane woodland, Coastal scrub
Aspidoscelis tigris stejnegeri	coastal whiptail	Reptiles	ARACJ02143	148	15	None	None	G5T5	S3	null	CDFW_SSC-Species of Special Concern	null
Astragalus hornii var. hornii	Horn's milk-vetch	Dicots	PDFAB0F421	28	1	None	None	GUT1	S1	1B.1	BLM_S-Sensitive	Alkali playa, Meadow & seep, Wetland
Athene cunicularia	burrowing owl	Birds	ABNSB10010	2011	13	None	None	G4	S2	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Coastal prairie, Coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, Valley & foothill grassland
Atriplex coronata var. notatior	San Jacinto Valley crownscale	Dicots	PDCHE040C2	16	5	Endangered	None	G4T1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Alkali playa, Valley & foothill grassland, Vernal pool, Wetland
Atriplex serenana var. davidsonii	Davidson's saltscale	Dicots	PDCHE041T1	26	1	None	None	G5T1	S1	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Coastal bluff scrub, Coastal scrub
Batrachoseps gabrieli	San Gabriel slender salamander	Amphibians	AAAAD02110	8	1	None	None	G2G3	S2S3	null	IUCN_DD-Data Deficient, USFS_S-Sensitive	Talus slope
Berberis nevinii	Nevin's barberry	Dicots	PDBER060A0	32	5	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub
Bombus crotchii	Crotch bumble bee	Insects	IIHYM24480	437	16	None	Candidate Endangered	G2	S2	null	IUCN_EN-Endangered	null
Bombus morrisoni	Morrison bumble bee	Insects	IIHYM24460	86	1	None	None	G3	S1S2	null	IUCN_VU-Vulnerable	null
Bombus pensylvanicus	American bumble bee	Insects	IIHYM24260	304	2	None	None	G3G4	S2	null	IUCN_VU-Vulnerable	Coastal prairie, Great Basin grassland, Valley & foothill grassland
Brodiaea filifolia	thread-leaved brodiaea	Monocots	PMLIL0C050	141	2	Threatened	Endangered	G2	S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Buteo regalis	ferruginous hawk	Birds	ABNKC19120	107	1	None	None	G4	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Great Basin grassland, Great Basin scrub, Pinon & juniper woodlands, Valley & foothill grassland
Buteo swainsoni	Swainson's hawk	Birds	ABNKC19070	2561	2	None	Threatened	G5	S4	null	BLM_S-Sensitive, IUCN_LC-Least Concern	Great Basin grassland, Riparian forest, Riparian woodland, Valley & foothill grassland
Calochortus palmeri var. palmeri	Palmer's mariposa-lily	Monocots	PMLIL0D122	111	4	None	None	G3T2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara	Chaparral, Lower montane coniferous forest, Meadow & seep

											Botanic Garden, USFS_S-Sensitive	
Calochortus plummerae	Plummer's mariposa-lily	Monocots	PMLIL0D150	230	24	None	None	G4	S4	4.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley & foothill grassland
Canyon Live Oak Ravine Forest	Canyon Live Oak Ravine Forest	Riparian	CTT61350CA	50	1	None	None	G3	S3.3	null	null	Riparian forest
Carex comosa	bristly sedge	Monocots	PMCYP032Y0	31	1	None	None	G5	S2	2B.1	IUCN_LC-Least Concern	Coastal prairie, Freshwater marsh, Marsh & swamp, Valley & foothill grassland, Wetland
Castilleja cinerea	ash-gray paintbrush	Dicots	PDSCR0D0H0	53	1	Threatened	None	G1G2	S1S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Meadow & seep, Mojavean desert scrub, Pavement plain, Pinon & juniper woodlands, Upper montane coniferous forest
Castilleja lasiorhyncha	San Bernardino Mountains owl's-clover	Dicots	PDSCR0D410	46	7	None	None	G2?	S2?	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Meadow & seep, Pavement plain, Riparian woodland, Upper montane coniferous forest, Wetland
Catostomus santaanae	Santa Ana sucker	Fish	AFCJC02190	28	3	Threatened	None	G1	S1	null	AFS_TH-Threatened, IUCN_EN-Endangered	Aquatic, South coast flowing waters
Centromadia pungens ssp. laevis	smooth tarplant	Dicots	PDAST4R0R4	137	17	None	None	G3G4T2	S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Alkali playa, Chenopod scrub, Meadow & seep, Riparian woodland, Valley & foothill grassland, Wetland
Ceratochrysis longimala	Desert cuckoo wasp	Insects	IIHYM71040	2	1	None	None	G1	S1	null	null	null
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	Mammals	AMAFD05031	101	25	None	None	G5T3T4	S3S4	null	null	Chaparral, Coastal scrub
Charina umbratica	southern rubber boa	Reptiles	ARADA01011	94	22	None	Threatened	G2G3	S2	null	IUCN_VU-Vulnerable, USFS_S-Sensitive	Meadow & seep, Riparian forest, Riparian woodland, Upper montane coniferous forest, Wetland
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	Dicots	PDSCR0J0C2	26	1	Endangered	Endangered	G4?T1	S1	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank, SB_SBBG-Santa Barbara Botanic Garden	Coastal dunes, Marsh & swamp, Salt marsh, Wetland
Chorizanthe parryi var. parryi	Parry's spineflower	Dicots	PDPGN040J2	150	29	None	None	G3T2	S2	1B.1	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Chorizanthe xanti var. leucotheca	white-bracted spineflower	Dicots	PDPGN040Z1	59	1	None	None	G4T3	S3	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_USDA-US Dept of Agriculture, USFS_S-Sensitive	Coastal scrub, Mojavean desert scrub, Pinon & juniper woodlands

Coccyzus americanus occidentalis	western yellow-billed cuckoo	Birds	ABNRB02022	165	3	Threatened	Endangered	G5T2T3	S1	null	BLM_S-Sensitive, USFS_S-Sensitive	Riparian forest
Coleonyx variegatus abbotti	San Diego banded gecko	Reptiles	ARACD01031	8	1	None	None	G5T5	S1S2	null	CDFW_SSC-Species of Special Concern	Chaparral, Coastal scrub
Crotalus ruber	red-diamond rattlesnake	Reptiles	ARADE02090	192	9	None	None	G4	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern, USFS_S-Sensitive	Chaparral, Mojavean desert scrub, Sonoran desert scrub
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	Dicots	PDCUS01111	6	1	None	None	G5T4?	SH	2B.2	null	Marsh & swamp, Wetland
Diadophis punctatus modestus	San Bernardino ringneck snake	Reptiles	ARADB10015	14	3	None	None	G5T2T3	S2?	null	USFS_S-Sensitive	null
Diplectrona californica	California diplectronan caddisfly	Insects	IITRI23010	2	1	None	None	G1G2	S1	null	null	Aquatic
Dipodomys merriami parvus	San Bernardino kangaroo rat	Mammals	AMAFD03143	81	28	Endangered	Candidate Endangered	G5T1	S1	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Dipodomys stephensi	Stephens' kangaroo rat	Mammals	AMAFD03100	226	35	Threatened	Threatened	G2	S3	null	IUCN_VU-Vulnerable	Coastal scrub, Valley & foothill grassland
Dodecahema leptoceras	slender-horned spineflower	Dicots	PDPGN0V010	42	9	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Cismontane woodland, Coastal scrub
Elanus leucurus	white-tailed kite	Birds	ABNKC06010	184	3	None	None	G5	S3S4	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern	Cismontane woodland, Marsh & swamp, Riparian woodland, Valley & foothill grassland, Wetland
Empidonax traillii extimus	southwestern willow flycatcher	Birds	ABPAE33043	70	5	Endangered	Endangered	G5T2	S3	null	null	Riparian woodland
Emys marmorata	western pond turtle	Reptiles	ARAAD02030	1559	1	Proposed Threatened	None	G3G4	S3	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, Artificial flowing waters, Klamath/North coast flowing waters, Klamath/North coast standing waters, Marsh & swamp, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Eremophila alpestris actia	California horned lark	Birds	ABPAT02011	94	4	None	None	G5T4Q	S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marine intertidal & splash zone communities, Meadow & seep
Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	Dicots	PDPLM03035	31	25	Endangered	Endangered	G4T1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Coastal scrub
Euchloe hyantis andrewsi	Andrew's marble butterfly	Insects	IILEPA5032	6	4	None	None	G4G5T1	S2	null	null	Lower montane coniferous forest
Eugnosta busckana	Busck's gallmoth	Insects	IILEM2X090	15	3	None	None	G1G3	S2S3	null	null	Coastal dunes, Coastal scrub
Eumops perotis californicus	western mastiff bat	Mammals	AMACD02011	296	6	None	None	G4G5T4	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern	Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Euphydryas editha quino	quino checkerspot butterfly	Insects	IILEPK405L	186	2	Endangered	None	G4G5T1T2	S1S2	null	null	Chaparral, Coastal scrub

Falco columbarius	merlin	Birds	ABNKD06030	37	2	None	None	G5	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Estuary, Great Basin grassland, Valley & foothill grassland
Fimbristylis thermalis	hot springs fimbristylis	Monocots	PMCYP0B0N0	19	1	None	None	G4	S1S2	2B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Meadow & seep, Wetland
Galium californicum ssp. primum	Alvin Meadow bedstraw	Dicots	PDRUB0N0E6	12	1	None	None	G5T2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Lower montane coniferous forest
Gila orcuttii	arroyo chub	Fish	AFCJB13120	49	2	None	None	G2	S2	null	AFS_VU-Vulnerable, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Aquatic, South coast flowing waters
Glaucomys oregonensis californicus	San Bernardino flying squirrel	Mammals	AMAFB09021	12	5	None	None	G5T1T2	S1S2	null	CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Broadleaved upland forest, Lower montane coniferous forest
Haliaeetus leucocephalus	bald eagle	Birds	ABNKC10010	333	3	Delisted	Endangered	G5	S3	null	BLM_S-Sensitive, CDF_S-Sensitive, CDFW_FP-Fully Protected, IUCN_LC-Least Concern, USFS_S-Sensitive	Lower montane coniferous forest, Oldgrowth
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	Dicots	PDAST4N102	7	1	None	None	G5TX	SX	1A	null	Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
Heuchera parishii	Parish's alumroot	Dicots	PDSAX0E1F0	70	5	None	None	G3	S3	1B.3	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Alpine boulder & rock field, Limestone, Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest
Horkelia cuneata var. puberula	mesa horkelia	Dicots	PDROS0W045	103	1	None	None	G4T1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Chaparral, Cismontane woodland, Coastal scrub
Icteria virens	yellow-breasted chat	Birds	ABPBX24010	101	3	None	None	G5	S4	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Riparian forest, Riparian scrub, Riparian woodland
Imperata brevifolia	California satintail	Monocots	PMPOA3D020	32	4	None	None	G3	S3	2B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden, USFS_S-Sensitive	Chaparral, Coastal scrub, Meadow & seep, Mojavean desert scrub, Riparian scrub, Wetland
Ivesia argyrocoma var. argyrocoma	silver-haired ivesia	Dicots	PDROS0X021	41	1	None	None	G2T2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Meadow & seep, Pavement plain, Upper montane coniferous forest
Lanius ludovicianus	loggerhead shrike	Birds	ABPBR01030	110	3	None	None	G4	S4	null	CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Broadleaved upland forest, Desert wash, Joshua tree woodland, Mojavean desert scrub, Pinon & juniper woodlands, Riparian woodland, Sonoran desert scrub
Lasiurus xanthinus	western yellow bat	Mammals	AMACC05070	58	8	None	None	G4G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Desert wash

Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Dicots	PDAST5L0A1	111	7	None	None	G4T2	S2	1B.1	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Alkali playa, Marsh & swamp, Salt marsh, Vernal pool, Wetland
Laterallus jamaicensis coturniculus	California black rail	Birds	ABNME03041	304	2	None	Threatened	G3T1	S2	null	BLM_S-Sensitive, CDFW_FP-Fully Protected, IUCN_EN-Endangered	Brackish marsh, Freshwater marsh, Marsh & swamp, Salt marsh, Wetland
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	Dicots	PDBRA1M114	142	9	None	None	G5T3	S3	4.3	null	Chaparral, Coastal scrub
Leptonycteris yerbabuenae	lesser long-nosed bat	Mammals	AMACB03030	2	1	Delisted	None	G3	S1	null	CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Mojavean desert scrub, Sonoran desert scrub, Upper Sonoran scrub
Lepus californicus bennettii	San Diego black-tailed jackrabbit	Mammals	AMAEB03051	103	12	None	None	G5T3T4	S3S4	null	null	Coastal scrub
Lilium parryi	lemon lily	Monocots	PMLIL1A0J0	160	16	None	None	G3	S3	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank, USFS_S-Sensitive	Lower montane coniferous forest, Meadow & seep, Riparian forest, Upper montane coniferous forest, Wetland
Lycium parishii	Parish's desert-thorn	Dicots	PDSOL0G0D0	21	1	None	None	G4	S1	2B.3	SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	Coastal scrub, Sonoran desert scrub
Malacothamnus parishii	Parish's bush-mallow	Dicots	PDMAL0Q0C0	1	1	None	None	GXQ	SX	1A	null	Chaparral, Coastal scrub
Monardella macrantha ssp. hallii	Hall's monardella	Dicots	PDLAM180E1	41	5	None	None	G5T3	S3	1B.3	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Broadleaved upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley & foothill grassland
Monardella pringlei	Pringle's monardella	Dicots	PDLAM180J0	2	1	None	None	GX	SX	1A	null	Coastal scrub
Nama stenocarpa	mud nama	Dicots	PDHYD0A0H0	22	1	None	None	G4G5	S1S2	2B.2	null	Marsh & swamp, Wetland
Nasturtium gambelii	Gambel's water cress	Dicots	PDBRA270V0	13	1	Endangered	Threatened	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Brackish marsh, Freshwater marsh, Marsh & swamp, Wetland
Neolarra alba	white cuckoo bee	Insects	IIHYM81010	8	2	None	None	GH	SH	null	null	null
Neotamias speciosus speciosus	lodgepole chipmunk	Mammals	AMAFB02172	24	3	None	None	G4T3T4	S2	null	null	Chaparral, Upper montane coniferous forest
Neotoma lepida intermedia	San Diego desert woodrat	Mammals	AMAFF08041	132	5	None	None	G5T3T4	S3S4	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Nyctinomops femorosaccus	pocketed free-tailed bat	Mammals	AMACD04010	90	2	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Joshua tree woodland, Pinon & juniper woodlands, Riparian scrub, Sonoran desert scrub
Oncorhynchus mykiss irideus pop. 10	steelhead - southern California DPS	Fish	AFCHA0209J	19	1	Endangered	Candidate Endangered	G5T1Q	S1	null	AFS_EN-Endangered	Aquatic, South coast flowing waters
Onychomys torridus ramona	southern grasshopper mouse	Mammals	AMAFF06022	28	3	None	None	G5T3	S3	null	CDFW_SSC-Species of Special Concern	Chenopod scrub
Packera bernardina	San Bernardino ragwort	Dicots	PDAST8H0E0	35	1	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Meadow & seep, Pavement plain, Upper montane coniferous forest, Wetland

Pelazoneuron puberulum var. sonorense	Sonoran maiden fern	Ferns	PPTHE05192	27	1	None	None	G5T3	S2	2B.2	USFS_S-Sensitive	Meadow & seep, Wetland
Perideridia parishii ssp. parishii	Parish's yampah	Dicots	PDAPI1N0C2	37	8	None	None	G4T3T4	S2	2B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Lower montane coniferous forest, Meadow & seep, Upper montane coniferous forest
Perognathus alticola alticola	white-eared pocket mouse	Mammals	AMAFD01081	3	3	None	None	G2TH	SH	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable, USFS_S-Sensitive	Lower montane coniferous forest, Mojavean desert scrub, Pinon & juniper woodlands
Perognathus longimembris brevinasus	Los Angeles pocket mouse	Mammals	AMAFD01041	70	18	None	None	G5T2	S1S2	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Phrynosoma blainvillii	coast horned lizard	Reptiles	ARACF12100	824	23	None	None	G4	S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Chaparral, Cismontane woodland, Coastal bluff scrub, Coastal scrub, Desert wash, Pinon & juniper woodlands, Riparian scrub, Riparian woodland, Valley & foothill grassland
Plegadis chihi	white-faced ibis	Birds	ABNGE02020	20	1	None	None	G5	S3S4	null	CDFW_WL-Watch List, IUCN_LC-Least Concern	Marsh & swamp, Wetland
Polioptila californica californica	coastal California gnatcatcher	Birds	ABPBJ08081	1087	14	Threatened	None	G4G5T3Q	S2	null	CDFW_SSC-Species of Special Concern	Coastal bluff scrub, Coastal scrub
Rana draytonii	California red-legged frog	Amphibians	AAABH01022	1764	1	Threatened	None	G2G3	S2S3	null	CDFW_SSC-Species of Special Concern, IUCN_VU-Vulnerable	Aquatic, Artificial flowing waters, Artificial standing waters, Freshwater marsh, Marsh & swamp, Riparian forest, Riparian scrub, Riparian woodland, Sacramento/San Joaquin flowing waters, Sacramento/San Joaquin standing waters, South coast flowing waters, South coast standing waters, Wetland
Rana muscosa	southern mountain yellow-legged frog	Amphibians	AAABH01330	186	5	Endangered	Endangered	G1	S2	null	CDFW_WL-Watch List, IUCN_EN-Endangered, USFS_S-Sensitive	Aquatic
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Insects	IIDIP05021	36	20	Endangered	None	G1T1	S1	null	null	Interior dunes
Rhinichthys osculus ssp. 8	Santa Ana speckled dace	Fish	AFCJB3705K	13	3	None	None	G5T1	S1	null	AFS_TH-Threatened, CDFW_SSC-Species of Special Concern, USFS_S-Sensitive	Aquatic, South coast flowing waters
Ribes divaricatum var. parishii	Parish's gooseberry	Dicots	PDGRO020F3	5	1	None	None	G5TX	SX	1A	null	Riparian woodland
Riversidian Alluvial Fan Sage Scrub	Riversidian Alluvial Fan Sage Scrub	Scrub	CTT32720CA	30	4	None	None	G1	S1.1	null	null	Coastal scrub
Salvadora hexalepis virgultea	coast patch-nosed snake	Reptiles	ARADB30033	34	2	None	None	G5T4	S3	null	CDFW_SSC-Species of Special Concern	Coastal scrub
Schoenus nigricans	black bog-rush	Monocots	PMCYP0P010	13	1	None	None	G4	S2	2B.2	IUCN_LC-Least Concern, USFS_S-Sensitive	Marsh & swamp, Wetland

Senecio aphanactis	chaparral ragwort	Dicots	PDAST8H060	98	2	None	None	G3	S2	2B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank	Chaparral, Cismontane woodland, Coastal scrub
Setophaga petechia	yellow warbler	Birds	ABPBX03010	78	3	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Riparian forest, Riparian scrub, Riparian woodland
Sidalcea hickmanii ssp. parishii	Parish's checkerbloom	Dicots	PDMAL110A3	24	1	None	Rare	G3T1	S1	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden, USFS_S-Sensitive	Chaparral, Cismontane woodland, Lower montane coniferous forest
Sidalcea malviflora ssp. dolosa	Bear Valley checkerbloom	Dicots	PDMAL110FH	18	1	None	None	G5T2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Lower montane coniferous forest, Meadow & seep, Riparian woodland, Upper montane coniferous forest, Wetland
Sidalcea neomexicana	salt spring checkerbloom	Dicots	PDMAL110J0	30	4	None	None	G4	S2	2B.2	USFS_S-Sensitive	Alkali playa, Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub, Wetland
Sidalcea pedata	bird-foot checkerbloom	Dicots	PDMAL110L0	24	1	Endangered	Endangered	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Meadow & seep, Pavement plain, Wetland
Southern Coast Live Oak Riparian Forest	Southern Coast Live Oak Riparian Forest	Riparian	CTT61310CA	246	2	None	None	G4	S4	null	null	Riparian forest
Southern Cottonwood Willow Riparian Forest	Southern Cottonwood Willow Riparian Forest	Riparian	CTT61330CA	111	3	None	None	G3	S3.2	null	null	Riparian forest
Southern Mixed Riparian Forest	Southern Mixed Riparian Forest	Riparian	CTT61340CA	14	1	None	None	G2	S2.1	null	null	Riparian forest
Southern Riparian Forest	Southern Riparian Forest	Riparian	CTT61300CA	20	1	None	None	G4	S4	null	null	Riparian forest
Southern Riparian Scrub	Southern Riparian Scrub	Riparian	CTT63300CA	56	2	None	None	G3	S3.2	null	null	Riparian scrub
Southern Sycamore Alder Riparian Woodland	Southern Sycamore Alder Riparian Woodland	Riparian	CTT62400CA	230	16	None	None	G4	S4	null	null	Riparian woodland
Southern Willow Scrub	Southern Willow Scrub	Riparian	CTT63320CA	45	1	None	None	G3	S2.1	null	null	Riparian scrub
Spea hammondii	western spadefoot	Amphibians	AAABF02020	1444	38	Proposed Threatened	None	G2G3	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_NT-Near Threatened	Cismontane woodland, Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Sphenopholis obtusata	prairie wedge grass	Monocots	PMPOA5T030	19	2	None	None	G5	S2	2B.2	null	Cismontane woodland, Meadow & seep, Wetland
Spinus lawrencei	Lawrence's goldfinch	Birds	ABPBY06100	4	1	None	None	G3G4	S4	null	IUCN_LC-Least Concern, USFWS_BCC-Birds of Conservation Concern	Broadleaved upland forest, Chaparral, Pinon & juniper woodlands, Riparian woodland

Streptanthus bernardinus	Laguna Mountains jewelflower	Dicots	PDBRA2G060	22	7	None	None	G3G4	S3S4	4.3	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Chaparral, Lower montane coniferous forest, Upper montane coniferous forest
Streptanthus campestris	southern jewelflower	Dicots	PDBRA2G0B0	73	4	None	None	G3	S3	1B.3	BLM_S-Sensitive, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank, USFS_S-Sensitive	Chaparral, Lower montane coniferous forest, Pinon & juniper woodlands
Streptocephalus woottoni	Riverside fairy shrimp	Crustaceans	ICBRA07010	83	2	Endangered	None	G1G2	S2	null	IUCN_EN-Endangered	Coastal scrub, Valley & foothill grassland, Vernal pool, Wetland
Symphyotrichum defoliatum	San Bernardino aster	Dicots	PDASTE80C0	102	3	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_CRES-San Diego Zoo CRES Native Gene Seed Bank, USFS_S-Sensitive	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Valley & foothill grassland
Taxidea taxus	American badger	Mammals	AMAJF04010	645	3	None	None	G5	S3	null	CDFW_SSC-Species of Special Concern, IUCN_LC-Least Concern	Alkali marsh, Alkali playa, Alpine, Alpine dwarf scrub, Bog & fen, Brackish marsh, Broadleaved upland forest, Chaparral, Chenopod scrub, Cismontane woodland, Closed-cone coniferous forest, Coastal bluff scrub, Coastal dunes, Coastal prairie, Coastal scrub, Desert dunes, Desert wash, Freshwater marsh, Great Basin grassland, Great Basin scrub, Interior dunes, Ione formation, Joshua tree woodland, Limestone, Lower montane coniferous forest, Marsh & swamp, Meadow & seep, Mojavean desert scrub, Montane dwarf scrub, North coast coniferous forest, Oldgrowth, Pavement plain, Redwood, Riparian forest, Riparian scrub, Riparian woodland, Salt marsh, Sonoran desert scrub, Sonoran thorn woodland, Ultramafic, Upper montane coniferous forest, Upper Sonoran scrub, Valley & foothill grassland
Thamnophis hammondii	two-striped gartersnake	Reptiles	ARADB36160	184	10	None	None	G4	S3S4	null	BLM_S-Sensitive, CDFW_SSC-Species of Special Concern, IUCN_LC-	Marsh & swamp, Riparian scrub, Riparian

											Least Concern, USFS_S-Sensitive	woodland, Wetland
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Dicots	PDAST9F031	12	1	None	None	G4T3	S1	2B.1	null	Marsh & swamp, Meadow & seep, Riparian forest, Vernal pool, Wetland
Vireo bellii pusillus	least Bell's vireo	Birds	ABPBW01114	505	29	Endangered	Endangered	G5T2	S3	null	null	Riparian forest, Riparian scrub, Riparian woodland

CALIFORNIA NATIVE PLANT SOCIETY

CNPS Rare Plant Inventory

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▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Abronia villosa var. *aurita*	chaparral sand-verbena	Nyctaginaceae	annual herb	(Jan)Mar-Sep	None	None	G5T2?	S2	1B.1		2001-01-01	 © 2011 Aaron E. Sims
Acanthoscyphus parishii var. *parishii*	Parish's oxytheca	Polygonaceae	annual herb	Jun-Sep	None	None	G4? T3T4	S3S4	4.2	Yes	2007-04-05	 © 2014 Keir Morse
Allium howellii var. *clokeyi*	Mt. Pinos onion	Alliaceae	perennial bulbiferous herb	Apr-Jun	None	None	G4T2	S2	1B.3	Yes	1974-01-01	 © 2016 Keir Morse
Allium marvinii	Yucaipa onion	Alliaceae	perennial bulbiferous herb	Apr-May	None	None	G1	S1	1B.2	Yes	2001-01-01	 © 2013 Keir Morse
Androsace elongata ssp. *acuta*	California androsace	Primulaceae	annual herb	Mar-Jun	None	None	G5? T3T4	S3S4	4.2		1994-01-01	 © 2008 Aaron Schusteff
Arenaria paludicola	marsh sandwort	Caryophyllaceae	perennial stoloniferous herb	May-Aug	FE	CE	G1	S1	1B.1		1984-01-01	No Photo Available
Artemisia palmeri	San Diego sagewort	Asteraceae	perennial deciduous shrub	(Feb)May-Sep	None	None	G3?	S3?	4.2		1974-01-01	No Photo Available
Asplenium vespertinum	western spleenwort	Aspleniaceae	perennial rhizomatous herb	Feb-Jun	None	None	G3?	S4	4.2		1974-01-01	No Photo Available

Monardella macrantha ssp. *hallii*	Hall's monardella	Lamiaceae	perennial rhizomatous herb	Jun-Oct	None	None	G5T3	S3	1B.3	Yes	1974-01-01	No Photo Available
Monardella pringlei	Pringle's monardella	Lamiaceae	annual herb	May-Jun	None	None	GX	SX	1A	Yes	1974-01-01	No Photo Available
Muhlenbergia californica	California muhly	Poaceae	perennial rhizomatous herb	Jun-Sep	None	None	G4	S4	4.3	Yes	1994-01-01	No Photo Available
Muilla coronata	crowned muilla	Themidaceae	perennial bulbiferous herb	Mar-Apr(May)	None	None	G3	S3	4.2		1988-01-01	No Photo Available
Nama stenocarpa	mud nama	Namaceae	annual/perennial herb	Jan-Jul	None	None	G4G5	S1S2	2B.2		1994-01-01	No Photo Available
Nasturtium gambelii	Gambel's water cress	Brassicaceae	perennial rhizomatous herb	Apr-Oct	FE	CT	G1	S1	1B.1		1980-01-01	No Photo Available
Packera bernardina	San Bernardino ragwort	Asteraceae	perennial herb	May-Jul	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Pelazoneuron puberulum var. *sonorense*	Sonoran maiden fern	Thelypteridaceae	perennial rhizomatous herb	Jan-Sep	None	None	G5T3	S2	2B.2		1994-01-01	No Photo Available
Perideridia parishii ssp. *parishii*	Parish's yampah	Apiaceae	perennial herb	Jun-Aug	None	None	G4T3T4	S2	2B.2		1974-01-01	No Photo Available
Phacelia mohavensis	Mojave phacelia	Hydrophyllaceae	annual herb	Apr-Aug	None	None	G4Q	S4	4.3	Yes	1994-01-01	No Photo Available
Phacelia stellaris	Brand's star phacelia	Hydrophyllaceae	annual herb	Mar-Jun	None	None	G1	S1	1B.1		1994-01-01	No Photo Available
Piperia leptopetala	narrow-petaled rein orchid	Orchidaceae	perennial herb	May-Jul	None	None	G4	S4	4.3	Yes	2001-01-01	No Photo Available
Quercus engelmannii	Engelmann oak	Fagaceae	perennial deciduous tree	Mar-Jun	None	None	G3	S3	4.2		1988-01-01	No Photo Available
Ribes divaricatum var. *parishii*	Parish's gooseberry	Grossulariaceae	perennial deciduous shrub	Feb-Apr	None	None	G5TX	SX	1A	Yes	1988-01-01	No Photo Available
Romneya coulteri	Coulter's matilija poppy	Papaveraceae	perennial rhizomatous herb	Mar-Jul(Aug)	None	None	G4	S4	4.2		1974-01-01	No Photo Available
Rupertia rigida	Parish's rupertia	Fabaceae	perennial herb	Jun-Aug	None	None	G4	S4	4.3		1974-01-01	No Photo Available

Caulanthus simulans	Payson's jewelflower	Brassicaceae	annual herb	(Feb)Mar-May(Jun)	None	None	G4	S4	4.2	Yes	1974-01-01	No Photo Available
Centromadia pungens ssp. *laevis*	smooth tarplant	Asteraceae	annual herb	Apr-Sep	None	None	G3G4T2	S2	1B.1	Yes	1994-01-01	No Photo Available
Chloropyron maritimum ssp. *maritimum*	salt marsh bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct(Nov)	FE	CE	G4?T1	S1	1B.2		1974-01-01	No Photo Available
Chorizanthe leptotheca	Peninsular spineflower	Polygonaceae	annual herb	May-Aug	None	None	G3	S3	4.2		1994-01-01	No Photo Available
Chorizanthe parryi var. *parryi*	Parry's spineflower	Polygonaceae	annual herb	Apr-Jun	None	None	G3T2	S2	1B.1	Yes	1994-01-01	 © 2012 Keir Morse
Chorizanthe xanti var. *leucotheca*	white-bracted spineflower	Polygonaceae	annual herb	Apr-Jun	None	None	G4T3	S3	1B.2	Yes	1994-01-01	No Photo Available
Convolvulus simulans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	None	None	G4	S4	4.2		1994-01-01	No Photo Available
Cuscuta obtusiflora var. *glandulosa*	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	Jul-Oct	None	None	G5T4?	SH	2B.2		2011-08-24	No Photo Available
Deinandra paniculata	paniculate tarplant	Asteraceae	annual herb	(Mar)Apr-Nov	None	None	G4	S4	4.2		2001-01-01	No Photo Available
Diplacus clevelandii	Cleveland's bush monkeyflower	Phrymaceae	perennial rhizomatous herb	Apr-Jul	None	None	G4	S4	4.2		1980-01-01	 © 2020 W. Juergen Schrenk
Dodecahema leptoceras	slender-horned spineflower	Polygonaceae	annual herb	Apr-Jun	FE	CE	G1	S1	1B.1	Yes	1980-01-01	No Photo Available
Eriastrum densifolium ssp. *sanctorum*	Santa Ana River woollystar	Polemoniaceae	perennial herb	Apr-Sep	FE	CE	G4T1	S1	1B.1	Yes	1980-01-01	No Photo Available
Eriophyllum lanatum var. *obovatum*	southern Sierra woolly sunflower	Asteraceae	perennial herb	Jun-Jul	None	None	G5T4	S4	4.3	Yes	1974-01-01	No Photo Available
Erythranthe exigua	San Bernardino Mountains monkeyflower	Phrymaceae	annual herb	May-Jul	None	None	G2	S2	1B.2		1974-01-01	No Photo Available

Fimbristylis thermalis	hot springs fimbristylis	Cyperaceae	perennial rhizomatous herb	Jul-Sep	None	None	G4	S1S2	2B.2		1980-01-01	No Photo Available
Frasera neglecta	pine green-gentian	Gentianaceae	perennial herb	May-Jul	None	None	G4	S4	4.3	Yes	1980-01-01	No Photo Available
Fritillaria pinetorum	pine fritillary	Liliaceae	perennial bulbiferous herb	May-Jul(Sep)	None	None	G4	S4	4.3	Yes	2001-01-01	 © 2008 Steve Matson
Galium californicum ssp. *primum*	Alvin Meadow bedstraw	Rubiaceae	perennial herb	May-Jul	None	None	G5T2	S2	1B.2	Yes	1974-01-01	 © 2013 Keir Morse
Galium johnstonii	Johnston's bedstraw	Rubiaceae	perennial herb	Jun-Jul	None	None	G4	S4	4.3	Yes	1974-01-01	 © 2015 Keir Morse
Helianthus nuttallii ssp. *parishii*	Los Angeles sunflower	Asteraceae	perennial rhizomatous herb	Aug-Oct	None	None	G5TX	SX	1A	Yes	1974-01-01	No Photo Available
Heuchera caespitosa	urn-flowered alumroot	Saxifragaceae	perennial rhizomatous herb	May-Aug	None	None	G3	S3	4.3	Yes	1974-01-01	 © 2015 Keir Morse
Heuchera parishii	Parish's alumroot	Saxifragaceae	perennial rhizomatous herb	Jun-Aug	None	None	G3	S3	1B.3	Yes	1974-01-01	 © 2015 Keir Morse
Hordeum intercedens	vernal barley	Poaceae	annual herb	Mar-Jun	None	None	G3G4	S3S4	3.2		1994-01-01	No Photo Available
Horkelia cuneata var. *puberula*	mesa horkelia	Rosaceae	perennial herb	Feb-Jul(Sep)	None	None	G4T1	S1	1B.1	Yes	2001-01-01	 © 2008 Tony Morosco
Hulsea vestita ssp. *parryi*	Parry's sunflower	Asteraceae	perennial herb	Apr-Aug	None	None	G5T4	S4	4.3	Yes	1994-01-01	 © 2015 Keir Morse

Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	Sep-May	None	None	G3	S3	2B.1		2006-12-26	 © 2020 Matt C. Berger
Ivesia argyrocoma var. *argyrocoma*	silver-haired ivesia	Rosaceae	perennial herb	Jun-Aug	None	None	G2T2	S2	1B.2	Yes	1974-01-01	 © 2015 Keir Morse
Juglans californica	Southern California black walnut	Juglandaceae	perennial deciduous tree	Mar-Aug	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2020 Zoya Akulova
Juncus duranii	Duran's rush	Juncaceae	perennial rhizomatous herb	Jul-Aug	None	None	G3	S3	4.3	Yes	1974-01-01	 © 2017 Keir Morse
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	None	None	G4T2	S2	1B.1		1994-01-01	 © 2013 Keir Morse
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	Brassicaceae	annual herb	Jan-Jul	None	None	G5T3	S3	4.3		1994-01-01	 © 2015 Keir Morse
Lilium humboldtii ssp. *ocellatum*	ocellated Humboldt lily	Liliaceae	perennial bulbiferous herb	Mar-Jul(Aug)	None	None	G4T4?	S4?	4.2	Yes	1980-01-01	 © 2008 Thomas Stoughton
Lilium parryi	lemon lily	Liliaceae	perennial bulbiferous herb	Jul-Aug	None	None	G3	S3	1B.2		1974-01-01	 © 2009 Thomas Stoughton
Lycium parishii	Parish's desert-thorn	Solanaceae	perennial shrub	Mar-Apr	None	None	G4	S1	2B.3		1980-01-01	No Photo Available
Malacothamnus parishii	Parish's bush-mallow	Malvaceae	perennial deciduous shrub	Jun-Jul	None	None	GXQ	SX	1A	Yes	1974-01-01	 © 2021 Keir Morse

Monardella macrantha ssp. hallii	Hall's monardella	Lamiaceae	perennial rhizomatous herb	Jun-Oct	None	None	G5T3	S3	1B.3	Yes	1974-01-01	No Photo Available
Monardella pringlei	Pringle's monardella	Lamiaceae	annual herb	May-Jun	None	None	GX	SX	1A	Yes	1974-01-01	No Photo Available
Muhlenbergia californica	California muhly	Poaceae	perennial rhizomatous herb	Jun-Sep	None	None	G4	S4	4.3	Yes	1994-01-01	No Photo Available
Muilla coronata	crowned muilla	Themidaceae	perennial bulbiferous herb	Mar-Apr(May)	None	None	G3	S3	4.2		1988-01-01	No Photo Available
Nama stenocarpa	mud nama	Namaceae	annual/perennial herb	Jan-Jul	None	None	G4G5	S1S2	2B.2		1994-01-01	No Photo Available
Nasturtium gambelii	Gambel's water cress	Brassicaceae	perennial rhizomatous herb	Apr-Oct	FE	CT	G1	S1	1B.1		1980-01-01	No Photo Available
Packera bernardina	San Bernardino ragwort	Asteraceae	perennial herb	May-Jul	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Pelazoneuron puberulum var. sonorense	Sonoran maiden fern	Thelypteridaceae	perennial rhizomatous herb	Jan-Sep	None	None	G5T3	S2	2B.2		1994-01-01	No Photo Available
Perideridia parishii ssp. parishii	Parish's yampah	Apiaceae	perennial herb	Jun-Aug	None	None	G4T3T4	S2	2B.2		1974-01-01	No Photo Available
Phacelia mohavensis	Mojave phacelia	Hydrophyllaceae	annual herb	Apr-Aug	None	None	G4Q	S4	4.3	Yes	1994-01-01	No Photo Available
Phacelia stellaris	Brand's star phacelia	Hydrophyllaceae	annual herb	Mar-Jun	None	None	G1	S1	1B.1		1994-01-01	No Photo Available
Piperia leptopetala	narrow-petaled rein orchid	Orchidaceae	perennial herb	May-Jul	None	None	G4	S4	4.3	Yes	2001-01-01	No Photo Available
Quercus engelmannii	Engelmann oak	Fagaceae	perennial deciduous tree	Mar-Jun	None	None	G3	S3	4.2		1988-01-01	No Photo Available
Ribes divaricatum var. parishii	Parish's gooseberry	Grossulariaceae	perennial deciduous shrub	Feb-Apr	None	None	G5TX	SX	1A	Yes	1988-01-01	No Photo Available
Romneya coulteri	Coulter's matilija poppy	Papaveraceae	perennial rhizomatous herb	Mar-Jul(Aug)	None	None	G4	S4	4.2		1974-01-01	No Photo Available
Rupertia rigida	Parish's rupertia	Fabaceae	perennial herb	Jun-Aug	None	None	G4	S4	4.3		1974-01-01	No Photo Available

Schoenus nigricans	black bog-rush	Cyperaceae	perennial herb	Aug-Sep	None	None	G4	S2	2B.2		2001-01-01	No Photo Available
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	None	None	G3	S2	2B.2		1994-01-01	No Photo Available
Senecio astephanus	San Gabriel ragwort	Asteraceae	perennial herb	May-Jul	None	None	G3	S3	4.3	Yes	2006-12-21	No Photo Available
Sidalcea hickmanii ssp. *parishii*	Parish's checkerbloom	Malvaceae	perennial herb	(May)Jun-Aug	None	CR	G3T1	S1	1B.2	Yes	1974-01-01	No Photo Available
Sidalcea malviflora ssp. *dolosa*	Bear Valley checkerbloom	Malvaceae	perennial herb	May-Aug	None	None	G5T2	S2	1B.2	Yes	2012-06-13	No Photo Available
Sidalcea neomexicana	salt spring checkerbloom	Malvaceae	perennial herb	Mar-Jun	None	None	G4	S2	2B.2		1994-01-01	No Photo Available
Sidalcea pedata	bird-foot checkerbloom	Malvaceae	perennial herb	May-Aug	FE	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Sidotheca caryophylloides	chickweed oxytheca	Polygonaceae	annual herb	Jul-Sep(Oct)	None	None	G4	S4	4.3	Yes	1980-01-01	 ©2021 Keir Morse
Sphenopholis obtusata	prairie wedge grass	Poaceae	perennial herb	Apr-Jul	None	None	G5	S2	2B.2		1974-01-01	No Photo Available
Streptanthus bernardinus	Laguna Mountains jewelflower	Brassicaceae	perennial herb	May-Aug	None	None	G3G4	S3S4	4.3	Yes	1980-01-01	No Photo Available
Streptanthus campestris	southern jewelflower	Brassicaceae	perennial herb	(Apr)May-Jul	None	None	G3	S3	1B.3		1994-01-01	No Photo Available
Symphyotrichum defoliatum	San Bernardino aster	Asteraceae	perennial rhizomatous herb	Jul-Nov	None	None	G2	S2	1B.2	Yes	2004-01-01	No Photo Available
Trichocoronis wrightii var. *wrightii*	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	None	None	G4T3	S1	2B.1		1988-01-01	No Photo Available
Trichostema micranthum	small-flowered bluecurls	Lamiaceae	annual herb	Jun-Sep	None	None	G4	S3	4.3		1974-01-01	No Photo Available

Showing 1 to 87 of 87 entries

Suggested Citation:

California Native Plant Society, Rare Plant Program. 2024. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 2 January 2024].

Attachment E
Exclusionary Fence Design

AMX48

Temporary & Permanent Wildlife Fencing

Specification & Installation Guides
LAST UPDATED MAY 2022

SUITABLE SPECIES

- TURTLES (Large)
- LIZARDS (Large)
- FROGS
- SMALL MAMMALS

Contents

Animex®

AMX 48
Basic Material Size & Features

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

The length of each **AMX 48** section will vary depending on the material choice.

AMX 48 dimensions based on Animex's optimal fencing materials.

SCORED PLASTIC - PERFORATED & NON-PERFORATED
Temporary Applications **(AMX-T)**
Thickness: 0.04in / 1mm
Length: 60ft / 18.2m
Weight: 50lbs / 23kg

Semi-Permanent Applications **(AMX-SP)**
Thickness: 0.08in / 2mm
Length: 30ft / 9m
Weight: 48lbs / 23kg

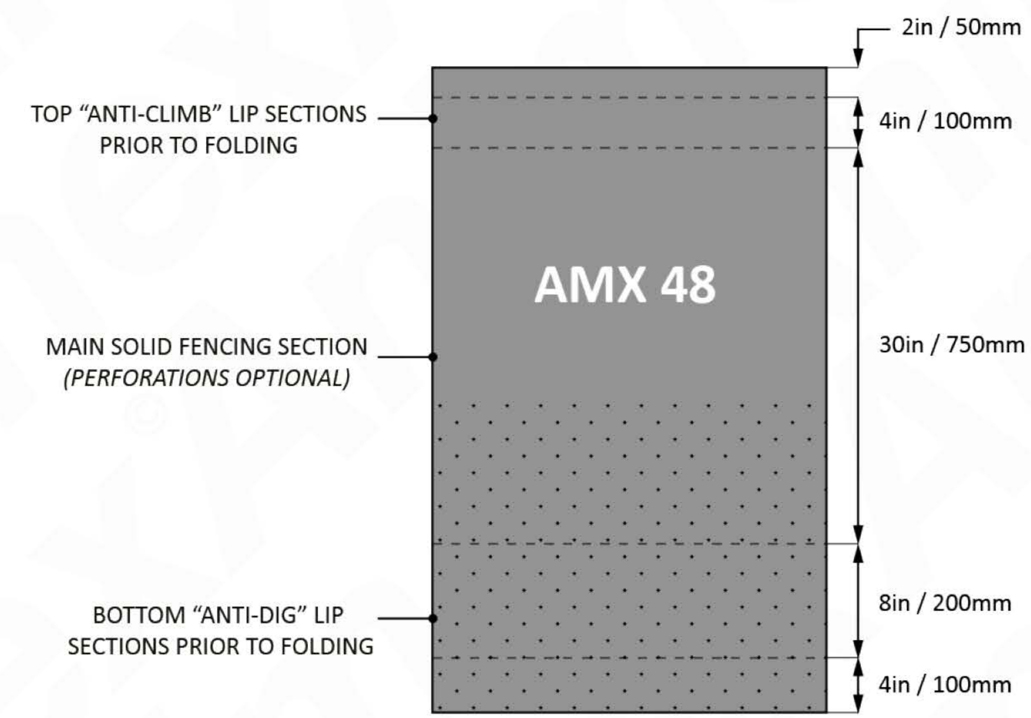
PREFORMED METAL- PERFORATED & NON-PERFORATED
Permanent Applications **(AMX-XP)**
Thickness: 0.08in / 2mm
Length: 8ft / 2.4m
Weight: 99lbs / 45kg

AMX 48 INSTALLED ABOVE GROUND HEIGHT: **30in / 750mm**

Notes:
These dimensions are based on maximising the amount of material that can be shipped economically and manoeuvred on site in line with common health and safety guidelines.

Material may be shipped in sheets or rolls depending on their length.

Customised options for alternative **AMX48** barrier options are available from Animex® Fencing suppliers upon request. Other traditional and existing fencing materials including posts and wire etc can be obtained from local contractors.



AMX 48
Step-by-Step Installation

1) Clear vegetation along the fence line and work area.

2) Mark out the Animex fence line.

3) Below Ground: Excavate trench. Ensure the trench is level and clear of large clumps or rocks.
Above Ground: Clear Ground. Ensure the ground is level and clear of large clumps or rocks.

4) Free-Standing: Lay out posts and roll out Animex barrier (Fold bottom lip if required).
Attached to exisiting fences: Roll out Animex barrier along fence (Fold bottom lip if required).

5) Install posts at the back of the trench using manual or machine powered post driver (Install horizontal wire if required and secure to end braces).

6) Place the Animex fence material into the trench with the lips facing towards the area that animals will encounter the fence.

7) Fasten the Animex to posts, straining wire or exisiting fence starting at the top and work down.

8) When attaching rolls overlap them following details on installation drawing Pg7. A minimum of 4 ties should be used on any joins in the fence

9) Back fill the trench. Ensure the backfill is compact to eliminate gaps for animals to crawl through. Do the same on the back side of the fence.

10) Fasten the top lips and install any additional features such as one-way funnels or pitfall traps (if required).

MATERIALS

Required
- Animex Fencing
- Animex Washers
- UV Resistant Zip-ties or Fencing Wire
- Fence Posts

Optional
- 12 Gauge Straining Wire
- Fence end braces & wire strainers
- Gripple Wire Joiners (or similar)
- Fence Post Safety Caps

TOOLS & EQUIPMENT

Required
- Weed wacker / Whipper
- String Line & Marker Pain
- Box Cutter / Stanley Knife
- Trencher / Excavator
- Spade / Trench / Shovel
- Post Diver / Sledge Hammer
- Battery Powered Drill
- Spade Drill Bit 3/4 (20mm)
- Cutting Pliers

Optional
- Shear Attachment For Drill (Trim Fence)
- Battery Powered reciprocating Saw (Trim Posts)
- Drill Bit For Drainage Holes 1/8in (3mm)
- Gripple Tensioning Tool

Fixings & Fastening
Scorded Plastic HDPE

AMX-T & AMX-SP

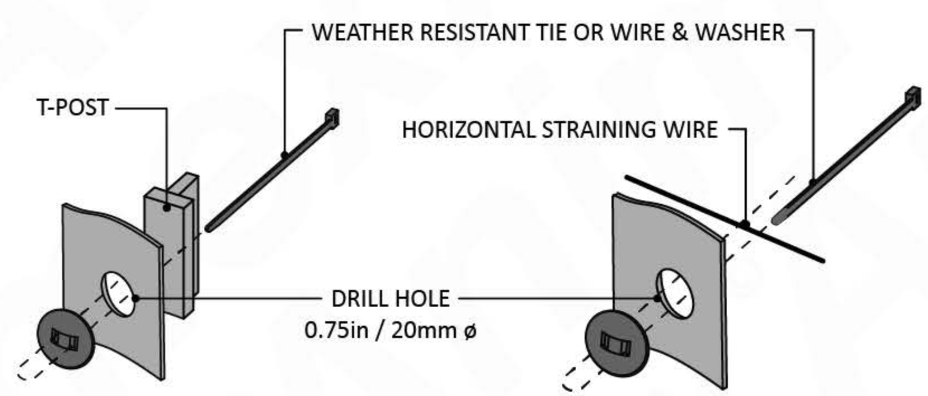
Pre-scored plastic (HDPE) sheets and rolls can expand in when installed inplaces where there are large flutucations in temperature. You should therfore avoid hard fixing this material as it can cause buckling and even open up gaps at overlapped or joining sections.

We have prepared some illustarions to demonstrate the best ways to connect and fasten HDPE rolls and sheets.

This technique helps to reduce the chances of gaps opening up at the joins and allows the fencing to expand and contract freely.

Ensuring the trench is backfilled correctly and the earth is compacted tightly against both sides of the fence is also essential to ensure there are no gaps at ground level where animals will be encountering the fence.

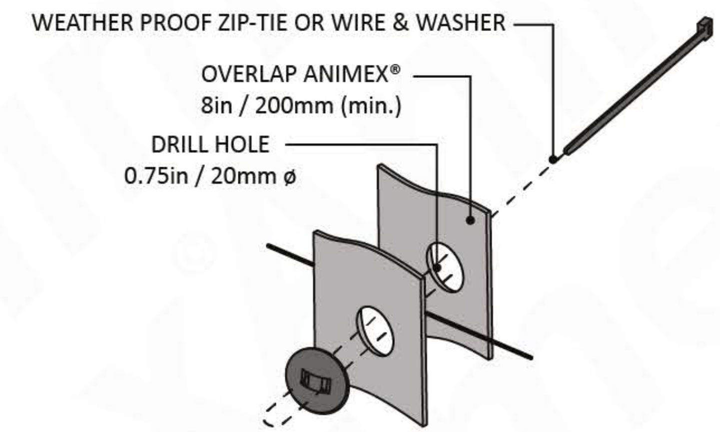
Joins should be made between posts and onto horizontal wire or horizontal parts of exitising fences where possible.



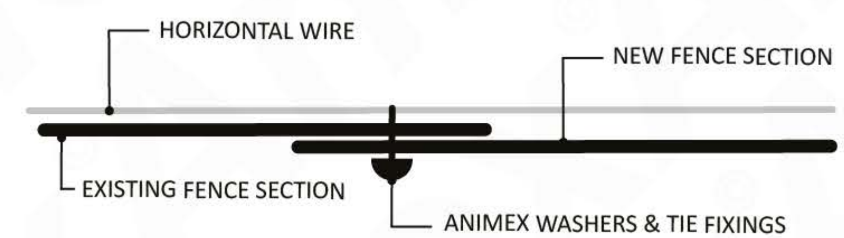
ATTACH TO POSTS
NOT TO SCALE

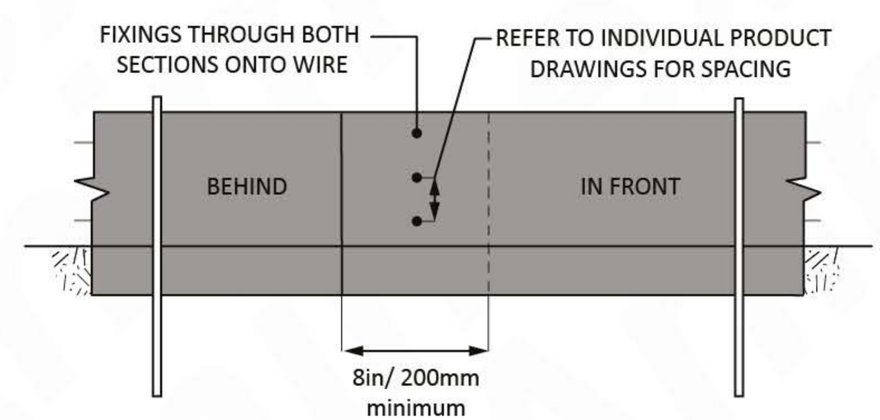
ATTACH TO WIRE
NOT TO SCALE

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



JOINING & OVERLAPPING SECTIONS
NOT TO SCALE





Fixings & Fastening
Preformed Metal

AMX-XP

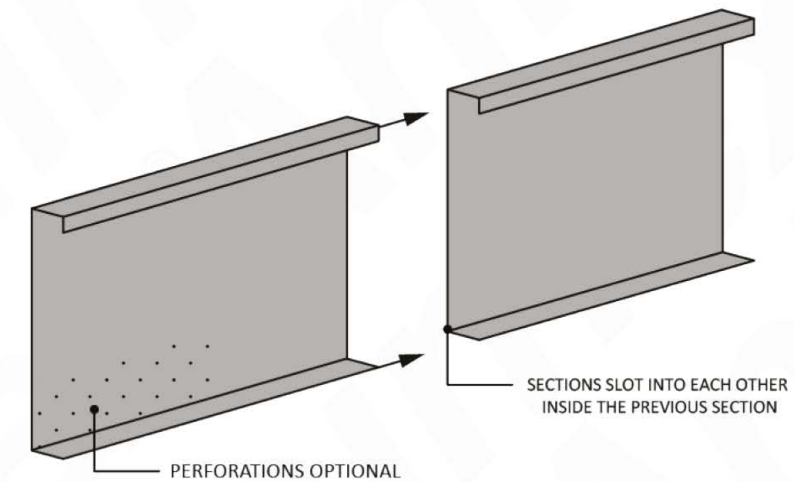
Preformed metal fencing is supplied in sections that are often custom made for your project.

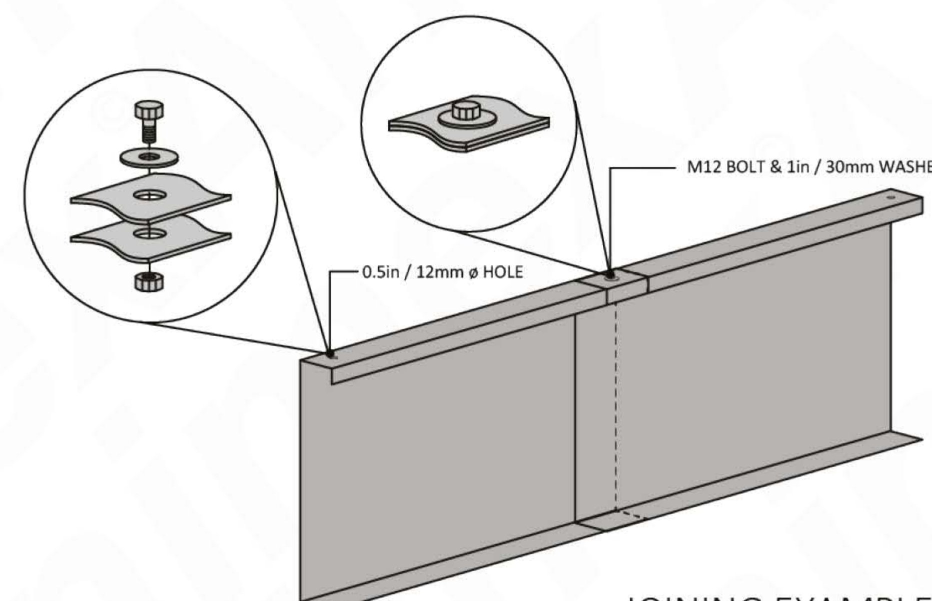
Each section slots inside the other and is then fastened by drilling holes through the overlapping sections and securing with bolt, nuts and washers.

End sections and turn-arounds will also be custom made per project and fitted on site.

Panels can be supplied with a power coating but this will increase costs and may need touch ups after installation.

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



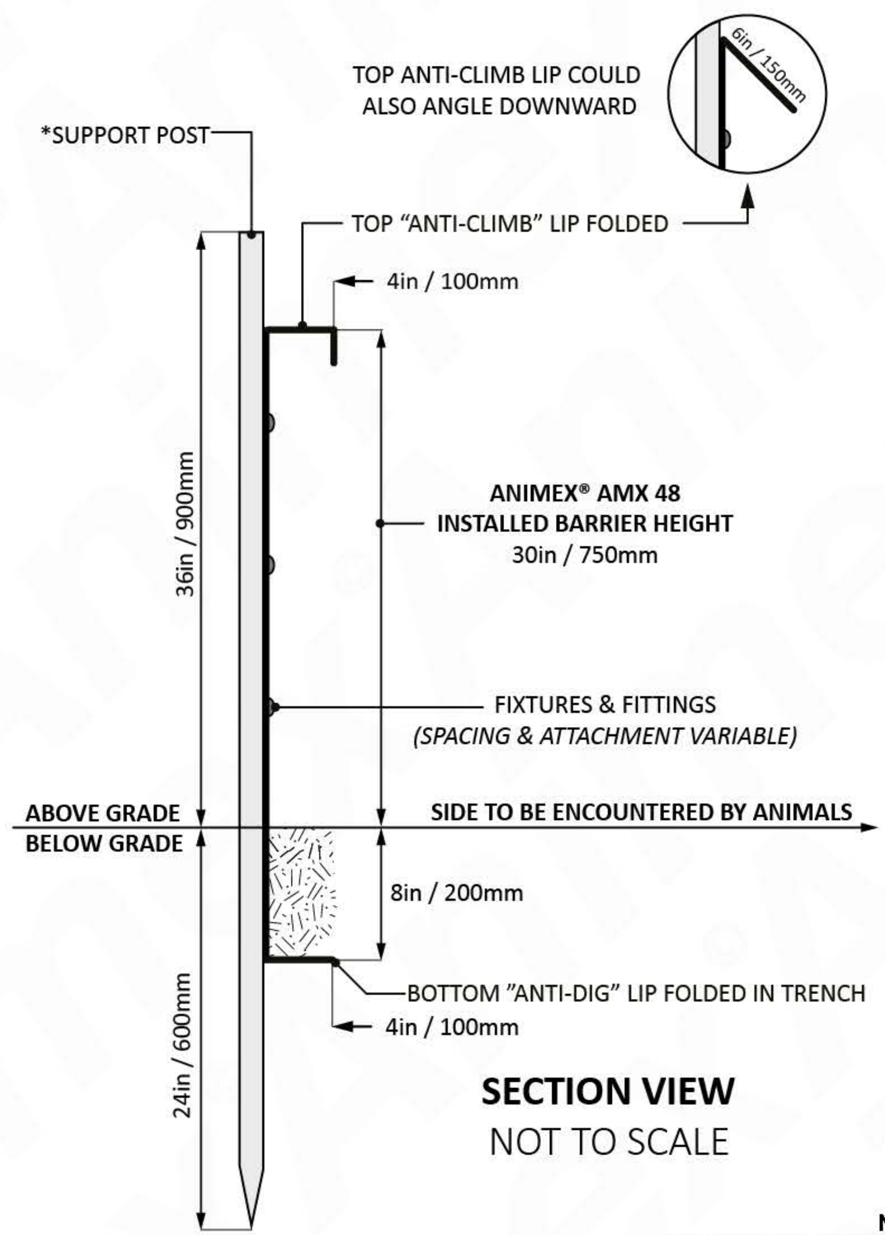


JOINING EXAMPLE
NOT TO SCALE

AMX 48

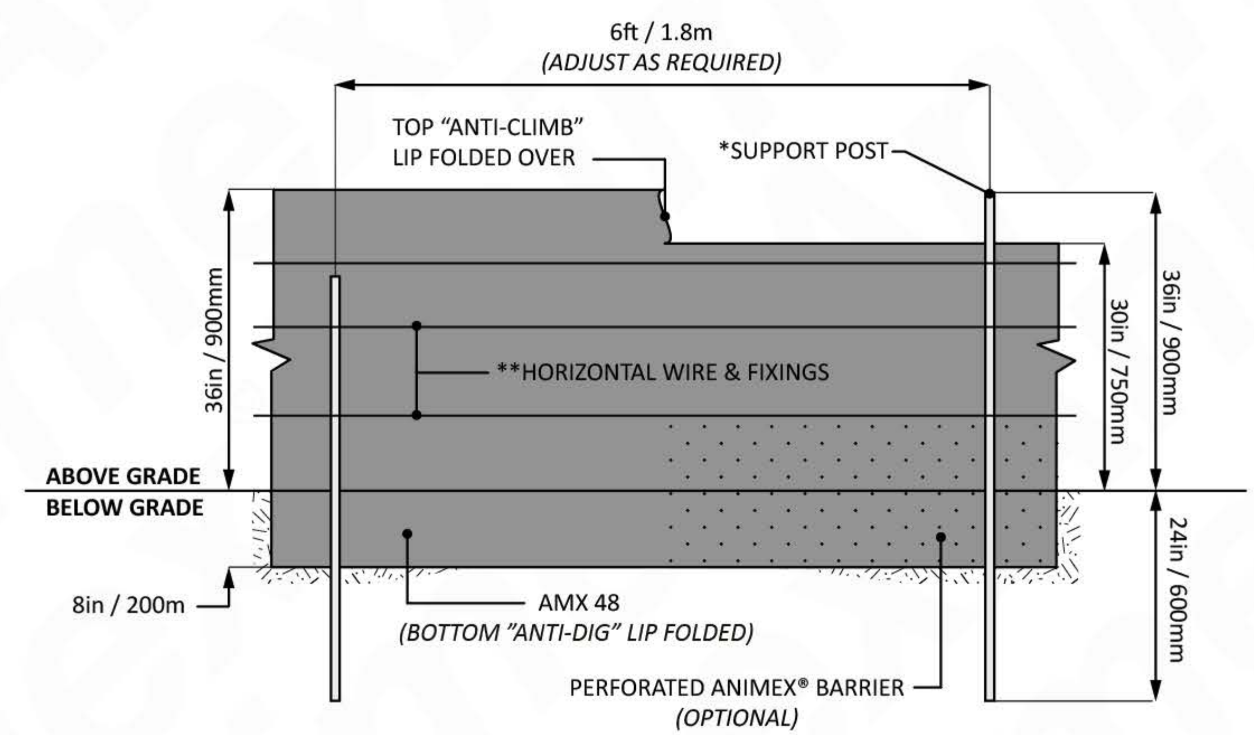
Free-standing Below Ground

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



SECTION VIEW
NOT TO SCALE

*SUPPORT POSTS & HORIZONTAL WIRE MAY NOT BE NEEDED FOR PREFORMED METAL (AMX-XP) FENCES
**HORIZONTAL WIRE MAY NOT BE NEEDED FOR TEMPORARY (AMX-T) FENCES

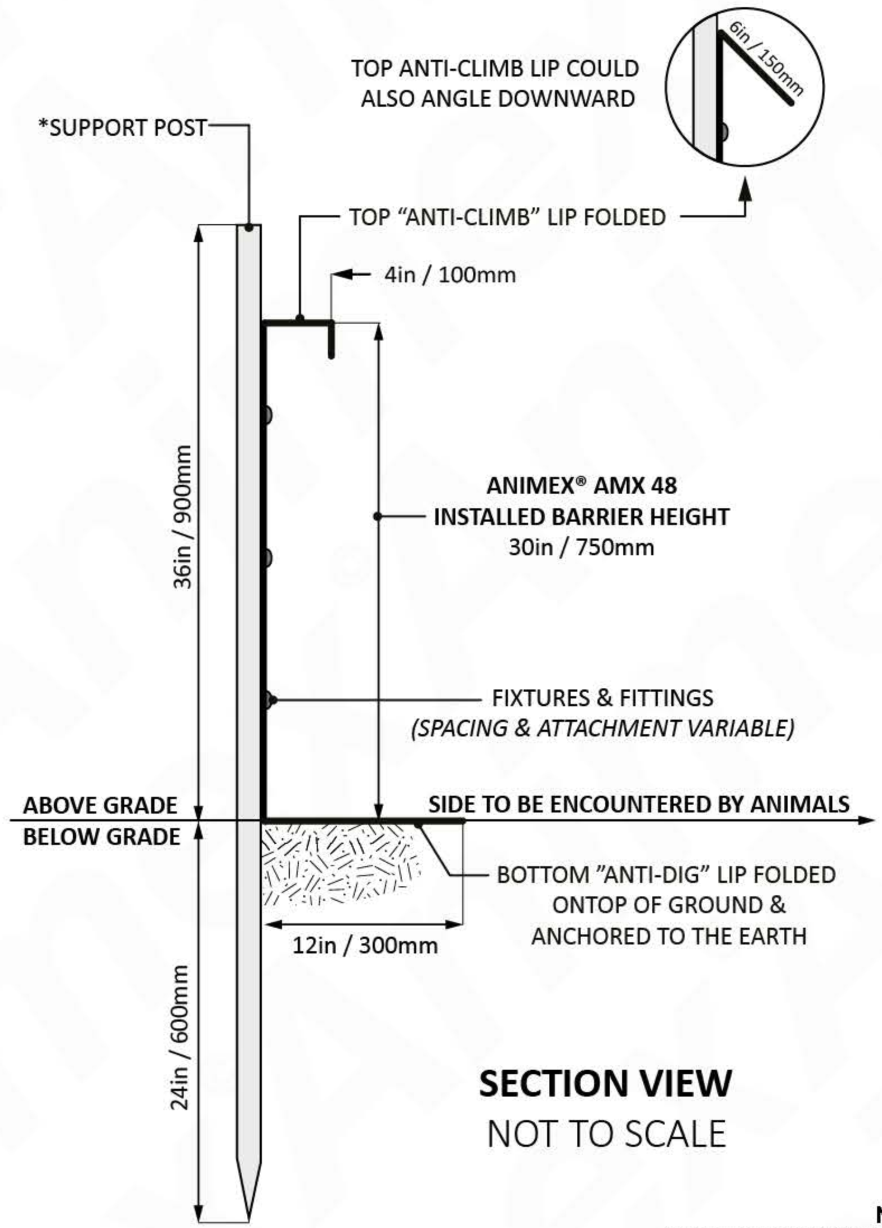


ELEVATION VIEW
NOT TO SCALE

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

AMX 48

Free-standing Above Ground



SECTION VIEW
NOT TO SCALE

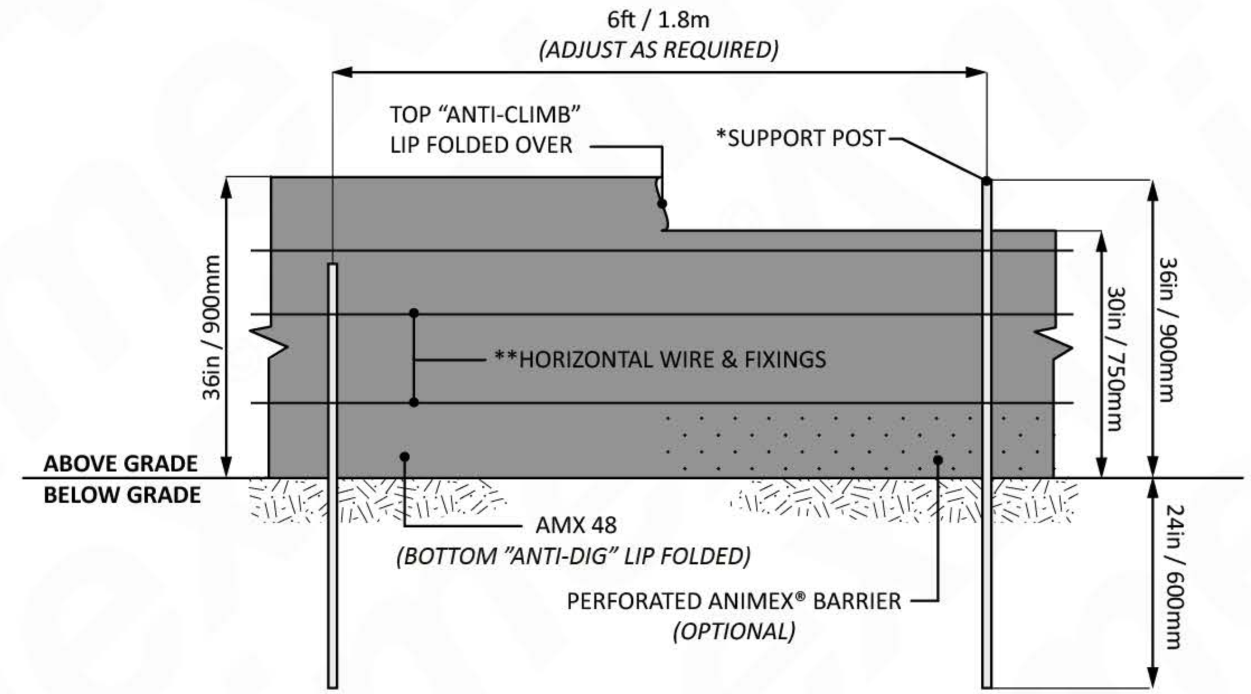
NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

APPLY THIS ABOVE GROUND METHOD WHEN ATTACHING TO EXISTING FENCE TYPES AS WELL

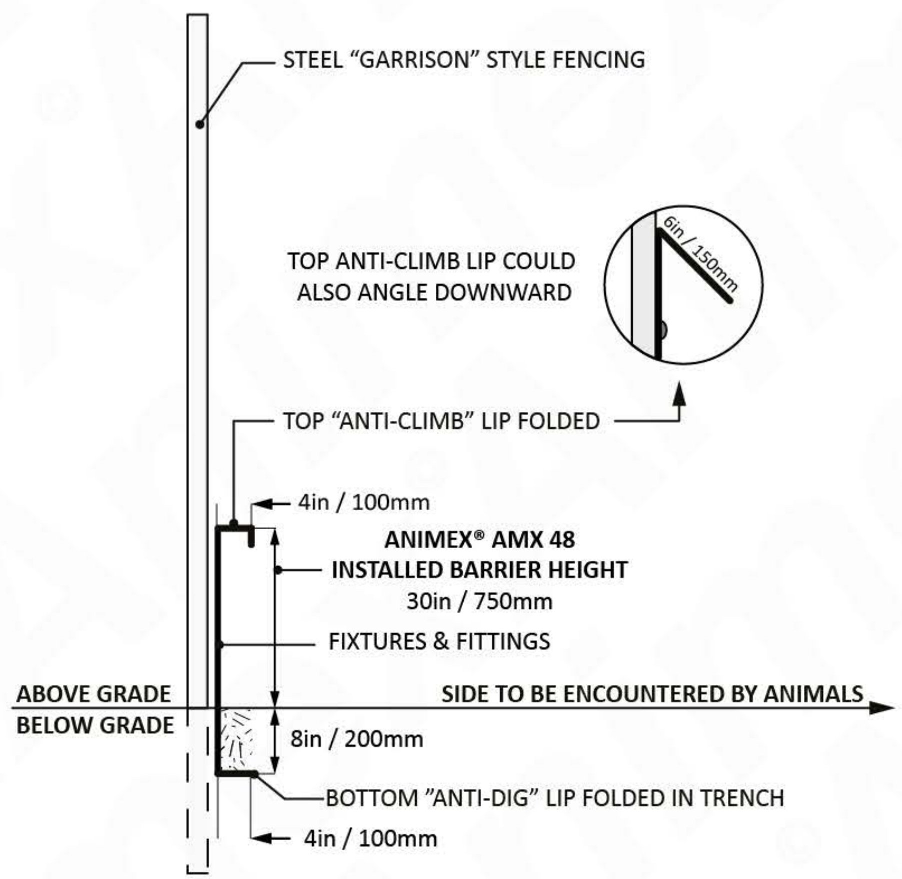
*SUPPORT POSTS & HORIZONTAL WIRE MAY NOT BE NEEDED FOR PREFORMED METAL (AMX-XP) FENCES

**HORIZONTAL WIRE MAY NOT BE NEEDED FOR TEMPORARY (AMX-T) FENCES



ELEVATION VIEW
NOT TO SCALE

AMX 48
Attached Garrison

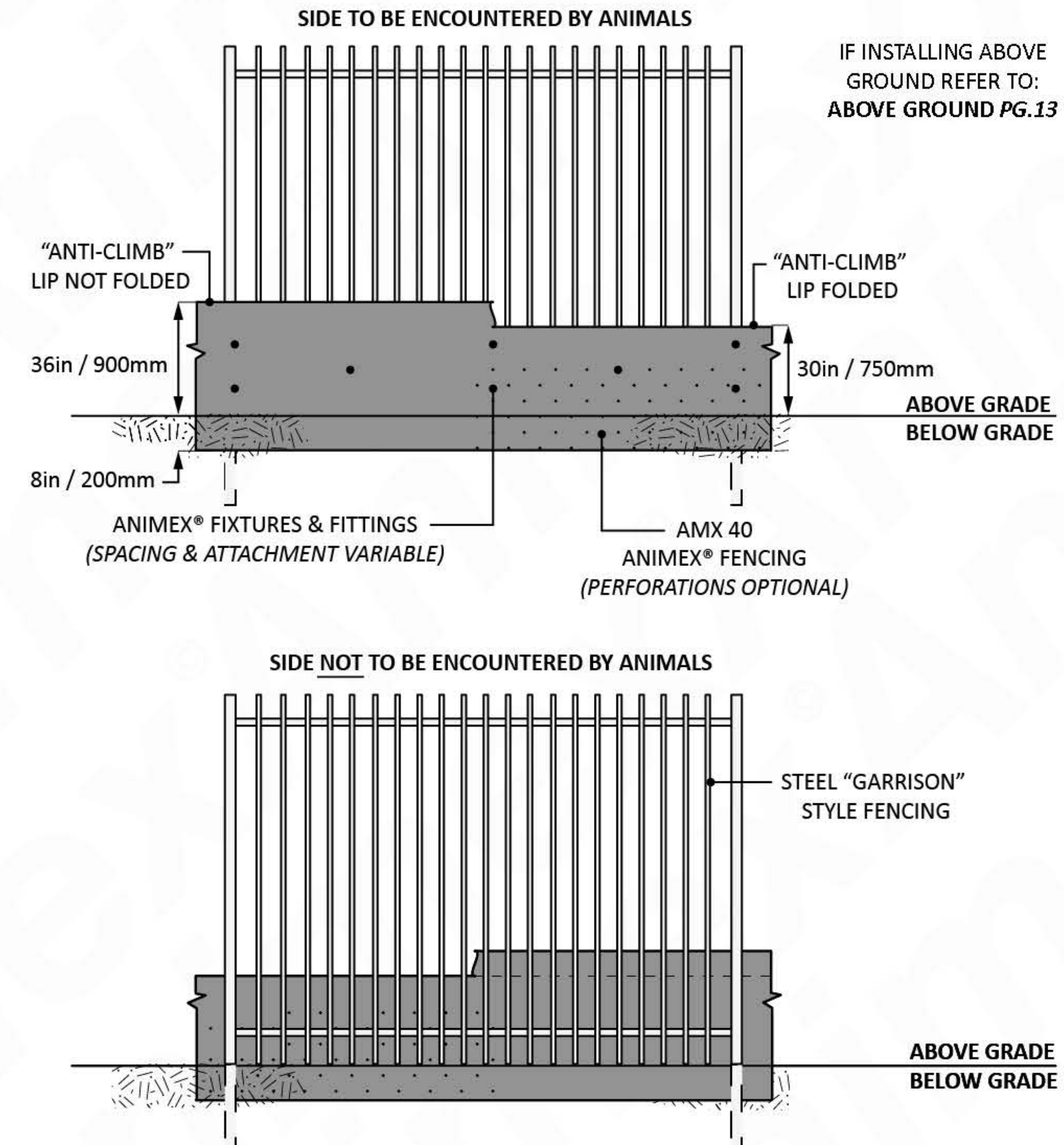


SECTION VIEW
NOT TO SCALE

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

Animex

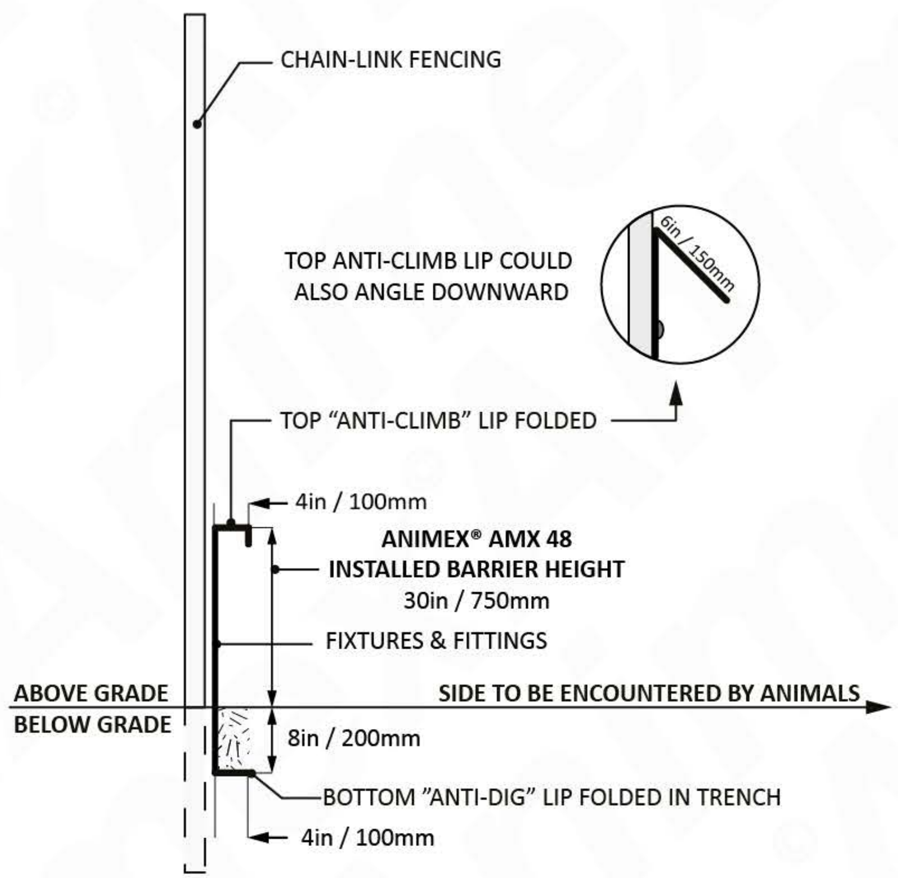
NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



ELEVATION VIEW
NOT TO SCALE

Animex

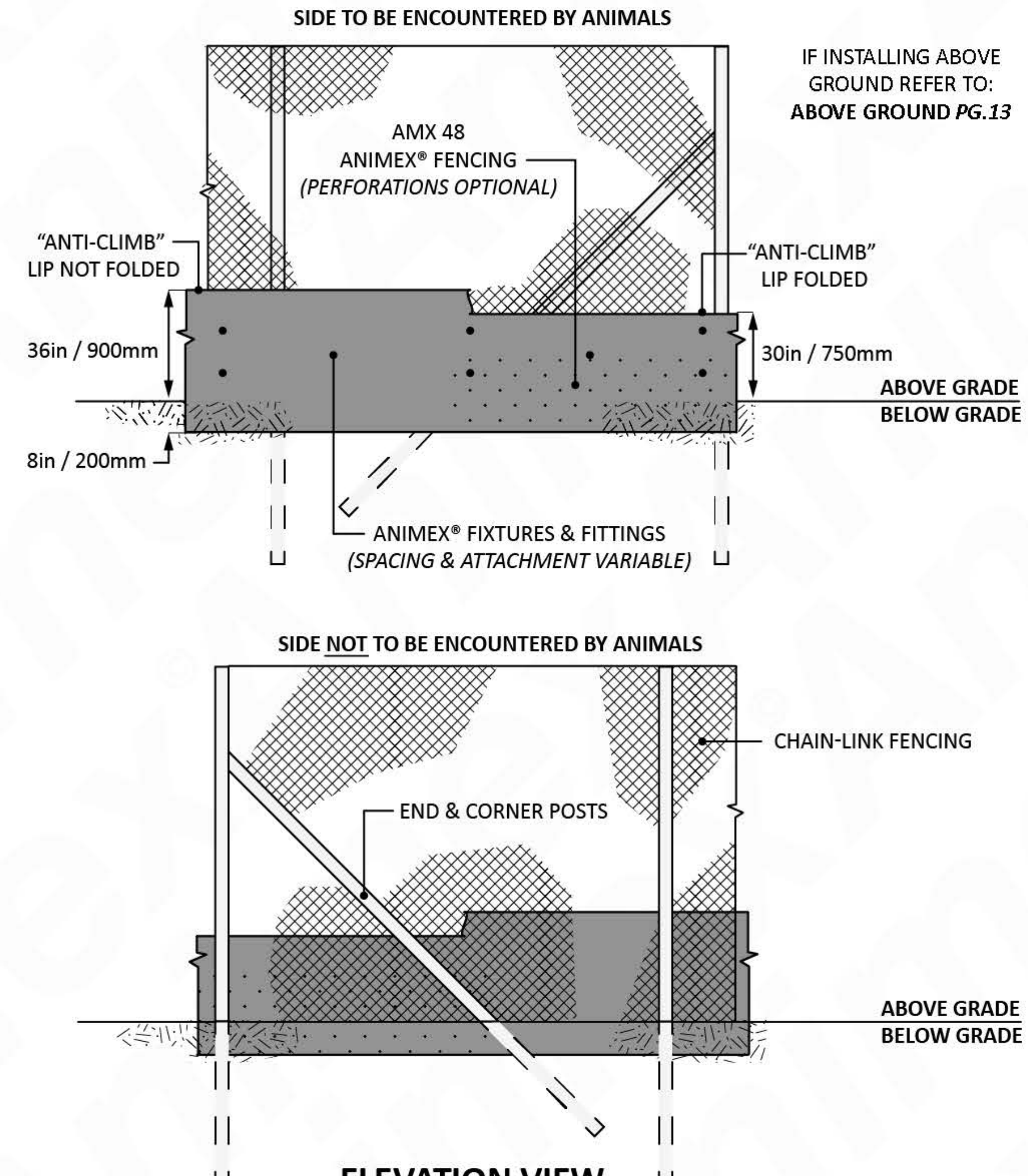
AMX 48
Attached Chain-link



SECTION VIEW
NOT TO SCALE

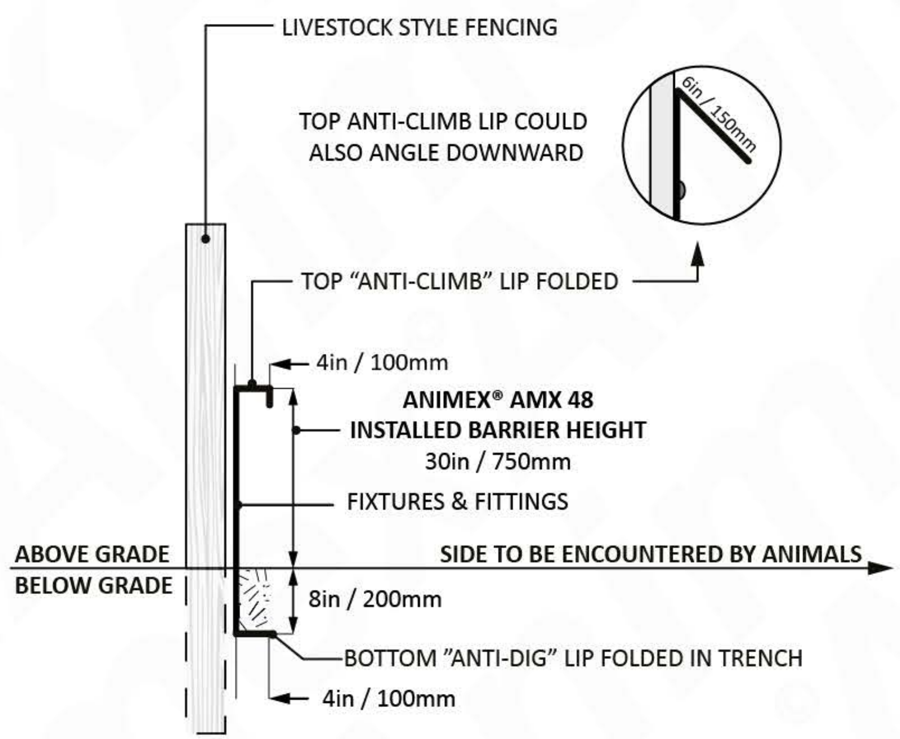
NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



ELEVATION VIEW
NOT TO SCALE

AMX 48
Attached Live Stock



SECTION VIEW
NOT TO SCALE

NOTES:
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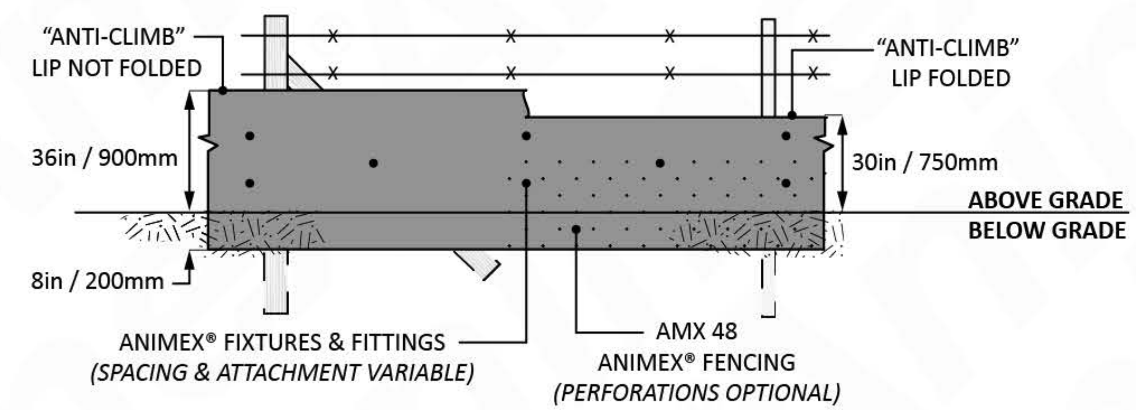
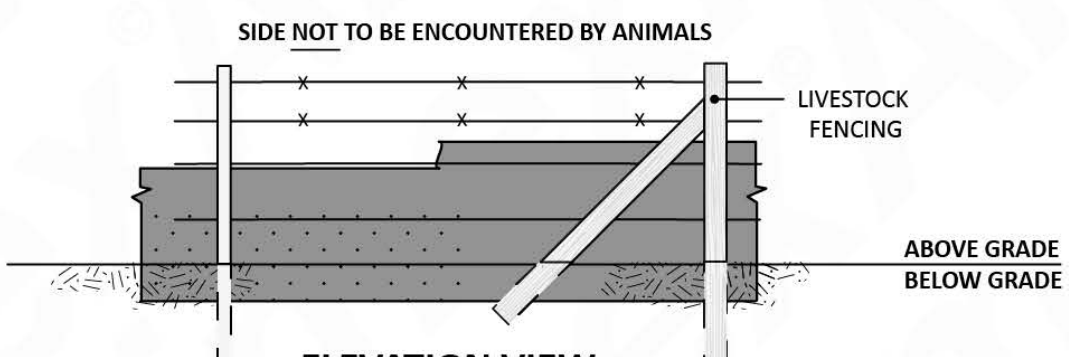
IF INSTALLING ABOVE GROUND REFER TO:
ABOVE GROUND *PG.13*





ELEVATION VIEW
NOT TO SCALE

NOTES:
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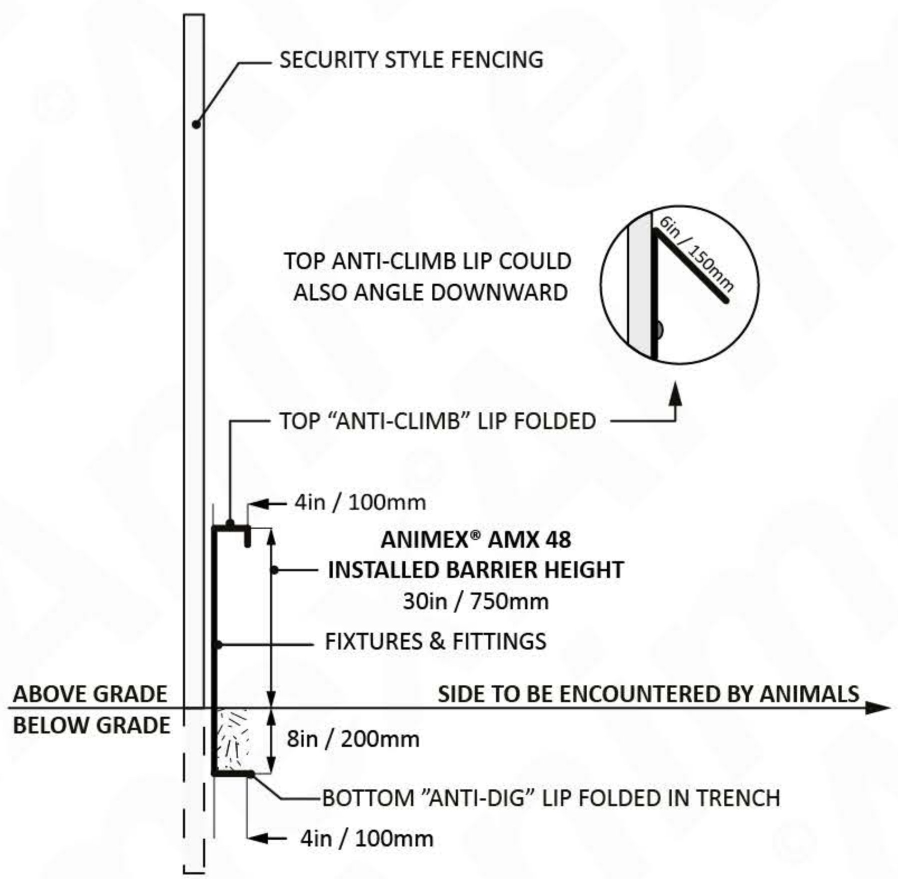
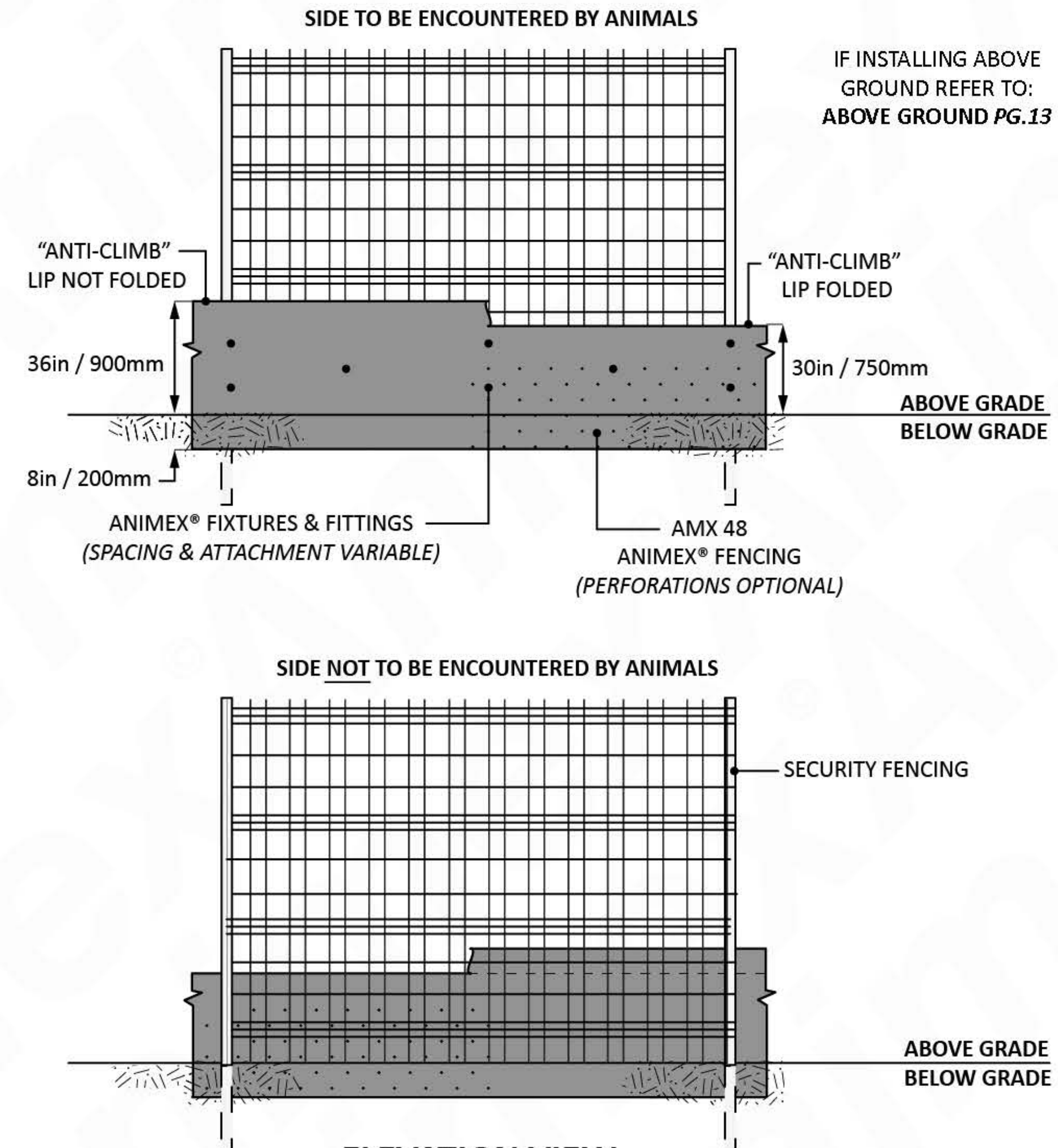
AMX 48

AMX 48
Attached Security

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



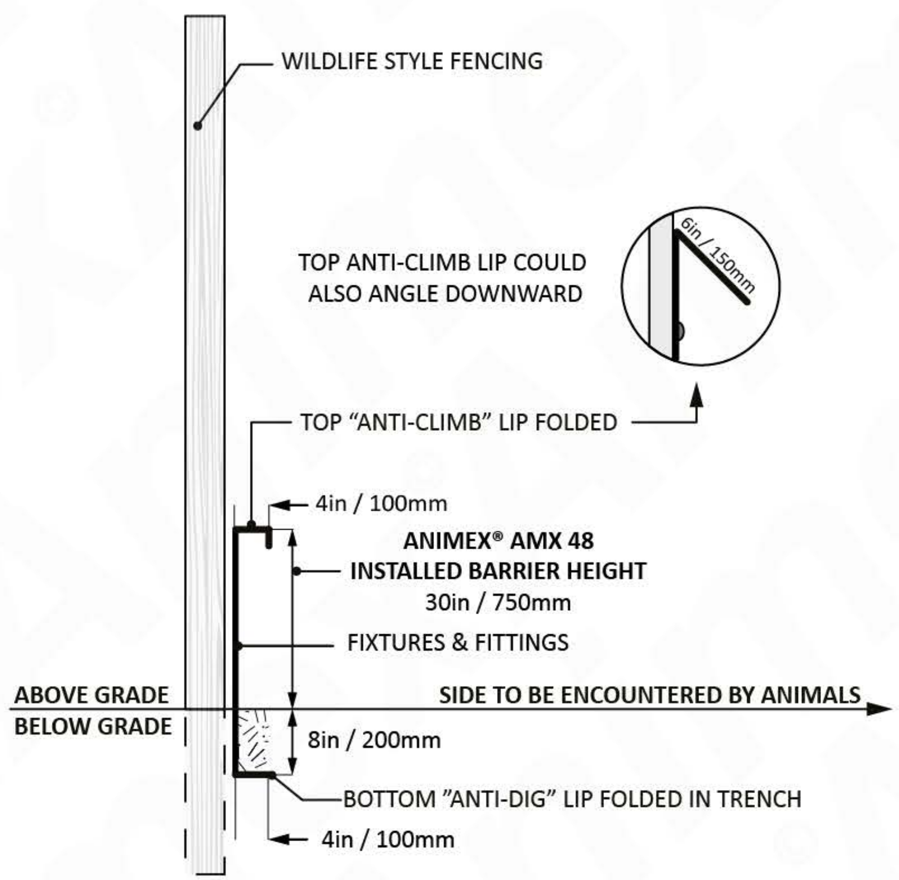
SECTION VIEW
NOT TO SCALE



ELEVATION VIEW
NOT TO SCALE

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

AMX 48
Attached Large Wildlife



SECTION VIEW
NOT TO SCALE

NOTES:
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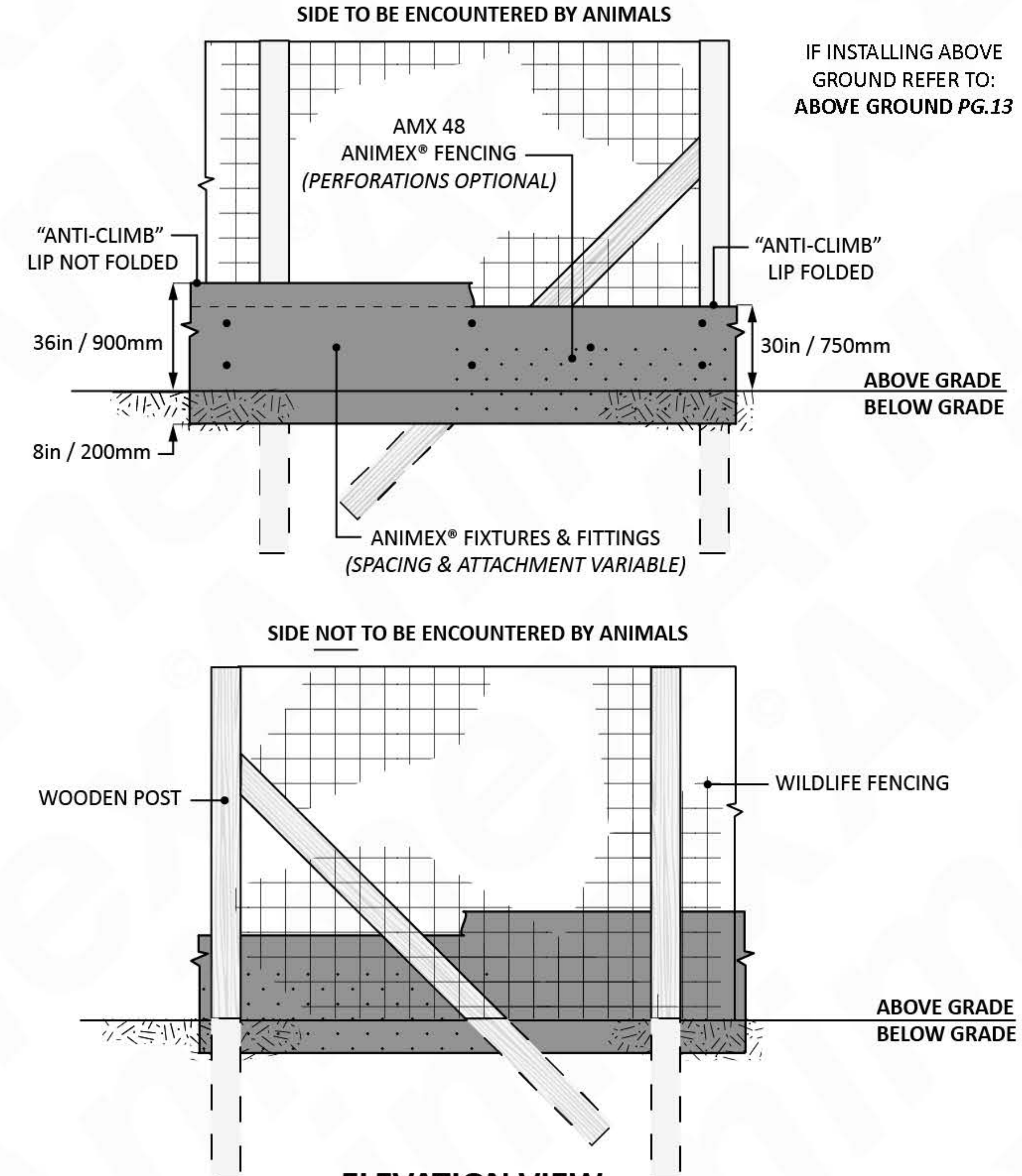
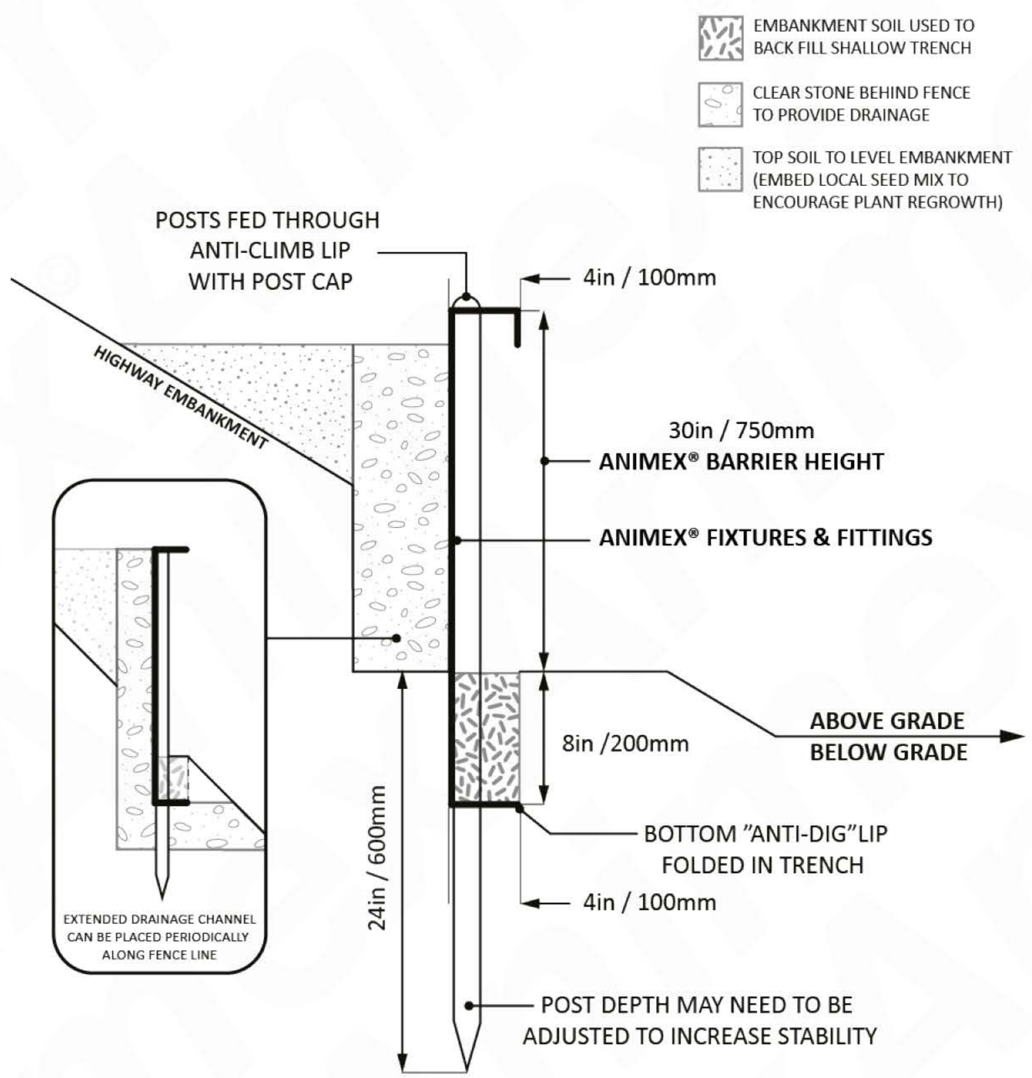
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



ELEVATION VIEW
NOT TO SCALE

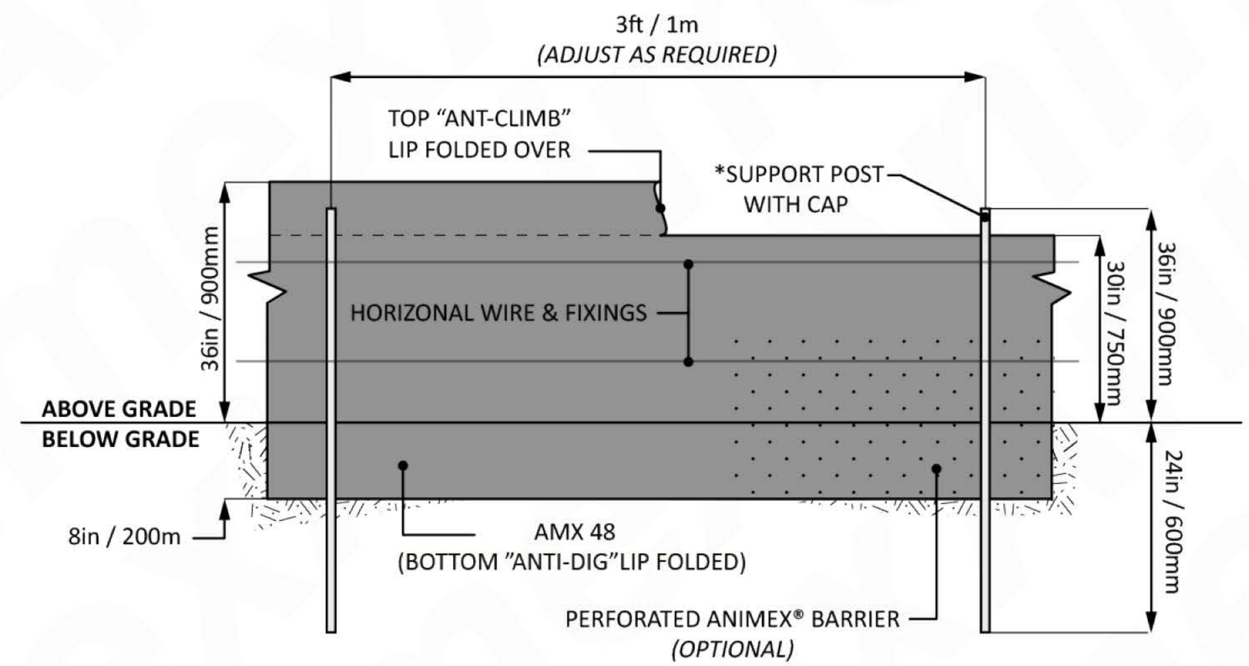
Specialized Fencing Specifications
Roadside Embankment

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



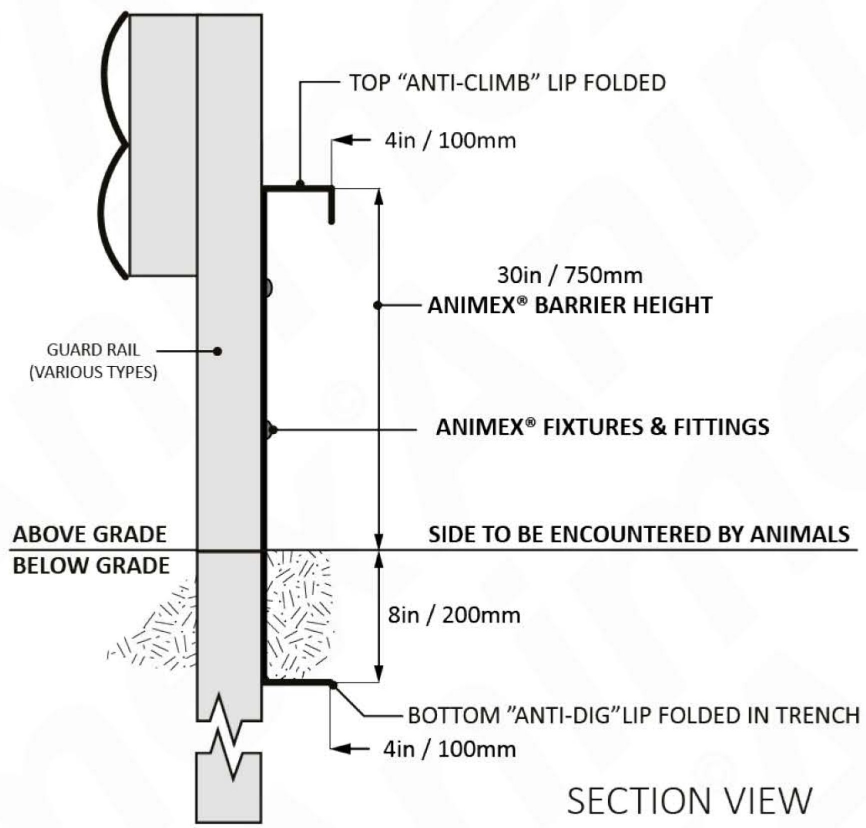
SECTION VIEW
NOT TO SCALE

*SUPPORT POSTS MAY NOT BE NEEDED FOR PRE-FORMED METAL (AMX-XP) FENCES



ELEVATION VIEW
NOT TO SCALE

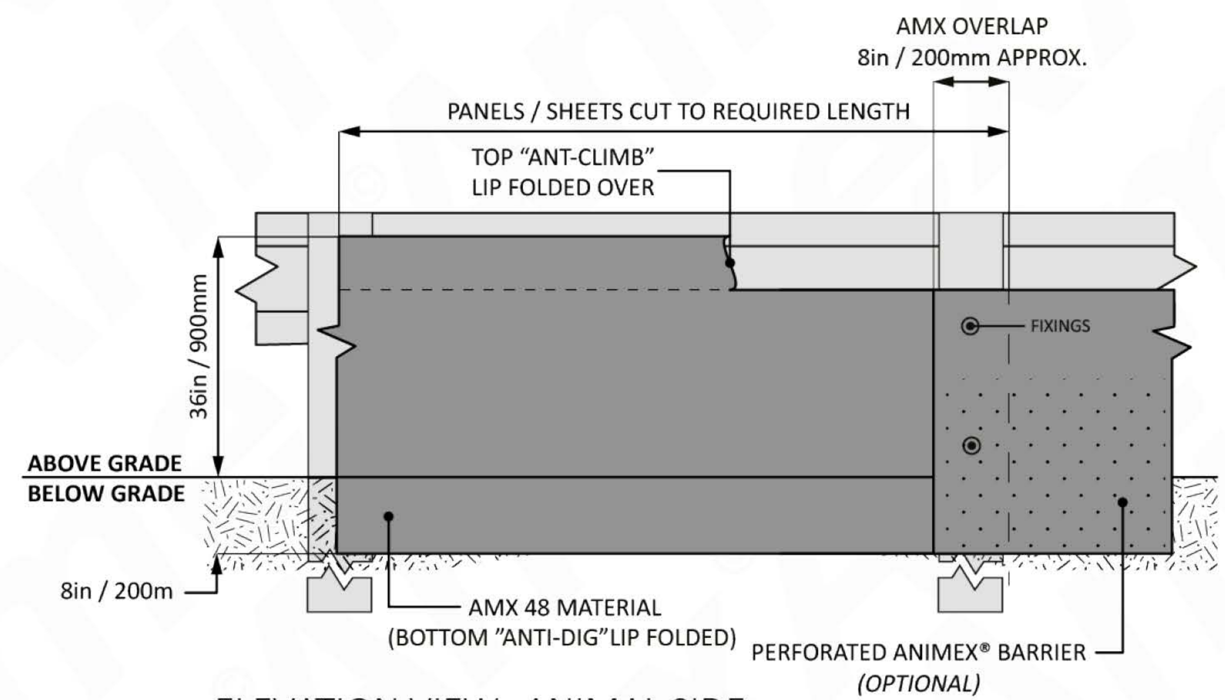
Specialized Fencing Specifications
Roadside Guardrail



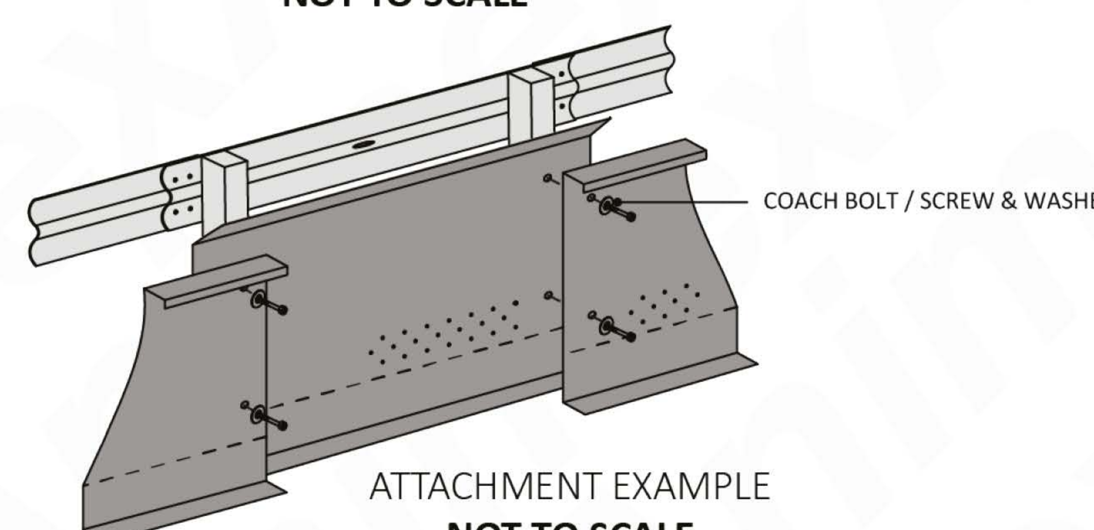
SECTION VIEW
NOT TO SCALE

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.

ADJUSTMENTS CAN BE MADE TO FIT ALL ROADSIDE GUARD RAILS VARIATIONS



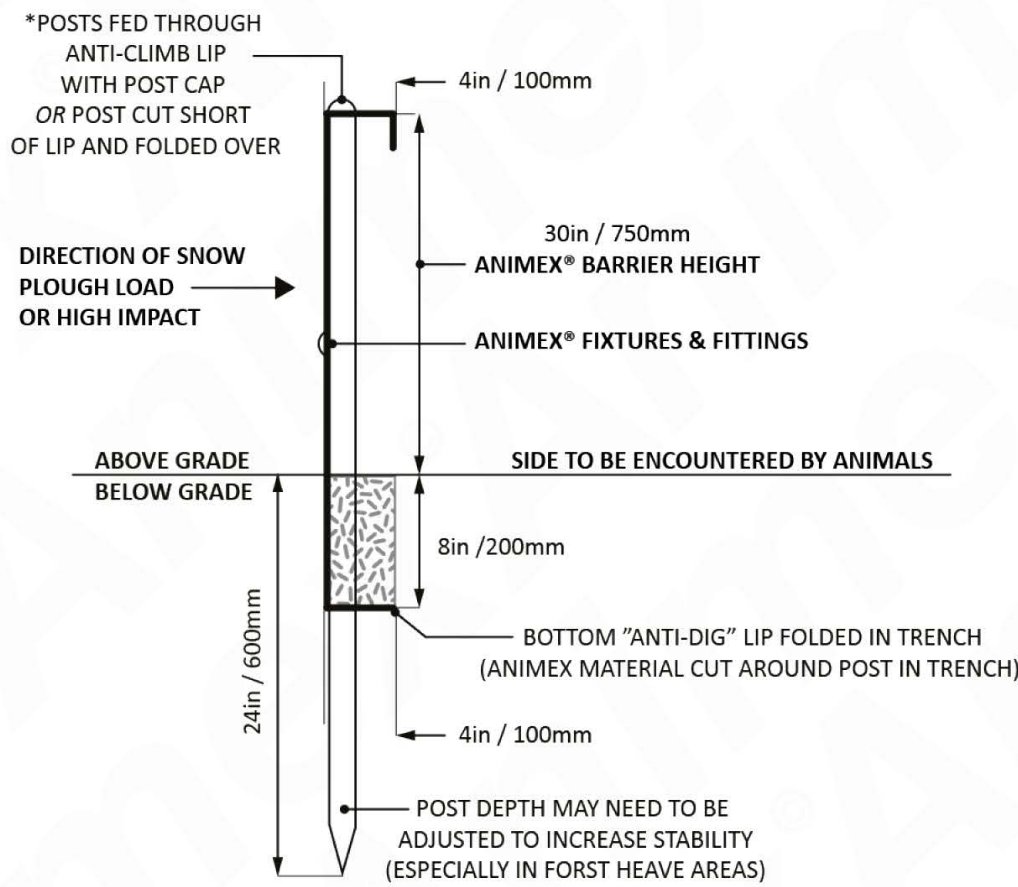
ELEVATION VIEW- ANIMAL SIDE
NOT TO SCALE



ATTACHMENT EXAMPLE
NOT TO SCALE

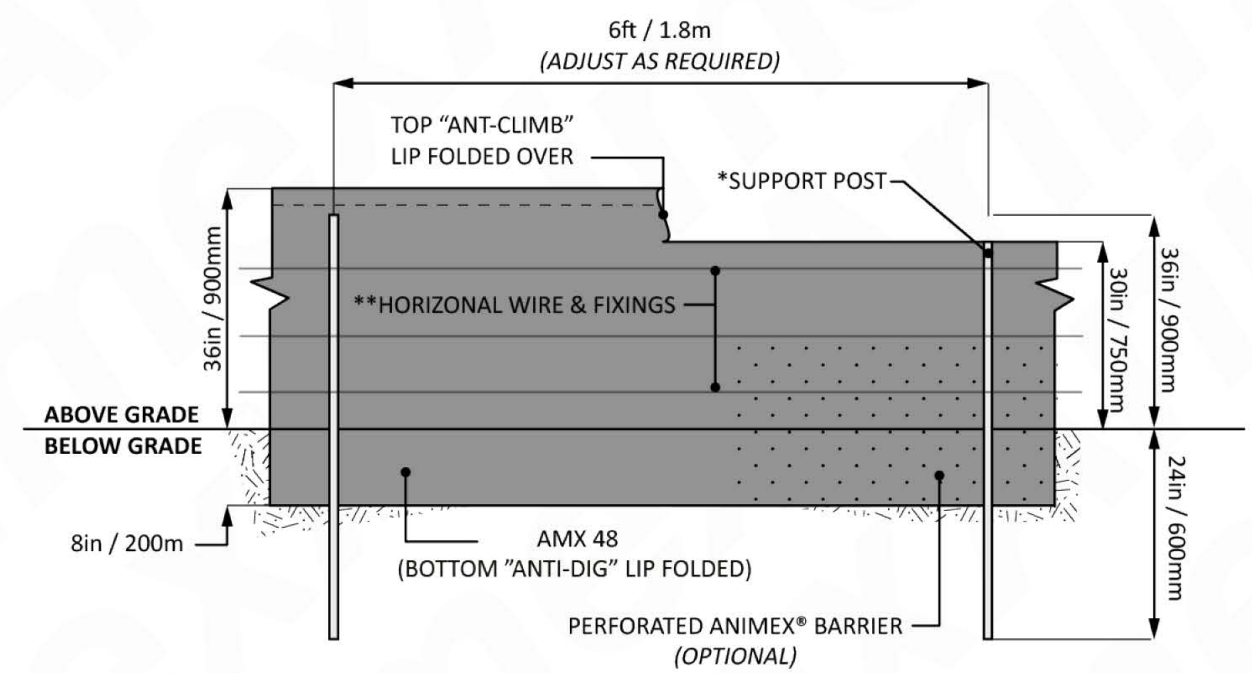
Specialized Fencing Specifications
Snow Load / High Impact

NOTES:
This specification should be used to aid installation. Measurements are accurate but may need to be adjusted dependent on location, conditions and local authority recommendations.



SECTION VIEW
NOT TO SCALE

*SUPPORT POSTS MAY NOT BE NEEDED FOR PRE-FORMED METAL (AMX-XP) FENCES
**ADD WIRE & FIXINGS AS REQUIRED - 3 HORIZONTAL WIRES MINIMUM



ELEVATION VIEW
NOT TO SCALE

Tender Document Descriptions

AMX-T / AMX-SP

General Description:
Specifically designed solid **Animex** wildlife fencing barrier to protect, exclude or guide wildlife.

Common Applications:
Roads
Construction sites
Scientific research
Conservation zones
Species re-introduction

Material Height:
1015mm (40in)
1070mm (42in)
1220mm (48in)
1550mm (60in)
Custom options available

Material Thickness:
AMX-T (Temporary): 1mm
AMX-SP (Semi-Permanent): 2mm

Material Properties:
Solid barrier - no mesh, matrix or geo-textile material
Made from High Density Polyethylene (HDPE) in North America
Grooves or scoreline 100mm (4in) from the top and bottom edge to create fold-able lips
Glossy surface on one side
Perforations to allow water flow (if required)
Supplied in sheets or rolls
Maximum weight per item 25kg (55lbs)

Installation:
See relevant drawings and guides displayed in this document between pages 6 and 29

AMX-XP

General Description:
Specifically designed solid Animex wildlife fencing barrier to protect, exclude or guide wildlife.

Common Applications:
Roads
Construction sites
Scientific research
Conservation zones
Species re-introduction

Material Height:
1015mm (40in)
1070mm (42in)
1220mm (48in)
1550mm (60in)
Custom options available

Material Thickness:
AMX-XP - (Permanent): 2mm

Material Properties:
Solid metal barrier - no mesh, matrix or geo-textile material
Made from weather resistant metals
Pre-formed with top and bottom lips (as detailed in drawing pg9)
Perforations to allow water flow (if required)
Supplied in sheets
Maximum weight per item 40kg (88lbs)

Installation:
See relevant drawings and guides displayed in this document on pages 8 and 9

This document is continually updated based on new research and information.

To ensure you are referencing the most recent version please contact:
info@animexfecing.com

FOR MORE INFORMATION OF WILDLIFE FENCING PLEASE VISIT:

WWW.WILDLIFEFENCING.COM

Animex®
www.animexfencing.com

C2 California Natural Diversity Database Results

Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (San Bernardino North (3411723) OR Harrison Mtn. (3411722) OR Keller Peak (3411721) OR Yucaipa (3411711) OR El Casco (3311781) OR Sunnymead (3311782) OR Riverside East (3311783) OR San Bernardino South (3411713) OR Redlands (3411712))

Inland Feeder - Foothill Pump Station Intertie Project (March 2024)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Alvin Meadow bedstraw *Galium californicum ssp. primum*	PDRUB0N0E6	None	None	G5T2	S2	1B.2
American badger *Taxidea taxus*	AMAJF04010	None	None	G5	S3	SSC
American bumble bee *Bombus pensylvanicus*	IIHYM24260	None	None	G3G4	S2	
Andrew's marble butterfly *Euchloe hyantis andrewsi*	IILEPA5032	None	None	G3G4T2	S2	
arroyo chub *Gila orcuttii*	AFCJB13120	None	None	G2	S2	SSC
ash-gray paintbrush *Castilleja cinerea*	PDSCR0D0H0	Threatened	None	G1G2	S1S2	1B.2
bald eagle *Haliaeetus leucocephalus*	ABNKC10010	Delisted	Endangered	G5	S3	FP
Bear Valley checkerbloom *Sidalcea malviflora ssp. dolosa*	PDMAL110FH	None	None	G5T2	S2	1B.2
Bell's sparrow *Artemisiospiza belli belli*	ABPBX97021	None	None	G5T2T3	S3	WL
bird-foot checkerbloom *Sidalcea pedata*	PDMAL110L0	Endangered	Endangered	G1	S1	1B.1
black bog-rush *Schoenus nigricans*	PMCYP0P010	None	None	G4	S2	2B.2
bristly sedge *Carex comosa*	PMCYP032Y0	None	None	G5	S2	2B.1
burrowing owl *Athene cunicularia*	ABNSB10010	None	None	G4	S2	SSC
Busck's gallmoth *Eugnosta busckana*	IILEM2X090	None	None	G1G3	S2S3	
California black rail *Laterallus jamaicensis coturniculus*	ABNME03041	None	Threatened	G3T1	S2	FP
California diplectronan caddisfly *Diplectrona californica*	IITRI23010	None	None	G1G2	S1	
California glossy snake *Arizona elegans occidentalis*	ARADB01017	None	None	G5T2	S2	SSC
California horned lark *Eremophila alpestris actia*	ABPAT02011	None	None	G5T4Q	S4	WL

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
California red-legged frog *Rana draytonii*	AAABH01022	Threatened	None	G2G3	S2S3	SSC
California satintail *Imperata brevifolia*	PMPOA3D020	None	None	G3	S3	2B.1
Canyon Live Oak Ravine Forest *Canyon Live Oak Ravine Forest*	CTT61350CA	None	None	G3	S3.3	
chaparral ragwort *Senecio aphanactis*	PDAST8H060	None	None	G3	S2	2B.2
coast horned lizard *Phrynosoma blainvillii*	ARACF12100	None	None	G4	S4	SSC
coast patch-nosed snake *Salvadora hexalepis virgultea*	ARADB30033	None	None	G5T4	S3	SSC
coastal California gnatcatcher *Polioptila californica californica*	ABPBJ08081	Threatened	None	G4G5T3Q	S2	SSC
coastal whiptail *Aspidoscelis tigris stejnegeri*	ARACJ02143	None	None	G5T5	S3	SSC
Cooper's hawk *Accipiter cooperii*	ABNKC12040	None	None	G5	S4	WL
Coulter's goldfields *Lasthenia glabrata ssp. coulteri*	PDAST5L0A1	None	None	G4T2	S2	1B.1
Crotch's bumble bee *Bombus crotchii*	IIHYM24480	None	Candidate Endangered	G2	S2	
Davidson's saltscale *Atriplex serenana var. davidsonii*	PDCHE041T1	None	None	G5T1	S1	1B.2
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*	IIDIP05021	Endangered	None	G1T1	S1	
Desert cuckoo wasp *Ceratochrysis longimala*	IIHYM71040	None	None	G1	S1	
ferruginous hawk *Buteo regalis*	ABNKC19120	None	None	G4	S3S4	WL
Gambel's water cress *Nasturtium gambelii*	PDBRA270V0	Endangered	Threatened	G1	S1	1B.1
golden eagle *Aquila chrysaetos*	ABNKC22010	None	None	G5	S3	FP
Hall's monardella *Monardella macrantha ssp. hallii*	PDLAM180E1	None	None	G5T3	S3	1B.3
Horn's milk-vetch *Astragalus hornii var. hornii*	PDFAB0F421	None	None	GUT1	S1	1B.1
hot springs fimbristylis *Fimbristylis thermalis*	PMCYP0B0N0	None	None	G4	S1S2	2B.2
Laguna Mountains jewelflower *Streptanthus bernardinus*	PDBRA2G060	None	None	G3G4	S3S4	4.3

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lawrence's goldfinch *Spinus lawrencei*	ABPBY06100	None	None	G3G4	S4	
least Bell's vireo *Vireo bellii pusillus*	ABPBW01114	Endangered	Endangered	G5T2	S3	
lemon lily *Lilium parryi*	PMLIL1A0J0	None	None	G3	S3	1B.2
lesser long-nosed bat *Leptonycteris yerbabuenae*	AMACB03030	Delisted	None	G3	S1	SSC
lodgepole chipmunk *Neotamias speciosus speciosus*	AMAFB02172	None	None	G4T3T4	S2	
loggerhead shrike *Lanius ludovicianus*	ABPBR01030	None	None	G4	S4	SSC
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	AMAFD01041	None	None	G5T2	S1S2	SSC
Los Angeles sunflower *Helianthus nuttallii ssp. parishii*	PDAST4N102	None	None	G5TX	SX	1A
marsh sandwort *Arenaria paludicola*	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
merlin *Falco columbarius*	ABNKD06030	None	None	G5	S3S4	WL
mesa horkelia *Horkelia cuneata var. puberula*	PDROS0W045	None	None	G4T1	S1	1B.1
Morrison bumble bee *Bombus morrisoni*	IIHYM24460	None	None	G3	S1S2	
Mt. Pinos onion *Allium howellii var. clokeyi*	PMLIL02161	None	None	G4T2	S2	1B.3
mud nama *Nama stenocarpa*	PDHYD0A0H0	None	None	G4G5	S1S2	2B.2
Nevin's barberry *Berberis nevinii*	PDBER060A0	Endangered	Endangered	G1	S1	1B.1
northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	AMAFD05031	None	None	G5T3T4	S3S4	
orange-throated whiptail *Aspidoscelis hyperythra*	ARACJ02060	None	None	G5	S2S3	WL
pallid bat *Antrozous pallidus*	AMACC10010	None	None	G4	S3	SSC
Palmer's mariposa-lily *Calochortus palmeri var. palmeri*	PMLIL0D122	None	None	G3T2	S2	1B.2
Parish's alumroot *Heuchera parishii*	PDSAX0E1F0	None	None	G3	S3	1B.3
Parish's bush-mallow *Malacothamnus parishii*	PDMAL0Q0C0	None	None	GXQ	SX	1A

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Parish's checkerbloom *Sidalcea hickmanii ssp. parishii*	PDMAL110A3	None	Rare	G3T1	S1	1B.2
Parish's desert-thorn *Lycium parishii*	PDSOL0G0D0	None	None	G4	S1	2B.3
Parish's gooseberry *Ribes divaricatum var. parishii*	PDGRO020F3	None	None	G5TX	SX	1A
Parish's yampah *Perideridia parishii ssp. parishii*	PDAPI1N0C2	None	None	G4T3T4	S2	2B.2
Parry's spineflower *Chorizanthe parryi var. parryi*	PDPGN040J2	None	None	G3T2	S2	1B.1
Peruvian dodder *Cuscuta obtusiflora var. glandulosa*	PDCUS01111	None	None	G5T4?	SH	2B.2
Plummer's mariposa-lily *Calochortus plummerae*	PMLIL0D150	None	None	G4	S4	4.2
pocketed free-tailed bat *Nyctinomops femorosaccus*	AMACD04010	None	None	G5	S3	SSC
prairie wedge grass *Sphenopholis obtusata*	PMPOA5T030	None	None	G5	S2	2B.2
Pringle's monardella *Monardella pringlei*	PDLAM180J0	None	None	GX	SX	1A
quino checkerspot butterfly *Euphydryas editha quino*	IILEPK405L	Endangered	None	G4G5T1T2	S1S2	
red-diamond rattlesnake *Crotalus ruber*	ARADE02090	None	None	G4	S3	SSC
Riverside fairy shrimp *Streptocephalus woottoni*	ICBRA07010	Endangered	None	G1G2	S2	
Riversidian Alluvial Fan Sage Scrub *Riversidian Alluvial Fan Sage Scrub*	CTT32720CA	None	None	G1	S1.1	
Robinson's pepper-grass *Lepidium virginicum var. robinsonii*	PDBRA1M114	None	None	G5T3	S3	4.3
salt marsh bird's-beak *Chloropyron maritimum ssp. maritimum*	PDSCR0J0C2	Endangered	Endangered	G4?T1	S1	1B.2
salt spring checkerbloom *Sidalcea neomexicana*	PDMAL110J0	None	None	G4	S2	2B.2
San Bernardino aster *Symphyotrichum defoliatum*	PDASTE80C0	None	None	G2	S2	1B.2
San Bernardino flying squirrel *Glaucomys oregonensis californicus*	AMAFB09021	None	None	G5T1T2	S1S2	SSC
San Bernardino kangaroo rat *Dipodomys merriami parvus*	AMAFD03143	Endangered	Endangered	G5T1	S1	SSC
San Bernardino Mountains owl's-clover *Castilleja lasiorhyncha*	PDSCR0D410	None	None	G2?	S2?	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
San Bernardino ragwort *Packera bernardina*	PDAST8H0E0	None	None	G2	S2	1B.2
San Bernardino ringneck snake *Diadophis punctatus modestus*	ARADB10015	None	None	G5T2T3	S2?	
San Diego banded gecko *Coleonyx variegatus abbotti*	ARACD01031	None	None	G5T5	S1S2	SSC
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	AMAEB03051	None	None	G5T3T4	S3S4	
San Diego desert woodrat *Neotoma lepida intermedia*	AMAFF08041	None	None	G5T3T4	S3S4	SSC
San Gabriel slender salamander *Batrachoseps gabrieli*	AAAAD02110	None	None	G2G3	S2S3	
San Jacinto Valley crownscale *Atriplex coronata var. notatior*	PDCHE040C2	Endangered	None	G4T1	S1	1B.1
Santa Ana River woollystar *Eriastrum densifolium ssp. sanctorum*	PDPLM03035	Endangered	Endangered	G4T1	S1	1B.1
Santa Ana speckled dace *Rhinichthys osculus ssp. 8*	AFCJB3705K	None	None	G5T1	S1	SSC
Santa Ana sucker *Catostomus santaanae*	AFCJC02190	Threatened	None	G1	S1	
silver-haired ivesia *Ivesia argyrocoma var. argyrocoma*	PDROS0X021	None	None	G2T2	S2	1B.2
slender-horned spineflower *Dodecahema leptoceras*	PDPGN0V010	Endangered	Endangered	G1	S1	1B.1
smooth tarplant *Centromadia pungens ssp. laevis*	PDAST4R0R4	None	None	G3G4T2	S2	1B.1
Sonoran maiden fern *Pelazoneuron puberulum var. sonorense*	PPTHE05192	None	None	G5T3	S2	2B.2
Southern California legless lizard *Anniella stebbinsi*	ARACC01060	None	None	G3	S3	SSC
southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	ABPBX91091	None	None	G5T3	S4	WL
Southern Coast Live Oak Riparian Forest *Southern Coast Live Oak Riparian Forest*	CTT61310CA	None	None	G4	S4	
Southern Cottonwood Willow Riparian Forest *Southern Cottonwood Willow Riparian Forest*	CTT61330CA	None	None	G3	S3.2	
southern grasshopper mouse *Onychomys torridus ramona*	AMAFF06022	None	None	G5T3	S3	SSC
southern jewelflower *Streptanthus campestris*	PDBRA2G0B0	None	None	G3	S3	1B.3
Southern Mixed Riparian Forest *Southern Mixed Riparian Forest*	CTT61340CA	None	None	G2	S2.1	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
southern mountain yellow-legged frog *Rana muscosa*	AAABH01330	Endangered	Endangered	G1	S2	WL
Southern Riparian Forest *Southern Riparian Forest*	CTT61300CA	None	None	G4	S4	
Southern Riparian Scrub *Southern Riparian Scrub*	CTT63300CA	None	None	G3	S3.2	
southern rubber boa *Charina umbratica*	ARADA01011	None	Threatened	G2G3	S2	
Southern Sycamore Alder Riparian Woodland *Southern Sycamore Alder Riparian Woodland*	CTT62400CA	None	None	G4	S4	
Southern Willow Scrub *Southern Willow Scrub*	CTT63320CA	None	None	G3	S2.1	
southwestern willow flycatcher *Empidonax traillii extimus*	ABPAE33043	Endangered	Endangered	G5T2	S3	
steelhead - southern California DPS *Oncorhynchus mykiss irideus pop. 10*	AFCHA0209J	Endangered	Candidate Endangered	G5T1Q	S1	
Stephens' kangaroo rat *Dipodomys stephensi*	AMAFD03100	Threatened	Threatened	G2	S3	
Swainson's hawk *Buteo swainsoni*	ABNKC19070	None	Threatened	G5	S4	
thread-leaved brodiaea *Brodiaea filifolia*	PMLIL0C050	Threatened	Endangered	G2	S2	1B.1
tricolored blackbird *Agelaius tricolor*	ABPBXB0020	None	Threatened	G1G2	S2	SSC
two-striped gartersnake *Thamnophis hammondii*	ARADB36160	None	None	G4	S3S4	SSC
western mastiff bat *Eumops perotis californicus*	AMACD02011	None	None	G4G5T4	S3S4	SSC
western pond turtle *Emys marmorata*	ARAAD02030	Proposed Threatened	None	G3G4	S3	SSC
western spadefoot *Spea hammondii*	AAABF02020	Proposed Threatened	None	G2G3	S3S4	SSC
western yellow bat *Lasiurus xanthinus*	AMACC05070	None	None	G4G5	S3	SSC
western yellow-billed cuckoo *Coccyzus americanus occidentalis*	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
white cuckoo bee *Neolarra alba*	IIHYM81010	None	None	GH	SH	
white-bracted spineflower *Chorizanthe xanti var. leucotheca*	PDPGN040Z1	None	None	G4T3	S3	1B.2
white-eared pocket mouse *Perognathus alticola alticola*	AMAFD01081	None	None	G2TH	SH	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
white-faced ibis *Plegadis chihi*	ABNGE02020	None	None	G5	S3S4	WL
white-tailed kite *Elanus leucurus*	ABNKC06010	None	None	G5	S3S4	FP
Wright's trichocoronis *Trichocoronis wrightii var. wrightii*	PDAST9F031	None	None	G4T3	S1	2B.1
yellow warbler *Setophaga petechia*	ABPBX03010	None	None	G5	S3	SSC
yellow-breasted chat *Icteria virens*	ABPBX24010	None	None	G5	S4	SSC
Yucaipa onion *Allium marvinii*	PMLIL02330	None	None	G1	S1	1B.2

Record Count: 129

C3 CNPS Rare Plant Inventory

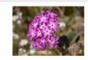
CALIFORNIA NATIVE PLANT SOCIETY

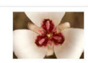
CNPS Rare Plant Inventory

Search Results

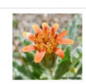
88 matches found. Click on scientific name for details

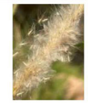
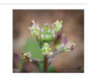
Search Criteria: Quad is one of [3411712:3411723:3411722:3411721:3411711:3311781:3311782:3311783:3411713]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Abronia villosa var. aurita	chaparral sand-verbena	Nyctaginaceae	annual herb	(Jan)Mar-Sep	None	None	G5T2?	S2	1B.1		2001-01-01	 © 2011 Aaron E. Sims
Acanthoscyphus parishii var. parishii	Parish's oxytheca	Polygonaceae	annual herb	Jun-Sep	None	None	G4? T3T4	S3S4	4.2	Yes	2007-04-05	 © 2014 Keir Morse
Allium howellii var. clokeyi	Mt. Pinos onion	Alliaceae	perennial bulbiferous herb	Apr-Jun	None	None	G4T2	S2	1B.3	Yes	1974-01-01	 © 2016 Keir Morse
Allium marvinii	Yucaipa onion	Alliaceae	perennial bulbiferous herb	Apr-May	None	None	G1	S1	1B.2	Yes	2001-01-01	 © 2013 Keir Morse
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	Mar-Jun	None	None	G5? T3T4	S3S4	4.2		1994-01-01	 © 2008 Aaron Schusteff
Arenaria paludicola	marsh sandwort	Caryophyllaceae	perennial stoloniferous herb	May-Aug	FE	CE	G1	S1	1B.1		1984-01-01	No Photo Available
Artemisia palmeri	San Diego sagewort	Asteraceae	perennial deciduous shrub	(Feb)May-Sep	None	None	G3?	S3?	4.2		1974-01-01	No Photo Available
Asplenium vespertinum	western spleenwort	Aspleniaceae	perennial rhizomatous herb	Feb-Jun	None	None	G3?	S4	4.2		1974-01-01	No Photo Available

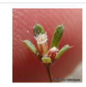
Astragalus hornii var. hornii	Horn's milk-vetch	Fabaceae	annual herb	May-Oct	None	None	GUT1	S1	1B.1		2006-12-01	No Photo Available
Astragalus pachypus var. jaegeri	Jaeger's milk-vetch	Fabaceae	perennial shrub	Dec-Jun	None	None	G4T1	S1	1B.1	Yes	1994-01-01	No Photo Available
Atriplex coronata var. notatior	San Jacinto Valley crownscale	Chenopodiaceae	annual herb	Apr-Aug	FE	None	G4T1	S1	1B.1	Yes	1988-01-01	 © 2008 Larry Sward
Atriplex serenana var. davidsonii	Davidson's saltscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G5T1	S1	1B.2		1994-01-01	No Photo Available
Berberis nevinii	Nevin's barberry	Berberidaceae	perennial evergreen shrub	(Feb)Mar-Jun	FE	CE	G1	S1	1B.1	Yes	1980-01-01	No Photo Available
Brodiaea filifolia	thread-leaved brodiaea	Themidaceae	perennial bulbiferous herb	Mar-Jun	FT	CE	G2	S2	1B.1	Yes	1974-01-01	 © 2016 Keir Morse
Calochortus catalinae	Catalina mariposa lily	Liliaceae	perennial bulbiferous herb	(Feb)Mar-Jun	None	None	G3G4	S3S4	4.2	Yes	1974-01-01	No Photo Available
Calochortus palmeri var. palmeri	Palmer's mariposa-lily	Liliaceae	perennial bulbiferous herb	Apr-Jul	None	None	G3T2	S2	1B.2	Yes	1994-01-01	No Photo Available
Calochortus plummerae	Plummer's mariposa-lily	Liliaceae	perennial bulbiferous herb	May-Jul	None	None	G4	S4	4.2	Yes	1994-01-01	No Photo Available
Calochortus simulans	La Panza mariposa-lily	Liliaceae	perennial bulbiferous herb	Apr-Jun	None	None	G2	S2	1B.3	Yes	1980-01-01	 © 2011 Aaron E. Sims
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1		1994-01-01	 Dean Wm. Taylor 1997
Castilleja cinerea	ash-gray paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	Jun-Aug	FT	None	G1G2	S1S2	1B.2	Yes	1974-01-01	No Photo Available
Castilleja lasiorhyncha	San Bernardino Mountains owl's-clover	Orobanchaceae	annual herb (hemiparasitic)	May-Aug	None	None	G2?	S2?	1B.2	Yes	1980-01-01	No Photo Available
Castilleja montigena	Heckard's paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	May-Aug	None	None	G3	S3	4.3	Yes	1974-01-01	No Photo Available

Caulanthus si lans	Payson's jewelflower	Brassicaceae	annual herb	(Feb)Mar-May(Jun)	None	None	G4	S4	4.2	Yes	1974-01-01	No Photo Available
Centro dia pungens ssp. *laevis*	smooth tarplant	Asteraceae	annual herb	Apr-Sep	None	None	G3G4T2	S2	1B.1	Yes	1994-01-01	No Photo Available
Chloropyron ma *m u riti m* ssp. *riti mu*	salt marsh bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct(Nov)	FE	CE	G4?T1	S1	1B.2		1974-01-01	No Photo Available
Chorizanthe leptotheca	Peninsular spineflower	Polygonaceae	annual herb	May-Aug	None	None	G3	S3	4.2		1994-01-01	No Photo Available
Chorizanthe parryi var. *parryi*	Parry's spineflower	Polygonaceae	annual herb	Apr-Jun	None	None	G3T2	S2	1B.1	Yes	1994-01-01	 © 2012 Keir Morse
Chorizanthe xanti var. *leucotheca*	white-bracted spineflower	Polygonaceae	annual herb	Apr-Jun	None	None	G4T3	S3	1B.2	Yes	1994-01-01	No Photo Available
Convolvulus si lans	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	None	None	G4	S4	4.2		1994-01-01	No Photo Available
Cuscuta obtusiflora var. *glandulosa*	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	Jul-Oct	None	None	G5T4?	SH	2B.2		2011-08-24	No Photo Available
Deinandra paniculata	paniculate tarplant	Asteraceae	annual herb	(Mar)Apr-Nov	None	None	G4	S4	4.2		2001-01-01	No Photo Available
Diplacus clevelandii	Cleveland's bush monkeyflower	Phrymaceae	perennial rhizomatous herb	Apr-Jul	None	None	G4	S4	4.2		1980-01-01	 © 2020 W. Juergen Schrenk
Dodecahe a leptoceras	slender-horned spineflower	Polygonaceae	annual herb	Apr-Jun	FE	CE	G1	S1	1B.1	Yes	1980-01-01	No Photo Available
Eriastrum densifolium ssp. *sanctorum*	Santa Ana River woollystar	Polemoniaceae	perennial herb	Apr-Sep	FE	CE	G4T1	S1	1B.1	Yes	1980-01-01	No Photo Available
Eriophyllum lanatum var. *obovatum*	southern Sierra woolly sunflower	Asteraceae	perennial herb	Jun-Jul	None	None	G5T4	S4	4.3	Yes	1974-01-01	No Photo Available
Erythranthe exigua	San Bernardino Mountains monkeyflower	Phrymaceae	annual herb	May-Jul	None	None	G2	S2	1B.2		1974-01-01	No Photo Available

Fimbristylis thermalis	hot springs fimbristylis	Cyperaceae	perennial rhizomatous herb	Jul-Sep	None	None	G4	S1S2	2B.2		1980-01-01	No Photo Available
Frasera neglecta	pine green-gentian	Gentianaceae	perennial herb	May-Jul	None	None	G4	S4	4.3	Yes	1980-01-01	No Photo Available
Fritillaria pinetorum	pine fritillary	Liliaceae	perennial bulbiferous herb	May-Jul(Sep)	None	None	G4	S4	4.3	Yes	2001-01-01	 © 2008 Steve Matson
Galium californicum ssp. primum	Alvin Meadow bedstraw	Rubiaceae	perennial herb	May-Jul	None	None	G5T2	S2	1B.2	Yes	1974-01-01	 © 2013 Keir Morse
Galium johnstonii	Johnston's bedstraw	Rubiaceae	perennial herb	Jun-Jul	None	None	G4	S4	4.3	Yes	1974-01-01	 © 2015 Keir Morse
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	Asteraceae	perennial rhizomatous herb	Aug-Oct	None	None	G5TX	SX	1A	Yes	1974-01-01	No Photo Available
Heuchera caespitosa	urn-flowered alumroot	Saxifragaceae	perennial rhizomatous herb	May-Aug	None	None	G3	S3	4.3	Yes	1974-01-01	 © 2015 Keir Morse
Heuchera parishii	Parish's alumroot	Saxifragaceae	perennial rhizomatous herb	Jun-Aug	None	None	G3	S3	1B.3	Yes	1974-01-01	 © 2015 Keir Morse
Hordeum intercedens	vernal barley	Poaceae	annual herb	Mar-Jun	None	None	G3G4	S3S4	3.2		1994-01-01	No Photo Available
Horkelia cuneata var. puberula	mesa horkelia	Rosaceae	perennial herb	Feb-Jul(Sep)	None	None	G4T1	S1	1B.1	Yes	2001-01-01	 © 2008 Tony Morosco
Hulsea vestita ssp. parryi	Parry's sunflower	Asteraceae	perennial herb	Apr-Aug	None	None	G5T4	S4	4.3	Yes	1994-01-01	 © 2015 Keir Morse

Imperata brevifolia	California satintail	Poaceae	perennial rhizomatous herb	Sep-May	None	None	G3	S3	2B.1		2006-12-26	 © 2020 Matt C. Berger
Ivesia argyrocoma var. argyrocoma	silver-haired ivesia	Rosaceae	perennial herb	Jun-Aug	None	None	G2T2	S2	1B.2	Yes	1974-01-01	 © 2015 Keir Morse
Juglans californica	Southern California black walnut	Juglandaceae	perennial deciduous tree	Mar-Aug	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2020 Zoya Akulova
Juncus duranii	Duran's rush	Juncaceae	perennial rhizomatous herb	Jul-Aug	None	None	G3	S3	4.3	Yes	1974-01-01	 © 2017 Keir Morse
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	None	None	G4T2	S2	1B.1		1994-01-01	 © 2013 Keir Morse
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	Brassicaceae	annual herb	Jan-Jul	None	None	G5T3	S3	4.3		1994-01-01	 © 2015 Keir Morse
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	Liliaceae	perennial bulbiferous herb	Mar-Jul(Aug)	None	None	G4T4?	S4?	4.2	Yes	1980-01-01	 © 2008 Thomas Stoughton
Lilium parryi	lemon lily	Liliaceae	perennial bulbiferous herb	Jul-Aug	None	None	G3	S3	1B.2		1974-01-01	 © 2009 Thomas Stoughton
Lycium parishii	Parish's desert-thorn	Solanaceae	perennial shrub	Mar-Apr	None	None	G4	S1	2B.3		1980-01-01	No Photo Available
Malacothamnus parishii	Parish's bush-mallow	Malvaceae	perennial deciduous shrub	Jun-Jul	None	None	GXQ	SX	1A	Yes	1974-01-01	 © 2021 Keir Morse

Monardella macrantha ssp. hallii	Hall's monardella	Lamiaceae	perennial rhizomatous herb	Jun-Oct	None	None	G5T3	S3	1B.3	Yes	1974-01-01	No Photo Available
Monardella pringlei	Pringle's monardella	Lamiaceae	annual herb	May-Jun	None	None	GX	SX	1A	Yes	1974-01-01	No Photo Available
Muhlenbergia californica	California muhly	Poaceae	perennial rhizomatous herb	Jun-Sep	None	None	G4	S4	4.3	Yes	1994-01-01	No Photo Available
Muilla coronata	crowned muilla	Themidaceae	perennial bulbiferous herb	Mar-Apr(May)	None	None	G3	S3	4.2		1988-01-01	No Photo Available
Nama stenocarpa	mud nama	Namaceae	annual/perennial herb	Jan-Jul	None	None	G4G5	S1S2	2B.2		1994-01-01	No Photo Available
Nasturtium gambelii	Gambel's water cress	Brassicaceae	perennial rhizomatous herb	Apr-Oct	FE	CT	G1	S1	1B.1		1980-01-01	No Photo Available
Packera bernardina	San Bernardino ragwort	Asteraceae	perennial herb	May-Jul	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Pelazoneuron puberulum var. sonorense	Sonoran maiden fern	Thelypteridaceae	perennial rhizomatous herb	Jan-Sep	None	None	G5T3	S2	2B.2		1994-01-01	No Photo Available
Perideridia parishii ssp. parishii	Parish's yampah	Apiaceae	perennial herb	Jun-Aug	None	None	G4T3T4	S2	2B.2		1974-01-01	No Photo Available
Phacelia mohavensis	Mojave phacelia	Hydrophyllaceae	annual herb	Apr-Aug	None	None	G4Q	S4	4.3	Yes	1994-01-01	No Photo Available
Phacelia stellaris	Brand's star phacelia	Hydrophyllaceae	annual herb	Mar-Jun	None	None	G1	S1	1B.1		1994-01-01	No Photo Available
Piperia leptopetala	narrow-petaled rein orchid	Orchidaceae	perennial herb	May-Jul	None	None	G4	S4	4.3	Yes	2001-01-01	No Photo Available
Quercus engelmannii	Engelmann oak	Fagaceae	perennial deciduous tree	Mar-Jun	None	None	G3	S3	4.2		1988-01-01	No Photo Available
Ribes divaricatum var. parishii	Parish's gooseberry	Grossulariaceae	perennial deciduous shrub	Feb-Apr	None	None	G5TX	SX	1A	Yes	1988-01-01	No Photo Available
Romneya coulteri	Coulter's matilija poppy	Papaveraceae	perennial rhizomatous herb	Mar-Jul(Aug)	None	None	G4	S4	4.2		1974-01-01	No Photo Available
Rupertia rigida	Parish's rupertia	Fabaceae	perennial herb	Jun-Aug	None	None	G4	S4	4.3		1974-01-01	No Photo Available

Schoenus nigricans	black bog-rush	Cyperaceae	perennial herb	Aug-Sep	None	None	G4	S2	2B.2		2001-01-01	No Photo Available
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	None	None	G3	S2	2B.2		1994-01-01	No Photo Available
Senecio astephanus	San Gabriel ragwort	Asteraceae	perennial herb	May-Jul	None	None	G3	S3	4.3	Yes	2006-12-21	No Photo Available
Sidalcea hickmanii ssp. parishii	Parish's checkerbloom	Malvaceae	perennial herb	(May)Jun-Aug	None	CR	G3T1	S1	1B.2	Yes	1974-01-01	No Photo Available
Sidalcea malviflora ssp. dolosa	Bear Valley checkerbloom	Malvaceae	perennial herb	May-Aug	None	None	G5T2	S2	1B.2	Yes	2012-06-13	No Photo Available
Sidalcea neomexicana	salt spring checkerbloom	Malvaceae	perennial herb	Mar-Jun	None	None	G4	S2	2B.2		1994-01-01	No Photo Available
Sidalcea pedata	bird-foot checkerbloom	Malvaceae	perennial herb	May-Aug	FE	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Sidotheca caryophylloides	chickweed oxytheca	Polygonaceae	annual herb	Jul-Sep(Oct)	None	None	G4	S4	4.3	Yes	1980-01-01	 ©2021 Keir Morse
Sphenopholis obtusata	prairie wedge grass	Poaceae	perennial herb	Apr-Jul	None	None	G5	S2	2B.2		1974-01-01	No Photo Available
Streptanthus bernardinus	Laguna Mountains jewelflower	Brassicaceae	perennial herb	May-Aug	None	None	G3G4	S3S4	4.3	Yes	1980-01-01	No Photo Available
Streptanthus campestris	southern jewelflower	Brassicaceae	perennial herb	(Apr)May-Jul	None	None	G3	S3	1B.3		1994-01-01	No Photo Available
Symphyotrichum defoliatum	San Bernardino aster	Asteraceae	perennial rhizomatous herb	Jul-Nov	None	None	G2	S2	1B.2	Yes	2004-01-01	No Photo Available
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	None	None	G4T3	S1	2B.1		1988-01-01	No Photo Available
Trichostema micranthum	small-flowered bluecurls	Lamiaceae	annual herb	Jun-Sep	None	None	G4	S3	4.3		1974-01-01	No Photo Available
Yucca brevifolia						CC			CBR		2011-12-13	No Photo Available

Showing 1 to 88 of 88 entries

Appendix D

Cultural Resources Assessment (Public Version)

INLAND FEEDER-FOOTHILL PUMP STATION INTERTIE PROJECT

Cultural Resources Assessment

Prepared for

The Metropolitan Water District of Southern California
700 North Alameda Street,
Los Angeles, California 90012

March 2024

INLAND FEEDER-FOOTHILL PUMP STATION INTERTIE PROJECT

Cultural Resources Assessment

Prepared for
The Metropolitan Water District of Southern California
700 North Alameda Street,
Los Angeles, California 90012

March 2024

Prepared by
ESA
626 Wilshire Boulevard, Suite 1100
Los Angeles, CA 90017

Principal Investigator:
James Clark, M.A.

Author:
Claudia Camacho-Trejo, B.A.

Project Location:
Redlands (CA) USGS 7.5-minute Topographic Quad
Township 1 South, Range 3 West, Section1

Acreage: Approx. 10.4 acres

ESA

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ACRONYMS AND OTHER ABBREVIATIONS

Acronym or Abbreviation	Definition
APE	Area of Potential Effects
B.P.	Before Present
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CRHR	California Register of Historical Resources
ESA	Environmental Science Associates
Metropolitan	Metropolitan Water District of Southern California
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PRC	California Public Resources Code
SBVMWD	San Bernardino Valley Municipal Water District
SBVWCD	San Bernardino Valley Water Conservation District
SCCIC	South Central Coastal Information Center
USC	United States Code
USGS	U.S. Geological Survey

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INLAND FEEDER-FOOTHILL PUMP STATION INTERTIE PROJECT

Cultural Resources Assessment

Introduction

Environmental Science Associates (ESA) has been retained by The Metropolitan Water District of Southern California (Metropolitan) to conduct a cultural resources assessment for the Inland Feeder-Foothill Pump Station Intertie Project (proposed project). The Inland Feeder is owned and operated by Metropolitan and conveys approximately 1.7 billion gallons of water daily throughout its distribution system. Located in western San Bernardino and Riverside counties, the Inland Feeder is a 44-mile-long, 12-foot-diameter conveyance pipeline supporting reliable water delivery to Southern California. The primary purpose of the Inland Feeder is to connect State Water Project supplies to Metropolitan's Eastern Distribution System.

Project Personnel

ESA personnel involved in the preparation of this report are as follows: Principal Investigator James Clark, M.A., RPA; report author and archaeologist Claudia Camacho-Trejo, B.A.; archaeologist Ellen McIlvain, B.A.; and GIS specialist Chance Scott. Resumes of key personnel are included in **Appendix A**.

Project Location

The proposed project is located on an approximately 10-acre, triangular-shaped parcel immediately south of the intersection of Cone Camp Road and Greenspot Road in Highland, California (assessor's parcel numbers 1210381240000 and 1210381250000; referred to in this report as the project area). The site is generally accessible from State Route 210 (Foothill Freeway), located roughly 3.5 miles to the west. Local access to the project area is provided by Cone Camp Road, with an entrance gate immediately north and south of the Foothill Pump Station. The majority of the site is secured with chain-link perimeter fencing. The project area is bounded by Greenspot Road and residential development to the north, the Santa Ana River and open space to the south, and large-lot, single-family residences and open space to the east and west.

Metropolitan owns 5.47 acres of the project area and has easement rights to approximately 1 acre of the project area. The San Bernardino Valley Municipal Water District (SBVMWD) and the San Bernardino Valley Water Conservation District (SBVWCD) own the remainder of the project area. SBVWCD also owns the parcel directly south of Metropolitan's triangular-shaped fee property. Metropolitan will obtain an additional easement for the SBVWCD property located between the

Metropolitan Inland Feeder alignment and its fee property. The project location is shown in **Figure 1, Regional Location Map**. The proposed project facilities are shown in **Figure 2, Project Location Map**, and are situated within Section 1 of Township 1 South, Range 3 West of the Redlands (CA) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle.

Project Description

To enhance Metropolitan's water delivery flexibility in response to drought conditions and limited State Water Project (SWP) allocations, Metropolitan is proposing two new pipeline connections between the Inland Feeder and the SBVMWD-Inland Feeder Interconnection Line 1 and SBVMWD's Foothill Pump Station (FPS).

Two new underground pipelines (supply connection and discharge connection), two underground vaults, four aboveground hydropneumatic surge tanks (HST), and associated appurtenant structures would be constructed in two stages as outlined below.

Stage 1 would include construction of the components mainly located within the existing fenced facility. This would include construction of an approximately 400-foot-long, 54-inch supply connection pipeline, an approximately 750-foot-long, 54-inch discharge connection pipeline, a 50-by-40-foot underground vault, four aboveground HSTs on concrete pads, and appurtenant structures. Additionally, the proposed project would include installation of a new fence-line along the western boundary of the project area to accommodate the supply and discharge connection components.

Stage 2 construction activities would occur along the southern portion of the project area, located mainly outside of the fenced facility, and would include a 45-by-40-foot underground vault, a portion of the 54-inch discharge connection pipeline, all associated appurtenant structures, and final connections to the existing Inland Feeder pipeline.

Most of the construction activities would occur during daylight hours, occasional nighttime construction activities may be required to shutdown the Inland Feeder and install the tie-in connection. Operation and maintenance activities at the FPS and Inland Feeder would be similar to existing conditions.

Area of Potential Effects

An Area of Potential Effects (APE) was established for the undertaking in accordance with Section 106 of the National Historic Preservation Act (NHPA). An APE is defined as:

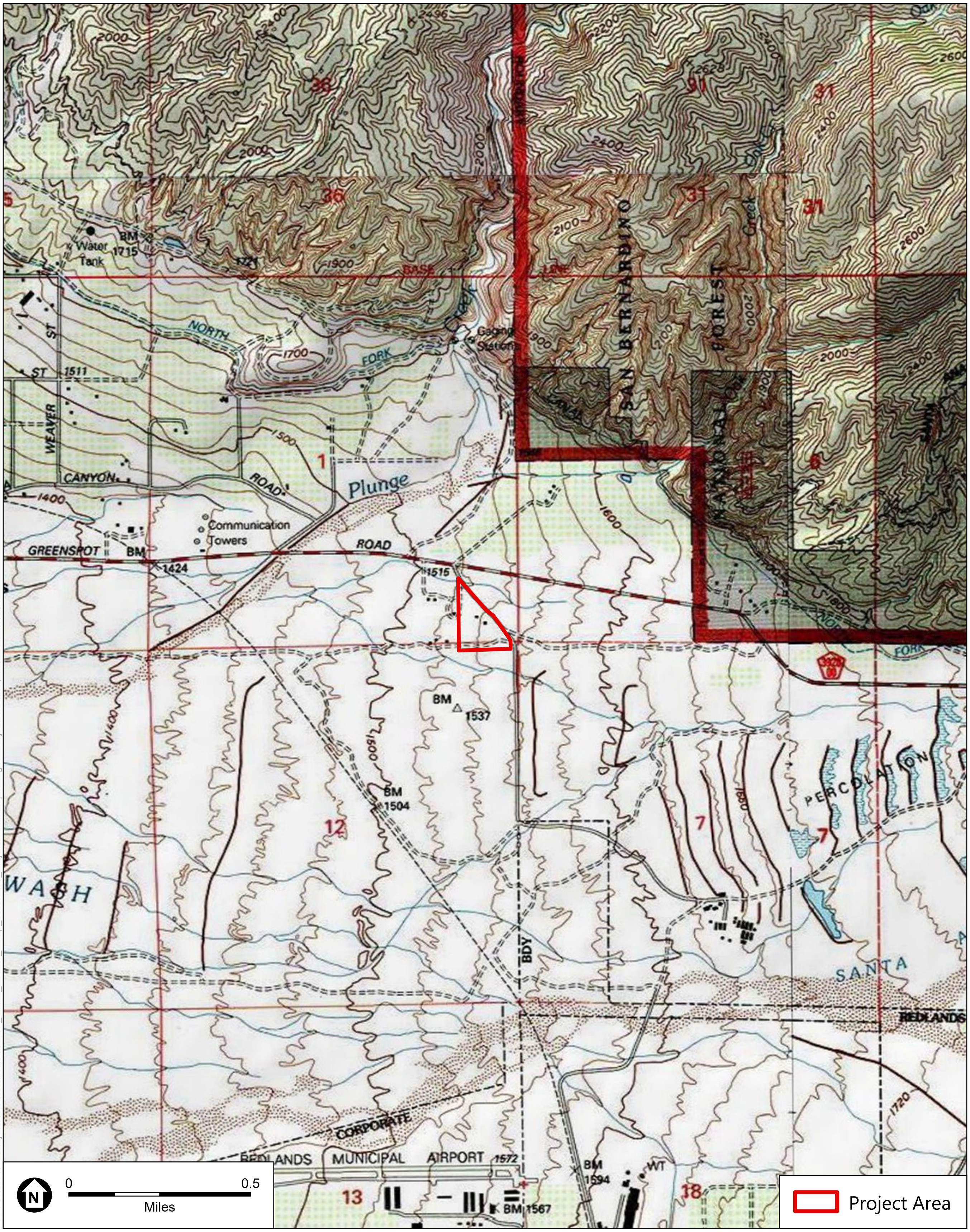
> *… the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking* (36 Code of Federal Regulations [CFR] 800.16[d]).

SOURCE: ESA, 2024

Inland Feeder Pump Station

Figure 1
Regional Location Map

ESA



SOURCE: ESA, 2024, USGS, 2023

Topo Quad: Redlands, 1980

Inland Feeder Pump Station

Figure 2
Project Location Map

ESA

The APE includes the area where project-related activities may directly or indirectly affect cultural resources. The total acreage for the horizontal APE is approximately 10 acres. The horizontal APE retains the level of anticipated disturbance. The vertical APE consists of the maximum depth of ground disturbance, which varies from 10 to 35 feet (**Figure 3, Area of Potential Effects [APE]**), given the nature of the undertaking, which would replace and enhance existing facilities or add underground pipelines, an indirect effects APE was not established.

Setting

Environmental Setting

The project site is located on the Peninsular and the south side of the Transverse Ranges border in the north and eastern part of the San Bernadino Valley. This section of San Bernardino Valley, known as Highland, comprises a slim belt of foothill slopes raised from the lowlands, skirting the southern base of the San Bernardino Mountains, and extending west over 10 miles from the gorge of the Santa Ana River. It comprises Quaternary-age young alluvial fan, channel, and wash deposits. Many different environments are recorded in the valley fill, including rivers, lakes, and broad alluvial fans. Alluvium, lake, playa, and terrace deposits at the surface range from the early Pleistocene to the Holocene (Morton and Miller 2006). Several fault systems are located within proximity of the project site.

Prehistoric Setting

The chronology of Southern California is typically divided into three general time periods: the Early Holocene (11,000 to 8,000 Before Present [B.P.]), the Middle Holocene (8,000 to 4,000 B.P.), and the Late Holocene (4,000 B.P. to A.D. 1769). This chronology is manifested in the archaeological record by particular artifacts and burial practices that indicate specific technologies, economic systems, trade networks, and other aspects of culture.

Early Holocene (11,000 to 8,000 B.P.)

While it is not certain when humans first came to California, their presence in Southern California by about 11,000 B.P. has been well documented. At Daisy Cave, on San Miguel Island, cultural remains have been radiocarbon dated to between 11,100 and 10,950 years B.P. (Byrd and Raab 2007). On the mainland, radiocarbon evidence confirms occupation of the Orange county and San Diego county coast by about 9,000 B.P., primarily in lagoon and river valley locations (Gallegos 2002). In western Riverside county, few Early Holocene sites are known to exist. One exception is site CA-RIV-2798, which contains deposits dating to as early as 8,580. B.P. (Grenda 1997). During the Early Holocene, the climate of Southern California became warmer and more arid and the human population, residing mainly in coastal or inland desert areas, began exploiting a wider range of plant and animal resources (Byrd and Raab 2007).

The primary Early Holocene cultural complex in coastal Southern California was the San Dieguito Complex, occurring between approximately 10,000 and 8,000 B.P. The people of the San Dieguito Complex inhabited the chaparral zones of southwestern California, exploiting the plant and animal resources of these ecological zones (Warren 1967). Leaf-shaped and large-stemmed projectile points, scraping tools, and crescentics are typical of San Dieguito Complex material culture.

SOURCE: ESA, 2024

Inland Feeder Pump Station

Figure 3
Area of Potential Effects

ESA

Middle Holocene (8,000 to 4,000 B.P.)

During the Middle Holocene, there is evidence for the processing of acorns for food and a shift toward a more generalized economy in coastal and inland Southern California. During this period, the processing of plant foods—particularly acorns—increased, a wider variety of animals were hunted, and trade with neighboring regions intensified (Byrd and Raab 2007).

The Middle Holocene La Jolla (8,000–4,000 B.P.) Complex is essentially a continuation of the San Dieguito Complex. La Jolla groups lived in chaparral zones or along the coast, often migrating between the two. Coastal settlement focused on the bays and estuaries of coastal Orange and San Diego counties. La Jolla peoples produced large, coarse stone tools, but also produced well-made projectile points and milling slabs. The La Jolla Complex represents a period of population growth and increasing social complexity, and it was also during this period that the first evidence of the exploitation of marine resources and the grinding of seeds for flour appears, as indicated by the abundance of millingstones in the archaeological record (Byrd and Raab 2007).

Contemporary with the La Jolla Complex, the Pauma Complex has been defined at coastal and adjacent inland sites in San Diego and Orange counties, as well as in inland Riverside county (True 1958). The Pauma Complex is similar in technology to the La Jolla Complex; however, evidence of coastal subsistence is absent from Pauma Complex sites (Moratto 1984). The Pauma and La Jolla Complexes may either be indicative of separate inland and coastal groups with similar subsistence and technological adaptations, or, alternatively, may represent inland and coastal phases of one group's seasonal rounds. The latter hypothesis is supported by the lack of hidden and deeply buried artifacts at Pauma sites, indicating that these sites may have been temporary camps for resource gathering and processing.

Late Holocene (4,000 B.P. to A.D. 1769)

During the Late Holocene, native populations of Southern California were becoming less mobile, and populations began to gather in small sedentary villages with satellite resource-gathering camps (Byrd and Raab 2007). Evidence indicates that the overexploitation of larger, high-ranked food resources may have led to a shift in subsistence towards a focus on acquiring greater amounts of smaller resources, such as shellfish and small-seeded plants (Byrd and Raab 2007).

Around 1,000 B.P., there was an episode of sustained drought, known as the Medieval Climatic Anomaly. While the effects of this environmental change on prehistoric populations are still debated, it likely led to changes in subsistence strategies to deal with the substantial stress on resources (Jones and Schwitalla 2008). In coastal Southern California, beginning before the Medieval Climatic Anomaly but possibly accelerated by it, conditions became drier, and many lagoons had been transformed into saltwater marshes. Because of this, populations abandoned coastal mesa and ridge tops to settle nearer to permanent freshwater resources (Gallegos 2002).

Trade intensity reached its zenith in the Late Holocene, with asphaltum (tar), seashells and steatite being traded from Southern California to the Great Basin. Major technological changes appeared as well, particularly with the advent of the bow and arrow, which largely replaced the use of the dart and atlatl (Byrd and Raab 2007). Small projectile points, ceramics, including Tizon brownware pottery, and obsidian from Obsidian Butte (Imperial county), are all representative artifacts of the Late Holocene.

It has been postulated that as early as 3,500 B.P., a Takic-speaking people arrived in coastal Los Angeles and Orange counties, having migrated west from inland desert regions (Kroeber 1925; Warren 1968; Sutton 2009). By around 1,500 to 1,000 B.P., Takic language and cultures had spread to the south and inland to the east. These new arrivals, linguistically and culturally different from earlier coastal populations, may have brought new settlement and subsistence systems with them, along with other new cultural elements. This migration has been postulated as being a factor in several of the significant changes in material culture seen in the Late Holocene (such as the use of smaller projectile points and pottery), as well as the introduction of cremation as a burial practice.

The San Luis Rey (divided into San Luis Rey I [AD 1400 to 1750] and San Luis Rey II [AD 1750 to 1850]) cultures represented the Late Period in southwestern Riverside county, northern San Diego county, southern Los Angeles county, and the interior mountains of Orange county (Meighan 1954; Moratto 1984). San Luis Rey I village sites contain manos (hand stones), metates (grinding slabs), bedrock mortars, shell artifacts, and triangular arrow points. In addition to these features, San Luis Rey II sites are characterized by the presence of pottery, pictographs, and the cremation of the dead (Moratto 1984).

San Luis Rey settlement patterns in the upper San Luis Rey River drainage are typified by seasonally occupied lowland villages located in proximity to water sources, and highland villages occupied in the late summer and fall for acorn collection (True and Waugh 1982). However, settlement patterns within southwestern Riverside county are less well known. The available information, stemming primarily from survey data, indicates that four primary site types existed within the region during the Late Period: field camps, resource procurement locations, residential bases, and villages (Mason 1999). Resource procurement locations and field camps, the most common site types, contain a limited assemblage of artifacts and subsistence remains, primarily lithic debitage, some tools, fire affected rock, and small amounts of animal bones and charred seeds and nuts. This indicates that these types of sites were used primarily for focused activities and short-term occupancy.

Villages and residential bases, on the other hand, show evidence for long-term occupation by large groups of people. Villages were occupied year-round, while residential bases were occupied seasonally. Artifacts and features found at both village and residential bases, including large amounts of faunal and botanical remains, numerous high-quality tools, fire-affected rock, and anthrosols, indicate a wide range of activities (Mason 1999). Bedrock mortars point to the processing of seeds and acorns, and ceremonial activities are evidenced by the presence of pictographs, petroglyphs, and cupules within village sites.

Ethnographic setting

Maara'yam

At the time of contact, San Bernardino county was occupied by two groups, the Maara'yam (referred to as the Serrano in ethnographic literature) and the Cahuilla, though the area of the undertaking was largely occupied by the Maara'yam. The Maara'yam speak a dialect of the Takic family of the Uto-Aztecan language group. The extent of Maara'yam ancestral territory, which includes the mountain regions occupied by the Mountain Maara'yam and desert region occupied by the Desert Maara'yam, sometimes referred to as "Vanyume". Maara'yam ancestral territory includes the Antelope Valley to the west, the southwest Mojave Desert to the north, portions of the San Gabriel and San Bernardino Mountains at its center, the Inland Empire north of the city of Riverside to the south, and the city of Twentynine Palms to the east (San Manuel Band of Mission Indians 2022).

The Maara'yam lived in seasonal rounds and utilized resources in specific locations at different times of year, such as acorns, piñon nuts, yucca, mesquite, cacti, chia, deer, bighorn sheep, antelope, rabbits, small rodents, and birds (primarily quail) (Bean and Smith 1978). The Maara'yam used shell, bone, feathers, wood, stone, and plant fibers in the manufacture of their material culture, including basketry, blankets, and clothing. The Maara'yam, and many neighboring language groups, were organized into independent but interconnected village communities. These villages consisted of extended families residing in circular, dome- shaped structures made of willow frames covered with tule thatching, also known as a *kiic* (Bean and Smith 1978). Each of these villages consisted of one or more patrilineal clans that belonged to one of two exogamous moieties, either coyote or wildcat. The clan-based villages and the larger moiety groups maintained complex ceremonial, familial, and political relationships with one another (Gifford 1918; Strong 1929). Frequently, a number of communities would combine to celebrate important festivals, harvest cycles, and other ceremonial events, occasionally inviting distant, linguistically unrelated groups. The APE covers a broad area and was potentially known and visited by separate groups. However, the northern slopes of the San Bernardino Mountains appear to have fallen within the territory of the Apihavatum, a Maara'yam clan whose primary village was located at the present-day Arrowhead Hot Springs. The village, as well as the entire region, was known as *Apihanava t* or *Apuiva't* (Strong 1929).

Historic Setting

Spanish Period (1769–1821)

The first European to cross into San Bernardino County was Pedro Fages, who entered the area in 1772. Fages was in pursuit of deserting Spanish soldiers. In 1774 and 1776, Juan Batista de Anza crossed into San Bernardino Valley. With the establishment of the Mission System in California, catastrophe was wrought on Native American communities, their social fabric, and lifeways. Much of the Maara'yam were removed from the Antelope Valley, the Mojave River region, and the Inland Empire to the San Gabriel Mission, established in 1771 (San Manuel Band of Mission Indians 2022). The first attempt by Spanish missionaries to settle the valley was short-lived and unsuccessful. In 1810, Father Dumetz set out from the San Gabriel Mission to establish a mission station adjacent to an Indian village on the Santa Ana River. The station, called Politana, was largely destroyed by an earthquake in 1812. Shortly thereafter, the mission station was raided by non-local Indians and the settlement was abandoned (Scott 1976).

In 1819, Spanish Missionaries attempted to establish another mission outpost in the San Bernardino Valley. The outpost, called Estancia San Bernardino, was located in the area around what is presently the city of Redlands. The estancia's overseers compelled local Maara'yam and other indigenous communities to work as laborers building infrastructure to support the outpost (San Manuel Band of Mission Indians 2022). One such piece of infrastructure established via the labor of the Maara'yam was the Mill Creek Zanja, an irrigation system that allowed for the watering of the estancia's agricultural fields and served the local population for 60 years (Herzberg 1976; San Manuel Band of Mission Indians 2022

Mexican Period (1821–1846)

Mexico received its independence from Spain in 1821 and secularized the Spanish Missions in 1834. In 1842, Mexican settlers began to populate the eastern portion of the San Bernardino Valley. The same year, the Mexican Governor of California granted the majority of east San Bernardino Valley, including the Estancia San Bernardino, to Don Antonio Lugo's sons—Jose del Carmen, Jose Maria, and Vincente—along with their cousin, Diego Sepulveda. The land was used primarily for cattle ranching and was known as San Bernardino Rancho. The Lugos subsequently sold off parcels of the rancho to incoming Mormon settlers in the early 1850s, including the sale of the estancia in 1852 (Hertzberg 1976; Scott 1976).

American Period (1846–Present)

Mexico ceded California to the United States as part of the Treaty of Guadalupe Hildalgo, which ended the Mexican American War (1846–1848). The treaty also recognized rights of Mexican citizens to retain ownership of land granted to them by Spanish or Mexican authorities. However, the claimant was required to prove their right to the land before a patent was given. The process was lengthy and costly, and generally resulted in the claimant losing at least a portion of their land to attorney's fees and other costs associated with proving ownership (Starr 2007).

The Gold Rush (1849–1855) saw the first big influx of American settlers to California. In San Bernardino county, Mormon settlers entered the San Bernardino Valley in 1851 and purchased 37,000 acres from the Lugos for $75,000. The Mormon pioneers established the town of San Bernardino, along with other settlements along the Santa Ana River, and created new irrigation systems such as the Tenny Ditch. In 1857, the Mormon colony was recalled to Salt Lake City and many of the settlers were forced to sell off their lands at a loss. New residents of the valley continued to divert water from the Santa Ana River and Mill Creek to expand local agricultural production (Hertzberg 1976). Over the next 20 years, as the population and agriculture increased, so did the scale of the region's irrigation systems.

With the influx of settlers came increased private land ownership within the ancestral lands of the Maara'yam as ranches, farms, mines, and logging camps were established in the region. As a result, the Maara'yam who still inhabited their ancestral lands were subject to violence by the new settlers and forced into marginal areas of the San Bernardino Valley (San Manuel Band of

Mission Indians 2022). In 1866, San Bernardino militia units began terrorizing Maara'yam in the Big Bear region, killing many, causing the local Maara'yam tribal head, Santos Manuel, to lead his *Yuhaaviatam* (People of the Pines) clan of 20–30 persons away from their mountain territory (San Manuel Band of Mission Indians 2022).

Following removal from their mountain homeland, the *Yuhaaviatam* inhabited the San Bernardino Valley along Warm Creek, and over a period of a decade settled in various areas such as what is presently the National Orange Show Event Center in San Bernardino, Meadowbrook Park, and Harlem Springs (San Manuel Band of Mission Indians 2022). In 1891, the *Yuhaaviatam* were removed to the San Manuel Reservation.

Regulatory Framework

There are various laws and regulations that require federal, state, and local agencies to consider the impact of a project on cultural resources. These laws and regulations specify a compliance process, outline the responsibilities of the different agencies involved in proposing the action, and establish the relationship between other relevant agencies.

Federal

Section 106 of the NHPA

Archaeological resources are protected through the NHPA of 1966, as amended (16 United States Code [USC] 470f), and its implementing regulation, Protection of Historic Properties (36 CFR Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979. Prior to implementing an "undertaking" (e.g., issuing a federal permit), Section 106 of the NHPA requires federal agencies to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation and the State Historic Preservation Officer a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register of Historic Places (National Register). As indicated in Section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural importance to a tribe are eligible for inclusion in the National Register. Under the NHPA, a resource is considered significant if it meets the National Register listing criteria at 36 CFR 60.4.

National Register of Historic Places

The National Register was established by the NHPA of 1966, as "an authoritative guide to be used by federal, State, and local governments, private groups and citizens to identify the Nation's historic resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). The National Register recognizes a broad range of cultural resources that are significant at the national, state, and local levels and can include districts, buildings, structures, objects, prehistoric archaeological sites, historic-period archaeological sites, traditional cultural properties, and cultural landscapes. As noted above, a resource that is listed in or eligible for listing in the National Register is considered "historic property" under Section 106 of the NHPA.

To be eligible for listing in the National Register, a property must be significant in American history, architecture, archaeology, engineering, or culture. Properties of potential significance must meet one or more of the following four established criteria:

A. Are associated with events that have made a significant contribution to the broad patterns of our history;

B. Are associated with the lives of persons significant in our past;

C. Embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one or more of the criteria of significance, a property must have integrity. Integrity is defined as "the ability of a property to convey its significance." The National Register recognizes seven qualities that, in various combinations, define integrity. The seven factors that define integrity are location, design, setting, materials, workmanship, feeling, and association. To retain historic integrity a property must possess several, and usually most, of these seven aspects. Thus, the retention of the specific aspects of integrity is paramount for a property to convey its significance.

Ordinarily religious properties, moved properties, birthplaces or graves, cemeteries, reconstructed properties, commemorative properties, and properties that have achieved significance within the past 50 years are not considered eligible for the National Register unless they meet one of the Criteria Considerations (a–g) below, in addition to meeting at least one of the four significance criteria A–D above, and retaining integrity (36 CFR 60.4):

a. A religious property deriving primary significance from architectural or artistic distinction or historical importance; or

b. A building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or

c. A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life.

d. A cemetery which derives its primary significance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or

e. A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or

f. A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

g. A property achieving significance within the past 50 years if it is of exceptional importance.

State

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is the principal statute governing environmental review of projects occurring in the state and is codified at California Public Resources Code (PRC) Section 21000 et seq. CEQA requires lead agencies to determine if a proposed project would have a significant effect on the environment, including significant effects on historical or unique archaeological resources. Under CEQA (Section 21084.1), a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

The CEQA Guidelines (Title 14 California Code of Regulations [CCR] Section 15064.5) recognize that historical resources include (1) a resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR); (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); and (3) any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California by the lead agency, provided the lead agency's determination is supported by substantial evidence in light of the whole record. The fact that a resource does not meet the three criteria outlined above does not preclude the lead agency from determining that the resource may be an historical resource as defined in PRC Sections 5020.1(j) or 5024.1.

If a lead agency determines that an archaeological site is a historical resource, the provisions of Section 21084.1 of CEQA and Section 15064.5 of the CEQA Guidelines apply. If an archaeological site does not meet the criteria for a historical resource contained in the CEQA Guidelines, then the site may be treated in accordance with the provisions of Section 21083, which is as a unique archaeological resource. As defined in Section 21083.2 of CEQA a "unique" archaeological resource is an archaeological artifact, object, or site, about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If an archaeological site meets the criteria for a unique archaeological resource as defined in Section 21083.2, then the site is to be treated in accordance with the provisions of Section 21083.2, which state that if the lead agency determines that a project would have a significant effect on unique archaeological resources, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place (Section 21083.1[a]). If preservation in place is not feasible, mitigation measures shall be required. The CEQA Guidelines note that if an archaeological resource is neither a unique archaeological nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064.5[c][4]).

A significant effect under CEQA would occur if a project results in a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5(a). Substantial adverse change is defined as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired" (CEQA Guidelines Section 15064.5[b][1]). According to CEQA Guidelines Section 15064.5(b)(2), the significance of a historical resource is materially impaired when a project demolishes or materially alters in an adverse manner those physical characteristics that:

A. Convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR; or
B. Account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in a historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
C. Convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a Lead Agency for purposes of CEQA.

In general, a project that complies with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Grimmer 2017) is considered to have mitigated its impacts to historical resources to a less-than-significant level (CEQA Guidelines Section 15064.5[b][3]).

California Register of Historical Resources

The CRHR is "an authoritative listing and guide to be used by State and local agencies, private groups, and citizens in identifying the existing historical resources of the State and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Section 5024.1[a]). The criteria for eligibility for the CRHR are based upon National Register of Historic Places (NRHP) criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the CRHR, including California properties formally determined eligible for, or listed in, the NRHP.

To be eligible for the CRHR, a prehistoric or historic-period property must be significant at the local, state, and/or federal level under one or more of the following four criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

A resource eligible for the CRHR must meet one of the criteria of significance described above, and retain enough of its historic character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. It is possible that a historic resource may not retain sufficient integrity to meet the criteria for listing in the NRHP, but it may still be eligible for listing in the CRHR.

Additionally, the CRHR consists of resources that are listed automatically and those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed on the NRHP and those formally determined eligible for the NRHP.
- California Registered Historical Landmarks from No. 770 onward.
- Those California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Commission for inclusion on the CRHR.

Other resources that may be nominated to the CRHR include the following:

- Historical resources with a significance rating of Category 3 through 5 (those properties identified as eligible for listing in the NRHP, the CRHR, and/or a local jurisdiction register).
- Individual historical resources.
- Historical resources contributing to historic districts.
- Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as an historic preservation overlay zone.

California Health and Safety Code Section 7050.5

California Health and Safety Code Section 7050.5 requires that in the event human remains are discovered, the County Coroner be contacted to determine the nature of the remains. In the event the remains are determined to be Native American in origin, the Coroner is required to contact the California NAHC within 24 hours to relinquish jurisdiction.

California Public Resources Code Section 5097.98

PRC Section 5097.98, as amended by Assembly Bill 2641, provides procedures in the event human remains of Native American origin are discovered during project implementation. PRC Section 5097.98 requires that no further disturbances occur in the immediate vicinity of the discovery, that the discovery is adequately protected according to generally accepted cultural and archaeological standards, and that further activities take into account the possibility of multiple burials. PRC Section 5097.98 further requires the NAHC, upon notification by a County Coroner, designate and notify a Most Likely Descendant (MLD) regarding the discovery of Native American human remains. Once the MLD has been granted access to the site by the landowner and inspected the discovery, the MLD then has 48 hours to provide recommendations to the landowner for the treatment of the human remains and any associated grave goods.

In the event that no descendant is identified, or the descendant fails to make a recommendation for disposition, or if the landowner rejects the recommendation of the descendant, the landowner may, with appropriate dignity, reinter the remains and burial items on the property in a location that will not be subject to further disturbance.

Archival Research

South Central Coastal Information Center Records Search

On December 15, 2023, ESA staff conducted a records search for the proposed project through the California Historical Resources Information System South Central Coastal Information Center (SCCIC), housed at California State University, Fullerton. The records search included a review of all recorded archaeological resources and previous studies within the APE and general vicinity.

Previous Cultural Resources Investigations

According to the search results, 13 cultural resources studies have been conducted within a 0.5-mile radius of the APE (as shown in **Table 1**). Approximately 50 percent of the searched radius was covered in these previous studies. Out of these 13 studies, two of them (SB-05816, and 07459) overlap nearly 90 percent of the APE, including adjacent roads.

TABLE 1
PREVIOUS CULTURAL RESOURCES INVESTIGATIONS

SCICC (SB-)	Author	Title	Year
01566	Brock, James, John F. Elliott, Benjamin Resnick, And William A. Sawyer	Santa Ana River Upstream Alternatives, Cultural Resources Survey	1986
01754	Hatheway, Roger G.	Historical And Architectural Evaluation, Seven Oaks Dam Bridges	1987
01783	Hornbeck, David And Howard Botts	Seven Oaks Dam Project: Water Systems	1988
02652	Mckenna, Jeanette A.	Results Of An Archaeological Monitoring Program For The Greenspot Road Pipeline Along Greenspot Road, East Highlands, San Bernardino County, California	1992
02685	Mckenna, Jeanette A. And Leta J. Franklin	Archaeological Testing And Mitigation Of Adverse Impacts At Ca-Sbr-7166h, An Historic Habitation Site, East Highlands, San Bernardino County, California	1992
02853	Foster, John M., James J. Schmidt, Carmen A. Weber, Gwendolyn R. Romani, And Roberta S. Greenwood	Cultural Resource Investigation: Inland Feeder Project, MWD Of Southern Ca	1991
04067	Tang, Bai Tom	APN: 297-021-04, -05 & The Southern Portion Of 097-021-12, Due Diligence/Feasibility Investigation, City Of Highland, San Bernardino County, Ca. 3PP	2004
04831	Brunzell, David and Curt Duke	Cultural Resource Assessment: Upper Santa Ana River Wash Land Management and Habitat Conservation Plan, San Bernardino County, California.	2005

SCICC (SB-)	Author	Title	Year
05816	Schmidt, Tiffany A. And Janis K. Offerman	East Branch Extension Phase II Archaeological Survey Report, San Bernardino County, California.	2007
06035	Goodwin, Riordan	Archaeological Survey Report for The Greenspot S-Curve Realignment, City Of Highland, San Bernardino County, California.	2008
07459	Tang, Bai “Tom”, Terri Jacquemain, Harry Quinn, Daniel Ballester, And Nina Gallardo	Identification and Evaluation of Historic Properties: Enhanced Recharge Facilities for Santa Ana River Water Diverted by Valley District and Western under Water Rights Permit Project (Phase 1 & 2), Cities of Highland and Redlands, San Bernardino County, California.	2012
07569	Mcdougall, Dennis P. And Jill A. Onken	Inland Feeder Pipeline Project: Final Synthetic Report of Archaeological Findings, San Bernardino County, California.	2003
08040	Tang, Bai "Tom" And Michael Hogan	Historical/Archaeological Resources Survey Report Tentative Tract Map no. 18893, City of Highland, San Bernardino County, California	2015

NOTES: APE = area of potential effects; APN = assessor’s parcel number, SCCIC = South Central Coastal Information Center.
SOURCE: SCCIC 2023.

Previously Recorded Cultural Resources

The records search results indicate that a total of 18 cultural resources have been recorded within the general vicinity of the APE (**Table 2**). Of the 18 resources, 8 are historic-period archaeological sites (P-36-005526, 006068, 010184, 033121, 033122, 033123, 033124, and 060194); two are historic isolates (P-36-023403 and 024382); and eight historic built-in structures (P-36-006847, 006848,007051, 007165, 007215, 023404, and 024384).

TABLE 2
PREVIOUSLY RECORDED CULTURAL RESOURCES

P Number (P-36-)	Permanent Trinomial (CASBR-)	Description	Dates Recorded	NRHP/ CRHR Eligibility
005526	005526H	Historic site: building foundation and refuse scatter	1985; 1987	Unknown
006068	006068H	Historic site: pipes, cans, and domestic debris	1987; 2018	Not Evaluated
006847	006847H	Historic site: (Structure, Site) segment of the historic alignment of the Southern California Railroad	1987; 2018	Ineligible
006848	006848H	Historic site: irrigation ditch	1990; 1992; 1993; 2006; 2010; 2017	Ineligible
007051	007051H	Historic Structure: Irrigation system	1990; 1994; 2003	Unknown
007165	007165H	Historic Site: Plunge Creek Bridge	1996; 1987	Ineligible
007215	007215h	Historic Site: road, orchard, irrigation canal and standpipe irrigation system.	1992	Unknown
010184	010184H	Historic Site: trash scatter	1999	Unknown
010681	010681H	Historic Site: building foundations	2002	Ineligible
023403	—	Historic Isolate: wooden and metal objects	2009	Unknown
023404	014789H	Historic Structure: pipe culvert	2009	Ineligible
024382	—	Historic Isolate	2012	Unknown

P Number (P-36-)	Permanent Trinomial (CASBR-)	Description	Dates Recorded	NRHP/ CRHR Eligibility
024384	—	Historic Site: Water Conveyance	2018	Ineligible
033121	033121H	Historic Site: Refuse scatter	2018	Not Evaluated
033122	033122H	Historic Site: Refuse scatter	2018	Not Evaluated
033123	033123H	Historic Site: Refuse scatter	2018	Not Evaluated
033124	033124H	Historic Site: Refuse scatter	2018	Unknown
060194	—	Historic: Porcelain fragments and a license plate	1984	Unknown

Native American Heritage Commission

The Native American Heritage Commission (NAHC) maintains a confidential Sacred Lands File that contains information about sites that hold a traditional, cultural, or religious value to the Native American community. On December 14, 2023, a request was made to the NAHC for a Sacred Land File search for the APE. On January 5, 2024, the NAHC responded to the request. The NAHC provided a list of tribal contacts and recommended that they be contacted to obtain additional information. The Sacred Lands File search has been included in (**Appendix B-Confidential**).

Historic Maps and Aerial Photographs

ESA examined historic maps and aerial photographs to discern historical information about the APE and to contribute to an assessment of the APE's archaeological sensitivity. Available maps include the 1954 and 2012 Redlands USGS 7.5-minute topographic quadrangle (TopoView 2023). Historic aerial photographs were available for the years 1938, 1959, 1980, 2002, 2005, 2010, 2013, and 2020 (Historicaerials.com 2023); 1933, 1952, 1954, and 1966, (FrameFinder 2023); 1995, 2002, 2003, 2005, 2018, and 2023 (Google Earth Pro 2024).

The 1901 topographic map depicts Greenspot Road and Cone Camp Road (unnamed) adjacent to the APE, although these are shown as unknown. A review of the 1954 topographic map shows the area is primarily undeveloped, with only two buildings in the southwest section of the APE. On the next available topographic map from 2012, no buildings near Cone Camp Road are visible.

The 1938 aerial photograph displays a historic-era resource within the APE. The northwest area of the APE was undeveloped. By 1959, more buildings (features) could be observed as part of the historic-era resource within the APE while the rest of the area remained the same. After 1966, housing growth can be observed on the east side of the APE. The 1995 aerial is missing features present in the 1966 aerial, indicating historic-era resources were removed sometime between the two images were taken. In the 2002 aerial image, it is evident that the last poultry farm standing within the southern portion of APE is no longer present. After 2005, the APE was turned into a staging area for the Inland Feeder construction. In the northeast section of the APE, the

SBVMWD Foothill Pump Station building is visible in aerial imagery. From 2006 to 2023, the south area remained a graded empty lot while the north section of the APE presented changes, including a pipeline running north to south, the Foothill Pump Station structure, a chain-link fence surrounding the APE and also acting as a divider between the north and south of the APE, and a short, paved road that leads to a graded parking area.

Geologic Map Review

The project area is entirely mapped as Holocene-aged Quaternary alluvial (Qa) "consisting of "sand and clay of valley areas, covered with gray clay soil, including "alluvial pebbly sand adjacent to mountain terranes" (Dibblee and Minch, 2004). Surficial sediment consists of alluvial sediments composed of gravel and sand. The vicinity of the project site also includes Young Alluvial Wash Deposits (Qw), Young Axial-Channel Deposits (Qya3 and Qya4), and artificial fill adjacent to or near the improvements (HDR Engineering, 2022; Morton and Matti, 2001).

Geotechnical Report Review

The geotechnical study was completed by HDR Engineering (2022). They conducted a geophysical survey by their subcontractors (Atlas) on June 24, 2022. In addition to the survey, three test pits were excavated to the maximum depth of 15 feet below ground surface to study the conditions of the project site. The first 5 to 11 feet of the test pit units showed artificial fill, alluvium soils were found beneath the artificial fill and consist of poorly graded sand mixed with gravel, cobbles, and boulders up to 49.6 inches in diameter. (HDR Engineering 2022).

Cultural Resources Survey

Methods

On December 20, 2023, ESA archaeologists Claudia Camacho-Trejo, B.A. and Ellen McIlvain, B.A. conducted an intensive pedestrian survey of the APE. The purpose of the survey was to identify archaeological and built environment resources within the APE. The survey methodology varied depending on the landforms encountered within the APE. Areas with flat terrain and visible ground surfaces were subject to systematic pedestrian surveys with transects spaced between 5 and 15 meters apart (approximately 15 to 45 feet). Areas with limited ground visibility, such as densely vegetated areas, underwent opportunistic surveys, where areas with some ground visibilities were targeted. The APE was verified using the ArcGIS Field Maps application on an Android phone. Photo logs, field observations, and results were documented using Survey 123 with a Samsung 10S device. No subsurface investigation was performed during the pedestrian survey.

Results

No cultural resources were discovered during the survey. The APE is a relatively flat area with SBVMWD Foothill Pump Station's modern pump structure on the northeast area surrounded by chain-link fences and gates subdividing the area. Soils generally consisted of graded sandy gravel with cobbles, including native vegetation and several trees. However, one modern feature, an F-shaped poured concrete foundation, was documented within the APE. The following paragraphs describe the results of the survey and the resources encountered during the survey. No artifacts were observed during the survey.

In the northern part of the APE, 5-meter transects were conducted along the chain-link fence with good ground visibility of around 60 to 70 percent. Elsewhere in northern part of the APE, due to a concentration of granite boulders, the Foothill Pump Station building, a depression near a pipeline area, and a graded parking lot area, ground visibility was low (about 10 to 20 percent); an opportunistic survey was conducted in this section of the APE (**Figures 4–6**).

The middle portion of the APE was surveyed using 5-meter transects; ground visibility was excellent (around 80 to 90 percent) due to previous grading and compaction of the area. The soil was composed of imported gravel and silty sand. This section of the APE was highly disturbed and previously used as a parking area, as two track marks are visible all over the area.

Figure 4. General View along Northwest Chain-Link Fence, View NW

SOURCE: Photo by Environmental Science Associates

Figure 5. General View of Depression of the Discharged Pipeline on the Northwest Section of the APE, View NW

SOURCE: Photo by Environmental Science Associates

Figure 6. General View of Granite Boulders, Foothill Pump Station Building and a Plastic Pipe Feature, View SE

SOURCE: Photo by Environmental Science Associates

On the southeast area of APE, an F-shaped concrete foundation was encountered. The foundation measured about 157.2 inches long and 53 inches wide. Based on aerial imagery, the foundation was built between 2012 and 2015 (Historicaerials 2023; Google Earth Pro 2024). This F-shaped concrete foundation was made for a trailer truck previously stationed in this area of the APE. Based on the aerial imagery, it is likely that this section of the APE was previously used as a parking location for trucks and trailers. The F-shaped concrete foundation was in excellent condition, with some spray paint markings and a small wood frame on the edges of the foundation (**Figures 7–8**).

Outside the gated facility, within the southern portion of the project area, visibility was poor (less than 10 percent) in the areas with overgrown vegetation, oversized granite boulders mixed in with modern trash debris; therefore, an opportunistic survey was conducted. Two existing, unpaved two track roads cross west to east in this portion of the APE (**Figures 9–11**).

Figure 7. General View of F-Shape Poured Cement Foundation, View SW

SOURCE: Photo by Environmental Science Associates

Figure 8. Overview F-Shape Poured Cement Foundation, View SW

SOURCE: Photo by Environmental Science Associates

Figure 9. General View of the SOUTH portion of the APE, Granite Boulder and Distribution Pole, View SW

SOURCE: Photo by Environmental Science Associates

Figure 10. General View of Two Track Road Transecting the South APE, View SE

SOURCE: Photo by Environmental Science Associates

Figure 11. Overview of APE, View N

SOURCE: Photo by Environmental Science Associates

Archaeological Sensitivity Assessment

Prehistoric Archaeological Analysis

The potential for prehistoric archaeological deposits is predicated on (1) proximity to permanent or semi-permanent water sources capable of supporting long-term or seasonal occupation of the area; and (2) flat or gently sloped topography conducive to human habitation. Previous research conducted elsewhere in California has indicated that the presence of buried archaeological sites is positively correlated with proximity to water, as well as flat to gently sloped landforms.

Review of the geologic map indicates that the APE is composed of Quaternary-age young alluvial fan, channel, and wash deposits. The review of the geotechnical report also shows a historic disturbance layer of 3 to 5 feet, and an artificial fill composed primarily of sand and gravel to at least 5 to 15 feet below ground surface.

The APE is located on a flat surface, and the closest body of water to the APE (per a review of historical topographic maps) is the Santa Ana River, located approximately 1.12 miles southeast of the APE. The NAHC indicated that the Sacred Lands File search yielded positive results. Based on all these factors, the potential for yielding surficial and not deeply buried prehistoric archaeological resources within the APE is considered to be low to moderate.

Historic Archaeological Analysis

The records search identified 19 historic-period archaeological sites (consisting of remains of irrigation features, concrete foundations/structures, refuse deposits, and bridges) recorded within the general vicinity. The number of historic-period archaeological sites, and historic use of the area within the APE and vicinity, indicate a low to moderate potential of encountering buried historic archaeological resources. The construction of the Inland Feeder conveyance system by the Metropolitan Water District began in 1997 and was completed in 2007. Before the proposed project of Inland Feeder Foothill Pump Station Intertie, the Foothill Pump Station was built in early 2005. Given previous construction, the APE was previously graded and disturbed by the construction of the Inland Feeder conveyance system and the Foothill Pump Station within the APE.

A total of two historic architectural resources are recorded within the general vicinity the APE; however, none of these resources are located within or immediately adjacent to the APE. Therefore, no impacts to historic architectural resources would occur as a result of the proposed project.

Conclusions and Recommendations

No cultural resources were identified as a result of the survey. As such, the proposed project would result in **No Historic Properties Affected** under Section 106 of the National Register and California Register under CEQA and the Project would not result in a direct impact to historical resources.

As a result of the archival research and cultural resources survey conducted for the proposed project, no cultural resources have been identified within the APE. However, the likelihood for encountering subsurface archaeological deposits within the APE during project construction is low to moderate based on the amount of disturbance and fill at the site. In the event that subsurface archaeological deposits are encountered during project implementation, they may qualify as historical resources or unique archaeological resources pursuant to CEQA and may be subject to significant impacts. As such, the following recommended measures for the retention of a qualified archaeologist, cultural resources sensitivity training, construction monitoring, and inadvertent discovery protocols are provided below. Since no cultural resources were identified within the APE, and with implementation of the recommended measures below, the Project would result in less than significant impacts related to archaeological resources.

Recommendations

Worker Archaeological Awareness Training. Because of the potential for the proposed project to encounter archaeological resources, a qualified archaeologist shall conduct worker training prior to the initiation for ground-disturbing activities to inform workers of the types of resources that may be encountered and advise them of the proper handling of such resources.

Inadvertent Discoveries. If archaeological resources are encountered at the project site, the Contractor shall not disturb the resources and shall immediately cease all work within 50 feet of the discovery, notify the Engineer, and protect the discovery area, as directed by the Engineer. The Engineer, with the qualified archaeologist, shall make a decision of validity of the discovery and designate an area surrounding the discovery as a restricted area. The Contractor shall not enter or work in the restricted area until the Engineer provides written authorization.

Should the resource be determined to be potentially significant, a treatment plan shall be prepared. The plan shall be implemented by the qualified archaeologist in consultation with the Metropolitan to provide for the adequate recovery of the scientifically consequential information contained in the archaeological resource. The treatment plan shall include measures regarding the curation of the recovered resources, which may include curation at a public, non-profit institution with a research interest in the materials, if such an institution agrees to accept the material.

Human Remains

In the event that human remains are discovered during excavation/construction activity, Health and Safety Code Section 7050.5, CEQA Guidelines Section 15064.5(e), and Public Resources Code (PRC) Section 5097.98 will apply. The Contractor shall notify Metropolitan at once and not enter or work in the restricted area until the Engineer provides written authorization.

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Appendix A
Personnel Qualifications

Claudia Camacho-Trejo

Cultural Resources Specialist III

EDUCATION

MA (In Progress), Anthropology, California State University, Los Angeles

BA, Anthropology, California State University, Los Angeles

AA, Behavioral Studies, East Los Angeles Community College

6 YEARS' EXPERIENCE

PROFESSIONAL AFFILIATIONS

Archaeological Institute of American, since 2016.

Society for California Archaeology, since 2016.

Golden Key International Honour Society, California State LA inducted 2015

Lambda Alpha Anthropological Honor Society, California State LA inducted 2014

Society of American Archaeology since 2014

Claudia Camacho-Trejo is an archaeologist with eleven years of experience throughout Eastern Sierra Nevada, the Mojave Desert, the California South Coast, and Mexico. Claudia had focused as a cultural resource specialist the last six years of her career, working as an author and co-author of California Environmental Quality Act (CEQA)-level technical reports, Environmental Impact Report (EIR) sections, Initial Study (IS) sections, archaeological peer reviews, archaeological monitoring reports, and reports under Bureau Land Management requirements. She has performed archaeological excavation and testing, site recordation, laboratory analysis, pedestrian surveys, and construction monitoring. She has experience requesting records searches through several California Historical Resources Information Systems-Information Centers. In addition to her archaeological background, Claudia has coauthored paleo reports.

Relevant Experience

Ten West Link Transmission Line Project, Riverside County, CA and La Paz County, AZ. *Senior Cultural Resources Specialist (November 2022 – Present).* Environmental Science Associates (ESA) was retained by Delaney Colorado River Transmission LLC to provide archaeological monitoring during construction as well as perform archaeological and historic architectural resource documentation and evaluation in compliance with Section 106, NEPA, and CEQA requirements. The project involves the construction of 125 miles of high voltage electrical transmission line from Tonopah, AZ, to Blythe, CA. The corridor spans numerous federal, state, and private jurisdictions with varied cultural resource requirements necessitating sophisticated tracking and implementation of numerous agency jurisdiction–specific mitigations. The project passes through many Abandoned Mine Land areas and ESA's team has identified, documented, and evaluated a wide array of historic mining and mining related features such as prospects, cairns and claim markers, roads and trails, mine openings, can and other refuse scatters, and other mining related infrastructure. The project footprint also encompasses culturally sensitive areas important to multiple tribes including CRIT. ESA is providing ESA's team is working alongside the construction contractor, several tribes including CRIT monitors, and with the BLM in two states. Claudia was a lithic specialist who conducted a macroscopic lithic analysis on stone tools artifacts recovered during monitoring and excavation activities. She also curated part of the lithics collection at the Pasadena Lab and co-authored parts of the report.

The San Manuel Ancestral Land Exchange, San Bernardino County, CA. *Cultural Resources Specialist (May 2022 – Present).* Yuhaaviatam of San Manuel Nation, a Federally recognized Indian Tribe, formerly known as the San Manuel Band of Mission Indians and the Forest Service, United States Department Of Agriculture entered into an Agreement to Initiate the San Manuel Ancestral Land Exchange. Environmental Science Associates (ESA) prepared a cultural Resources Assessment in support of the Land Exchange. The study was conducted in compliance with Section 106 of the National Historic Preservation Act

(NHPA) of 1966 and considered a 2,997-acre study area, comprised of the combined six privately owned Non-Federal Parcels and two USFS-administered Federally Parcels. Claudia authored portions of the reports and conducted a heritage record search.

Caltrans-ROW Project, Olancha, CA. *Archaeologist.* Claudia performed archaeological screening from dewatering dwell spoils to recover cultural artifacts. This task was conducted directly with the tribal monitors and ESA supervisors to ensure the protection of culturally sensitive areas and artifact density areas identified during Phase I & II testing.

Material Culture Consulting, Pomona, CA. *Archaeologist/Project Analyst.* Claudia conducted pedestrian surveys for SCE pole replacement on public and private lands as an archaeologist. She also performed background research for archaeological studies, including processing records searches. Additional duties included conducting archaeological desktop reviews, including background data, project information, archaeological sensitivity, land ownership, and preparing DPR reports. Claudia then performed cultural resources monitoring during ground-disturbing activities. As a project analyst, Claudia provided Administrative and operational support for Operations and Maintenance Projects with extensive use of Excel, EHSYNC, and Google Earth. With a focus on archaeology, she collaborated with a team of subject matter experts regarding project status, assignment status, pre-construction and post-construction status, and other project issues as appropriate. She compiled and issued Environmental Clearance Documents to clients, project management, and field staff. Claudia prepared project information (e.g., project maps using GIS, Google Earth, or a similar program, and project description) for agency consultation and approvals. She also performed desktop clearances related to deteriorated pole replacements, Master Special Use Permit pole replacements on U.S. Forest Service Land, and private lands for Southern California Edison.

SWCA, Pasadena, CA. *Archaeologist.* Claudia conducted archaeological pedestrian surveys, construction monitoring, and other field or office tasks. She also prepared DPRs, technical reports and organized the company's artifacts collections being deaccessioned to an Orange County Museum.

California State University, Los Angeles Los Angeles, CA. *Graduate Thesis Reviewer.* Claudia conducted thesis examination meetings for Master degree candidates from all fields of study. She met with graduate students on an individual basis to review theses, provide direction regarding format requirements and academic standards, answer questions, and communicate policy guidelines. Claudia recorded the outcome of student thesis appointments, progress and dates of completion and maintained accurate and complete records of each thesis meeting with students to demonstrate progress. She would also communicate with students, to provide thesis related information, review select thesis pages, deadlines, and/or answer questions. She managed all activities related to the completion, submission and reporting and oversaw the thesis publication process with ProQuest and the distribution of hard copies to the academic units.

James J. Clark

Senior Archaeologist

EDUCATION

MA, Museum Studies, New York University

BA, Ancient Near Eastern Civilizations (Egyptology), Minor, Anthropology, University of California Los Angeles

24 YEARS' EXPERIENCE

CERTIFICATIONS/ REGISTRATION

Registered Professional Archaeologist, #16586

Meets Secretary of the Interior's PQS for Archaeology

United States Department of Agriculture Organics Act Permit, Principal Investigator

California BLM Permit, Principal Investigator

Meets Caltrans PQS for Principal Investigator

PROFESSIONAL AFFILIATIONS

Society of California Archaeology

Society of Black Archaeologists

James Clark is a Senior Archaeologist with over two decades of experience working in California, as well as the U.S. Northeast and Southeast. James provides technical oversight, expertise, and quality assurance for cultural resources support services, including survey, testing, data recovery, and monitoring projects. He has conducted numerous cultural resource studies for local, state, and federal agencies, as well as private utility companies and corporate entities pursuant to Sections 106 and 110 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act, and the California Environmental Quality Act. James is experienced in Native American coordination and compliance with California Assembly Bill 52. He is also experienced in archaeological curation and collections rehabilitation (36 CFR 79) and is proficient in several collections management and database applications including Gallery Systems/The Museum System, Microsoft Access, and SQL.

James meets the Secretary of the Interior's Professional Qualification Standards for Archaeology (i.e., 36 Code of Federal Regulations Part 61) and is a Registered Professional Archaeologist. Further, he also meets the California Department of Transportation (Caltrans) Professionally Qualified Staff standards at the level of Principal Investigator and is also named on permits to perform archaeological studies for a number of federal, state, and local agencies as well as Native American tribes.

Relevant Experience

Southern California Edison, Rush Creek Hydroelectric System FERC Relicensing Project #1039, **Inyo National Forest, Mono County, CA.** *Project Manager.* James coordinated the implementation of the archival research and fieldwork components of the project's Technical Study Plans for archaeological and built environment resources within the proposed APE for the Undertaking. Archival research entailed record searches at the Eastern Information Center and the Inyo National Forest office and an examination of germane documents from various repositories and on-line databases; fieldwork involved an intensive Class III inventory of the project APE. James also participated in project stakeholder meetings, as well as coordinated the preparation of separate Technical Study Reports (TSRs) which included preliminary NRHP eligibility recommendations for resources identified within the APE.

Southern California Edison, Ivanpah-Control Transmission Line Rating Remediation (TLRR) 15 Sites National Register of Historic Places and California Register of Historic Resources Eligibility Evaluations, **Inyo County, CA.** *Principal Investigator*. James coordinated the implementation of the project research design for the testing of 15 sites (prehistoric, historical period, and multicomponent) for NRHP and CRHR eligibility. In addition to coordinating testing fieldwork, he also supervised artifact analysis (including obsidian hydration and sourcing) and performed senior review of the technical report and its Department of Parks and Recreation 523 series site form appendix.

Naval Facilities Engineering Command (NAVFAC) SW Division, **Post-Fire Archeological Survey of 2,645 Acres, Naval Weapons Station Seal Beach, Detachment Fallbrook, CA.** *Principal Investigator.* This project entailed NRHP Section 110 Class III Inventory of 2,645 acres at Naval Weapons Station Seal Beach, Detachment Fallbrook. James coordinated, co-authored, and provided senior review the project work plan, research design, safety plan, technical report, and Department of Parks and Recreation 523 series site forms. James also supervised the fieldwork phase of the project.

National Park Service, Scorpion Pier Replacement Project, Santa Cruz Island, Channel Island National Park, **Santa Barbara County, CA.** *Principal Investigator.* As required per a 2017 Programmatic agreement between the NPS and the California State Historic Preservation Office, this project involved archaeological and osteological monitoring during construction-related ground disturbance at Scorpion Pier, Channel Island National Park for NHPA Section 106 compliance. James coordinated monitoring fieldwork and co-authored the technical report.

Property One, LLC. Redlands Packing House District Phase 2, Distillery, Coffee Shop, and Mixed-Use Retail Cultural Resources Investigations, Redlands, CA. *Project Manager.* This project entailed preconstruction and construction cultural resources monitoring, mechanical stripping, trenching, and testing at various parcels overlaying historic Chinatown (i.e., CA-SBR-5314H) and Sonora town in Downtown Redlands, California. James coordinated all phases of fieldwork, ethnographic interviews w/community stakeholders, artifact analysis, and technical report writing.

Naval Facilities Engineering Command (NAVFAC) SW Division, Archaeological Survey of a Portion of the Wilcox Ranch Properties for the Cultural Resources Program, Travis Air Force Base, Solano County, CA. *Principal Investigator.* The project involved an NHPA Section 106 Class III cultural resources inventory of 271- acres of privately owned land in support of a potential land exchange with Travis AFB. James coordinated, co-authored, and provided senior review of the project work plan, research design, safety plan, and technical report. James also supervised the fieldwork phase of the project.

United States Fish and Wildlife Service, **Cultural Resources Survey for a Potential Land Exchange at Bitter Creek National Wildlife Refuge, Kern County, CA**. *Project Manager.* The project involved an NHPA Section 106 Class III cultural resources inventory of 714- acres at 10 district parcels located within the Bitter Creek NWF, Kern County, California in support of a potential land exchange. James coordinated, co-authored, and provided senior review of the project work plan, research design, safety plan, and technical report. James also supervised the fieldwork phase of the project.

First Solar, LLC., First Solar Desert Quartzite Solar Farm Survey, Blythe, CA. *Project Manager*. The project entailed an NHPA Section 106 Class III archaeological inventory of approximately 5,000 acres of Bureau of Land Management land near Blythe, California for a 300-megawatt power-generating solar photovoltaic facility. James coordinated the production of the project work plan, research design, safety plan and technical report. James also supervised the fieldwork phase of the project.

Naval Facilities Engineering Command (NAVFAC) SW Division, **Section 110 Site Recordation, Evaluation, and Data Recovery at Locus 1019, CA-IMP-8396, Naval Air Facility, El Centro, CA**. *Project Manager.* The project involved an NHPA Section 110 survey, testing, and data recovery at CA-IMP-8396 Locus 1019 which consisted of three house pit house structures, several thermal features, and a midden situated along the maximum high stand shoreline of Lake Cahuilla. James coordinated preparation of the project work plan, research design, safety plan, technical report. James also supervised all three fieldwork phases of the project and coordinated all artifact analysis (including special studies conducted by external analysts).

Sara Dietler

Senior Archaeologist

EDUCATION

BA, Anthropology, San Diego State University

24 YEARS' EXPERIENCE

CERTIFICATIONS/ REGISTRATION

California BLM Permit, Principal Investigator, Statewide

Nevada BLM Permit, Paleontology, Field Agent, Statewide

PROFESSIONAL AFFILIATIONS

Society for American Archaeology (SAA)

Society for California Archaeology (SCA)

Sara Dietler is a senior archaeology and paleontology lead with more than 20 years of experience in cultural resources management in Southern California. As a senior project manager, she manages and prepares technical studies to report the findings of archaeological and paleontological surveys to assess a project's potential impacts. She applies her expertise for project-specific as well as on on-call contracts for cities, counties, utilities, transportation, and other agencies throughout the state of California.

Sara is well versed in preparing documentation and providing consultation in compliance with the National Historic Preservation Act (NHPA), National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and the Society of Vertebrate Paleontology guidelines and requirements. Cross-trained in paleontological monitoring, Sara regularly monitors and supervises fossil salvage for public agencies and private developers. She has extensive experience providing oversight for long-term compliance monitoring projects throughout the Los Angeles Basin for archaeological, Native American, and paleontological monitoring projects and provides streamlined management for these disciplines.

Lending her expertise in Native American consultation, Sara also conducts trainings for and provides expert support to clients managing tribal cultural resource issues under CEQA and NEPA for all types of projects and environmental documents.

Relevant Experience

City of Los Angeles, Department of Recreation and Parks, Rancho Cienega Celes King III Swimming Pool. *Project Manager.* Sara is managing the historic recordation and archaeological, paleontological, and Native American monitoring performed for the proposed new Recreation Center and swimming pool at the Rancho Cienega Sports Complex.

City of Los Angeles, Department of Recreation and Parks, San Pasqual Park Restroom Replacement Project. *Project Manager.* Sara managed and oversaw the archaeological and Native American monitoring performed during ground disturbance of the San Pasqual Park Restroom Replacement project. The project required monitoring during construction activities due to known archaeological sensitivity at the park.

City of Los Angeles Department of Public Works – Bureau of Engineering, San Pedro Plaza Park, San Pedro, Los Angeles, CA. *Senior Cultural Resources Project Manager.* Sara provided archaeological and paleontological monitoring support for the San Pedro Plaza Park Project. The project area is located in the City of Los Angeles port district of San Pedro, approximately 26 miles south of downtown Los Angeles. Sara provided quality control oversight for the archaeological and paleontological mitigation. During monitoring on the project, archaeological materials were recovered include refuse associated with park use since it opened in 1889, and historic building debris likely

Sara Dietler (Continued)

Senior Archaeologist

associated with the Carnegie Library which formerly stood on site. Sara also provided recommendations for commemoration and protection of the find.

City of Los Angeles Department of Public Works – Bureau of Engineering, Gaffey Street Pool Construction Monitoring, San Pedro, Los Angeles, CA. *Project Manager.* Sara oversaw the data recovery of a World War I slit trench discovered during project excavation for an ADA compliant sidewalk. Serving as project manager and senior archaeologist on the project Sara provided mitigation recommendations and immediate response to the find.

City of Los Angeles Department of Public Works – Bureau of Engineering, Warner Grand Theatre, Historic Resources Technical Report and Conditions Assessment, San Pedro, Los Angeles, CA. *Project Manager, Report Co-Author.* The Bureau of Engineering's Environmental Management Group requested a Cultural Resources Surveys to inform and guide future rehabilitation or redevelopment efforts of the Warner Grand Theatre. The Warner Grand Theatre designed in the Art Deco-Modern style by master architect B. Marcus Priteca in 1931, and is listed on the National Register of Historic Places, and is designated a Los Angeles Historic-Cultural Monument. ESA prepared a historical resources technical report and conditions assessment report, which provided a comprehensive table of character-defining features along with a conditions assessment of each feature located within the interior and exterior of the Warner Grand Theatre. Sara managed both the archaeological and historic efforts providing one point of contact for the City.

City of Los Angeles Department of Public Works – Bureau of Engineering, Alameda Street Widening Between Harry Bridges Boulevard and Anaheim Street Project, Los Angeles, CA. *Project Manager.* The project included upgrades to Alameda Street and adjoining streets with improved infrastructure to accept increased traffic from existing and proposed projects located primarily within the Port of Los Angeles and the Wilmington Industrial Park and to adequately deal with storm flows. Sara oversaw a California Historical Resources Information System record search of the project area for archaeological and paleontological resources and technical documents regarding the findings and recommendations for construction activities during the proposed project. In addition, she provided and oversaw staff for the Archaeological/paleontological monitoring for geotechnical testing and made further recommendations based on the results of the testing.

Alameda Street Widening Archaeological Resource Assessment; Los Angeles, California; LADPW, Bureau of Engineering. Project Archaeologist. During the course of monitoring, archaeologists discovered historic archaeological resources from the late 19th and early 20th century use of the area. Resources discovered included a segment of the original Zanja Madre irrigation system, railroad elements, and the original vitrified brick paving surface of Alameda Street located under the present roadway. Mitigation in compliance with CEQA was developed to address each of the resource types, and included documentation, avoidance, and removal. Brick paving was reused in design of current traffic island as a result of this mitigation. Role included analysis of artifacts, research and development of mitigation during field phase of project and client consultation.

Main Street Archaeological/Paleontological Monitoring and Assessment; Los Angeles, California; City of Los Angeles BOE. Archaeologist. Archaeological monitoring resulted in the identification of 18 archaeological features. The features mainly consisted of subterranean architecture such as basements that had been backfilled and capped. Directed construction crew in controlled excavation of these features so that they could be exposed and recorded prior to demolition. Completed the analysis of artifacts recovered and produced a technical report. Directed the archaeological and paleontological monitoring of a police parking facility in downtown Los Angeles. Coordinated with the client and construction personnel throughout the project.

RSC VE LLC., 670 Mesquit Street and Seventh Street Bridge Evaluation, Los Angeles, CA. *Project Manager and Report Co-author.* ESA prepared an EIR for the 670 Mesquit Street project in Los Angeles. As part of the EIR, a Cultural Resources Technical Report was prepared to determine if the project site was eligible for listing as a historical resource. The project site, originally occupied by the Los Angeles Ice and Cold Storage Company, was determined to lack integrity and therefore, ineligible for listing. Although the core of the building on the project site retained elements of the historic cold storage building, the facility was seismically upgraded resulting in significant alterations to its exterior. In its current condition, the facility does not convey its historical associations. Located south of the project site is the Seventh Street Bridge, which is listed on the California Register of Historical Resources, and eligible for the National Register of Historic Places. The project was also evaluated to determine if it would result in any potential impacts to nearby historic resources, including the Seventh Street Bridge and adjacent railroad tracks. Sara provided oversight and analysis for the preparation of Cultural Resources Technical Report.

Clark Construction, Long Beach Courthouse Project, Long Beach, CA. *Senior Project Archaeologist and Project Manager.* Sara directed the paleontological and archaeological monitoring for the construction of the New Long Beach Courthouse. She supervised monitors inspecting excavations up to 25 feet in depth. Nine archaeological features were recovered. Sara completed an assessment of the artifacts and fossil localities in a technical report at the completion of the project.

Vadnais Trenchless Services, Venice Dual Force Main Project, Venice, CA. *Cultural Resources Lead.* The Venice Dual Force Main Project is an $88 million sewer force main construction project spanning 2 miles within Venice, Marina del Rey, and Playa del Rey. Contracted to Vadnais Trenchless Services and reporting to the City of Los Angeles, Bureau of Engineering, Environmental Management Group, ESA is serving as the project's environmental resource manager. ESA is serving as the project's environmental resource manager responsible to documenting the projects compliance with required environmental measures. The project is situated in a dense residential neighborhood and has garnered significant public interest. Monitoring includes the electronic collection of compliance data in the areas of aesthetics, biology, cultural resources, noise, vibration, stormwater pollution prevention best management practices, parking, haul routes, tree protection, among others. Sara provides quality control oversight for the archaeological and paleontological mitigation.

Advanced Water Treatment Facility Project Groundwater Reliability Improvement Project, Pico Rivera, CA. *Project Manager.* ESA is providing environmental compliance monitoring for the Water Replenishment District to ensure compliance with the conditions contained in the Mitigation and Monitoring Reporting Programs associated with three environmental documents, including the Final Environmental Impact Report (EIR), a Mitigated Negative Declaration, and a Supplemental EIR, pertaining to three infrastructure components associated with the project. ESA provides general compliance monitoring at varying rates of frequency depending on the nature of the activities and is sometimes on-site for 4-hour spot checks and other times for full 24-hour rotations. The project is located near a residential neighborhood and adjacent the San Gabriel River. Issues of concern include noise, vibration, night lighting, biological resources, cultural resources, and air quality. Sara provides quality assurance and oversight of the field monitoring, and day-to-day response to issues. She oversees archaeological and Native American monitoring for ground disturbance and coordinates all sub-consultants for the project. She also provides daily, weekly, and quarterly reporting on project compliance to support permitting and agency oversight.

Southern California Edison On-Call Master Services Agreement for Natural and Cultural Resources Services, Avalon, CA. *Cultural Resources Task Manager.* Sara provided project management and senior archaeological support for an on-call Master Services Agreement with Southern California Edison for cultural and natural resources consulting services. This contract included numerous surveys and monitoring projects for pole replacements and small- to mid-size reconductoring projects, substation maintenance, and construction projects. Sara served as project manager for more than 25 projects under this contract and served as the go-to person for all water, gas, and power projects occurring in the city of Avalon on Santa Catalina Island. Sara was responsible for oversight of archaeological and paleontological monitors and served as report author and report manager.

Los Angeles Unified School District (LAUSD) Central Los Angeles High School #9; Los Angeles, CA. *Senior Project Archaeologist and Project Manager.* Sara conducted on-site monitoring and investigation of archaeological sites exposed as a result of construction activities. During the data recovery phase in connection with a 19th century cemetery located on-site, she participated in locating of features, feature excavation, mapping, and client coordination. She organized background research on the cemetery, including genealogical, local libraries, city and county archives, other local cemetery records, internet, and local fraternal organizations. Sara advised on the lab methodology and setup and served as project manager. She was a contributing author and editor for the published monograph, which was published as part of a technical series, "Not Dead but Gone Before: The Archaeology of Los Angeles City Cemetery."

City of Los Angeles Department of Water and Power, Scattergood Olympic Transmission Line, Los Angeles, CA. *Report Author.* The Los Angeles Department of Water and Power constructed approximately 11.4 miles of new 230 kilovolt (kv) underground transmission line connecting the Scattergood Generation Station and Olympic Receiving Station. The project includes monitoring of construction activities occurring in street rights-of-way. Sara provided final reporting for the long-term monitoring and QA/QC of the field data.

Veterans Administration Long Beach, Long Beach, CA. *Senior Project Manager.* Sara managed a long-term monitoring project or the Veteran's Administration campus, which also includes implementation of a Memorandum of Agreement, a Plan of Action, and Historic Properties Treatment plan for the mitigation of disturbance to a prehistoric site on the campus.

City of Los Angeles Department of Public Works – Bureau of Engineering, Downtown Cesar Chavez Median Project, City of Los Angeles, CA. *Project Manager.* As a part of the Specialty Services On-Call Contract with the Bureau of Engineering, Sara assisted the City with a Local Assistance Project requiring consultations with Caltrans cultural resources. Sara was responsible for Caltrans coordination, serving as contributing author and report manager for the required Archaeological Survey Report, Historic Properties Survey Report, and Historical Resources Evaluation Report prepared for the project. Approximate Cost: $9,956, Project Work Dates: 09/2015 to 12/2015

John Laing Homes, Hellman Ranch Project, Orange County, CA. *Lab Director.* Sara served as the lab director for the final monitoring phase of the John Laing Homes development project, cataloging and analyzing artifacts recovered from salvage monitoring and test units placed in relation to recovered intact burials. She conducted microscopic analysis of small items such as bone tools and shell and stone beads, directed lab assistants, and oversaw special studies, including the photo-documentation of the entire collection. Sara completed a section reporting on the results of the bead and ornament analysis in the final report, which was published as part of a technical series.

Hansen Dam Golf Course Water Recycling Project, Los Angeles, CA. *Senior Archaeologist and Project Manager.* Sara directed a phase I historical assessment for the Hansen Dam Golf Course Water Recycling Project located in the Los Angeles' San Fernando Valley. The project included the construction of an outdoor pumping station adjacent to the existing Hansen Tank located at the Los Angeles Department of Water and Power's Valley Generating Station. In addition, a pipeline or distribution line was planned to be installed from the pumping station to the Hansen Dam Golf Course along the Tujunga Wash. The phase I study of this project included mitigation for the effects of the project on the portion of the golf course falling within the area of potential effects, which was potentially sensitive for buried cultural resources as the result of a complex of World War II housing units placed on the site between the 1940s and the 1960s. Sara conducted consultation with the U.S. Army Corps of Engineers regarding the project.

Alameda Corridor-East Construction Authority (ACE). San Gabriel Trench Grade Separation Environmental Compliance Services, San Gabriel, CA. *Senior Archaeologist and Report Manager.* Sara conducted bead analysis, lab supervision and served as contributing author to data recovery report. She oversaw preparation of a published monograph, which includes the analysis of the feature and artifact recovery from the San Gabriel Mission site, as well as a contextual history of the site and findings. Sara provided artifact analysis and co-authored the artifact chapter in the monograph. The 2.2-mile San Gabriel Trench grade separation project resulted in the lowering of a 1.4-mile section of Union Pacific railroad track in a 30-foot-deep, 65-footwide trench through the city of San Gabriel with bridges constructed at Ramona Street, Mission Road, Del Mar Avenue and San Gabriel Boulevard, allowing vehicles and pedestrians to pass over the tracks. Proximity to the San Gabriel Mission provided sensitivity for cultural resources and a number of known archaeological resources in the project site. The cultural resources support was a multi-year effort consisting of Phase II testing, data recovery, and monitoring resulting in some of the most important finds known to the region.

Coachella Flats Wind Energy Repower Environmental Surveys, Coachella, CA. *Senior Cultural Resources Task Leader.* Sara served as Senior Cultural and Paleontological manager providing management and oversight for the surveys and reporting. She conducted coordination with the client and the U.S. Bureau of Land Management. Sara provided cultural resources, paleontological resources, and biological resources services in support of an Environmental Impact Report for the project.

Los Angeles County Department of Public Works (LACDPW), Topanga Library Project, Topanga Canyon, CA. *Project Manager.* Sara supervised the archaeological monitoring effort and directed data recovery of findings for the library project as part of an LACDPW On-call Contract. Construction included the installation waterlines along the roadway outside of the main project area. Monitoring resulted in the discovery of materials associated with the recorded archaeological site CA-LAN-8. Sara prepared a Data Recovery Plan and Research Design to mitigate the disturbance to the known site during installation of a water main for the library project. The resources were identified and evaluated for eligibility to the National Register of Historic Places. During the project, Sara worked closely with the LACDPW to assist them in mitigating the effects of the project as well as coordinating with Caltrans who had oversight on the project. Approximate Cost: $145,000.00, Project Work Dates: 01/2009 to 12/2012

Pacific Gas & Electric (PG&E) North American Electric Reliability Corporation Support; Multiple Counties, CA. *Senior Cultural Resources Specialist.* Sara provided recommendations on archaeological, historic, and paleontological sensitivity based on desktop research via Geographic Information Systems, Google Earth, historic maps and aerials, and the National Geological Map database to determine sensitivity of cultural resources within the right-of-way for eight different transmission line projects. She supported PG&E Land and Environmental Management and PG&E Electric Transmission with cultural, and paleontological resource sensitivity assessments and other compliance efforts.

Pacific Gas & Electric (PG&E) Vallejo Substation B Reconductoring Projects Cultural Resources Support, Vallejo, CA. *Senior Project Manager.* Sara provided oversight of archaeological and historic evaluation of the property. The project consisted of an evaluation of a PG&E substation for potential historical register listing and conducted a cultural resources sensitivity desktop review.

Interstate 5 High Occupancy Vehicle Lanes Project, Orange County, CA. *Cultural Resources Task Manager.* Sara directed the Orange County Transportation Authority (OCTA) Interstate 5 (I-5) High Occupancy Vehicle (HOV) Lanes Project, which involves improvements to I-5 between State Route (SR) 55 and SR-57 and included a phase I study. Orange County Transportation Authority and the California Department of Transportation (Caltrans) served as the overseeing agencies. She coordinated with planners, other resource managers, and Caltrans. Sara completed analysis of existing conditions, conducted an archaeological survey, and produced an Archaeological Survey Report following Caltrans guidelines.

Holland Partners, Sixth and Bixel Project, Los Angeles, CA. *Project Manager.* Sara managed a monitoring phase of the project for a Holland Partners mixed-use development in downtown Los Angeles, which included the recovery of fossils such as marine invertebrates, sharks, and a partial whale. She conducted coordination with the Los Angeles Natural History Museum regarding preparation and curation of the whale fossil.

Los Angeles Department of Water and Power, Elysian/USC Water Recycling Project Initial Study/ Environmental Assessment, Los Angeles, CA. *Project Manager.* Sara worked on the Initial Study/Mitigated Negative Declaration and an Environmental Assessment/Finding of No Significant Impact to construct recycled water pipelines for irrigation and other industrial uses serving Los Angeles Department of Water and Power customers in downtown Los Angeles, including Elysian Park. The U.S. Environmental Protection Agency is the federal lead agency. Sara prepared two technical reports and a treatment plan for archaeological, historic, and paleontological resources identified during the phase I assessment.

Recurrent Energy, Kern County Solar Energy Projects, Kern County, CA. *Project Manager/Senior Archaeologist.* Sara provided cultural resources, paleontological resources, and Native American monitoring services for five separate solar photovoltaic projects for Recurrent Energy. The five projects include a total of 626 acres of previously undeveloped land in the eastern portion of the county. Sara served as project manager for all five projects and Senior Archaeologist providing client coordination and oversight of paleontological monitoring and reporting.

City of Beverly Hills, Purple Line Extension Project Independent Compliance Manager, Beverly Hills, CA. *Supervisor.* ESA conducted general compliance monitoring under contract to the City of Beverly Hills to ensure project compliance with the Memorandum of Agreement between the City of Beverly Hills and LA Metro during the advanced utilities relocation and construction of Section 1 of the Metro Purple Line Extension. In this role, ESA was responsible for compliance oversight of provisions in a Memorandum of Agreement between Metro and the City of Beverly Hills. Significant issues included traffic, pedestrian access, haul routes, and noise. Sara provided scheduling and oversight of the field monitoring and day-to-day response to compliance issues.

Crystal Geyser Roxane, Cabin Bar Ranch Water Bottling Facility Slowdown Lane, Inyo County, CA. *Project Manager, Senior Archaeologist.* Crystal Geyser Roxane proposed to construct a slowdown lane on the west side of U.S. Highway 395 for the spring water bottling facility, requiring an encroachment permit from Caltrans. ESA conducted testing at two National Register-eligible sites in accordance with Caltrans requirements. ESA evaluated the portions of the sites within the encroachment permit area and found that these areas did not contain sufficient data to address National Register criteria. Sara obtained necessary permitting, strategized and authored treatment plans in coordination with Caltrans archaeologist, Caltrans Environmental, Permitting, the Tribe and the client team. She also oversaw compliance with treatment plan during monitoring. Approximate Cost: $34,000, Project Work Dates: 05/2016 – 02/2017

El Camino Real Bridge Replacement, Atascadero, CA. *Paleontological Project Manager.* Sara oversaw the preparation of all California Environmental Quality Act/National Environmental Policy Act documentation, survey, technical studies, and permitting, for the replacement of the El Camino Real Bridge over Santa Margarita Creek in Atascadero. Caltrans was the overseeing agency on the project and all reporting was prepared in accordance with the Caltrans Standard Environmental Reference for paleontology. Approximate Cost: $8,600, Project Work Dates: 09/2015 to 12/2015

Orange County Parks Cooper Center Curation Project, Orange County, CA. *Project Manager.* Sara served as project manager and senior cultural resources report author and reviewer. ESA conducted this study on curation in California at the request of Orange County Parks. The purpose of the study was to conduct market research and collect a data set of curation costs and long-term management models used by curation facilities that house collections throughout California. The facilities in the data set included museums, universities, colleges, archaeological centers, cultural centers, tribal curation facilities, historical societies, city facilities, and county facilities.

Peters Canyon Channel Reuse Pipeline Project, Irvine, CA. *Paleontological Lead.* Sara served as paleontological lead for the paleontological monitoring report for the Peters Canyon Channel Reuse Pipeline Project. The project will divert high selenium nuisance surface and groundwater flows from the channel to the Orange County Sanitation District for treatment and reuse. Sara provided reporting and analysis of fossils encountered during construction.

City of Burbank, Avion Project Environmental Impact Report, Burbank, CA. *Paleontological Lead.* Sara is preparing the cultural resources section and overseeing the paleontological technical report for the Environmental Impact Report in support of a General Plan Amendment to change the General Plan land use designation from Airport to Golden State Commercial/Industrial for the westernmost 18-acre portion of the 60-acre project site.

County of Los Angeles, Rancho Los Amigos South Campus Environmental Impact Report (EIR), Los Angeles, CA. *Paleontological Lead.* Sara provided review and oversight of the paleontological technical report in support of the project EIR. ESA lead the CEQA process on behalf of the County, including preparation of all technical studies in support of a full-scope EIR for the Rancho Los Amigos South Campus Project. This includes a historic district evaluation, archaeological surveys, traffic, water supply, arborist services, and all other California Environmental Quality Act-required topics.

The Onni Group, Los Angeles Times Mirror Square Environmental Impact Report, Los Angeles, CA. *Cultural Resources Task Leader.* Sara served as cultural lead, providing coordination and senior oversight for reporting on archaeological, tribal, and paleontological resources. The project includes the development of two mixed-use residential towers and the rehabilitation of the historic Los Angeles Times structures on a 3.6-acre city block within the Center City/Historic Core District of Downtown Los Angeles. Approximate Project Cost: $219,400 (as of 2018)

Publications and Presentations

2015. Artifacts. In Abundant Harvests: The Archaeology of Industry and Agriculture at San Gabriel Mission. Dietler, John, Heather Gibson, and James M. Potter, eds. SWCA Anthropological Research Paper Number 11. SWCA Environmental Consultants. Pasadena, California.

2013. To the West of the Mission: Artifacts and Mortuary Patterns of the 19th Century Los Angeles Plaza Cemetery. Oral Presentation at the Society for California Archaeology Meeting, Honolulu, HI Session: California Mission Archaeology in the Los Angeles Area.

2012. Not Dead but Gone Before: The Archaeology of Los Angeles City Cemetery. AECOM Cultural Heritage Publication No. 4 (Author/Editor).

2008. Digging Deep: Archival Research into the History of Los Angeles' City Cemetery. Oral Presentation at the Society for American Archaeology Meeting, Vancouver, B.C., Canada and Society for California Archaeology Meeting, Ventura, California.

2007. Beads and Ornaments, in Piecing Together the Prehistory of Landing Hill: A Place Remembered. Chapter 15, EDAW Cultural Publications No. 3.

2006. Bones, Beads and Bowls: Variation in Habitation and Ritual Contexts at Landing Hill. Oral Presentation at the Society for California Archaeology Meeting, Ventura, California.

Appendix B

Sacred Land File Search

(Confidential – Not for public distribution)

Appendix C

DPR Forms

(Confidential – Not for public distribution)

Appendix E

Paleontological Resources Assessment Report (Public Version)

Public Draft

INLAND FEEDER-FOOTHILL PUMP STATION INTERTIE PROJECT

Paleontological Resources Assessment Report

Prepared for

The Metropolitan Water District of Southern California
700 North Alameda Street,
Los Angeles, California 90012

May 2024

Public Draft

INLAND FEEDER-FOOTHILL PUMP STATION INTERTIE PROJECT

Paleontological Resources Assessment Report

Prepared for:
The Metropolitan Water District of Southern California
700 North Alameda Street,
Los Angeles, California 90012

May 2024

Prepared by:
ESA
626 Wilshire Blvd. Suite 1100
Los Angeles, CA 90017

Principal Investigator:
J.D. Stewart, PhD.

Authors:
J.D. Stewart, PhD.
Fatima Clark, B.A.

Project Manager
Sara Dietler, B.A.

Project Location:
Redlands (CA) USGS 7.5-minute Topographic Quad
Township 1 South, Range 3 West, Section1

Acreage: Approx. 10.4 acres

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ESA

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CONTENTS

Paleontological Resources Assessment Report

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INLAND FEEDER-FOOTHILL PUMP STATION INTERTIE PROJECT

Paleontological Resources Assessment Report

Introduction

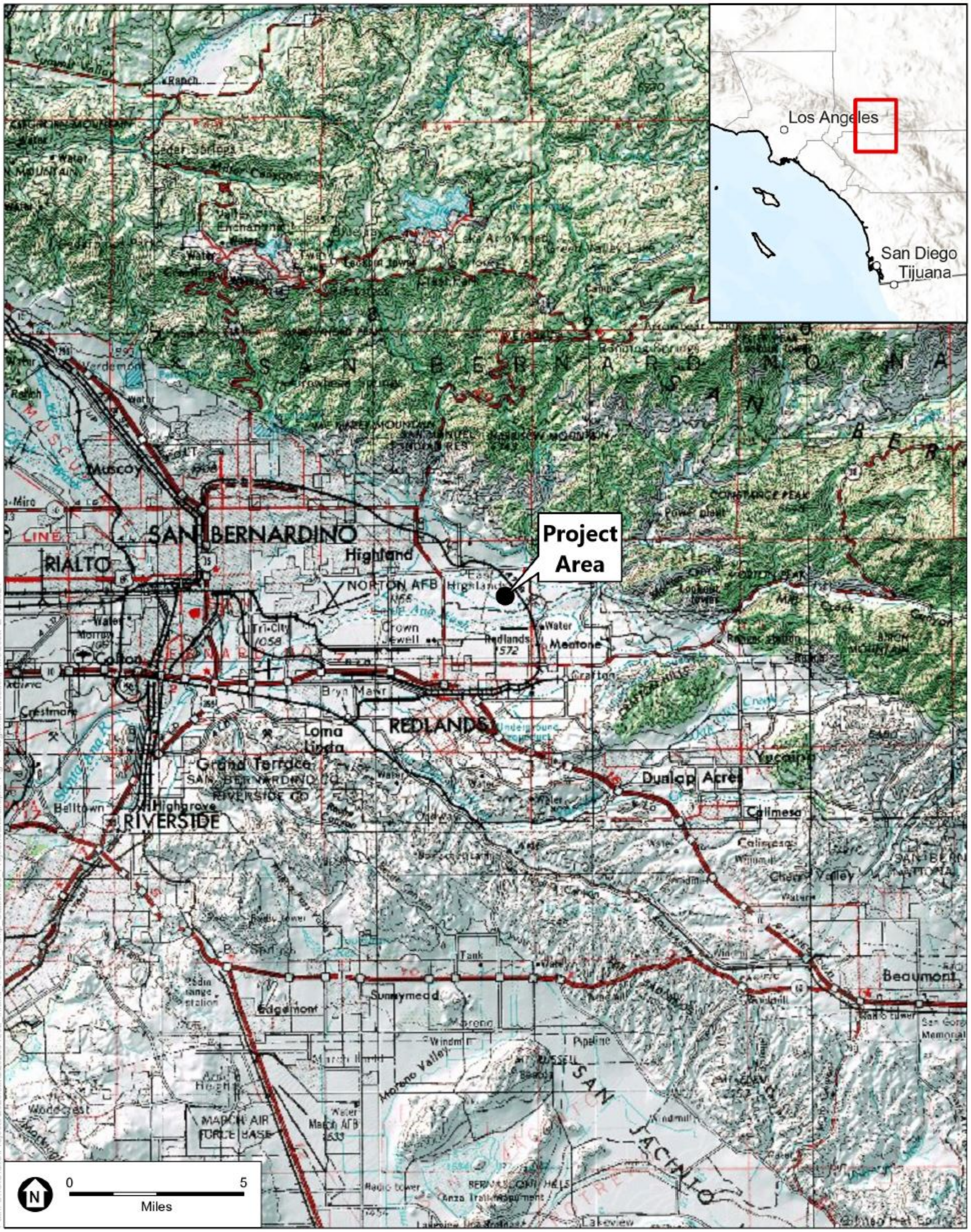
Environmental Science Associates (ESA) has been retained by The Metropolitan Water District of Southern California (Metropolitan) to conduct a paleontological resources assessment for the Inland Feeder-Foothill Pump Station Intertie Project (proposed project). The Inland Feeder is owned and operated by Metropolitan and conveys approximately 1.7 billion gallons of water daily throughout its distribution system. Located in western San Bernardino and Riverside counties, the Inland Feeder is a 44-mile-long, 12-foot-diameter conveyance pipeline supporting reliable water delivery to Southern California. The primary purpose of the Inland Feeder is to connect State Water Project supplies to Metropolitan's Eastern Distribution System. Metropolitan is the lead agency under the California Environmental Quality Act (CEQA).

Project Personnel

ESA personnel involved in the preparation of this report are as follows: J.D. Stewart, Ph.D., Principal Investigator of paleontology and report author; Fatima Clark, B.A., report contributor; Sara Dietler, B.A., project manager; and Chance Scott, GIS specialist. Resumes of key personnel are included in **Appendix A**.

Project Location

The proposed project is located on an approximately 10-acre, triangular-shaped parcel immediately south of the intersection of Cone Camp Road and Greenspot Road in Highland, California (assessor's parcel numbers 1210381240000 and 1210381250000; referred to in this report as the project area) (**Figure 1**). The site is generally accessible from State Route 210 (Foothill Freeway), located roughly 3.5 miles to the west. Local access to the project area is provided by Cone Camp Road, with an entrance gate immediately north and south of the Foothill Pump Station. The majority of the site is secured with chain-link perimeter fencing. The project area is bounded by Greenspot Road and residential development to the north, the Santa Ana River and open space to the south, and large-lot, single-family residences and open space to the east and west.



SOURCE: ESA, 2024

Inland Feeder Pump Station

Figure 1
Regional Location

ESA

Metropolitan owns 5.47 acres of the project area and has easement rights to approximately 1 acre of the project area. The San Bernardino Valley Municipal Water District (SBVMWD) and the San Bernardino Valley Water Conservation District (SBVWCD) own the remainder of the project area. SBVWCD also owns the parcel directly south of Metropolitan's triangular-shaped fee property. Metropolitan will obtain an additional easement for the SBVWCD property located between the Metropolitan Inland Feeder alignment and its fee property.

The proposed project facilities are situated within Section 1 of Township 1 South, Range 3 West of the Redlands (CA) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (**Figure 2**).

Project Description

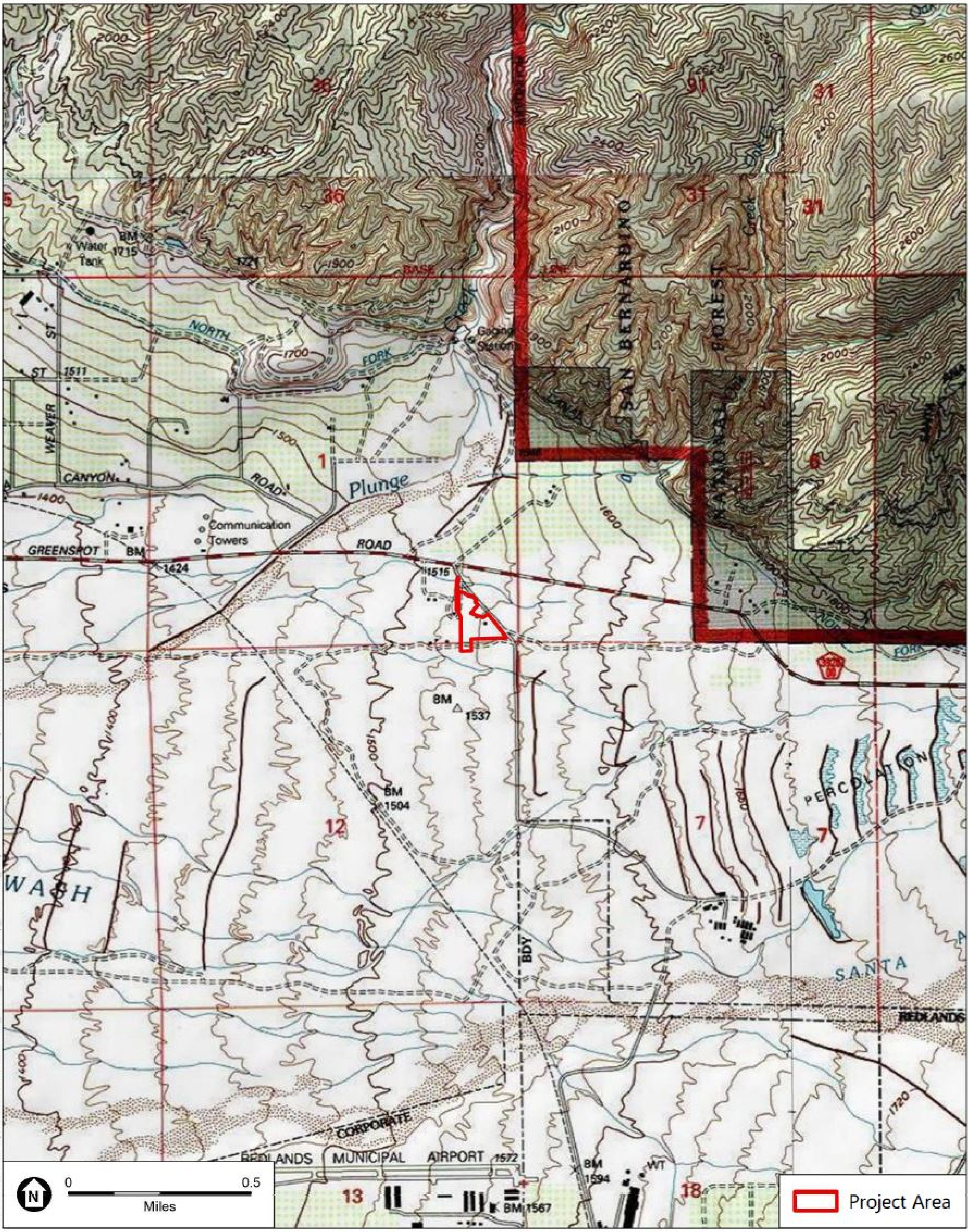
To enhance Metropolitan's water delivery flexibility in response to drought conditions and limited State Water Project (SWP) allocations, Metropolitan is proposing two new pipeline connections between the Inland Feeder and the SBVMWD-Inland Feeder Interconnection Line 1 and SBVMWD's Foothill Pump Station (FPS).

Two new underground pipelines (supply connection and discharge connection), two underground vaults, four aboveground hydropneumatic surge tanks (HST), and associated appurtenant structures would be constructed in two stages as outlined below.

Stage 1 would include construction of the components mainly located within the existing fenced facility. This would include construction of an approximately 400-foot-long, 54-inch-diameter supply connection pipeline, an approximately 750-foot-long, 54-inch-diameter discharge connection pipeline, a 50-foot by 40-foot underground vault, four aboveground HSTs on concrete pads, and appurtenant structures. Additionally, the proposed project would include installation of a new fence-line along the western boundary of the project area to accommodate the supply and discharge connection components.

Stage 2 construction activities would occur along the southern portion of the project area, located mainly outside of the fenced facility, and would include a 45-foot by 40-foot underground vault, a portion of the 54-inch-diameter discharge connection pipeline, all associated appurtenant structures, and final connections to the existing Inland Feeder pipeline.

Most of the construction activities would occur during daylight hours, occasional nighttime construction activities may be required to shut down the Inland Feeder and install the tie-in connection. Operation and maintenance activities at the FPS and Inland Feeder would be similar to existing conditions.



SOURCE: ESA, 2024, USGS, 2023

Topo Quad: Redlands, 1980

Inland Feeder Pump Station

Figure 2
Local Vicinity Map (Topo)

ESA

Regulatory Framework

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value that are afforded protection under state laws and regulations. The following section summarizes the applicable state laws and regulations, as well as professional standards provided by the Society of Vertebrate Paleontology (SVP 2010).

State Regulations

California Environmental Quality Act

In California, unique paleontologic resources, sites, and geologic features, particularly with regard to fossil localities, are afforded protection under a number of state environmental statutes, including the California Environmental Quality Act (CEQA). Under CEQA, a lead agency must determine if the project would result in the direct or indirect destruction of a unique paleontologic resource or site or unique geologic feature, and if such impacts would be significant. The CEQA lead agency is responsible for ensuring that feasible mitigation measures are implemented in order to reduce impacts to a less-than-significant level. CEQA does not include a specific definition of "unique paleontological resource or site," nor does it establish thresholds for significance.

Further guidance can be found in Scott and Springer (2003). Those authors stated that significant paleontologic resources include "fossil remains of large to very small aquatic and terrestrial vertebrates, remains of plants and animals previously not represented in certain portions of the stratigraphy, and fossils that might aid stratigraphic correlations, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, paleoclimatology, and the relationships of aquatic and terrestrial species" (2003:6). Furthermore, they also advised that impacts might be considered less than significant if dense concentrations of plant and/or invertebrate fossil remains were "so locally abundant that the impacts to the resources do not appreciably diminish their overall abundance or diversity" (2003:6).

More recent guidance has been developed by the Society for Vertebrate Paleontology (SVP 2010), which defines significant paleontologic resources as "fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years)."

Therefore, any identifiable vertebrate fossil remains would be considered unique under CEQA, and direct or indirect impacts on such remains would be considered significant. Identifiable invertebrate and plant fossils would be considered unique if they meet the criteria presented above. Determinations shall take into account the abundance and densities of fossil specimens or newly and previously recorded fossil localities in exposures of the rock units present at a project site.

Public Resources Code Section 5097.5

Other state regulations for paleontological resource management are included in PRC Section 5097.5. These statutes prohibit the removal of any paleontological site or feature from public lands without permission of the jurisdictional agency, define the removal of paleontological sites or features as a misdemeanor, and require reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, district) lands.

Society for Vertebrate Paleontology

The SVP has established standard guidelines (SVP 2010) that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most agencies with paleontological resource-specific Laws, Ordinances, Regulations, and Standards (LORS) accept and use the professional standards set forth by the SVP.

As defined by the SVP (2010:11), significant nonrenewable paleontological resources are:

> *Fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).*

Based on the significance definitions of the SVP (2010), all identifiable vertebrate fossils are considered to have significant scientific value. This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

A geologic unit known to contain significant fossils is considered to be "sensitive" to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either directly or indirectly disturb or destroy fossil remains. Paleontological sites indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case (SVP 2010).

Paleontological Sensitivity

Paleontological sensitivity is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its "Standard Guidelines for the Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources," the SVP (2010:1–2) defines four categories of paleontological sensitivity (potential) for rock units: high, low, undetermined, and no potential:

- **High Potential.** Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e. g., ashes or tephras), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e. g., middle Holocene and older, fine-grained fluvial sandstones, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstones, fine-grained marine sandstones, etc.).
- **Low Potential.** Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections, or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e. g. basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.
- **Undetermined Potential.** Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.
- **No Potential.** Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection nor impact mitigation measures relative to paleontological resources.

For geologic units with high potential, full-time monitoring is generally recommended during any Project-related ground disturbance. For geologic units with low potential, protection or salvage efforts would not generally be necessary. For geologic units with undetermined potential, field surveys by a qualified vertebrate paleontologist should be conducted to specifically determine the paleontologic potential of the rock units present within the study area.

Methods and Results

The project area was the subject of thorough background research and analysis to assess its paleontological sensitivity. The research included geologic setting, literature, geologic map, and geotechnical report review, a paleontological records search conducted by the Natural History Museum of Los Angeles County (LACM), and a paleontological sensitivity analysis conducted by ESA Principal Paleontologist, J.D. Stewart, Ph.D.

Geologic Setting

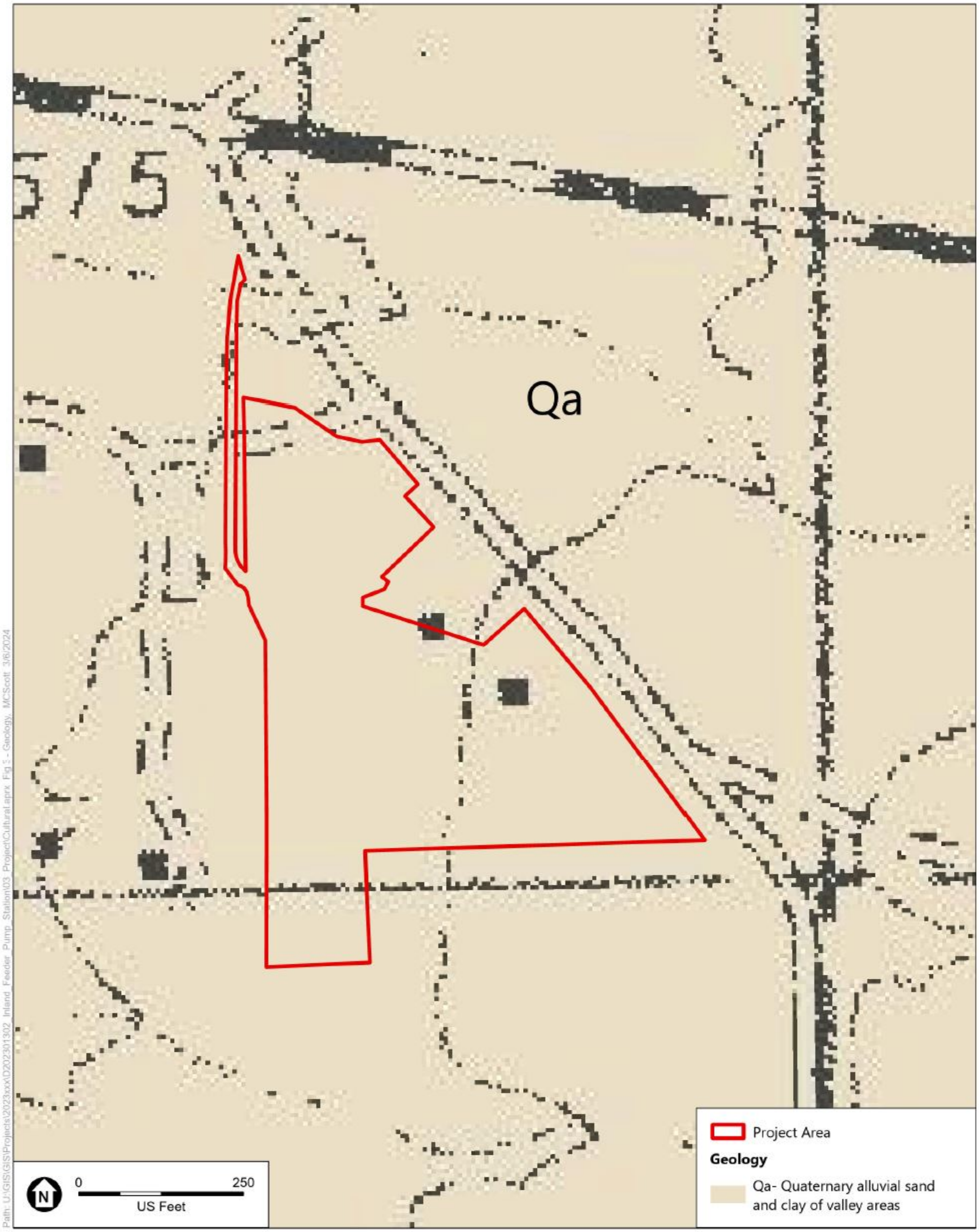
The project area is situated on the limit of the Peninsular and Transverse Range geomorphic provinces. The Peninsular Geomorphic Province follows a northwest to southeast course from Baja California to the Santa Ana Mountains. The Transverse Ranges trend east-west and consist of mountain ranges and valleys from the Mojave and Colorado Desert Provinces to Point Arguello at the Pacific Ocean. The project area is located within the San Bernardino Valley, made up of alluvial deposits created as a result of igneous and metasedimentary rock of the San Bernardino Mountains. The Santa Ana River along with the San Bernardino Mountains are the predominant features in the vicinity. The San Andreas Fault Zone, Crafton Hill Fault, and the San Jacinto Fault are located in the vicinity of the project area (Morton and Miller 2006; HDR Engineering Inc. 2022).

Literature Review

The Pleistocene deposits of the greater Los Angeles area host many significant vertebrate fossils. However, the Project should not disturb Pleistocene alluvium, only Holocene. The late Holocene is considered too young to host significant fossils (SVP 2010). Neither of the compendia of Pleistocene vertebrate fossil localities in California by Jefferson (1991a, b) list any nearby localities not listed in the Report of Bell (2024).

Geologic Map

The project area is entirely mapped as Holocene-aged Quaternary alluvial “sand and clay of valley areas, covered with gray clay soil”, including “alluvial pebbly sand adjacent to mountain terranes” (Dibblee and Minch 2004) (**Figure 3**).



SOURCE: ESA, 2024

Inland Feeder Pump Station

Figure 3
Geologic Map

ESA

Geotechnical Report Review

ESA reviewed the geotechnical report prepared by HDR Engineering (2022) for the proposed Project. HDR Engineering (2022) excavated three test pits to a depth of 49.6 feet below ground surface (bgs) to study the conditions of the project area. The first 5 to 11 feet of the test pit units showed artificial fill. Alluvium soils were found beneath the artificial fill and consist of poorly graded sand mixed with gravel, cobbles, and boulders (HDR Engineering 2022).

Paleontological Record

A paleontological resources database search was conducted by the Natural History Museum of Los Angeles County (LACM) on January 7, 2024 (**Appendix B**). The search entailed an examination of current geologic maps and known fossil localities within the project area and vicinity. The purpose of the records search was to (1) determine whether any previously recorded fossil localities occur in the project area or vicinity; (2) assess the potential for disturbance of these localities during construction; and (3) assist in evaluating the paleontological sensitivity of the project area.

Results of the paleontological resources records search conducted by the LACM indicated that no fossil localities lie directly within the project area; however, four fossil localities (LACM VP 1782, 4540, 4619, and 7811) were identified nearby from sedimentary deposits that may be found in the subsurface in the project area (**Table 1**) (Bell 2022).

TABLE 1
LACM FOSSIL LOCALITIES

Locality Number	Formation	Taxa	Depth
LACM VP 1782	Unnamed formation (Pleistocene)	Camel family (Camelidae)	Unknown
LACM VP 4540	Unnamed formation	Horse Family (Equidae)	unknown
LACM VP 4619	Unknown formation (eolian, tan silt;	Mammoth (Mammuthus)	9–11 feet bgs
LACM VP 7811	(Pleistocene, gravel pit)	Whip snake (Masticophis)	100 feet bgs

LACM VP 1782 produced fossil specimens of the camel family (Camelidae) at an unknown depth. LACM VP 4540 yielded specimens of the horse family (Equidae) at an unknown depth. LACM VP 4619 produced a fossil specimen of mammoth (*Mammuthus*) at 9 and 11 feet bgs. LACM VP 7811 produced a fossil specimen of whip snake (*Masticophis*) at 100 feet bgs.

Paleontological Sensitivity Analysis

The literature and geologic mapping review, as well as the LACM records search results, were used to assign paleontological sensitivity to the geologic units at surface and underlying the project area, following the guidelines of the SVP (2010):

Qa: Holocene alluvium is found throughout the broad coastal valley hosting the project area, bounded outside the project area by uplifted regions of older Pleistocene marine and non-marine deposits. While these Pleistocene units likely underly the younger, Holocene alluvium in the project area, the depth is unknown but most likely lies deeper than the planned excavation based on the geotechnical reports. The Qa throughout the project area is likely less than 5,000 years old and is considered to not contain fossils, if the age is correct. Therefore, this unit is assigned a **Low Potential** to contain paleontological resources.

Conclusions and Recommendations

The Quaternary alluvium underlying the proposed project area is of low paleontological sensitivity, increasing to higher sensitivity with depth. While the exact depth is not known, it likely lies deeper than the planned excavation. However, should aspects of the proposed project excavate below the potential shift from Holocene to Pleistocene alluvium and potentially impact unique paleontological resources. Per Metropolitan’s general Standard Practices, a project-specific WEAP training will be prepared and given to all construction personnel. The training will include all potential concerns and considerations related to paleontological resources, including types of paleontological resources that may be encountered and the proper procedures to be enacted in the event of an inadvertent discovery of paleontological resources. In addition, per Metropolitan’s paleontological resources Standard Practice, the following standard would be met:

- If archaeological or paleontological resources are encountered at the project site, the Contractor shall not disturb the resources and shall immediately cease all work within 50 feet of the discovery, notify the Engineer, and protect the discovery area, as directed by the Engineer. The Engineer, with the qualified architectural historian, archaeologist and/or paleontologist, shall make a decision of validity of the discovery and designate an area surrounding the discovery as a restricted area. The Contractor shall not enter or work in the restricted area until the Engineer provides written authorization.

Impacts to unique paleontological resources would result in less than significant impacts through adherence to Metropolitan’s Standard Practices and local and state regulations.

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Appendix A
Personnel

Sara Dietler

Cultural Resources Technical Lead

EDUCATION

BA, Anthropology, San Diego State University

25 YEARS' EXPERIENCE

CERTIFICATIONS/ REGISTRATION

California BLM Permit, Principal Investigator, Statewide

Nevada BLM Permit, Paleontology, Field Agent, Statewide

PROFESSIONAL AFFILIATIONS

Society for American Archaeology (SAA)

Society for California Archaeology (SCA)

Sara Dietler is a senior archaeology and paleontology lead with more than 25 years of experience in cultural resources management in Southern California. As a senior project manager, she manages and prepares technical studies to report the findings of archaeological and paleontological assessments to determine a project's potential impacts. She applies her expertise for project-specific as well as on on-call contracts for cities, counties, utilities, transportation, and other agencies throughout the state of California. Sara is well versed in preparing documentation and providing consultation in compliance with the National Historic Preservation Act (NHPA), National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), and the Society of Vertebrate Paleontology guidelines and requirements. She has extensive experience managing multidisciplinary projects throughout the Los Angeles Basin fincluding analyis of archaeological, paleontological, tribal, and built enviroment resources, and provides streamlined management for these disciplines.

Relevant Experience

County of Los Angeles, Department of Public Works, Los Angeles River Bike Path Project, City of Los Angeles and Universal City, California. *Project Manager, Report Author.* ESA completed a cultural resources assessment for the proposed Los Angeles River Bike Path Project. The proposed project consists of constructing approximately 1.5 miles of paved path varying in width from 12 to 14 feet, along the Los Angeles River Flood Control Channel in the cities of Los Angeles and Universal City. Class I bicycle paths, also called shared-use paths or multi-use paths, are for exclusive use by bicyclists, pedestrians, and other non-motorized modes of travel. This project was initiated through the 2012 County of Los Angeles Bicycle Master Plan and a development agreement with NBC Universal with the purpose of installing a Class I bicycle facility**.** As part of the assessment direct and indirect impacts to the LAR were found to be not significant. Sara provided senior cultural resource expertise, tribal consultation support, authored the report and MND section of the environmental document.

The City of Los Angeles Bureau of Engineering, North Atwater East Bank Riverway Project, Los Angeles, CA. *Project Manager, Report Author.* The North Atwater East Bank Riverway project will convert an existing maintenance road that runs along the LAR Channel into an aesthetically pleasing pathway for use by pedestrians and equestrians. The existing site pathway is an asphalt maintenance road alongside a series of power lines in the Atwater Village area, specifically along the LAR Channel east bank, south of 134 Freeway and north of Los Feliz Boulevard. ESA, working with BOE and the US Army Corps of Engineers, prepared a report compliant with Section 106 of NEPA.

The City of Los Angeles Bureau of Engineering, North Outfall Sewer Rehabilitation Unit 11 – Humboldt St. to Cardinal St. Project, Los Angeles, CA. *Project Manager, Report Author.* ESA completed an Archaeological Resources Assessment, Paleontological Resources

Assessment, and a Cultural Resources Mitigation Monitoring Plan for the North Outfall Sewer Rehabilitation Unit 11 Project. The Project proposed to rehabilitate 3,942 linear feet of 54-inch Burns-McDonnell Semi Elliptical North Outfall Sewer that was constructed in the 1920s. The line was originally constructed with concrete and a layer of tile above the invert and all the way to the crown. Sara prepared the cultural resources study and found a high sensitivity for buried resources. She then worked with BOE staff to create recommendations and PDFs to support the Project.

The City of Los Angeles Bureau of Engineering, CBD Sewer Rehabilitation Units 13 and 14 – Griffith to Grand Avenue Project, Los Angeles, CA. ESA completed an Archaeological Resources Assessment, Paleontological Resources Assessment, and a Cultural Resources Mitigation Monitoring Plan for the CBD Sewer Rehabilitation Units 13 and 14 Project. The Project proposed to rehabilitate 4,828 linear feet of existing circular brick sewer and rehabilitate 13 existing maintenance holes. The Project limits span from the existing maintenance hole 537-03-204 on East Washington Boulevard from Griffith Avenue to Main Street at MH 516-14-149. The CBD Unit 13 proposes to rehabilitate approximately 3,600 linear feet of existing 40 and 45-inch diameter circular brick sewer. ESA prepared the cultural resources study and found a high sensitivity for buried resources as well as a potential to impact the Zanja Conduit System. ESA worked with BOE staff to create recommendations and PDFs to support the Project and design the project around the location of resources

City of Burbank, Avion Project Environmental Impact Report, Burbank, CA. *Paleontological Lead*. Sara is preparing the cultural resources section and overseeing the paleontological technical report for the Environmental Impact Report in support of a General Plan Amendment to change the General Plan land use designation from Airport to Golden State Commercial/Industrial for the westernmost 18-acre portion of the 60-acre project site.

City of Los Angeles Department of Public Works – Bureau of Engineering, Warner Grand Theatre, Historic Resources Technical Report and Conditions Assessment, San Pedro, Los Angeles, CA. *Project Manager, Co-Author.* Sara managed the Cultural Resources Surveys to inform and guide future rehabilitation or redevelopment efforts of the Warner Grand Theatre. The Warner Grand Theatre designed in the Art Deco-Modern style by master architect B. Marcus Priteca in 1931, and is listed on the National Register of Historic Places, and is designated a Los Angeles Historic-Cultural Monument. ESA prepared a historical resources technical report and conditions assessment report, which provided a comprehensive table of character-defining features along with a conditions assessment of each feature located within the interior and exterior of the Warner Grand Theatre. Sara managed both the archaeological and historic efforts providing one point of contact for the City.

Los Angeles Department of Water and Power, Elysian/USC Water Recycling Project Initial Study/ Environmental Assessment, Los Angeles, CA. *Project Manager*. Sara worked on the IS/MND and an EA/Finding of No Significant Impact to construct recycled water pipelines for irrigation and other industrial uses serving Los Angeles Department of Water and Power customers in downtown Los Angeles, including Elysian Park. Sara prepared two technical reports and a treatment plan for archaeological, historic, and paleontological resources identified during the phase I assessment.

JD Stewart, PhD

Paleontologist

EDUCATION

PhD, Systematics & Ecology, University of Kansas

MA, Systematics and Ecology, University of Kansas

BA Degree, Biology, University of Kansas

40 YEARS' EXPERIENCE

CERTIFICATIONS/ REGISTRATION

Meets Society of Vertebrate Paleontology definition of qualified professional paleontologist

Orange County Certified Paleontologist

PROFESSIONAL AFFILIATIONS

Society of Vertebrate Paleontology

Research Associate, Natural History Museum of Los Angeles County

Dr. JD Stewart has more than 40 years' experience in the field of paleontology, with 30 years' experience in California. He has authored or co-authored 40 peer-reviewed articles for scientific journals and books. Within these, he has authored or co-authored descriptions of three new genera and three new species.

He is a recognized authority on fossil fishes of Cretaceous rocks of North America and Cenozoic rocks of the western coast of North America. As a result, Dr. Stewart is often called upon to identify paleontological and archaeological specimens. He has served as expert witness for the U.S. Department of Justice.

Dr. Stewart has extensive experience finding and excavating fossils for county, state, and provincial institutions. His field work includes projects in cooperation with the U.S. Bureau of Land Management, National Parks Service, U.S. Army Corps of Engineers, U.S. Navy, U. S. Department of Energy, Federal Aviation Administration, California Energy Commission, Caltrans, and California State Parks. The Bureau of Land Management's national website features one of his excavations from 2004. He has supervised monitoring of construction activity in numerous California counties and municipalities. In addition to fieldwork, he has experience in the supervision of preparators, surveyors, curatorial assistants, and excavators. He also has extensive experience preparing fossils, and has processed, recovered, and identified thousands of microvertebrate fossils.

Relevant Experience

Salton Sea Mitigation Implementation Plan, Riverside and Imperial Counties, CA. *Paleontologist.* ESA prepared an adaptive management and monitoring plan for the Salton Sea basin for the Salton Sea Management Program, which is a partnership between the California Natural Resources Agency, DWR, and CDFW. The monitoring plan will prioritize and guide monitoring for biological resources, including avian species, fish and invertebrates, as well as water quality, hydrology, air quality, and socioeconomics. The monitoring plan will inform status and trends of resources, as well as the implementation of future habitat and dust suppression projects. JD compiled the paleontological resource mitigation and monitoring plan and prepared the team for monitoring.

California Water Service Company, Palos Verdes Peninsula Water Reliability Project, Rolling Hills Estates, CA. Paleontologist. ESA provided a full suite of environmental services for the Palos Verdes Peninsula Water Reliability project. The proposed project involves the construction of approximately seven miles of buried potable water pipelines and a new booster pump station to replace the current water distribution system serving the Palos Verdes Peninsula. The large 7-mile utility/infrastructure project, which crossed multiple jurisdictions, including the cities of Rolling Hills Estates and Rancho Palos Verdes, and the County of Los Angeles. JD oversaw paleontological monitoring for reaches 3 and 4 and the pump station, coordinating finds, identifying fossils, and processing the fossils at the lab.

Syphon Reservoir Geotechnical Investigations Project IS/MND, Orange County, CA. *Principal Paleontologist.* IRWD implemented the Geotechnical Investigations Project to characterize the geologic and geotechnical conditions of the Syphon Reservoir site to support the potential development of a future reservoir expansion. The Project included a combination of exploratory test pits, borings, and geophysical surveys to characterize the subsurface conditions of the soil at the Syphon Reservoir site and verified the characteristics of the Center Valley Fault. ESA provided extensive biological surveys and cultural surveys, assisted IRWD with AB 52 process for Tribal consultation. Dr. Stewart supervised paleontological monitoring during geotechnical explorations (including borings, exploratory test pits, and abutment/seismic trenches) at the Syphon Reservoir, as the project is located within geologic formations (Silverado and Sespe/Vaqueros) that have a high paleontological potential for yielding paleontological resources. Sediment sampling was conducted to identify the presence/absence of microvertebrate fossils.

Goetz Road Potable Water Storage Tank and Pipeline Project EIR, Riverside, CA. *Paleontologist.* ESA prepared an EIR and conducted supporting biological, archaeological, and paleontological surveys, as well as prepared visual simulations and a shade and shadow report for the Goetz Road Potable Water Storage Tank and Pipeline project. The project would involve construction and operation of an 8-million-gallon potable water storage tank in the City of Perris. JD led the paleontology survey.

City of Menifee, On-Call Consulting and Peer Review Services, Menifee, CA. *Paleontologist.* For 5 years, ESA has provided on-call peer reviews of more than 30 applicant-prepared cultural resources technical reports. ESA has become a trusted advisor to the City. JD has provided peer review of paleontology sections and reports for the City.

Rosedale-Rio Bravo Water Storage District, Onyx Ranch South Fork Valley Water Project EIR, Kern County, CA. *Paleontologist.* ESA prepared the EIR and associated technical studies to support the Onyx Ranch South Fork Valley Water Project. RRBWSD proposes to change the point of diversion and place of use for the water rights associated with Onyx Ranch and Smith Ranch on the South Fork of the Kern River. The intent of the project is to allow water to be delivered in the RRBWSD service area on the San Joaquin Valley floor and used for irrigation and groundwater recharge. The proposed project would assist the RRBWSD in meeting its sustainability goals under the Sustainable Groundwater Management Act. JD prepared the paleontology report to support the CEQA section.

Guild GC, 8777 Washington Boulevard MND, Culver City, CA. *Paleontologist.* ESA prepared an MND to address the proposed redevelopment of an approximately 1-acre property at 8777 Washington Boulevard north of the intersection at Washington Boulevard and National Boulevard in Culver City. The project is proposing a four-story building up to 56 feet. The project is proposing approximately 128,000 square feet of office space on Levels 2 through 4 and 4,500 square feet of retail/food retail on the ground level. JD provided monitoring oversight, oversaw fossil discovery, and processed fossil samples.

I-805 Managed Lanes South Project, Caltrans District 11, San Diego County, CA. *Paleontologist.* Dr. Stewart supervised the pedestrian survey of the project footprint and wrote the Paleontological Resource Assessment.

I-805 North Corridor Project, Caltrans District 11, San Diego County, CA. *Paleontologist.* Dr. Stewart supervised the pedestrian survey of the project footprint and wrote the Paleontological Resource Assessment.

Crestavilla Retirement and Assisted Living Community Project, Laguna Niguel, CA. *Principal Paleontologist.* Dr. Stewart supervised paleontological monitoring during the construction of a new 224-unit retirement and assisted living facility and an approximately 1,870 square-foot Spiritual Resource Center (Shepherd of the Hills Church) within a four-story structure located over a one-level subterranean parking structure. The monitoring led to the identification of a remarkable collection of vertebrate fossils, including the first record of a gulper shark (*Centrophorus*) from any Neogene sediments of coastal California and the first reported specimens of the cookie-cutter shark (*Isistius*) from the Capistrano Formation. Additionally, the project yielded the most complete fossil tuna ever found in California and it probably represents a species new to science.

Palos Verdes Peninsula Water Reliability Project, Palos Verdes Peninsula, CA. *Principal Paleontologist.* Dr. Stewart supervised paleontological monitoring during construction of new potable water pipelines and a new booster pump station to replace the current water distribution system serving the Palos Verdes Peninsula. The monitoring led to the identification and salvage of numerous fossils from Altamira Shale deposits of the Monterey Formation, including fossils of leaf imprints, sardine scales, fish parts (vertebrae, dentary, mandible) and the fossil appendage (dactyl) of a type of Mantis shrimp (Stomatopod). The Mantis shrimp specimen is believed to be the only second known occurrence in southern California of *Angelosquilla altamierensis*, and the only one with a known precise locality and provenience.

Oaks at Monte Nido, Santa Monica Mountains, Unincorporated Los Angeles County, CA. *Principal Paleontologist.* Dr. Stewart was in charge of the preparation of the Paleontological Resources Assessment Report, which included a pedestrian survey. The pedestrian survey yielded the identification of a sandstone boulder that contains a fossil impression of the skull of a small-toothed cetacean “dolphin” and the identification of fossilized shells of pelecypods (e.g., bivalves such as clams, mussels, oysters, and cockles) and gastropods (e.g., snails and slugs). The project proposes the development of 15 single-family residences on separate individual recorded parcels within the Monte Nido Community, along the scenic route of Piuma Road.

Heritage Fields/Great Park Paleontological Review, Orange County, CA. *Principal Paleontologist.* Dr. Stewart conducted Phase I and II paleontological assessments at the Heritage Fields / Great Park in Orange County, California where he and his team discovered significant portions of a Miocene-aged (15 million years ago) whale fossil, and a Pleistocene microvertebrate fauna dating to before 28,000 years ago.

Calnev Pipeline Project, San Bernardino County, CA, and Clark County, NV. *Principal Paleontologist.* Dr. Stewart directed paleontological survey of a 234-mile-long project area in San Bernardino County, California and Clark County, Nevada and wrote the paleontological assessment.

Appendix B

LACM Records Search – Confidential – Not for Public Distribution

Appendix F
Noise Calculations and Modeling

Project: Inland Feeder

Construction Noise Impact on Sensitive Receptors

Unmitigated

Parameters

Leq to L10 factor	3

A - Upper South				R1 (West, 30)					R2 (East, 40)					R3 (North, 250)					R4 (West, 275)				
Construction Phase Equipment Type	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA
Pipeline Trenching and Installation-SC					*92*	*89*				*90*	*86*				*75*	*71*				*74*	*70*		
Drum Mixer	1	80	50%	30	84	81	84	0	40	82	79	82	0	250	66	63	66	0	275	65	62	65	0
Excavator	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Generator	1	82	50%	30	86	83	86	0	40	84	81	84	0	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	230	67	60	63	0	240	66	59	62	0	450	61	54	57	0	475	60	53	56	0
Vacuum Street Sweeper	1	80	10%	230	67	57	60	0	240	66	56	59	0	450	61	51	54	0	475	60	50	53	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Welder	1	73	40%	230	60	56	59	0	240	59	55	58	0	450	54	50	53	0	475	53	49	52	0
Vault Structure Excavation-SC					*91*	*87*				*88*	*84*				*73*	*69*				*72*	*68*		
Excavator	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	72	62	65	0	140	71	61	64	0	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	84	80	83	0	40	82	78	81	0	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Vault Structure Installation-SC					*92*	*87*				*90*	*84*				*75*	*69*				*74*	*68*		
Compressor (air)	1	80	40%	30	84	80	83	0	40	82	78	81	0	250	66	62	65	0	275	65	61	64	0
Crane	1	85	16%	30	89	81	84	0	40	87	79	82	0	250	71	63	66	0	275	70	62	65	0
Forklift	1	75	10%	230	62	52	55	0	240	61	51	54	0	450	56	46	49	0	475	55	45	48	0
Generator	1	82	50%	30	86	83	86	0	40	84	81	84	0	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	67	57	60	0	240	66	56	59	0	450	61	51	54	0	475	60	50	53	0
Surge Tank Excavation-SC					*91*	*87*				*88*	*84*				*73*	*69*				*72*	*68*		
Excavator	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	72	62	65	0	140	71	61	64	0	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	84	80	83	0	40	82	78	81	0	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Surge Tank Installation-SC					*94*	*89*				*91*	*86*				*76*	*71*				*75*	*70*		
Compressor (air)	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Crane	1	85	16%	30	89	81	84	0	40	87	79	82	0	250	71	63	66	0	275	70	62	65	0
Generator	1	82	50%	30	86	83	86	0	40	84	81	84	0	250	68	65	68	0	275	67	64	67	0
Grader	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	67	57	60	0	240	66	56	59	0	450	61	51	54	0	475	60	50	53	0
Welder	1	73	40%	230	60	56	59	0	240	59	55	58	0	450	54	50	53	0	475	53	49	52	0

A - Upper South				R1					R2					R3					R4				
Construction Phase **Equipment Type**	**No. of Equip.**	**Reference Noise Level at 50ft, Lmax**	**Acoustical Usage Factor**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
Pipeline Trenching and Installation-DC					***92***	***89***				***90***	***86***				***75***	***71***				***74***	***70***		
Drum Mixer	1	80	50%	30	84	81	84	0	40	82	79	82	0	250	66	63	66	0	275	65	62	65	0
Excavator	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Generator	1	82	50%	30	86	83	86	0	40	84	81	84	0	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	230	67	60	63	0	240	66	59	62	0	450	61	54	57	0	475	60	53	56	0
Vacuum Street Sweeper	1	80	10%	230	67	57	60	0	240	66	56	59	0	450	61	51	54	0	475	60	50	53	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Welder	1	73	40%	230	60	56	59	0	240	59	55	58	0	450	54	50	53	0	475	53	49	52	0
Vault Structure Excavation-DC					***91***	***87***				***88***	***84***				***73***	***69***				***72***	***68***		
Excavator	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	72	62	65	0	140	71	61	64	0	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	84	80	83	0	40	82	78	81	0	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Vault Structure Installation-DC					***92***	***87***				***90***	***84***				***75***	***69***				***74***	***68***		
Compressor (air)	1	80	40%	30	84	80	83	0	40	82	78	81	0	250	66	62	65	0	275	65	61	64	0
Crane	1	85	16%	30	89	81	84	0	40	87	79	82	0	250	71	63	66	0	275	70	62	65	0
Forklift	1	75	10%	230	62	52	55	0	240	61	51	54	0	450	56	46	49	0	475	55	45	48	0
Generator	1	82	50%	30	86	83	86	0	40	84	81	84	0	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	67	57	60	0	240	66	56	59	0	450	61	51	54	0	475	60	50	53	0
Surge Tank Excavation-DC					***91***	***87***				***88***	***84***				***73***	***69***				***72***	***68***		
Excavator	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	72	62	65	0	140	71	61	64	0	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	84	80	83	0	40	82	78	81	0	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Surge Tank Installation-DC					***94***	***89***				***91***	***86***				***76***	***71***				***75***	***70***		
Compressor (air)	1	80	40%	130	72	68	71	0	140	71	67	70	0	350	63	59	62	0	375	62	59	62	0
Crane	1	85	16%	30	89	81	84	0	40	87	79	82	0	250	71	63	66	0	275	70	62	65	0
Generator	1	82	50%	30	86	83	86	0	40	84	81	84	0	250	68	65	68	0	275	67	64	67	0
Grader	1	85	40%	30	89	85	88	0	40	87	83	86	0	250	71	67	70	0	275	70	66	69	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	72	65	68	0	140	71	64	67	0	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	67	57	60	0	240	66	56	59	0	450	61	51	54	0	475	60	50	53	0
Welder	1	73	40%	230	60	56	59	0	240	59	55	58	0	450	54	50	53	0	475	53	49	52	0

Project: Inland Feeder

Construction Noise Impact on Sensitive Receptors

Mitigated

Parameters

Leq to L10 factor	3

				West					East					North					West				
						30					40					250					275		
				R1					R2					R3					R4				
Construction Phase Equipment Type	No. of Equip.	Reference Noise Level at 50ft, Lmax	Acoustical Usage Factor	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA	Distance (ft)	Lmax	Leq	L10	Estimated Noise Shielding, dBA
Pipeline Trenching and Installation-SC					*87*	*84*				*85*	*81*				*75*	*71*				*74*	*70*		
Drum Mixer	1	80	50%	30	79	76	79	5	40	77	74	77	5	250	66	63	66	0	275	65	62	65	0
Excavator	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Generator	1	82	50%	30	81	78	81	5	40	79	76	79	5	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	230	62	55	58	5	240	61	54	57	5	450	61	54	57	0	475	60	53	56	0
Vacuum Street Sweeper	1	80	10%	230	62	52	55	5	240	61	51	54	5	450	61	51	54	0	475	60	50	53	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Welder	1	73	40%	230	55	51	54	5	240	54	50	53	5	450	54	50	53	0	475	53	49	52	0
Vault Structure Excavation-SC					*86*	*82*				*83*	*79*				*73*	*69*				*72*	*68*		
Excavator	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	67	57	60	5	140	66	56	59	5	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	79	75	78	5	40	77	73	76	5	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Vault Structure Installation-SC					*87*	*82*				*85*	*79*				*75*	*69*				*74*	*68*		
Compressor (air)	1	80	40%	30	79	75	78	5	40	77	73	76	5	250	66	62	65	0	275	65	61	64	0
Crane	1	85	16%	30	84	76	79	5	40	82	74	77	5	250	71	63	66	0	275	70	62	65	0
Forklift	1	75	10%	230	57	47	50	5	240	56	46	49	5	450	56	46	49	0	475	55	45	48	0
Generator	1	82	50%	30	81	78	81	5	40	79	76	79	5	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	62	52	55	5	240	61	51	54	5	450	61	51	54	0	475	60	50	53	0
Surge Tank Excavation-SC					*86*	*82*				*83*	*79*				*73*	*69*				*72*	*68*		
Excavator	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	67	57	60	5	140	66	56	59	5	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	79	75	78	5	40	77	73	76	5	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Surge Tank Installation-SC					*89*	*84*				*86*	*81*				*76*	*71*				*75*	*70*		
Compressor (air)	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Crane	1	85	16%	30	84	76	79	5	40	82	74	77	5	250	71	63	66	0	275	70	62	65	0
Generator	1	82	50%	30	81	78	81	5	40	79	76	79	5	250	68	65	68	0	275	67	64	67	0
Grader	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	62	52	55	5	240	61	51	54	5	450	61	51	54	0	475	60	50	53	0
Welder	1	73	40%	230	55	51	54	5	240	54	50	53	5	450	54	50	53	0	475	53	49	52	0

				R1					R2					R3					R4				
Construction Phase **Equipment Type**	**No. of Equip.**	**Reference Noise Level at 50ft, Lmax**	**Acoustical Usage Factor**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
Pipeline Trenching and Installation-DC					***87***	***84***				***85***	***81***				***75***	***71***				***74***	***70***		
Drum Mixer	1	80	50%	30	79	76	79	5	40	77	74	77	5	250	66	63	66	0	275	65	62	65	0
Excavator	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Generator	1	82	50%	30	81	78	81	5	40	79	76	79	5	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	230	62	55	58	5	240	61	54	57	5	450	61	54	57	0	475	60	53	56	0
Vacuum Street Sweeper	1	80	10%	230	62	52	55	5	240	61	51	54	5	450	61	51	54	0	475	60	50	53	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Welder	1	73	40%	230	55	51	54	5	240	54	50	53	5	450	54	50	53	0	475	53	49	52	0
Vault Structure Excavation-DC					***86***	***82***				***83***	***79***				***73***	***69***				***72***	***68***		
Excavator	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	67	57	60	5	140	66	56	59	5	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	79	75	78	5	40	77	73	76	5	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Vault Structure Installation-DC					***87***	***82***				***85***	***79***				***75***	***69***				***74***	***68***		
Compressor (air)	1	80	40%	30	79	75	78	5	40	77	73	76	5	250	66	62	65	0	275	65	61	64	0
Crane	1	85	16%	30	84	76	79	5	40	82	74	77	5	250	71	63	66	0	275	70	62	65	0
Forklift	1	75	10%	230	57	47	50	5	240	56	46	49	5	450	56	46	49	0	475	55	45	48	0
Generator	1	82	50%	30	81	78	81	5	40	79	76	79	5	250	68	65	68	0	275	67	64	67	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	62	52	55	5	240	61	51	54	5	450	61	51	54	0	475	60	50	53	0
Surge Tank Excavation-DC					***86***	***82***				***83***	***79***				***73***	***69***				***72***	***68***		
Excavator	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Vacuum Street Sweeper	1	80	10%	130	67	57	60	5	140	66	56	59	5	350	63	53	56	0	375	62	52	55	0
Tractor/Loader/Backhoe	1	80	40%	30	79	75	78	5	40	77	73	76	5	250	66	62	65	0	275	65	61	64	0
Tractor/Loader/Backhoe	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Surge Tank Installation-DC					***89***	***84***				***86***	***81***				***76***	***71***				***75***	***70***		
Compressor (air)	1	80	40%	130	67	63	66	5	140	66	62	65	5	350	63	59	62	0	375	62	59	62	0
Crane	1	85	16%	30	84	76	79	5	40	82	74	77	5	250	71	63	66	0	275	70	62	65	0
Generator	1	82	50%	30	81	78	81	5	40	79	76	79	5	250	68	65	68	0	275	67	64	67	0
Grader	1	85	40%	30	84	80	83	5	40	82	78	81	5	250	71	67	70	0	275	70	66	69	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Compactor (ground)	1	80	20%	130	67	60	63	5	140	66	59	62	5	350	63	56	59	0	375	62	56	59	0
Vacuum Street Sweeper	1	80	10%	230	62	52	55	5	240	61	51	54	5	450	61	51	54	0	475	60	50	53	0
Welder	1	73	40%	230	55	51	54	5	240	54	50	53	5	450	54	50	53	0	475	53	49	52	0

Inland Feeder

Table I. Off-Site Structural Vibration Impacts

Receptor	Type of Building	Equipment	Reference Distance	Reference Level[a]	Distance to Receptor (ft)[b]	Impact Level	Threshold	Exceeds Threshold?
				PPV (in/sec)		PPV (in/sec)	PPV (in/sec)[a]	
Residential Buildings	Residential Buildings	Loaded Trucks	25	0.076	25	0.076	0.20	**No**
		Loaded Trucks	25	0.076	50	0.027	0.20	**No**
		Loaded Trucks	25	0.076	60	0.020	0.20	**No**
		Loaded Trucks	25	0.076	75	0.015	0.20	**No**
		Loaded Trucks	25	0.076	100	0.010	0.20	**No**

Notes:

a. Caltrans Transportation and Construction Vibration Guidance Manual (2020), Table 15 and Table 18

b. Distances represent the closest measurement from project building footprint to closest building footprint