

APPENDIX C
BIOLOGICAL RESOURCES EVALUATION

BIOLOGICAL RESOURCES EVALUATION

For The

Penske Sales, Leasing, and Maintenance Facility Project

**APNs 297-120-002, 297-120-018, 297-120-017,
297-120-025, 297-100-091, 297-100-073, 297-
100-076 and 297-120-003,**

Riverside County, California

Prepared for:



Penske

1711 West Greentree Drive, Suite 117
Tempe, Arizona, 85284

Prepared by:



UltraSystems Environmental Inc.

16431 Scientific Way
Irvine, CA 92618
(949) 788-4900

September 2022

This page intentionally left blank.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS	vi
Executive Summary	viii
1.0 INTRODUCTION.....	1-1
1.1 Report Purpose	1-1
1.2 Project Location.....	1-2
2.0 PROJECT DESCRIPTION	2-1
3.0 REGULATORY CONTEXT.....	3-1
3.1 Federal Statutes, Regulations and Executive Orders	3-1
3.1.1 Clean Water Act	3-1
3.1.2 Endangered Species Act (ESA)	3-2
3.1.3 Migratory Bird Treaty Act (MBTA)	3-3
3.1.4 National Environmental Policy Act (NEPA)	3-3
3.1.5 Prevention and Control of Invasive Species – Executive Order 13112	3-4
3.2 State Statutes and Regulations	3-4
3.2.1 California Environmental Quality Act (CEQA)	3-4
3.2.2 California Endangered Species Act (CESA).....	3-4
3.2.3 Fully Protected Species - California Fish and Game Code § 3511, § 4700, § 5050 and § 5515	3-5
3.2.4 Bird Nests and Eggs - California Fish and Game Code § 3503.....	3-5
3.2.5 Birds of Prey and their Eggs – California Fish and Game Code § 3503.5.....	3-5
3.2.6 Migratory Birds – California Fish and Game Code § 3513	3-6
3.2.7 Native Plant Protection Act – California Fish and Game Code §§ 1900-1913.....	3-6
3.2.8 Porter-Cologne Water Quality Control Act.....	3-6
3.2.9 State Water Resources Control Board Resolution No. 2019-0015.....	3-7
3.2.10 Natural Community Conservation Planning Act of 2003 (NCCP Act).....	3-8
3.3 Local Management Plans	3-9
3.3.1 Western Riverside County Multiple Species Habitat Conservation Plan	3-9
3.3.2 City of Moreno Valley Municipal Code.....	3-1
4.0 STUDY METHODS	4-1
4.1 Literature Review	4-2
4.1.1 Topography and Physical Features	4-2
4.1.2 Soils.....	4-2
4.1.3 Sensitive Plant Communities and Special-Status Species.....	4-2
4.1.4 Hydrology and Waters of the U.S. and State.....	4-4
4.1.5 MSHCP Riparian/Riverine Areas, Vernal Pools, and Fairy Shrimp	4-5
4.1.6 Critical Habitat	4-6
4.1.7 Wildlife Corridors	4-6
4.2 Field Survey Methods.....	4-7

4.2.1	Habitat Assessment and Land Cover Type Mapping	4-9
4.2.2	General Plant Survey	4-10
4.2.3	General Wildlife Survey	4-10
4.2.4	Burrowing Owl Habitat Assessment	4-11
4.2.5	Riparian/Riverine/Vernal Pools and Fairy Shrimp Habitat Assessment	4-11
4.2.6	Large Branchiopod (Including Fairy Shrimp) Focused Surveys.....	4-13
4.2.7	Jurisdictional Delineation Survey.....	4-14
4.2.8	Wildlife Movement Evaluation	4-15
5.0	Results.....	5-1
5.1	Environmental Setting.....	5-1
5.2	Local Climate.....	5-1
5.3	Soils.....	5-1
5.4	Land Cover Types	5-1
5.4.1	Developed/Disturbed Land	5-2
5.4.2	Vernal Pool Complex.....	5-3
5.5	Plants.....	5-4
5.5.1	Plant Species Observed During the Field Surveys.....	5-4
5.5.2	Non-native Plants.....	5-4
5.5.3	Special-Status Plants with Potential to Occur in the BSA	5-6
5.5.4	Listed Endangered, Threatened, Candidate, and State Rare Plants.....	5-7
5.5.5	Sensitive Plants	5-7
5.6	Wildlife.....	5-11
5.6.1	Wildlife Species Observed and/or Detected During the Field Surveys	5-11
5.6.2	Large Branchiopod (Including Fairy Shrimp) Focused Survey Results	5-12
5.6.3	Special-Status Wildlife with a Potential to Occur in the Biological Study Area	5-13
5.6.4	BUOW - Habitat Assessment	5-13
5.6.5	Special-Status Wildlife with a Potential to Occur in the Biological Study Area.....	5-14
5.6.6	Listed Endangered, Threatened, and Candidate Wildlife	5-17
5.6.7	Sensitive Wildlife.....	5-17
5.7	Hydrology and Jurisdictional Areas	5-18
5.7.1	Jurisdictional Waters.....	5-18
5.8	Critical Habitat	5-19
5.9	Wildlife Corridors	5-19
6.0	MSHCP Consistency Analysis.....	6-1
6.1	Introduction	6-1
6.1.1	Project Location within the MSHCP Boundary	6-1
6.1.2	Project Description	6-3
6.1.3	Covered Roads.....	6-3
6.1.4	Covered Public Access Activities	6-3
6.1.5	General Setting.....	6-4
6.2	Reserve Assembly Analysis.....	6-4

6.2.1	Public Quasi-Public Lands	6-4
6.3	Vegetation Mapping	6-4
6.3.1	Developed/Disturbed	6-4
6.4	MSHCP Section 6.1.2, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools	6-5
6.4.1	Riparian/Riverine Resources.....	6-5
6.4.2	Vernal Pools.....	6-5
6.4.3	Fairy Shrimp.....	6-7
6.4.4	Riparian birds	6-9
6.4.5	Other Section 6.1.2 Species	6-9
6.5	Protection of Narrow Endemic Plant Species (Section 6.1.3).....	6-9
6.6	Additional Survey Needs and Procedures (Section 6.3.2)	6-10
6.6.1	Criteria Area Plant Species.....	6-10
6.6.2	Amphibians.....	6-10
6.6.3	Burrowing Owl.....	6-10
6.6.4	Mammals.....	6-10
6.7	Information on Other Species	6-10
6.7.1	Delhi Sands Flower Loving Fly	6-10
6.7.2	Species Not Adequately Conserved	6-11
6.8	Guidelines Pertaining to the Urban/Wildlands Interface Guidelines (Section 6.1.4).....	6-11
6.9	Best Management Practices (Volume I, Appendix C)	6-11
7.0	Potential Impacts	7-1
7.1	Thresholds of Significance	7-1
7.2	Potential Impacts to Plant Communities.....	7-3
7.2.1	Direct Impacts	7-3
7.2.2	Indirect Impacts.....	7-3
7.2.3	Mitigation Measures	7-4
7.2.4	Impact Determination	7-4
7.3	Potential Impacts to Special-Status Plants	7-4
7.3.1	Direct and Indirect Impacts	7-4
7.3.2	Mitigation Measures	7-4
7.3.3	Impact Determination	7-5
7.4	Potential Impacts to Special-Status Wildlife.....	7-5
7.4.1	Direct Impacts	7-5
7.4.2	Indirect Impacts.....	7-7
7.4.3	Mitigation Measures	7-8
7.5	Potential Impacts to Breeding Birds	7-9
7.5.1	Direct Impacts	7-9
7.5.2	Indirect Impacts.....	7-9
7.5.3	Mitigation Measures	7-9
7.5.4	Impact Determination	7-9
7.6	Potential Impacts to Waters of the U.S. or State (Jurisdictional Waters/Wetlands).....	7-10
7.6.1	Direct Impacts	7-10
7.6.2	Indirect Impacts.....	7-11
7.6.3	Mitigation Measures	7-11
7.6.4	Impact Determination	7-11

7.7	Potential Impacts to Critical Habitat.....	7-12
7.7.1	Direct and Indirect Impacts	7-12
7.7.2	Mitigation Measures	7-12
7.7.3	Impact Determination	7-12
7.8	Potential Impacts to Wildlife Movement or Native Wildlife Nursery Sites.....	7-12
7.8.1	Direct and Indirect Impacts	7-12
7.8.2	Mitigation Measures	7-12
7.8.3	Impact Determination	7-12
7.9	Potential Impacts to Local Policies or Ordinances	7-12
7.9.1	Direct and Indirect Impacts	7-13
7.9.2	Mitigation Measures	7-13
7.9.3	Impact Determination	7-13
7.10	Potential Impacts to HCPs or NCCPs.....	7-13
7.10.1	Mitigation Measures	7-14
7.10.2	Impact Determination	7-14
8.0	Mitigation Measures.....	8-1
8.11	BIO-1: Biological Monitor	8-1
8.12	BIO-2: Construction Best Management Practices.....	8-2
8.13	BIO-3: Pre-Construction Breeding Bird Survey.....	8-2
8.14	BIO-4: Mitigation for Loss of Waters of the State (RWQCB)	8-3
9.0	Potential Federal, State, and Local Biological Permits and Approvals	9-1
10.0	Literature Cited and References	10-2

TABLES

Table 4.2-1	- Field Survey Information.....	4-8
Table 5.3-1	- Summary of Soil Mapping Units.....	5-1
Table 5.4-1	- Acreage of Mapped Land Cover Types.....	5-2
Table 5.5-1	- Recorded Non-Native Plant Species with a Cal-IPC Rating.....	5-6
Table 5.5-2	- Special-Status Vernal Pool Plant Species with a Potential to Occur in the BSA	5-8
Table 5.6-1	- Special-Status Vernal Pool Wildlife Species with a Potential to Occur in the BSA.....	5-15
Table 6.1-1	- MSHCP Project Review Checklist	6-1
Table 6.1-2	- Survey Requirements Within the MSHCP Plan Area.....	6-3
Table 7.2-1	- Acreage of Anticipated Direct Impacts to Land Cover Types	7-3

APPENDICES

Appendix A	Figures
	<ul style="list-style-type: none"> • <i>Figure 1: Regional Location</i> • <i>Figure 2: Project Vicinity</i> • <i>Figure 3: Project Location and Biological Study Area (BSA)</i> • <i>Figure 4: USGS Topographic Map</i> • <i>Figure 5: CNDDDB Known Occurrences Plant Species and Habitats</i> • <i>Figure 6: CNDDDB Known Occurrences Wildlife Species</i> • <i>Figure 7: USGS Surface Waters and Watersheds</i> • <i>Figure 8: USDA Soils</i> • <i>Figure 9: Land Cover Types</i>

	<ul style="list-style-type: none">• <i>Figure 10: Jurisdictional Areas and Fairy Shrimp Locations</i>• <i>Figure 11: USFWS Critical Habitats</i>• <i>Figure 12: CDFW Wildlife Corridors</i>
Appendix B	Project Drawings (Site Plan)
Appendix C	Special-Status Species Occurrence Potential Determination
Appendix D	Jurisdictional Delineation Report
Appendix E	Plant and Wildlife Species Recorded During the Field Surveys
Appendix F	Field Data Sheets
Appendix G	Wet Season Fairy Shrimp Survey Report
Appendix H	Dry Season Fairy Shrimp Survey Report
Appendix I	Site Photographs
Appendix J	Soils Report
Appendix K	RCA MSHCP Information Map Report

LIST OF ABBREVIATIONS AND ACRONYMS

Acronym/Abbreviation	Term
AOU	American Ornithological Union
BIOS	Biogeographic and Information Observation System
BMPs	best management practices
BRE	biological resources evaluation
BSA	Biological Study Area
BUOW	burrowing owl
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	United States Army Corps of Engineers
CRPR	California Rare Plant Rank
cuckoo	western yellow-billed cuckoo
CWA	Clean Water Act
DBESP	Determination of Biologically Equivalent or Superior Preservation
EPA	Environmental Protection Agency
EPD	Environmental Programs Department
ESA	Endangered Species Act
°F	degrees Fahrenheit
GIS	Geographic Information System
GPS	Global Positioning System
HCP	Habitat Conservation Plan
HUC	Hydrologic unit code
IPaC	Information, Planning, and Conservation System
LBV	least Bell's vireo
LSA	Lake or Streambed Alteration
MBTA	Migratory Bird Treaty Act
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
NMFS	National Marine Fisheries Service
NPPA	Native Plant Protection Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OHWM	Ordinary High-Water Mark
Porter-Cologne	Porter-Cologne Water Quality Control Act

Acronym/Abbreviation	Term
project	Magnolia Avenue Multi-Family Development Project
RCA	Western Riverside County Regional Conservation Authority
RCIP	Riverside County Integrated Project
RCTLMA	Riverside County Transportation and Land Management Agency
RSP	Rock Slope Protection
RWQCB	Regional Water Quality Control Board
SWFL	southwestern willow flycatcher
SWRCB	State Water Resources Control Board
UltraSystems	UltraSystems Environmental Inc.
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQC	Water Quality Certification
§	Section
§§	Sections

EXECUTIVE SUMMARY

UltraSystems prepared this Biological Resources Evaluation report (BRE) for the proposed Penske Sales, Leasing, and Maintenance Facility Project (project). The project would consist of a new state-of-the-art six-bay service facility, wash bay, rental and sales office building, and associated fuel island. The project site is located within areas covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

UltraSystems biologists conducted a literature review, reconnaissance-level field survey, and focused surveys for biological resources potentially associated with the project site and within a zone 500 feet out from the project site; these define the Biological Study Area (BSA). Biologists visited the BSA to conduct a reconnaissance-level biological surveys in which the following resources were assessed: (1) Plant communities, habitats and land cover types; (2) Riparian/riverine/vernal pools and fairy shrimp habitat assessment; (3) Jurisdictional waters; (4) Plant and wildlife species; (5) Wildlife corridors; (6) Burrowing owl habitat.

Soils

The BSA contains three soil map units, none of which are listed on the National Hydric Soils List as hydric.

Land Cover Types

Three land cover types were observed and mapped within the BSA during the field surveys: (1) Residential/Urban/Exotic, (2) Disturbed/depression (3) Non-native grasslands. None of these land cover types are considered sensitive habitats.

Vernal Pools

A vernal pool complex comprised of two vernal pools containing aquatic invertebrates and other Arid West wetland indicators was observed within the BSA. Wet and dry season sampling of the invertebrates revealed the presence of one species: versatile fairy shrimp, which is not a special-status or sensitive species. No special-status fairy shrimp were observed during any of the surveys, including species addressed under the MSHCP.

Listed and Sensitive Plants

No listed or sensitive plants were observed within the BSA during the field surveys.

Listed and Sensitive Wildlife

No listed or sensitive wildlife were observed within the BSA during the field surveys.

Jurisdictional Areas

The BSA contains isolated jurisdictional waters of the State. The BSA does not contain waters of the U.S. The site also contains jurisdictional waters regulated by the MSHCP defined vernal pools.

Critical Habitats

The project area is not located within designated or proposed critical habitat for listed plant or wildlife species. The nearest critical habitat (coastal California gnatcatcher [*Polioptila californica*]) is located approximately 7.5 miles north from the project site.

Wildlife Corridors

The literature review and field surveys determined that the project site does not contain wildlife corridors or native wildlife nursery sites.

Conclusion

Development of the project would lead to the loss of a vernal pool complex in the eastern region of the project site. Because these isolated vernal pools are waters of the State, and also protected under the MSHCP, implantation of mitigation measures such as payment into a mitigation bank would be necessary to reduce project impacts to a less than significant level. The project is anticipated to have less than significant impacts on biological resources with the implementation of mitigation measures that offset the loss of vernal pool habitat. For those resources that could potentially be impacted by the project, avoidance and minimization measures, as appropriate, have been recommended to reduce those potential impacts below the level of significance. These measures would be incorporated into the project specifications for the construction contractor retained for this project.

1.0 INTRODUCTION

UltraSystems prepared this BRE for the proposed Penske Sales, Leasing, and Maintenance Facility Project, in Moreno Valley, California. The project parcels are identified as APNs 297-100-073, 297-100-076, 297-100-091, 297-120-002, 297-120-003, 297-120-017, 297-120-018, and 297-120-025; the street address is 21839 Alessandro Boulevard, Moreno Valley, California, 92553.

UltraSystems' biologists conducted a literature review, reconnaissance-level field survey, and focused surveys of the biological resources potentially associated with the project site and of areas within a 500-foot zone around the project site; collectively, this area is referred to as the Biological Study Area (BSA).

The site is generally bordered by a mixture of commercial, residential, and open space to the north; commercial and retail to the east, industrial on the south, and commercial (i.e., unoccupied warehouse facility) on the west. Interstate 215 is approximately 0.3 mile west of the entrance to the proposed project site. The project site currently consists of disturbed open space, with several trees; there is structural debris in the southeast corner.

UltraSystems biologists visited the BSA to conduct the reconnaissance-level biological survey in which the following resources were assessed: land cover types, waters of the U.S. or State, including wetlands, habitats including riparian/riverine/vernal pools, and fairy shrimp habitats, plant and wildlife species, burrowing owl (BUOW) habitat, and wildlife corridors.

1.1 Report Purpose

This report documents the methods and results of the literature review and the field surveys and provides a summary of existing conditions, an assessment of the potential presence of sensitive biological resources, and an analysis of the potential impacts to those resources from project construction and development. It summarizes the biological resources present within the BSA at the time of the field surveys including plant communities, plants, and wildlife; and the potential occurrence of special-status plant and wildlife species, critical habitat, and potential wildlife corridors.

Plant and wildlife species listed under the federal Endangered Species Act (ESA) or under the California Endangered Species Act (CESA) as endangered, threatened or as a candidate for listing will be referred to collectively as "listed species" in this document. Plant and wildlife species not listed under ESA or CESA but still protected by federal agencies, state agencies, local or regional plans, such as the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP), and/or conservation organizations such as the California Native Plant Society (CNPS), are collectively referred to as "sensitive species" in this document. The term "special-status species" will be used when collectively referring to both listed and sensitive species. Some of these plant and wildlife species are afforded special legal or management protection because they are limited in population size, and typically have a limited geographic range and/or limited habitat.

This report also identifies and analyzes the potential impacts to biological resources of site construction and development in view of federal, state, and local laws, regulations, policies, orders, ordinances and/or management plans. Finally, it recommends, as appropriate, mitigation measures (best management practices [BMPs], avoidance and protection measures, and mitigation measures) to avoid or reduce potential environmental impacts to less than significant levels.

The study of biological resources associated with the BSA was conducted to comply with the California Environmental Quality Act (CEQA) requirements for a biological evaluation of projects that would potentially impact natural resources. CEQA is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. This report is intended to satisfy the biological resource needs of the CEQA process. This report will also assist federal and state resource agencies in their review of the project and support permits required for the project from these resource agencies. In addition, because the project site falls within the MSHCP area, a MSHCP Consistency Analysis will also be included in this report.

1.2 Project Location

The project site is located in the City of Moreno Valley in western Riverside County, California on the United States Geological Survey (USGS) 7.5-Minute Topographic Map *Riverside East* Quadrangle. The project site is located at Township 3 South, Range 4 West, Section 15 Northeast (see **Appendix A**; Figure 1: *Regional Location*; Figure 2: *Project Vicinity*; Figure 3: *Project Location and Biological Study Area [BSA]*; Figure 4: *USGS Topographic Map*; USGS, 1996). The approximate center of the project site is located at 33.915455° -117.281648°. The project site is generally between 1,540 to 1,550 feet above mean sea level.

The majority of the project area is located within the Reche Canyon/Badlands Area Plan of the MSHCP. The western edge of the project area occurs within the Lake Matthews/Woodcrest Area Plan. The project is not located within any MSHCP criteria cells, conservation areas, wildlife movement corridors or linkages. There are no MSHCP survey requirements for this area.

The project site is located in the jurisdiction of the following resource agency field offices:

- **United States Fish and Wildlife Service (USFWS)**
Palm Springs Fish and Wildlife Office
777 E. Tahquitz Canyon Way, Suite 208
Palm Springs, CA 92262
Phone: (760) 322-2070

- **California Department of Fish and Wildlife (CDFW)**
Inland Desert Region 6
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764
Phone: (909) 484-0167

- **United States Army Corps of Engineers (USACE)**
Los Angeles District
915 Wilshire Boulevard, Suite 980
Los Angeles, CA 90017
Phone: (213) 452-3908/3333

- **Regional Water Quality Control Board (RWQCB)**
Santa Ana Region (Region 8)
3737 Main Street, Suite 500
Riverside, CA 92501-3339

Phone: (951) 782-4130

- **Riverside County Planning Department: Environmental Programs Division (County EPD)**
4080 Lemon Street, 12th Floor
P.O. Box 1409, Riverside, CA 92502-1409
Phone: (951) 955-3200

2.0 PROJECT DESCRIPTION

Penske is proposing to construct a new state-of-the-art six bay service facility (with a 4011 square-foot office core) and wash bay, in addition to a rental and sales office building (with a 1,792 square-foot office core) and associated two-lane, three product (gas, diesel, diesel exhaust fluid) fuel island. The City of Moreno Valley would process an application seeking design review approval for the proposed facility, which would be located southeast of the intersection of Interstate 215 Frontage Road and Alessandro Boulevard. The roughly rectangular site for the proposed project is currently undeveloped and is used for truck storage (**Appendix B, Project Drawings [Site Plan]**).

The project would involve the construction of a multi-use facility intended for activities related to truck rentals, sales, maintenance, and other operations on approximately 9.6 acres in the City of Moreno Valley. Penske Truck Leasing Co, L.P. (“Penske”) is proposing to construct a new state-of-the-art six bay service facility (with a 4011 square-foot office core) and wash bay in addition to a rental and sales office building (with a 1,792 square-foot office core) and associated two-lane, three product (gas, diesel, diesel exhaust fluid) fuel island.

Penske’s intended use of the premises is for the operation of a motor vehicle and truck leasing, rental, and sales business which would include the housing, maintaining to full capacity and repairing of motor trucks and trailers, outside parking and storage of such vehicles, motor vehicle repair shop and the storage and dispensing of fuel for the benefit of its internal customers only.

Penske would conduct truck and trailer repairs consisting of general and preventive maintenance to its private and customer fleets, such as clutches, oil changes, belt/bub replacements, tune-ups, tire changes, etc. No major work such as framework, collision repair or bodyshop work, etc. would occur. All work would be conducted within the facility, which would not be open to the general public.

3.0 REGULATORY CONTEXT

Each project must comply with applicable federal, state and local environmental laws, regulations, ordinances, policies, programs, and environmental management plans. The following is a summary of the key federal and state laws and regulations that apply to protecting plants and wildlife.

3.1 Federal Statutes, Regulations and Executive Orders

3.1.1 Clean Water Act

Section 401 – Clean Water Act

Section 401 is implemented through issuance of a Water Quality Certification (WQC). In the State of California, the U.S. Environmental Protection Agency (USEPA) has given the responsibility for issuing Section 401 WQCs to the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs), unless a discharge of dredged or fill material is proposed within more than one region. In the event that a project proposes discharges of dredged or fill material in more than one region, responsibility for issuance of a Section 401 WQC will lay either with the SWRCB, or, upon agreement of the RWQCBs for the affected regions, with the RWQCB chosen in the discretion of the RWQCBs. Cal. Water Code, § 13160; Cal. Code Regs., tit. 23, § 3838. Certification must be based on a finding that the proposed discharge will comply with water quality standards, which include numeric and narrative water quality objectives applicable to identified surface waters in the Water Quality Control Plan for the region (Basin Plan) in which a discharge of fill is proposed.

The Santa Ana RWQCB (Region 8) would provide review and certification services for this project.

Section 404 – Clean Water Act

Section 404 CWA requires authorization from the Secretary of the Army, acting through the U.S. Army Corps of Engineers (USACE), for the discharge of dredged or fill material into waters of the United States, including wetlands. Authorizations are conducted through the issuance of Nationwide (or General) Permits for activities that would cause only minimal (between 0.1 and 0.5 acre) permanent individual and cumulative impacts; through Individual (or Standard) Permits for activities that are likely to have more than a minimal (greater than 0.5 acre) permanent or cumulative impact on waters of the U.S.; and through Letters of Permission (LOPs) which are a type of individual permit issued through an abbreviated process that includes coordination with federal and state fish and wildlife agencies and a public interest evaluation, but without the 30-day permit notice period that is required for Individual Permits.

Wetlands and other waters that do not meet the definition of waters of the U.S. are not covered by the CWA; however, they are regulated by the State of California through the Porter-Cologne Water Quality Control Act (Porter-Cologne) and SWRCB Resolution No. 2019-0015 (see **Section 3.2.8** and **Section 3.2.9**).

The Los Angeles District of the USACE would provide review and permitting services for this project.

3.1.2 Endangered Species Act (ESA)

The federal Endangered Species Act of 1973 (Title 16, United States Code [U.S.C.] Sections (§§) 1531-1543) (ESA), as amended, designates and provides for protection of listed threatened and endangered plant and animal species, and their critical habitat. The USFWS, in the Department of the Interior, and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), in the Department of Commerce, share responsibility for administration of the ESA. These responsibilities include listing and delisting species, designating critical habitat, and formulating recovery plans. The ESA is divided into 18 sections that work together to prevent species from going extinct by helping to stabilize populations, reduce the threats to their survival, and to help species recover to the point that they no longer require federal protection.

Section 4 (Determination of Endangered Species and Threatened Species)

Section 4 of the ESA addresses listing of species in need of the ESA's protection. Species are listed as either endangered or threatened under Section 4 of the ESA. A federally-endangered species is one that is facing extinction throughout all or a significant portion of its range. A federally-threatened species is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Under Section 4, actions needed to recover those species and conserve their habitats are also identified, along with a process for reaching recovery goals that allow for a species' removal from federal protection. The presence on a project site of any fish or wildlife species that is federally listed as endangered or threatened generally imposes constraints on development to the extent that development is likely to result in a prohibited "take" of the species or substantial adverse modification of its habitat as described in **Section 3.1.3.3, Section 9 (Prohibited Acts)**, below.

Section 7 (Interagency Cooperation)

Two sections of the ESA (§§ 7 and 10) authorize incidental take. Section 7 of the ESA regulates take associated with federal projects or projects that require a federal permit. It also requires federal agencies to use their authority to carry out conservation programs to benefit endangered and threatened species. Under § 7, federal agencies are required to consult with the USFWS or the NMFS to ensure that any action the agency carries out, including those they fund or authorize (such as through a permit) will not likely jeopardize the continued existence of listed species, or result in the destruction or adverse modification of proposed or designated critical habitat of such species. Under § 7, consultations can either be informal or formal.

Section 9 (Prohibited Acts)

Once a species is listed, Section 9 of the ESA makes it unlawful for any person, including private and public entities, to take species listed as endangered or without a permit issued pursuant to Section 10 or an incidental take statement issued pursuant to Section 7. Section 9 defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." The term "harm" is defined as "an act which actually kills or injures wildlife. Such an act may include substantial habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."

ESA Section 9's take prohibitions apply to listed wildlife and fish species, but not to plants. Endangered plants are not protected from take, although it is unlawful to remove, possess, or maliciously damage or destroy them on federal lands. Removing or damaging listed plants on state

and private lands in knowing violation of state law, or in the course of violating a state criminal trespass law, also is illegal under the ESA.

Section 10 (Incidental Take Permits and Habitat Conservation Plans)

An incidental take permit pursuant to Section 10(a)(1)(B) is required when non-Federal, otherwise lawful activities, including lawful project development, will result in take of threatened or endangered wildlife. Under this provision, the USFWS and/or NMFS may, where appropriate, authorize the taking of federally listed wildlife or fish if such taking occurs incidentally during otherwise legal activities. Section 10(a)(2)(B) requires an application for an incidental take permit to include an HCP. The purpose of the habitat conservation planning process associated with the permit is to ensure there is adequate avoidance, minimization and mitigation measures to address the effects of the authorized incidental take. Section 10 provides a clear regulatory mechanism to permit the incidental take of federally listed fish and wildlife species by private interests and non-Federal governmental agencies.

The County of Riverside is a Permittee pursuant to the MSHCP and related Section 10(a)(b)(1) permit. Payment of the development mitigation fee and compliance with the requirements of the MSHCP are intended to provide full mitigation under CEQA, the National Environmental Policy Act (NEPA), the ESA and the California Endangered Species Act (CESA) for the impacts to the species and habitats covered by the MSHCP (MSHCP, Vol. I, p. 6-3).

3.1.3 Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (MBTA) of 1918 (Title 16, U.S.C. Sections 703 - 712), as amended, implements various treaties and conventions between the United States (U.S.) and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. The MBTA makes it unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a permit issued by the Secretary of the Interior. Some regulatory exceptions apply. Take is defined in regulations implementing the MBTA as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to carry out these activities.” The MBTA prohibits the collection and destruction of a migratory bird, its nest, and birds or eggs contained in the nest. The USFWS’ Migratory Bird Permit Memorandum (MBPM-2) dated April 15, 2003, clarifies that destruction of most unoccupied bird nests is permissible under the MBTA; exceptions include nests of federally listed threatened or endangered migratory birds, bald eagles, and golden eagles. Take under the MBTA does not include habitat destruction or alteration, as long as there is not a direct taking of birds, nests, eggs, or parts thereof. The USFWS has statutory authority and responsibility for enforcing the MBTA (USFWS, 2022a).

3.1.4 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. §§ 4321) requires federal agencies carrying out, funding, or permitting projects, or implementing any other major federal action that significantly adversely affects the quality of the human environment to prepare a detailed environmental impact analysis for the major Federal action. The analysis, known as the Environmental Impact Statement or an Environmental Assessment, must address the adverse environmental impacts of the proposed action, any adverse environmental effects which cannot be avoided should the proposal be implemented, alternatives to the proposed action, the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-

term productivity, and any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. The Council on Environmental Quality (CEQ) has promulgated regulations for implementing NEPA's requirements. (40 C.F.R. §§ 1502 et seq.) Pursuant to state and federal law, NEPA evaluations may be prepared in combination with, or may rely upon environmental analyses prepared under the California Environmental Quality Act 40 C.F.R. §§ 1506.2, 1506.4.

3.1.5 Prevention and Control of Invasive Species – Executive Order 13112

Executive Order 13112 (February 3, 1999) directs all federal agencies to work cooperatively to prevent and control the introduction of invasive non-native species in a cost-effective and environmentally sound manner to minimize their economic, ecological, and human health impacts. Executive Order 11312 established a national Invasive Species Council made up of federal agencies and departments and a supporting Invasive Species Advisory Committee composed of state, local, and private entities. The Invasive Species Council and Advisory Committee oversee and facilitate implementation of the Executive Order, including preparation of a National Invasive Species Management Plan.

3.2 State Statutes and Regulations

3.2.1 California Environmental Quality Act (CEQA)

The California Environmental Quality Act of 1970 (Title 14, California Code of Regulations, §§ 15002-15387) (CEQA) is California's broadest environmental law. CEQA applies to certain activities of state and local public agencies. It requires lead agencies - that is, those making land use decisions – as well as any other responsible state agencies issuing discretionary permits, to evaluate and disclose the significance of all potential environmental impacts of a project. The lead agency is also responsible for identifying, negotiating and implementing feasible impacts avoidance, minimization, or mitigation measures that reduce and compensate for significant environmental impacts with the goal of reducing those impacts to less than significant levels. Lead agencies determine significance on a project-by-project basis because they must consider all potential risk, including cumulative impacts, within a local and regional context, as well as evaluate unique factors particular to the project area when exercising their discretion to approve or disapprove a project.

The CEQA Guidelines specify that a project has a significant impact on the environment if, among other things, it has the potential to “substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or an animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species....” [CEQA Guidelines § 15065(a)(1)] (CDFW, 2022a).

3.2.2 California Endangered Species Act (CESA)

The California Endangered Species Act (CESA; California Fish and Game Code §§ 2050-2089) was enacted in 1984 to parallel the federal ESA and allows the Fish and Game Commission to designate species, including plants, as “threatened” or “endangered”. CESA states that all native species of fishes, amphibians, reptiles, birds, mammals, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved. Unlike the ESA, the CESA does not include listing provisions for non-aquatic invertebrate species.

CESA makes it illegal to import, export, take, possess, purchase, sell, or attempt to do any of those actions to species that are designated as threatened, endangered, or candidates for listing, unless permitted by CDFW. Section 2080 of the California Fish and Game Code prohibits take of any species that the commission determines to be an endangered species or a threatened species. "Take" is defined in § 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Under CESA, CDFW may permit take or possession of threatened, endangered, or candidate species for scientific, educational, or management purposes, and may also permit take of these species that is incidental to otherwise lawful activities if certain conditions are met. Some of the conditions for incidental take are that the take is minimized and fully mitigated, adequate funding is ensured for this mitigation, and that the activity will not jeopardize the continued existence of the species. CESA emphasizes early consultation to avoid potential impacts on rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species populations and their essential habitats (CDFW, 2022b).

3.2.3 Fully Protected Species - California Fish and Game Code § 3511, § 4700, § 5050 and § 5515

The classification of fully protected was the State of California's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for birds (§ 3511), mammals (§ 4700), amphibians and reptiles (§ 5050), and fish (§ 5515). Fully protected animal species may not be taken or possessed at any time and no licenses or permits may be issued for their take, except for collecting these species for scientific research and relocation of the species for certain purposes. "Take" is defined in § 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Under § 2835 of the Fish and Game Code, CDFW may only issue permits allowing incidental take of fully protected species if a NCCP is prepared that provides for the protection of that species in accordance with the requirements and standards applicable to NCCPs (Fish and Game Code §§ 2800-2835). Alternatively, avoidance measures sufficient to prevent incidental take of fully protected species must be incorporated into project design, and construction plans and operations. The MSHCP is an HCP and a NCCP, and includes incidental take authorization pursuant to Fish and Game Code § 2085, but the MSHCP does not authorize take of fully protected species. (CDFW, 2022c)

3.2.4 Bird Nests and Eggs - California Fish and Game Code § 3503

California Fish and Game Code § 3503 states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered take. Avoidance measures sufficient to prevent incidental take of bird nests and eggs protected by this statute must be incorporated into project design, and construction plans and operations.

3.2.5 Birds of Prey and their Eggs – California Fish and Game Code § 3503.5

The word "raptor" is the term used for a group of birds consisting of hawks, falcons, kites, eagles, vultures and owls. Raptors, also referred to as "birds of prey," are a valuable resource to the State of California. More than 30 species of raptors inhabit California at some point in their life cycle. California Fish and Game Code § 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (raptors) or to take, possess, or destroy the nest or eggs of

any such birds except as otherwise provided by this code or any regulation adopted pursuant thereto. The order Falconiformes is comprised of four families with around 311 species. These are the birds of prey (falcons, hawks, eagles, vultures, and ospreys). The order Strigiformes, comprised solely of owls, contains two families and over 130 species. All raptors and their nests are protected under § 3503.5. Avoidance measures sufficient to prevent incidental take of these species, their eggs and their nests protected by this statute must be incorporated into project design, and construction plans and operations.

3.2.6 Migratory Birds – California Fish and Game Code § 3513

California Fish and Game Code § 3513 protects California’s migratory birds by making it unlawful to take or possess any migratory non-game bird as designated by the MBTA, except as authorized in regulations adopted by the federal government under provisions of the MBTA. Except as permitted by USFWS under the MSHCP, avoidance measures sufficient to prevent incidental take of these species, their eggs and their nests protected by this statute must be incorporated into project design, and construction plans and operations.

3.2.7 Native Plant Protection Act – California Fish and Game Code §§ 1900-1913

The Native Plant Protection Act (NPPA), enacted in 1977, allows the Fish and Game Commission to designate native plants as state endangered or rare, mirroring the designations created for animal species by the CESA of 1970. The NPPA, administered by CDFW, requires all state agencies to utilize their authority to preserve, protect and enhance endangered or rare native plants of California. Section 1908 of the NPPA prohibits the take, possession, propagation, import, export, or sale of any native plant that the Fish and Game Commission determines to be an endangered or rare native plant, except when the take is incidental to agricultural and nursery operations, emergencies, or the possession or sale of real property on which the plant is growing.

CDFW may authorize the take, possession, import, or export of some plants that are protected by the NPPA. It may also authorize take and possession for scientific, educational or management purposes, or authorize take that is incidental to otherwise lawful activities if certain conditions are met. CDFW issues most of these permits to individuals to identify, document and voucher listed plant species, typically during botanical surveys, and may also issue permits to individuals or organizations for other scientific, educational or management purposes, most typically research or recovery actions for state-listed plant species.

3.2.8 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne) defines water quality objectives as the allowable “limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisances within a specific area.” Thus, water quality objectives are intended to protect the public health and welfare, and to maintain or enhance water quality in relation to the existing and/or potential beneficial uses of the water. Water quality objectives apply to both waters of the U.S. and waters of the State. In the State of California, Porter-Cologne is administered jointly with the § 401 CWA WQC for waters of the U.S. For waters of the State, Porter-Cologne is administered as part of SWRCB Resolution No. 2019-0015 (Procedures; see **Section 3.2.9**).

As with § 401 CWA, the Santa Ana RWQCB (Region 8) would provide review and permitting services for Porter-Cologne.

3.2.9 State Water Resources Control Board Resolution No. 2019-0015

The California Code of Regulations, Title 23, § 3831(w) states that “[a]ll waters of the United States are also ‘waters of the state.’” This regulation has remained in effect to protect waters that are outside the scope of federal jurisdiction; it is consistent with the SWRCBs intent to include both historic and current definitions of waters of the U.S. into the SWRCBs wetland jurisdictional framework.

On April 2, 2019, the SWRCB adopted **Resolution No. 2019-0015**, *Amendment to the Water Quality Control Plan for Ocean Waters of California and the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California to Establish a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (Procedures). for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. As they apply to this project, the Procedures provide the SWRCB and its nine RWQCBs to approve a project only if the applicant has demonstrated compliance with certain requirements. (SWRCB, 2019)

On April 6, 2021, the SWRCB issued **Resolution No. 2021-0012** confirming that the “State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State” (1) are in effect as state policy for water quality control for all waters of the State and (2) shall be applied via the inland surface waters and enclosed bays and estuaries plan to only waters of the United States. Examples of waters of the State include (but are not limited to) ephemeral streams and isolated wetlands.

When a discharge is proposed to waters outside of federal jurisdiction, the SWRCB and the RWQCBs regulate the discharge under Porter-Cologne through the issuance of Water Discharge Requirements (WDRs). WDRs and waivers of WDRs are referred to as orders or permits. The SWRCB and its nine RWQCBs have the authority to regulate the discharge of dredged or fill material under Resolution Nos. 2019-0015 and 2021-0012. Dischargers that do not require a federal permit or license that authorizes impacts to waters of the U.S. (i.e., waters that are within federal jurisdiction), such as § 404 CWA and § 10 of the Safe Rivers and Harbors Act, must obtain a WDR or a waiver of a WDR from the SWRCB or RWQCB to ensure that the discharge does not violate state water quality standards or any other appropriate requirement of State law.

The Santa Ana RWQCB (Region 8) would provide review and certification/permitting for this project.

Basin Plans.

The SWRCB requires its nine RWQCBs to develop water quality control plans (Basin Plans) designed to preserve and enhance water quality and protect the beneficial uses of all Regional waters. Specifically, Basin Plans designate beneficial uses for surface waters and groundwater, set narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State antidegradation policy, and describe implementation programs to protect all waters in the Regions. In addition, Basin Plans incorporate by reference all applicable State and Regional Board plans and policies, and other pertinent water quality policies and regulations. This project is under the jurisdiction of the Water Quality Control Plan of the Santa Ana River Basin (RWQCB 2019).

Construction Stormwater Program.

The SWRCB implements water quality regulations under the federal CWA and Porter-Cologne and requires compliance with the National Pollutant Discharge Elimination System (NPDES) for discharges of stormwater runoff associated with a construction activity.

Dischargers whose projects disturb one or more acres of soil are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-009-DWQ, as amended). Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires dischargers of potential pollutants into waters of the State and waters of the U.S. to: (1) implement best management practices (BMPs) to eliminate or reduce point and non-point source discharges of pollutants; and (2) if one acre or more of soil is disturbed during construction, to prepare a site-specific Storm Water Pollution Prevention Plan (SWPPP) to protect water quality and beneficial uses. The Construction General Permit establish enforceable limits on discharges, require effluent monitoring, designate reporting requirements, and require construction and post-construction BMPs to eliminate or reduce point and non-point source discharges of pollutants.

The SWRCB would provide Construction General Permit review and permitting services for this project.

Lake or Streambed Alteration Agreement.

§§ 1600-1617 FGC of the **California Fish and Game Code (FGC)** protect the natural flow and the bed, channel, and bank of any river, stream, or lake designated by the CDFW which is at any time an existing fish or wildlife resource, or a waterbody from which these resources derive benefit. General project plans must be submitted to CDFW in sufficient detail to indicate the nature of the project proposed for construction, if the project would:

- Divert, obstruct, or change a streambed;
- Use material from the streambeds;
- Result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a stream.

The Inland Deserts Region (Region 6) of the CDFW serves Riverside County and would provide LSA Notification Review and Agreement services for this project.

3.2.10 Natural Community Conservation Planning Act of 2003 (NCCP Act)

The California Natural Community Conservation Planning Act (NCCP Act) was enacted to encourage broad-based planning to provide for effective protection and conservation of the State's wildlife resources while continuing to allow appropriate development and growth (California Fish and Game Code §§ 2800 to 2835). NCCPs may be implemented, which identify measures necessary to conserve and manage natural biological diversity within the planning area, while allowing compatible and appropriate economic development, growth, and other human uses. An approved NCCP enables the California Department of Fish and Wildlife to authorize take of species consistent with the NCCP Act and California Fish and Game Code § 2835.

3.3 Local Management Plans

3.3.1 Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County Regional Conservation Authority (“RCA”) was formed in 2004 to manage the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), the nation’s largest conservation plan. The MSHCP strengthens the environmental sustainability in western Riverside County by protecting natural resources that occur within the plan area (RCA, 2022a).

The MSHCP is a comprehensive, multi-jurisdictional regional plan focusing on conservation of species and associated habitats to address biological and ecological diversity conservation needs, while development is simultaneously approved on non-federal lands in western Riverside County (Dudek and Associates, 2003). The MSHCP serves as an HCP pursuant to § 10(a)(1)(B) of the ESA, as well as a NCCP under the California Natural Community Conservation Planning Act. HCPs came out of an amendment to the ESA allowing “incidental take” by using a planning process that protects listed species while allowing for lawful activities of landowners in the presence of listed species. Rather than deal with endangered species on a one-by-one basis, the MSHCP focuses on the conservation of 146 species and their habitats. The MSHCP establishes a framework and mechanism for projects to comply with state and federal endangered species regulations.

The final MSHCP was approved by the County Board of Supervisors on June 17, 2003. The plan was approved by the USFWS and CDFW through the execution of an Implementing Agreement. The Implementing Agreement outlines the specific enforceable measures and mechanisms that are required to effectively implement the plan. The federal and state permits were issued by the USFWS and CDFW on June 22, 2004 and implementation of the MSHCP began on June 23, 2004. The term of the permits is 75 years.

Additional information regarding the MSHCP is in **Section 6.0**, *MSHCP Consistency Analysis*.

3.3.2 City of Moreno Valley Municipal Code

Ordinance No. 923

Ordinance No. 923 is an ordinance of the city council of the City of Moreno Valley amending the municipal code to add chapter 14.40, which will adopt regulations for the planting and maintenance of trees within the city.

Chapter 14.40 of the City's municipal codes outlines the regulations implemented for the planting and maintenance of trees within the City of Moreno Valley.

§ 14.40.020. Authorized Tree Species for Planting

Only trees that are indigenous to the area, and/or suitable for the local climate shall be used. Site layout shall take into consideration Moreno Valley's climate by including trees, landscaping and architectural elements to provide shade, as appropriate for the available root and tree canopy space.

§ 9.17.030 Landscape and design irrigation standards (Heritage Trees): Moreno Valley Municipal Code Title 9 Chapter 17 § 030 (G) states the following regarding the definition of and protection requirements for heritage trees:

Any tree that defines the historical and cultural character of the city including older Palm and Olive trees, and/or any tree designated as such by official action. 2) Trees with a fifteen (15) inch diameter measured twenty-four (24) inches above ground level. 3) Trees that have reached a height of fifteen (15) feet or greater.

No person shall remove, destroy, top, or disfigure a heritage tree within the city limits. Removal of a heritage tree is permitted if the tree poses a dangerous or hazardous condition to people, structures, property, or another heritage tree. Removal of a heritage tree is permitted if tree is diseased, dying, or dead, and if a reasonable undertaking to preserve the tree had occurred. Removal of a heritage tree in the public or future right-of-way is permitted with the approval of the community development director and if a reasonable undertaking to preserve the tree had occurred. Removal of a heritage tree designated historic and or culturally significant by official action shall require the review of the ecological historical preservation board. Trees grown by nurseries and tree farms for sale purposes are exempt from being heritage trees.

§ 9.17.030 Landscape and irrigation design standards (Trees): Moreno Valley Municipal Code Title 9 Chapter 17 § 030 (E) provides the following tree replacement standards:

Projects necessitating the removal of existing trees with four-inch or greater trunk diameters(calipers), shall be replaced at a three to one ratio, with minimum twenty-four (24) inch box size trees of the same species, or a minimum thirty-six (36) inch box for a one to one replacement, where approved

4.0 STUDY METHODS

This section describes the study methods used by biologists for evaluating the biological resources associated with the BSA and project vicinity.

4.1 Literature Review

Prior to the field survey, UltraSystems biologists conducted a literature review to identify habitats, special-status plant and wildlife species, critical habitats, and wildlife movement corridors potentially associated with the project site. Biologists reviewed relevant literature, databases, agency web sites, reports and management plans, Geographic Information System (GIS) data, maps, and aerial imagery obtained from public domain sources. The review also helped to determine which biological surveys may be required prior to site construction and development.

4.1.1 Topography and Physical Features

To gain a perspective of the topographic and physical features associated with the BSA and project vicinity, biologists reviewed maps such as the USGS 7.5-Minute Topographic Map *Riverside East* Quadrangle and current aerial imagery (Google Earth Pro, 2022). Information obtained from this review included onsite and offsite locations of city and county boundaries and jurisdictions; valleys, hills, and mountain ranges; park boundaries; natural and man-made drainages, and open waters (lakes, ponds, etc.); plant community boundaries; land use such as developed land, agriculture, and natural open space; important landmarks; roads, highways, paths, and trails; and potential wildlife movement corridors.

4.1.2 Soils

The Web Soil Survey, operated by the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS), was used to create a custom soils resource report for a description of the soils associated with the BSA. The Web Soil Survey provides soil data and information produced by the National Cooperative Soil Survey.

4.1.3 Sensitive Plant Communities and Special-Status Species

The methods described below were used to research and derive a comprehensive project-specific list of sensitive habitats, and special-status plants and wildlife to target during the field surveys. The literature review and query of the databases for reported locations of special-status species and habitats helped to identify the known locations of these resources in the project region and assisted in identifying the potential for onsite occurrence of such species.

- CDFW's California Natural Diversity Database (CNDDB) was used to identify sensitive plant communities and special-status species that may exist within the project site and within a two-mile radius of the site (CNDDB, 2022a).
- The USFWS' Information, Planning, and Conservation (IPaC) system was used to identify federal threatened and endangered plant and wildlife species and other natural resources of concern that may exist within the BSA (USFWS, 2022b).
- The online CNPS *Inventory of Rare and Endangered Plants of California, 8th Edition* and *A Manual of California Vegetation, Online Edition* were used to identify the distribution and habitats of special-status vascular plants that may have a potential to occur within the vicinity of the BSA (CNPS, 2022a, b).
- Reports, information, and databases associated with the MSHCP, and the RCA MSHCP Information Map was used to identify habitat assessment requirements and special-status

species possibly occurring within the project limits and possibly requiring surveys in accordance with the MSHCP (RCA, 2021; RCA, 2022a, b; Dudek and Associates, 2003).

Although the inventory list of special-status plant and wildlife species was not exhaustive of all species that might be of concern for the property, it provides a wide range of species that are representative of the habitats in the area.

Sensitive Plant Communities

Sensitive plant communities (sensitive habitats) are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental impacts of projects. Sensitive habitats are often threatened with local extirpation and are therefore considered as valuable biological resources. The most current version of CDFW's *California Natural Community List* indicates which natural communities are sensitive given the current state of the California classification. The *California Natural Community List* (CDFW, 2022d), MSHCP Report (Dudek and Associates, 2003), *Preliminary Descriptions of the Terrestrial Natural Communities of California*. State of California (Holland, 1986) and *A Manual of California Vegetation, Second Edition* (Sawyer et al., 2009) were all referenced for ranking the conservation status of vegetation communities within the BSA. The *California Natural Community List* includes alliance rankings according to their degree of imperilment. For this BRE, plant communities are considered "sensitive" if they meet any of the following criteria:

- Recognized and considered sensitive by CDFW, USFWS, MSHCP, and/or special interest groups such as the CNPS.
- Habitat is under the jurisdiction of CDFW pursuant to §§ 1600-1612 of the California Fish and Game Code.
- Known or believed to be of high priority for inventory in the CNDDDB.
- Considered regionally rare.
- Has undergone a large-scale reduction due to increased encroachment and development.
- Supports special-status plant and/or wildlife species.
- Functions as an important corridor for wildlife movement.

Except for jurisdictional and wetland habitats, which cannot be filled without authorization from the USACE and/or RWQCBs, sensitive habitats are not afforded legal protection unless they support protected special-status plant or wildlife species.

Based on the literature review and CNDDDB search, no sensitive habitat has the potential to occur within the BSA; however, one sensitive habitat, southern sycamore alder riparian woodland, has been recorded within two miles of the project site.

Special-Status Plants

There were 31 special-status plant species recorded in the literature review within 10 miles of the project site, (CNDDDB, 2022a; CNPS, 2022a, b, USFWS, 2022b; see **Appendix A**, Figure 5: *CNDDDB Known Occurrences - Plant Species, and Habitats*; **Appendix C** *Special-Status Species Occurrence Potential Determination*).

Each special-status plant species was assessed for its potential to occur within the BSA by comparing its habitat, elevation range and distribution (obtained from the literature review, the CNPS website

(CNPS, 2022a) and other databases) with the location and elevation range of the BSA. A species was determined as having no potential to occur within the BSA if the BSA is outside the species' known distribution and/or the species' known elevation range. Through this analysis, 19 of the 31 special-status plant species were determined to either have no potential to occur or are not expected to occur in the BSA and were eliminated from further evaluation. It is anticipated that the project would have no impacts to these species and they are not discussed further in this BRE. The analysis of special-status plant species that were determined to have at least a low potential to occur in the BSA can be found in **Table 5.5-2**.

Special-Status Wildlife

The literature review found 66 wildlife species recorded within 10 miles of the project site (see **Appendix A**, Figure 6, *CNDDDB Known Occurrences - Wildlife Species*; **Appendix C** *Special-Status Species Occurrence Potential Determination*). Twenty-one of these wildlife species are federal or state listed endangered, threatened, or candidate species under the ESA and/or the CESA, and are referred to as listed species. Forty-five of the special-status wildlife species have no designated status under the ESA and/or the CESA, but are designated as sensitive or locally important by federal agencies, state agencies, local agencies such as the RCA, and nonprofit resource organizations. These wildlife species are referred to as "sensitive" in this BRE.

Each special-status wildlife species was assessed for its potential to occur within the BSA by comparing its habitat elevation range and distribution (if known) with the location and elevation range of the BSA. A species was determined as having "no potential to occur" within the BSA if the BSA is outside the species' known distribution and/or the species' known elevation range. Through this analysis, 45 of the 66 special-status wildlife species were determined to have no potential to occur within the BSA and were eliminated from further evaluation; it is anticipated that the project would have no impacts to these species and they are not further discussed in this BRE. The potential to occur analysis of special-status wildlife species for all the species reported in the literature review can be found in **Appendix C** *Special-Status Species Occurrence Potential Determination*.

4.1.4 Hydrology and Waters of the U.S. and State

Aerial imagery was reviewed to identify natural and man-made drainages, open water (lakes, ponds, etc.), and other features that may be subject to federal or state jurisdictional authority within watersheds within the BSA. The USGS 7.5-Minute Topographic Map *Riverside East* Quadrangle was reviewed to identify potential presence or absence of onsite and offsite watercourses, and other mapped water features. Topographic maps do not show all drainages or streams that may exist.

The National Wetlands Inventory (NWI) database and maps developed by the USFWS were used as preliminary indicators of potential wetland areas based on changes in vegetation patterns as observed from satellite imagery. The NWI data were viewed in GIS platforms (Google Earth Pro, 2022) to identify potentially jurisdictional features within the project area as indicated from topographic changes or visible ephemeral stream patterns. The USFWS Wetlands Mapper was used to review and download the digital wetland data for the project vicinity (USFWS, 2022c).

The USGS National Hydrography Dataset (NHD) was used to identify hydrologic features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages (USGS, 2022a).

Additionally, the watershed boundary data set containing the most current 10-digit and 12-digit HUCs was obtained in geodatabase form from the USGS to aid with assessing USACE jurisdiction of waters draining the project site (USGS, 2022b).

The following were also reviewed and consulted:

- *1987 Manual* (i.e., *Corps of Engineers Wetlands Delineation Manual*; Environmental Laboratory, 1987).
- *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE, 2008) (referred to as Arid West Supplement in this BRE).
- *The National Wetland Plant List*. version 3.4: (USACE, 2018).
- *The National Wetland Plant List 2020 List of Proposed Changes* (USACE, 2020).
- *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley, 2008).
- Updated Datasheet for the *Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Curtis and Lichvar, 2010).
- *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports, March, 2017* (Minimum Standards) (USACE, 2017).
- United States Department of Agriculture National Resources Conservation Service State Hydric Soils List (USDA-NRCS, 2022).

In 1987, the USACE published the 1987 Manual for the identification and delineation of wetlands which have since been superseded and presented in regional supplements. In 2008, the USACE published a supplement to the 1987 Manual that describes wetland indicators, delineation guidance, and other information that is specific to the arid west region (USACE, 2008).

4.1.5 MSHCP Riparian/Riverine Areas, Vernal Pools, and Fairy Shrimp

Section 6.1.2, *Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*, of the MSHCP describes the process through which protection of riparian/riverine areas, vernal pools, and fairy shrimp species will occur within the MSHCP plan area. Protection of these resources is important for a number of conservation objectives and for a number of plant and wildlife species. MSHCP riparian/riverine areas and vernal pools must be avoided or an assessment of a project's potentially significant effects on MSHCP riparian/riverine areas, vernal pools, and fairy shrimp habitat is required.

MSHCP Vernal Pools

The definition of vernal pools in Section 6.1.2 of the MSHCP is reprinted in **Section 3.3.1** of this report.

MSHCP Fairy Shrimp Habitat

Fairy shrimp habitat for the Riverside fairy shrimp, vernal pool fairy shrimp, and Santa Rosa fairy shrimp, as described under the MSHCP, includes ephemeral pools, artificially created habitat, such as tire ruts and stock ponds, and/or other features determined appropriate by a qualified biologist.

4.1.6 Critical Habitat

When a species is listed as federal endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. Under the ESA, the federal government is required to designate critical habitat for each species it lists under the ESA. Federal agencies are prohibited from authorizing, funding or carrying out actions that destroy or adversely modify critical habitat. Section 3 of the ESA defines critical habitat for a threatened or endangered species as [ESA § 3(5)(A)]:

- The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of § 4 of the ESA, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and
- Specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of § 4 of the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species.

Designated critical habitat is described in 50 CFR Parts 17 and 226. Critical habitat may include areas that are not currently occupied by the species, but that will be needed for its recovery. In addition, the USFWS normally excludes developed areas within mapped critical habitat boundaries as critical habitat. The USFWS' Critical Habitat Portal was reviewed to identify federal threatened and endangered species designated final and proposed critical habitat designations within ten miles of the project site (USFWS, 2022d).

4.1.7 Wildlife Corridors

A wildlife corridor is a connection of habitat, generally native vegetation, which joins two or more larger areas of similar habitat that are otherwise separated by natural barriers, changes in vegetation composition, or land permanently altered for human activities, such as farms; and some infrastructure. When native vegetation is cleared, fragmented patches of open space or isolated “islands” of wildlife habitat are created. Fragmentation and habitat loss are the two main contributors to continuing biodiversity decline. The main goal of corridors is to facilitate movement of individuals, through dispersal, seasonal migration, and movement for foraging, breeding, cover, etc. Corridors allow for physical and genetic exchange between isolated wildlife populations and are critical for the maintenance of ecological processes, including allowing for the movement of animals and the continuation of viable populations and higher species diversity.

Habitat within the corridor generally contains biological and physical features that are needed to temporarily support wildlife and allow avian and ground-dwelling wildlife to safely move through it. Wildlife corridors may either be contiguous strips of vegetation and habitat, such as ridgelines or riverbeds, or intermittent patches of habitat or physical features spaced closely enough to allow safe travel. Corridors can be natural, such as a riparian corridor, or man-made, such as culverts, tunnels, drainage pipes, underpasses, or overpasses. Man-made corridors are often referred to as “wildlife crossings” and they allow wildlife to pass over, under, or through physical barriers that otherwise hinder movement, such as roads or highways. Wildlife corridors also vary greatly in size, shape, and composition. Generally, there are three types of wildlife corridors:

- **Regional corridor:** a primary landscape connection between larger important areas of habitat. They are generally substantial in width (more than 2,000 feet) and not only provide

for dispersal of individual species, but also act as habitat in their own right for a range of species. These areas provide adequate food, water, cover, and shelter to support wildlife within the corridor.

- **Sub-regional corridor:** a landscape connection not as wide as a regional corridor, but wide enough (generally more than 1,000 feet) to provide species movement and dispersal. Sub-regional corridors typically connect larger vegetated landscape features such as ridgelines and valley floors.
- **Local corridor:** smaller, shorter, less defined linkages that provide local connection of remnant patches of vegetation and landscape features such as creek lines, gullies, and wetlands. They may in some cases be less than 160 feet wide and thus may be influenced by edge effects. Many of wildlife crossings are considered local corridors.

In general, the wider and more safeguarded a wildlife corridor is from adjacent human activities, noise, traffic, and light, the better it functions for the movement of wildlife. To determine the potential for the BSA to contain wildlife corridors, biologists reviewed the USGS 7.5-Minute Topographic Map *Riverside East* Quadrangle and viewed aerial images to search for physical features that might serve as wildlife corridors. Biologists also used the Biogeographic and Information Observation System (BIOS) Habitat Connectivity Viewer to search for CDFW Essential Connectivity Areas, Natural Landscape Blocks, and Interstate Connections within the BSA and vicinity (CDFW, 2022e). The literature review also included maps and reports on wildlife home ranges and migration and dispersal patterns (Zeiner et al., 1988 - 1990; CDFW, 2022f). In addition, for the purpose of this report, the Open Space Areas Cores and Linkages (Cores and Linkages) for existing and proposed Cores and Linkages (MSHCP Section 3.2.3, *Cores and Linkages within the MSHCP Conservation Area*) were reviewed.

4.2 Field Survey Methods

This section describes the field survey methods used by UltraSystems within the BSA. An UltraSystems biologist visited the BSA to conduct the following reconnaissance-level and focused biological surveys:

- Habitat and Land Cover Type Assessment
- General plant survey
- General wildlife survey
- Burrowing Owl Habitat Assessment
- Riparian/Riverine/Vernal Pools and Fairy Shrimp Habitat Assessment
- Jurisdictional Assessment
- Wildlife Movement Evaluation

The purpose of the survey was to evaluate the initial results of the literature review and to collect additional data on existing site conditions. The field survey was performed by UltraSystems biologists Mr. Matthew Sutton and Ms. Audrey McNamara on September 21, 2021. Several additional surveys were conducted for other purposes and are discussed below.

The general biological surveys covered all accessible areas of the BSA, including all areas that would be impacted by the project. The surveys were conducted during the daytime on foot by walking

slowly and methodically across each area. Biologists used binoculars from strategic vantage points to survey areas of private property with no access rights.

Biologists used topographic and aerial maps to help them navigate in the field and used pertinent regional flora and fauna field guides during the field surveys to identify and record special-status species and to assist identifying habitats and physical features. The biologists also used Global Positioning System (GPS) units, GIS, and other survey-related techniques, hardware and software to collect data and to populate any attributes required by the relevant agencies. Digital color photographs were taken during the field surveys to record site conditions at the time of the surveys. The methods for each type of biological survey are described in the following sections.

Field surveys were conducted as described in **Table 4.2-1**.

Table 4.2-1
FIELD SURVEY INFORMATION

Survey Date	Survey Time	Temperature	Weather	Surveyors	Survey Conducted
September 21, 2021	7:05 a.m. – 10:00 a.m.	64-89°F	0% cc	MT & AM	Habitat Assessment (including plants, wildlife, and jurisdictional assessment); BUOW Habitat
October 14, 2021	10:00 a.m. – 12:30 p.m.	70-76°F	0% cc	MT & MS	Jurisdictional Delineation Survey
December 10, 2021	10:00 a.m. – 12:30 p.m.	n/a	n/a	MS	Mapping of additional potential fairy shrimp habitat; Ponds/Basins; Wildlife & Plant Survey
December 15, 2021	10:05 a.m. – 10:45 a.m.	n/a	n/a	MS	Ponding Check; Wildlife & Plant Survey
December 21, 2021	10:00 a.m. – 2:30 p.m.	62-64°F	100% cc	PL	Wet Season Brachiopod Survey
December 22, 2021	8:00 a.m. – 5:30 p.m.	n/a	n/a	MS	Mapping of Ponds/Basins; Wildlife & Plant Survey
December 28, 2021	9:00 a.m. – 1:40 p.m.	62-64°F	100% cc	PL	Wet Season Brachiopod Survey
January 4, 2022	9:40 a.m. – 2:30 a.m.	58-62°F	5% cc	PL	Wet Season Brachiopod Survey
January 11, 2022	9:30 a.m. – 1:45 p.m.	65-73°F	30% cc	PL	Wet Season Brachiopod Survey
January 18, 2022	10:00 a.m. – 2:00 p.m.	65-73°F	60% cc	PL	Wet Season Brachiopod Survey
January 24, 2022	9:00 a.m. – 12:00 p.m.	64-69°F	0% cc	MS	Wet Season Brachiopod Survey
January 30, 2021	1:00 p.m. – 2:00 p.m.	70°F	0% cc	MS	Ponding Check; Wildlife & Plant Survey
January 31, 2022	9:30 a.m. – 12:00 p.m.	62-64°F	90% cc	PL ¹	Wet Season Brachiopod Survey
February 6, 2022	3:00 p.m. – 3:30 p.m.	76°F	0% cc	MS	Ponding Check: Wildlife & Plant Survey

Survey Date	Survey Time	Temperature	Weather	Surveyors	Survey Conducted
February 16, 2022	10:30 a.m. – 12:30 p.m.	54°F	0% cc	MS	Ponding Check; Wildlife & Plant Survey
March 10, 2022	10:00 a.m. – 10:30 a.m.	n/a	n/a	AC	Ponding Check
April 4, 2022	5:00 a.m. – 5:30 a.m.	74°F	25% cc	MS	Ponding Check
April 5, 2022	10:00 – 2:30 p.m.	73-8°F	0-10% cc	PL	Wet Season Brachiopod Survey
April 11, 2022	11:30 a.m. – 3:00 p.m.	62-66°F	100% cc	PL	Wet Season Brachiopod Survey
April 18, 2022	9:40 a.m. – 12:30 p.m.	65-74°F	10% cc	PL	Wet Season Brachiopod Survey
April 24, 2022	2:30 p.m. – 3:00 p.m.	82°F	0% cc	PL	Wet Season Brachiopod Survey
April 29, 2022	3:00 p.m. – 3:45 p.m.	78°F	0% cc	MS	Ponding Check; Wildlife & Plant Survey
June 29, 2022	Not recorded	Not recorded	Not recorded	PL	Dry Season Branchiopod Survey
Notes					

MT = Michelle Tollett; MS = Matthew Sutton; AM = Audrey McNamara; PL = Paul Lemon (Dudek); AC = Allison Carver; cc = cloud cover

1. The wet season fairy shrimp surveys were conducted by Dudek biologist Paul Lemons (TE051248-6) between December 21, 2021, and April 24, 2022.
2. The dry season fairy shrimp surveys were conducted on June 29, 2022 by Dudek biologist Paul Lemons (TE051248-6).

4.2.1 Habitat Assessment and Land Cover Type Mapping

During the September 21, 2021 survey, biologists characterized existing habitat and searched for the presence of sensitive plant communities. The purpose of this habitat assessment was to identify and map habitat areas and land cover types, and to ascertain if the existing site conditions could be suitable for special-status plant and wildlife species.

The plant communities observed by the biologists were marked on a color aerial map and with the use of a GPS unit. Descriptions of vegetation types and habitats within the biological survey areas were based on the dominant perennial species. Generally, classifications of habitat types or vegetation communities were based on Holland's *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986) and *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009) with modifications to better represent existing site conditions. The classifications were then checked against CDFW's *California Natural Community List* (CDFW, 2022d).

Topography, soil characteristics, substrates, disturbed, and developed areas were also components of the habitat assessment to help search for special-status plants and wildlife species. Following the field mapping, UltraSystems GIS staff took the habitat boundaries from the aerial map and/or downloaded the data from the GPS unit and digitized the boundaries into an ArcGIS file. Once the boundaries were in the ArcGIS, the acreage of each land cover present within the BSA was then calculated.

4.2.2 General Plant Survey

Prior to the field surveys, biologists researched information on the blooming periods and habitat preferences for the special-status plants determined to have potential to occur within the BSA based on the distribution and elevation range. Biologists then surveyed the BSA for existing habitat, vegetation, and the presence of special-status plant species which was conducted concurrently with other field surveys. Special attention was noted to habitat areas that appeared to provide suitable habitat for special-status plant species. Plant species were identified using plant field guides and taxonomical guides, such as *The Jepson Manual: Vascular Plants of California*, second edition (Baldwin et al., 2012). All identifiable plant species encountered during the field surveys were recorded in field notes. Refer to **Table 5.0-1** for information regarding the dates and conditions of the various general plant surveys.

After the field surveys and mapping of the plant communities within the BSA were complete, an additional evaluation was conducted in the office for each special-status plant species in the plant inventory. The evaluation considered whether the BSA contained suitable habitats and soils to support those special-status plant species. A species was determined to have “no potential to occur” or be “absent” within the BSA if the existing habitats and/or soils on the BSA were clearly absent or clearly unsuitable to support the species. For example, plant species that are only found within sand dunes, desert scrub, and conifer forests, would be determined to have no potential to occur because those habitats are clearly absent from the BSA. In addition, plant species that are only known to grow within highly alkaline or highly acidic soils would be determined to have no potential to occur because those soils are absent from the BSA. Those special-status plant species determined to be absent or have no potential to occur within the BSA, and therefore would not be impacted were eliminated from further evaluation and are not discussed further in this report. The occurrence potential analysis can be found in **Appendix C** *Special-Status Species Occurrence Potential Determination*.

4.2.3 General Wildlife Survey

Prior to the start of field surveys, biologists researched information on the natural history and habitat preferences for the special-status wildlife determined to have some potential to occur within the BSA based on distribution and elevation range. The location of the BSA is within the general distributional range of several special-status vertebrate species; however, most of the special-status terrestrial wildlife species that could occur within the BSA are not subject to specific published survey protocols.

Biologists surveyed the BSA for common wildlife and the presence of special-status wildlife species which ran concurrently with the other field surveys. The purpose of the wildlife surveys was to record those species observed, ascertain general site conditions, and identify habitat areas that could be suitable for special-status wildlife species.

All wildlife species encountered visually or audibly during the field surveys were identified and recorded in field notes. Refer to **Table 5.0-1** for information regarding the dates and conditions of the various general wildlife surveys. Biologists recorded signs of wildlife including animal tracks, burrows, dens, nests, nest sites, scat, and remains. Biologists also surveyed areas that could potentially serve as roosting habitat and/or hibernacula for bat species. Binoculars and wildlife field guides were used to aid in identifying observed wildlife. During the general wildlife survey, no fossorial mammals such as California ground squirrels were observed on the project site, however some small mammal burrows were observed near the debris pile in the south east corner of the project site and also along the eastern side.

After the field surveys and mapping of the plant communities within the BSA were complete, an additional evaluation was conducted in the office for each special-status wildlife species in the wildlife inventory. The evaluation considered whether the BSA contained suitable habitat to support those special-status wildlife species. A species was determined to have “no potential to occur” within the BSA if suitable and adequate biological and physical features that are needed to support the wildlife species are clearly absent from the BSA. Those special-status wildlife species determined to have no potential to occur within the BSA, and therefore would not be impacted, were eliminated from further evaluation and are not discussed further in this report. The occurrence potential analysis can be found in **Appendix C** *Special-Status Species Occurrence Potential Determination*.

4.2.4 Burrowing Owl Habitat Assessment

Prior to conducting the BUOW habitat assessment, biologists conducted a literature search and reviewed the results of a search of the CNDDDB (CNDDDB, 2022a) within a 10-mile radius of the project site to determine recorded observations of BUOW on and adjacent to the BSA. The habitat assessment is to address, at a minimum, the potential of the BSA to support suitable habitat for BUOW.

The burrowing owl habitat assessment was conducted on September 21, 2021 by UltraSystems biologists, Mr. Matthew Sutton and Ms. Audrey McNamara. Natural history, ecology, behavior, and field identification and its sign were reviewed prior to conducting the survey. The survey was conducted during a non-breeding season, as BUOW breeding season occurs between March 1 and August 31. The assessment was conducted in accordance with the *Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area* (RCTLMA, 2006) as recommended by the MSHCP.

4.2.5 Riparian/Riverine/Vernal Pools and Fairy Shrimp Habitat Assessment

The MSHCP survey requirements for the project site include an assessment of potential riparian/riverine, vernal pool and fairy shrimp habitats. MSHCP Section 6.1.2, *Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*, describes the process through which protection of riparian/riverine areas, vernal pools, and fairy shrimp species will occur within the MSHCP area. Protection of these resources is important for a number of conservation objectives. Riparian/riverine/vernal pools must be avoided or an assessment of a project’s potentially significant effects on riparian/riverine areas, vernal pools, and fairy shrimp habitat will be required. Additional MSHCP objectives reviewed for consistency during the survey included Section 6.1.2 Riparian/Riverine Areas and Vernal Pools. Guidelines for determining whether these resources exist on site are described as follows.

Riparian/Riverine Areas

Riparian/riverine areas include “lands which contain habitat dominated by trees, shrubs, persistent emergents, or emergent mosses and lichens which occur close to or which depend upon soil moisture from a nearby fresh water source or areas with fresh water flow during all or a portion of the year.” Riparian/riverine areas under the MSHCP also include drainage areas that are vegetated or have upland (non-riparian/riverine) vegetation that drain directly into an area described for conservation under the MSHCP (or areas already conserved). Riparian/riverine areas must be mapped and assessed for the potential to support riparian conservation species.

Vernal Pools

Vernal pools are described in the USACE Arid West Supplement (2008); vernal pools are also described by the MSHCP as “seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season.” The BSA was assessed for areas meeting this definition during the habitat assessment. Features that were potentially vernal pools were observed during the habitat assessment, and a follow-up survey was scheduled.

During the literature review, limited evidence of jurisdictional waters or wetlands were identified within the BSA. However, no previously mapped NWI wetlands, or other jurisdictional areas including streams, drainages, wetlands, riparian/riverine or vernal pools, were evident within the BSA (**Appendix A**, Figure 7, *USGS Surface Waters and Watersheds*). In particular, the project site is not located within the Western Riverside County Vernal Pool Region as reported in the *California Vernal Pool Assessment Preliminary Report* (Keeler-Wolf et al., 1998). That said, a review of aerial imagery indicated the possible occurrence of inundated areas in an eastern area of the project site (1978, 2005, 2014, 2016, 2017, 2018, 2019, 2020, 2021; NETROnline 2022; Google Earth Pro, 2022).

During the reconnaissance level survey on September 21, 2021, two larger depressions with cracked mud on the soil surface were observed on the project site. Vegetation typical of more hydric conditions was also observed within these depressions. A follow-up jurisdictional delineation survey was conducted on October 14, 2021 to determine if these depressions, or any other onsite basins or tire ruts, met the criteria of vernal pools as defined by the Arid West Supplement or the MSHCP. A more detailed description of the methods used during the jurisdictional delineation of the project site, and results of the delineation, is found in **Appendix D**, *Jurisdictional Delineation Report*, and is also reported in **Section 4.2.8** of this BRE. Plants species within and on the edge of the pools were recorded during each visit (see **Appendix E**, *Plant and Wildlife Species Observed During the Surveys*). Plant species observed during the jurisdictional assessment and delineation were recorded on field forms (see **Appendix F** *Field Data Sheets*)

Fairy Shrimp

Fairy shrimp habitat, as described under MSHCP Section 6.1.2, is habitat for Riverside fairy shrimp, vernal pool fairy shrimp, or Santa Rosa Plateau fairy shrimp, and includes ephemeral pools, artificially created habitat, such as tire ruts and stock ponds, and/or other features determined appropriate by a qualified biologist. The BSA was assessed for areas meeting this definition during the habitat assessment. Two depressions (i.e., vernal pools; see previous section and **Appendix D**, *Jurisdictional Delineation Report*) on the project site with ponded water and evidence of live fairy shrimp were identified during a jurisdictional delineation survey conducted on October 14, 2021. Therefore, focused wet-season surveys for the presence or absence of fairy shrimp were conducted between December 21, 2021 and April 24, 2022 by Dudek biologist Paul Lemons; the dry-season survey was conducted on June 29, 2022. Surveys were conducted in accordance with *Survey Guidelines for the Listed Large Branchiopods* (USFWS, 2017).

4.2.6 Large Branchiopod (Including Fairy Shrimp) Focused Surveys

Wet Season Branchiopod (Including Fairy Shrimp) Surveys

The 2021-2022 wet season survey for the presence or absence of listed large vernal pool branchiopods was conducted between December 21, 2021 and April 24, 2022 by Dudek biologist Paul Lemons (TE051248-6). Surveys were conducted in accordance with *the Survey Guidelines for the Listed Large Branchiopods* (USFWS 2017).

The onset of the 2021-2022 wet season survey at the project site began with a significant rain event occurring around December 14, 2021. Within 24 hours after this rain event, the site was visited by UltraSystems Environmental biologist Mathew Sutton on December 15th to confirm pooling. Mapping (using a Trimble GeoXT handheld Global Positioning System (GPS) unit) of inundated features was also conducted by UltraSystems Environmental in January 2022. All protocol-level branchiopod surveys were conducted by permitted biologist Paul Lemons (TE051248-5), and began on December 21, 2021. The protocol states that sampling must be initiated within 7 days of inundation. All suitable habitat features on site that met the USFWS inundation criteria to initiate protocol-level surveys were sampled, and USFWS survey forms were completed.

After initial inundation, all wet features were surveyed at approximate 7 day intervals, according to the survey protocol, until dried up. Features that dried up and then refilled were surveyed within 7 days of refilling and surveys were reinitiated at the approximate 7-day intervals. During the 2021-2022 wet season survey, the project site was visited on 11 occasions. During each site visit, Mr. Lemons evaluated all features to document inundation levels and performed sampling when appropriate. Throughout the 2021-2022 season, daily precipitation was monitored from multiple weather stations across the proposed project alignment, using Weather Underground Inc. 2021-2022).

Protocol-level sampling was performed within all features that were considered potentially suitable for listed vernal pool branchiopods and any basins meeting the USFWS 3-centimeter (1.2-inch) inundation criteria. The location of each feature sampled was recorded using a Global Positioning System (GPS) unit with sub-meter accuracy. GPS data were downloaded into an ArcGIS file by geographic information systems (GIS) specialists at UltraSystems Environmental.

During each survey, Mr. Lemons inspected the individual features for depth, surface area of water, air and water temperature, level of disturbance, and presence of aquatic wildlife. An aquarium dip net was passed through every feature that met the USFWS inundation criteria. All portions of ponded water were surveyed from the bottom to the surface by moving the dip net in a mild zigzag pattern through the feature as directed by the sampling protocol (USFWS 2017). Dip net contents were frequently viewed and discarded of algae, plants, and other debris material when occurring at high concentrations (USFWS 2017). Samples were collected, when needed, using the aquarium net and a 40-milliliter (1.4-ounce) glass vial. Specimens were stored in the vial with water collected where the specimen was found. Specimens were taken to the laboratory within 24 hours of collection and placed in a non-denatured ethyl alcohol (200 proof) solution for preservation. Each specimen was inspected thoroughly using a dissecting microscope and soft-tip forceps. Eriksen and Belk (1999) was used to verify the species of each specimen collected. If any listed vernal pool branchiopods would have been identified during this survey effort, the USFWS would have been notified within 10 days of occupied features as stated in the protocol.

Survey data sheets (provided in the 2017 survey protocol) were completed for every feature that met the minimum USFWS inundation requirement at the time of sampling. All information was hand recorded in the field using the data sheet, with the most pertinent information (e.g., pool feature data, fairy shrimp presence/absence, and species identification) recorded. A summary of the dry season survey results is provided in **Appendix G** *Wet Season Fairy Shrimp Survey Report*.

Dry Season Branchiopod (Including Fairy Shrimp) Surveys

The 2022 dry season survey for the presence or absence of listed large vernal pool branchiopods was conducted on June 29, 2022. Dudek biologist Paul Lemons (TE051248-6) conducted the soil collection according to the Survey Guidelines for the Listed Large Branchiopods (USFWS 2017). Soil samples from a total of 16 features were collected during this 2022 dry season survey effort. Wet season surveys were conducted during the 2021-2022 wet season the same 16 features.

Soil samples collected on June 29, 2022 were submitted to biologist Greg Mason (TE58862A, Alden Environmental, Inc.) on June 30, 2022 for soil sieving and cyst culturing.

Soil samples were collected on June 29, 2022, after several weeks of no recorded precipitation in the Moreno Valley region, therefore soil samples were extremely dry. A hand spade was used to collect each sample. Samples were taken the top 1-3 centimeters of soil within each feature. Where possible, the hand spade was used to pry up intact chunks of sediment. All samples were collected from the lowest topographic areas of each feature. Three of the 16 features measured between 236 and 2300 square meters, therefore 50 samples were collected. Nine of the 16 features measured between 25 and 235 square meters; therefore 25 samples were collected. The remaining four features measured under 25 square meters; therefore 10 samples were collected. A summary of the dry season survey results is provided in **Appendix H**, *Dry Season Fairy Shrimp Survey Report*.

4.2.7 Jurisdictional Delineation Survey

Prior to conducting the onsite field investigation, a review of readily available data relevant to the project was performed and the results were compiled from federal, state, and regional agency websites, databases, and management plans; aerial imagery, USGS topographic maps, National Wetland Inventory (NWI) maps, data from the U.S. Environmental Protection Refer to Table 5.0-1 for information regarding the dates and conditions of the various general plant surveys. Agency's Watershed Assessment, Tracking, & Environmental Results System (WATERS), and Natural Resources Conservation Service (NRCS) soil surveys to determine areas of potential USACE, RWQCB, and CDFW jurisdiction (i.e., waters of the U.S. and State, including wetlands).

On October 14, 2021, UltraSystems biologists Ms. Michelle Tollett and Mr. Matthew Sutton conducted a survey of potentially jurisdictional features within the project site. Wetlands and other waters of the U.S. and State that are located outside of the BSA and not within known or anticipated areas of project-related ground disturbance would not be affected by the project and were therefore, not delineated. Results of the delineation surveys are provided in **Section 5.7**.

Biologists surveyed the project site to determine the location and extent of waters and wetlands subject to jurisdiction of the USACE, RWQCB, CDFW and/or the County of Riverside; however, these agencies make the final determination of jurisdiction in accordance with their regulatory authority. Biologists also noted the surrounding environment, topography, land uses, substrates, and vegetation within and adjacent to each drainage. At each potential jurisdictional area, biologists searched for the presence of wetland hydrology, hydric soils, hydrophytic vegetation, signs of an

OHWB, the presence of a well-defined bed and bank, evidence of recent water flow, and/or areas of scour. All water features identified in the BSA were examined for connectivity, or a lack thereof, to larger drainages. Vegetation along the water features was also identified and any potential indicators of wetland conditions were recorded on data sheets and in field notes (see **Appendix D**, *Jurisdictional Delineation Survey Report*, for details).

Boundaries of potential jurisdictional areas were delineated using a Trimble Geo 7X hand-held GPS unit. Following the field mapping, UltraSystems GIS staff converted the jurisdictional boundaries into an ArcGIS file. Lengths, widths, acreages, and boundaries for each agency's jurisdiction were then calculated in ArcGIS.

4.2.8 Wildlife Movement Evaluation

UltraSystems biologists Mr. Sutton and Ms. McNamara surveyed the project site on September 21, 2021 and evaluated potential wildlife movement within the BSA and immediate vicinity through the literature review, field surveys, and by examining aerial imagery and maps. While in the field, UltraSystems biologists searched for potential natural and man-made travel routes that wildlife would use to traverse the site, such as drainages, canyons, riparian courses, ridgelines, trails, and other linear features. Biologists assumed that wildlife species would use these linear features for travel if they occurred within the site. Biologists also searched for natural and man-made barriers to wildlife movement that may interfere with the movement of some wildlife species. In addition, for the purpose of this report, the Open Space Areas Cores and Linkages (Cores and Linkages) for existing and proposed Cores and Linkages (MSHCP § 3.2.3, *Cores and Linkages within the MSHCP Conservation Area*) were also reviewed.

5.0 RESULTS

This section describes the results of the literature review and the existing conditions within the BSA at the time the biological field survey was conducted (environmental baseline). Photographs of the BSA that were taken during the field survey can be found in **Appendix I, Site Photographs**.

5.1 Environmental Setting

Topography of the project site is generally level with approximate elevations of 1,539 to 1,551 feet above mean sea level. There is a large debris pile located in the south east corner of the project site, consisting of building materials,(concrete and fencing remnants, plywood fragments), branches, trash, and other various materials. A large portion of the project site area, as of September 21, houses trucks and shipping containers.

5.2 Local Climate

Moreno Valley has a mild semi-arid climate with Mediterranean characteristics. During the summer months there is very little precipitation except for infrequent thunderstorms, which typically occur late in the season. Most precipitation falls between November and March. Semi-arid climates tend to support short or scrubby vegetation, with semi-arid areas usually dominated by either grasses or shrubs.

California Irrigation Management System (CIMIS) Station 044, located at the U.S. Riverside Agricultural Experiment Station (approximately 4.6 miles northwest of the project site), has been in operation since June 2, 1985. Between January 1, 1986 and December 31, 2021, this station recorded an average annual precipitation of 0.73-inch; average maximum air temperature for the period of record was 78.12 °F, and average minimum temperature was 52.86 °F (CIMIS 2022).

5.3 Soils

Based on the USDA NRCS Soil Survey, the BSA contains two soil map units which are shown in **Appendix A, Figure 8: USDA Soils**, described in **Appendix J, Soils Report**, and listed in **Table 5.3-1**. None of the soil map units are listed on the National Hydric Soils List as hydric (USDA-NRCS, 2021).

Table 5.3-1
SUMMARY OF SOIL MAPPING UNITS

Name	Symbol	Hydric Status	Acreage in BSA
Monserate sandy loam, 0 to 5 percent slopes,	MmB	Not hydric	46.0
Monserate sandy loam, 5 to 8 percent slopes, eroded	MmC2	Not hydric	11.5
Total Acreage			57.6

5.4 Land Cover Types

This section describes the land cover types (plant communities and non-vegetated features) determined to be present within the BSA by the literature review and field surveys, and augmented by examining aerial imagery. Two land cover types were observed and mapped within the BSA (See **Table 5.4-1**; and, **Appendix A, Figure 9: Land Cover Types**). Field notes used to identify land cover

types are located in **Appendix F, Field Data Sheets**, and photographs of different land cover types are located in **Appendix I, Site Photographs**. Classifications of the plant communities are based on Holland's *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986), *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009) and the MSHCP (Dudek and Associates, 2003) with modifications to better represent existing site conditions.

Table 5.4-1
ACREAGE OF MAPPED LAND COVER TYPES

Mapped Land Cover	MCV Alliance Name ¹	Holland Classification ²	MSHCP Vegetation Communities Classification ³	Acreage Mapped within the BSA
Vernal pool complex	N/A	N/A	Developed or disturbed land	0.26
Developed/disturbed	Wild oats and annual brome grasslands	Non-native grassland (42200)	Developed or disturbed land	57.40
Total Acreage				57.65
Legend and Notes				

1. MCV Alliances are based on *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009).
2. Holland Classification (and Holland Element Code) are taken from Robert F. Holland's *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986).
3. MSHCP Vegetation Communities Classification is taken from *Section 2.0, Plan Area Description and Setting of the MSHCP* (Dudek and Associates, 2003).

Neither the Developed nor Disturbed lands that are dominant throughout the BSA, or the disturbed vegetation within the vernal pool complex fit the characteristics of sensitive plant communities listed on the CDFW's *California Natural Community List* (CDFW, 2022d). The BSA contains only Developed or Disturbed lands. Characteristics of this land cover type within the BSA are described in detail in the following sections.

5.4.1 Developed/Disturbed Land

The developed/disturbed land cover type is described in Section 2.1.3 of the MSHCP as “*areas that have been disced, cleared, or otherwise altered. Developed lands may include roadways, existing buildings, and structures*” (Dudek and Associates, 2003). Disturbed lands can also contain ornamental plantings as part of landscaping and ruderal vegetation dominated by non-native, weedy species.

On the project site, the developed/disturbed land cover comprises a paved strip in the southwestern area of the project site and natural soils; patches of ruderal vegetation occur in some areas of the project site.

Developed/disturbed lands cover the majority of the onsite areas. The majority of the onsite soils are highly compacted due to frequent movement and long-term parking of large trucks. There is sparse or absent vegetative cover in areas that experience high truck traffic or parking usage, which represents approximately 75 percent of the project site. There are some vegetated patches along the northern and eastern fence lines and in a few other areas where vehicle traffic and parking is less frequent. The vegetated patch along the eastern fence line fits the non-native grassland classification

as described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986) and wild oats and annual brome grasslands alliance as described in *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009). The dominant species within this patch consist primarily of non-native, annual grass and forb species such as slender wild oat (*Avena barbata*), riggut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis*), wall barley (*Hordeum murinum*), redstem filaree (*Erodium cicutarium*), short-podded mustard (*Hirschfeldia incana*), and Russian thistle (*Salsola tragus*). Other vegetated patches within the project site consist of weedy species and do not fit with any classification in either Holland (1986) or Sawyer et al. (2009).

A large debris pile, approximately 35 feet by 50 feet, is located in the southeastern corner of the project site. The debris pile is formed of various building materials, construction waste, and discarded fill soil. There are a number of small rodent burrows scattered around the soils of the debris pile. A variety of weedy plant species such as non-native, annual grasses, Russian thistle, tree tobacco (*Nicotiana glauca*), a pepper tree (*Schinus molle*) sapling, and other weedy species occur on the soils within the debris pile.

Developed/disturbed lands cover the entirety of the offsite areas within the BSA. The developed areas comprise residential, commercial, and industrial properties and structures, flood control drainages, paved surfaces such as sidewalks and roadways, and all other impermeable surfaces that cannot support vegetation. Disturbed areas comprise dirt roads, undeveloped areas, and residential yards with fallow vegetation and ornamental landscaping around buildings and homes. Many of the undeveloped areas receive a lot of vehicle traffic and are sparsely vegetated. The vegetated areas of the undeveloped areas of the BSA primarily consist of non-native annual grass and forb species. Approximately 8.67 acres and 57.40 acres of developed/disturbed lands were mapped within the project site and BSA, respectively.

5.4.2 Vernal Pool Complex

There are two adjacent vernal pools, constituting a vernal pool complex, located on the east side of the project site. Both vernal pools are characterized by depressions in the soil surface relative to adjacent soil surfaces. Both vernal pools become inundated during rain events and the waters persist within the pools for greater than seven days after large rain events. The total area of the vernal pool complex on the project site is 0.26 acre. For a detailed description of the vernal pool complex refer to **Section 5.7** of this report and **Appendix H, Jurisdictional Delineation Report**.

Vegetation at the vernal pool complex is significantly disturbed by truck movement and parking. The majority of the vegetation observed within the vernal pool complex consists of ruderal vegetation, dominated by non-native annual forbs (herb stratum). The plant species with the highest cover in the vernal pools include stinkwort (*Dittrichia graveolens*), hairy leaved sunflower (*Helianthus annuus*; FACU¹), knotweed (*Polygonum aviculare*; FAC²), and nettle leaf goosefoot (*Chenopodium murale*; FACU).

Plants recorded at the vernal pool complex during the wet season site visits include willow dock (*Rumex salicifolius*; FACW³), nut grass (*Cyperus esculentis*; FACW), salt marsh sand-spurry (*Spergularia marina*; FACW), knotweed (*Polygonum aviculare*; FAC), ryegrass (*Festuca perennis*; FACU), clustered tarweed (*Deinandra fasciculata*; FACU), and common sow thistle (*Sonchus*

¹ Facultative Upland

² Facultative

³ Facultative Wetland

oleraceus; UPL⁴. No NWPL-designated obligate (OBL) plant species were observed in the vernal pool complex during the October 14, 2021 jurisdictional delineation survey or the subsequent site visits. A complete list of plants recorded at VP1 and VP2 during the survey and the 2021-2022 wet season site visits is in **Appendix E, Plant and Wildlife Species Observed**.

Plant distribution within the vernal pools varies both spatially and temporally. During the wet season, plant cover is low in the centermost regions of each vernal pool, where the waters are deepest during periods of inundation; whereas, plant cover is higher near the edges of the vernal pools and consist of species that are tolerant of hydric conditions such as nettle leaf goosefoot, lamb's quarters (*Chenopodium album*), tumbleweed (*Amaranthus albus*), clustered tarweed, nut grass, goldentop (*Lamarckia aurea*), and willow dock. During the dry season, plant cover is higher in the centermost areas and consists of species that are tolerant of both upland and hydric conditions such as knotweed (*Polygonum aviculare*), tumbleweed, nettle leaf goosefoot, doveweed (*Croton setiger*), and willow dock; whereas, the edges of the vernal pools consist of thatch of dead annual as well as species more adapted to xeric conditions such as stinkwort, Russian thistle, and hairy leaved sunflower.

The disturbed plant community that occupies the wetland (vernal pool complex) does not fit classifications described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986) or in *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009). Similarly, the plant community within the vernal pool complex does not contain species mentioned in the description of the vernal pool vegetation community in Section 2.1.3 of the MSHCP (Dudek and Associates, 2003). However, the spatial and temporal vegetation distribution within the vernal pools is similar to distribution patterns typical of vernal pools (USFWS, 1998; USFWS, 2005). Although there is a weedy nature of the plant community within the vernal pools, it is distinct from the other vegetated patches that occur on the project site. Thus, the vernal pool complex is represented as a distinct land cover type. This community is not listed as sensitive on the CDFW *Natural Community List* (CDFW, 2022d).

5.5 Plants

5.5.1 Plant Species Observed During the Field Surveys

Fifty-two plant species from fifteen distinct families were observed at the project site. Of the 52 plant species observed, 17 were native and 35 were non-native.

5.5.2 Non-native Plants

Twenty of the documented non-native plant species have a Cal-IPC (California Invasive Plant Council) rating of watch, limited, moderate, or high (Cal-IPC, 2006; see **Table 5.5-1**). These ratings are briefly described below. No federally listed noxious weeds were observed onsite during the field surveys per the USDA Animal and Plant Health Inspection Service (APHIS) Federal Noxious Weed List (USDA, 2010).

Cal-IPC Ratings

The Cal-IPC Invasive Plant Inventory categorizes non-native invasive plants that threaten the state's wildlands. Categorization is based on an assessment of the ecological impacts of each plant. The Inventory represents the best available knowledge of invasive plant experts in the state. However, it

⁴ Upland

has no regulatory authority, and should be used with full understanding of the limitations described below (Cal-IPC, 2022).

High: *These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.*

Moderate: *These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.*

Limited: *These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.*

Watch: *These species have been assessed as posing a high risk of becoming invasive in the future in California.*

Table 5.5-1
RECORDED PLANT SPECIES WITH A CAL-IPC RATING

Scientific Name (=Synonym)	Common Name (=Synonym)	Cal-IPC Rating
<i>Oncosiphon pilulifer</i>	stinknet	high
<i>Dittrichia graveolens</i>	stinkwort	moderate
<i>Brassica nigra</i>	black mustard	moderate
<i>Centaurea melitensis</i>	tocalote	moderate
<i>Bromus diandrus</i>	ripgut grass	moderate
<i>Pennisetum setaceum</i>	fountaingrass	moderate
<i>Avena barbata</i>	slender oat	moderate
<i>Nicotiana glauca</i>	tree tobacco	moderate
<i>Rumex crispus</i>	curly dock	limited
<i>Salsola tragus</i>	Russian thistle	limited
<i>Schinus molle</i>	Peruvian pepper tree	limited

5.5.3 Special-Status Plants with Potential to Occur in the BSA

Based on a literature review and query from publicly available databases (USFWS, 2022b, d; CNDDDB 2022a) for reported occurrences within a ten-mile radius of the project site, there were 12 listed and 19 sensitive plant species identified by one of the following means: reported in the IPaC or CNDDDB databases, recognized as occurring based on previous surveys or knowledge of the area, or observed during the habitat assessment survey; the collective list of species identified from these resources is named the plant inventory in this report. Of the 31 total special-status species in the plant inventory, it was determined that two listed and four sensitive species have a low potential to occur in the BSA. Because there was a vernal pool complex identified on the project site, several plant surveys were conducted (see **Table 4.2-1**) to determine if the three listed and three sensitive plant species within the plant inventory that are associated with vernal pools occur onsite; none of those species were detected during any of the surveys, and thus are not anticipated to occur onsite (see **Table 5.5-2**). The remaining 19 special-status plant species in the plant inventory either have no potential to occur or are not expected to occur in the BSA.

Plant nomenclature is based on the CNPS and plant taxonomic order is based on *The Jepson Manual: Vascular Plants of California*, second edition (Baldwin et al., 2012). The table describes each species' status and describes each species' requirements and preferred habitat. **Appendix C Special-Status Species Occurrence Potential Determination** also summarizes conclusions from the literature review and a field survey regarding the potential occurrence of special-status plant species within the BSA. Note, the detection of suitable habitat does not indicate presence or absence of a species.

Based on an analysis of the biological, physical and environmental conditions necessary for each special-status plant species identified in the plant inventory, 19 species have no potential to occur or are not expected to occur within the BSA because the BSA lacks suitable habitat and/or is outside of the geographic and elevation ranges of these species (Calflora, 2022; CNDDDB, 2022a, b, e; CNPS, 2022a, b; Google Earth Pro, 2022; Jepson, 2022; Sawyer et al., 2009; Soil Survey Staff, 2022; USDA-NRCS, 2022; USEPA, 2022; USFWS, 2022b, c, d). Refer to **Appendix C Special-Status Species Occurrence Potential Determination** for a list of these species and the descriptions of their respective status rankings.

Prior to the field surveys, the biologists assessed the probability of occurrence rather than make a definitive conclusion about plant species presence or absence. Population numbers and failure to detect the presence of a plant species are not definitive and vary from year to year. This may be due to variable effects associated with wild fires, drought, rainfall patterns, temperatures, and/or season.

5.5.4 Listed Endangered, Threatened, Candidate, and State Rare Plants

No listed plants, including the plants in the plant inventory, were observed within the BSA during the general biological survey. One site visit was performed, and no listed species were observed during the survey. The literature review and field survey concluded that the five listed plant species in the plant inventory only have a low potential to occur within the BSA (see **Appendix C** *Special-Status Species Occurrence Potential Determination*) because the BSA only provides low-quality habitat value for these species due to a lack of suitable habitats, soils, and/or other factors to support them. Therefore, listed species were determined absent from the BSA and no mitigation is required.

5.5.5 Sensitive Plants

No sensitive plants, including the plants in the plant inventory, were observed within the BSA during the survey. One site visit was performed and no sensitive plant species were observed during the survey. In addition, the literature review and field surveys concluded that six sensitive plant species in only have a low potential to occur within the BSA (see **Appendix C** *Special-Status Species Occurrence Potential Determination*) because the BSA only provides low-quality suitable habitat value for these species due to a lack of suitable habitats, soils, and/or other factors to support them; therefore, these species were determined absent from the BSA and no mitigation is required.

**Table 5.5-2
SPECIAL-STATUS VERNAL POOL PLANT SPECIES WITH A POTENTIAL TO OCCUR IN THE BSA**

Scientific Name (=Synonym)	Common Name (=Synonym)	Status	General Habitat Description in California	Plant Elevation Range (feet amsl)	BSA Contains Potential Suitable Habitats	BSA is Located Within the Plant Species' Known:		Potential For Occurrence in the BSA
						Elevation Range	General Distribution	
Listed Endangered, Threatened, Candidate and State Rare Plants: Plants with official status under the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), and/or the Native Plant Protection Act (NPPA). A species may have other sensitive designations in addition to their federal or state listing.								
<i>Atriplex coronata</i> var. <i>notatior</i>	San Jacinto Valley crownscale	FE, CRPR: 1B.1, WRCMSHCP: Covered (a, d)	Lifeform: annual herb Habitats: floodplains (seasonal wetlands) on moist, alkaline soils dominated by alkali chenopod scrub, alkali playas, vernal pools, and, to a lesser extent, alkali grasslands Soils: alkaline soils Bloom Period: April to August	456 - 1,640	Yes	Yes	Yes	Not detected during 2021-2022 focused surveys. The vernal pools on the project site have the potential to provide suitable habitat to support this species, however this species was not observed during surveys.
<i>Navarretia fossalis</i>	spreading navarretia (=Moran's nosegay)	FT, CRPR: 1B.1, WRCMSHCP: Covered (a, b)	Lifeform: annual herb Habitats: vernal pools and depressions and ditches in areas that once supported vernal pools, in alkaline or saline scrubs (chenopod scrub) and playas, shallow freshwater marshes and swamps Soils: saline-alkaline soils Wetlands, Drainages, or Seeps: Yes Bloom Period: April to June	98 - 2,148	Yes	Yes	Yes	Not detected during 2021-2022 focused surveys. The vernal pools on the project site have the potential to provide suitable habitat to support this species, however this species was not observed during surveys.
<i>Brodiaea filifolia</i>	thread-leaved brodiaea (=threadleaf clusterlily)	FT, SE, CRPR: 1B.1, WRCMSHCP: Covered (a, d)	Lifeform: perennial bulbiferous herb Habitats: gentle hillsides, valleys, and floodplains in semi-alkaline mudflats, vernal pools, mesic southern needlegrass grasslands, mixed native-nonnative grasslands and alkali grasslands plant communities Soils: clay to fine sand Bloom Period: March to June	82 - 3,674	Yes	Yes	Yes	Not detected during 2021-2022 focused surveys. The vernal pools on the project site have the potential to provide suitable habitat to support this species, however this species was not observed during surveys.
Sensitive Plants: These plants have no official status under the ESA, the CESA, and/or the NPPA; however, they are designated as sensitive or locally important by federal agencies, state agencies, and/or local conservation agencies and organizations.								
<i>Symphyotrichum defoliatum</i> (=Aster bernardinus)	San Bernardino aster	CRPR: 1B.2	Lifeform: perennial rhizomatous herb Habitats: cismontane woodlands, coastal scrub, lower montane coniferous forests, meadows and seeps, marshes and swamps, and vernal mesic valley and foothill grasslands Soils: moist fine alluvial soils Wetlands, Drainages, or Seeps: Yes Bloom Period: July to November	7 - 6,691	Yes	Yes	Yes	Not detected during 2021-2022 focused surveys. The vernal pools on the project site have the potential to provide suitable habitat to support this species, however this species was not observed during surveys.
<i>Chorizanthe polygonoides</i> var. <i>longispina</i>	long-spined spineflower (=knotweed spineflower)	CRPR: 1B.2, WRCMSHCP: Covered	Lifeform: annual herb Habitats: vernal pools, meadows and seeps, valley and foothill grasslands, and openings in coastal scrub, and chaparral Soils: heavy, often rocky, clay soils Wetlands, Drainages, or Seeps: Yes Bloom Period: April to July	98 - 5,018	Yes	Yes	Yes	Not detected during 2021-2022 focused surveys. The vernal pools on the project site have the potential to provide suitable habitat to support this species, however this species was not observed during surveys.
<i>Atriplex serenana</i> var. <i>davidsonii</i>	Davidson's saltscale (=Davidson's saltbush, bractscale)	CRPR: 1B.2, WRCMSHCP: Covered (a, d)	Lifeform: annual herb Habitats: coastal bluff scrub and coastal scrub, alkali vernal pools, alkali annual grasslands, alkali playa, and alkali scrub components of alkali vernal plains Bloom Period: April to October	33 - 656	Yes	No	Yes	Not detected during 2021-2022 focused surveys. The vernal pools on the project site have the potential to provide suitable habitat to support this species, however this species was not observed during surveys.
Legend and Notes								

Scientific Name (=Synonym)	Common Name (=Synonym)	Status	General Habitat Description in California	Plant Elevation Range (feet amsl)	BSA Contains Potential Suitable Habitats	BSA is Located Within the Plant Species' Known:		Potential For Occurrence in the BSA
						Elevation Range	General Distribution	
<p><u>Federal Endangered Species Act (ESA) Listing Codes:</u> the ESA is administered by the USFWS and NMFS. The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments. The official federal listing of Endangered and Threatened plants is published in 50 CFR § 17.12.</p> <ul style="list-style-type: none"> • FE = federally listed as endangered: any species of plant or animal that is in danger of extinction throughout all or a significant portion of their range. • FT = federally listed as threatened: any species of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future. <p><u>California Endangered Species Act (CESA) and California Native Plant Protection Act (NPPA) Listing Codes:</u> the CESA and NPPA are administered by CDFW. The official listing of Plants of California Declared to Be Endangered, Threatened or Rare is contained in the California Code of Regulations, Title 14, § 670.2. Species, subspecies and varieties of California native plants are declared to be endangered, threatened as defined by § 2062 and § 2067 of the Fish and Game Code or rare as defined by § 1901 of the Fish and Game Code.</p> <ul style="list-style-type: none"> • SE = state-listed as endangered: "endangered species" means a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease (Fish and Game Code § 2062). <p><u>California Rare Plant Ranks</u> (Formerly known as CNPS Lists): the CNPS is a statewide, nonprofit organization that maintains, with CDFW, an Inventory of Rare and Endangered Plants of California. In the spring of 2011, CNPS and CDFW officially changed the name "CNPS List" or "CNPS Ranks" to "California Rare Plant Rank" (or CRPR). This was done to reduce confusion over the fact that CNPS and CDFW jointly manage the Rare Plant Status Review Groups and the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.</p> <ul style="list-style-type: none"> • CRPR 1B = California Rare Plant Rank 1B - plants rare, threatened, or endangered in California and elsewhere: plants with a CRPR of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. All of the plants constituting CRPR 1B meet the definitions of § 2062 and § 2067 (CESA) of the Fish and Game Code, and are eligible for state listing. It is mandatory that they be fully considered during preparation of environmental documents relating to CEQA. <p><u>California Native Plant Society (CNPS) Threat Ranks:</u> The CNPS Threat Rank is an extension added onto the California Rare Plant Rank (CRPR) (as a decimal code) and designates the level of threats by a 1 to 3 ranking with 1 being the most threatened and 3 being the least threatened. A Threat Rank is present for all CRPR 1B's, 2B's, 4's, and the majority of CRPR 3's. CRPR 4 plants are seldom assigned a Threat Rank of .1, as they generally have large enough populations to not have significant threats to their continued existence in California; however, certain conditions exist to make the plant a species of concern and hence be assigned a CRPR. In addition, all CRPR 1A and 2A (presumed extirpated in California), and some CRPR 3 (need more information) plants, which lack threat information, do not have a Threat Rank extension. • .1 = seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat) • .2 = moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) • .3 = not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)</p> <p><u>Western Riverside County Multiple Species Habitat Conservation Plan (WRCMSHCP):</u> The WRCMSHCP provides regulatory coverage for a total of 146 individual species. Under the WRCMSHCP, regulatory coverage means that future incidental take of these species would be permitted for new development and that no additional mitigation under the CESA or ESA would be required over the mitigation provided for by the plan. The following species are identified as "Covered Species" by the WRCMSHCP and the Implementing Agreement. The WRCMSHCP permits would provide take authorization for Covered Species. • WRCMSHCP: Covered: no further surveys are required. • WRCMSHCP: Covered (a): surveys may be required for these species as part of wetlands mapping (Section 6.1.2 of WRCMSHCP). • WRCMSHCP: Covered (b): surveys may be required for these species within Narrow Endemic Plant Species survey area (Section 6.1.3 of WRCMSHCP). • WRCMSHCP: Covered (d): surveys may be required for these species within Criteria Area as (Section 6.3.2 of WRCMSHCP).</p> <p><u>Other:</u></p> <ul style="list-style-type: none"> • Annual: grows from seed and reproduce within a single year. • Perennial: lives more than one year. • Mesic habitat: a habitat with a moderate or well-balanced supply of moisture. • Herbs: plants that are herbaceous and lack above-ground woody tissue. <ul style="list-style-type: none"> o Bulbiferous herb: plants that have fleshy underground storage organs typically derived from scale leaves (this category includes cormiferous and other similar plants in which storage organs have other origins). o Rhizomatous herb: plants that have underground stems (rhizomes), typically bearing shoots which develop into new plants. 								

Scientific Name (=Synonym)	Common Name (=Synonym)	Status	General Habitat Description in California	Plant Elevation Range (feet amsl)	BSA Contains Potential Suitable Habitats	BSA is Located Within the Plant Species' Known:		Potential For Occurrence in the BSA
						Elevation Range	General Distribution	

Notes:

The project site contains approximate elevations of 1,539 to 1,551 feet above mean sea level (amsl).

- **Low potential to occur**= the BSA is located within the wildlife species' known distribution, elevation range, and/or the BSA contains low-quality suitable habitats or conditions to support the species. The plant species has a low potential to occur within the BSA.
- **Moderate potential to occur** = the BSA is located within the plant species' known distribution, elevation range, and/or the BSA contains moderate-quality suitable habitats or conditions to support the species. The plant species has a moderate potential to occur within the BSA.
- **No potential to occur** = the BSA is not located within the plant species' known distribution, elevation range, and/or the BSA contains no suitable habitats or conditions to support the species. The plant species has no potential to occur within the BSA.
- **Not expected to occur:** the BSA is located within the plant species' known distribution, elevation range, and may contain some suitable habitat. Therefore, it is possible that the species could occur, however the species is not expected to occur due to other factors or a combination of factors
- **Not detected during 2021-2022 focused surveys**= A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. A CNPS elevation range is provided for each taxon in feet. The stated range is for the California portion of a plant's range only (if the taxon also occurs outside the state). These CNPS elevation range data are accumulated from literature, herbarium specimens, and field survey information.

Resources

- *The Jepson Desert Manual (Baldwin et al., 2002);*
- *The Jepson Manual: Vascular Plants of California, second edition (Baldwin et al., 2012);*
- *The Status of Rare, Threatened, and Endangered Plants and Animals of California, 2000–2004 (CDFG, 2005);*
- *CNDDB;*
- *Special Vascular Plants, Bryophytes, and Lichens List (CNDDB, 2022e);*
- *State and Federally Listed Endangered, Threatened, and Rare Plants of California (CNDDB, 2022b);*
- *(CNPS website);*
- *(eFloras.org website);*
- *(NatureServe Explorer website);*
- *UltraSystems in-house records.*

5.6 Wildlife

This section describes the wildlife observed and/or detected during the field surveys and the special-status wildlife that have a potential to occur within the BSA as determined by the literature review and field surveys.

5.6.1 Wildlife Species Observed and/or Detected During the Field Surveys

The BSA does not support a diverse assemblage of wildlife. During the field surveys, eighteen bird, one reptile, one invertebrate, and two mammal species were recorded within the BSA. Nomenclature throughout this BRE is based on the following sources: 1) The American Ornithologists Union's (AOU's) *AOU Check-list of North American Birds. 7th Edition* (AOU, 1998) for bird species, and, 2) CDFW's *Life History Accounts* for species other than birds (CDFW, 2022f). One sensitive bird species, California horned lark (*Eromophila alpestris actia*) was observed during one of the surveys. A list of wildlife species recorded within the BSA during the field surveys is provided in **Appendix E, Plant and Wildlife Species Observed**. Wildlife survey limitations include:

- The biological field surveys were conducted during the daytime to maximize the detection of most wildlife. Birds represent the largest component of the fauna observed because most birds are active in the daytime. In contrast, daytime surveys usually result in few observations of mammals, many of which may only be active at night. Many mammal species may also have been underrepresented due to lack of nocturnal survey visits.
- Many wildlife species are wide-ranging, transient, migratory, and would be expected to occur seasonally at a particular location; therefore, many taxa may not have been present at the time of surveys.
- Many species of amphibians, reptiles, and mammals are secretive and may require focused surveys with specialized equipment for capture and release (e.g., mist netting, box traps, or pitfall traps) which were not included in the scope of work for this project.
- A survey is a “snapshot in time”; therefore, true baseline surveys require high-frequency, repeated visits over several years to best characterize wildlife use at a location.

Wildlife depend upon a variety of vegetation communities (habitats) for survival. Most wildlife species are inextricably linked to certain habitats that form the basis for shelter, food, and reproductive opportunities. All wildlife depends upon land and vegetation for nesting and denning sites, escape and movement cover, and protection from adverse weather. Some taxa are habitat specific or “obligate species” which require a narrow array of vegetation communities for all their survival requirements. Others move freely between different plant communities to obtain all their survival needs. In general, complex habitats with varying strata (vertical vegetation layers), greater horizontal interspersions (lateral habitat zonation) and greater plant species assemblage provide higher value wildlife habitat than less complex vegetation communities. More complex communities have more niches for wildlife and usually support more animal species than less complex communities.

Although less complex communities support wildlife species that are more adaptable, those few species may occur in greater numbers than would be expected in a more diverse habitat. In other words, urban areas support high numbers of urban-adapted species.

5.6.2 Large Branchiopod (Including Fairy Shrimp) Focused Survey Results

Wet Season Branchiopod (Including Fairy Shrimp) Survey Results

Suitable and potentially suitable ephemeral wet/ponded features for vernal pool branchiopods were identified on-site and includes Vernal Pool – East (VP1) and Vernal Pool – West (VP2), as well as 14 additional puddles or road rut (manmade) depressions, lacking vegetation (aside from algae when inundated), scattered throughout the site. A total of 16 features (basins plus vernal pools) were identified as suitable habitat for vernal pool branchiopods and were surveyed during the 2021-2022 wet survey season (see **Appendix A**, Figure 10, *Jurisdictional Impact Areas*). These 16 basins had not been previously surveyed.

The basins within the study area are distributed evenly across the topographically flat lot. Fourteen (14) of the basins onsite are considered road ruts or puddles. Road ruts are depressions that are typically formed by vehicular traffic within or immediately adjacent to roadways, generally lack aquatic vegetation, and are heavily disturbed by vehicular traffic, and are moderately to highly disturbed (i.e., parked vehicles, trailers, tire tracks, trash). Puddles are simply topographically low areas where water collects and pools. Two basins (VP1 and VP2) meet the USACE criteria for vernal pools (see **Appendix D**, *Jurisdictional Delineation Report*). Vernal pools are depressions that retain sufficient water level, support vernal pool indicator plant species, and support aquatic invertebrates. Vernal pool branchiopods were detected within both VP east and VP west during the 2021-2022 wet season surveys.

No federally listed large branchiopod species were identified during the 2021/22 wet season survey effort. During the 11 survey sampling visits, 12 basins (VP1, VP2, Basin 1, and Basins 6 through 14) of the 16 total basins were found to be occupied by versatile fairy shrimp (*Branchinecta lindahli*), which is discussed below. (see **Appendix A**, Figure 10, *Jurisdictional Impact Areas*). Details of the wet season survey results are provided in **Appendix K** *Wet Season Survey Report*.

Versatile fairy shrimp

Versatile fairy shrimp inhabit vernal pools of California that exhibit a wide range of conditions including playas, arid grassland and swale pools, small water-filled gas pockets in old lava flows, and depressions. This species may also occur in disturbed settings such as areas that have undergone frequent vehicle use, recreation or various human uses, excavation, and other disturbances which could create vernal conditions. In general, this species typically finds arid regions to be more favorable. In addition, this species is fairly tolerant of a range of physical conditions and water chemistry. Eggs of this species typically hatch at cold to cool water temperatures; this species typically occurs in vernal pools from mid-December to mid-May in California. Most pools in which this species occurs typically last between 5-30 days, succumbing when the pool dries up (Eriksen and Belk, 1999; Maynard, 1977).

The wet season fairy shrimp focused survey report is attached as **Appendix G** *Wet Season Fairy Shrimp Survey Report*.

Dry Season Branchiopod (Including Fairy Shrimp) Survey Results

Suitable and potentially suitable habitat (i.e., ephemeral wet/ponded features) for vernal pool branchiopods was identified on site and includes features VP1 and VP2, as well as 14 additional puddles or road rut (man-made) depressions, lacking vegetation (aside from algae when inundated),

scattered throughout the site. This survey identified the eggs of only the versatile fairy shrimp (in one instance, an egg was identified only as *Branchinecta* sp.) in the dry season soils samples.

Details of the dry season survey is presented in **Appendix G** *Dry Season Survey Report* of this report.

5.6.3 Special-Status Wildlife with a Potential to Occur in the Biological Study Area

Based on a literature review and query from publicly available databases (USFWS 2022a, b, CNDDDB 2022a) for reported occurrences within a ten-mile radius of the project site, there were 21 listed and 45 sensitive wildlife species identified by one of the following means: reported in the search, recognized as occurring based on previous surveys or knowledge of the area, or observed during the habitat assessment survey, the collective list of species identified from these resources is named the wildlife inventory in this report. Of those 66 total species, one wildlife species was determined to have a moderate potential to occur, and 3 listed and 11 sensitive wildlife species were determined to have at least a low potential to occur in the BSA. One special-status wildlife species was observed during the field survey. Because there was a vernal pool complex identified on the project site, focused branchiopod (including fairy shrimp) surveys were conducted to determine if the three listed and two sensitive fairy shrimp species within the wildlife inventory occur onsite; none of those species were detected during any of the surveys and thus are not anticipated to occur onsite (see **Table 5.6-1**). It was determined that 45 of the special-status wildlife species in the wildlife inventory have no potential to occur or are not expected to occur within the BSA and are not discussed further in this BRE. The potential to occur analysis for all species in the wildlife inventory is provided in **Appendix C** *Special-Status Species Occurrence Potential Determination*.

Even with field surveys, wildlife biologists assessed probability of occurrence rather than making definitive conclusions about species presence or absence. Failure to detect the species is not definitive, and may be due to variable effects associated with migration, weather, fire, and/or time of day and year

5.6.4 BUOW - Habitat Assessment

The area of the BSA that is east of the project site boundary falls within a BUOW survey area, and therefore a habitat assessment for BUOW was required. As part of a reconnaissance level survey and habitat assessment, the potential for BUOW to occur on the project site was evaluated. Although the disturbed project site contains primarily non-native grassland, it was determined that the habitat within the BSA is not suitable for BUOW and there is no potential for BUOW to occur for the following three reasons: 1) No fossorial species were observed on the project site, thus making it unlikely that BUOW would establish on the project site; 2) Small burrows associated with fossorial species were infrequently observed on the project site, however they are of inadequate diameter to support BUOW and did not exhibit signs of occupation by BUOW; and, 3) there is a high level of soil compaction throughout the project site due to long-term use (i.e., truck movement and parking), which reduces overall vegetative cover, and thereby reduces the amount of available foraging habitat for BUOW. The project site itself is not within a MSHCP-required BUOW survey area (see **Appendix K**, *RCA MSHCP Information Map Report*).

During the habitat assessment, no BUOWs, BUOW signs, or suitable burrows were observed. Therefore, focused surveys for BUOW are not considered necessary.

5.6.5 Special-Status Wildlife with a Potential to Occur in the Biological Study Area

Based on a literature review and query from publicly available databases (USFWS 2022a, b, CNDDDB 2022a) for reported occurrences within a ten-mile radius of the project site, there were 21 listed and 45 sensitive wildlife species identified by one of the following means: reported in the search, recognized as occurring based on previous surveys or knowledge of the area, or observed during the habitat assessment survey, the collective list of species identified from these resources is named the wildlife inventory in this report. Of those 66 total species, one wildlife species was determined to have a moderate potential to occur, and 3 listed and 11 sensitive wildlife species were determined to have at least a low potential to occur in the BSA. One special-status wildlife species was observed during the field survey. Because there was a vernal pool complex identified on the project site, focused branchiopod (including fairy shrimp) surveys were conducted to determine if the three listed and two sensitive fairy shrimp species within the wildlife inventory occur onsite; none of those species were detected during any of the surveys and thus are not anticipated to occur onsite (see **Table 5.6-1**). It was determined that 45 of the special-status wildlife species in the wildlife inventory have no potential to occur or are not expected to occur within the BSA and are not discussed further in this BRE. The potential to occur analysis for all species in the wildlife inventory is provided in **Appendix C** *Special-Status Species Occurrence Potential Determination*.

Even with field surveys, wildlife biologists assessed probability of occurrence rather than making definitive conclusions about species presence or absence. Failure to detect the species is not definitive, and may be due to variable effects associated with migration, weather, fire, and/or time of day and year.

**Table 5.6-1
SPECIAL-STATUS VERNAL POOL WILDLIFE SPECIES WITH A POTENTIAL TO OCCUR IN THE BSA**

Scientific Name	Common Name (=Synonym)	Status	General Habitat Descriptions in California	Distribution and/or Elevation Range (if known)	Suitable Foraging, Roosting, and/or Breeding Habitats	Potential For Occurrence in the BSA
Listed Endangered, Threatened, and Candidate Wildlife: Wildlife with official status under the federal Endangered Species Act (ESA) and/or the California Endangered Species Act (CESA). A species may have other sensitive designations in addition to their federal or state listing.						
Listed Invertebrates						
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT, WRCMSHCP: Covered (a)	Habitats: ephemeral freshwater habitats, such as vernal pools and swales, prefers cool-water pools that have low to moderate dissolved solids	Yes	Yes	Not detected during 2021-2021 focused surveys. A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. However, the project site provides suitable vernal conditions to support this species.
<i>Branchinecta sandiegonensis</i>	San Diego fairy shrimp	FE	Habitats: small, shallow vernal pools, which range in depth from 2 to 12 inches and in water temperature from 10 to 20 degrees Celsius, ditches and road ruts	Yes	Yes	Not detected during 2021-2021 focused surveys. A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. However, the project site provides suitable vernal conditions to support this species.
<i>Streptocephalus woottoni</i>	Riverside fairy shrimp	FE, WRCMSHCP: Covered (a)	Habitats: deep, long-lived, cool lowland vernal pools, vernal pool like ephemeral ponds, and stock ponds that retain water, minimum depth of 30 cm at maximum filling and the water is usually moderately turbid, seasonal grasslands	Yes	Yes	Not detected during 2021-2022 focused surveys. A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. However, the project site provides suitable vernal conditions to support this species.
Sensitive Wildlife: These animals have no official status under the ESA and/or the CESA; however, they are designated as sensitive or locally important by federal agencies, state agencies, and/or local conservation agencies and organizations						
Sensitive Invertebrates						
<i>Linderiella santarosae</i>	Santa Rosa Plateau fairy shrimp	WRCMSHCP: Covered (a)	Habitats: southern basalt flow vernal pools, unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions	Yes	Yes	Not detected during 2021-2021 focused surveys. A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. However, the project site provides suitable vernal conditions to support this species.
<i>Linderiella occidentalis</i>	California linderiella	Special Animals List	Habitats: large, fairly clear vernal pools and lakes. However, they can survive in clear to turbid water with pH of 6.1-8.5, and they have also been found in small pools.	Yes	Yes	Not detected during 2021-2021 focused surveys. A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. However, the project site provides suitable vernal conditions to support this species.
Legend and Notes						
<p><u>Federal Endangered Species Act (ESA) Listing Codes: the ESA is administered by the USFWS and NMFS. The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments. The official federal listing of Endangered and Threatened animals is published in 50 CFR § 17.11.</u></p> <ul style="list-style-type: none"> • FE = federally listed as endangered: any species of plant or animal that is in danger of extinction throughout all or a significant portion of their range. • FT = federally listed as threatened: any species of plant or animal that is considered likely to become endangered throughout all or a significant portion of its range within the foreseeable future. 						

Scientific Name	Common Name (=Synonym)	Status	General Habitat Descriptions in California	Distribution and/or Elevation Range (if known)	Suitable Foraging, Roosting, and/or Breeding Habitats	Potential For Occurrence in the BSA
<p><u>California Department of Fish and Wildlife (CDFW) Designations:</u> For some wildlife species, the CNDDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nesting colonies. For many species of birds, the primary emphasis is on the breeding population in California. For some species which do not breed in California but winter here, emphasis is on wintering range. The SSC designation thus may include a comment regarding the specific protection provided such as nesting or wintering</p> <ul style="list-style-type: none"> • Special Animals List: the CESA does not allow listing of insects, so despite the insect’s precarious status, the insect has no protection under state legislation. CDFW includes this insect on its Special Animals List. <p>California Fish and Game Code §§ 4800 – 4810: The mountain lion (genus Puma) is a specially protected mammal under the laws of California. It is unlawful to take, injure, possess, transport, import, or sell any mountain lion or any part or product thereof, except as specifically provided in California Fish and Game Code §§ 4800 - 4810. Protected by § 460 of the California Code of Regulations [CCR], Title 14</p> <p><u>Western Riverside County Multiple Species Habitat Conservation Plan (WRCMSHCP):</u> The WRCMSHCP provides regulatory coverage for a total of 146 individual species. Under the WRCMSHCP, regulatory coverage means that future incidental take of these species would be permitted for new development and that no additional mitigation under the CESA or ESA would be required over the mitigation provided for by the plan. The following species are identified as “Covered Species” by the WRCMSHCP and the Implementing Agreement. The WRCMSHCP permits would provide take authorization for Covered Species.</p> <ul style="list-style-type: none"> • WRCMSHCP: Covered (a): surveys may be required for these species as part of wetlands mapping (Section 6.1.2 of WRCMSHCP). <p><u>Resources</u></p> <ul style="list-style-type: none"> • <i>State & Federally Listed Endangered & Threatened Animals of California (CNDDDB, 2022c);</i> • <i>Special Animals List (CNDDDB, 2022d);</i> • <i>Fairy Shrimps of California’s Puddles, Pools, and Playas (Eriksen and Belk, 1999);</i> • <i>Inland Fishes of California (Moyle, 2002);</i> • <i>Fish Species of Special Concern in California, Third Edition (Moyle et al., 2015);</i> • <i>UltraSystems in-house records.</i> • <i>The Sibley Guide to Birds (Sibley, 2000)</i> • <i>A Field Guide to Western Reptiles and Amphibians (Stebbins, 2003)</i> • <i>A New American Fairy Shrimp, Linderiella santarosae (Crustacea: Anostraca: Linderiellidae), from Vernal Pools of California (Thiery and Fugate, 1994)</i> • <i>Mammalian Species of Special Concern in California (Williams, 1986)</i> <p><u>Notes:</u></p> <ul style="list-style-type: none"> • Low potential to occur= the BSA is located within the wildlife species’ known distribution, elevation range, and/or the BSA contains low-quality suitable habitats or conditions to support the species. The wildlife species has a low potential to occur within the BSA. • Moderate potential to occur = the BSA is located within the wildlife species’ known distribution, elevation range, and/or the BSA contains moderate-quality suitable habitats or conditions to support the species. The wildlife species has a moderate potential to occur within the BSA. . • No potential to occur = the BSA is not located within the wildlife species’ known distribution, elevation range, and/or the BSA contains no suitable habitats or conditions to support the species. The wildlife species has no potential to occur within the BSA. • Not expected to occur: the BSA is located within the wildlife species’ known distribution, elevation range, and may contain some suitable habitat. Therefore, it is possible that the species could occur, , however the species is not expected to occur due to other factors or a combination of factors • Not detected during 2021-2022 focused surveys= A series of focused wet-season fairy shrimp surveys conducted between December 21, 2021, and April 24, 2022 determined that this species was not present on the project site during survey periods. <p><u>Glossary</u></p> <ul style="list-style-type: none"> • Alluvial fan: a wide, cone-shaped deposit of rocks, sand, gravel, and finer materials that has been deposited by a stream as it flows out of a mountainous area onto a plain. • Alluvium: river or stream deposits, such as sand and silt. • Aquatic: growing, living in, or frequenting water, usually open water. • Ephemeral: a waterbody or species that persists for brief period of time before drying up or dying. • Vernal pools: seasonal wetlands that form in depressions on the soil surface above a water-restricting layer of soil or rock. Plant and animal taxa endemic to vernal pools are those which can adapt to a unique cycle of flooding, temporary ponding, and drying. • Wetland: a general term referring to the transitional zone between aquatic and upland areas. Some wetlands are flooded or saturated only during certain seasons of the year. 						

5.6.6 Listed Endangered, Threatened, and Candidate Wildlife

No listed wildlife species were observed within the BSA during the biological surveys. The literature review and field survey concluded that six listed wildlife species have at least a low potential to occur within the BSA.

The following listed fairy shrimp species were not detected during the wet and dry season surveys:

Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)

The vernal pool fairy shrimp (VPFS) is a small, freshwater crustacean that occurs in vernal pools of California and southern Oregon. VPFS have stalked compound eyes and 11 pairs of swimming legs that also are functional gills. They travel through water upside down, swimming by beating their legs in a wavelike motion. Unlike other species of shrimp, the VPFS does not have a hard exoskeleton. In California, this species is currently found in 32 counties across the central valley, central coast, and areas of southern California (USFWS, 2006; USFWS, 2007).

San Diego Fairy Shrimp (*Branchinecta sandiegonensis*)

The San Diego fairy shrimp (SDFS) is a small aquatic crustacean that is generally restricted to vernal pools of coastal southern California and northwestern Baja California, Mexico. SDFS are usually observed from January to March when seasonal rainfall fills vernal pools and initiates the hatching of cysts (eggs) (USFWS, 2008a).

Riverside Fairy Shrimp (*Streptocephalus woottoni*)

The Riverside fairy shrimp is narrowly distributed across its five localities within the MSHCP Plan Area, in deep vernal pools. In the Plan Area, this species has been observed in vernal pools supporting Riverside Fairy shrimp have identified on Murrieta stony clay loams, Las Posas series, Wyman clay loam, and Willows soils. Riverside fairy shrimp are generally not tolerant of a wide range of chemical and physical factors (Dudek and Associates, 2003; Eriksen and Belk, 1999; USFWS, 2008b).

5.6.7 Sensitive Wildlife

The following listed fairy shrimp species were not detected during the wet and dry season surveys:

Santa Rosa plateau fairy shrimp (*Linderiella santarosae*)

The Santa Rosa Plateau fairy shrimp is narrowly distributed in the MSHCP Plan Area. It is restricted to cool-water vernal pools which are formed on Southern Basalt Flows. This species and its microhabitat are only known to occur on the Santa Rosa Plateau.

Because the Santa Rosa Plateau fairy shrimp requires specific conditions, occurs in few locations, and is confined to a well-defined habitat that is very narrowly distributed, this species would require site specific considerations, protection of preferred habitat, and species specific management conditions (Dudek and Associates, 2003; Thierry and Fugate, 1994; Keeler-Wolf, 1998).

California linderiella (*Linderiella occidentalis*)

California linderiella is one of the most widely distributed of the California endemic large branchiopods (range nearly mirrors *Branchinecta lynchi*), occurring throughout most of the length of

California's Central Valley, with disjunct populations in the Santa Rosa Plateau near Rancho Santa California in Riverside County. Geographic range also includes from near Redding to Fresno County, mainly to the east of the Sacramento and San Joaquin Rivers. This species has been documented on most land forms, geologic formations and soil types supporting vernal pools in California at altitudes up to 1,150 meters (3,770 ft) amsl. (Eriksen and Belk, 1999; Helm, 1998).

5.7 Hydrology and Jurisdictional Areas

There is an NWI-mapped Riverine System within the BSA, located approximately 350 feet west of the project site boundary. This riverine area does not intersect areas of the project site. (USFWS, 2022c). There are two vernal pools (forming a vernal pool complex) in the southeast quadrant of the project site that lie in an east-to-west orientation with the eastern end of the larger vernal pool terminating at the eastern border of the project site.

No onsite NWI wetlands within the BSA.

5.7.1 Jurisdictional Waters

The results of the literature review and the October 14, 2021 jurisdictional delineation survey determined that the project site contains waters of the State, which are under RWQCB jurisdiction in accordance with the California Porter-Cologne Water Quality Control Act and the Procedures (SWRCB Resolution No. 2019-0015). (**Appendix A**, Figure 7, *USGS Surface Waters and Watersheds*; also, **Appendix D**, *Jurisdictional Delineation Report*).

Jurisdictional Delineation Results

Due to indications of repeated inundation seen on historic aerial imagery (1978, 2005, 2014, 2016, 2017, 2018, 2019, 2020, 2021; NETROnline 2022, Google Earth Pro 2022), the project site was investigated for the potential presence of wetlands during a biological survey conducted on September 21, 2021. During this survey, fairy shrimp were observed in two ponded areas onsite. The site was revisited on October 14, 2021; this visit resulted in the delineation of two vernal pools, Vernal Pool-East (VP1) and Vernal Pool-West (VP2), constituting a vernal pool complex, on the east side of the project site (see **Appendix A**, Figure 10, *Jurisdictional Impact Areas*; see also **Appendix D**, *Jurisdictional Delineation Report*).

The vernal pool complex (VP1 and VP2) is on the eastern side of the project site, adjacent to each other and separated by a narrow dirt path (see **Appendix A**, Figure 10, *Jurisdictional Impact Areas*). The larger vernal pool (VP1) is approximately 250-feet long by a width that ranges from approximately 10 to 40 feet. The smaller vernal pool (VP2) is directly west of VP1; the pools are separated by a 15-foot dirt path that crosses between the VP1 and VP2. VP1 is approximately 25-feet long by 50-feet wide. The area of VP1 is 0.24 acre (10,319 square feet) and that of VP2 is 0.02 acre (778 square feet).

A 24-inch plastic corrugated pipe is located at the eastern end of VP1 at the boundary of the project site and extends into the adjacent property (C5 Equipment Rentals and Maintenance). The culvert is buried in approximately four feet of soil, and the base of the culvert is directly beneath the base of the chain-linked fence that separates the two properties. Due to lack of public access to the equipment rental and maintenance facility, the source of the water discharging from the culvert could not be determined. Based on historic aerials (1978a, 1978b; NETROnline 2022) it is possible that the culvert is part of a drainage system that dates from the 1970s and discharges nuisance flows and/or

stormwater from the adjacent properties (see **Appendix H, Photographs**) onto the project site. As described in Section 6.0, indications of repeated inundation (Wetland Hydrology Indicator B7) were visible on historic aerial imagery (1978, 2005, 2014, 2016, 2017, 2018, 2019, 2020, 2021; NETROnline 2022, Google Earth Pro, 2022),

Surface water (Wetland Hydrology Indicator A1) was present in VP1 and VP2 during the October 14, 2021 jurisdictional delineation survey, and was possibly the result of two light rain events that had occurred on October 5, and 8, 2021, six and nine days prior to the jurisdictional delineation survey, respectively. Precipitation records from CIMIS Station 44 at the University of California, Riverside, reported 0.08 inches of rain on October 5, and 0.19 inches of rain on October 8, 2021 (CIMIS, 2021).

Subsequent site visits in response to rain events during the 2021-2022 wet season documented water levels within V1 and V2 that ranged in depth from approximately four to 24 inches. VP1 and VP2 merged after at least one rain event during the 2021-2022 wet season.

VP1 and VP2 exhibited four primary indicators of wetland hydrology required by the *Arid West Supplement* (USACE 2008): Surface Water (A1), Surface Soil Cracks (B6), Inundation Visible on Aerial Imagery (B7), and Aquatic Invertebrates (B13; see **Appendix D, Jurisdictional Delineation Survey Report**). Photographs of the project site are located in **Appendix I, Site Photographs**.

5.8 Critical Habitat

The BSA is not located within a designated or proposed critical habitat for listed plant or wildlife species (**Appendix A, Figure 11, USFWS Critical Habitats**). The nearest USFWS-designated wildlife critical habitats are for the coastal California gnatcatcher and Santa Ana sucker. Both designated critical habitats are located approximately 6.75 miles north and northwest of the BSA, respectively.

5.9 Wildlife Corridors

The literature review and field surveys concluded that the project site does not function as a wildlife movement corridor, however evidence of the passage of animals through the project site were observed, including signs of coyote and cottontail rabbit. Due to the fact that the project site is disturbed, surrounded by roadways, and experiences high volumes of frequent human activity, it does not represent an optimal wildlife corridor because it does not connect two open-space areas. In addition, the literature review and field surveys concluded that the areas outside of the project site within the BSA do not function as a wildlife movement corridor either. These areas do not contain wildlife travel routes, such as a long riparian strip, or ridgeline; or wildlife crossings, such as a tunnel, culvert, or underpass.

The BSA does not overlap with CDFW Essential Connectivity Areas or Natural Landscape Blocks (**Appendix A, Figure 12, CDFW Wildlife Corridors**).

These permanent structures serve as significant barriers to wildlife movement through the BSA and region. This development precludes the BSA from being used as wildlife corridor to connect open space areas. Human activities, lighting, noise, traffic noise, and fencing associated with the development would most likely deter wildlife movement through the site.

6.0 MSHCP CONSISTENCY ANALYSIS

6.1 Introduction

The purpose of this Consistency Analysis (Analysis) report is to summarize the biological data for the proposed project and to document project's consistency with the goals and objectives of the MSHCP. The proposed project consists of the development service facility complex on a project site in the City of Moreno Valley in Riverside County. The project proponent proposes to construct a service facility, wash bay, rental and sales office building, and a two-lane fuel island on the site.

The project site is located within areas covered by the MSHCP in Western Riverside County. Each project located within the plan area must be consistent with the MSHCP. This section analyzes consistency with MSHCP requirements. **Table 6.1-1** lists MSHCP conditions that were considered in this Analysis.

Table 6.1-1
MSHCP PROJECT REVIEW CHECKLIST

MSHCP Conditions	Yes	No
Are riverine/riparian/wetland habitats or vernal pools present?	X	
Is the project located in a Narrow Endemic Plant Species Survey Area?		X
Is the project located in a Criteria Area or Public/Quasi-Public Land?		X
Is the project located in Criteria Area for Amphibian Species Survey Area?		X
Is the project located in Criteria Area for Burrowing Owl Survey Area?		X
Is the project located in Criteria Area for Mammal Species Survey Area?		X
Is the project located adjacent to WRCMSHCP Conservation Areas?		X

Appendix D, RCA MSHCP Information Map Report, shows the results from the RCA MSHCP Information Map query (RCA, 2021; RCA 2022b). The report was used to identify habitat assessment requirements and any special-status species possibly occurring within the BSA and possibly requiring surveys in accordance with the MSHCP.

6.1.1 Project Location within the MSHCP Boundary

The project site is located at 21839 Alessandro Blvd. (APNs 297120002, 29710018, 29710017, 297100076, 297100073, 297100091, 29710025, 29710003) in the City of Moreno Valley, Riverside County. (see **Appendix A**, Figure 1, *Regional Location*). It lies approximately 1.6 miles east of Interstate 215. The project site is 5.5 miles northwest of Lake Perris State Recreation Area and Perris Reservoir and 0.65 miles south east miles east of Sycamore Canyon Wilderness Park, a Public Quasi-Public Conserved Land. (see **Appendix A**; Figure 1, *Regional Location*; Figure 2: *Project Vicinity*; Figure 3: *Project Location and Biological Study Area [BSA]*). The existing surface elevation at the subject property ranges from approximately 1539 to 1551 feet amsl (Google Earth Pro, 2022). The

project site is within the Reche Canyon/Badlands Area Plan of the MSHCP. The BSA is approximately three miles south of the Sycamore Canyon/Box Springs Central Subunit Area.

All project construction and operations would occur on the 9.6-acre project site. Thus, project impacts would occur largely within the project boundaries. All of the land cover within the property boundary would be disturbed during grading and construction activities (see **Table 5.4-1**).

MSHCP Criteria Areas/Criteria Cells/Conservation Areas

UltraSystems biologists used GIS software to determine the project site's location in relation to applicable MSHCP Core or Linkage, Area Plan Subunit and Cell or Cell Group, and specific survey areas for plant and wildlife. Biologists also reviewed the project property's APNs in the RCA MSHCP Information Map Report to determine the location of Conservation Areas in the vicinity of the BSA (RCA, 2021; RCA, 2022b; Dudek and Associates, 2003). The project site is situated within the Reche Canyon/Badlands Area Plan of the MSHCP, and it does not fall within a planning area subunit. The nearest Criteria Cell, which is part of the Sycamore Canyon/Box Springs Subunit Area, is approximately 5.3 miles north of the BSA. No impacts are anticipated to occur to this Criteria Cell as a result of project operations. Therefore, with the implementation of standard BMPs describe in Section 8.0, no mitigation measures are anticipated to be required for this project.

The RCA MSHCP Information Map Report indicates that this project site is not anticipated to be subject to Criteria Cell, Criteria Area or Conservation Area requirements under the MSHCP (RCA, 2021; Dudek and Associates, 2003).

Cores and Linkages within the MSHCP Conservation Area

The MSHCP Conservation Area comprises a variety of existing and proposed Cores, Extensions of Existing Cores, Linkages, Constrained Linkages, and Non-contiguous Habitat Blocks. These features are generally called "Cores and Linkages" (MSHCP Section 3.2.3). The project site is not located within an existing or proposed Core or Linkage. The closest MSHCP Core Areas is Existing Core H, comprised of Lake Perris State Recreation Area, San Jacinto Wildlife Area, private lands and lands with pre-existing conservation agreements, which is located approximately 6.5 miles east of the BSA. and the closest MSHCP Linkage is Proposed Constrained Linkage 7, which occurs approximately 8 miles southwest of the BSA.

MSHCP Survey Areas

The MSHCP requires focused surveys for certain plant and animal species for project sites located within designated plant and animal survey areas when potential suitable habitat is present. The RCA MSHCP Information Map Report summarized the guidance in the MSHCP that pertains to the project property (RCA, 2021; Dudek and Associates, 2003). Habitat assessments are required for those species identified on the RCA MSHCP Information Map Report for every APN that is included in the project (RCA, 2021). UltraSystems reviewed the RCA MSHCP Information Map Report to determine the required surveys for the project. The results from the RCA MSHCP Information Map Report are found in **Table 6.1-2**.

**Table 6.1-2
SURVEY REQUIREMENTS WITHIN THE MSHCP PLAN AREA**

Amphibian Species	Burrowing Owl	Criteria Area Species	Mammalian Species	Narrow Endemic Plant Species	Special Linkage Area
No	No	No	No	No	No

The RCA MSHCP Information Map Report did not indicate that the project site is within an area that requires further study for MSHCP Criteria Area plant species, Criteria Area status mammals, Narrow Endemic Plant Species, amphibian species, BUOW or special linkage areas (RCA, 2021). Some offsite areas of the BSA had requirements for BUOW surveys, but most of those areas have recently been developed with a warehouse and other construction and do not have any potential BUOW habitat. Although this is useful information for compliance with the MSHCP, other natural resource databases, such as CDFW's CNDDDB (CNDDDB, 2022a) and the USFWS' IPaC (USFWS, 2022b) were also reviewed in conjunction with this query.

6.1.2 Project Description

Penske Truck Leasing Co, L.P. ("Penske") is proposing to construct a new state-of-the-art six bay service facility (with a 4011 square-foot office core) and wash bay in addition to a rental and sales office building (with a 1,792 square-foot office core) and associated two-lane, three product (gas, diesel, diesel exhaust fluid) fuel island. The City of Moreno Valley would process an application seeking design review approval for the proposed facility, which would be located at Interstate 215 Frontage Road, close to Alessandro Blvd to the north. The roughly rectangular site for the proposed project is currently developed and is used for truck storage.

Penske's intended use of the premises is for the operation of a motor vehicle and truck leasing, rental, and sales business which would include the housing, maintaining to full capacity and repairing of motor trucks and trailers, outside parking and storage of such vehicles, motor vehicle repair shop and the storage and dispensing of fuel for the benefit of its internal customers only.

Penske would conduct truck and trailer repairs consisting of general and preventive maintenance to its private and customer fleets, such as clutches, oil changes, belt/bub replacements, tune-ups, tire changes, etc. No major work such as framework, collision repair or bodyshop work, etc. would occur. All work would be conducted within the facility, which would not be open to the general public.

6.1.3 Covered Roads

Construction of the project does not involve construction or maintenance of or impacts to MSHCP Covered Roads within the BSA. Therefore, the project is consistent with sections 7.2, 7.3.4, and 7.3.5 in the MSHCP.

6.1.4 Covered Public Access Activities

Construction of the project would occur on private property and is not located in the vicinity of any MSHCP Conservation Areas. The project would not have any significant adverse effects on public access areas in MSHCP Conservation Areas such as trails, facilities, and areas for passive recreational activities. Therefore, the project is consistent with sections 7.3.6 and 7.4.2 in the MSHCP.

6.1.5 General Setting

The project site is located in a highly-disturbed area surrounded by roadways, and commercial and developed buildings, and therefore optimal habitat for special-status plant and wildlife species is lacking. The project site is bordered by Alessandro Boulevard and commercial properties to the north, Old 215 Frontage Road to the west, a commercial/industrial facility to the south, and a commercial area to the east. The majority of the project site's surfaces consist of highly compacted soils with little to no vegetative cover. There is a paved surface in the southwestern section of the project site which is approximately 45 feet wide by 230 feet long. There is a depression in the southeastern section that is vegetated with ruderal forbs, grasses and shrubs; the areas adjacent to the depression are vegetated with non-native annual grasses and forbs. There are a few small trees concentrated along the southern end of the project site.

6.2 Reserve Assembly Analysis

Projects that are located within a Cell Criteria Area, Criteria Cell(s), or Area Plan Subunit must be evaluated to determine their effect on the Reserve Assembly. The project is not located within a Criteria Area or Area Plan Subunit; therefore, it does not have to meet the objectives of the Reche Canyon/Badlands Area Plan.

6.2.1 Public Quasi-Public Lands

The project is not located within the vicinity of any Public Quasi-Public Lands and therefore would not have any impacts to these lands.

6.3 Vegetation Mapping

UltraSystems biologists conducted a literature review and field survey to identify land cover types (plant communities and non-vegetated features) within the BSA. In addition, aerial imagery was reviewed to aid in identifying land cover types (Google Earth Pro, 2022). Classifications of the plant communities are based on Holland's *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986), *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009) and the MSHCP (Dudek and Associates, 2003) with modifications to better represent existing site conditions. During the field surveys, UltraSystems biologists walked throughout the project site and used a GPS unit to record the borders of each land cover type. The methods used to assess land cover types are described in **Section 4.2.1** of this BRE.

UltraSystems biologists identified and mapped two land cover types within the BSA (see **Appendix A**, Figure 9, *Land Cover Types*). Each of the land cover types listed below are described in **Section 5.4** of this BRE, and the respective acreages of the land cover types are listed in **Table 5.4-1**. Each land cover type would be permanently impacted by the construction of the project.

6.3.1 Developed/Disturbed

In the MSHCP, the Developed/Disturbed land cover type is described as follows: "*consist of areas that have been disced, cleared, or otherwise altered. Developed lands may include roadways, existing buildings, and structures*" (MSHCP Vol. 1 Sec 2.0). This land cover dominates the majority of the project site. The developed area is a paved surface in the southwestern section of the project site which is approximately 45 feet wide by 230 feet long. The disturbed areas consist of highly compacted soils where trucks are parked or driven and a few patches of ruderal vegetation in the

southeastern section of the project site, consisting mainly of non-native annual grasses and forbs. There are a few small trees concentrated along the southern end of the project site. There are approximately 57.39 acres of Developed/Disturbed land cover within the BSA and approximately 8.66 acres on the project site itself.

There is a vernal pool complex comprised of two vernal pools located in the southeastern section of the project site that are vegetated with ruderal plant species, both native and non-native. The larger depression is approximately 250 feet in length by a width that ranges from approximately 10 to 40 feet. The smaller depression is directly west of the larger depression and is separated by a 15-foot dirt road that crosses between the two vernal pools. The small vernal pool is approximately 25-feet in length by 50-feet in width. There are two hydrophytic plant species, willow dock (*Rumex salicifolia*) and nut grass (*Cyperus esculentis*), that were observed in the larger depression. The plant species with the highest cover in the vernal pools include stinkwort (*Dittrichia graveolens*), common sunflower (*Helianthus annuus*), knotweed (*Polygonum aviculare*). See **Appendix D Jurisdictional Delineation Report**). Many of the plants are mesic species that establish in vernal pools. Besides fairy shrimp, there were no species that are subject to the protection of species associated with vernal pools described in Section 6.1.2 of the MSHCP observed in the vernal pools. Impacts to fairy shrimp will be discussed in Section 6.5 of this BRE. Therefore, the project is consistent with Section 6.1.2 in the MSHCP. There were no Narrow Endemic Plant Species or species subject to the Additional Survey Needs and Procedures; therefore, the project is consistent with Section 6.1.2 and Section 6.1.3 of the MSHCP.

6.4 MSHCP Section 6.1.2, Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools

6.4.1 Riparian/Riverine Resources

Riverine features may include features that are natural in origin as well as past natural features that have been heavily modified and/or redirected and can include features indirectly created through man-made manipulation of the landscape, including channelization of a historic riverine feature. If these features are connected to nearby downstream resources that are either existing or described conservation lands, they are considered to be riverine.

The BSA was assessed for areas meeting the MSHCP's definition of Riparian/Riverine Areas during the September 21 2021 biological survey. It was determined that the BSA does not contain MSHCP Riparian/Riverine Areas. Since no direct or indirect impacts to MSHCP Riparian/Riverine Areas are anticipated, no mitigation measures are planned for impacts to these areas. Therefore, the project is consistent with Section 6.1.2 in the MSHCP.

6.4.2 Vernal Pools

According to MSHCP Section 6.1.2, any project located within the MSHCP plan area must conduct a habitat assessment for vernal pools, fairy shrimp, LBV, SWFL, and cuckoo. Vernal pools are defined in **Section 3.3.1** of this report.

Methods

UltraSystems biologists conducted a habitat assessment on September 21, 2021, and during the habitat assessment they evaluated whether or not any areas within the BSA contained evidence of vernal pools. They conducted a walking survey of all accessible areas. They followed meandering

transects of approximately 100-foot separation and recorded any evidence of vernal pools (e.g., tire ruts, cracked mud, surface depressions, ponding, and other indicators of vernal pools). They augmented the walking survey with a binocular survey of fenced, gated or otherwise inaccessible areas. Due to the observation of two onsite depressions in which evidence of ponding, such as cracked mud, was observed, a jurisdictional delineation was conducted of those areas.

During the jurisdictional delineation conducted on October 14, 2021, UltraSystems biologists surveyed the two onsite depressions that were observed during the habitat assessment. Evidence of the hydrological source of the water input into the depressions was evaluated. Plant species not observed during the habitat assessment were identified and documented. Ponded water was examined for sign or observation of fairy shrimp or vernal pool indicator species. Lateral lines of the edges of each depression were recorded using a Trimble Geo 7 GPS unit. The edge of the depression was based on the boundary between hydrophytic species and upland plant species and also on the edge of where mud-cracking was visible.

Existing Conditions and Results

Two vernal pools were observed on the project site during the surveys, both adjacent to each other (forming a vernal pool complex) and both supplied by the same source of water (see **Appendix A**, Figure 10, *Jurisdictional Impact Areas*). The larger vernal pool is approximately 250 feet in length by a width that ranges from approximately 10 to 40 feet. The smaller vernal pool is directly west of the larger vernal pool and is separated by a 15-foot dirt road that crosses between the two vernal pools. The small vernal pool is approximately 25-feet in length by 50-feet in width. Both vernal pools show evidence of cracked mud across the bottom surfaces. During the jurisdictional delineation survey, two shallow ponds were observed in the larger vernal pool, likely resulting from a rain event the preceding week.

These onsite vernal pools meet the MSHCP criteria of hydrology and vegetation and partially meet the criteria of soils for a vernal pool (in addition to the USACE Arid West Supplement [2008] criteria). The total area of the larger vernal pool is 0.23 acres and that of the smaller vernal pool is 0.01 acres. Regarding hydrology, a 24-inch culvert discharges into the larger vernal pool at the eastern boundary of the project site. The source of the water in the culvert is unknown but it may be a combination of nuisance water from a heavy equipment wash area on the property directly east of the project site as well as stormwater flow that enters into the drain on the adjacent property and discharges from the culvert.

Vegetation at the vernal pool complex is significantly disturbed, likely due to repeated attempts by previous landowners to fill the pools (1978, 2005, 2014, 2016, 2017, 2018, 2019, 2020, 2021; NETROnline 2022, Google Earth Pro 2022). The majority of the vegetation observed within the vernal pool complex consists of ruderal vegetation, dominated by non-native annual forbs (herb stratum). The plant species with the highest cover in the vernal pools include stinkwort (*Dittrichia graveolens*), hairy leaved sunflower (*Helianthus annuus*; FACU), knotweed (*Polygonum aviculare*; FAC), and nettle leaf goosefoot (*Chenopodium murale*; FACU).

Plants recorded at the vernal pool complex during the wet season site visits include willow dock (*Rumex salicifolius*; FACW), nut grass (*Cyperus esculentis*; FACW), salt marsh sand-spurry (*Spergularia marina*; FACW), knotweed (*Polygonum aviculare*; FAC), ryegrass (*Festuca perennis*; FACU), clustered tarweed (*Deinandra fasciculata*; FACU), and common sow thistle (*Sonchus oleraceus*; UPL). No NWPL-designated obligate (OBL) plant species were observed in the vernal pool complex during the October 14, 2021 jurisdictional delineation survey or the subsequent site visits.

The disturbed plant community that occupies the wetland (vernal pool complex) does not fit any classification described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986) or in *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009). Thus, although the vernal pool plant community is weedy in nature and contains many non-native species, it is described as a vernal pool complex and not as part of the Developed/disturbed land cover type in this report (see **Section 5.4**).

Two hydrophytic plant species were observed in the larger vernal pool (VP1), willow dock (*Rumex salicifolia*) and nut grass (*Cyperus esculentis*), both of which are designated as facultative wet species on USACE's National Wetland Plant List (NWPL) [USACE, 2018]. There are also several other plant species observed in both vernal pools that are designated by USACE's NWPL as facultative upland and facultative species (USACE, 2018). No NWPL-designated obligate plant species were observed in the vernal pool complex.

Regarding soils, two areas of ponding were observed in the VP1 during the jurisdictional delineation survey. The water in the ponds was likely the result of a rain event that had occurred six days previously on October 8, 2021. Versatile fairy shrimp were observed in these ponds; however, there were no listed, sensitive, and/or MSHCP-protected fairy shrimp observed during the focused (wet and dry season) surveys. Aquatic invertebrates are vernal pool indicator species; therefore, it was concluded that these depressions are vernal pools. To maintain the integrity of the vernal pools, soil samples were not collected during the survey. Details of the vernal pools and the methodology by which they were this determined can be found in **Appendix D, Jurisdictional Delineation Report**.

Impacts

Development of the project would result in permanent fill of the existing vernal pools. These pools cover approximately 0.26 acre of the project site. The area is proposed to be covered with a paved parking area for large trucks, and the vernal pools would therefore be permanently impacted as a result of the project. Thus, the water from the adjacent property that discharges into the larger vernal pool would be blocked off. This water would need to be re-directed to discharge to another location.

Mitigation

To compensate for the loss of vernal pools, the project proponent would pay a mitigation fee to the RCA. Additional mitigation would be determined following consultation with the RCA.

6.4.3 Fairy Shrimp

Fairy shrimp protected under the MSHCP such as Riverside fairy shrimp, Santa Rosa Plateau fairy shrimp, and vernal pool fairy shrimp were not detected within the BSA during the wet and dry season large brachiopod surveys. Descriptions of these species is provided in **Section 5.8.6** of this BRE. These MSHCP-protected fairy shrimp are briefly discussed below.

Tire ruts, cracked mud, and hydrolytic vegetation were observed during the September 21, 2021 habitat assessment survey. Ponded water and fairy shrimp within the ponds was observed during the October 14 2021 jurisdictional delineation survey, following the October 8 rainfall. Vernal pools or associated vernal pool vegetation were identified within the BSA. Consistent with the MSHCP, focused fairy shrimp surveys were conducted due to the observation of vernal pools and fairy shrimp during the jurisdictional delineation survey.

Methods

A discussion of the methods used during the large branchiopod protocol surveys can be found in **Section 4.2.6** of this BRE and in **Appendix G**, *Dry Season Survey Report (Dudek)* and **Appendix K**, *Wet Season Survey Report (Dudek)*.

Existing Conditions and Results

During the jurisdictional delineation survey conducted on October 14, 2021, UltraSystems biologists Ms. Tollett and Mr. Sutton investigated two surface depressions on the project site that had been previously documented during the September 21, 2022 reconnaissance-level biological survey as having signs of intermittent inundation (Wetland Hydrology Indicator B6, Surface Soil Cracks).

The site was revisited for a jurisdictional delineation survey on October 14, 2021; this visit resulted in the delineation of two vernal pools approximately three to four inches deep, Vernal Pool-East (VP1) and Vernal Pool-West (VP2). These vernal pools constitute a vernal pool complex on the east side of the project site (see **Appendix A**, Figure 10, *Jurisdictional Impact Areas*; see also **Appendix I**, *Site Photographs*).

No federally listed large branchiopod species were identified during the 2021 – 2022 wet season surveys. During the 11 survey sampling visits, 12 features (VP east, VP west, Basin 1, and Basins 6 through 14) of the 16 total features were found to be occupied by versatile fairy shrimp (*Branchinecta lindahli*), which is discussed below. A summary of the wet season survey results and The distribution of features sampled in the study area is provided in **Appendix K** *Wet Season Survey Report (Dudek)*.

versatile fairy shrimp (*Branchinecta lindahli*)

Versatile fairy shrimp inhabit vernal pools of California that exhibit a wide range of conditions including playas, arid grassland and swale pools, small water-filled gas pockets in old lava flows, and depressions. This species may also occur in disturbed settings such as areas that have undergone frequent vehicle use, recreation or various human uses, excavation, and other disturbances which could create vernal conditions. In general, this species typically finds arid regions to be more favorable. In addition, this species is fairly tolerant of a range of physical conditions and water chemistry. Eggs of this species typically hatch at cold to cool water temperatures; this species typically occurs in vernal pools from mid-December to mid-May in California. Most pools in which this species occurs typically last between 5-30 days, succumbing when the pool dries up (Eriksen and Belk, 1999)

Impacts

No special-status fairy shrimp were observed during the surveys, and therefore direct impacts to special-status fairy shrimp are not anticipated as a result of construction of the project; therefore, no mitigation is required. The proposed project would alter the discharge of water from the culvert on the eastern end of VP1. These discharge waters would need to be directed to another location if the proposed project is implemented.

Mitigation

Because no listed fairy shrimp species, including the three fairy shrimp species protected under MSHCP Section 6.1.2, were observed during surveys, mitigation measures for loss of fairy shrimp or their habitat is not required. The project is consistent with Section 6.1.2 in the MSHCP.

6.4.4 Riparian birds

There are no riparian/riverine habitats within the BSA, and therefore it is not anticipated that there would be any impacts associated with special status riparian bird species such as LBV, SWFL, or Cuckoo. Consistent with the MSHCP, focused LBV, SWFL, or cuckoo surveys were not conducted or required. No direct impacts to LBV, SWFL, or cuckoo are anticipated as a result of construction of the project; therefore, mitigation for these species is not required. The project is consistent with Section 6.1.2 in the MSHCP.

6.4.5 Other Section 6.1.2 Species

Methods

A literature review was conducted for all special-status plant and wildlife species recorded within 10 miles of the project site based on databases from CDFW's CNDDDB and USFWS's IPaC. A determination of the potential to occur within the BSA was made for all special-status species in the literature review. UltraSystems biologists conducted a pedestrian survey of all accessible areas of the BSA and a binocular survey of all inaccessible areas (i.e., fenced areas, areas with locked gate entrances, and all private property and other areas with restrictions to public access). During the survey, biologists recorded all plant and wildlife species that were observed. Refer to **Appendix E, *Plant and Wildlife Species Observed During Surveys*** for a list of all plant and wildlife species observed during the habitat assessment survey and subsequent surveys.

Existing Conditions and Results

The existing conditions in the BSA were evaluated. It was determined that the species listed in Section 6.1.2 in the MSHCP have no potential to occur or are not expected to occur, with the exception of spreading navarretia which was determined by the literature search to have a low potential to occur on the project site (see **Table 5.5-1** and **Table 5.6-1**).

Impacts

Development of the project would have less than significant impacts to Other Section 6.1.2 Species. Therefore, the project is consistent with Section 6.1.2 in the MSHCP.

Mitigation

Because no significant impacts are anticipated to other Section 6.1.2 species, no mitigation for project impacts to these species is required.

6.5 Protection of Narrow Endemic Plant Species (Section 6.1.3)

Based on a review of the RCA MSHCP Information Map Report, it was determined that the BSA is not located in a Narrow Endemic Plant Species Survey Area (RCA, 2021). Nevertheless, a literature

review was conducted to determine if any narrow endemic plant species or other special-status plant species have the potential to occur in the BSA (see **Section 4.1.3** for detailed literature review methods). The results of that review indicate that the project site does contain suitable habitat to support vernal pool-associated Narrow Endemic Plant Species due to the fact that there is a vernal pool complex on the project site (see **Table 5.5-2**), however none of these species were observed during the surveys. There is only low-quality suitable habitat for these species because the project site undergoes frequent disturbances including compaction resulting from vehicle use over the site. A general plant survey was conducted on September 21, 2021 and the UltraSystems biologist did not identify any Narrow Endemic species or other rare plant species within the BSA (see **Section 4.2.5** for detailed methods of these surveys and **Section 5.5.1** for results of the plant surveys). Therefore, no impacts to Narrow Endemic Plant Species are anticipated as a result of the project; the project is consistent with Section 6.1.3 in the MSHCP.

6.6 Additional Survey Needs and Procedures (Section 6.3.2)

The RCA MSHCP Information Map Report and the RCA MSHCP Information Map did not indicate that the BSA is within an area that requires further study for narrow endemic plant species, MSHCP Criteria Area species, BUOW, Amphibian Species or Mammal Species Survey Areas, or special linkage areas (RCA, 2021; RCA, 2022b). Therefore, the project is consistent with Section 6.3.2 in the MSHCP.

6.6.1 Criteria Area Plant Species

None of the APNs within the project boundary fall within a Criteria Area, therefore, a survey of Criteria Area plant species is not required.

6.6.2 Amphibians

None of the APNs within the project boundary fall within an amphibian survey area, therefore, a survey is not required. Therefore, the project is consistent with Section 6.1.3 in the MSHCP.

6.6.3 Burrowing Owl

None of the APNs within the project boundary fall within a BUOW survey area, therefore, a BUOW habitat assessment is not required. No BUOW, BUOW sign, or suitable BUOW burrows were observed onsite during the reconnaissance-level biological survey. Therefore, the project is consistent with Section 6.3.2 in the MSHCP.

6.6.4 Mammals

None of the APNs within the project boundary fall within a mammal survey area, therefore, a mammal survey is not required. Therefore, the project is consistent with Section 6.3.2 in the MSHCP.

6.7 Information on Other Species

6.7.1 Delhi Sands Flower Loving Fly

UltraSystems conducted a habitat assessment within the BSA and reviewed soil maps for the project site. It was determined that the BSA does not contain suitable soils (Delhi sands) or vegetation habitats to support the Delhi Sands flower-loving fly (DSFLF; *Rhaphiomidas terminatus abdominalis*).

Consistent with the MSHCP, focused DSFLF surveys were not conducted or required. Therefore, this project is consistent with Section 6.7 in the MSHCP.

6.7.2 Species Not Adequately Conserved

118 species are considered to be adequately conserved. The remaining 28 Covered Species would be considered to be adequately conserved when certain conservation requirements are met as identified in the species-specific conservation objectives for those species. For 16 of the 28 species, particular species-specific conservation objectives, which are identified in Table 9-3 of the MSHCP, must be satisfied to shift those particular species to the list of Covered Species Adequately Conserved. No Species Not Adequately Conserved were considered to have a potential to occur in the BSA (MSHCP Vol. 1 Sec. 9.0). Therefore, this project is consistent with Section 9.2 in the MSHCP.

6.8 Guidelines Pertaining to the Urban/Wildlands Interface Guidelines (Section 6.1.4)

Section 6.1.4 of the MSHCP discusses guidelines to address indirect effects associated with locating development in proximity to the MSHCP Conservation Area. These guidelines specifically apply to any review of development projects adjoining MSHCP Conservation Area(s). The wildland-urban interface is defined as a zone (less than 100 feet) between urban development and natural open space. Guidelines to take into consideration for wildland-urban interface include drainage, toxics, lighting, noise, invasive, barriers, and grading/land development. The BSA is not located in the vicinity of a Conservation Area; therefore, the Urban/Wildlands guidelines do not need to be adhered to for construction of the project.

The closest MSHCP Linkage is Proposed Constrained Linkage 7, which is approximately 8 miles south west of the BSA; however, because the area in between the Linkage and the BSA is heavily urbanized, no impacts would occur to the conservation easement nor would stormwater generated on the project site discharge onto this conservation easement.

In conclusion, because the land immediately surrounding the site is urban/residential, the potential to affect MSHCP Conservation Areas by way of drainage, toxics, lighting, noise, invasive, barriers, and grading/land development is considered low. Therefore, the project is consistent with Section 6.1.4 in the MSHCP.

6.9 Best Management Practices (Volume I, Appendix C)

The project proponent would comply with the MSHCP Appendix C, Standard Best Management Practices. Refer to **Section 8.0** for a list of all of the biological mitigation measures that would be implemented in this project. All of the requirements of the BMPs described in the MSHCP Appendix C, Standard Best Management Practices, are covered by and incorporated into the various mitigation measures in Section 8.0.

Memorandum of Understanding

The MSHCP requires that a Biological Assessment be prepared by a biologist who holds a Memorandum of Understanding (MOU) on file with the County. UltraSystems holds a MOU with the County and UltraSystems biologists prepared this BRE pursuant to the MSHCP requirements.

7.0 POTENTIAL IMPACTS

This section discusses potential significant effects or impacts, if any, to the environmental baseline and sensitive biological resources that could result from project construction and development. This is an important step in the CEQA process. Biological resources may be either directly or indirectly impacted by a project (defined by CEQA Guidelines § 15358). Direct and indirect impacts may be either permanent or temporary in nature. These impact categories are defined below.

- **Direct impact:** Direct impacts are those that may cause an immediate effect on the species or its habitat and occur at the same time and place. Any loss, alteration, disturbance or destruction of biological resources that could result from project-related activities is a direct impact. Examples include vegetation clearing and loss of habitat, encroaching into wetlands, diverting natural surface water flows, and the loss of individual species.
- **Indirect impact:** As a result of project-related activities, biological resources may also be affected in a manner that is not direct. Indirect impacts are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect or secondary effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. Indirect impacts can affect biological resources within the project site, adjacent to the project site, or away from the project site. Examples of indirect impacts include increased human activity, elevated noise, light, and dust levels, decreased water quality, soil compaction, erosion created by the removal of vegetation, and the introduction of invasive plants and unnatural predators. Indirect impacts may be both short term and long-term in their extent. Indirect impacts are also referred to as “edge effects.”
- **Permanent impacts (long term):** All impacts that result in the long-term or irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources. Permanent impacts cannot be mitigated in-place.
- **Temporary impacts (short term):** Impacts considered to have reversible impacts to biological resources can be viewed as temporary. Examples include short-term increased vehicle traffic and noise and the generation of fugitive dust during construction; or removing vegetation and either allowing the natural vegetation to recolonize or actively revegetating the impact area. Temporary impacts can be reversed with the implementation of in-place mitigation measures.

7.1 Thresholds of Significance

This section describes the significance criteria used for determining impacts to biological resources. As mentioned in the CEQA Guidelines (§ 15064.7[a]), each public agency is encouraged to develop and publish thresholds of significance (significance criteria) that it uses to determine the significance of environmental impacts. A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental impact, non-compliance with which means the impact would normally be determined to be significant by the agency and compliance with which means the impact normally would be determined to be less than significant.

Significance criteria serve as benchmarks for determining if a project would result in a significant adverse environmental impact when evaluated against the baseline. CEQA Guidelines § 15065(a) states that a project may have a significant impact on the environment if the project has the potential to:

- Substantially degrade the quality of the environment,
- Substantially reduce the habitat of a fish or wildlife species,
- Cause a fish or wildlife population to drop below self-sustaining levels,
- Threaten to eliminate a plant or animal community, or
- Substantially reduce the number or restrict the range of an endangered, rare or threatened species.

The Environmental Checklist Form in Appendix G of the CEQA Statute and Guidelines (2014) was reviewed in order to determine the level of significance of project related impacts to biological resources. Under CEQA Guidelines impacts to biological resources are considered potentially significant if one or more of the following thresholds are exceeded with construction and operation of the project.

- Threshold 1:** The project would have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW and USFWS.
- Threshold 2:** The project would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW and USFWS.
- Threshold 3:** The project would have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Threshold 4:** The project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Threshold 5:** The project would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Threshold 6:** The project would conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP.

Significant impacts can be reduced to less than significant levels by incorporating off-setting mitigation measures (BMPs, avoidance and protection measures, and/or mitigation measures). Less than significant impacts are those in which impacts would occur, but are not expected to be substantial. Impacts to biological resources that are considered less than significant include impacts to biological resources that are reasonably widespread or exist in a degraded or disturbed state, rendering them less valuable as habitat to support wildlife diversity or special-status species, or

impacts that do not meet or exceed the significance thresholds defined above. These less than significant impacts do not require mitigation measures.

7.2 Potential Impacts to Plant Communities

7.2.1 Direct Impacts

Direct impacts to plant communities have immediate consequences, such as the changes that occur when land is cleared for permanent development and plant communities are altered or removed during project construction activities. Direct permanent impacts include all areas within the limits of construction in the project footprint. **Table 7.2-1** describes the approximate acreages of each plant community and non-vegetated feature that is anticipated to be directly impacted by project activities. Calculations were based on the currently proposed development design in conjunction with the vegetation map from field surveys and aerial imagery.

**Table 7.2-1
ACREAGE OF ANTICIPATED DIRECT IMPACTS TO LAND COVER TYPES**

Land Cover Type	Acreage Mapped within the BSA	Total Permanent Impact Acreage	Total Temporary Impact Acreage	Total Impact Acreage
Vernal pool complex	0.26	0.26	0	0.26
Developed/disturbed	57.40	8.67	0	8.67
Total Acreage:	57.65	8.92	0	8.92

Development of the project site would result in direct impacts (permanent loss of vegetation) to plant communities and habitats. Direct impacts to wild oats and annual brome grasslands and several non-native trees that occur on the project site are considered less than significant because these habitats are not considered sensitive. Direct impacts to these non-sensitive plant communities do not meet or exceed significance thresholds and are considered less than significant. Mitigation is not required for direct impacts to these communities.

7.2.2 Indirect Impacts

Indirect impacts to plant communities result in secondary consequences and are likely to be temporary. Indirect impacts could occur on plant communities within areas located adjacent to the limits of grading in the project footprint. Examples of indirect, temporary impacts include the effects of airborne fugitive dust and mud splatter created by construction activities. Construction-generated fugitive dust and mud splatter can adversely affect plant communities by settling on plant surfaces and inhibiting metabolic processes such as photosynthesis and respiration. Construction-related erosion, runoff, siltation, sedimentation, soil compaction, and alteration of drainage patterns could affect plants by altering site conditions so that the location in which they are growing becomes unfavorable.

Construction of the project could result in indirect impacts to non-native trees and other vegetation in landscaped areas of residential properties located adjacent to the project work sites. Indirect

impacts to non-native vegetation of the residential/urban/exotic land cover type do not meet or exceed significance thresholds and are considered less than significant.

7.2.3 Mitigation Measures

There are no sensitive plant communities that occur within the BSA. Impacts of construction and project development to sensitive plant communities would be less than significant and no mitigation measures are anticipated for these impacts.

7.2.4 Impact Determination

Significance criterion: *impacts would be considered significant if the project were to have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS.*

No sensitive plant communities occur within or in the immediate vicinity of the BSA; therefore, direct and indirect impacts to sensitive plant communities are not anticipated to occur as a result of construction of the project.

In regard to the significance criterion, the project is anticipated to have no substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS: **No Impact.**

7.3 Potential Impacts to Special-Status Plants

No listed or sensitive plants were observed within the BSA during the field survey. The vernal pool complex on the project site could provide suitable habitat for the vernal-pool-associated plants that are in the plant inventory. The results of that review indicate that the project site does contain suitable habitat to support vernal pool-associated plant species due to the fact that there is a vernal pool complex on the project site, however none of these species were observed during the surveys. There is only low-quality suitable habitat for these species because the project site undergoes frequent disturbances including compaction resulting from vehicle use over the site. A general plant survey was conducted on September 21, 2021 and the UltraSystems biologist did not identify any special-status and/or rare plant species within the BSA (see **Section 4.2.5** for detailed methods of these surveys and **Section 5.5.1** for results of the plant surveys). Therefore, no impacts to Narrow Endemic Plant Species are anticipated as a result of the project; the project is consistent with Section 6.1.3 in the MSHCP.

7.3.1 Direct and Indirect Impacts

No direct or indirect impacts to listed or sensitive plant species are anticipated as a result of construction of the project.

7.3.2 Mitigation Measures

Listed or sensitive plants are not anticipated to be impacted; therefore, no mitigation measures are required.

7.3.3 Impact Determination

Significance criterion: *impacts would be considered significant if the project were to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.*

The literature review and field survey determined that the BSA is not likely to contain listed or sensitive plant species; therefore, the project is not anticipated to have direct or indirect impacts to listed or sensitive plants. In regard to the significance criterion, the project is anticipated to have no substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS: **Less Than Significant Impact**.

7.4 Potential Impacts to Special-Status Wildlife

Listed Endangered, Threatened, and Candidate Wildlife

No listed wildlife was observed within the BSA during the general wildlife survey. The results of the literature review and field surveys concluded that there is suitable habitat on the project site for listed fairy shrimp species due to the presence of the vernal pool complex on the project site. These listed fairy shrimps were not observed during the focused fairy shrimp surveys. The majority of the other listed wildlife species in the wildlife inventory, excluding fairy shrimp, were determined to have no potential to occur or are not expected to occur due to lack of suitable biological and physical features that are adequately needed to support them.

Sensitive Wildlife

No sensitive wildlife was observed within the BSA during the general wildlife survey. The results of the literature review and field surveys concluded that there is suitable habitat on the project site for sensitive fairy shrimp species including those addressed under the MSHCP due to the presence of the vernal pool complex on the project site; these species were not observed during the focused surveys. The literature review and field survey concluded that a majority of the other sensitive species in the wildlife inventory, excluding fairy shrimp, were determined to have no potential to occur, are not expected to occur, or only have a low potential to occur due to a lack of suitable biological and physical features that are adequately needed to support them.

One California horned lark (*Eremophila alpestris actia*) was observed during the September 21, 2021 survey, but because the individual only landed briefly and did not exhibit nesting or foraging behaviors, it was determined to be a flyover/transient and not an onsite occurrence. California horned lark is on the MSHCP list of Covered Species Adequately Conserved.

7.4.1 Direct Impacts

Potential direct impacts to common and special-status wildlife occupying the project site could occur from construction related mortality, injury, or harassment of individuals as a result of permanent development of the project site and from the removal and direct loss of breeding, foraging, and/or sheltering habitat. These impacts could be considered significant and potentially significant. Project development could diminish the habitat available for common and special-status wildlife species

from utilizing the onsite habitat. Direct permanent impacts include all areas within the limits of grading in the project footprint.

Ground disturbing and habitat altering activities could involve significant disturbance to common and special-status ground-dwelling animals or nesting birds. Examples include grading, clearing, ripping, grubbing, excavation, trenching, paving, mowing, heavy equipment compacting, driving over habitat to access the construction work sites, vegetation management activities, and use of herbicides and pesticides. Direct impacts to less mobile fossorial (burrowing) animals that are underground during most of the day or year (e.g., small mammals or lizards) or have a life stage in the soil or on plants (e.g., amphibians, nesting birds, insects) could occur from encounters with vehicles or heavy equipment as many of these animals do not run away from construction vehicles/equipment and would most likely be killed. These species could be expected to experience direct mortality, injury, harassment, and displacement from increased human activity and vehicle/equipment travel if they are present onsite within the project footprint at the time of construction. Individual losses are more likely, especially during clearing and grubbing activities. Individuals could also be injured, disturbed, or killed from encounters with workers' or visitors' pets. Birds and bats could be injured or killed from collisions with transmission lines and wind turbines structures. Birds and bats could be injured or killed from electrocution from electric lines and structures. The loss of these animals could also affect other common and special-status wildlife that depend on them as prey. Construction related direct impacts are considered a significant impact.

The BSA also supports a small number of trees and other physical features that could potentially provide foraging, nesting, and cover habitat to support a diverse assortment of special-status bird species (year-round residents, seasonal residents, and migrants). It is unlawful to take special-status birds, and their nests, eggs, and young. Activities which are most likely to result in take of migratory birds during the breeding bird season when eggs or young are likely to be present include, but are not limited to clearing or grubbing of bird nesting habitat, tree removal, or structure demolition. The project has a potential to directly take individual breeding birds, their nests, young, or eggs.

Listed Endangered, Threatened, and Candidate Wildlife

There were no listed endangered, threatened, or candidate wildlife observed during any of the surveys. Listed wildlife are anticipated to be impacted to a less than significant degree; therefore, no mitigation measures are required.

Sensitive Wildlife

Sixteen sensitive wildlife species have at least a low potential to occur on the project site and could be impacted by construction of the project. Low-quality foraging and/or nesting habitat occurs on the project site for some tree and ground-nesting birds species including California horned lark and Cooper's hawk. However, it is not anticipated that project activities would directly impact these species because they were determined to have no more than a low potential to occur and were not observed during any of the field surveys.

Several small burrows were observed throughout the project site; However, it is not anticipated that the project site supports sensitive fossorial wildlife species such as San Bernardino kangaroo rat, Los Angeles pocket mouse, Stephen's kangaroo rat, southwestern San Diego pocket mouse, and San Diego kangaroo rat. These species typically must utilize shrub cover for protection from predators such as raptors. The lack of dense vegetative cover and highly compact soils limits areas for burrows and foraging. Lastly, no sensitive wildlife was detected during any of the surveys (see **Appendix E Plant**

and Wildlife Species Observed During Surveys). The project is not anticipated to directly impact sensitive wildlife.

7.4.2 Indirect Impacts

Indirect impacts could occur within areas located adjacent to the limits of construction in the project footprint. Indirect impacts are more subtle than direct ones. Impacts may either be short-term related to construction or long-term and may affect populations and habitat quality over an extended period of time, long after construction activities have been completed. Examples of indirect impacts, such as mortality, injury, or harassment of common and special-status wildlife species that could potentially occur from the project include the following.

- The permanent loss of habitat and physical features that would occur from clearing and grading could indirectly impact wildlife species through the loss of foraging, roosting, denning, and/or breeding habitat available. Habitat loss could displace species from existing territories and reduce the home range of those species and impact nearby populations of similar species. Displaced species would then have to compete for and/or find new territories and compete for food with resident species. This could result in delayed nest building, fewer nest attempts, reduced clutch size, and an overall reduction in reproductive output.
- Project construction could result in temporary increased ambient noise levels, dust, vibration, lighting and/or human intrusion in and near habitat. This could disrupt natural foraging, roosting, denning, and/or breeding behavior of wildlife species. Wildlife species stressed by these factors may disperse from habitat in the project site and project vicinity. In addition, increased noise levels could interfere with territorial and mating vocalizations, thereby interfering with wildlife reproduction.
- Project construction could increase fugitive dust, pollution, runoff, siltation, sedimentation, and erosion. This could result in degradation and alteration of habitat and soils. Consequently, the ability of onsite and adjacent plant communities to support wildlife populations may decrease.
- Nighttime construction work and use of artificial lighting could disrupt natural foraging and breeding behaviors and/or alter wildlife movement patterns and migratory routes of nocturnally active species such as mammals and snakes. Most animals would attempt to avoid moving in or near the lighting; however, some animals such as insects, migratory birds, and bats might be attracted to the lighting, increasing construction-related mortalities. Artificial lighting could also indirectly affect wildlife by increasing detection by predators. The new development could also provide an increase in artificial lighting and glare which could disrupt nocturnal wildlife behavior.
- An increase and continuation of human activities within and adjacent to the project site could lead to mortality, injury, or harassment of wildlife species by providing food in the form of trash and litter or water which attracts predators such as the common raven (*Corvus corax*), northern raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), and coyote.

Listed Endangered, Threatened, and Candidate Wildlife

No indirect impacts to endangered, threatened, or candidate wildlife species are anticipated as a result of construction of the project.

Sensitive Wildlife

There are potential indirect impacts of construction of the project on foraging and/or nesting behavior of sensitive wildlife species that have a potential to occur throughout the BSA such as Cooper's hawks, California glossy snake, Stephen's kangaroo rat, Los Angeles pocket mouse, San Diego kangaroo rat, northwestern San Diego pocket mouse, and San Bernardino kangaroo rat. These species would lose foraging habitat as a result of construction of the project. However, all of these species are highly mobile and have access to suitable foraging habitat near the site and thus neither species would experience significant impacts from this loss of foraging habitat.

Indirect impacts to wildlife would occur as a result of the loss of onsite vegetated areas, which support prey species such as small birds and mammals. Ample suitable breeding and foraging habitat are present in the project vicinity. An indirect impact would be noise and dust generated by construction activities would indirectly impact its foraging and nesting behavior. In addition, contact with toxic chemicals such as oil or gas that leak from machinery and which could contaminate soil surfaces or temporary onsite water sources may indirectly impact wildlife species. Wildlife species could come into contact with these contaminated soils or waters either through direct contact or by consumption of prey species that have contacted contaminated soils or waters. The potential indirect impacts to sensitive wildlife species as a result of construction of the project are anticipated to be less than significant.

7.4.3 Mitigation Measures

Listed Endangered, Threatened, and Candidate Wildlife

Listed wildlife are anticipated to be impacted to a less than significant degree; therefore, no mitigation measures are required.

Sensitive Wildlife

Sensitive wildlife are anticipated to be impacted to a less than significant degree; therefore, no mitigation measures are required. Impact Determination

Significance criterion: *impacts would be considered significant if the project were to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.*

Listed Endangered, Threatened, and Candidate Wildlife

The project is not anticipated to have direct or indirect impacts to listed wildlife. In regard to the significance criterion, the project is anticipated to have no substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS: **Less Than Significant Impact**

Sensitive Wildlife

Project construction is not expected to cause impacts to bird species that only forage at the site or occur as transient visitors. Direct and indirect impacts to breeding birds, their nests, young, or eggs are not anticipated to occur as a result of construction of the project. The minor reduction of suitable

nesting habitat; the nature of the disturbance; and the availability of other habitat within the immediate project vicinity, the potential impacts to breeding birds, their nests, young, or eggs would likely be less than significant: **Less than Significant Impact**.

7.5 Potential Impacts to Breeding Birds

The BSA supports small trees, tree resprouts, tree saplings and shrub vegetation, or other physical features that could potentially provide foraging, nesting, and cover habitat to support a diverse assortment of bird species (year-round residents, seasonal residents, and migrants). A majority of the birds observed during the field surveys and those birds that could potentially breed within the BSA are protected by the MBTA and Fish and Game Code § 3503, § 3503.5, and § 3513. The statutes make it unlawful to take native breeding birds, and their nests, eggs, and young.

7.5.1 Direct Impacts

Activities which are most likely to result in take of migratory birds during the breeding bird season when eggs or young are likely to be present include, but are not limited to, clearing or grubbing of bird nesting habitat; structure demolition; or vegetation trimming or clearing. The project has a potential to directly take individual breeding birds, their nests, young, or eggs; during excavation and other ground-disturbing activities.

The native mulefat (*Baccharis salicifolia*) and willows (*Salix* spp.) on the project site provide some suitable nesting habitat for several tree-nesting bird species addressed under the MBTA, such as those routinely observed during the several surveys. The removal of the existing onsite trees would cause the destruction of any nests within those trees. In addition, the project site provides low-quality suitable habitat for ground-nesting birds, as horned lark (*Eremophila alpestris*) was observed on the project site. This observation indicates that the project area provides some suitable habitat for ground-nesting birds. The project site could potentially offer nesting habitat to tree and ground-nesting native birds protected under the MBTA such as those observed during surveys (see **Appendix E Plant and Wildlife Species Observed During Surveys**). To mitigate impacts to these MBTA birds, a pre-construction breeding bird survey (**BIO-4**) is recommended.

7.5.2 Indirect Impacts

Indirect impacts to breeding birds could occur from increased noise, vibration, lighting and dust during construction, which could adversely affect the breeding behavior of some birds and lead to the loss (take) of eggs and chicks, or nest abandonment. The project has a low potential to indirectly affect individual breeding birds, their nests, young, or eggs; therefore, mitigation is required.

7.5.3 Mitigation Measures

Implementing the recommended mitigation measures **BIO-4**, which requires that pre-construction breeding bird survey is conducted would help to avoid, eliminate or reduce potential impacts to breeding birds, their nests, young, or eggs.

7.5.4 Impact Determination

Project construction is not expected to cause impacts to bird species that only forage at the site or occur as transient visitors. Direct and indirect impacts to breeding birds, their nests, young, or eggs could potentially occur as a result of construction of the project. Development of the project would remove all onsite vegetation and all soils would be completely disturbed and covered with pavement.

Implementing the recommended mitigation measures BIO-4 described in **Section 8.0** would help to avoid, eliminate or reduce significant impacts to breeding birds, their nests, young, or eggs to less than significant levels; therefore, it is anticipated that the project may impact breeding birds, their nests, young, or eggs, but the impacts would not be significant: **Less than Significant Impact with Mitigation Incorporated.**

7.6 Potential Impacts to Waters of the U.S. or State (Jurisdictional Waters/Wetlands)

This section discusses potential significant effects or impacts, if any, to jurisdictional wetlands, waters, water quality, water quantity, and aquatic/riparian habitats that could result from project development. Biological resources may be either “directly” or “indirectly” impacted by a project (defined by CEQA Guidelines § 15358). Direct and indirect impacts may be either “permanent” or “temporary” in nature. These impact categories are defined below.

- **Direct impact:** Direct impacts caused by the project are impacts that may cause an immediate effect on jurisdictional wetlands, waters, water quality, water quantity, and aquatic/riparian habitats and occur at the same time and place. Any loss, alteration, disturbance or destruction of biological resources that would result from project-related activities is a direct impact. Examples include vegetation clearing, encroaching into wetlands, diverting natural surface water flows, and the loss of habitat. Direct impacts are long-term.
- **Indirect impact:** As a result of project-related activities, jurisdictional wetlands, waters, water quality, water quantity, and aquatic/riparian habitats may also be affected in a manner that is not direct. Indirect impacts caused by the project occur later in time or farther removed in distance, but are still reasonably foreseeable. Indirect or secondary effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. Examples of indirect impacts include increased human activity, elevated dust levels, decreased water quality, soil compaction, erosion created by the removal of vegetation, and the introduction of invasive plants. These indirect impacts may be both short term and long-term in their extent.
- **Permanent impacts:** All impacts that result in the long-term or irreversible removal of jurisdictional resources are considered permanent. Examples include constructing a building or permanent road on an area containing jurisdictional areas.
- **Temporary impacts:** Any impacts considered to have reversible effects on jurisdictional resources can be viewed as temporary. Examples include short-term increased vehicle traffic and the generation of fugitive dust during construction; or removing vegetation and either allowing the natural vegetation to recolonize or actively revegetating the impact area.

All impacts (permanent) to jurisdictional waters are considered significant due to regulation by those agencies. Impacts are regulated by the resource agencies and would necessitate permits.

7.6.1 Direct Impacts

Direct impacts to jurisdictional wetlands, waters, water quality, water quantity, and aquatic/riparian habitats have immediate consequences, such as the changes that occur when land is cleared for permanent development and jurisdictional waters are altered or filled in during project construction activities. Examples of potential direct impacts which could destroy or significantly impact

jurisdictional waters include any ground-disturbing activities, such as grading, clearing, ripping, grubbing, excavation, trenching, paving, or heavy equipment compacting that would remove or alter jurisdictional waters permanently. Other examples of potential direct impacts to jurisdictional waters include filling of onsite drainages, stockpiling, channelization, bank stabilization, road crossings, or any other permanent drainage modification.

There are jurisdictional waters of the State on the project site (see **Appendix D** *Jurisdictional Delineation Report*). The project construction would result in the jurisdictional vernal pools being filled, and therefore there are direct permanent impacts associated with this project.

7.6.2 Indirect Impacts

Indirect impacts to jurisdictional wetlands, waters, water quality, water quantity, and aquatic/riparian habitats result in secondary consequences and are likely to be temporary during construction, but they could also be long-term as a result of impervious surfaces and permanent development. Indirect impacts from project implementation are not anticipated to occur, as any water from the washing of trucks at the facility would be redirected into the appropriate drainage system.

7.6.3 Mitigation Measures

The project is anticipated to permanently impact the following:

- RWQCB waters of the State (wetlands/vernal pools): 0.26 acre (11,097 square feet).
- EPD MSHCP wetland (vernal pools): 0.26 acre (11,097 square feet).

To offset permanent impacts to waters of the State, the applicant proposes to implement mitigation measure **BIO-5.0**, which would compensate through one or more of the following methods: (1) offsite compensatory mitigation lands (at a ratio of 3:1); (2) contribution to a mitigation bank or in-lieu fee program as necessary to fund replacement, restoration and conservation of equivalent habitat outside the project site at a ratio of 3:1 and as approved by the Riverside County Environmental Programs Department (EPD).

7.6.4 Impact Determination

In regard to the significance criterion for jurisdictional riparian areas, the project is anticipated to have no impacts on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS: **No Impact**.

In regard to the significance criterion for federally defined wetlands, the project is anticipated to have no substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. The onsite isolated vernal pools have no connectivity to federally protected waters: **No Impact**.

In regard to the significance criterion for state defined wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.), the project is anticipated to have substantial adverse effect on state protected wetlands through direct removal, filling, hydrological interruption, or other means. There are onsite isolated vernal pools that would be directly impacted by development of the project and implementing mitigation measure BIO-5 would reduce impacts to waters of the State to a less than significant level: **Less Than Significant With Mitigation Incorporated**.

7.7 Potential Impacts to Critical Habitat

The literature review determined that the project site is not located within a designated or proposed critical habitat for listed plant or wildlife species.

7.7.1 Direct and Indirect Impacts

No direct or indirect impacts to critical habitat are anticipated as a result of construction of the project.

7.7.2 Mitigation Measures

Critical habitats are not anticipated to be impacted; therefore, no mitigation measures are required.

7.7.3 Impact Determination

The project is not anticipated to have direct or indirect impacts to critical habitat and it is anticipated that the project would not adversely modify designated or proposed critical habitat. **No Impact.**

7.8 Potential Impacts to Wildlife Movement or Native Wildlife Nursery Sites

The literature review and field surveys determined that the project site does not contain wildlife corridors or native wildlife nursery sites.

7.8.1 Direct and Indirect Impacts

No direct or indirect impacts to wildlife corridors or native wildlife nursery sites are anticipated as a result of construction of the project.

7.8.2 Mitigation Measures

Wildlife corridors and native wildlife nursery sites are not anticipated to be impacted; therefore, no mitigation measures are required.

7.8.3 Impact Determination

Significance criterion: *impacts would be considered significant if the project were to interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors.*

The literature review and field surveys determined that the project site does not contain wildlife corridors or native wildlife nursery sites; therefore, the project is not anticipated to have direct or indirect on wildlife corridors. In addition, the project site does not support resident or migratory fish species. In regard to the significance criterion, the project is not anticipated to interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors: **No Impact.**

7.9 Potential Impacts to Local Policies or Ordinances

The literature review and field surveys determined that the project site does not impact any local policies in the County of Riverside or the City of Moreno Valley, excluding those covered by the

MSHCP which are later discussed in **Section 7.10**. There are a few small trees, tree resprouts, tree saplings and shrubs onsite, but none of these trees meet the City's definition of heritage trees or otherwise protected trees.

7.9.1 Direct and Indirect Impacts

No direct or indirect impacts to local policies or ordinances other than those covered by the MSHCP are anticipated as a result of construction of the project.

7.9.2 Mitigation Measures

Local policies and ordinances excluding those covered by the MSHCP are not anticipated to be impacted; therefore, no mitigation measures are required.

7.9.3 Impact Determination

Significance criterion: *impacts would be considered significant if the project were to conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

The literature review and field surveys determined that the project is not anticipated to have direct or indirect on local policies or ordinances other than those covered by the MSHCP, which are later discussed in **Section 7.1.0: No Impact**.

7.10 Potential Impacts to HCPs or NCCPs

The literature review determined that the project site is located within the MSHCP.

MSHCP Compliance

The project site is located within the MSHCP boundary. Please refer to **Section 6.0** for a discussion of project consistency with the MSHCP.

The MSHCP Conservation Area is comprised of a variety of existing and proposed Cores, Extensions of Existing Cores, Linkages, Constrained Linkages, and Non-contiguous Habitat Blocks. These features are generally called "Cores and Linkages" (MSHCP Section 3.2.3). The project site is not located within an existing or proposed Core or Linkage.

In the project's MSHCP consistency analysis, a review of all of the potential impacts to biological resources protected by the MSHCP was assessed. Wildlife species and vernal pools are the resources that would potentially be impacted by construction of the project.

Based on the results of a literature search and a general wildlife survey, UltraSystems biologists determined that construction of the project would potentially impact some special-status wildlife species to a less than significant degree, as discussed in **Section 5.6** of this BRE.

Although the primary biological resources that would potentially be impacted by construction of the project are wildlife species, there are other resources that may be impacted by the project. To comply with MSHCP requirements, various BMPs and other mitigation measures would be implemented so that impacts to biological resources covered by the MSHCP would be less than significant.

7.10.1 Mitigation Measures

With the implementation of mitigation measures **BIO-1** through **BIO-4**, impacts to MSHCP-covered wildlife species and other MSHCP covered resources would be less than significant.

7.10.2 Impact Determination

Significance criterion: *impacts would be considered significant if the project were to conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP.*

As described in **Section 6.0**, the project is consistent with the MSHCP with inclusion of the recommended mitigation measures **BIO-1 – BIO-4**. As such, the project would not conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state HCP: **Less than Significant Impact with Mitigation Incorporated.**

8.0 MITIGATION MEASURES

CEQA states that “mitigation measures are not required for effects which are not found to be significant” [§ 15126.4(a)(3)]. Therefore, no mitigation measures are proposed for impacts on biological resources that are less than significant. However; if significant impacts on biological resources are identified, then possible mitigation measures are recommended to avoid, eliminate or reduce the level of the impacts to less than significant levels. There are several forms of mitigation. Under CEQA (§ 15370), “mitigation” includes all of the following:

- “Avoiding” the impact altogether by not taking a certain action or parts of an action.
- “Minimizing” impacts by limiting the degree or magnitude of the action and its implementation.
- “Rectifying” the impact by repairing, rehabilitating, or restoring the impacted environment.
- “Reducing” or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- “Compensating” for the impact by replacing or providing substitute resources or environments.

The following mitigation measures would help to avoid, eliminate or reduce direct or indirect impacts on biological resources to less than significant levels and to comply with all appropriate environmental laws, ordinances, policies, regulations, and management plans.

8.11 BIO-1: Biological Monitor

As per the MSHCP requirements stated in Volume 1, Appendix C of the MSHCP, A qualified project biologist shall monitor construction activities for the duration of the project to ensure that practicable measures are being employed to avoid incidental disturbance of habitat and species of concern outside the project footprint (Dudek and Associates, 2003).

A biological monitor shall monitor activities that result in tree or vegetation removal to minimize the likelihood of inadvertent impacts to nesting birds and special-status wildlife species, with special attention given to any protected species observed during the pre-construction breeding bird surveys. Monitoring shall also be conducted periodically during construction activities to ensure no new nests are built during any vegetation removal or building demolition activities between February 1 and August 31. The biological monitor shall ensure that all BMPs, avoidance, protection and mitigation measures described in the relevant project permits and reports are in place and are adhered to.

The biological monitor shall have the authority to temporarily halt all construction activities and all non-emergency actions if sensitive species and/or nesting birds are identified and would be directly affected. The monitor shall notify the appropriate resource agency and consult if needed. If necessary, the biological monitor shall relocate the individual outside of the work area where it would not be harmed. Work can continue at the location if the applicant and the consulted resource agency determine that the activity would not result in adverse effects to the species.

The appropriate agencies shall be notified if a dead or injured protected species is located within the project site. Written notification shall be made within 15 days of the date and time of the finding or

incident (if known) and must include; location of the carcass, a photograph, cause of death (if known), and other pertinent information.

8.12 BIO-2: Construction Best Management Practices

Project work crews would be directed to use BMPs where applicable. These measures would be identified prior to construction and incorporated into the construction operations.

Implementation of this mitigation measure would help to avoid, eliminate or reduce impacts on sensitive or common biological resources, such as special-status terrestrial wildlife species, to less than significant levels. Standard BMPs as outlined in the MSHCP (MSHCP, Volume 1, Appendix C) and that apply to construction of this project, and that are not incorporated to other mitigation measures proposed for this project are as follows:

- Water pollution and erosion control plans shall be developed and implemented in accordance with RWQCB requirements.
- Equipment storage, fueling, and staging areas shall be located on upland sites with minimal risks of direct drainage into riparian areas or other sensitive habitats. These designated areas shall be located in such a manner as to prevent any runoff from entering sensitive habitat. Necessary precautions shall be taken to prevent the release of cement or other toxic substances into surface waters. Project related spills of hazardous materials shall be reported to appropriate entities including but not limited to applicable jurisdictional city, USFWS, RWQCB or MSHCP areas and shall be cleaned up immediately and contaminated soils removed to approved disposal areas.
- The Permittee shall have the right to access and inspect any sites of approved projects including any restoration/enhancement area for compliance with project approval conditions including these BMPs.

8.13 BIO-3: Pre-Construction Breeding Bird Survey

To be in compliance with the MBTA and Fish and Game Code, and to avoid impacts or take of migratory non-game breeding birds, their nests, young, and eggs, the following measures would be implemented. The measures below would help to reduce direct and indirect impacts caused by construction on migratory non-game breeding birds to less than significant levels.

- Project activities that would remove or disturb potential nest sites, such as open ground, trees, shrubs, grasses, or burrows, during the breeding season would be a potential significant impact if migratory non-game breeding birds are present. Project activities that would remove or disturb potential nest sites would be scheduled outside the breeding bird season to avoid potential direct impacts on migratory non-game breeding birds protected by the MBTA and Fish and Game Code. The breeding bird nesting season is typically from February 15 through September 15, but can vary slightly from year to year, usually depending on weather conditions. Removing all physical features that could potentially serve as nest sites would also help to prevent birds from nesting within the project site during the breeding season and during construction activities.
- If project activities cannot be avoided during February 15 through September 15, a qualified biologist would conduct a pre-construction breeding bird survey for breeding birds and

active nests or potential nesting sites within the limits of project disturbance. The survey would be conducted at least seven days prior to the onset of scheduled activities, such as mobilization and staging. It would end no more than three days prior to vegetation, substrate, and structure removal and/or disturbance.

- If no breeding birds or active nests are observed during the pre-construction survey or they are observed and would not be impacted, project activities may begin and no further mitigation would be required.
- If a breeding bird territory or an active bird nest is located during the pre-construction survey and would potentially be impacted, the site would be mapped on engineering drawings and a no activity buffer zone would be marked (fencing, stakes, flagging, orange snow fencing, etc.) a minimum of 100 feet in all directions or 500 feet in all directions for listed bird species and all raptors. The biologist would determine the appropriate buffer size based on the type of activities planned near the nest and the type of bird that created the nest. Some bird species are more tolerant than others of noise and activities occurring near their nest. This no-activity buffer zone would not be disturbed until a qualified biologist has determined that the nest is inactive, the young have fledged, the young are no longer being fed by the parents, the young have left the area, or the young would no longer be impacted by project activities. Periodic monitoring by a biologist would be performed to determine when nesting is complete. Once the nesting cycle has finished, project activities may begin within the buffer zone.
- If listed bird species are observed within the project site during the pre-construction survey, the biologist would immediately map the area and notify the appropriate resource agency to determine suitable protection measures and/or mitigation measures and to determine if additional surveys or focused protocol surveys are necessary. Project activities may begin within the area only when concurrence is received from the appropriate resource agency.
- Birds or their active nests would not be disturbed, captured, handled or moved. Active nests cannot be removed or disturbed; however, nests can be removed or disturbed if determined inactive by a qualified biologist.

8.14 BIO-4: Mitigation for Loss of Waters of the State (RWQCB)

According to the definition in SWRCB's Resolution No. 2021-0012 (Procedures), the project site contains waters of the State, and these waters would be unavoidably permanently impacted by the project (0.26 acres); moreover, the SWRCB's Resolution No. 2019-0015 grants the RWQCB the authority to require compliance with its procedures for discharges of dredge or fill material to waters of the State. Dischargers into waters of the State, such as the project proponent, must obtain a Waste Discharge Requirement (WDR) or a waiver of a WDR from the RWQCB to ensure that the discharge does not violate state water quality standards or any other appropriate requirement of State law.

The project proponent would consult with the RWQCB, to determine appropriate mitigation to compensate for the loss of waters of the State.

9.0 POTENTIAL FEDERAL, STATE, AND LOCAL BIOLOGICAL PERMITS AND APPROVALS

There are no sensitive habitats or resident special-status species on the project site, and therefore it is not required to acquire permits for impacts to such resources.

As vernal pools have been identified onsite, it is necessary to submit a Determination of Biological Equivalent or Superior Preservation (DBESP) and it may be necessary to pay fees to the County EPD for impacts to MSHCP-protected resources. In conclusion, no federal, biological permits and approvals are required for this project.

As discussed in this BRE, there are jurisdictional waters of the State that have been identified within the project area. Jurisdictional waters on the project site include RWQCB waters of the State (wetlands/vernal pools) and EPD MSHCP wetland (vernal pools).

To offset permanent impacts to jurisdictional areas, the applicant proposes to compensate through one or more of the following methods: (1) offsite compensatory mitigation lands (at a ratio of 3:1); (2) contribution to a mitigation bank or in-lieu fee program as necessary to fund replacement, restoration and conservation of equivalent habitat outside the project site at a ratio of 3:1 or as approved by the RWQCB and the Riverside County Environmental Programs Department (EPD).

10.0 LITERATURE CITED AND REFERENCES

- AOU (The American Ornithologists' Union). 1998. *The AOU Check-list of North American Birds. 7th Edition*. American Ornithologists' Union, Washington, D.C. 829 pp.
- Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. *The Jepson Manual: Vascular Plants of California*, second edition. University California Press,
- Calflora. 2022. Search for Plants, an online database of California plant species information. Retrieved from: <http://www.calflora.org/>. Accessed on August 2, 2022.
- Cal-IPC (California Invasive Plant Council). 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA. Updated in 2022 on the online version named The Cal-IPC Inventory. Available at <https://www.cal-ipc.org/plants/inventory/>. Last accessed on September 2, 2022.
- Cal-IPC (California Invasive Plant Council), 2022. About the Cal-IPC Inventory. Accessed online at: <https://www.cal-ipc.org/plants/inventory/about-the-inventory/> on September 13, 2022.
- CDFW. 2022a. California Environmental Quality Act (CEQA) website. Retrieved from: <http://www.dfg.ca.gov/habcon/ceqa/>
- CDFW. 2022b. California Endangered Species Act (CESA) website. Retrieved from: <http://www.dfg.ca.gov/habcon/cesa/>
- CDFW. 2022c. Fully Protected Animals website. Retrieved from: <https://wildlife.ca.gov/Conservation/Fully-Protected> Accessed on August 30, 2022.
- CDFW (California Department of Fish and Wildlife). 2022d. California Natural Community List. Retrieved from <https://wildlife.ca.gov/Data/VegCAMP/Natural-Communities>. Accessed on July 3, 2022.
- CDFW (California Department of Fish and Wildlife) 2022e. BIOS Habitat Connectivity Viewer. Accessed at ftp://ftp.dfg.ca.gov/BDB/GIS/BIOS/Habitat_Connectivity/. Accessed on June 20, 2022.
- CDFW (California Department of Fish and Wildlife), 2022f. CDFW California Wildlife Habitat Relationships Life History Accounts and Range Maps. Available at <https://wildlife.ca.gov/Data/CWHR/Life-History-and-Range>. Accessed on May 20, 2022.
- CIMIS (California Irrigation Management Information System). 2021. Daily Reports for Station 44 (University of California, Riverside) from October 1 through October 14, 2021. Available at <https://cimis.water.ca.gov/>. Accessed on October 18, 2021.
- CNDDDB (California Natural Diversity Database). 2022a. RareFind 5 (Internet). California Department of Fish and Wildlife (5.2.14). Accessed on June 20, 2022.
- CNDDDB (California Natural Diversity Database) 2022b. State and Federally Listed Endangered, Threatened, and Rare Plants of California. Last updated July 2022. California Department of

- Fish and Wildlife, Sacramento, CA. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109390> Accessed on July 2, 2022. Accessed on August 30, 2022.
- CNDDDB (California Natural Diversity Database), 2022c. State and Federally Listed Endangered, Threatened Animals of California. State of California, The Natural Resources Agency, Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database, Sacramento, CA. Updated July 2022. Available at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109405> Accessed on July 22, 2022.
- CNDDDB (California Natural Diversity Database), 2022d. Special Animals List . State of California, The Natural Resources Agency, Department of Fish and Wildlife, Biogeographic Data Branch, California Natural Diversity Database, Sacramento, CA. Updated on July 7, 2022. Accessed on June 22, 2022.
- CNDDDB (California Natural Diversity Database), 2022e. Natural Diversity Database. October, Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. Last updated July, 2022.
- CNPS (California Native Plant Society). 2022a. Rare Plant Program. Inventory of Rare and Endangered Plants (online edition, v8-03 0.39). Retrieved from: <http://www.rareplants.cnps.org>. Accessed on August 20, 2022.
- CNPS (California Native Plant Society). 2022b. A Manual of California Vegetation, Online Edition. California Native Plant Society, CA. 1300 pp. Retrieved from: <https://vegetation.cnps.org/> . Accessed on August 20, 2022.
- Curtis, K.E. and R.W. Lichvar. 2010. Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. Wetland Regulatory Assistance Program. Cold Regions Research and Engineering Laboratory. U.S. Army Engineer Research and Development Center, Hanover, New Hampshire.
- Dudek and Associates. 2003. Final MSHCP Volume I: The Plan (Part 1 of 2 [Volume 1, Section 6]). Prepared for: County of Riverside Transportation and Land Management Agency. Approved June 17, 2003. Section 6 Revised April 16, 2021. Available at <https://www.wrc-rca.org/document-library/>. Downloaded on September 8, 2022.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station. Retrieved from: <http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf>
- Eriksen, C. H. and D. Belk. 1999. Fairy Shrimps of California's Puddles, Pools, and Playas. Mad River Press: Eureka, California 196 pp.
- Google Earth Pro. 2022. Version 7.3.4.8248 (July 16, 2021). (Penske Sales, Leasing, and Maintenance Facility Project) Moreno Valley, Riverside County, California. 33°55'01.67" N 117°16'31.64" W. Eye altitude 4,284 feet. Imagery date April, 2020. ©Google 2021. Accessed on September 21, 2021.
- Helm, Brent A. 1998. Biogeography of Eight Large Branchiopods Endemic to California. Available at: <https://vernalpools.ucmerced.edu/sites/vernalpools.ucmerced.edu/files/page/documents>

- /2.6_biogeography_of_eight_large_branchiopods_endemic_to_california_by_brent_p_helm_0.pdf Accessed on September 12, 2022.
- Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California, The Resources Agency, Nongame Heritage Program, California Department of Fish & Game, Sacramento, Calif. 156 pp.
- Jepson Flora Project (eds.), 2022. Jepson eFlora, Available at <http://ucjeps.berkeley.edu/eflora/>. Accessed on August 25, 2022.
- Keeler-Wolf et al. 1998. California vernal pool assessment preliminary report. California Department of Fish and Game, Sacramento, CA.
- Lichvar, R. W and S. M. McColley. 2008. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States: A Delineation Manual. Cold Regions Research and Engineering Laboratory. U.S. Army Engineer Research and Development Center, Hanover, New Hampshire.
- NETROnline. 2022. Historic Aerials (1978a, 1978b, and 2005). Available at <https://www.historicaerials.com/viewer>. Accessed on October 15, 2021.
- RCA (Western Riverside County – Regional Conservation Authority). 2021. RCA MSHCP Information Map Report. RCA MSHCP Information Map. Retrieved from <https://wrcrca.maps.arcgis.com/apps/webappviewer/>. Accessed on October 6, 2021.
- RCA (Western Riverside County – Regional Conservation Authority). 2022a. Habitat Conservation Web Page. Retrieved from <https://www.wrc-rca.org/habitat-conservation/>. Accessed on August 12, 2022.
- RCA (Western Riverside County – Regional Conservation Authority). 2022b. RCA MSHCP Information Map. Retrieved from <https://wrcrca.maps.arcgis.com/apps/webappviewer/>. Last accessed on August 12, 2022.
- RCTLMA. 2006. Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan Area. March 29, 2006. Environmental Programs Department
- RWQCB (Regional Water Quality Control Board. 2019. Santa Ana River Basin Plan. Available at: https://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/
- Sawyer, J.O., T. Keeler-Wolf, J.M. Evens. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society Press. Sacramento, CA.
- Soil Survey Staff, 2022. Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey: Custom Soil Resource Report for Orange County and Part of Riverside County, California. Available at <https://websoilsurvey.sc.egov.usda.gov/>.
- Sibley, David Allen. 2000. *National Audubon Society, The Sibley Guide to Birds*. Alfred A. Knopf, New York.

- Stebbins, Robert C. 2003. *A Field Guide to Western Reptiles and Amphibians, Third Edition*. Houghton Mifflin Co. Boston, MA. 533 pp.
- SWRCB (State Water Resources Control Board). 2019. Resolution No. 2019-0015. https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/rs2019_0015.pdf.
- Thiery, A. and M. Fugate 1994. A new American fairy shrimp, *Linderiella santarosae* (Crustacea: Anostraca: Linderiellidae), from vernal pools of California. U.S.A. Proceedings of the Biological Society of Washington 107:641-656. Accessed on September 9, 2022.
- USACE (United States Army Corps of Engineers). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), Page 2*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE (United States Army Corps of Engineers). 2017. Minimum Standards for Acceptance of Aquatic Resources Delineation Reports, U.S. Army Corps of Engineers. Los Angeles District. March 16, 2017.
- USACE. 2020. National Wetland Plant List, version 3.3. Retrieved from: http://wetland_plant USACE (United States Army Corp of Engineers). 2020. National Wetland Plant List, 2020 List of Proposed Changes. Retrieved from: <http://wetland-plants.usace.army.mil/s.usace.army.mil/> Accessed on January 20, 2021.
- USDA NRCS (United States Department of Agriculture, Natural Resources Soil Conservation Service), 2022. Soil Data Access (SDA) State Hydric Soils List. Available at https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316619.html. Accessed on August 30, 2022.
- USDA NRCS, 2021. Official Soil Series Descriptions, Soil Survey Staff, Natural Resources Conservation Service.
- USDA (United States Department of Agriculture), 2010. Federal Noxious Weed List. December 10, 2010. Available at: http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf Accessed on August 20, 2022.
- USEPA (U.S. Environmental Protection Agency). 2022. WATERS GeoViewer. Available at <https://www.epa.gov/waterdata/waters-geoviewer>. Accessed on August 22, 2022.
- USFWS (U.S. Fish and Wildlife Service), 1998. Vernal Pools of Southern California Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. Accessed online at: <https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/OtayRanchVillage13Resort/PrePC/2019Comments/Comments/RO-6/02.%20Recovery%20Plan%20for%20Vernal%20Pools%20of%20Southern%20California.pdf>
- USFWS (U.S. Fish and Wildlife Service), 2005. Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon. U.S. Fish and Wildlife Service, Portland, Oregon. December 15, 2005. 606 pp. Accessed on September 9, 2022.

- USFWS (U.S. Fish and Wildlife Service), 2007. Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) 5-Year Review, Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento, California. September 20, 2007. 74 pp.
- USFWS (U.S. Fish and Wildlife Service), 2008a. San Diego Fairy Shrimp (*Branchinecta sandiegonensis*) 5-Year Review, Summary and Evaluation. Sacramento Fish and Wildlife Office, Sacramento, California. September 2008. 56 pp. Accessed on September 9, 2022.
- USFWS (U.S. Fish and Wildlife Service), 2008b. *Streptocephalus woottoni* Riverside Fairy Shrimp 5-Year Review: Summary and Evaluation. Carlsbad, CA. Accessed on September 9, 2022.
- USFWS (United States Fish and Wildlife Service) 2017. Revised Survey Guidelines for the Listed Large Brachiopods. Available at <https://www.fws.gov/ventura/docs/species/protocols/vpshrimp/shrimp2017.pdf>
- USFWS (United States Fish and Wildlife Service). 2022a. Migratory Bird Program's Migratory Bird Treaty Act Summary. Available at <https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php>.
- USFWS (United States Fish and Wildlife Service). 2022b. Information for Planning, and Consultation (IPac), IPac Official Species List. March 3, 2021. Retrieved from <http://ecos.fws.gov/ipac/> Accessed on September 5, 2021.
- USFWS (United States Fish and Wildlife Service). 2022c. August 27, 2019. National Wetlands Inventory (NWI) website, U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Retrieved from <https://www.fws.gov/wetlands/>. Accessed on September 22, 2021.
- USFWS (United States Fish and Wildlife Service) 2022d USFWS Critical Habitat Portal: <http://ecos.fws.gov/crithab/>. Latest database search conducted on May 13, 2022.
- USGS (U.S. Geological Survey) 2022a. National Hydrography Dataset (NHD) Available at <https://www.usgs.gov/national-hydrography/national-hydrography-dataset>. Accessed on July 6, 2022.
- USGS (United States Geological Survey) 2022b. USGS Surface Waters and Watersheds. <https://www.usgs.gov/mission-areas/water-resources/maps>
- USGS (U.S. Department of the Interior, United States Geological Survey), 1996. *Riverside East* Quadrangle, California, 7.5-Minute Series [map]. Scale 1:24,000. Prepared for U.S. Topo: The National Map. Available at <https://ngmdb.usgs.gov/topoview/>. Downloaded on September 25, 2021.
- Williams, Daniel F. 1986. Mammalian Species of Special Concern in California. Prepared for the State of California, The Resources Agency, Department of Fish and Game, Sacramento, CA.
- Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California Department of Fish and Game, Sacramento, California. Updated 2005. Available at <https://wildlife.ca.gov/Data/CWHR/Life-History-and-Range>. Downloaded on August XX, 2022.

APPENDIX C2
WET SEASON PRSENCE/ABSENCE SURVEY FOR VERNAL POOL
BRANCHIPOPODS

June 16, 2022

13911

U.S. Fish and Wildlife Service
Attn: Recovery Permit Coordinator
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods for the Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

The 2021/22 wet season survey for the presence or absence of listed large vernal pool branchiopods was conducted between December 21, 2021, and April 24, 2022. Dudek biologist Paul Lemons (TE051248-6) conducted the surveys according to the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2017). This report summarizes the results of the 2021/2022 wet season survey in order to fulfill the report requirements in accordance with the Section 10(a)(1)(A) Recovery Permit for the proposed Penske Sales, Leasing, and Maintenance Facility Project, located in Riverside County, California.

A total of 16 features were identified as suitable habitat for vernal pool branchiopods and were surveyed during the 2021/2022 wet survey season. These 16 features were identified as new in 2021/22 and not previously surveyed.

PROJECT LOCATION AND EXISTING CONDITIONS

The Penske Sales, Leasing, and Maintenance Facility Project is located in the City of Moreno Valley, Riverside County, California. The Project site is located at 21839 and 21921 Alessandro Boulevard. The Project site is approximately 9.63 acres and is located at the southeast corner of Old 215 Frontage Road and Alessandro Boulevard. Streets surrounding the site include Alessandro Drive to the north, Interstate 215 to the west, Cactus Avenue to the south, and Day Street to the east. The Project site occurs in Township 3 South, Range 4 West of the Riverside East U.S. Geological Survey 7.5 minute quadrangle map (Figure 1). The project site is flat, with an elevation of approximately 1,540 feet above mean sea level (amsl). The site is currently actively being used as a truck cargo container/trailer storage area. The site is completely surrounded by commercial/light industrial land uses.

Approxiamtely 88% of the soils within the Penske site consist of Monserate sandy loam, 0 to 5 percent slopes, and the remaining 12 % consists of Monserate sandy loam, 5 to 8 percent slopes, eroded (USDA 2022).

Recovery Permit Coordinator

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

VEGETATION COMMUNITIES, LAND COVERS, AND VERNAL POOL FEATURES

The entire Penske Sales, Leasing, and Maintenance Facility Project site would be classified as disturbed land. The site has historically been graded flat and is essentially bare ground, with the exception of two seasonally wet/ponded areas (VP east and VP west on Figure 2), which are vegetated with ruderal weedy vegetation, some of which includes facultative and non-facultative wet species on the national wetland plant list including clustered tarweed (*Deinandra fasciculata*), yellow nutsedge (*Cyperus esculentus*) and willow dock (*Rumex salicifolia*). Both VP east and VP west receive water from a 24-inch storm drain pipe outlet at the eastern edge of the site boundary.

Suitable and potentially suitable habitat (i.e., ephemeral wet/ponded features) for vernal pool branchiopods was identified on site and includes basins VP1 and VP2, as well as 14 additional puddles or road rut (man-made) depressions, lacking vegetation (aside from algae when inundated), scattered throughout the site.

PREVIOUS BRACHIOPOD STUDIES

To Dudek's knowledge, no previous protocol-level surveys have been conducted within the wet features surveyed during the 2021/22 wet season and discussed in this report.

SURVEY METHODS

The surveys methods follow the current USFWS survey guidelines protocol (USFWS 2017). The onset of the 2021/22 wet season survey at the project site began with a significant rain event occurring between December 14, 2021. Within 24 hours after this rain event, the site was visited by UltraSystems Environmental biologist Mathew Sutton to confirm pooling. Mapping (using a Trimble GeoXT handheld Global Positioning System (GPS) unit) of inundated features was also conducted by UltraSystems Environmental in January 2022. All protocol-level branchiopod surveys were conducted by permitted biologist Paul Lemons (TE051248-5), and began on December 21, 2021. The protocol states that sampling must be initiated within 7 days of inundation. All suitable habitat features on site that met the USFWS inundation criteria to initiate protocol-level surveys were sampled, and USFWS survey forms were completed.

After initial inundation, all wet features were surveyed at approximate 7 day intervals, according to the survey protocol, until dried up. Features that dried up and then refilled were surveyed within 7 days of refilling and surveys were reinitiated at the approximate 7 day intervals. During the 2021/22 wet season survey, the project site was visited on 11 occasions. A schedule of the 2021/22 wet season survey effort is presented in Table 1.

Recovery Permit Coordinator

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

During each site visit, Mr. Lemons evaluated all features to document inundation levels and performed sampling when appropriate. Throughout the 2021/22 season, daily precipitation was monitored from multiple weather stations across the proposed project alignment, using Weather Underground Inc. 2021–2022).

Table 1
2021/22 Schedule of Surveys

Visit Number	Biologist	Date	Survey Type	Survey Conditions
1	Mathew Sutton	December 15, 2021	Ponding check	No conditions recorded
2	PML	December 21, 2021	Branchiopod Survey	1000-1430; 62°F–64°F; 100% cc; 0-1 mph winds
3	PML	December 28, 2021	Branchiopod Survey	0900-1340; 47-49°F; 90-100% cc; 1-7 mph winds
4	PML	January 4, 2022	Branchiopod Survey	0940-1430; 58-62°F; 5% cc; 0-2 mph winds
5	PML	January 11, 2022	Branchiopod Survey	0930-1345; 65-73°F; 30% cc; 0-3 mph winds
6	PML	January 18, 2022	Branchiopod Survey	1000–1400; 56-62°F; 80-60% cc; 0-2 mph winds
7	PML	January 24, 2022	Branchiopod Survey	0900–1200; 64-69°F; 0% cc; 0-5 mph winds
8	PML	January 31, 2022	Branchiopod Survey	0930–1200; 57–62°F; 90% cc; 1-3 mph winds
9	PML	April 5, 2022	Branchiopod Survey	1000–1430; 73-81°F; 10-0% cc; 1-8 mph winds
10	PML	April 11, 2022	Branchiopod Survey	1130–1500; 62-66°F; 100% cc; 1-7 mph winds
11	PML	April 18, 2022	Branchiopod Survey	0940-1230; 65-74°F; 10% cc; 1-5 mph winds
12	PML	April 24, 2022	Branchiopod Survey	1430-1500; 82°F; 0% cc; 3-8 mph winds

Surveyor: PML = Paul Lemons (TE051248-6)

Survey Conditions: °F = degrees Fahrenheit, cc = cloud cover, mph = miles per hour

Protocol-level sampling was performed within all features that were considered potentially suitable for listed vernal pool branchiopods and any depressions meeting the USFWS 3-centimeter (1.2-inch) inundation criteria. The location of each feature sampled was recorded using a Global Positioning

Recovery Permit Coordinator

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

System (GPS) unit with sub-meter accuracy. GPS data were downloaded into an ArcGIS file by geographic information systems (GIS) specialists at UltraSystems Environmental.

During each survey, Mr. Lemons inspected the individual features for depth, surface area of water, air and water temperature, level of disturbance, and presence of aquatic wildlife. An aquarium dip net was passed through every feature that met the USFWS inundation criteria. All portions of ponded water were surveyed from the bottom to the surface by moving the dip net in a mild zigzag pattern through the feature as directed by the sampling protocol (USFWS 2017). Dip net contents were frequently viewed and discarded of algae, plants, and other debris material when occurring at high concentrations (USFWS 2017). Samples were collected, when needed, using the aquarium net and a 40-milliliter (1.4-ounce) glass vial. Specimens were stored in the vial with water collected where the specimen was found. Specimens were taken to the laboratory within 24 hours of collection and placed in a non-denatured ethyl alcohol (200 proof) solution for preservation. Each specimen was inspected thoroughly using a dissecting microscope and soft-tip forceps. Eriksen and Belk (1999) was used to verify the species of each specimen collected. If any listed vernal pool branchiopods would have been identified during this survey effort, the USFWS would have been notified within 10 days of occupied features as stated in the protocol.

Survey data sheets (provided in the 2017 survey protocol) were completed for every feature that met the minimum USFWS inundation requirement at the time of sampling (Appendix A). All information was hand recorded in the field using the data sheet, with the most pertinent information (e.g., pool feature data, fairy shrimp presence/absence, and species identification) recorded. Photographs of the pool features are included in Appendix B.

SURVEY RESULTS

Feature Descriptions

A total of 16 features were identified as suitable habitat for vernal pool branchiopods and were surveyed during the 2021/22 wet survey season. The features within the study area are distributed evenly across the topographically flat lot. Fourteen (14) of the features onsite are considered road ruts or puddles. Road ruts are depressions that are typically formed by vehicular traffic within or immediately adjacent to roadways, generally lack aquatic vegetation, and are heavily disturbed by vehicular traffic, and are moderately to highly disturbed (i.e., parked vehicles, trailers, tire tracks, trash). Puddles are simply topographically low areas where water collects and pools. Two features (VP east and VP west) might be considered vernal pools. Vernal pools are depressions that retain sufficient water level, support vernal pool indicator plant species, and

likely support vernal pool branchiopods (Note that vernal pool branchiopods were detected within both VP east and VP west during the 2021/22 wet season surveys).

Fairy Shrimp Presence/Absence

No federally listed large branchiopod species were identified during the 2021/22 wet season survey effort. During the 11 survey sampling visits, 12 features (VP east, VP west, Basin 1, and Basins 6 through 14) of the 16 total features were found to be occupied by versatile fairy shrimp (*Branchinecta lindahli*). A summary of the survey results is provided in Table 2. The distribution of features sampled in the study area is presented in Figure 2 of this report.

Table 2
2021/22 Vernal Pool Branchiopods Survey Results*

Feature ID	Branchiopod Species Observed
VP east	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
VP west	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 1	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 2	None
Basin 3	None
Basin 4	None
Basin 5	None
Basin 6	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 7	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 8	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 9	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 10	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 11	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 12	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 13	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 14	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)

Recovery Permit Coordinator

*Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods,
Penske Sales, Leasing, and Maintenance Facility Project, Riverside County,
California*

I certify that the information presented in this survey report and attached exhibits fully and accurately represents my work. Please contact Paul Lemons at plemons@dudek.com if you have any questions regarding the contents of this report.

Sincerely,



Paul Lemons
TE051248-6

*Att: Figure 1, Regional Map
Figures 2, 2021/22 Survey Results
Appendix A, Survey Data Forms
Appendix B, Photographs*

cc: Hina Gupta, UltraSystems Environmental

Recovery Permit Coordinator

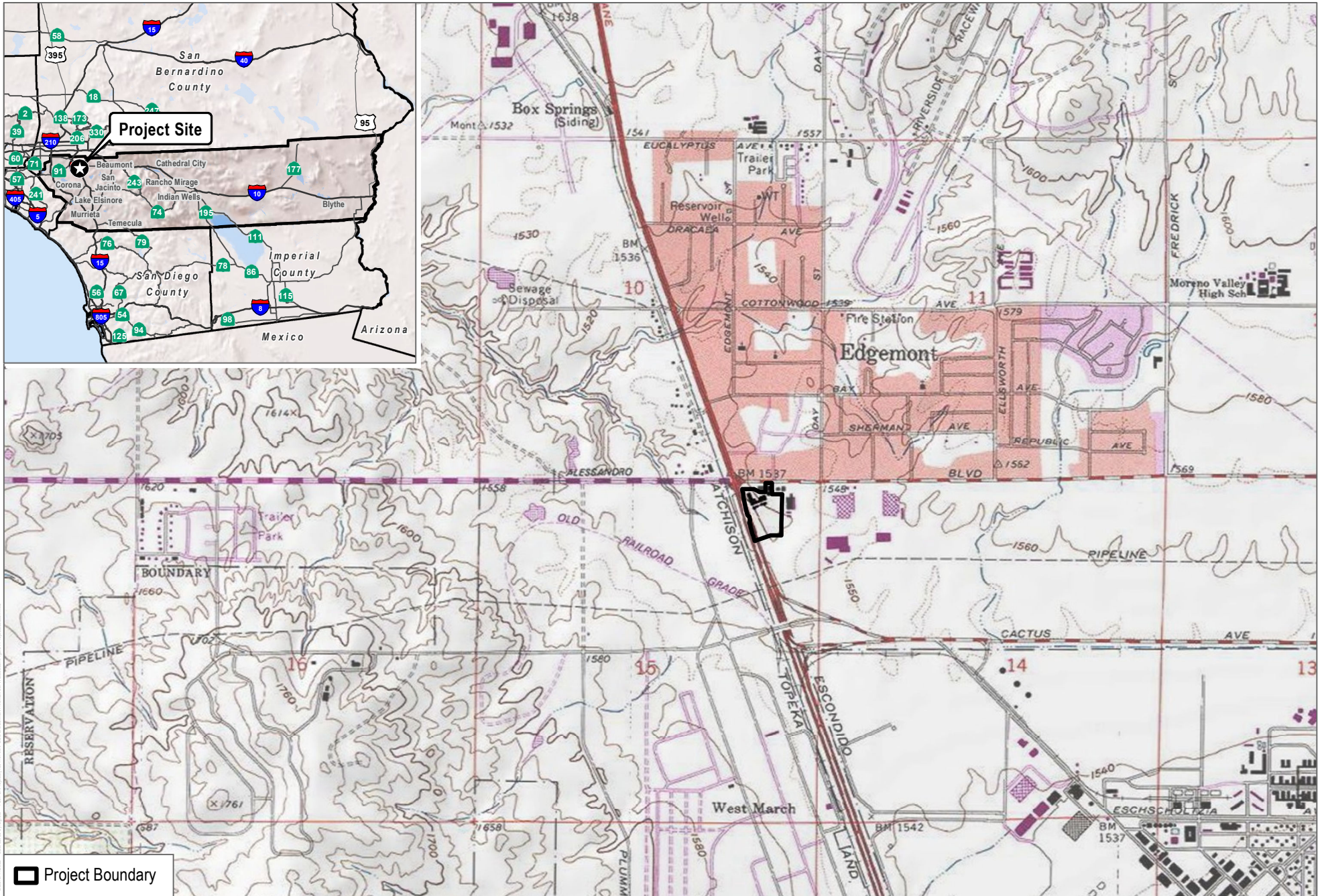
Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

REFERENCES CITED

Eriksen, C., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Eureka, California: Mad River Press Inc.

USFWS. 2017. Survey Guidelines for the Listed Large Branchiopods. Sacramento, California: USFWS Pacific Southwest Region. Revised: November 13, 2017.

Weather Underground Inc. 2021–2022. Various Weather Station across San Diego County. Data accessed periodically from November 2021 through June 2022.
<http://www.wunderground.com>

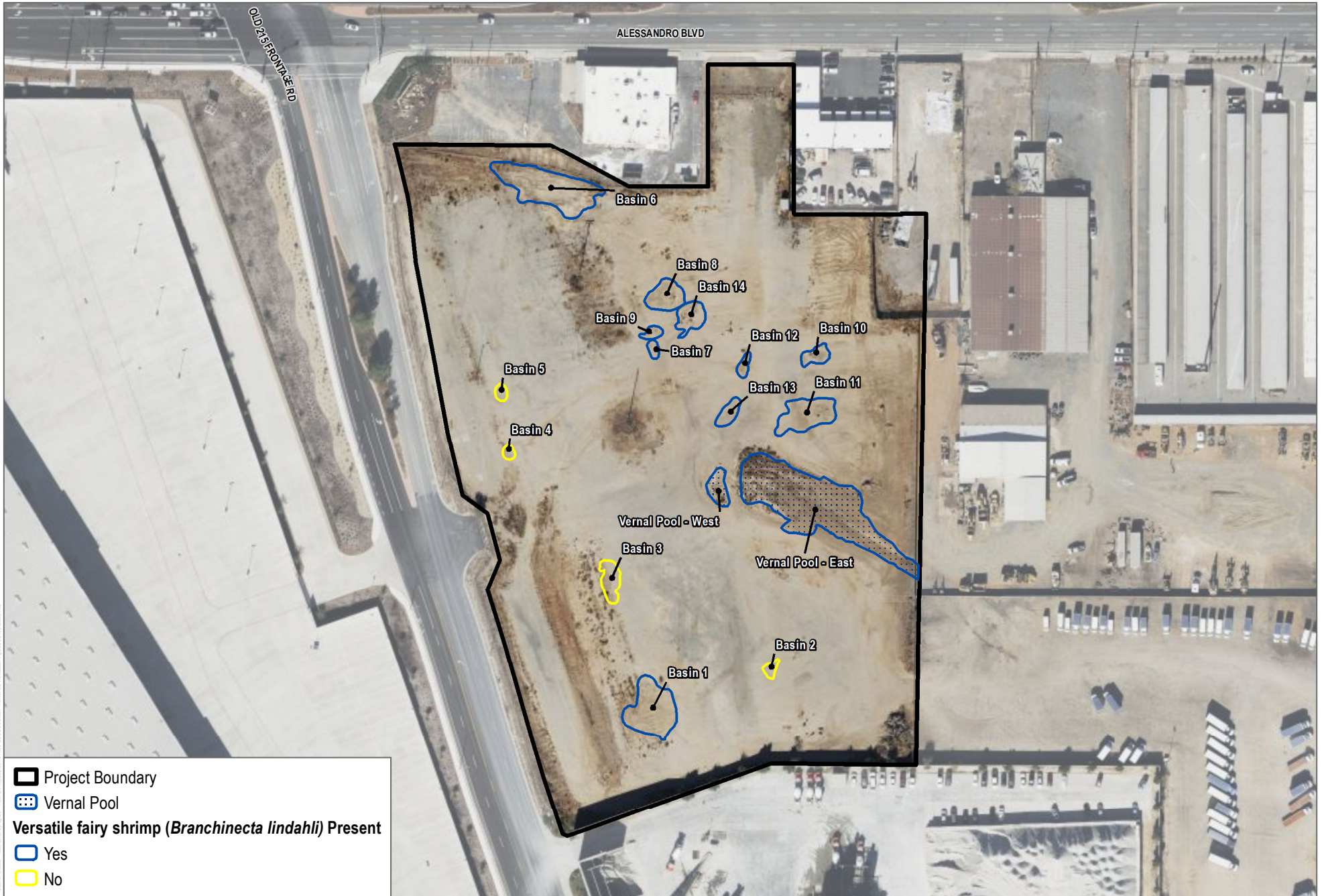


SOURCE: USGS 7.5-Minute Series Riverside East Quadrangle



FIGURE 1

Project Location



SOURCE: UltraSystems 2021; Riverside County 2022; Bing Maps



FIGURE 2
Survey Results

APPENDIX A

Survey Data Forms

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 12/21/2021 Time: 1000-1430 Weather Conditions: 100% CC, 0-1 mph wind, 62-64 F

* First visit Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomida			
VP east	3152795 N 474007 E	16.7	11.1	15	40	75x10	100x15											TT, T	No Shrimp
VP west	3152799 N 473976 E	16.7	11.1	8	15	25x20	30x20											TT, T	
Basin 1	3152788 N 473951 E	17	10.5	6	12	25x20	50x30											TT	
Basin 2	3152786 N 473941 E	17.5	11	5	10	3x3	5x5											TT	
Basin 3	3152769 N 473939 E	18	11.5	3	10	8x3	10x4											TT	
Basin 4	3152767 N 473918 E	18	11	4	8	2x3	4x3											TT	
Basin 5	3152729 N 473912 E	18	11.5	4	8	3x3	5x5											TT	
Basin 6	3152715 N 473877 E	18	12.7	8	15	30x6	40x8											TT	
Basin 7	3152713 N 473847 E	18	12.4	6	10	6x3	10x4											TT	
Basin 8	3152702 N 473852 E	18	12.7	10	15	15x8	30x15											TT	
Basin 9	3152701 N 473847 E	18	12.7	6	10	4x3	10x5											TT	
Basin 10	3152844 N 474071 E	18	10	5	12	5x3	8x4											TT	
Basin 11	3152831 N 474606 E	18	11	6	12	14x8	18x10											TT	
Basin 12	3152831 N 473984 E	18	11	4	8	4x3	8x3											TT	

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindleriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152826 N 473984 E	18	13.3	7	16	12x3	13x4											TT	
----------	-----------------------	----	------	---	----	------	------	--	--	--	--	--	--	--	--	--	--	----	--

Basin 14 = Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: <u>Penske</u>	County: <u>Riverside</u>	Quad: <u>Riverside East</u>	Township: <u>3S</u>	Range: <u>4W</u>	Section: <u>5</u>
SURVEYOR / Permit Number: <u>Paul Lemons / TEO51248-6</u>					
Date: <u>1/4/22</u>		Time: <u>0940-1430</u>		Weather Conditions: <u>5% cc, 0-2 mph wind, 58-62 F</u>	

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects			Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152115 N 474007 E	58	50	15	40	130x15	100x15	X									TT, AB	BRLI, VP east
VP west	3152119 N 473976 E	58	50	15	15	130x15	30x20	X									TT, AB	west combined
Basin 1	3152108 N 473951 E	60	54	10	12	40x30	50x30	X									TT	Shrimp present too immature
Basin 2	3152136 N 473911 E	61	50	6	10	5x5	5x5										TT, AB	No FS
Basin 3	3152160 N 473932 E	61	55	4	10	15x3	10x4										TT	No FS
Basin 4	3152205 N 473898 E	62	50	4	8	4x3	4x3										TT	No FS
Basin 5	3152221 N 473922 E	62	54	4	8	4x5	5x5										TT	No FS
Basin 6	3152115 N 473917 E	62	52	8	15	35x8	40x8	X									TT, AB	BRLI
Basin 7	3152113 N 473947 E	62	N/A	N/A	10	N/A	10x4										TT	Dry
Basin 8	3152162 N 473952 E	62	55	8	15	25x15	30x15	X									TT, AB	BRLI
Basin 9	3152191 N 473947 E	62	61	6	10	8x5	10x5	X									TT, AB	BRLI
Basin 10	3152244 N 474007 E	62	58	6	12	5x2	8x4	X							X		TT, AB	BRLI
Basin 11	3152251 N 474006 E	62	57	8	12	15x10	18x10	X									TT	BRLI
Basin 12	3152251 N 473984 E	62	55	5	8	4x3	8x3	X									TT	BRLI

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindleriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool, UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152226 N 473984 E	62	55	8	16	10x4	13x4	X									TT	BRLI
Basin 14	3152205 N 474003 E	60	54	6	12	17x3	20x4	X									TT, AB	BRLI

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site/Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5

SURVEYOR / Permit Number: Paul Lemons / TEO51248-6

Date: 1/11/22 Time: 11:45 AM Weather Conditions: 30% cc, 0-3mph wind, 65-73°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		± Air	± Water	Average	Est. Max.	Present	Est. Max.	F	S	LIOC	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera			
VP east	3152795N 474007E	65	58	15	40	20x10	100x15	X										TT, T	BRLI
VP West West	3152798N 473976E	66	57	10	15	25x20	30x20	X										TT, T	BRLI
Basin 1	3152708N 473951E	68	56	8	12	30x20	50x30											TT	No FS
Basin 2	3152708N 473951E	68	57	3	10	2x2	5x5											TT, AB	No FS
Basin 3	3152708N 473951E	68	59	3	10	8x1	10x4											TT	No FS
Basin 4	3152707N 473958E	68	59	3	8	4x2	4x3											TT	No FS
Basin 5	3152707N 473952E	68	59	3	8	3x2	5x5											TT	No FS
Basin 6	3152715N 473977E	69	58	8	15	30x8	40x8	X										TT, AB	BRLI
Basin 7	3152743N 473947E				10		10x4											TT	Dry
Basin 8	3152702N 473952E	69	57	10	15	20x10	30x15	X										TT	BRLI
Basin 9	3152701N 473947E	70	58	4	10	5x2	10x5											TT	BRLI
Basin 10	3152704N 474007E				12		8x4											TT	Dry
Basin 11	3152701N 474006E	70	56	6	12	10x5	18x10	X										TT	BRLI
Basin 12	3152703N 473984E				8		8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152726N 473984E	73	61	8	16	6x2	13x4	X										TT	BRLI
Basin 14	3152705N 474003E				12		20x4	23										TT	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 1/18/22 Time: 1000-1460 Weather Conditions: 80-60%.cc, 0-2mph wind, 55-62.F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	F	S	LIOC	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera			
VP east	3152115 N 474007 E	57	58	10	40	80x8	100x15	X										TT, T	FS-BRLI
VP west	3152119 N 473976 E	57	58	7	15	20x10	30x20	X										TT	FS-Only Z- R
Basin 1	3152108 N 473951 E	57	57	7	12	30x15	50x30											TT	No FS
Basin 2	3152136 N 473911 E	58	58	3	10	1x1	5x5											TT	No FS
Basin 3	3152160 N 473939 E	58	—	—	10	—	10x4											TT	Dry
Basin 4	3152201 N 473898 E	58	56	3	8	4x1	4x3											TT	No FS
Basin 5	3152221 N 473912 E	58	57	4	8	2x2	5x5											TT	No FS
Basin 6	3152115 N 473877 E	59	61	7	15	30x6	40x8	X										TT, AB	FS-1600's-BRLI
Basin 7	3152143 N 473947 E	60	—	—	10	—	10x4											TT	Dry
Basin 8	3152162 N 473952 E	61	61	10	15	15x10	30x15	X										TT	FS-BRLI
Basin 9	3152191 N 473977 E	61	—	—	10	—	10x5											TT	Dry
Basin 10	3152211 N 474007 E	62	—	—	12	—	8x4											TT	Dry
Basin 11	3152231 N 474006 E	62	60	5	12	4x4	18x10	X										TT	FS-100's BRLI
Basin 12	3152251 N 473984 E	62	—	—	8	—	8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152260 N 473984 E	62	60	6	16	3x2	13x4											TT	No FS
Basin 14	3152265 N 474003 E	62	—	—	12	—	20x4	23										TT	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Pencke County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 1/24/22 Time: 0900-1200 Weather Conditions: 0".cc, 0-5mph wind, 64-69°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects			Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		°F Air	°F Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cleodocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152195 N 474007 E	64	66	8	40	16x2	100x15				X						II, T	BRL1
VP west	3152199 N 473976 E	65	62	10	15	16x8	30x20				X						II, T	No FS
Basin 1	3152188 N 473951 E	67	67	6	12	20x2	50x30				X						II	No FS
Basin 2	3152186 N 473941 E				10		5x5										II	Dry
Basin 3	3152186 N 473939 E				10		16x4										II	Dry
Basin 4	3152180 N 473898 E				8		4x3										II	Dry
Basin 5	3152179 N 473912 E				8		5x5										II	Dry
Basin 6	3152115 N 473877 E				15		40x8										II	Dry
Basin 7	3152113 N 473847 E				10		10x4										II	Dry
Basin 8	3152162 N 473852 E	69	67	6	15	9x6	30x15				X						II	No FS
Basin 9	3152151 N 473847 E				10		10x5										II	Dry
Basin 10	3152144 N 474607 E				12		8x4										II	Dry
Basin 11	3152151 N 474606 E				12		18x10										II	Dry
Basin 12	3152151 N 473984 E				8		8x3										II	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindieria occidentalis*, BRL1 = *Branchinecta lindahl*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 473984 E				16		13x4										II	Dry
Basin 14	3152105 N 474003 E				12		20x4	23									II	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 1/31/22 Time: 0930-1200 Weather Conditions: 90% cc, 1-3 mph wind, 57-62°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C) °F		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		°F Air	°F Water	Average	Est. Max.	Present	Est. Max.	F Anostracans	S LIOC	NO Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152795 N 474007 E				40		100x15											TT	Dry
VP west	3152798 N 473976 E	57	55	3	15	5x4	30x20											TT, T	No FS
Basin 1	3152798 N 473951 E	59	56	3	12	10x4	50x30											TT	No FS
Basin 2	3152786 N 473911 E				10		5x5											TT	Dry
Basin 3	3152768 N 473939 E				10		10x4											TT	Dry
Basin 4	3152907 N 473998 E				8		4x3											TT	Dry
Basin 5	3152872 N 473972 E				8		5x5											TT	Dry
Basin 6	3152715 N 473977 E				15		40x8											TT	Dry
Basin 7	3152943 N 473947 E				10		10x4											TT	Dry
Basin 8	3152962 N 473952 E	62	59	3	15	3x1	30x15											TT	No FS
Basin 9	3152951 N 473977 E				10		10x5											TT	Dry
Basin 10	3152844 N 474007 E				12		8x4											TT	Dry
Basin 11	3152851 N 474006 E				12		18x10											TT	Dry
Basin 12	3152831 N 473984 E				8		8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindleriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152826 N 473984 E				16		13x4											TT	Dry
Basin 14	3152905 N 474003 E				12		20x4	23										TT	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 4/5/22 Time: 1000-1430 Weather Conditions: 10-0% LL, 1-8 mph, 73-81 °F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	F	S	LIOC (Lindoriella)	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera			
VP east	3152195 N 414007 E	73	77	15	40	40x3	100x15	X										TT	FS - Immature
VP west	3152191 N 413976 E	73	73	7	15	17x13	30x20	X										TT	FS - Immature
Basin 1	3152188 N 413951 E	74	63	5	12	20x18	50x30											TT	No FS
Basin 2	3152186 N 413911 E	75	-	-	10	-	5x5											TT	Dry
Basin 3	3152186 N 413939 E	75	-	-	10	-	10x4											TT	Dry
Basin 4	3152180 N 413898 E	77	-	-	8	-	4x3											TT	Dry
Basin 5	3152171 N 413912 E	77	-	-	8	-	5x5											TT	Dry
Basin 6	3152115 N 413817 E	78	81	10	15	28x7	40x8	X										TT	FS - Immature
Basin 7	3152143 N 413947 E	79	69	6	10	7x4	10x4	X										TT	FS - Too immature
Basin 8	3152162 N 413952 E	80	73	7	15	15x15	30x15	X										TT	↓
Basin 9	3152151 N 413947 E	80	73	6	10	8x5	10x5	X										TT	↓
Basin 10	3152144 N 414027 E	80	70	3	12	4x3	8x4											TT, AB	No FS
Basin 11	3152131 N 414006 E	80	77	5	12	14x10	18x10											TT	No FS
Basin 12	3152131 N 413984 E	80	-	-	8	-	8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindoriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 413984 E	81	-	-	16	-	13x4											TT	Dry
Basin 14	3152105 N 414003 E	86	84	7	12	16x2	20x4	X										TT, T	28's BRLI

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 4/11/22 Time: 1130-1500 Weather Conditions: 100% cc, 1-7mph, 62-66°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans				Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information	
		Air	Water	Average	Est. Max.	Present	Est. Max.	F	S	A	N	Copepods	Ostracods	Cladocera	Coleoptera				Hemiptera
VP east	3152145N 474007E	62	-	-	40	-	100x15											TT	Dry
VP west	3152144N 4739166E	62	66	10	15	12x8	30x20	X					X					TT	BRLI
Basin 1	3152148N 4739151E	63	55	5	12	18x16	50x30											TT, T	No FS BRLI - very few
Basin 2	3152136N 4739111E	63	-	-	10	-	5x5											TT	Dry
Basin 3	3152166N 4739199E	64	-	-	10	-	10x4											TT	Dry
Basin 4	3152207N 4739198E	64	-	-	8	-	4x3											TT	Dry
Basin 5	3152221N 4739122E	64	-	-	8	-	5x5											TT	Dry
Basin 6	3152215N 4739177E	64	75	7	15	18x5	40x8	X								X		TT	BRLI
Basin 7	3152243N 4739177E	65	-	-	10	-	10x4											TT	Dry
Basin 8	3152262N 4739152E	65	73	4	15	3x5	30x15											TT	No FS
Basin 9	3152291N 4739177E	65	72	6	10	7x5	10x5	X										TT	BRLI
Basin 10	3152244N 474007E	66	-	-	12	-	8x4											TT	Dry
Basin 11	3152281N 474006E	66	68	4	12	12x8	18x10											TT	No FS
Basin 12	3152281N 4739184E	66	-	-	8	-	8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152226N 4739184E	66	-	-	16	-	13x4											TT	Dry
Basin 14	3152205N 474003E	66	-	-	12	-	20x4	23										TT	Dry

(24" outlet)
very few

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 4/18/22 Time: 0940-1230 Weather Conditions: 10%cc, 1-5 mph, 65-74°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans				Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152195 N 474007 E	—	—	—	40	—	100x15									II	Dry	
VP west	3152199 N 4739716 E	65	66	7	15	60x4	30x20	X			X	X				II	BRLI	
Basin 1	3152183 N 473951 E	66	61	4	12	15x3	50x30				X					II	No FS	
Basin 2	3152186 N 473911 E	—	—	—	10	—	5x5									II	Dry	
Basin 3	3152180 N 473939 E	—	—	—	10	—	60x4									II	Dry	
Basin 4	3152185 N 473898 E	—	—	—	8	—	4x3									II	Dry	
Basin 5	3152182 N 473912 E	—	—	—	8	—	5x5									II	Dry	
Basin 6	3152115 N 473817 E	73	76	4	15	7x3	40x8	X			X					II	BRLI	
Basin 7	3152143 N 473947 E	—	—	—	10	—	10x4									II	Dry	
Basin 8	3152162 N 473952 E	—	—	—	15	—	30x15									II	Dry	
Basin 9	3152191 N 473947 E	—	—	—	10	—	10x5									II	Dry	
Basin 10	3152144 N 474007 E	—	—	—	12	—	8x4									II	Dry	
Basin 11	3152181 N 474006 E	—	—	—	12	—	18x10									II	Dry	
Basin 12	3152181 N 473984 E	—	—	—	8	—	8x3									II	Dry	

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 473984 E	—	—	—	16	—	13x4									II	Dry
Basin 14	3152105 N 474003 E	—	—	—	12	—	20x4	23								II	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5

SURVEYOR / Permit Number: Paul Lemons / TEO51248-6

Date: 4/24/22 Time: 1430-1500 Weather Conditions: 0% cc, 3-8 mph wind, 82°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (Flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomida			
VP east	3152795 N 474007 E				40		100x15										II	Dry	
VP west	3152799 N 473976 E				15		30x20										II	Dry	
Basin 1	3152708 N 473951 E	82	74	3	12	12x10	50x30				X						II, T	No FS	
Basin 2	3152706 N 473911 E				10		5x5										II	Dry	
Basin 3	3152709 N 473932 E				10		6x4										II	Dry	
Basin 4	3152807 N 473898 E				8		4x3										II	Dry	
Basin 5	3152821 N 473912 E				8		5x5										II	Dry	
Basin 6	3152715 N 473877 E				15		40x8										II	Dry	
Basin 7	3152843 N 473147 E				10		10x4										II	Dry	
Basin 8	3152862 N 473152 E				15		30x15										II	Dry	
Basin 9	3152951 N 473177 E				10		10x5										II	Dry	
Basin 10	3152844 N 474007 E				12		8x4										II	Dry	
Basin 11	3152851 N 474006 E				12		18x10										II	Dry	
Basin 12	3152831 N 473984 E				8		8x3										II	Dry	
<p>Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = <i>Lindierella occidentalis</i>, BRLI = <i>Branchinecta lindahl</i>). For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present. (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.</p>																			
Basin 13	3152826 N 473984 E				16		13x4										II	Dry	
Basin 14	3152905 N 474003 E				12		20x4	23									II	Dry	

Entire site =
Graded lot =
CP, D, T

APPENDIX B
Photographs





















APPENDIX C3
DRY SEASON PRSENCE/ABSENCE SURVEY FOR VERNAL POOL
BRANCHIPOPODS

August 12, 2022

13911

U.S. Fish and Wildlife Service
Attn: Recovery Permit Coordinator
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

Subject: 2022 Dry Season Survey Report for List Large Branchiopods at the Penske Sales, Leasing, and Maintenance Facility Project Site, Riverside County, California

Dear Recovery Permit Coordinator:

The 2022 dry season survey for the presence or absence of listed large vernal pool branchiopods was conducted on June 29, 2022. Dudek biologist Paul Lemons (TE051248-6) conducted the soil collection according to the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2017). Soil samples from a total of 16 features were collected during this 2022 dry season survey effort. Wet season surveys were conducted during the 2021/22 wet season the same 16 features.

Soil samples collected on June 29, 2022 were submitted to biologist Greg Mason (TE58862A, Alden Environmental, Inc.) on June 30, 2022 for soil sieving and cyst culturing.

Project Location and Existing Conditions

The Penske Sales, Leasing, and Maintenance Facility (Penske) Project is located in the City of Moreno Valley, Riverside County, California. The Project site is located at 21839 and 21921 Alessandro Boulevard. The Project site is approximately 9.63 acres and is located at the southeast corner of Old 215 Frontage Road and Alessandro Boulevard. Streets surrounding the site include Alessandro Drive to the north, Interstate 215 to the west, Cactus Avenue to the south, and Day Street to the east. The Project site occurs in Township 3 South, Range 4 West of the Riverside East U.S. Geological Survey 7.5 minute quadrangle map (Figure 1). The project site is flat, with an elevation of approximately 1,540 feet above mean sea level (amsl). The site is currently actively being used as a truck cargo container/trailer storage area. The site is completely surrounded by commercial/light industrial land uses.

Approximately 88% of the soils within the Penske site consist of Monserate sandy loam, 0 to 5 percent slopes, and the remaining 12 % consists of Monserate sandy loam, 5 to 8 percent slopes, eroded (USDA 2022).

Vegetation Communities, Land Covers, and Vernal Pool Features

The entire Penske site would be classified as disturbed land. The site has historically been graded flat and is essentially bare ground, with the exception of two seasonally wet/ponded areas (VP east and VP west on Figure 2), which are vegetated with ruderal weedy vegetation, some of which includes facultative and non-facultative wet species on the national wetland plant list including clustered tarweed (*Deinandra fasciculata*), yellow nutsedge

(*Cyperus esculentus*) and willow dock (*Rumex salicifolia*). Both VP east and VP west receive water from a 24-inch storm drain pipe outlet at the eastern edge of the site boundary.

Suitable and potentially suitable habitat (i.e., ephemeral wet/ponded features) for vernal pool branchiopods was identified on site and includes features VP1 and VP2, as well as 14 additional puddles or road rut (man-made) depressions, lacking vegetation (aside from algae when inundated), scattered throughout the site.

Previous Brachiopod Studies

Dudek biologist Paul Lemons conducted a wet season survey for listed large Branchiopods at the Penske site during the 2021/22 wet season. The wet season survey report was submitted to the U.S. Fish and Wildlife Service on June 28, 2022.

Survey Methods

Soil samples were collected on June 29, 2022, after several weeks of no recorded precipitation in the Moreno Valley region, therefore soil samples were extremely dry. A hand spade was used to collect each sample. Samples were taken the top 1-3 cm of soil within each feature. Where possible, the hand spade was used to pry up intact chunks of sediment. All samples were collected from the lowest topographic areas of each feature.

Three of the 16 features were between 236 and 2300 square meters, therefore 50 samples were collected. Nine of the 16 features were between 25 and 235 square meters, therefore 25 samples were collected. The remaining four features were under 25 square meters, therefore 10 samples were collected. Table 1 summarizes the area of each feature and number of samples collected. Data sheets were completed for each basin that was surveyed (Appendix A). Selected photographs of basins sampled are attached to this report as Appendix B.

Table 1. Soil Sample Collection Data

Basin	B. lindahli present during wet season?	Square meters	Number of 50 mL Samples Collected	Total mL collected
Basin 1	YES	272.73	50	2,500
Basin 2	NO	21.77	10	500
Basin 3	NO	81.78	25	1,250
Basin 4	NO	17.50	10	500
Basin 5	NO	19.97	10	500
Basin 6	YES	402.37	50	2,500
Basin 7	YES	20.58	10	500
Basin 8	YES	118.75	25	1,250
Basin 9	YES	25.78	25	1,250
Basin 10	YES	51.69	25	1,250
Basin 11	YES	191.12	25	1,250
Basin 12	YES	26.77	25	1,250
Basin 13	YES	51.45	25	1,250
Basin 14	YES	89.29	25	1,250

Table 1. Soil Sample Collection Data

Basin	B. lindahli present during wet season?	Square meters	Number of 50 mL Samples Collected	Total mL collected
Vernal Pool - East	YES	958.65	50	2,500
Vernal Pool - West	YES	72.31	25	1,250

Surveyor: PML = Paul Lemons (TE051248-6)

Immediately after sample collection, each soil sample was carefully placed into plastic bags and labeled according to each feature ID. Soil samples collected on June 29, 2022 from each basin were immediately submitted to Mr. Greg Mason of Alden Environmental, Inc. on June 30, 2022. Soil samples were then processed by Mr. Mason for examination in the laboratory using the methods described in the dry season report by Alden Environmental, Inc. (Appendix A).

Survey Results

Fairy Shrimp Presence/Absence

Results of the dry sample analysis yielded the presence of cysts from the fairy shrimp genus *Branchinecta* in 14 features, including VP east, VP west, Basin 1, Basin, 3, Basin 4, Basin 6, Basin 7, Basin 8, Basin 9, Basin 10, Basin 11, Basin 12, Basin 13, and Basin 14. All cysts collected from these features were attempted to be cultured and raised to maturity to make a species-level identification.. This attempt was successful in 13 of the 14 features where cysts were collected. Only Basin 3 failed to produce hatched shrimp, therefore, the cysts from this basin could only be positively identified to genus level (i.e., *Branchinecta*). All shrimp that were successfully raised to maturity were identified as versatile fairy shrimp (*Branchinecta lindahli*). No federally-listed Branchiopods were identified during this 2022 dry season survey effort. Detailed results of soil analysis and cyst culturing, as well as all required data collection information per the survey guidelines (USFWS, 2017) are included in the Alden Environmental Report (Appendix A). Representative site photographs are included as Appendix B of this report.

I certify that the information presented in this survey report and attached exhibits fully and accurately represents my work. Please contact Paul Lemons at plemons@dudek.com if you have any questions regarding the contents of this report.

Sincerely,



Paul Lemons
TE051248-6

cc: Hina Gupta, UltraSystems Environmental

Att: Figure 1, Regional Map

Figure 2, 2021/22 Survey Results

Appendix A, Alden Environmental, Inc. – Dry Season Fairy Shrimp Sampling Results for the Penske Truck Leasing Facility Site

Appendix B, Site Photographs

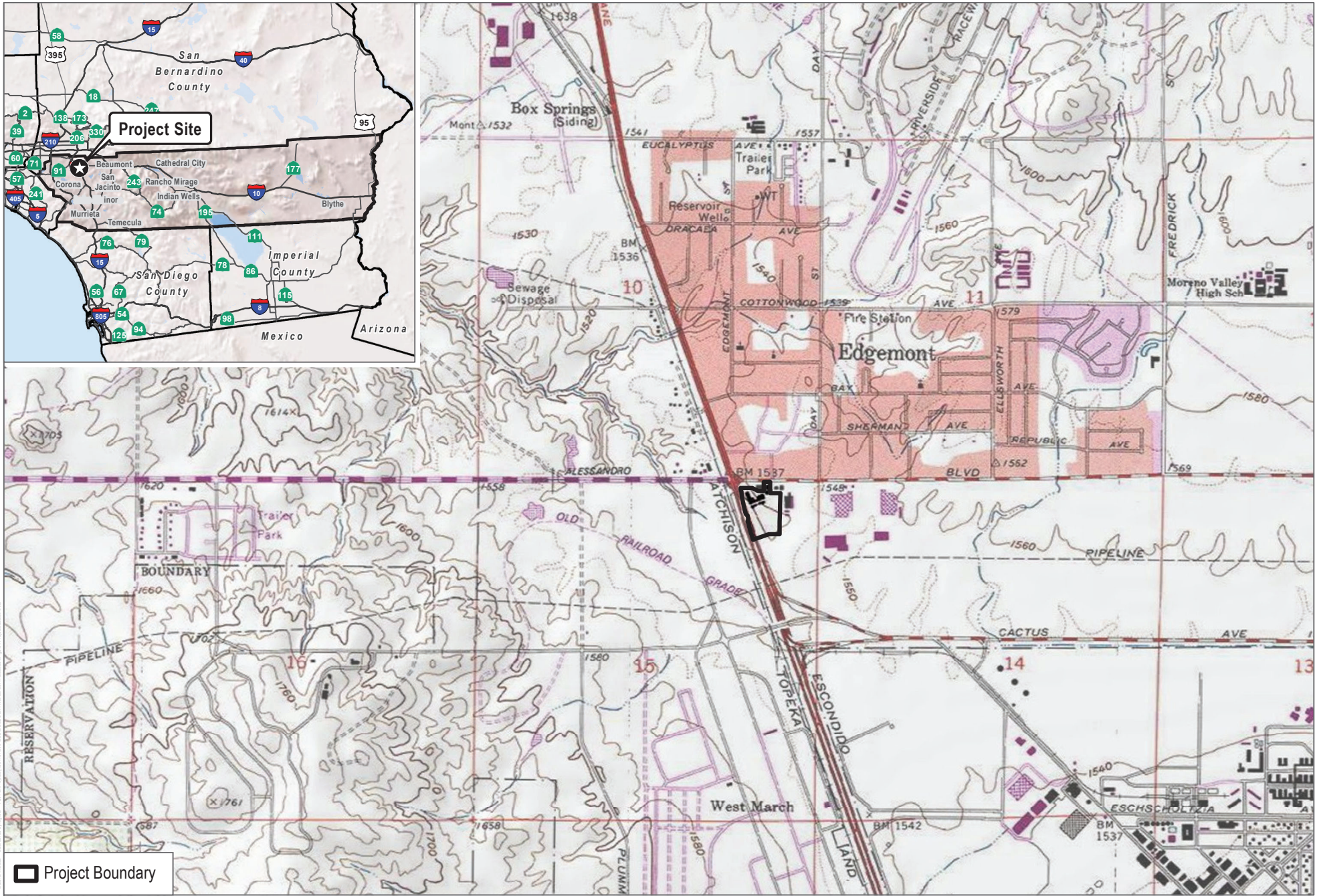
References Cited

Eriksen, C., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Eureka, California: Mad River Press Inc.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: <http://websoilsurvey.sc.egov.usda.gov/>. Accessed June 3, 2022.

USFWS. 2017. Survey Guidelines for the Listed Large Branchiopods. Sacramento, California: USFWS Pacific Southwest Region. Revised: November 13, 2017.

Weather Underground Inc. 2022. Various Weather Station across San Diego County. Data accessed June 2022. <http://www.wunderground.com>



SOURCE: USGS 7.5-Minute Series Riverside East Quadrangle



FIGURE 1
Project Location
 2022 Dry Season Survey for Vernal Pool Branchiopods, Penske Truck Leasing Facility Project, City of Moreno Valley, Riverside County, California



SOURCE: UltraSystems 2021; Riverside County 2022; Bing Maps



FIGURE 2
Survey Results
 2022 Dry Season Survey for Vernal Pool Branchiopods, Penske Truck Leasing Facility Project, City of Moreno Valley, Riverside County, California

Appendix A

Alden Environmental, Inc. - Dry Season Fairy Shrimp
Sampling Results for the Penske Truck Leasing Facility Site

August 5, 2022

Mr. Paul Lemons
Dudek
605 Third Street
Encinitas, CA 92024

Subject: Dry Season Fairy Shrimp Sampling Results for the Penske Truck Leasing Facility Site

Dear Mr. Lemons:

This letter presents the results of dry season fairy shrimp sampling (cyst identification and rearing) conducted for the Penske Truck Leasing Facility Site.

Methods

Cyst Identification

On June 30, 2022, Alden received soil samples collected from 16 basins on the project site. The soil was provided in bags labeled with the basin number. The collected soil from each basin was divided into subsamples, based on the area of the pool and the amount of soil collected. Each sample was then hydrated and processed through a series of sieves to separate out fairy shrimp cysts that may be present. The sieves used were of 710-, 355-, and 212- μm pore size screens. The final sieve pore size is smaller than the target fairy shrimp genera (*Branchinecta* and *Streptocephalus*) average cyst diameter and therefore would retain cysts. The material remaining on the final sieve was next placed in a brine solution to help separate organic from inorganic material. The organic portion was then filtered through a standard coffee filter and allowed to dry. The dried material on the filters was then examined under a stereo dissecting scope to determine if cysts were present. Cyst surface characteristics were then used to identify cysts to genus, if present.

Hatching/Rearing

The collected *Branchinecta* fairy shrimp cysts were hydrated by placing them into plastic containers filled with approximately 525 ml of filtered, non-chlorinated drinking water. The coffee filters (from the soil sieving effort) with the collected cysts were slowly opened over the containers and gently shaken to allow the material to fall into the water. The sides of the filters were then rubbed against one another to release any additional material. Finally, a squirt bottle filled with filtered drinking water was used to spray any additional material from the filters into the containers.

The containers were given sample identification numbers and placed on a table in a climate controlled room. Lighting in the room was provided by indirect sunlight as well as an overhead light (full spectrum bulb) that was kept on approximately 12 hours a day to help emulate spring season lighting conditions. An overhead fan also was kept on at a low level to provide for some air movement across the water surface in the sample containers.

The samples were checked daily to see if any fairy shrimp had emerged. Once nauplii were observed, feeding began. The hatched shrimp were fed 2-4 drops of prepared food on a daily basis until they were collected. The food used was a mix of active brewer’s yeast, sugar, powdered fish food, and water.

The hatched shrimp were allowed to continue under these conditions until they had reached maturity, as determined by reaching full size, antennal development (males) and brood pouch development (females). Once mature, the fairy shrimp were collected for identification by pouring the material in the container through a small strainer. Collected shrimp were then placed into a dish of carbonated (soda) water to slowly asphyxiate the shrimp. Once dead, the collected shrimp were placed in a 27 x 57 mm (5 dram) clear glass vial, filled with 70% ethyl alcohol. The collected shrimp were then identified to the species level with the aid of a stereo dissecting scope.

Results

Cyst Identification

Cysts of the genus *Branchinecta* were found in 14 basins (Table 1; Attachment A). No cysts of the genus *Streptocephalus* were found in any of the sampled basins.

Table 1 Dry Season Sampling Results			
Basin	Number of Subsamples	<i>Branchinecta</i>	<i>Streptocephalus</i>
1	50	219	-
2	10	-	-
3	25	2	-
4	10	700	-
5	10	-	-
6	50	3600	-
7	10	15	-
8	25	206	-
9	25	602	-
10	25	539	-
11	25	222	-
12	25	12	-
13	25	45	-
14	25	66	-
VP East	50	702	-
VP West	25	5	-

Hatching/Rearing

Hydration and hatching of the samples with recovered cysts was conducted, resulting in the collection and identification of the non-sensitive versatile fairy shrimp (*B. lindahli*) from all but one (Basin 3) of the basins with fairy shrimp cysts present (Table 2). Basin 3 had a very low numbers of recovered cysts (2), making successful hatching difficult. No other fairy shrimp species were identified.

Table 2 Fairy Shrimp Hatching Results	
Basin¹	<i>Branchinecta Lindahli</i>
1	✓
3	-
4	✓
6	✓
7	✓
8	✓
9	✓
10	✓
11	✓
12	✓
13	✓
14	✓
VP East	✓
VP West	✓

¹Only basins from which cysts were recovered

The above text presents the final results of the dry season fairy shrimp cyst identification and hatching effort for the project. The non-listed versatile fairy shrimp was the only shrimp species to be reared from the recovered cysts. If you have any questions or need additional information please call.

Sincerely,



Greg Mason
Principal/Senior Biologist

Attachment A Cyst per subsample table

Attachment A

BASIN	B. lindahli present during wet season?	SQ_M	# Samples	Results (# cysts recovered)																																																		Notes						
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50		Total					
Basin 1	YES	272.7	50	4	5	1	6	0	6	4	5	2	2	7	4	1	14	0	9	5	21	2	3	3	7	7	1	7	6	2	5	4	8	6	3	2	0	4	8	3	2	2	4	3	5	1	2	7	3	2	9	1	1	219	Ostracod shells Is					
Basin 2	NO	21.8	10	0	0	0	0	0	0	0	0	0	0																																								0							
Basin 3	NO	81.8	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0																											2						
Basin 4	NO	17.5	10	77	63	54	105	66	56	76	13	99	91																																								700							
Basin 5	NO	20.0	10	0	0	0	0	0	0	0	0	0	0																																								0							
Basin 6	YES	402.4	50	76	65	72	24	106	55	33	76	45	67	56	45	87	57	34	88	21	44	67	89	111	22	56	76	87	45	67	43	67	66	46	76	88	67	165	88	222	108	157	99	88	98	78	44	67	54	77	88	22	21	3600	Ostracod shells Is					
Basin 7	YES	20.6	10	3	5	6	0	0	1	0	0	0	0																																										15					
Basin 8	YES	118.8	25	6	9	4	8	12	0	4	45	5	4	6	36	0	20	7	4	8	3	4	5	1	2	7	0	6																													206	Ostracod shells Is		
Basin 9	YES	25.8	25	24	54	12	67	45	45	87	2	5	7	33	56	34	9	53	2	0	6	24	12	3	5	6	7	4																												602	Ostracod shells Is, Cladoceran ephippia Is			
Basin 10	YES	51.7	25	5	44	67	1	34	66	6	77	7	33	6	67	6	4	5	43	9	1	0	13	32	1	1	5	6																												539				
Basin 11	YES	191.1	25	8	9	4	7	3	6	55	12	4	0	7	4	8	9	24	7	5	3	8	11	12	0	2	6	8																														222	Ostracod shells Is	
Basin 12	YES	26.8	25	0	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0																														12		
Basin 13	YES	51.4	25	0	0	5	8	1	0	4	0	0	6	9	0	0	0	0	0	0	4	2	6	0	0	0	0	0																															45	
Basin 14	YES	89.3	25	0	5	9	4	7	11	5	3	0	0	0	0	2	6	3	10	1	0	0	0	0	0	0	0	0																															66	
VP - East	YES	958.6	50	14	7	9	1	76	44	34	77	3	8	5	70	11	0	44	4	7	21	5	66	78	5	7	3	4	1	0	3	0	4	0	5	1	2	22	0	0	0	4	6	7	8	3	9	1	3	2	7	4	7	702	Ostracod shells 10s					
VP - West	YES	72.3	25	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0																																5	
			415																																																									

Appendix B

Site Photographs





**PRELIMINARY JURISDICTIONAL DELINEATION
REPORT**

For The

**Penske Sales, Leasing, and Maintenance Facility
APNs 297-120-002, 297-120-018, 297-120-017,
297-120-025, 297-100-091, 297-100-073, 297-
100-076 and 297-120-003**

Riverside County, California

Prepared for:



Penske

1711 West Greentree Drive, Suite 117
Tempe, Arizona 85284

Prepared by:



UltraSystems Environmental Inc.

16431 Scientific Way
Irvine, CA 92618
Phone: (949) 788-4900

September 2022

This page intentionally left blank.

TABLE OF CONTENTS

1.0	Introduction	1-1
1.1	Project Location.....	1-1
2.0	Project Description	2-1
3.0	Regulatory Framework	3-1
3.1	Federal.....	3-1
3.2	State.....	3-3
3.3	MSHCP Riparian/Riverine Areas and Vernal Pools.....	3-5
4.0	Methodology	4-6
5.0	Data Review Results	5-1
5.1	Climate and Hydrological Data.....	5-1
5.2	Soils.....	5-2
5.3	Surface Water	5-3
5.4	Groundwater.....	5-3
5.5	Land Use	5-3
5.6	Local Hydrology.....	5-4
6.0	Field Investigation Results	6-4
6.1	Riparian/Riverine Areas.....	6-4
6.2	Impacts to Jurisdictional Waters	6-7
6.3	Observed Jurisdictional Status	6-8
7.0	Mitigation Measures	7-1
7.1	Mitigation for Impacts to Jurisdictional Waters.....	7-1
8.0	Literature Cited and References	8-1

TABLES

Table 5.2-1	- Summary of Soil Mapping Units.....	5-2
Table 6.1-1	- Direct Impacts to Jurisdictional Waters	6-8

APPENDICES

Appendix A	Figures
	<ul style="list-style-type: none"> • <i>Figure 1: Project Location and Biological Study Area</i> • <i>Figure 2: USGS Topographic Map</i> • <i>Figure 3: Management Plan and Land Designation Areas</i> • <i>Figure 4: USDA Soils</i> • <i>Figure 5: USGS Surface Waters and Watersheds</i> • <i>Figure 6: Jurisdictional Impact Areas</i>

Appendix B	Site Plans
-------------------	------------

Appendix C	Soils Report
Appendix D	2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods
Appendix E	2022 Dry Season Survey Report for List Large Branchiopods
Appendix F	Plant Species Observed
Appendix G	Data Sheets and Field Notes
Appendix H	Photographs

LIST OF ABBREVIATIONS AND ACRONYMS

Acronym/Abbreviation	Term
BMPs	best management practices
BSA	Biological Study Area
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DBESP	Determination of Biologically Equivalent or Superior Preservation
EPD	Environmental Programs Department
FGC	Fish and Game Code
GIS	Geographic Information System
GPS	Global Positioning System
LSAA	Lake or Streambed Alteration Agreement
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
Porter-Cologne project	Porter-Cologne Water Quality Control Act
	Penske Sales, Leasing, and Maintenance Facility Project
<i>Rapanos</i>	<i>Rapanos vs. United States and Carabell vs. U.S. Army Corps of Engineers</i>
RWQCB	Regional Water Quality Control Board
SWANCC	<i>Solid Waste Agency of Northern Cook County vs. United States Army Corps of Engineers</i>
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USACE Manual	<i>Corps of Engineers Wetlands Delineation Manual</i>
UltraSystems	UltraSystems Environmental Inc.
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDRs	Waste Discharge Requirements
MSHCP	Western Riverside County Multiple Species Habitat Conservation Plan
WRCC	Western Regional Climate Center
§	Section
§§	Sections

EXECUTIVE SUMMARY

UltraSystems Environmental Inc. (UltraSystems) prepared this jurisdictional delineation report for the proposed Penske Sales, Leasing, and Maintenance Facility (project). The project will consist of a new state-of-the-art six bay service facility, wash bay, rental and sales office building, and associated fuel island. The project site is located within areas covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

UltraSystems biologists conducted a jurisdictional assessment and delineation of the project site. The survey was conducted to determine the presence and extent of federal or state wetlands, waters, and habitats that are potentially subject to the jurisdictional authority of the United States Army Corps of Engineers (USACE), the California State Water Resources Control Board (SWRCB) as represented by the Santa Ana Regional Water Quality Control Board (RWQCB), and the California Department of Fish and Wildlife (CDFW). The survey was also conducted to determine the presence of vernal pools areas, as defined and regulated by the MSHCP.

Prior to conducting the jurisdictional delineation, UltraSystems biologists first conducted a reconnaissance-level field survey of the biological resources potentially associated with the project site and within a zone 500 feet out from the project site; these define the Biological Study Area (BSA). The BSA includes all areas that could potentially be directly, indirectly, or cumulatively impacted by the project. This survey confirmed the potential presence of federal and/or state waters and habitats located within the BSA.

On October 14, 2021, an approximately 250-foot segment of two adjacent depressions was surveyed. It was determined that the two depressions meet the criteria for wetlands as described by the USACE and the SWRCB/RWQCB, and as defined by the MSHCP. Vernal pools are classified as waters of the State.

Between December 21, 2021 and June 29, 2022, a series of wet and dry season surveys for listed vernal pool branchiopods were conducted accordance with the Section 10(a)(1)(A) Recovery Permit for the proposed project, as well as the MSHCP.

Prior to project construction, the project may need to obtain the following federal and state biological permits, certifications, agreements, and/or approvals:

- Waste Discharge Requirements (WDR) permit from the RWQCB,
- Approval from the Riverside County Environmental Programs Department (EPD), and potentially
- California Fish and Game Code § 1602 Lake or Streambed Alteration Agreement (LSAA) with CDFW.

To offset permanent impacts to jurisdictional areas, the applicant proposes to compensate through one or more of the following methods: (1) offsite compensatory mitigation lands (at a ratio of 3:1); (2) contribution to a mitigation bank or in-lieu fee program as necessary to fund replacement, restoration and conservation of equivalent habitat outside the project site at a ratio of 3:1 and as approved by the EPD. CDFW may also require compensatory mitigation for impacts to waters of the State.

1.0 INTRODUCTION

UltraSystems prepared this jurisdictional delineation report for the proposed Penske Sales, Leasing, and Maintenance Facility Project (project). The project parcels are identified as APNs 297-100-073, 297-100-076, 297-100-091, 297-120-002, 297-120-003, 297-120-017, 297-120-018, and 297-120-025; the street address is 21839 Alessandro Boulevard, Moreno Valley, California, 92553 (see **Appendix A**, Figure 1: *Project Location and Biological Study Area [BSA]*).

The project would involve the construction of a multi-use facility intended for activities related to truck rentals, sales, maintenance, and other operations on approximately 9.6 acres in the City of Moreno Valley, Riverside County, California. Penske Truck Leasing Co, L.P. (“Penske”) is proposing to construct a new state-of-the-art six bay service facility (with a 4011 square-foot office core) and wash bay in addition to a rental and sales office building (with a 1,792 square-foot office core) and associated two-lane, three product (gas, diesel, diesel exhaust fluid) fuel island.

The City of Moreno Valley would process an application seeking design review approval for the proposed facility, which would be located southeast of the intersection of Interstate 215 Frontage Road and Alessandro Boulevard. The roughly rectangular site for the proposed project is currently undeveloped and is used for truck storage.

UltraSystems biologists conducted a jurisdictional assessment and delineation of the project site and the immediate area surrounding the site. The survey was conducted to determine the presence and extent of waters and habitats that are potentially subject to the jurisdictional authority of the USACE, the Santa Ana Region of RWQCB, CDFW, and the MSHCP. This report documents the methods and results of the survey and provides an analysis of the potential impacts to jurisdictional areas from site construction and development in view of federal and state laws and regulations. The results presented in this report are preliminary since the USACE, RWQCB, and CDFW will make the final determination of jurisdiction in accordance with their regulatory authority. Finally, the report recommends, as appropriate, BMPs to minimize or avoid potential impacts to less than significant levels. The report was prepared based upon results of a literature review and field survey, and the report will support permits required by the project from federal and state resource agencies.

1.1 Project Location

The project site is located on the United States Geological Survey (USGS) 7.5-Minute Topographic Map *Riverside East* Quadrangle, the project site is located at Township 3 South, Range 4 West, Section 15 Northeast (see **Appendix A**, Figure 2: *USGS Topographic Map*). The approximate center of the project site is located at 33.915455° -117.281648°. The project site is generally between 1,540 to 1,550 feet above mean sea level.

The project site is located within areas covered by the Reche Canyon/Badlands Area Plan of the MSHCP. The western edge of the project area occurs within the Lake Matthews/Woodcrest Area Plan; however, the BSA does not fall within any criteria cells, conservation areas, wildlife movement corridors or linkages. The MSHCP does not have any survey requirements for this area. Access to the project site is provided from Interstate 215 (the San Bernardino Freeway). To reach the site, exit Alessandro Boulevard (exit 27C) in Moreno Valley and travel east for approximately 0.5 mile. From there, the project alignment sits along the southeast corner of the intersection of East Alessandro Boulevard and Old 215 Frontage Road at 21839 Alessandro Boulevard. The project site comprises the eight Assessor’s Parcel Numbers (APNs), which are listed below.

Project APNs:

- 297120002
- 297120025
- 297120003
- 297120018
- 297120017
- 297100091
- 297100076
- 297100073

The project site is located in Moreno Valley and the BSA overlaps with three jurisdictions, Moreno Valley to the north, east and south, the City of Riverside to the northeast, and unincorporated Riverside County to the west. The project site is bordered by Alessandro Boulevard and commercial properties to the north, Old 215 Frontage Road and a commercial facility to the west, an industrial facility to the south, and commercial/industrial properties to the east.

The project site is located within areas covered by the MSHCP and the Reche Canyon/Badlands Area Plan of the MSHCP; however, it does not fall within any criteria cells, conservation areas, wildlife movement corridors or linkage (**Appendix A**, Figure 3: *Management Plan Areas*). The City of Moreno Valley is a participant in the MSHCP.

The project site is under the jurisdiction of the following resource agency field offices:

- **USACE - Los Angeles District**
915 Wilshire Blvd., Suite 980
Los Angeles, CA 90017
Phone: (213) 452-3908/3333
Fax: (213) 452-4209
- **RWQCB - Santa Ana Region (Region 8)**
3737 Main Street, Suite 500
Riverside, CA 92501-3339
Phone: (951) 782-4130
Fax: (951) 781-6288
- **CDFW - Inland Desert Region 6**
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764
Phone: (909) 484-0167
Fax: (909) 481-2945
- **Riverside County Planning Department: Environmental Programs Division (EPD)**
4080 Lemon Street, 12th Floor
P.O. Box 1409, Riverside, CA 92502-1409
Phone: (951) 955-3200

2.0 PROJECT DESCRIPTION

Penske is proposing to construct a new state-of-the-art six bay service facility (with a 4011 square-foot office core) and wash bay, in addition to a rental and sales office building (with a 1,792 square-foot office core) and associated two-lane, three product (gas, diesel, diesel exhaust fluid) fuel island. The City of Moreno Valley would process an application seeking design review approval for the proposed facility, which would be located southeast of the intersection of Interstate 215 Frontage Road and Alessandro Boulevard. The roughly rectangular site for the proposed project is currently undeveloped and is used for truck storage.

Penske's intended use of the premises is for the operation of a motor vehicle and truck leasing, rental, and sales business which will include the housing, maintaining to full capacity and repairing of motor trucks and trailers, outside parking and storage of such vehicles, motor vehicle repair shop and the storage and dispensing of fuel for the benefit of its internal customers only (see **Appendix B, Site Plans**).

Penske will conduct truck and trailer repairs consisting of general and preventive maintenance to its private and customer fleets, such as clutches, oil changes, belt/bub replacements, tune-ups, tire changes, etc. No major work such as framework, collision repair or bodyshop work, etc. will occur. All work will be conducted within the facility, which will not be open to the general public.

3.0 REGULATORY FRAMEWORK

Each project must comply with federal, state, and local environmental laws, regulations, ordinances, and policies. These provide a potential regulatory constraint to development and construction and are the regulatory drivers that require biological and water resource surveys and associated permits. This section summarizes the major applicable federal and state laws that apply to protecting jurisdictional wetlands, waters, water quality, water quantity, and aquatic/riparian habitats from impacts from the projects and which may be relevant and applicable to the project.

In California, the USACE, RWQCBs, and CDFW regulate activities within inland streams, coastal streams, wetlands, and other waters. These agencies enforce the many federal and state laws, regulations, and policies that prevent further impacts to jurisdictional wetlands and waters. The USACE regulates the discharge of dredged or fill material in Waters of the United States (waters of the U.S.) (defined below) pursuant to Section 404 of the federal Clean Water Act (CWA). The RWQCBs regulate activities pursuant to Section 401(a)(1) of the CWA. The RWQCBs also have jurisdiction over waters of the State (defined below) under the Porter-Cologne Water Quality Control Act (Porter-Cologne). CDFW regulates water resources under Sections (§§) 1600-1616 of the California Fish and Game Code (FGC).

The County of Riverside also regulates alteration of riverine and riparian areas and vernal pools under the MSHCP as discussed below.

3.1 Federal

Section 401 Clean Water Act. Although the Clean Water Act (CWA) is a federal law, the U.S. Environmental Protection Agency (USEPA) has authorized some states, including California, to have the primary authority and responsibility for setting surface- and groundwater water quality standards.

Section 401 is implemented through the Water Quality Certification (WQC) process. In the State of California, the USEPA has given responsibility for issuing Section 401 WQCs to the State Water Quality Resources Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs), unless a discharge of dredged or fill material is proposed within more than one region. In the event that a project proposes discharges of dredged or fill material in more than one region, responsibility for issuance of a Section 401 WQC will lie either with the SWRCB, or, upon agreement of the RWQCBs for the affected regions, with the RWQCB chosen in the discretion of the RWQCBs (Cal. Water Code, § 13160; Cal. Code Regs., tit. 23, § 3838). Certification must be based on a finding that the proposed discharge will comply with water quality standards, which include numeric and narrative water quality objectives applicable to identified surface waters in the Water Quality Control Plan for the region (Basin Plan) in which a discharge of fill is proposed. The Santa Ana Regional Water Quality Control Board (Region 8) will provide review and water quality certification services for this project.

Section 404 Clean Water Act. Section 404 CWA requires authorization from the Secretary of the Army, acting through the U.S. Corps of Engineers (USACE), for the discharge of dredged or fill material into all waters of the United States, including wetlands. Authorizations are conducted through the issuance of Nationwide (or General) Permits, for activities that would cause only minimal permanent individual (between 0.1 and 0.5 acre) and cumulative impacts; through Individual (or Standard) Permits for activities that are likely to have more than a minimal permanent (greater than 0.5 acre) or cumulative impact on aquatic resources; and through Letters of Permission (LOPs) which are a

type of individual permit issued through an abbreviated process that includes coordination with federal and state fish and wildlife agencies and a public interest evaluation, but without the 30-day permit notice period that is required for Individual Permits. The Los Angeles District of the USACE will provide review and permitting services for this project.

The USEPA and USACE are in receipt of the U.S. District Court for the District of Arizona's August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. Consequently, the agencies have halted implementation of the 2020 Navigable Waters Protection Rule ("NWPR") nationwide and are interpreting "waters of the United States" consistent with the pre-2015 regulatory text until further notice.

On November 18, 2021, the USEPA and USACE announced the ruling to revise the definition of "waters of the United States," and will now implement the pre-2015 definition of "waters of the United States," updated to reflect consideration of Supreme Court decisions. This familiar approach would support a stable implementation of "waters of the United States" while the USEPA and USACE continue to consult with states, tribes, local governments, and a broad array of stakeholders in both the current implementation and future regulatory actions.

The agencies are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice.

40 CFR 230.3(s):

- *All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide*
- *All interstate waters including interstate wetlands;*
- *All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters: a) Which are or could be used by interstate or foreign travelers for recreational or other purposes; b) From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or which are used or could be used for industrial purposes by industries in interstate commerce*
- *All impoundments of waters otherwise defined as waters of the United States under this definition*
- *Tributaries of waters identified above*
- *The territorial seas*
- *Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States*

Wetlands and other waters that do not meet the definition of waters of the U.S. are not covered by the CWA; however, they are regulated by the State of California through the Porter-Cologne Water Quality Control Act (Porter-Cologne) and SWRCB Resolution No. 2019-0015 for California (see **Section 3.2**).

3.2 State

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act (Porter-Cologne) defines “water quality objectives” as the allowable “limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisances within a specific area.” Thus, water quality objectives are intended to protect the public health and welfare, and to maintain or enhance water quality in relation to the existing and/or potential beneficial uses of the water. Water quality objectives apply to both waters of the U.S. and waters of the State. In the State of California, the Porter-Cologne Water Quality Control Act is administered in concurrence with the § 401 CWA Water Quality Certification. As with § 401 CWA, the Santa Ana RWQCB will provide review and water quality certification for Porter-Cologne.

State Water Resources Control Board Resolution No. 2019-0015. The California Code of Regulations, title 23, Section 3831(w) states that “[a]ll waters of the United States are also ‘waters of the state.’” This regulation has remained in effect despite Supreme Court decisions such as *Rapanos* and *SWANCC*, which added limitations to what could be considered a water of the U.S. Because the interpretation of waters of the U.S. in place at the time § 3831(w) was adopted was broader than any post-*Rapanos* or post-*SWANCC* regulatory definitions that incorporated more limitations into the scope of federal jurisdiction, it is consistent with the Water Boards’ intent to include both historic and current definitions of waters of the United States into the SWRCBs wetland jurisdictional framework.

As set forth in Resolution No. 2009-0026, although the state of California has historically relied primarily on requirements in the Clean Water Act to protect wetlands, U.S. Supreme Court rulings reducing the jurisdiction of the Clean Water Act over wetland areas by limiting the definition of “waters of the United States” necessitated the use of California’s independent authorities under the Porter-Cologne Act to protect these vital resources.

The inclusion of both current and historic definitions of “waters of the U.S.” ensures some regulatory stability in an area that has otherwise been in flux. The status of a water of the U. S. may only be used to establish that a wetland or water qualifies as a water of the State; it cannot be used to exclude a wetland or water from qualifying as a water of the State. In other words, wetlands that are categorically excluded from qualifying as a water of the U.S. may nevertheless qualify as waters of the State under another jurisdictional category. Examples of waters of the State include (but are not limited to) ephemeral streams and isolated wetlands.

On April 2, 2019, the SWRCB adopted **Resolution No. 2019-0015, Amendment to the Water Quality Control Plan for Ocean Waters of California and the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California to Establish a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State** (Procedures). for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. As they apply to this project, the Procedures provide the SWRCB and its nine RWQCBs to approve a project only if the applicant has demonstrated the following:

- A sequence of actions has been taken to first avoid, then to minimize, and lastly, compensate for adverse impacts that cannot be practicably avoided or minimized to waters of the state;
- The potential impacts will not contribute to a net loss of the overall abundance, diversity, and condition of aquatic resources in a watershed (or multiple watersheds when compensatory mitigation is permitted in another watershed);
- The discharge of dredged or fill material will not violate water quality standards and will be consistent with all applicable water quality control plans and policies for water quality control; and
- The discharge of dredged or fill material will not cause or contribute to significant degradation of the waters of the state.

The SWRCB and the RWQCBs have the authority to regulate the discharge of dredged or fill material under § 401 CWA and Porter-Cologne. Dischargers that obtain a federal permit or license that authorizes impacts to waters of the U.S. (i.e., waters that are within federal jurisdiction), such as § 404 CWA and § 10 of the Safe Rivers and Harbors Act, must obtain certification from the SWRCB or a RWQCB to ensure that the discharge does not violate state water quality standards or any other appropriate requirement of State law. When a discharge is proposed to waters outside of federal jurisdiction, the SWRCB and the RWQCBs regulate the discharge under Porter-Cologne through the issuance of Waste Discharge Requirements (WDRs). CWA § 401 Water Quality Certifications, WDRs, and waivers of WDRs are referred to as orders or permits.

The Santa Ana RWQCB (Region 8) would provide review and certification/permitting for this project.

Basin Plans. The SWRCB requires its nine RWQCBs to develop water quality control plans (Basin Plans) designed to preserve and enhance water quality and protect the beneficial uses of all Regional waters. Specifically, Basin Plans designate beneficial uses for surface waters and groundwater, set narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State antidegradation policy, and describe implementation programs to protect all waters in the Regions. In addition, Basin Plans incorporate by reference all applicable State and Regional Board plans and policies, and other pertinent water quality policies and regulations. This project is under the jurisdiction of the Santa Ana RWQCB.

Construction Stormwater Program. The SWRCB implements water quality regulations under the federal CWA and California Porter-Cologne Water Quality Control Act and require compliance with the National Pollutant Discharge Elimination System (NPDES) for discharges of stormwater runoff associated with a construction activity.

Dischargers whose projects disturb one acre or more of soil are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-009-DWQ, as amended). Construction Activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s) which shows the

construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns.

The SWRCB will provide Construction General Permit review and permitting for this project.

Lake or Streambed Alteration Agreement. Sections 1600-1617 of the Fish and Game Code (FGC) protect the natural flow and the bed, channel, and bank of any river, stream, or lake designated by the CDFW which is at any time an existing fish or wildlife resource, or a waterbody from which these resources derive benefit. General project plans must be submitted to CDFW in sufficient detail to indicate the nature of the project proposed for construction, if the project would:

- Divert, obstruct, or change a streambed;
- Use material from the streambeds;
- Result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a stream.

The Inland Deserts Region (Region 6) of the CDFW serves Riverside County and will provide LSA Notification Review and Agreement services for this project.

3.3 MSHCP Riparian/Riverine Areas and Vernal Pools

The MSHCP survey requirements for the project site include vernal pool and fairy shrimp habitats. MSHCP Section 6.1.2, *Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools*, describes the process through which protection of vernal pools and fairy shrimp species will occur within the MSHCP area. Protection of these resources is important for a number of conservation objectives. Vernal pools must be avoided or an assessment of a project's potentially significant effects on vernal pools and fairy shrimp habitat is required. Guidelines for determining whether these resources exist on site are described below.

Riparian/Riverine Areas are described in Section 6.1.2 of the MSHCP as:

Riparian/Riverine Areas are lands which contain Habitat dominated by tress [sic], shrubs, persistent emergents, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from a nearby fresh water source; or areas with fresh water flow during all or a portion of the year (Dudek 2003, p. 17).

Vernal pools are described in Section 6.1.2 of the MSHCP as:

Vernal pools are seasonal wetlands that occur in depression areas that have wetlands indicators of all three parameters (soils, vegetation and hydrology) during the wetter portion of the growing season but normally lack wetlands indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season.

The determination that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by-case basis. Such determinations should consider the length of the time the area exhibits upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history,

vegetation, soils, and drainage characteristics, uses to which it has been subjected, and weather and hydrologic records (Dudek 2003, p. 17).

4.0 METHODOLOGY

Prior to conducting the onsite field investigation, a review of readily available data relevant to the project was performed and the results were compiled from federal, state, and regional agency websites, databases, and management plans; aerial imagery, USGS topographic maps, National Wetland Inventory (NWI) maps, data from the U.S. Environmental Protection Agency's Watershed Assessment, Tracking, & Environmental Results System (WATERS), and Natural Resources Conservation Service (NRCS) soil surveys to determine areas of potential USACE, RWQCB, and CDFW jurisdiction (i.e., waters of the U.S. and State, including wetlands).

On October 14, 2021, UltraSystems biologists Ms. Michelle Tollett and Mr. Matthew Sutton conducted a survey of potentially jurisdictional features within the project site. Wetlands and other waters of the U.S. and State that are located outside of the BSA and not within known or anticipated areas of project-related ground disturbance will not be affected by the project and were therefore, not delineated. Results of the delineation surveys are provided in **Section 6.0**.

Biologists surveyed the project site to determine the location and extent of waters and wetlands subject to jurisdiction of the USACE, RWQCB, CDFW and/or the County of Riverside; however, these agencies make the final determination of jurisdiction in accordance with their regulatory authority. Biologists also noted the surrounding environment, topography, land uses, substrates, and vegetation within and adjacent to each drainage. At each potential jurisdictional area, biologists searched for the presence of wetland hydrology, hydric soils, hydrophytic vegetation, signs of an OHWM, the presence of a well-defined bed and bank, evidence of recent water flow, and/or areas of scour. All water features identified in the BSA were examined for connectivity, or a lack thereof, to larger drainages. Vegetation along the water features was also identified and any potential indicators of wetland conditions were recorded on data sheets and in field notes.

Boundaries of potential jurisdictional areas were delineated using a Trimble Geo 7X hand-held GPS unit. Following the field mapping, UltraSystems GIS staff converted the jurisdictional boundaries into an ArcGIS file. Lengths, widths, acreages, and boundaries for each agency's jurisdiction were then calculated in ArcGIS.

5.0 DATA REVIEW RESULTS

5.1 Climate and Hydrological Data

Moreno Valley has a mild semi-arid climate with Mediterranean characteristics. During the summer months there is very little precipitation except for infrequent thunderstorms, which typically occur late in the season. Most precipitation falls between November and March. Semi-arid climates tend to support short or scrubby vegetation, with semi-arid areas usually dominated by either grasses or shrubs.

California Irrigation Management System (CIMIS) Station 044, located at the U.S. Riverside Agricultural Experiment Station (approximately 4.6 miles northwest of the project site), has been in operation since June 2, 1985. Between January 1, 1986 and December 31, 2021, this station recorded an average annual precipitation of 0.73-inch; average maximum air temperature for the period of record was 78.12 °F, and average minimum temperature was 52.86 °F (CIMIS 2022).

The U.S. Drought Monitor website, operated by the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, has recorded drought information across the United States since 1999 (NDMC 2022). The U.S. Drought Monitor levels of drought are defined in **Table 3.1-2, U.S. Drought Monitor Drought Level Definitions**.

Table 5.1-1

U.S. DROUGHT MONITOR DROUGHT LEVEL DEFINITIONS

Drought Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: <ul style="list-style-type: none"> • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: <ul style="list-style-type: none"> • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	<ul style="list-style-type: none"> • Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> • Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> • Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> • Exceptional and widespread crop/pasture losses

Drought Category	Description	Possible Impacts
		<ul style="list-style-type: none"> Shortages of water in reservoirs, streams, and wells creating water emergencies

Source: NDMC 2022

Between January 1, 2014 and August 4, 2022, the NDMC recorded a total of 300 consecutive weeks of severe or greater (Categories D2 – D4) drought as presented in **Table 5.1-2**.

Table 5.1-2

U.S. DROUGHT MONITOR WEEKS OF CONSECUTIVE DROUGHT 2014 - 2022

Start Date	End Date	Consecutive Weeks in Drought	Minimum Drought Category
January 2, 2014	February 2, 2017	157	D2 – Severe Drought
November 26, 2014	November 23, 2016	5	D2 – Severe Drought
February 8, 2018	January 10, 2019	48	D2 – Severe Drought
November 12, 2020	August 4, 2022	90	D2 – Severe Drought
SOURCE: NDMC 2022			

As of August 4, 2022, the U.S. Drought Monitor also recorded 302 non-consecutive weeks of severe or greater (Categories D2 – D4) drought in Riverside County. During the 2021-2022 surveys, the Moreno Valley area was experiencing severe drought (D2; NDMC 2022).

5.2 Soils

Based on the USDA NRCS Web Soil Survey for the Western Riverside Area, California (Soil Survey Staff 2022), the BSA contains three soil map units (shown in **Appendix A**, Figure 4: *USDA Soils*, and described in **Appendix C**, *Soils Report*), which are presented in **Table 5.2-1**, *Soils Mapped Within the BSA*. None of the soils are listed on the State Soil Data Access Hydric Soils List (USDA-NRCD 2022).

Table 5.2-1
SUMMARY OF SOIL MAPPING UNITS

Name	Symbol	Land Form	Parent Material	Hydric Status
Monserate sandy loam, 0 to 5 percent slopes	MmB	Alluvial Fans	Alluvium derived from granite	Not hydric
Monserate sandy loam, 5 to 8 percent slopes, eroded	MmC2	Alluvial Fans	Alluvium derived from granite	Not hydric
Monserate sandy loam, shallow, , 5 to 15 percent slopes, eroded	MnD2	Alluvial Fans	Alluvium derived from granite	Not hydric

Name	Symbol	Land Form	Parent Material	Hydric Status
SOURCE: Soil Survey Staff 2022				

5.3 Surface Water

The U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) has mapped an intermittent stream within the BSA, located approximately 500 feet west of the project site boundary (see **Appendix A**, Figure 5: *Water Resources*). This intermittent stream existed as mapped by the NWI as recently as 2018 (Google Earth 2022a), but appears to have been undergrounded due to construction by August 15, 2019 (Google Earth 2022b). This intermittent stream is the only NWI wetland mapped within or adjacent to the BSA.

5.4 Groundwater

The BSA is located within the San Jacinto Groundwater Basin (DWR Basin 8-05). This groundwater basin has a surface area of approximately 293 square miles and underlies the San Jacinto, Perris, Moreno, and Menifee Valleys in western Riverside County. The valleys are drained by the San Jacinto River and its tributaries. The San Jacinto Groundwater Basin is bounded by the San Jacinto Mountains on the east, the San Timoteo Badlands on the northeast, the Box Mountains on the north, the Santa Rosa Hills and Bell Mountain on the south, and unnamed hills on the west. Lake Perris is located in the eastern part of Perris Valley (DWR 2003).

The USGS has a groundwater monitoring well located on March Air Reserve Base, approximately 1.2 miles southeast of the project site. Groundwater levels at this well (USGS Well ID 335408117154401) have been recorded since August 15, 2015; the most recent measurement occurred on July 6, 2022, when the groundwater level was measured at 9.74 feet below ground surface (bgs). The lowest groundwater level at this well was 12.69 feet bgs measured on September 8, 2016, and the highest level was 8.27 feet bgs measured on April 29, 2020 (USGS 2022).

5.5 Land Use

The project is located in the Southern California Coastal Plain (MRLA Region 19) of the California Subtropical Fruit, Truck, and Specialty Crop Region (USDA, NRCS 2022). MRLAs are geographically associated land resource units delineated by the Natural Resources Conservation Service and are the basic units for delineating statewide patterns of soils, climate, water resources, and land use by analyzing elevations, topography, and rainfall data (effective amount, timing, kind, and distribution).

In the valleys of Region 19 nearly two-thirds of this area consists of urban or built-up land, and the rest is rapidly being converted to urban uses. About a third of the area is brushland used for watershed protection. The irrigated crops are subtropical fruits such as avocados, citrus, deciduous fruits, grain, truck crops, grapes, hay, and pasture. (USDA NRCS, 2022, pp. 70).

The majority of the BSA is comprised of roadways and commercial/industrial facilities, with some residences to the northeast.

5.6 Local Hydrology

The project site is located within the Tequesquite Arroyo hydrologic unit (HU; HU Code 180702030802), which drains approximately 29.7 square miles. The Tequesquite Arroyo HU is contained within the larger Middle Santa Ana River hydrologic unit (HUC 1807020308), which drains approximately 292.4 square miles (USEPA 2020). The Santa Ana River discharges into the Pacific Ocean between Huntington Beach and Newport Beach.

6.0 FIELD INVESTIGATION RESULTS

6.1 Riparian/Riverine Areas

MSHCP Riparian/Riverine Areas and associated plant and wildlife species were not observed within the BSA. The BSA is Vernal Pool Complex. The majority of the BSA is developed and does not support surface drainages, including MSHCP Riparian/Riverine Areas.

6.1.1 Vernal Pool Overview

Due to indications of repeated inundation seen on historic aerial imagery (1978, 2005, 2014, 2016, 2017, 2018, 2019, 2020, 2021; NETROnline 2022, Google Earth 2022a), the project site was investigated for the potential presence of wetlands during a biological survey conducted on September 21, 2021. During this survey, fairy shrimp were observed in two ponded areas onsite. The site was revisited on October 14, 2021; this visit resulted in the delineation of two vernal pools, Vernal Pool-East (VP1) and Vernal Pool-West (VP2), constituting a vernal pool complex, on the east side of the project site (see **Appendix A**, Figure 6, *Jurisdictional Impact Areas*; see also **Appendix H**, *Photographs*).

The site was revisited throughout the 2021-2022 wet season in response to rain events. Site visits included a search for additional depressions that may provide sufficient ponding of water to sustain fairy shrimp and hydrophytic vegetation during the growing season (see **Appendix D**, *2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods for the Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California*, and **Appendix E**, *2022 Dry Season Survey Report for List Large Branchiopods at the Penske Sales, Leasing, and Maintenance Facility Project Site, Riverside County, California*).

During the *2021-2022 Wet Season Presence/Absence Survey*, Dudek (2022a) identified an additional 14 basins (depressions) on the project site that had the potential to support fairy shrimp species; however, four of these basins did not support fairy shrimp during the *2021-2022 Wet Season Presence/Absence Survey* (see **Appendix A**, Figure 6, *Jurisdictional Impact Areas*). Although 10 of the additional 14 basins supported fairy shrimp during the wet season surveys, only VP1 and VP2 exhibited sufficient wetland hydrology indicators to satisfy *Arid West Supplement* (USACE 2008) requirements of a wetland/vernal pool.

Plants species within and on the edge of the pools were recorded during each visit (see **Appendix F**, *Plant Species Observed*).

Both depressions showed evidence of surface soil cracks during a September 21, 2021 biological resources assessment survey. During the jurisdictional delineation survey conducted on October 14, 2021, UEI biologists Ms. Tollett and Mr. Sutton investigated two surface depressions on the project

site that had been documented during the reconnaissance-level biological survey as having signs of intermittent inundation (Wetland Hydrology Indicator B6, Surface Soil Cracks).

During the October 14, 2021 jurisdictional delineation survey, two shallow ponds, approximately three to four inches deep, were observed in the VP1, possibly resulting from a rain event the preceding week.

The vernal pool complex (VP1 and VP2) is on the eastern side of the project site, adjacent to each other and separated by a narrow dirt path (see **Appendix A**, Figure 6, *Jurisdictional Impact Areas*). The larger depression (VP1) is approximately 250-feet long by a width that ranges from approximately 10 to 40 feet. The smaller depression (VP2) is directly west of VP1; the pools are separated by a 15-foot dirt path that crosses between the VP1 and VP2. VP1 is approximately 25-feet long by 50-feet wide. The area of VP1 is 0.24 acre (10,319 square feet) and that of VP2 is 0.02 acre (778 square feet; see **Table 6.1-1**).

6.1.2 Hydrophytic Vegetation

Since common names of plants vary between references, scientific names are included upon initial mention of each species, and then the common names are used after that. The list of plants and wildlife observed during the field surveys is found in **Appendix G**, *Data Sheets and Field Notes*, and in **Appendix F**, *Plant Species Observed*.

Plant species present at VP1 and VP2 were recorded during the jurisdictional delineation survey and during each of the 2021-2022 wet season site visits, and their wetland indicator status was verified with the National Wetland Plant List (NWPL; USACE 2020).

Vegetation at the vernal pool complex is significantly disturbed, likely due to repeated attempts by previous landowners to fill the pools (Google Earth 2022b). The majority of the vegetation observed within the vernal pool complex consists of ruderal vegetation, dominated by non-native annual forbs (herb stratum). The plant species with the highest cover in the depressions include stinkwort (*Dittrichia graveolens*), hairy leaved sunflower (*Helianthus annuus*; FACU¹), knotweed (*Polygonum aviculare*; FAC²), and nettle leaf goosefoot (*Chenopodium murale*; FACU).

Plants recorded at the vernal pool complex during the wet season site visits include willow dock (*Rumex salicifolius*; FACW³), nut grass (*Cyperus esculentis*; FACW), salt marsh sand-spurry (*Spergularia marina*; FACW), knotweed (*Polygonum aviculare*; FAC), ryegrass (*Festuca perennis*; FACU), clustered tarweed (*Deinandra fasciculata*; FACU), and common sow thistle (*Sonchus oleraceus*; UPL⁴). No NWPL-designated obligate (OBL) plant species were observed in the vernal pool complex during the October 14, 2021 jurisdictional delineation survey or the subsequent site visits. A complete list of plants recorded at VP1 and VP2 during the survey and the 2021-2022 wet season site visits is in **Appendix F**, *Plant Species Observed*.

The disturbed plant community that occupies the wetland (vernal pool complex) does not fit any classification described in *Preliminary Descriptions of the Terrestrial Communities of California* (Holland, 1986) or in *A Manual of California Vegetation Second Edition* (Sawyer et al., 2009). Thus,

¹ Facultative Upland

² Facultative

³ Facultative Wetland

⁴ Upland

although the vernal pool plant community is weedy in nature and contains many non-native species, it is described as a vernal pool complex and not as part of the Developed/Disturbed land cover type in this report.

6.1.3 Hydric Soil Indicators

The soil at the base of the vernal pool complex formed an intact ball when rolled between the fingers indicating a loamy clay composition. Soil cores were not taken from VP1 and VP2 due to the presence of fairy shrimp. Because fairy shrimp, a vernal pool indicator species, were observed in the ponds, it was concluded that the depressions are vernal pools. The UEI biologists did not dig soil pits to maintain the integrity of the vernal pools (Hydric Soil Indicator F9) and to avoid disturbing fairy shrimp, eggs, or habitat.

6.1.4 Wetland Hydrology Indicators

A 24-inch plastic corrugated pipe is located at the eastern end of VP1 at the boundary of the project site and extends into the adjacent property (C5 Equipment Rentals and Maintenance). The culvert is buried in approximately four feet of soil, and the base of the culvert is directly beneath the base of the chain-linked fence that separates the two properties. Due to lack of public access to the equipment rental and maintenance facility, the source of the water discharging from the culvert could not be determined. Based on historic aerials (1978a, 1978b; NETROnline 2022) it is possible that the culvert is part of a drainage system that dates from the 1970s and discharges nuisance flows and/or stormwater from the adjacent properties (see **Appendix H, Photographs**) onto the project site. As described in Section 6.0, indications of repeated inundation (Wetland Hydrology Indicator B7) was visible on historic aerial imagery (1978, 2005, 2014, 2016, 2017, 2018, 2019, 2020, 2021; NETROnline 2022, Google Earth 2022),

Surface water (Wetland Hydrology Indicator A1) was present in VP1 and VP2 during the October 14, 2021 jurisdictional delineation survey, and was possibly the result of two light rain events that had occurred on October 5, and 8, 2021, six and nine days prior to the jurisdictional delineation survey, respectively. Precipitation records from CIMIS Station 44 at the University of California, Riverside, reported 0.08 inches of rain on October 5, and 0.19 inches of rain on October 8, 2021 (CIMIS, 2021).

Subsequent site visits in response to rain events during the 2021-2022 wet season documented water levels within V1 and V2 that ranged in depth from approximately four to 24 inches. VP1 and VP2 merged after at least one rain event during the 2021-2022 wet season.

VP1 and VP2 exhibited four primary indicators of wetland hydrology required by the *Arid West Supplement* (USACE 2008): Surface Water (A1), Surface Soil Cracks (B6), Inundation Visible on Aerial Imagery (B7), and Aquatic Invertebrates (B13; see **Section 6.1.3**).

6.1.5 Aquatic Invertebrates

Fairy shrimp were observed in VP1 during the October 14, 2021 jurisdictional delineation survey. Dudek biologist Mr. Paul Lemons (TE051248-6) conducted a survey for the presence/absence of listed large vernal pool branchiopods between December 21, 2021 and April 24, 2022 (see **Appendix D, 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods for the Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California**). The surveys were conducted according to the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2017). A total of 16 features, including VP1 and VP2, were identified as suitable habitat for vernal pool branchiopods and

were surveyed during the 2021/2022 wet survey season. These 16 features were identified as new in 2021/22 and not previously surveyed (Dudek 2022a).

Fourteen of the features onsite are considered road ruts or puddles. Road ruts are depressions that are typically formed by vehicular traffic within or immediately adjacent to roadways, generally lack aquatic vegetation, and are heavily disturbed by vehicular traffic, and are moderately to highly disturbed (i.e., parked vehicles, trailers, tire tracks, trash). During the 11 survey sampling visits, 12 features (including VP1 and VP2) of the 16 total features were found to be occupied by versatile fairy shrimp (*Branchinecta lindahli*). No federally listed large branchiopod species were identified during the 2021/22 wet season survey (Dudek 2022a).

The 2022 dry season survey for the presence or absence of listed large vernal pool branchiopods was conducted on June 29, 2022. Dudek biologist Paul Lemons (TE051248-6) conducted the soil collection according to the Survey Guidelines for the Listed Large Branchiopods (USFWS 2017). Soil samples were collected during this 2022 dry season survey from the 16 features which were surveyed during the wet season survey. The soil samples collected on June 29, 2022 were submitted to biologist Greg Mason of Alden Environmental, Inc. (TE58862A; Dudek 2022b) on June 30, 2022 for soil sieving and cyst culturing (see **Appendix E**, *2022 Dry Season Survey Report for Listed Large Branchiopods at the Penske Sales, Leasing, and Maintenance Facility Project Site, Riverside County, California*).

Results of the dry sample analysis yielded the presence of cysts from the fairy shrimp genus *Branchinecta* in 14 features, including VP1 and VP2. All cysts collected from these features were attempted to be cultured and raised to maturity to make a species-level identification. This attempt was successful in 13 of the 14 features in which cysts were collected. Only one basin (Basin 3, see **Appendix E**) failed to produce hatched shrimp, therefore, the cysts from this basin could only be positively identified to genus level (i.e., *Branchinecta*). All shrimp that were successfully raised to maturity were identified as versatile fairy shrimp (*Branchinecta lindahli*). No federally-listed Branchiopods were identified during this 2022 dry season survey effort (Dudek 2022b)

The versatile fairy shrimp was identified in VP1 and VP2, which satisfies Wetland Hydrology Indicator B13, Aquatic Invertebrates.

6.2 Impacts to Jurisdictional Waters

The proposed project would permanently fill VP1 and VP2 and develop the entire project site (see **Appendix B**, *Site Plans*), thus resulting in permanent impacts to the vernal pool complex.

Potential permanent impacts to waters of the State and waters under the jurisdiction of the MSHCP that may result from construction of the project are presented in Table 6.1-1.

Table 6.1-1
DIRECT IMPACTS TO JURISDICTIONAL WATERS

Agency Jurisdiction	Permanent Impact Area (acres/square feet)		Total Impact Area (acres)
	VP 1	VP 2	
Wetland/Vernal Pools (RWQCB)	0.24/10,319	0.02/778	0.26/11,097
Wetland/Vernal Pools (MSHCP)	0.24/10,319	0.02/778	0.26/11,097

In addition to VP1 and VP2, 14 basins that had the potential to support fairy shrimp were identified (see **Appendix A**, Figure 6, *Jurisdictional Impact Areas*); however, only 10 to these basins were determined to support fairy shrimp (*Branchinecta lindahli*) during the 2021-2022 wet season (Dudek 2022a, p. 5). Results of the 2022 dry season analysis found eggs of *Branchinecta lindahli* (or *Branchinecta* sp.) in all 14 basins (Dudek 2022b, p. 3).

While these 14 basins contained fairy shrimp or their eggs, none of these basins exhibited other wetland indicators and were therefore determined not to be wetlands/vernal pools.

6.3 Observed Jurisdictional Status

Based on the results of the jurisdictional delineation survey, subsequent site visits during the wet season, the 2021-2022 wet season presence/absence survey for vernal pool branchiopods, and the 2022 dry season survey for list large branchiopods described in sections 6.1.1 through 6.1.4 of this document, it was determined that VP1 and VP2 on the project site are not waters of the U.S. jurisdictional to the USACE under § 404 of the CWA. VP1 and VP2 are isolated ephemeral basins (i.e., vernal pools) and do not connect with a known water of the U.S. or a tributary thereof. The project would not be required to submit a Preconstruction Notification to the USACE or obtain coverage under a Nationwide Permit. Additionally, because VP1 and VP2 are not waters of the U.S., the project will not be required to obtain a § 401 CWA Water Quality Certification.

VP1 and VP2 are determined to be waters of the State under the jurisdiction of the RWQCB under the California Porter-Cologne Water Quality Control Act and the Procedures (SWRCB Resolution No. 2019-0015), all waters in the State of California are waters of the State; the wetland (vernal pool complex) are wetland waters of the State, including isolated waters and wetlands not protected by the CWA. The project will be required to obtain a WDR permit from the RWQCB for permanent impacts to waters of the State.

CDFW does not regulate wetlands; however, § 1602(a) FGC states *An entity shall not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake if the agency determines that the activity may substantially adversely affect an existing fish or wildlife resource...* (§ 1602[a][4][B] FGC). Because VP1 and VP1 support versatile fairy shrimp, CDFW may opt to take jurisdiction of VP1 and VP2 under §§ 1600 et seq., although this is not anticipated.

Section 6.1.2 of the MSHCP states *determinations that an area exhibits vernal pool characteristics, and the definition of the watershed supporting vernal pool hydrology, must be made on a case-by-case basis.* Determinations are made based on the length of the time the area is expected to support vernal pool hydrological characteristics based primarily on its history, vegetation, soils, and drainage characteristics. Fairy shrimp are an invertebrate class of species that are particularly adapted to vernal pool ecology and ephemeral pools that support similar characteristics. Based on the results of the assessment described in Sections 6.1.1 through 6.1.4 of this report, VP1 and VP2 may qualify as vernal pools as defined in the MSHCP and the project may require approval from the Riverside County Planning Department: Environmental Programs Division (EPD).

These permits and approvals described above would mandate BMPs, avoidance and protection measures, and compensatory mitigation measures for permanent impacts to jurisdictional waters (waters of the State, MSHCP Vernal Pools). All measures to protect waters, water quality, fish, and wildlife resources would be incorporated into the project design as appropriate. Specific mitigation details to offset impacts to jurisdictional areas will be finalized during the permitting process with RWQCB and EPD.

Basins 1 through 14 did not exhibit wetland indicators other than the presence of aquatic invertebrates, and were therefore determined to not be wetlands. Basins 1 through 14 are not considered to be waters of the U.S. or State.

Final jurisdictional status will be provided by the RWQCB, CDFW, and EPD. **Appendix A**, Figure 6, *Jurisdictional Impact Areas*, depict the jurisdictional boundaries of the waters of the State that were delineated within the affected portion of the project site.

For supporting documentation pertaining to the observed jurisdictional status, please refer to **Appendix G**, *Data Sheets and Field Notes*. Photographs of the project site are located in **Appendix H**, *Photographs*.

7.0 MITIGATION MEASURES

Prior to the issuance of grading permits for the project, and prior to any impacts to jurisdictional areas, the **project** would obtain permits pursuant to Porter Cologne and the Procedures for impacts to jurisdictional waters of the State, EPD approval for impacts to MSHCP vernal pools, and potentially for waters of the State under the jurisdiction of CDFW. These permits would mandate BMPs, avoidance and protection measures, and compensatory mitigation for permanent impacts to jurisdictional waters. All measures to protect waters, water quality, fish, and wildlife resources would be incorporated into the project design as appropriate. Specific mitigation details to offset impacts to jurisdictional areas will be finalized during the permitting process with RWQCB, and EPD.

7.1 Mitigation for Impacts to Jurisdictional Waters

7.1.1 Permanent Impact Mitigation

The project is anticipated to permanently impact the following:

- RWQCB waters of the State (wetlands/vernal pools): 0.26 acre (11,097 square feet).
- EPD MSHCP wetland (vernal pools): 0.26 acre (11,097 square feet).

The project may permanently impact the following:

- CDFW waters of the State: 0.26 acre (11,097 square feet).

To offset permanent impacts to jurisdictional areas, the applicant proposes to compensate through one or more of the following methods: (1) offsite compensatory mitigation lands (at a ratio of 3:1); (2) contribution to a mitigation bank or in-lieu fee program as necessary to fund replacement, restoration and conservation of equivalent habitat outside the project site at a ratio of 3:1 and as approved by the Riverside County Environmental Programs Department (EPD). CDFW may also require compensatory mitigation for impacts to waters of the State.

8.0 LITERATURE CITED AND REFERENCES



- CIMIS (California Irrigation Management Information System). 2021. Daily Reports for Station 44 (University of California, Riverside) from October 1 through October 14, 2021. Available at <https://cimis.water.ca.gov/>. Accessed on October 18, 2021.
- Curtis, K.E. and R.W. Lichvar. 2010. *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*. Wetland Regulatory Assistance Program. Cold Regions Research and Engineering Laboratory. U.S. Army Engineer Research and Development Center, Hanover, New Hampshire.
- Dudek and Associates. 2003. Final MSHCP Volume I: The Plan (Part 1 of 2 [Volume 1, Section 6]). Prepared for: County of Riverside Transportation and Land Management Agency. Approved June 17, 2003. Section 6 Revised April 16, 2021. Available at <https://www.wrc-rca.org/document-library/>. Downloaded on September 8, 2022.
- Dudek. 2022a. 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods for the Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California. Prepared for U.S. Fish and Wildlife Service. June 16, 2022.
- Dudek. 2022b. 2022 Dry Season Survey Report for List Large Branchiopods at the Penske Sales, Leasing, and Maintenance Facility Project Site, Riverside County, California. Prepared for U.S. Fish and Wildlife Service. August 12, 2022.
- DWR (California Department of Water Resources. Bulletin 118-03 *California's Ground Water: Update 2003*. Basin Report 8-005, San Jacinto Groundwater Basin (updated January 20, 2006). Available at https://data.cnra.ca.gov/dataset/12e534ff-f604-4ba9-82db-486d81e082ff/resource/96414e5b-1d47-44aa-9b7b-f5551610299/download/b118_2003_basindescription_8_005.pdf. Downloaded on August 5, 2022.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station. Retrieved from: <http://el.erdc.usace.army.mil/wetlands/pdfs/wlman87.pdf>
- Google Earth [2022a]. Version 7.3.4.8642 (May 12, 2022). Penske Sales. Leasing, and Maintenance Facility Project. 33.915443° -117.281611°. Eye altitude 3,254. Google Earth 2011, 2014, 2016, 2018, 2020. Accessed on August 18, 2022.
- Google Earth [2022b]. Version 7.3.4.8642 (May 12, 2022). Penske Sales. Leasing, and Maintenance Facility Project. 33.915443° -117.281611°. Eye altitude 3,254. Google Earth 2016, 2019. Accessed on August 18, 2022.
- Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California*. The Resources Agency, Nongame Heritage Program, California Department of Fish & Game, Sacramento, Calif. 156 pp.
- NDMC (National Drought Mitigation Center). 2022. U.S. Drought Monitor. Available at <http://droughtmonitor.unl.edu/Data.aspx>. Accessed on August 5, 2022.

- NETROnline. 2022. Historic Aerials (1978a, 1978b, and 2005). Available at <https://www.historicaerials.com/viewer>. Accessed on October 15, 2021.
- Sawyer, J.O., T. Keeler-Wolf, J.M. Evens. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society Press. Sacramento, CA.
- Soil Survey Staff. 2022. Web Soil Survey: Custom Soil Resource Report for Western Riverside Area, California. Available at <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed on August 5. Downloaded on August 8, 2022.
- USACE (U.S. Army Corps of Engineers). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE (U.S. Army Corps of Engineers). 2020. National Wetland Plant. Available at https://cwbi-app.sec.usace.army.mil/nwpl_static/v34/home/home.html. Accessed on August 16 and 17, 2022.
- USDA NRCS (United States Department of Agriculture, Natural Resources Soil Conservation Service). 2020. Soil Data Access (SDA) Hydric Soils List. Available at https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcseprd1316620.html. Accessed on August 5, 2022.
- USDA NRCS (United States Department of Agriculture, Natural Resources Conservation Service). 2022. *Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin*. U.S. Department of Agriculture, Agriculture Handbook 296
- USEPA (U.S. Environmental Protection Agency). 2020. WATERS (Watershed Assessment, Tracking & Environmental Results System), version 1.10 (kmz). Available at <https://www.epa.gov/waterdata/viewing-waters-data-using-google-earth>. Downloaded on June 3, 2022.
- USGS (U. S. Geological Survey). 2022. National Water Information System, USGS Water Resources: Groundwater Levels for the Nation (USGS 335408117154401). Available at https://nwis.waterdata.usgs.gov/nwis/gwlevels?site_no=335408117154401&agency_cd=USGS&format=html. Accessed on August 5, 2022.

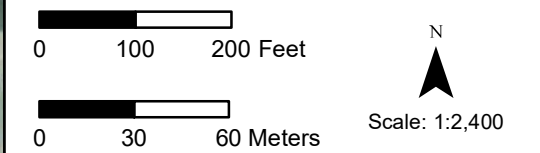
APPENDIX A
FIGURES

**Penske Sales, Leasing,
and Maintenance Facility**

Legend

-  Project Boundary
-  500ft Biological Study Area (BSA)

Key Map

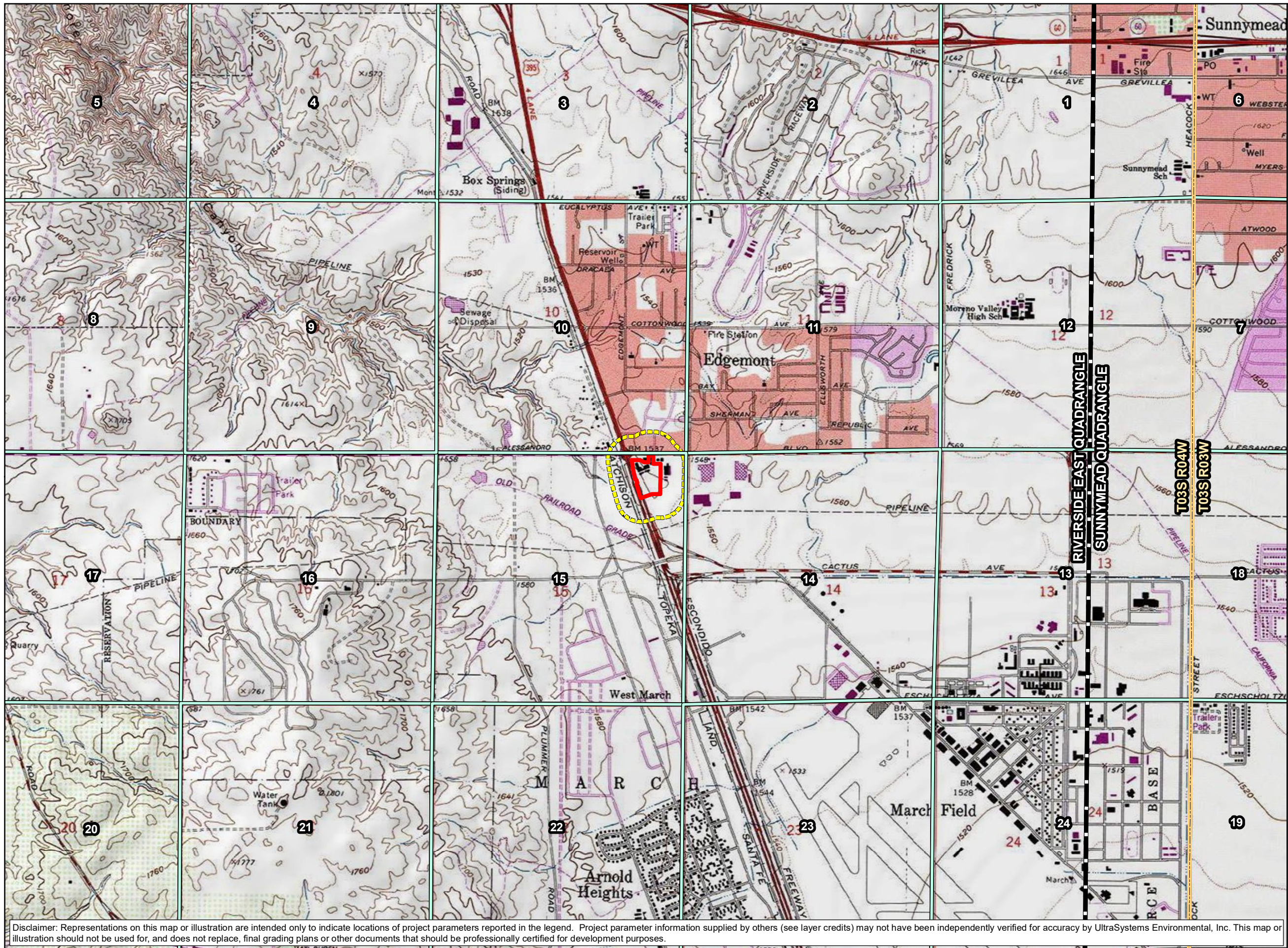


**Project Location and
Biological Study Area (BSA)**

Figure 1



Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.



Penske Sales, Leasing, and Maintenance Facility

Legend

- Project Boundary
- 500ft Biological Study Area (BSA)
- Quadrangle Boundary
- Township Boundary
- Section Boundary

Key Map

0 1,000 2,000 Feet

0 300 600 Meters

N

Scale: 1:24,000

Topographic Map

Figure 2

USGS Quadrangle: Riverside Esat
 Township: 3S Range: 4W
 Section: 15

UltraSystems
environmental • management • planning

Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.

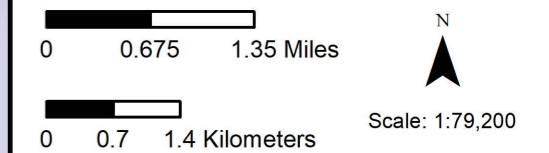
Path: \\GIS\SVR\gis\Projects\7110_Penske_Truck_Leasing_IS_MND\MXDs\BIO\7110_Penske_4_4_Bio_Topo_11x17_2021_10_05.mxd
 Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community. Copyright© 2013 National Geographic Society, i-cubed; Cal-Atlas, 2015; California Department of Conservation, 2019; UltraSystems Environmental, Inc., 2021

Penske Sales, Leasing, and Maintenance Facility

Legend

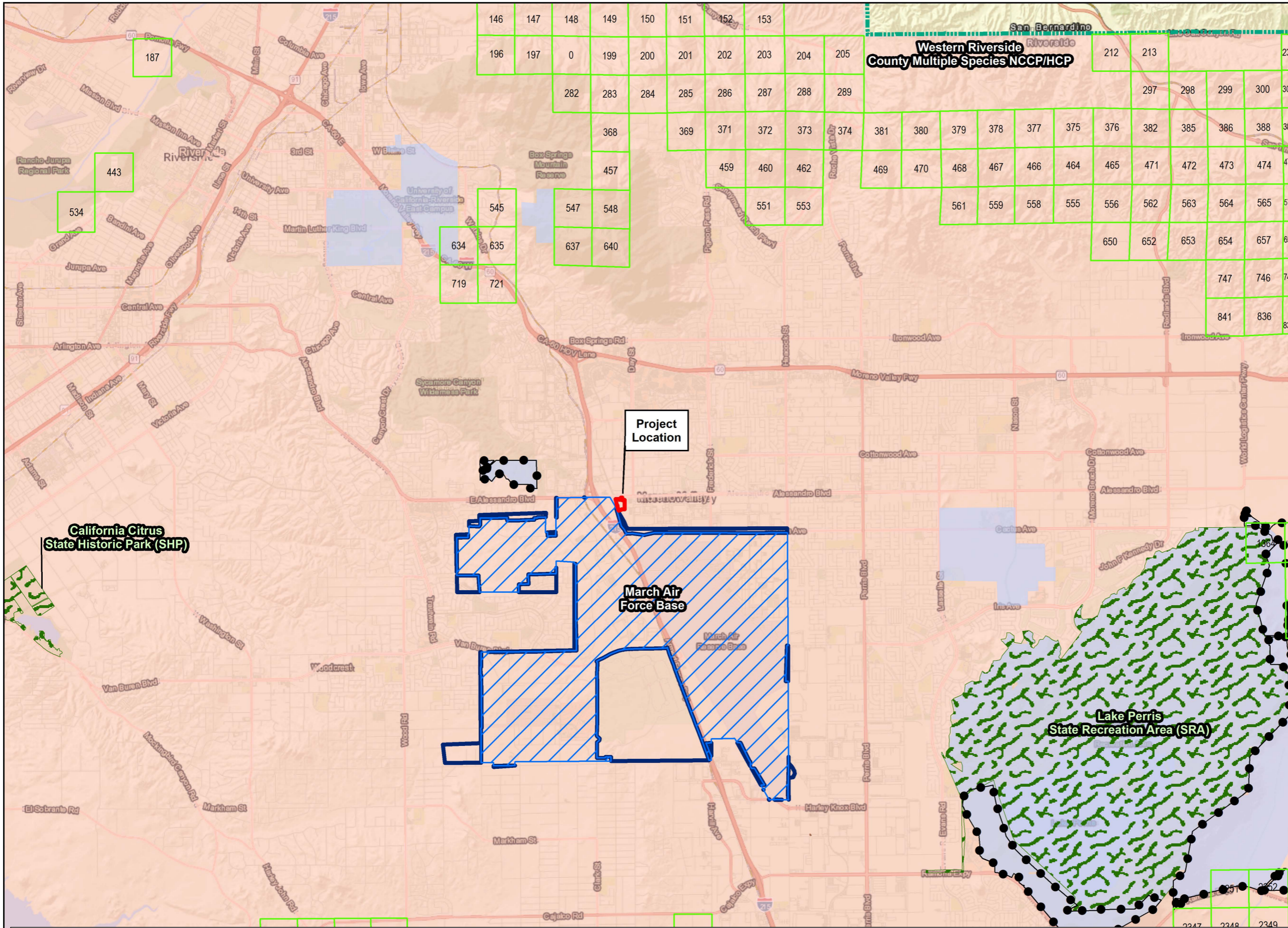
-  Project Boundary
-  State Park
-  State Land
-  US Bureau of Land Management
-  Department of Defense (DOD)
-  Air Force Base
-  Habitat Conservation Plan (HCP)/Natural Community Conservation Plan (NCCP)
-  Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP)
-  CDFW Owned and Operated Lands
-  MSHCP Criteria Cell

Key Map



Management Plan and Land Designation Areas

Figure 3



Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.

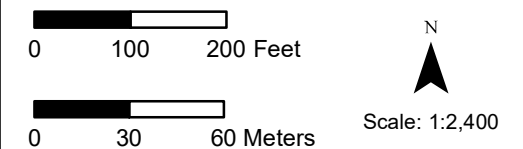
Path: \\GIS\SVR\GIS\Projects\7110_Penske_Truck_Leasing_IS_MND\MXDs\BIO\7110_Penske_4_4_Management_Plans_11x17_2021_10_06.mxd
 Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community; BLM, 2019, 2020; County of Riverside, 2019,2021; CDFW, 2013; the State of California, Department of Parks and Recreation, 2018; UltraSystems Environmental, Inc., 2021

**Penske Sales, Leasing,
and Maintenance Facility**

Legend

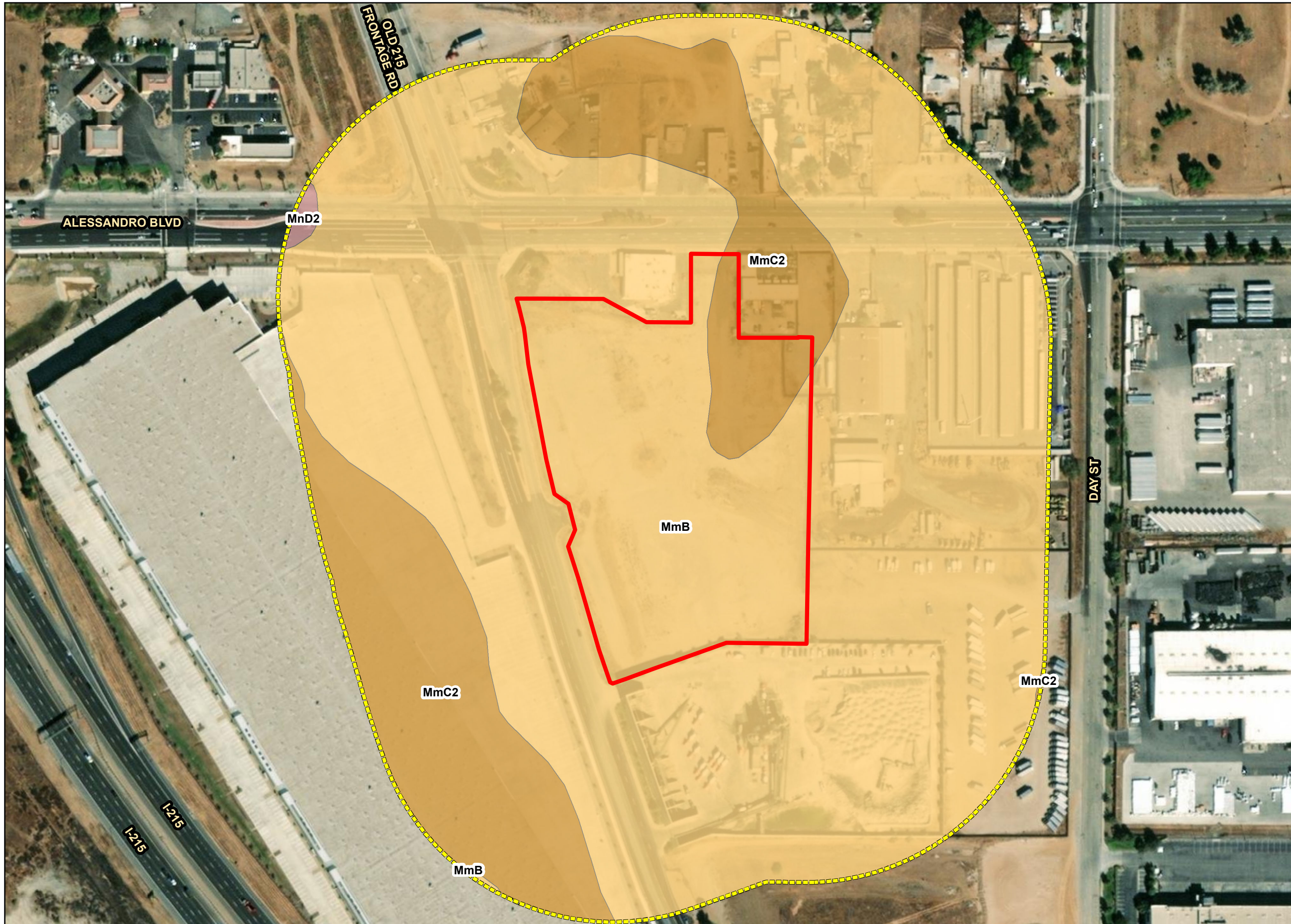
- Project Boundary
- 500ft Biological Study Area (BSA)
- USGS Soil Unit**
- MmB-Monserate sandy loam, 0 to 5 percent slopes
- MmC2-Monserate sandy loam, 5 to 8 percent slopes, eroded
- MnD2-Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded

Key Map



USDA Soils

Figure 4



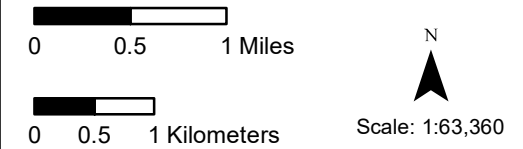
Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.

Penske Sales, Leasing, and Maintenance Facility

Legend

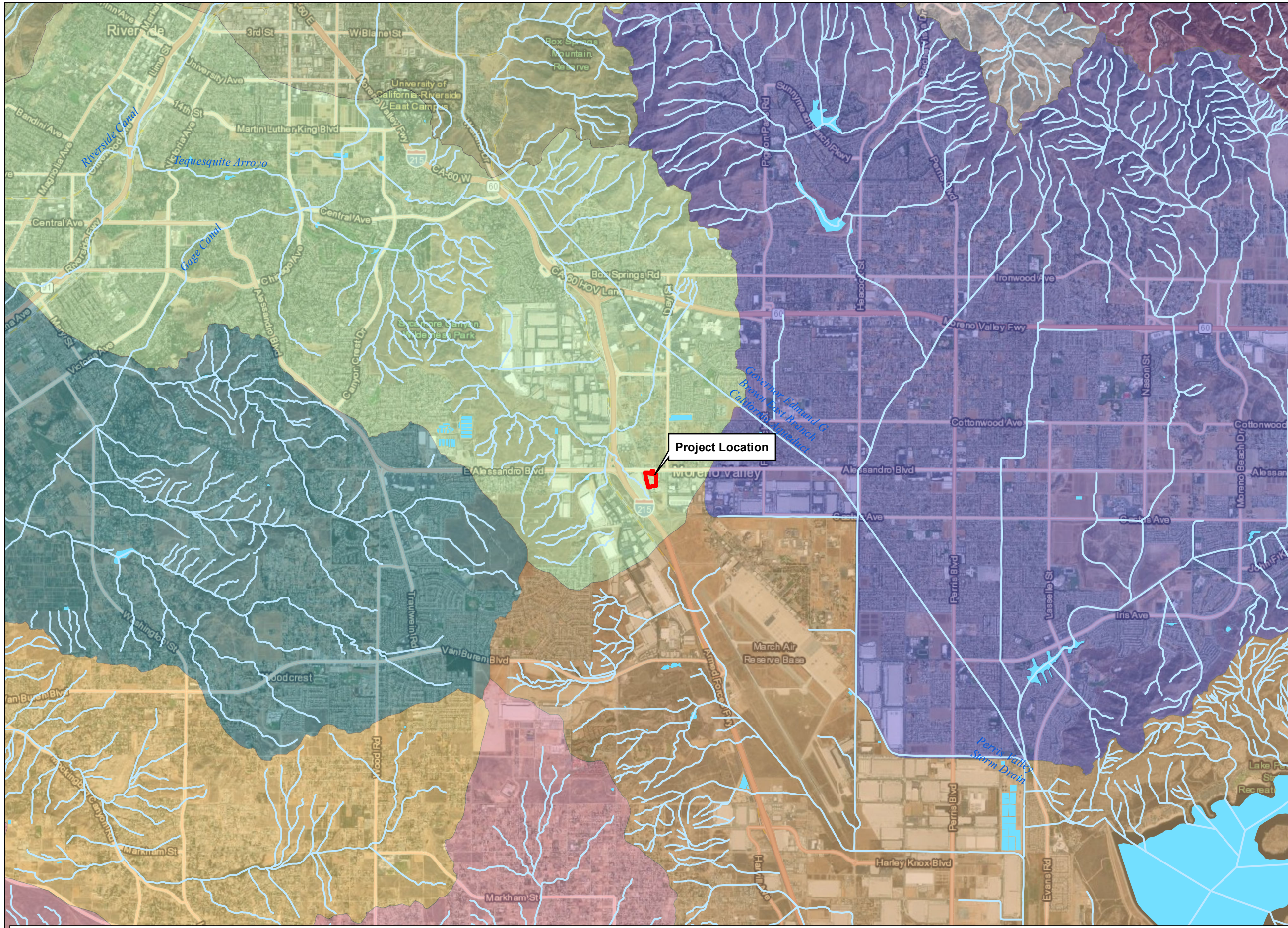
- Project Boundary
- USGS Waterbody
- USGS Stream
- HUC12, Name**
- 180702020304, Moreno Valley
- 180702020305, Perris Reservoir
- 180702030403, San Timoteo Canyon-San Timoteo Wash
- 180702030603, Lake Mathews
- 180702030605, Main Street Wash-Temescal Wash
- 180702030801, Reche Canyon
- 180702030802, Tequesquite Arroyo
- 180702030803, Hole Lake
- 180702030804, East Etiwanda Creek-Santa Ana River

Key Map



USGS Surface Waters and Watersheds

Figure 5



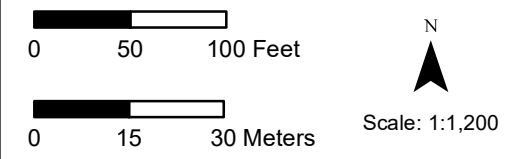
Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.

Penske Sales, Leasing, and Maintenance Facility

Legend

- Project Boundary
- Permanent Impacts
- Jurisdictional Areas**
- Vernal Pool Complex (RWQCB/MSHCP)
- Non-Jurisdictional Basins**
- Basin
- Other Features**
- Culvert
- Dirt Road

Key Map



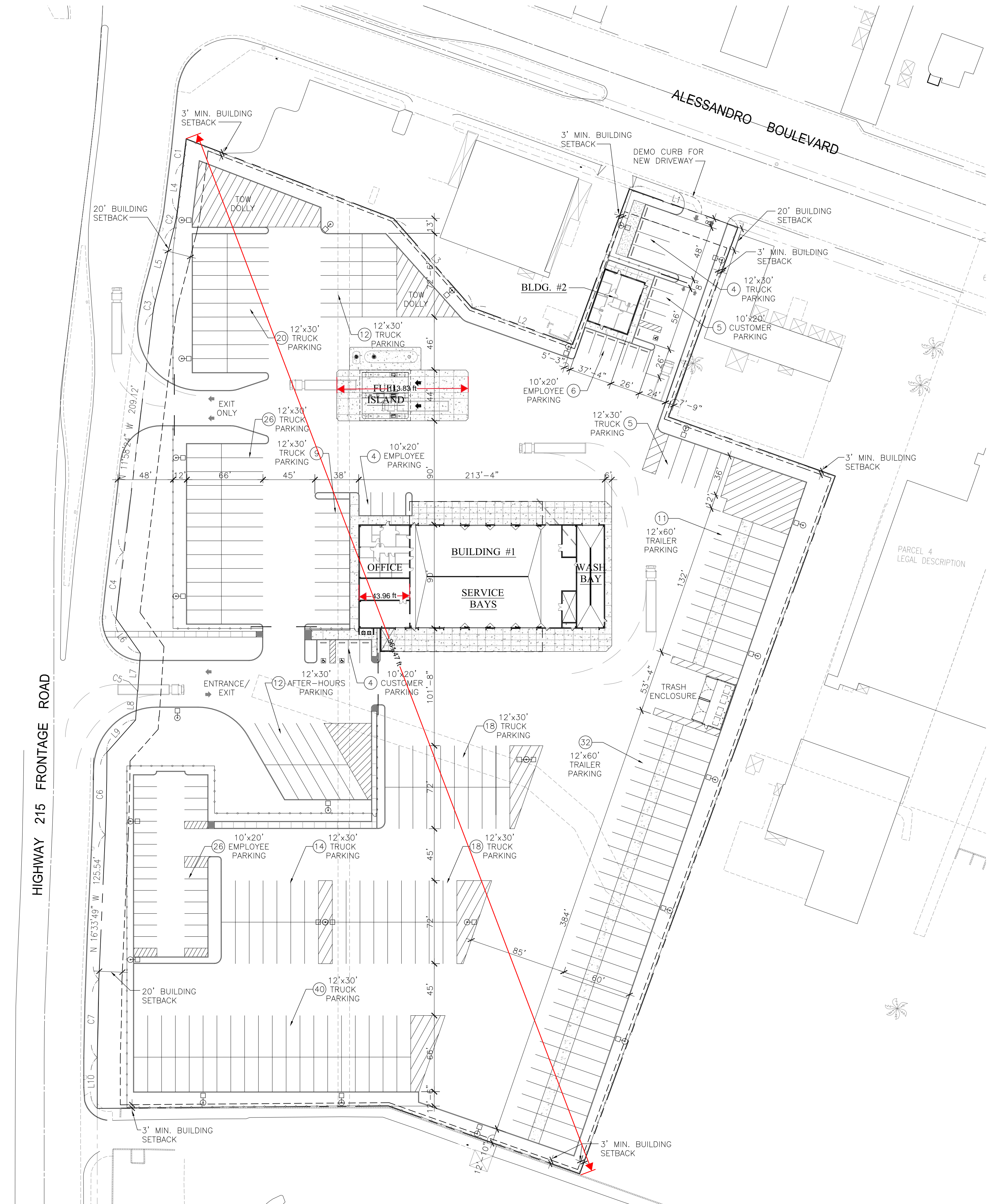
Jurisdictional Impact Areas

Figure 6



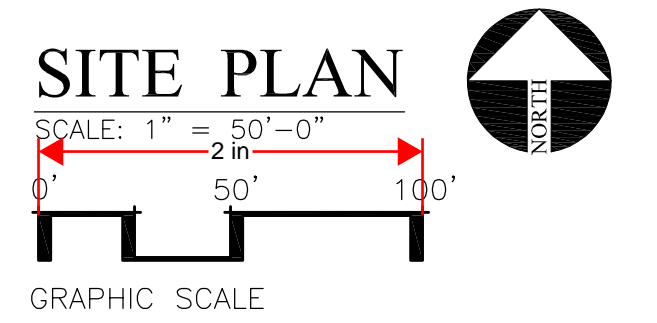
Disclaimer: Representations on this map or illustration are intended only to indicate locations of project parameters reported in the legend. Project parameter information supplied by others (see layer credits) may not have been independently verified for accuracy by UltraSystems Environmental, Inc. This map or illustration should not be used for, and does not replace, final grading plans or other documents that should be professionally certified for development purposes.

APPENDIX B
SITE PLANS



PARKING DATA		
10' x 20'	CAR PARKING	45
12' x 30'	TRUCK PARKING	161
12' x 60'	TRAILERS	47

BUILDING S.F.
 BUILDING #1: = 19,200 S.F.
 BUILDING #2: = 1,792 S.F.



NEW FACILITY FOR PENSKE TRUCK LEASING
 HWY. 215 FRONTAGE ROAD
 MORENO VALLEY, CA.

K/G ARCHITECTS
 7585 E. REDFIELD ROAD
 SUITE 102
 SCOTTSDALE, AZ. 85260
 (480) 443-3705 - TEL.
 (480) 443-3805 - FAX

DRAWN BY:	DATE:	REVISIONS:
IBIA		
CHECKED BY:		
LK, PG		
PROJECT NO:	SITE PLAN	
21104		

PEN 21-0025	
DATE:	ISSUED FOR:
09-08-21	REVIEW
SHEET NO:	
A1-0	

APPENDIX C
SOIL REPORT



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Western Riverside Area, California

Updated August 5, 2022



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map (Updated August 5, 2022).....	9
Legend.....	10
Map Unit Legend (Updated August 5, 2022).....	11
Map Unit Descriptions (Updated August 5, 2022).....	11
Western Riverside Area, California.....	13
MmB—Monserate sandy loam, 0 to 5 percent slopes.....	13
MmC2—Monserate sandy loam, 5 to 8 percent slopes, eroded.....	14
MnD2—Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded..	15
Soil Information for All Uses	17
Soil Properties and Qualities.....	17
Soil Qualities and Features.....	17
Hydrologic Soil Group (Updated August 5, 2022).....	17
References	23
Glossary	25

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

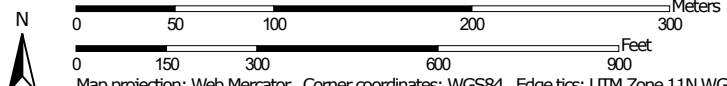
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Updated August 5, 2022)



Map Scale: 1:3,820 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
 Survey Area Data: Version 14, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 14, 2022—Mar 17, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Updated August 5, 2022)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MmB	Monserate sandy loam, 0 to 5 percent slopes	46.0	79.8%
MmC2	Monserate sandy loam, 5 to 8 percent slopes, eroded	11.5	20.0%
MnD2	Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded	0.1	0.2%
Totals for Area of Interest		57.6	100.0%

Map Unit Descriptions (Updated August 5, 2022)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

Custom Soil Resource Report

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Western Riverside Area, California

MmB—Monserate sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: hcx4

Elevation: 700 to 2,500 feet

Mean annual precipitation: 10 to 18 inches

Mean annual air temperature: 63 to 64 degrees F

Frost-free period: 220 to 280 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Monserate and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monserate

Setting

Landform: Alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: sandy loam

H2 - 10 to 28 inches: sandy clay loam

H3 - 28 to 45 inches: indurated

H4 - 45 to 57 inches: cemented

H5 - 57 to 70 inches: loamy coarse sand

Properties and qualities

Slope: 0 to 5 percent

Depth to restrictive feature: 20 to 39 inches to duripan

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R019XD029CA - LOAMY

Hydric soil rating: No

Minor Components

Greenfield

Percent of map unit: 5 percent

Custom Soil Resource Report

Hydric soil rating: No

Tujunga

Percent of map unit: 5 percent

Hydric soil rating: No

Hanford

Percent of map unit: 5 percent

Hydric soil rating: No

MmC2—Monserate sandy loam, 5 to 8 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcx5

Elevation: 700 to 2,500 feet

Mean annual precipitation: 10 to 18 inches

Mean annual air temperature: 63 to 64 degrees F

Frost-free period: 220 to 280 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Monserate and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monserate

Setting

Landform: Alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: sandy loam

H2 - 10 to 28 inches: sandy clay loam

H3 - 28 to 45 inches: indurated

H4 - 45 to 57 inches: cemented

H5 - 57 to 70 inches: loamy coarse sand

Properties and qualities

Slope: 5 to 8 percent

Depth to restrictive feature: 20 to 39 inches to duripan

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Custom Soil Resource Report

Available water supply, 0 to 60 inches: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R019XD029CA - LOAMY

Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 3 percent

Hydric soil rating: No

Greenfield

Percent of map unit: 3 percent

Hydric soil rating: No

Ramona

Percent of map unit: 3 percent

Hydric soil rating: No

Unnamed

Percent of map unit: 3 percent

Hydric soil rating: No

Hanford

Percent of map unit: 3 percent

Hydric soil rating: No

MnD2—Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded

Map Unit Setting

National map unit symbol: hcx8

Elevation: 700 to 2,500 feet

Mean annual precipitation: 10 to 18 inches

Mean annual air temperature: 63 to 64 degrees F

Frost-free period: 220 to 280 days

Farmland classification: Not prime farmland

Map Unit Composition

Monserate and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Monserate

Setting

Landform: Alluvial fans

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Custom Soil Resource Report

Across-slope shape: Linear

Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 10 inches: sandy loam

H2 - 10 to 18 inches: sandy clay loam

H3 - 18 to 45 inches: indurated

H4 - 45 to 57 inches: cemented

H5 - 57 to 70 inches: loamy coarse sand

Properties and qualities

Slope: 5 to 15 percent

Depth to restrictive feature: 10 to 20 inches to duripan

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: R019XD060CA - SHALLOW LOAMY (1975)

Hydric soil rating: No

Minor Components

Tujunga

Percent of map unit: 5 percent

Hydric soil rating: No

Hanford

Percent of map unit: 5 percent

Hydric soil rating: No

Greenfield

Percent of map unit: 5 percent

Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (Updated August 5, 2022)

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

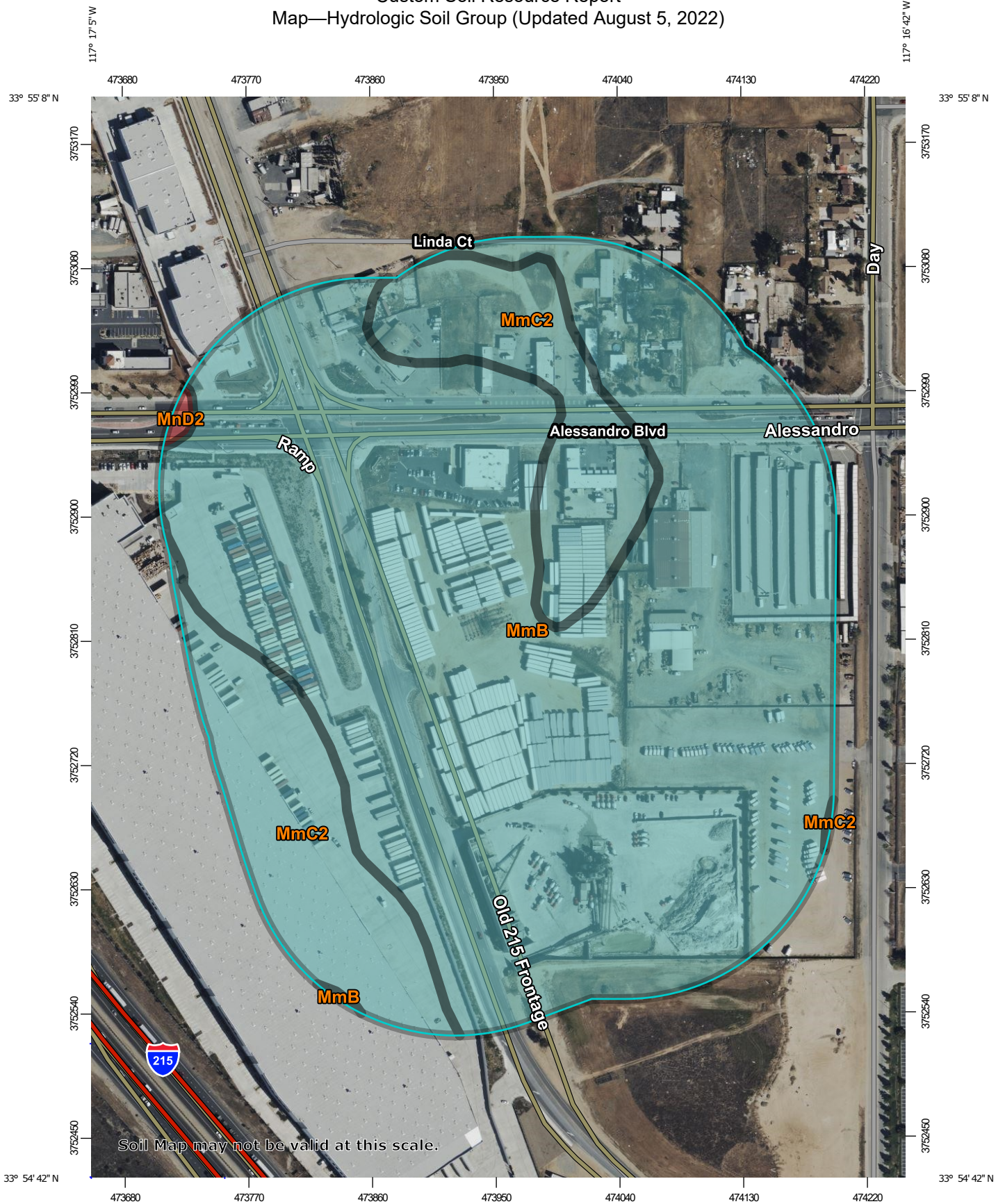
Custom Soil Resource Report

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
 Map—Hydrologic Soil Group (Updated August 5, 2022)




Map Scale: 1:3,820 if printed on A portrait (8.5" x 11") sheet.











Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND









Area of Interest (AOI)
 Area of Interest (AOI)

Soils





Soil Rating Polygons

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available


Soil Rating Lines

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available






Soil Rating Points

-  A
-  A/D
-  B
-  B/D


Water Features

-  Streams and Canals





Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

-  Aerial Photography

Soils

-  C
-  C/D
-  D
-  Not rated or not available

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
 Survey Area Data: Version 14, Sep 13, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 14, 2022—Mar 17, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group (Updated August 5, 2022)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MmB	Monserate sandy loam, 0 to 5 percent slopes	C	46.0	79.8%
MmC2	Monserate sandy loam, 5 to 8 percent slopes, eroded	C	11.5	20.0%
MnD2	Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded	D	0.1	0.2%
Totals for Area of Interest			57.6	100.0%

Rating Options—Hydrologic Soil Group (Updated August 5, 2022)

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be

Custom Soil Resource Report

considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the following National Soil Survey Handbook link: "[National Soil Survey Handbook](#)."

ABC soil

A soil having an A, a B, and a C horizon.

Ablation till

Loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

AC soil

A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil

The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil

Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial cone

A semiconical type of alluvial fan having very steep slopes. It is higher, narrower, and steeper than a fan and is composed of coarser and thicker layers of material deposited by a combination of alluvial episodes and (to a much lesser degree) landslides (debris flow). The coarsest materials tend to be concentrated at the apex of the cone.

Alluvial fan

A low, outspread mass of loose materials and/or rock material, commonly with gentle slopes. It is shaped like an open fan or a segment of a cone. The material was deposited by a stream at the place where it issues from a narrow mountain valley or upland valley or where a tributary stream is near or at its junction with the main stream. The fan is steepest near its apex, which points upstream, and slopes gently and convexly outward (downstream) with a gradual decrease in gradient.

Alluvium

Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl

A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM)

The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions

Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillic horizon

A subsoil horizon characterized by an accumulation of illuvial clay.

Arroyo

The flat-floored channel of an ephemeral stream, commonly with very steep to vertical banks cut in unconsolidated material. It is usually dry but can be transformed into a temporary watercourse or short-lived torrent after heavy rain within the watershed.

Aspect

The direction toward which a slope faces. Also called slope aspect.

Association, soil

A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity)

The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Custom Soil Resource Report

Very low: 0 to 3

Low: 3 to 6

Moderate: 6 to 9

High: 9 to 12

Very high: More than 12

Backslope

The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Backswamp

A flood-plain landform. Extensive, marshy or swampy, depressed areas of flood plains between natural levees and valley sides or terraces.

Badland

A landscape that is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes and narrow interfluves. Badlands develop on surfaces that have little or no vegetative cover overlying unconsolidated or poorly cemented materials (clays, silts, or sandstones) with, in some cases, soluble minerals, such as gypsum or halite.

Bajada

A broad, gently inclined alluvial piedmont slope extending from the base of a mountain range out into a basin and formed by the lateral coalescence of a series of alluvial fans. Typically, it has a broadly undulating transverse profile, parallel to the mountain front, resulting from the convexities of component fans. The term is generally restricted to constructional slopes of intermontane basins.

Basal area

The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation

The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope (geomorphology)

A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding plane

A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology)

from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedding system

A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock

The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography

A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench terrace

A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum

Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout (map symbol)

A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed. The adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Borrow pit (map symbol)

An open excavation from which soil and underlying material have been removed, usually for construction purposes.

Bottom land

An informal term loosely applied to various portions of a flood plain.

Boulders

Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks

A landscape or tract of steep, rough or broken land dissected by ravines and gullies and marking a sudden change in topography.

Breast height

An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management

Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Butte

An isolated, generally flat-topped hill or mountain with relatively steep slopes and talus or precipitous cliffs and characterized by summit width that is less than the height of bounding escarpments; commonly topped by a caprock of resistant material and representing an erosion remnant carved from flat-lying rocks.

Cable yarding

A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil

A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche

A general term for a prominent zone of secondary carbonate accumulation in surficial materials in warm, subhumid to arid areas. Caliche is formed by both geologic and pedologic processes. Finely crystalline calcium carbonate forms a nearly continuous surface-coating and void-filling medium in geologic (parent) materials. Cementation ranges from weak in nonindurated forms to very strong in indurated forms. Other minerals (e.g., carbonates, silicate, and sulfate) may occur as accessory cements. Most petrocalcic horizons and some calcic horizons are caliche.

California bearing ratio (CBR)

The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy

The leafy crown of trees or shrubs. (See Crown.)

Canyon

A long, deep, narrow valley with high, precipitous walls in an area of high local relief.

Capillary water

Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena

A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation

An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity

The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps

See Terracettes.

Cement rock

Shaly limestone used in the manufacture of cement.

Channery soil material

Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment

Control of unwanted vegetation through the use of chemicals.

Chiseling

Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque

A steep-walled, semicircular or crescent-shaped, half-bowl-like recess or hollow, commonly situated at the head of a glaciated mountain valley or high on the side of a mountain. It was produced by the erosive activity of a mountain glacier. It commonly contains a small round lake (tarn).

Clay

As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions

See Redoximorphic features.

Clay film

A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay spot (map symbol)

A spot where the surface texture is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser.

Claypan

A dense, compact subsoil layer that contains much more clay than the overlying materials, from which it is separated by a sharply defined boundary. The layer restricts the downward movement of water through the soil. A claypan is commonly hard when dry and plastic and sticky when wet.

Climax plant community

The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil

Sand or loamy sand.

Cobble (or cobblestone)

A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material

Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility)

See Linear extensibility.

Colluvium

Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope

Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil

A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions

See Redoximorphic features.

Conglomerate

A coarse grained, clastic sedimentary rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system

Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage

A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil

Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping

Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section

The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat)

A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology)

A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations)

Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop

A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management

Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system

Growing crops according to a planned system of rotation and management practices.

Cross-slope farming

Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown

The upper part of a tree or shrub, including the living branches and their foliage.

Cryoturbate

A mass of soil or other unconsolidated earthy material moved or disturbed by frost action. It is typically coarser than the underlying material.

Cuesta

An asymmetric ridge capped by resistant rock layers of slight or moderate dip (commonly less than 15 percent slopes); a type of homocline produced by differential erosion of interbedded resistant and weak rocks. A cuesta has a long, gentle slope on one side (dip slope) that roughly parallels the inclined beds; on the other side, it has a relatively short and steep or clifflike slope (scarp) that cuts through the tilted rocks.

Culmination of the mean annual increment (CMAI)

The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave

The walls of excavations tend to cave in or slough.

Decreasers

The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing

Postponing grazing or resting grazing land for a prescribed period.

Delta

A body of alluvium having a surface that is fan shaped and nearly flat; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Dense layer

A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression, closed (map symbol)

A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage.

Depth, soil

Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Desert pavement

A natural, residual concentration or layer of wind-polished, closely packed gravel, boulders, and other rock fragments mantling a desert surface. It forms where wind action and sheetwash have removed all smaller particles or where rock fragments have migrated upward through sediments to the surface. It typically protects the finer grained underlying material from further erosion.

Diatomaceous earth

A geologic deposit of fine, grayish siliceous material composed chiefly or entirely of the remains of diatoms.

Dip slope

A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace)

A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming

A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Drainage class (natural)

Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”

Drainage, surface

Runoff, or surface flow of water, from an area.

Drainageway

A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Draw

A small stream valley that generally is shallower and more open than a ravine or gulch and that has a broader bottom. The present stream channel may appear inadequate to have cut the drainageway that it occupies.

Drift

A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Drumlin

A low, smooth, elongated oval hill, mound, or ridge of compact till that has a core of bedrock or drift. It commonly has a blunt nose facing the direction from which the ice approached and a gentler slope tapering in the other direction. The longer axis is parallel to the general direction of glacier flow. Drumlins are products of streamline (laminar) flow of glaciers, which molded the subglacial floor through a combination of erosion and deposition.

Duff

A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune

A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.

Earthy fill

See Mine spoil.

Ecological site

An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation

The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation

A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposit

Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.

Ephemeral stream

A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation

A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion

The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated)

Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion (geologic)

Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion pavement

A surficial lag concentration or layer of gravel and other rock fragments that remains on the soil surface after sheet or rill erosion or wind has removed the finer soil particles and that tends to protect the underlying soil from further erosion.

Erosion surface

A land surface shaped by the action of erosion, especially by running water.

Escarpment

A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.

Escarpment, bedrock (map symbol)

A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, nonbedrock (map symbol)

A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.

Esker

A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left

behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.

Extrusive rock

Igneous rock derived from deep-seated molten matter (magma) deposited and cooled on the earth's surface.

Fallow

Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fan remnant

A general term for landforms that are the remaining parts of older fan landforms, such as alluvial fans, that have been either dissected or partially buried.

Fertility, soil

The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat)

The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity

The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

Fill slope

A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil

Sandy clay, silty clay, or clay.

Firebreak

An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom

An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.

Flaggy soil material

Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone

A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain

The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms

A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay

A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step

An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial

Of or pertaining to rivers or streams; produced by stream or river action.

Foothills

A region of steeply sloping hills that fringes a mountain range or high-plateau escarpment. The hills have relief of as much as 1,000 feet (300 meters).

Footslope

The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb

Any herbaceous plant not a grass or a sedge.

Forest cover

All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type

A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan

A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil

The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai

Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glaciofluvial deposits

Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits

Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil

Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping

Growing crops in strips that grade toward a protected waterway.

Grassed waterway

A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel

Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravel pit (map symbol)

An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel.

Gravelly soil material

Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol)

A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments.

Green manure crop (agronomy)

A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water

Water filling all the unblocked pores of the material below the water table.

Gully (map symbol)

A small, steep-sided channel caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage whereas a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock

Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to reclaim

Reclamation is difficult after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Hardpan

A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head slope (geomorphology)

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat)

Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops

Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill

A generic term for an elevated area of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline. Slopes are generally more than 15 percent. The distinction between a hill and a mountain is arbitrary and may depend on local usage.

Hillslope

A generic term for the steeper part of a hill between its summit and the drainage line, valley flat, or depression floor at the base of a hill.

Horizon, soil

A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

Custom Soil Resource Report

O horizon: An organic layer of fresh and decaying plant residue.

L horizon: A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon: The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon: The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon: The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon: The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon: Soft, consolidated bedrock beneath the soil.

R layer: Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

M layer: A root-limiting subsoil layer consisting of nearly continuous, horizontally oriented, human-manufactured materials.

W layer: A layer of water within or beneath the soil.

Humus

The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups

Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties include depth to a seasonal high water table, the infiltration rate, and depth to a layer that significantly restricts the downward movement of water. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock

Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation

The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil

A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers

Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration

The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity

The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate

The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate

The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Very low: Less than 0.2

Low: 0.2 to 0.4

Moderately low: 0.4 to 0.75

Moderate: 0.75 to 1.25

Moderately high: 1.25 to 1.75

High: 1.75 to 2.5

Very high: More than 2.5

Interfluve

A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology)

A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream

A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders

On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions

See Redoximorphic features.

Irrigation

Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin: Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border: Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding: Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation: Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle): Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow: Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler: Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation: Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding: Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame

A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Karst (topography)

A kind of topography that formed in limestone, gypsum, or other soluble rocks by dissolution and that is characterized by closed depressions, sinkholes, caves, and underground drainage.

Knoll

A small, low, rounded hill rising above adjacent landforms.

Ksat

See Saturated hydraulic conductivity.

Lacustrine deposit

Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain

A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace

A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Landfill (map symbol)

An area of accumulated waste products of human habitation, either above or below natural ground level.

Landslide

A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones

Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lava flow (map symbol)

A solidified, commonly lobate body of rock formed through lateral, surface outpouring of molten lava from a vent or fissure.

Leaching

The removal of soluble material from soil or other material by percolating water.

Levee (map symbol)

An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.

Linear extensibility

Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $1/3$ - or $1/10$ -bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit

The moisture content at which the soil passes from a plastic to a liquid state.

Loam

Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess

Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength

The soil is not strong enough to support loads.

Low-residue crops

Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Marl

An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Marsh or swamp (map symbol)

A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Not used in map units where the named soils are poorly drained or very poorly drained.

Mass movement

A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses

See Redoximorphic features.

Meander belt

The zone within which migration of a meandering channel occurs; the flood-plain area included between two imaginary lines drawn tangential to the outer bends of active channel loops.

Meander scar

A crescent-shaped, concave or linear mark on the face of a bluff or valley wall, produced by the lateral erosion of a meandering stream that impinged upon and undercut the bluff.

Meander scroll

One of a series of long, parallel, close-fitting, crescent-shaped ridges and troughs formed along the inner bank of a stream meander as the channel migrated laterally down-valley and toward the outer bank.

Mechanical treatment

Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil

Very fine sandy loam, loam, silt loam, or silt.

Mesa

A broad, nearly flat topped and commonly isolated landmass bounded by steep slopes or precipitous cliffs and capped by layers of resistant, nearly horizontal rocky material. The summit width is characteristically greater than the height of the bounding escarpments.

Metamorphic rock

Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Mine or quarry (map symbol)

An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines.

Mine spoil

An accumulation of displaced earthy material, rock, or other waste material removed during mining or excavation. Also called earthy fill.

Mineral soil

Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage

Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area

A kind of map unit that has little or no natural soil and supports little or no vegetation.

Miscellaneous water (map symbol)

Small, constructed bodies of water that are used for industrial, sanitary, or mining applications and that contain water most of the year.

Moderately coarse textured soil

Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil

Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon

A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine

In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil

The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil

Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain

A generic term for an elevated area of the land surface, rising more than 1,000 feet (300 meters) above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can

Custom Soil Resource Report

occur as a single, isolated mass or in a group forming a chain or range. Mountains are formed primarily by tectonic activity and/or volcanic action but can also be formed by differential erosion.

Muck

Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat

See Hemic soil material.

Mudstone

A blocky or massive, fine grained sedimentary rock in which the proportions of clay and silt are approximately equal. Also, a general term for such material as clay, silt, claystone, siltstone, shale, and argillite and that should be used only when the amounts of clay and silt are not known or cannot be precisely identified.

Munsell notation

A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon

A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Neutral soil

A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules

See Redoximorphic features.

Nose slope (geomorphology)

A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes consist dominantly of colluvium and slope-wash sediments (for example, slope alluvium).

Nutrient, plant

Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter

Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Custom Soil Resource Report

Very low: Less than 0.5 percent

Low: 0.5 to 1.0 percent

Moderately low: 1.0 to 2.0 percent

Moderate: 2.0 to 4.0 percent

High: 4.0 to 8.0 percent

Very high: More than 8.0 percent

Outwash

Stratified and sorted sediments (chiefly sand and gravel) removed or “washed out” from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain

An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleoterrace

An erosional remnant of a terrace that retains the surface form and alluvial deposits of its origin but was not emplaced by, and commonly does not grade to, a present-day stream or drainage network.

Pan

A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

Parent material

The unconsolidated organic and mineral material in which soil forms.

Peat

Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped

An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedisediment

A layer of sediment, eroded from the shoulder and backslope of an erosional slope, that lies on and is being (or was) transported across a gently sloping erosional surface at the foot of a receding hill or mountain slope.

Pedon

The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation

The movement of water through the soil.

Perennial water (map symbol)

Small, natural or constructed lakes, ponds, or pits that contain water most of the year.

Permafrost

Ground, soil, or rock that remains at or below 0 degrees C for at least 2 years. It is defined on the basis of temperature and is not necessarily frozen.

pH value

A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil

A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping

Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting

Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plastic limit

The moisture content at which a soil changes from semisolid to plastic.

Plasticity index

The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plateau (geomorphology)

A comparatively flat area of great extent and elevation; specifically, an extensive land region that is considerably elevated (more than 100 meters) above the adjacent lower lying terrain, is commonly limited on at least one side by an abrupt descent, and has a flat or nearly level surface. A comparatively large part of a plateau surface is near summit level.

Playa

The generally dry and nearly level lake plain that occupies the lowest parts of closed depressions, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff. Playa deposits are fine grained and may or may not have a high water table and saline conditions.

Plinthite

The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan

A compacted layer formed in the soil directly below the plowed layer.

Ponding

Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded

Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings

See Redoximorphic features.

Potential native plant community

See Climax plant community.

Potential rooting depth (effective rooting depth)

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning

Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil

The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil

A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use

Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and

promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rangeland

Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil

A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid: Less than 3.5

Extremely acid: 3.5 to 4.4

Very strongly acid: 4.5 to 5.0

Strongly acid: 5.1 to 5.5

Moderately acid: 5.6 to 6.0

Slightly acid: 6.1 to 6.5

Neutral: 6.6 to 7.3

Slightly alkaline: 7.4 to 7.8

Moderately alkaline: 7.9 to 8.4

Strongly alkaline: 8.5 to 9.0

Very strongly alkaline: 9.1 and higher

Red beds

Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redoximorphic concentrations

See Redoximorphic features.

Redoximorphic depletions

See Redoximorphic features.

Redoximorphic features

Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

Custom Soil Resource Report

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:
 - A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*
 - B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*
 - C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.
2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:
 - A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*
 - B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).
3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix

See Redoximorphic features.

Regolith

All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief

The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material)

Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill

A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Riser

The vertical or steep side slope (e.g., escarpment) of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural, steplike landforms, such as successive stream terraces.

Road cut

A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments

Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop (map symbol)

An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where "Rock outcrop" is a named component of the map unit.

Root zone

The part of the soil that can be penetrated by plant roots.

Runoff

The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil

A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Saline spot (map symbol)

An area where the surface layer has an electrical conductivity of 8 mmhos/cm more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm or less.

Sand

As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone

Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol)

A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer.

Sapric soil material (muck)

The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat)

The ease with which pores of a saturated soil transmit water. Formally, the proportionality coefficient that expresses the relationship of the rate of water movement to hydraulic gradient in Darcy's Law, a law that describes the rate of water movement through porous media. Commonly abbreviated as "Ksat." Terms describing saturated hydraulic conductivity are:

Very high: 100 or more micrometers per second (14.17 or more inches per hour)

High: 10 to 100 micrometers per second (1.417 to 14.17 inches per hour)

Moderately high: 1 to 10 micrometers per second (0.1417 inch to 1.417 inches per hour)

Moderately low: 0.1 to 1 micrometer per second (0.01417 to 0.1417 inch per hour)

Low: 0.01 to 0.1 micrometer per second (0.001417 to 0.01417 inch per hour)

Very low: Less than 0.01 micrometer per second (less than 0.001417 inch per hour).

To convert inches per hour to micrometers per second, multiply inches per hour by 7.0572. To convert micrometers per second to inches per hour, multiply micrometers per second by 0.1417.

Saturation

Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Scarification

The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Sedimentary rock

A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Sequum

A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil

A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot (map symbol)

An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which "severely eroded," "very severely eroded," or "gullied" is part of the map unit name.

Shale

Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion

The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope (map symbol)

A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.

Shoulder

The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell

The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Shrub-coppice dune

A small, streamlined dune that forms around brush and clump vegetation.

Side slope (geomorphology)

A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silica

A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio

The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt

As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone

An indurated silt having the texture and composition of shale but lacking its fine lamination or fissility; a massive mudstone in which silt predominates over clay.

Similar soils

Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole (map symbol)

A closed, circular or elliptical depression, commonly funnel shaped, characterized by subsurface drainage and formed either by dissolution of the surface of underlying bedrock (e.g., limestone, gypsum, or salt) or by collapse of underlying caves within bedrock. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography.

Site index

A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic)

Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slide or slip (map symbol)

A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces.

Slope

The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope alluvium

Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow refill

The slow filling of ponds, resulting from restricted water transmission in the soil.

Slow water movement

Restricted downward movement of water through the soil. See Saturated hydraulic conductivity.

Sodic (alkali) soil

A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodic spot (map symbol)

An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less.

Sodicity

The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $\text{Ca}^{++} + \text{Mg}^{++}$. The degrees of sodicity and their respective ratios are:

Slight: Less than 13:1

Moderate: 13-30:1

Strong: More than 30:1

Sodium adsorption ratio (SAR)

A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock

Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil

A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates

Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand: 2.0 to 1.0

Coarse sand: 1.0 to 0.5

Medium sand: 0.5 to 0.25

Fine sand: 0.25 to 0.10

Very fine sand: 0.10 to 0.05

Silt: 0.05 to 0.002

Clay: Less than 0.002

Solum

The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol)

A pile of earthy materials, either smoothed or uneven, resulting from human activity.

Stone line

In a vertical cross section, a line formed by scattered fragments or a discrete layer of angular and subangular rock fragments (commonly a gravel- or cobble-sized lag concentration) that formerly was draped across a topographic surface and was later buried by additional sediments. A stone line generally caps material that was subject to weathering, soil formation, and erosion before burial. Many stone lines seem to be buried erosion pavements, originally formed by sheet and rill erosion across the land surface.

Stones

Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony

Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot (map symbol)

A spot where 0.01 to 0.1 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones.

Strath terrace

A type of stream terrace; formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream terrace

One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping

Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil

The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are:

Platy: Flat and laminated

Prismatic: Vertically elongated and having flat tops

Columnar: Vertically elongated and having rounded tops

Angular blocky: Having faces that intersect at sharp angles (planes)

Subangular blocky: Having subrounded and planar faces (no sharp angles)

Granular: Small structural units with curved or very irregular faces

Structureless soil horizons are defined as follows:

Single grained: Entirely noncoherent (each grain by itself), as in loose sand

Massive: Occurring as a coherent mass

Stubble mulch

Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil

Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling

Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum

The part of the soil below the solum.

Subsurface layer

Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow

The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit

The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer

The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil

The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus

Rock fragments of any size or shape (commonly coarse and angular) derived from and lying at the base of a cliff or very steep rock slope. The accumulated mass of such loose broken rock formed chiefly by falling, rolling, or sliding.

Taxadjuncts

Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine

An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation)

An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field

generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology)

A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Terracettes

Small, irregular steplike forms on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may be induced or enhanced by trampling of livestock, such as sheep or cattle.

Texture, soil

The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer

Otherwise suitable soil material that is too thin for the specified use.

Till

Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain

An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil

The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope

The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topsoil

The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements

Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Tread

The flat to gently sloping, topmost, laterally extensive slope of terraces, flood-plain steps, or other stepped landforms; commonly a recurring part of a series of natural steplike landforms, such as successive stream terraces.

Tuff

A generic term for any consolidated or cemented deposit that is 50 percent or more volcanic ash.

Upland

An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.

Valley fill

The unconsolidated sediment deposited by any agent (water, wind, ice, or mass wasting) so as to fill or partly fill a valley.

Variiegation

Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve

A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Very stony spot (map symbol)

A spot where 0.1 to 3.0 percent of the soil surface is covered by rock fragments that are more than 10 inches in diameter in areas where the surface of the surrounding soil is covered by less than 0.01 percent stones.

Water bars

Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering

All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.

Well graded

Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol)

A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit.

Wilting point (or permanent wilting point)

The moisture content of soil, on an oven-dry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow

The uprooting and tipping over of trees by the wind.

APPENDIX D

**2021/22 WET SEASON PRESENCE/ABSENCE SURVEY
FOR VERNAL POOL BRANCHIOPODS**

June 16, 2022

13911

U.S. Fish and Wildlife Service
Attn: Recovery Permit Coordinator
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods for the Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

The 2021/22 wet season survey for the presence or absence of listed large vernal pool branchiopods was conducted between December 21, 2021, and April 24, 2022. Dudek biologist Paul Lemons (TE051248-6) conducted the surveys according to the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2017). This report summarizes the results of the 2021/2022 wet season survey in order to fulfill the report requirements in accordance with the Section 10(a)(1)(A) Recovery Permit for the proposed Penske Sales, Leasing, and Maintenance Facility Project, located in Riverside County, California.

A total of 16 features were identified as suitable habitat for vernal pool branchiopods and were surveyed during the 2021/2022 wet survey season. These 16 features were identified as new in 2021/22 and not previously surveyed.

PROJECT LOCATION AND EXISTING CONDITIONS

The Penske Sales, Leasing, and Maintenance Facility Project is located in the City of Moreno Valley, Riverside County, California. The Project site is located at 21839 and 21921 Alessandro Boulevard. The Project site is approximately 9.63 acres and is located at the southeast corner of Old 215 Frontage Road and Alessandro Boulevard. Streets surrounding the site include Alessandro Drive to the north, Interstate 215 to the west, Cactus Avenue to the south, and Day Street to the east. The Project site occurs in Township 3 South, Range 4 West of the Riverside East U.S. Geological Survey 7.5 minute quadrangle map (Figure 1). The project site is flat, with an elevation of approximately 1,540 feet above mean sea level (amsl). The site is currently actively being used as a truck cargo container/trailer storage area. The site is completely surrounded by commercial/light industrial land uses.

Approxiamtely 88% of the soils within the Penske site consist of Monserate sandy loam, 0 to 5 percent slopes, and the remaining 12 % consists of Monserate sandy loam, 5 to 8 percent slopes, eroded (USDA 2022).

Recovery Permit Coordinator

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

VEGETATION COMMUNITIES, LAND COVERS, AND VERNAL POOL FEATURES

The entire Penske Sales, Leasing, and Maintenance Facility Project site would be classified as disturbed land. The site has historically been graded flat and is essentially bare ground, with the exception of two seasonally wet/ponded areas (VP east and VP west on Figure 2), which are vegetated with ruderal weedy vegetation, some of which includes facultative and non-facultative wet species on the national wetland plant list including clustered tarweed (*Deinandra fasciculata*), yellow nutsedge (*Cyperus esculentus*) and willow dock (*Rumex salicifolia*). Both VP east and VP west receive water from a 24-inch storm drain pipe outlet at the eastern edge of the site boundary.

Suitable and potentially suitable habitat (i.e., ephemeral wet/ponded features) for vernal pool branchiopods was identified on site and includes basins VP1 and VP2, as well as 14 additional puddles or road rut (man-made) depressions, lacking vegetation (aside from algae when inundated), scattered throughout the site.

PREVIOUS BRACHIOPOD STUDIES

To Dudek's knowledge, no previous protocol-level surveys have been conducted within the wet features surveyed during the 2021/22 wet season and discussed in this report.

SURVEY METHODS

The surveys methods follow the current USFWS survey guidelines protocol (USFWS 2017). The onset of the 2021/22 wet season survey at the project site began with a significant rain event occurring between December 14, 2021. Within 24 hours after this rain event, the site was visited by UltraSystems Environmental biologist Mathew Sutton to confirm pooling. Mapping (using a Trimble GeoXT handheld Global Positioning System (GPS) unit) of inundated features was also conducted by UltraSystems Environmental in January 2022. All protocol-level branchiopod surveys were conducted by permitted biologist Paul Lemons (TE051248-5), and began on December 21, 2021. The protocol states that sampling must be initiated within 7 days of inundation. All suitable habitat features on site that met the USFWS inundation criteria to initiate protocol-level surveys were sampled, and USFWS survey forms were completed.

After initial inundation, all wet features were surveyed at approximate 7 day intervals, according to the survey protocol, until dried up. Features that dried up and then refilled were surveyed within 7 days of refilling and surveys were reinitiated at the approximate 7 day intervals. During the 2021/22 wet season survey, the project site was visited on 11 occasions. A schedule of the 2021/22 wet season survey effort is presented in Table 1.

Recovery Permit Coordinator

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

During each site visit, Mr. Lemons evaluated all features to document inundation levels and performed sampling when appropriate. Throughout the 2021/22 season, daily precipitation was monitored from multiple weather stations across the proposed project alignment, using Weather Underground Inc. 2021–2022).

Table 1
2021/22 Schedule of Surveys

Visit Number	Biologist	Date	Survey Type	Survey Conditions
1	Mathew Sutton	December 15, 2021	Ponding check	No conditions recorded
2	PML	December 21, 2021	Branchiopod Survey	1000-1430; 62°F–64°F; 100% cc; 0-1 mph winds
3	PML	December 28, 2021	Branchiopod Survey	0900-1340; 47-49°F; 90-100% cc; 1-7 mph winds
4	PML	January 4, 2022	Branchiopod Survey	0940-1430; 58-62°F; 5% cc; 0-2 mph winds
5	PML	January 11, 2022	Branchiopod Survey	0930-1345; 65-73°F; 30% cc; 0-3 mph winds
6	PML	January 18, 2022	Branchiopod Survey	1000–1400; 56-62°F; 80-60% cc; 0-2 mph winds
7	PML	January 24, 2022	Branchiopod Survey	0900–1200; 64-69°F; 0% cc; 0-5 mph winds
8	PML	January 31, 2022	Branchiopod Survey	0930–1200; 57–62°F; 90% cc; 1-3 mph winds
9	PML	April 5, 2022	Branchiopod Survey	1000–1430; 73-81°F; 10-0% cc; 1-8 mph winds
10	PML	April 11, 2022	Branchiopod Survey	1130–1500; 62-66°F; 100% cc; 1-7 mph winds
11	PML	April 18, 2022	Branchiopod Survey	0940-1230; 65-74°F; 10% cc; 1-5 mph winds
12	PML	April 24, 2022	Branchiopod Survey	1430-1500; 82°F; 0% cc; 3-8 mph winds

Surveyor: PML = Paul Lemons (TE051248-6)

Survey Conditions: °F = degrees Fahrenheit, cc = cloud cover, mph = miles per hour

Protocol-level sampling was performed within all features that were considered potentially suitable for listed vernal pool branchiopods and any depressions meeting the USFWS 3-centimeter (1.2-inch) inundation criteria. The location of each feature sampled was recorded using a Global Positioning

Recovery Permit Coordinator

Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

System (GPS) unit with sub-meter accuracy. GPS data were downloaded into an ArcGIS file by geographic information systems (GIS) specialists at UltraSystems Environmental.

During each survey, Mr. Lemons inspected the individual features for depth, surface area of water, air and water temperature, level of disturbance, and presence of aquatic wildlife. An aquarium dip net was passed through every feature that met the USFWS inundation criteria. All portions of ponded water were surveyed from the bottom to the surface by moving the dip net in a mild zigzag pattern through the feature as directed by the sampling protocol (USFWS 2017). Dip net contents were frequently viewed and discarded of algae, plants, and other debris material when occurring at high concentrations (USFWS 2017). Samples were collected, when needed, using the aquarium net and a 40-milliliter (1.4-ounce) glass vial. Specimens were stored in the vial with water collected where the specimen was found. Specimens were taken to the laboratory within 24 hours of collection and placed in a non-denatured ethyl alcohol (200 proof) solution for preservation. Each specimen was inspected thoroughly using a dissecting microscope and soft-tip forceps. Eriksen and Belk (1999) was used to verify the species of each specimen collected. If any listed vernal pool branchiopods would have been identified during this survey effort, the USFWS would have been notified within 10 days of occupied features as stated in the protocol.

Survey data sheets (provided in the 2017 survey protocol) were completed for every feature that met the minimum USFWS inundation requirement at the time of sampling (Appendix A). All information was hand recorded in the field using the data sheet, with the most pertinent information (e.g., pool feature data, fairy shrimp presence/absence, and species identification) recorded. Photographs of the pool features are included in Appendix B.

SURVEY RESULTS

Feature Descriptions

A total of 16 features were identified as suitable habitat for vernal pool branchiopods and were surveyed during the 2021/22 wet survey season. The features within the study area are distributed evenly across the topographically flat lot. Fourteen (14) of the features onsite are considered road ruts or puddles. Road ruts are depressions that are typically formed by vehicular traffic within or immediately adjacent to roadways, generally lack aquatic vegetation, and are heavily disturbed by vehicular traffic, and are moderately to highly disturbed (i.e., parked vehicles, trailers, tire tracks, trash). Puddles are simply topographically low areas where water collects and pools. Two features (VP east and VP west) might be considered vernal pools. Vernal pools are depressions that retain sufficient water level, support vernal pool indicator plant species, and

likely support vernal pool branchiopods (Note that vernal pool branchiopods were detected within both VP east and VP west during the 2021/22 wet season surveys).

Fairy Shrimp Presence/Absence

No federally listed large branchiopod species were identified during the 2021/22 wet season survey effort. During the 11 survey sampling visits, 12 features (VP east, VP west, Basin 1, and Basins 6 through 14) of the 16 total features were found to be occupied by versatile fairy shrimp (*Branchinecta lindahli*). A summary of the survey results is provided in Table 2. The distribution of features sampled in the study area is presented in Figure 2 of this report.

Table 2
2021/22 Vernal Pool Branchiopods Survey Results*

Feature ID	Branchiopod Species Observed
VP east	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
VP west	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 1	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 2	None
Basin 3	None
Basin 4	None
Basin 5	None
Basin 6	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 7	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 8	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 9	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 10	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 11	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 12	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 13	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)
Basin 14	Fairy shrimp present; Versatile fairy shrimp (<i>Branchinecta lindahli</i>)

Recovery Permit Coordinator

*Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods,
Penske Sales, Leasing, and Maintenance Facility Project, Riverside County,
California*

I certify that the information presented in this survey report and attached exhibits fully and accurately represents my work. Please contact Paul Lemons at plemons@dudek.com if you have any questions regarding the contents of this report.

Sincerely,



Paul Lemons
TE051248-6

*Att: Figure 1, Regional Map
Figures 2, 2021/22 Survey Results
Appendix A, Survey Data Forms
Appendix B, Photographs*

cc: Hina Gupta, UltraSystems Environmental

Recovery Permit Coordinator

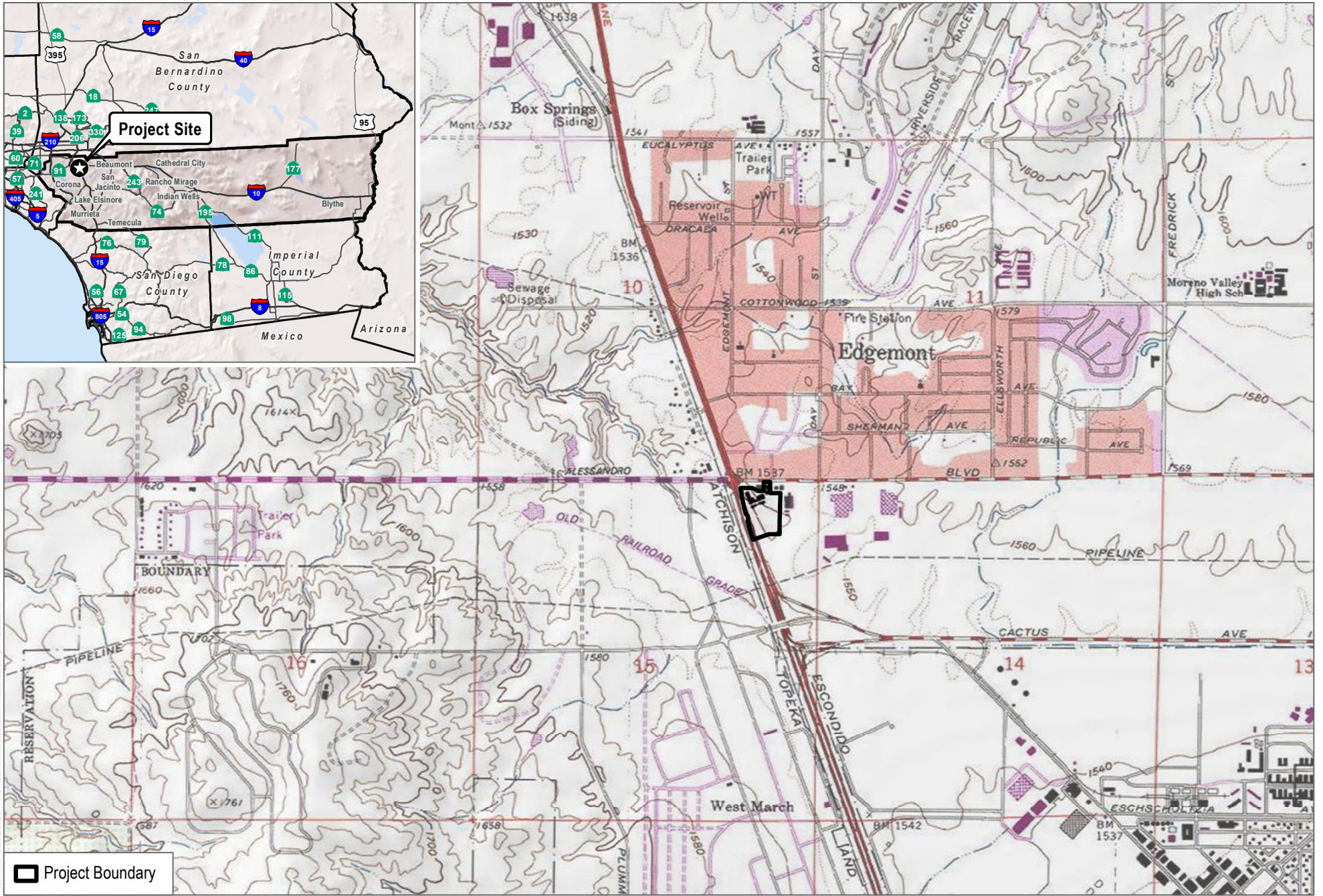
Subject: 2021/22 Wet Season Presence/Absence Survey for Vernal Pool Branchiopods, Penske Sales, Leasing, and Maintenance Facility Project, Riverside County, California

REFERENCES CITED

Eriksen, C., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Eureka, California: Mad River Press Inc.

USFWS. 2017. Survey Guidelines for the Listed Large Branchiopods. Sacramento, California: USFWS Pacific Southwest Region. Revised: November 13, 2017.

Weather Underground Inc. 2021–2022. Various Weather Station across San Diego County. Data accessed periodically from November 2021 through June 2022.
<http://www.wunderground.com>

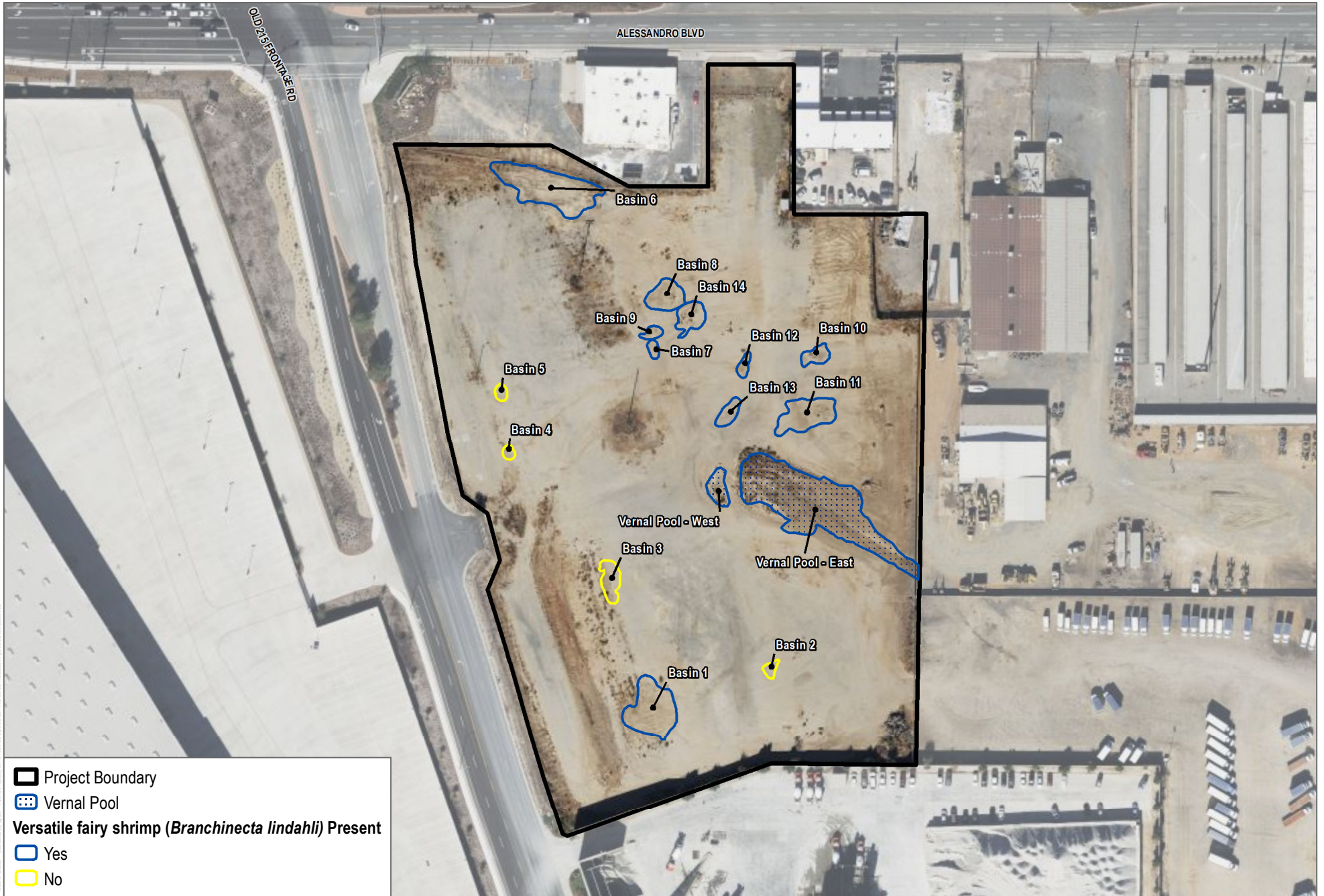


SOURCE: USGS 7.5-Minute Series Riverside East Quadrangle



FIGURE 1

Project Location



SOURCE: UltraSystems 2021; Riverside County 2022; Bing Maps



FIGURE 2
Survey Results

APPENDIX A

Survey Data Forms

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 12/21/2021 Time: 1000-1430 Weather Conditions: 100% CC, 0-1 mph wind, 62-64 F

* First visit Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomida			
VP east	3152795 N 474007 E	16.7	11.1	15	40	75x10	100x15											TT, T	No Shrimp
VP west	3152799 N 473976 E	16.7	11.1	8	15	25x20	30x20											TT, T	
Basin 1	3152798 N 473951 E	17	10.5	6	12	25x20	50x30											TT	
Basin 2	3152796 N 473941 E	17.5	11	5	10	3x3	5x5											TT	
Basin 3	3152796 N 473939 E	18	11.5	3	10	8x3	10x4											TT	
Basin 4	3152797 N 473918 E	18	11	4	8	2x3	4x3											TT	
Basin 5	3152797 N 473912 E	18	11.5	4	8	3x3	5x5											TT	
Basin 6	3152795 N 473877 E	18	12.7	8	15	30x6	40x8											TT	
Basin 7	3152793 N 473847 E	18	12.4	6	10	6x3	10x4											TT	
Basin 8	3152792 N 473852 E	18	12.7	10	15	15x8	30x15											TT	
Basin 9	3152791 N 473847 E	18	12.7	6	10	4x3	10x5											TT	
Basin 10	3152844 N 474071 E	18	10	5	12	5x3	8x4											TT	
Basin 11	3152831 N 474606 E	18	11	6	12	14x8	18x10											TT	
Basin 12	3152831 N 473984 E	18	11	4	8	4x3	8x3											TT	✓

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindleriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152826 N 473984 E	18	13.3	7	16	12x3	13x4											TT	
----------	-----------------------	----	------	---	----	------	------	--	--	--	--	--	--	--	--	--	--	----	--

Basin 14 = Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5

SURVEYOR / Permit Number: Paul Lemons / TEO51248-6

Date: 1/4/22 Time: 0940-1430 Weather Conditions: 5% cc, 0-2 mph wind, 58-62 F

Feature ID #	UTM (Northing Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects			Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152115 N 474007 E	58	50	15	40	130x 15	100x 15	X									TT, AB	BRLI, VP east
VP west	3152119 N 473976 E	58	50	15	15	130x 15	30x20	X									TT, AB	west combined
Basin 1	3152108 N 473951 E	60	54	10	12	40x 30	50x 30	X									TT	Shrimp present too immature
Basin 2	3152130 N 473911 E	61	50	6	10	5x5	5x5										TT, AB	No FS
Basin 3	3152109 N 473932 E	61	55	4	10	15x 3	10x4										TT	No FS
Basin 4	3152105 N 473918 E	62	50	4	8	4x3	4x3										TT	No FS
Basin 5	3152121 N 473922 E	62	54	4	8	4x5	5x5										TT	No FS
Basin 6	3152115 N 473917 E	62	52	8	15	35x8	40x8	X									TT, AB	BRLI
Basin 7	3152113 N 473947 E	62	N/A	N/A	10	N/A	10x4										TT	Dry
Basin 8	3152162 N 473952 E	62	55	8	15	25x 15	30x 15	X									TT, AB	BRLI
Basin 9	3152111 N 473947 E	62	61	6	10	8x5	10x5	X									TT, AB	BRLI
Basin 10	3152114 N 474007 E	62	58	6	12	5x2	8x4	X							X		TT, AB	BRLI
Basin 11	3152151 N 474006 E	62	57	8	12	15x 10	18x10	X									TT	BRLI
Basin 12	3152151 N 473984 E	62	55	5	8	4x3	8x3	X									TT	BRLI

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindleriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool, UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 473984 E	62	55	8	16	10x4	13x4	X									TT	BRLI
Basin 14	3152105 N 474003 E	60	54	6	12	17x3	20x4	X									TT, AB	BRLI

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site/Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5

SURVEYOR / Permit Number: Paul Lemons / TEO51248-6

Date: 1/11/22 Time: 11:45 AM Weather Conditions: 30% cc, 0-3mph wind, 65-73°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Fi Air	Fi Water	Average	Est. Max.	Present	Est. Max.	F	S	LIOC	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera			
VP east	3152795N 474007E	65	58	15	40	20x10	100x15	X										TT, T	BRLI
VP West West	3152799N 473976E	66	57	10	15	25x20	30x20	X										TT, T	BRLI
Basin 1	3152708N 473951E	68	56	8	12	30x20	50x30											TT	No FS
Basin 2	3152706N 473941E	68	57	3	10	2x2	5x5											TT, AB	No FS
Basin 3	3152706N 473939E	68	59	3	10	8x1	10x4											TT	No FS
Basin 4	3152707N 473938E	68	59	3	8	4x2	4x3											TT	No FS
Basin 5	3152707N 473927E	68	59	3	8	3x2	5x5											TT	No FS
Basin 6	3152715N 473917E	69	58	8	15	30x8	40x8	X										TT, AB	BRLI
Basin 7	3152713N 473917E				10		10x4											TT	Dry
Basin 8	3152702N 473952E	69	57	10	15	20x10	30x15	X										TT	BRLI
Basin 9	3152701N 473947E	70	58	4	10	5x2	10x5											TT	BRLI
Basin 10	3152704N 474007E				12		8x4											TT	Dry
Basin 11	3152701N 474006E	70	56	6	12	10x5	18x10	X										TT	BRLI
Basin 12	3152703N 473984E				8		8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152726N 473924E	73	61	8	16	6x2	13x4	X										TT	BRLI
Basin 14	3152705N 474003E				12		20x4	23										TT	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 1/18/22 Time: 1000-1460 Weather Conditions: 80-60%.cc, 0-2mph wind, 56-62.F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°) °F		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	F	S	LIOC	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera			
VP east	3152115 N 474007 E	57	58	10	40	80x8	100x15	X										TT, T	FS-BRLI
VP west	3152119 N 473976 E	57	58	7	15	20x10	30x20	X										TT	FS-Only Z- R
Basin 1	3152108 N 473951 E	57	57	7	12	30x15	50x30											TT	No FS
Basin 2	3152136 N 473911 E	58	58	3	10	1x1	5x5											TT	No FS
Basin 3	3152160 N 473939 E	58	—	—	10	—	10x4											TT	Dry
Basin 4	3152201 N 473898 E	58	56	3	8	4x1	4x3											TT	No FS
Basin 5	3152221 N 473912 E	58	57	4	8	2x2	5x5											TT	No FS
Basin 6	3152115 N 473877 E	59	61	7	15	30x6	40x8	X										TT, AB	FS-1600's-BRLI
Basin 7	3152143 N 473947 E	60	—	—	10	—	10x4											TT	Dry
Basin 8	3152162 N 473952 E	61	61	10	15	15x10	30x15	X										TT	FS-BRLI
Basin 9	3152191 N 473977 E	61	—	—	10	—	10x5											TT	Dry
Basin 10	3152211 N 474007 E	62	—	—	12	—	8x4											TT	Dry
Basin 11	3152231 N 474006 E	62	60	5	12	4x4	18x10	X										TT	FS-100's BRLI
Basin 12	3152251 N 473984 E	62	—	—	8	—	8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152260 N 473984 E	62	60	6	16	3x2	13x4											TT	No FS
Basin 14	3152265 N 474003 E	62	—	—	12	—	20x4	23										TT	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Pencke County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 1/24/22 Time: 0900-1200 Weather Conditions: 0".cc, 0-5mph wind, 64-69°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects			Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		°F Air	°F Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cleodocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152195 N 474007 E	64	66	8	40	16x2	100x15				X						II, T	BRL1
VP west	3152199 N 473976 E	65	62	10	15	16x8	30x20				X						II, T	No FS
Basin 1	3152188 N 473951 E	67	67	6	12	20x2	50x30				X						II	No FS
Basin 2	3152186 N 473941 E				10		5x5										II	Dry
Basin 3	3152186 N 473939 E				10		16x4										II	Dry
Basin 4	3152180 N 473898 E				8		4x3										II	Dry
Basin 5	3152179 N 473912 E				8		5x5										II	Dry
Basin 6	3152115 N 473877 E				15		40x8										II	Dry
Basin 7	3152113 N 473847 E				10		10x4										II	Dry
Basin 8	3152162 N 473852 E	69	67	6	15	9x6	30x15				X						II	No FS
Basin 9	3152151 N 473847 E				10		10x5										II	Dry
Basin 10	3152144 N 474607 E				12		8x4										II	Dry
Basin 11	3152151 N 474606 E				12		18x10										II	Dry
Basin 12	3152151 N 473984 E				8		8x3										II	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindieria occidentalis*, BRL1 = *Branchinecta lindahl*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 473984 E				16		13x4										II	Dry
Basin 14	3152105 N 474003 E				12		20x4	23									II	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 1/31/22 Time: 0930-1200 Weather Conditions: 90% CC, 1-3 mph wind, 57-62°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°C) °F		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		°F Air	°F Water	Average	Est. Max.	Present	Est. Max.	F Anostracans	S LIOC	MO Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152795 N 474007 E				40		100x15											TT	Dry
VP west	3152798 N 473976 E	57	55	3	15	5x4	30x20							X				TT, T	No FS
Basin 1	3152798 N 473951 E	59	56	3	12	10x4	50x30							X				TT	No FS
Basin 2	3152796 N 473911 E				10		5x5											TT	Dry
Basin 3	3152796 N 473939 E				10		10x4											TT	Dry
Basin 4	3152797 N 473919 E				8		4x3											TT	Dry
Basin 5	3152797 N 473922 E				8		5x5											TT	Dry
Basin 6	3152795 N 473917 E				15		40x8											TT	Dry
Basin 7	3152793 N 473947 E				10		10x4											TT	Dry
Basin 8	3152792 N 473952 E	62	59	3	15	3x1	30x15							X				TT	No FS
Basin 9	3152791 N 473947 E				10		10x5											TT	Dry
Basin 10	3152794 N 474007 E				12		8x4											TT	Dry
Basin 11	3152791 N 474002 E				12		18x10											TT	Dry
Basin 12	3152791 N 473984 E				8		8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152796 N 473984 E				16		13x4											TT	Dry
Basin 14	3152795 N 474003 E				12		20x4	23										TT	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5

SURVEYOR / Permit Number: Paul Lemons / TEO51248-6

Date: 4/5/22 Time: 1000-1430 Weather Conditions: 10-0% LL, 1-8 mph, 73-81 °F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects			Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information	
		Air	Water	Average	Est. Max.	Present	Est. Max.	F	S	LIOC (Lindoriella)	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera				Hemiptera
VP east	3152195 N 414007 E	73	77	15	40	40x3	100x15	X				X						TT	FS - Immature
VP west	3152195 N 413947 E	73	73	7	15	17x13	30x20	X				X						TT	FS - Immature
Basin 1	3152198 N 413951 E	74	63	5	12	20x18	50x30											TT	No FS
Basin 2	3152186 N 413911 E	75	-	-	10	-	5x5											TT	Dry
Basin 3	3152169 N 413939 E	75	-	-	10	-	10x4											TT	Dry
Basin 4	3152180 N 413918 E	77	-	-	8	-	4x3											TT	Dry
Basin 5	3152171 N 413912 E	77	-	-	8	-	5x5											TT	Dry
Basin 6	3152115 N 413817 E	78	81	10	15	28x7	40x8	X				X						TT	FS - Immature
Basin 7	3152143 N 413947 E	79	69	6	10	7x4	10x4	X				X						TT	FS - Too immature
Basin 8	3152162 N 413952 E	80	73	7	15	15x15	30x15	X				X						TT	↓
Basin 9	3152151 N 413947 E	80	73	6	10	8x5	10x5	X				X						TT	↓
Basin 10	3152144 N 414027 E	80	70	3	12	4x3	8x4											TT, AB	No FS
Basin 11	3152131 N 414006 E	80	77	5	12	14x10	18x10											TT	No FS
Basin 12	3152131 N 413984 E	80	-	-	8	-	8x3											TT	Dry

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Lindoriella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed: with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by: C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 413984 E	81	-	-	16	-	13x4											TT	Dry
Basin 14	3152105 N 414003 E	86	84	7	12	16x2	20x4	X				X						TT, T	28's BRLI

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 4/11/22 Time: 1130-1500 Weather Conditions: 100% cc, 1-7mph, 62-66°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans				Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	A	S	N	C	O	C	C	H			
VP east	3152145 N 474007 E	62	-	-	40	-	100x15										II	Dry
VP west	3152144 N 4739166 E	62	66	10	15	12x8	30x20	X					X				II	BRLI
Basin 1	3152148 N 4739151 E	63	55	5	12	18x16	50x30										II, T	No FS BRLI - very few
Basin 2	3152136 N 4739111 E	63	-	-	10	-	5x5										II	Dry
Basin 3	3152168 N 4739199 E	64	-	-	10	-	10x4										III	Dry
Basin 4	3152207 N 4739198 E	64	-	-	8	-	4x3										II	Dry
Basin 5	3152221 N 4739172 E	64	-	-	8	-	5x5										II	Dry
Basin 6	3152215 N 4739171 E	64	75	7	15	18x5	40x8	X							X		II	BRLI
Basin 7	3152243 N 4739171 E	65	-	-	10	-	10x4										II	Dry
Basin 8	3152262 N 4739152 E	65	73	4	15	3x5	30x15										II	No FS
Basin 9	3152291 N 4739171 E	65	72	6	10	7x5	10x5	X									II	BRLI
Basin 10	3152244 N 4740071 E	66	-	-	12	-	8x4										II	Dry
Basin 11	3152281 N 4740066 E	66	68	4	12	12x8	18x10										II	No FS
Basin 12	3152281 N 4739184 E	66	-	-	8	-	8x3										II	Dry

(24" outlet)
very few

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152266 N 4739184 E	66	-	-	16	-	13x4										II	Dry
Basin 14	3152265 N 4740033 E	66	-	-	12	-	20x4	23									II	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5
 SURVEYOR / Permit Number: Paul Lemons / TEO51248-6
 Date: 4/18/22 Time: 0940-1230 Weather Conditions: 10% cc, 1-5 mph, 65-74 F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans				Insects				Platyhelminths (flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae			
VP east	3152195 N 474007 E	—	—	—	40	—	100x15									II	Dry	
VP west	3152199 N 4739716 E	65	66	7	15	60x4	30x20	X			X	X				II	BRLI	
Basin 1	3152183 N 473951 E	66	61	4	12	15x3	50x30				X					II	No FS	
Basin 2	3152186 N 473911 E	—	—	—	10	—	5x5									II	Dry	
Basin 3	3152180 N 473939 E	—	—	—	10	—	60x4									II	Dry	
Basin 4	3152185 N 473898 E	—	—	—	8	—	4x3									II	Dry	
Basin 5	3152182 N 473912 E	—	—	—	8	—	5x5									II	Dry	
Basin 6	3152115 N 473817 E	73	76	4	15	7x3	40x8	X			X					II	BRLI	
Basin 7	3152143 N 473947 E	—	—	—	10	—	10x4									II	Dry	
Basin 8	3152162 N 473952 E	—	—	—	15	—	30x15									II	Dry	
Basin 9	3152191 N 473947 E	—	—	—	10	—	10x5									II	Dry	
Basin 10	3152144 N 474007 E	—	—	—	12	—	8x4									II	Dry	
Basin 11	3152181 N 474006 E	—	—	—	12	—	18x10									II	Dry	
Basin 12	3152181 N 473984 E	—	—	—	8	—	8x3									II	Dry	

Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = *Linderiella occidentalis*, BRLI = *Branchinecta lindahli*).
 For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present.
 (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.

Basin 13	3152126 N 473984 E	—	—	—	16	—	13x4									II	Dry
Basin 14	3152105 N 474003 E	—	—	—	12	—	20x4	23								II	Dry

Appendix 1. U.S. Fish and Wildlife Service – Data Sheet for Wet Season Surveys For Listed Large Branchiopods

Site or Project Name: Penske County: Riverside Quad: Riverside East Township: 3S Range: 4W Section: 5

SURVEYOR / Permit Number: Paul Lemons / TEO51248-6

Date: 4/24/22 Time: 1430-1500 Weather Conditions: 0%.c., 3-8 mph wind, 82°F

Feature ID #	UTM (Northing, Easting, Datum)	Temp (°F)		Depth (cm)		Surface Area (m x m)		Crustaceans					Insects				Platyhelminths (Flatworms)	Habitat Condition	Notes / Voucher information
		Air	Water	Average	Est. Max.	Present	Est. Max.	Anostracans	Notostracans	Copepods	Ostracods	Cladocera	Coleoptera	Hemiptera	Diptera Culicidae	Diptera Chironomida			
VP east	3152795 N 474007 E				40		100x15										II	Dry	
VP west	3152799 N 473976 E				15		30x20										II	Dry	
Basin 1	3152708 N 473951 E	82	74	3	12	12x10	50x30				X						II, T	No FS	
Basin 2	3152706 N 473911 E				10		5x5										II	Dry	
Basin 3	3152709 N 473932 E				10		6x4										II	Dry	
Basin 4	3152807 N 473898 E				8		4x3										II	Dry	
Basin 5	3152821 N 473912 E				8		5x5										II	Dry	
Basin 6	3152715 N 473877 E				15		40x8										II	Dry	
Basin 7	3152843 N 473147 E				10		10x4										II	Dry	
Basin 8	3152862 N 473152 E				15		30x15										II	Dry	
Basin 9	3152951 N 473177 E				10		10x5										II	Dry	
Basin 10	3152844 N 474007 E				12		8x4										II	Dry	
Basin 11	3152851 N 474006 E				12		18x10										II	Dry	
Basin 12	3152831 N 473984 E				8		8x3										II	Dry	
<p>Notes: Fill in abbreviated names of Anostracans and Notostracans, for all others indicate presence with a check mark. Anostracan and Notostracan Abbreviations: Use first two letters of genus and species name (e.g., LIOC = <i>Lindierella occidentalis</i>, BRLI = <i>Branchinecta lindahl</i>). For habitat conditions use two letter abbreviation as follows: NP = Natural Pool, CP = Constructed Pool; UD = undisturbed, D = disturbed; with TT = tire tracks, T = trash, P = plowed; G = grazed, UG = ungrazed by; C = cattle, H = horses, S = sheep; AB = Algal blooms present. (Estimate grazing regime by height of grasses and forbs and density of hoof prints) LG = light grazing, MG = moderate grazing, HG = heavy grazing.</p>																			
Basin 13	3152826 N 473984 E				16		13x4										II	Dry	
Basin 14	3152905 N 474003 E				12		20x4	23									II	Dry	

Entire site =
Graded lot =
CP, D, T

APPENDIX B
Photographs





















APPENDIX E

**2022 DRY SEASON SURVEY REPORT FOR LIST LARGE
BRANCHIOPODS**

August 12, 2022

13911

U.S. Fish and Wildlife Service
Attn: Recovery Permit Coordinator
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

Subject: 2022 Dry Season Survey Report for List Large Branchiopods at the Penske Sales, Leasing, and Maintenance Facility Project Site, Riverside County, California

Dear Recovery Permit Coordinator:

The 2022 dry season survey for the presence or absence of listed large vernal pool branchiopods was conducted on June 29, 2022. Dudek biologist Paul Lemons (TE051248-6) conducted the soil collection according to the *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2017). Soil samples from a total of 16 features were collected during this 2022 dry season survey effort. Wet season surveys were conducted during the 2021/22 wet season the same 16 features.

Soil samples collected on June 29, 2022 were submitted to biologist Greg Mason (TE58862A, Alden Environmental, Inc.) on June 30, 2022 for soil sieving and cyst culturing.

Project Location and Existing Conditions

The Penske Sales, Leasing, and Maintenance Facility (Penske) Project is located in the City of Moreno Valley, Riverside County, California. The Project site is located at 21839 and 21921 Alessandro Boulevard. The Project site is approximately 9.63 acres and is located at the southeast corner of Old 215 Frontage Road and Alessandro Boulevard. Streets surrounding the site include Alessandro Drive to the north, Interstate 215 to the west, Cactus Avenue to the south, and Day Street to the east. The Project site occurs in Township 3 South, Range 4 West of the Riverside East U.S. Geological Survey 7.5 minute quadrangle map (Figure 1). The project site is flat, with an elevation of approximately 1,540 feet above mean sea level (amsl). The site is currently actively being used as a truck cargo container/trailer storage area. The site is completely surrounded by commercial/light industrial land uses.

Approximately 88% of the soils within the Penske site consist of Monserate sandy loam, 0 to 5 percent slopes, and the remaining 12 % consists of Monserate sandy loam, 5 to 8 percent slopes, eroded (USDA 2022).

Vegetation Communities, Land Covers, and Vernal Pool Features

The entire Penske site would be classified as disturbed land. The site has historically been graded flat and is essentially bare ground, with the exception of two seasonally wet/ponded areas (VP east and VP west on Figure 2), which are vegetated with ruderal weedy vegetation, some of which includes facultative and non-facultative wet species on the national wetland plant list including clustered tarweed (*Deinandra fasciculata*), yellow nutsedge

(*Cyperus esculentus*) and willow dock (*Rumex salicifolia*). Both VP east and VP west receive water from a 24-inch storm drain pipe outlet at the eastern edge of the site boundary.

Suitable and potentially suitable habitat (i.e., ephemeral wet/ponded features) for vernal pool branchiopods was identified on site and includes features VP1 and VP2, as well as 14 additional puddles or road rut (man-made) depressions, lacking vegetation (aside from algae when inundated), scattered throughout the site.

Previous Brachiopod Studies

Dudek biologist Paul Lemons conducted a wet season survey for listed large Branchiopods at the Penske site during the 2021/22 wet season. The wet season survey report was submitted to the U.S. Fish and Wildlife Service on June 28, 2022.

Survey Methods

Soil samples were collected on June 29, 2022, after several weeks of no recorded precipitation in the Moreno Valley region, therefore soil samples were extremely dry. A hand spade was used to collect each sample. Samples were taken the top 1-3 cm of soil within each feature. Where possible, the hand spade was used to pry up intact chunks of sediment. All samples were collected from the lowest topographic areas of each feature.

Three of the 16 features were between 236 and 2300 square meters, therefore 50 samples were collected. Nine of the 16 features were between 25 and 235 square meters, therefore 25 samples were collected. The remaining four features were under 25 square meters, therefore 10 samples were collected. Table 1 summarizes the area of each feature and number of samples collected. Data sheets were completed for each basin that was surveyed (Appendix A). Selected photographs of basins sampled are attached to this report as Appendix B.

Table 1. Soil Sample Collection Data

Basin	B. lindahli present during wet season?	Square meters	Number of 50 mL Samples Collected	Total mL collected
Basin 1	YES	272.73	50	2,500
Basin 2	NO	21.77	10	500
Basin 3	NO	81.78	25	1,250
Basin 4	NO	17.50	10	500
Basin 5	NO	19.97	10	500
Basin 6	YES	402.37	50	2,500
Basin 7	YES	20.58	10	500
Basin 8	YES	118.75	25	1,250
Basin 9	YES	25.78	25	1,250
Basin 10	YES	51.69	25	1,250
Basin 11	YES	191.12	25	1,250
Basin 12	YES	26.77	25	1,250
Basin 13	YES	51.45	25	1,250
Basin 14	YES	89.29	25	1,250

Table 1. Soil Sample Collection Data

Basin	B. lindahli present during wet season?	Square meters	Number of 50 mL Samples Collected	Total mL collected
Vernal Pool - East	YES	958.65	50	2,500
Vernal Pool - West	YES	72.31	25	1,250

Surveyor: PML = Paul Lemons (TE051248-6)

Immediately after sample collection, each soil sample was carefully placed into plastic bags and labeled according to each feature ID. Soil samples collected on June 29, 2022 from each basin were immediately submitted to Mr. Greg Mason of Alden Environmental, Inc. on June 30, 2022. Soil samples were then processed by Mr. Mason for examination in the laboratory using the methods described in the dry season report by Alden Environmental, Inc. (Appendix A).

Survey Results

Fairy Shrimp Presence/Absence

Results of the dry sample analysis yielded the presence of cysts from the fairy shrimp genus *Branchinecta* in 14 features, including VP east, VP west, Basin 1, Basin, 3, Basin 4, Basin 6, Basin 7, Basin 8, Basin 9, Basin 10, Basin 11, Basin 12, Basin 13, and Basin 14. All cysts collected from these features were attempted to be cultured and raised to maturity to make a species-level identification.. This attempt was successful in 13 of the 14 features where cysts were collected. Only Basin 3 failed to produce hatched shrimp, therefore, the cysts from this basin could only be positively identified to genus level (i.e., *Branchinecta*). All shrimp that were successfully raised to maturity were identified as versatile fairy shrimp (*Branchinecta lindahli*). No federally-listed Branchiopods were identified during this 2022 dry season survey effort. Detailed results of soil analysis and cyst culturing, as well as all required data collection information per the survey guidelines (USFWS, 2017) are included in the Alden Environmental Report (Appendix A). Representative site photographs are included as Appendix B of this report.

I certify that the information presented in this survey report and attached exhibits fully and accurately represents my work. Please contact Paul Lemons at plemons@dudek.com if you have any questions regarding the contents of this report.

Sincerely,



Paul Lemons
TE051248-6

cc: Hina Gupta, UltraSystems Environmental
Att: Figure 1, Regional Map
Figure 2, 2021/22 Survey Results
Appendix A, Alden Environmental, Inc. – Dry Season Fairy Shrimp Sampling Results for the Penske Truck Leasing Facility Site
Appendix B, Site Photographs

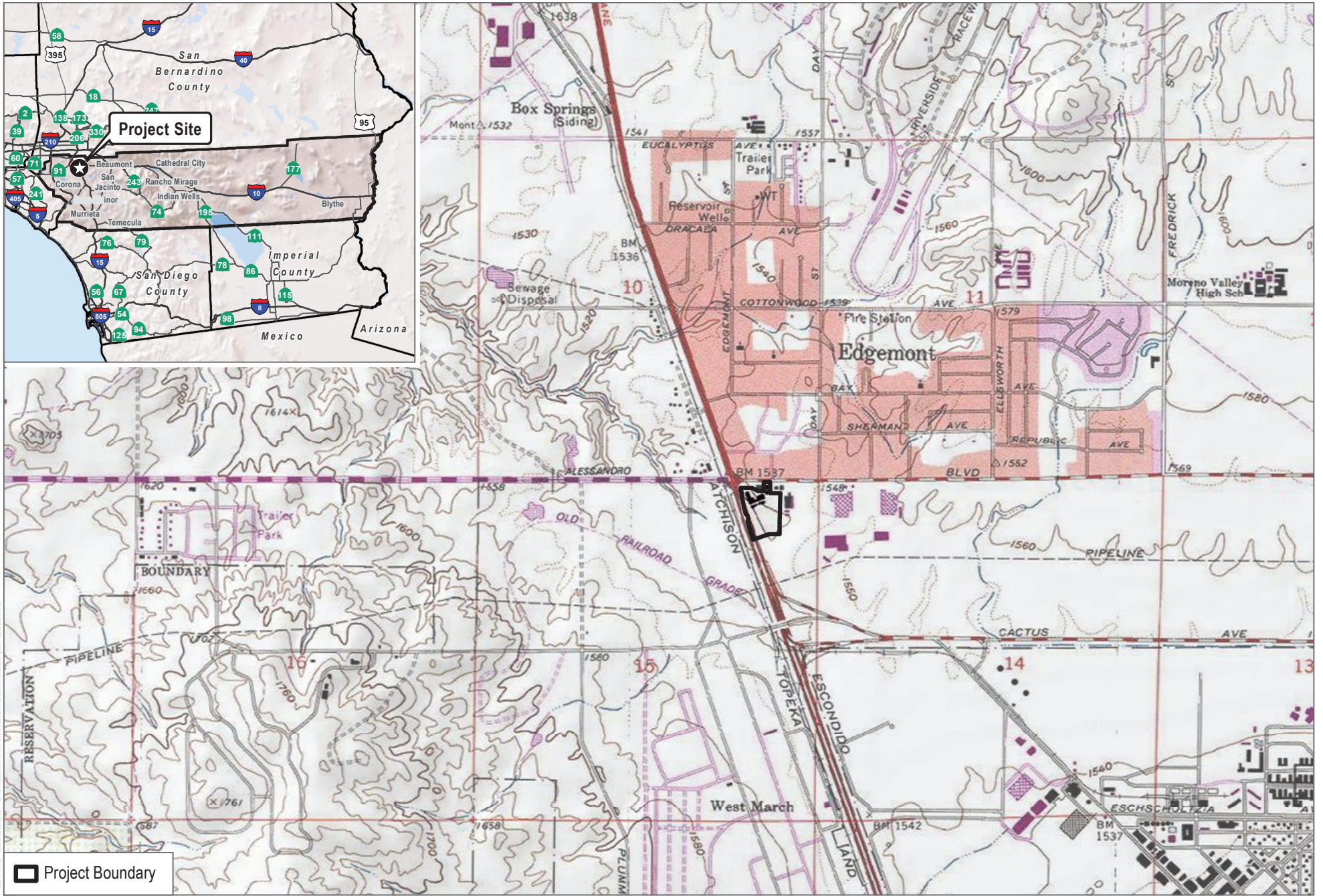
References Cited

Eriksen, C., and D. Belk. 1999. *Fairy Shrimps of California's Puddles, Pools, and Playas*. Eureka, California: Mad River Press Inc.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: <http://websoilsurvey.sc.egov.usda.gov/>. Accessed June 3, 2022.

USFWS. 2017. Survey Guidelines for the Listed Large Branchiopods. Sacramento, California: USFWS Pacific Southwest Region. Revised: November 13, 2017.

Weather Underground Inc. 2022. Various Weather Station across San Diego County. Data accessed June 2022. <http://www.wunderground.com>



SOURCE: USGS 7.5-Minute Series Riverside East Quadrangle



FIGURE 1
Project Location

2022 Dry Season Survey for Vernal Pool Branchiopods, Penske Truck Leasing Facility Project, City of Moreno Valley, Riverside County, California



SOURCE: UltraSystems 2021; Riverside County 2022; Bing Maps



FIGURE 2
Survey Results
 2022 Dry Season Survey for Vernal Pool Branchiopods, Penske Truck Leasing Facility Project, City of Moreno Valley, Riverside County, California

Appendix A

Alden Environmental, Inc. - Dry Season Fairy Shrimp
Sampling Results for the Penske Truck Leasing Facility Site

August 5, 2022

Mr. Paul Lemons
Dudek
605 Third Street
Encinitas, CA 92024

Subject: Dry Season Fairy Shrimp Sampling Results for the Penske Truck Leasing Facility Site

Dear Mr. Lemons:

This letter presents the results of dry season fairy shrimp sampling (cyst identification and rearing) conducted for the Penske Truck Leasing Facility Site.

Methods

Cyst Identification

On June 30, 2022, Alden received soil samples collected from 16 basins on the project site. The soil was provided in bags labeled with the basin number. The collected soil from each basin was divided into subsamples, based on the area of the pool and the amount of soil collected. Each sample was then hydrated and processed through a series of sieves to separate out fairy shrimp cysts that may be present. The sieves used were of 710-, 355-, and 212- μm pore size screens. The final sieve pore size is smaller than the target fairy shrimp genera (*Branchinecta* and *Streptocephalus*) average cyst diameter and therefore would retain cysts. The material remaining on the final sieve was next placed in a brine solution to help separate organic from inorganic material. The organic portion was then filtered through a standard coffee filter and allowed to dry. The dried material on the filters was then examined under a stereo dissecting scope to determine if cysts were present. Cyst surface characteristics were then used to identify cysts to genus, if present.

Hatching/Rearing

The collected *Branchinecta* fairy shrimp cysts were hydrated by placing them into plastic containers filled with approximately 525 ml of filtered, non-chlorinated drinking water. The coffee filters (from the soil sieving effort) with the collected cysts were slowly opened over the containers and gently shaken to allow the material to fall into the water. The sides of the filters were then rubbed against one another to release any additional material. Finally, a squirt bottle filled with filtered drinking water was used to spray any additional material from the filters into the containers.

The containers were given sample identification numbers and placed on a table in a climate controlled room. Lighting in the room was provided by indirect sunlight as well as an overhead light (full spectrum bulb) that was kept on approximately 12 hours a day to help emulate spring season lighting conditions. An overhead fan also was kept on at a low level to provide for some air movement across the water surface in the sample containers.

The samples were checked daily to see if any fairy shrimp had emerged. Once nauplii were observed, feeding began. The hatched shrimp were fed 2-4 drops of prepared food on a daily basis until they were collected. The food used was a mix of active brewer’s yeast, sugar, powdered fish food, and water.

The hatched shrimp were allowed to continue under these conditions until they had reached maturity, as determined by reaching full size, antennal development (males) and brood pouch development (females). Once mature, the fairy shrimp were collected for identification by pouring the material in the container through a small strainer. Collected shrimp were then placed into a dish of carbonated (soda) water to slowly asphyxiate the shrimp. Once dead, the collected shrimp were placed in a 27 x 57 mm (5 dram) clear glass vial, filled with 70% ethyl alcohol. The collected shrimp were then identified to the species level with the aid of a stereo dissecting scope.

Results

Cyst Identification

Cysts of the genus *Branchinecta* were found in 14 basins (Table 1; Attachment A). No cysts of the genus *Streptocephalus* were found in any of the sampled basins.

Table 1 Dry Season Sampling Results			
Basin	Number of Subsamples	<i>Branchinecta</i>	<i>Streptocephalus</i>
1	50	219	-
2	10	-	-
3	25	2	-
4	10	700	-
5	10	-	-
6	50	3600	-
7	10	15	-
8	25	206	-
9	25	602	-
10	25	539	-
11	25	222	-
12	25	12	-
13	25	45	-
14	25	66	-
VP East	50	702	-
VP West	25	5	-

Hatching/Rearing

Hydration and hatching of the samples with recovered cysts was conducted, resulting in the collection and identification of the non-sensitive versatile fairy shrimp (*B. lindahli*) from all but one (Basin 3) of the basins with fairy shrimp cysts present (Table 2). Basin 3 had a very low numbers of recovered cysts (2), making successful hatching difficult. No other fairy shrimp species were identified.

Table 2 Fairy Shrimp Hatching Results	
Basin ¹	<i>Branchinecta Lindahli</i>
1	✓
3	-
4	✓
6	✓
7	✓
8	✓
9	✓
10	✓
11	✓
12	✓
13	✓
14	✓
VP East	✓
VP West	✓

¹Only basins from which cysts were recovered

The above text presents the final results of the dry season fairy shrimp cyst identification and hatching effort for the project. The non-listed versatile fairy shrimp was the only shrimp species to be reared from the recovered cysts. If you have any questions or need additional information please call.

Sincerely,



Greg Mason
Principal/Senior Biologist

Attachment A Cyst per subsample table

Attachment A

BASIN	B. lindahli present during wet season?	SQ_M	# Samples	Results (# cysts recovered)																																																		Notes						
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50		Total					
Basin 1	YES	272.7	50	4	5	1	6	0	6	4	5	2	2	7	4	1	14	0	9	5	21	2	3	3	7	7	1	7	6	2	5	4	8	6	3	2	0	4	8	3	2	2	4	3	5	1	2	7	3	2	9	1	1	219	Ostracod shells 1s					
Basin 2	NO	21.8	10	0	0	0	0	0	0	0	0	0	0																																							0								
Basin 3	NO	81.8	25	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0																										2							
Basin 4	NO	17.5	10	77	63	54	105	66	56	76	13	99	91																																							700								
Basin 5	NO	20.0	10	0	0	0	0	0	0	0	0	0	0																																							0								
Basin 6	YES	402.4	50	76	65	72	24	106	55	33	76	45	67	56	45	87	57	34	88	21	44	67	89	111	22	56	76	87	45	67	43	67	66	46	76	88	67	165	88	222	108	157	99	88	98	78	44	67	54	77	88	22	21	3600	Ostracod shells 1s					
Basin 7	YES	20.6	10	3	5	6	0	0	1	0	0	0	0																																									15						
Basin 8	YES	118.8	25	6	9	4	8	12	0	4	45	5	4	6	36	0	20	7	4	8	3	4	5	1	2	7	0	6																													206	Ostracod shells 1s		
Basin 9	YES	25.8	25	24	54	12	67	45	45	87	2	5	7	33	56	34	9	53	2	0	6	24	12	3	5	6	7	4																												602	Ostracod shells 1s, Cladoceran ephippia 1s			
Basin 10	YES	51.7	25	5	44	67	1	34	66	6	77	7	33	6	67	6	4	5	43	9	1	0	13	32	1	1	5	6																												539				
Basin 11	YES	191.1	25	8	9	4	7	3	6	55	12	4	0	7	4	8	9	24	7	5	3	8	11	12	0	2	6	8																														222	Ostracod shells 1s	
Basin 12	YES	26.8	25	0	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0																														12		
Basin 13	YES	51.4	25	0	0	5	8	1	0	4	0	0	6	9	0	0	0	0	0	0	4	2	6	0	0	0	0	0																															45	
Basin 14	YES	89.3	25	0	5	9	4	7	11	5	3	0	0	0	0	2	6	3	10	1	0	0	0	0	0	0	0	0																															66	
VP - East	YES	958.6	50	14	7	9	1	76	44	34	77	3	8	5	70	11	0	44	4	7	21	5	66	78	5	7	3	4	1	0	3	0	4	0	5	1	2	22	0	0	0	4	6	7	8	3	9	1	3	2	7	4	7	702	Ostracod shells 10s					
VP - West	YES	72.3	25	0	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0																																5	
			415																																																									

Appendix B

Site Photographs





APPENDIX F
PLANT SPECIES OBSERVED

Table 1 contains the list of vascular plant taxa recorded during the surveys conducted within the project site; however ornamental, landscaped, and agricultural vegetation is not included. Plant nomenclature and taxonomic order is based on *The Jepson Manual: Vascular Plants of California*, second Edition (Baldwin et al., 2012).

TABLE 1
PLANT SPECIES OBSERVED DURING THE FIELD SURVEY

Scientific Name (=Synonym)	Common Name (=Synonym)	Non-Native	Cal-IPC Rating	Status
Amaranthaceae	Amaranth Family			
<i>Amaranthus albus</i>	pigweed amaranth, tumbleweed	X	-	-
Asteraceae (=Compositae)				
Asteraceae (=Compositae)	Sunflower Family			
<i>Ambrosia psilostachya</i>	western ragweed		-	-
<i>Anthemis cotula</i>	mayweed, dog fennel, stinking chamomile	X	-	-
<i>Baccharis salicifolia</i> ssp. <i>salicifolia</i> (= <i>Baccharis salicifolia</i>)	mule fat		-	-
<i>Centaurea melitensis</i>	totalote, Napa star thistle, Malta star thistle	X	Moderate	-
<i>Corethrogyne filaginifolia</i> (= <i>Lessingia filaginifolia</i>)	common sandaster		-	-
<i>Deinandra fasciculata</i> (= <i>Hemizonia fasciculata</i>)	clustered tarweed		-	-
<i>Dittrichia graveolens</i>	stinkwort	X	Moderate	-
<i>Erigeron canadensis</i> (= <i>Conyza canadensis</i>)	Canada horseweed		-	-
<i>Gazania linearis</i>	gazania	X	Moderate	-
<i>Helianthus annuus</i>	common sunflower, hairy leaved sunflower, sunflower		-	-
<i>Heterotheca grandiflora</i>	telegraph weed		-	-
<i>Lactuca serriola</i>	prickly lettuce, prickly wild lettuce	X	-	-
<i>Oncosiphon piluliferum</i>	stinknet	X	High	-
<i>Sonchus oleraceus</i>	common sow-thistle	X	-	-
<i>Stephanomeria</i> sp.	stephanomeria		-	-

Scientific Name (=Synonym)	Common Name (=Synonym)	Non-Native	Cal-IPC Rating	Status
Boraginaceae				
Boraginaceae	Borage or Waterleaf Family			
<i>Amsinckia menziesii</i>	Menzie's fiddleneck, small flowered fiddleneck		-	-
<i>Cryptantha</i> sp.	cryptantha		-	-
Brassicaceae (=Cruciferae)				
Brassicaceae (=Cruciferae)	Mustard Family			
<i>Brassica nigra</i>	black mustard	X	Moderate	-
<i>Hirschfeldia incana</i> (=Brassica geniculata)	short-podded mustard, Mediterranean hoary mustard, summer mustard	X	Moderate	-
Caryophyllaceae				
Caryophyllaceae	Pink Family			
<i>Spergularia marina</i> (=Spergularia salina)	Saltmarsh sand-spurry		-	-
Chenopodiaceae				
Chenopodiaceae	Goosefoot Family			
<i>Atriplex semibaccata</i>	Australian saltbush	X	Moderate	-
<i>Chenopodium album</i>	lamb's quarters, white goosefoot	X	-	-
<i>Chenopodium murale</i>	nettle-leaved goosefoot, sowbane	X	-	-
<i>Salsola tragus</i>	Russian thistle, tumbleweed	X	Limited	-
Euphorbiaceae				
Euphorbiaceae	Spurge Family			
<i>Euphorbia serpens</i>	matted sandmat		-	-
<i>Croton setiger</i>	turkey mullein		-	-
Fabaceae (=Leguminosae)				
Fabaceae (=Leguminosae)	Legume Family			
<i>Acacia longifolia</i>	Sydney golden wattle	X	Watch	-
<i>Trichostema lanceolatum</i>	vinegarweed		-	-

Scientific Name (=Synonym)	Common Name (=Synonym)	Non-Native	Cal-IPC Rating	Status
<i>Vicia benghalensis</i>	purple vetch	X	-	-
Poaceae				
Grasses Family				
<i>Avena barbata</i>	slender wild oat	X	Moderate	-
<i>Bromus diandrus</i>	ripgut grass	X	Moderate	-
<i>Bromus madritensis</i>	telegraph weed			-
<i>Festuca perennis</i>	rye grass	X	Moderate	-
<i>Hordeum murrinum</i>	Wall barley	X	Moderate	-
<i>Lamarckia aurea</i>	goldentop		-	-
<i>Pennisetum setaceum</i>	crimson fountain grass	X	Moderate	-
<i>Schismus barbatus</i>	common Mediterranean grass	X	Limited	-
Salicaceae				
Willow Family				
<i>Salix exigua</i>	narrow-leaved willow		-	-
<i>Salix lasiolepis</i>	arroyo willow		-	-
Solonaceae				
Nightshade Family				-
<i>Nicotiana glauca</i>	tree tobacco	X	Moderate	-
<i>Solanum elaeagnifolium</i>	white horse-nettle	X	-	-
Cyperaceae				
Sedges Family				
<i>Cyperus esculentus</i>	nut grass		-	-
Polygonaceae				
Buckwheat Family				
<i>Polygonum aviculare</i>	prostate knotweed	X	-	-
<i>Rumex crispus</i>	curly dock	X	Limited	-
<i>Rumex salicifolius</i>	willow dock		-	-

Scientific Name (=Synonym)	Common Name (=Synonym)	Non-Native	Cal-IPC Rating	Status
Tamaricaceae				
Tamaricaceae	Tamarisk Family		-	
<i>Tamarix ramosissima</i>	saltcedar	X	High	-
Malvaceae				
Malvaceae	Mallow Family			
<i>Malva parviflora</i>	cheeseweed	X	-	-
<i>Erodium cicutarium</i>	redstem filaree	X	Limited	-
<i>Erodium moschatum</i>	greenstem filaree	X	-	-

APPENDIX G
DATA SHEETS AND FIELD NOTES

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Penske Sales, Leasing, and Maintenance Facility City/County: Moreno Valley/Riverside Sampling Date: 4/29/2022
 Applicant/Owner: Penske State: AZ Sampling Point: N/A
 Investigator(s): Michelle Tollett, Matthew Sutton Section, Township, Range: Township 3 South, Range 4 West, Section 15 NE
 Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): None Slope (%): < 1%
 Subregion (LRR): C Lat: 33.915232° Long: -117.281156° Datum: WGS 84
 Soil Map Unit Name: Monserate sandy loam, 0 to 5 percent slopes (MmB) NWI classification: PEM2J

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: <u>Review of historic aerial imagery on Google Earth shows a history of failed attempts by the previous landowner(s) to blade or fill the vernal pools. Pools are fed by precipitation and also by runoff water from an unknown source which discharges into the pools via a corrugated pipe at the existing property line (33.915047° -117.280792°)</u> <u>Area is experiencing severe drought.</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.75</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>2</u> x 2 = <u>4</u> FAC species <u>1</u> x 3 = <u>3</u> FACU species <u>11</u> x 4 = <u>44</u> UPL species <u>1</u> x 5 = <u>5</u> Column Totals: <u>15</u> (A) <u>56</u> (B) Prevalence Index = B/A = <u>3.7</u>
Sapling/Shrub Stratum (Plot size: _____) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: _____) 1. <u>See attached plant list</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: _____) 1. _____ 2. _____ _____ = Total Cover				
% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____				
Remarks: <u>Review of historic aerial imagery on Google Earth shows a history of failed attempts by the previous landowner(s) to blade or fill the vernal pools, thus repeatedly disturbing the vegetation communities. Site is a tractor trailer storage site; dried mud was visible on many trailers.</u> Pools are fed by precipitation and also by runoff water from an unknown source which discharges into the pools at the existing property line (33.915047° -117.280792°).				

Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Date	Location	Common name	Scientific Name	Family	Stratum	NWPL Category	Prevalence†
9/21/2021	VP1	tumbleweed	<i>Amaranthus albus</i> *	Amaranthaceae	herb	FACU	CD
9/21/2021	VP2	tumbleweed	<i>Amaranthus albus</i> *	Amaranthaceae	herb	FACU	CD
9/21/2021	VP2	clustered tarweed	<i>Deinandra fasciculata</i>	Asteraceae	herb	FACU	C
9/21/2021	VP2	horseweed	<i>Erigeron canadensis</i>	Asteraceae	herb	FACU	C
9/21/2021	VP2	hairy leaved sunflower	<i>Helianthus annuus</i>	Asteraceae	herb	FACU	C
9/21/2021	VP2	stinknet	<i>Oncosiphon pilulifer</i> *	Asteraceae	herb	FACU	C
9/21/2021	VP1	lamb's quarters	<i>Chenopodium album</i> *	Chenopodiaceae	herb	FACU	C
9/21/2021	VP2	lamb's quarters	<i>Chenopodium album</i> *	Chenopodiaceae	herb	FACU	C
9/21/2021	VP1	nettle leaf goosefoot	<i>Chenopodium murale</i> *	Chenopodiaceae	herb	FACU	CD
9/21/2021	VP2	nettle leaf goosefoot	<i>Chenopodium murale</i> *	Chenopodiaceae	herb	FACU	CD
9/21/2021	VP2	nut grass	<i>Cyperus esculentus</i>	Cyperaceae	grass	FACW	IF
9/21/2021	VP2	doveweed	<i>Croton setiger</i>	Euphorbiaceae	herb	-	C
9/21/2021	VP2	goldentop	<i>Lamarckia aurea</i> *	Poaceae	grass	FACU	IF
9/21/2021	VP2	knotweed	<i>Polygonum aviculare</i> *	Polygonaceae	herb	FAC	CD
9/21/2021	VP2	willow dock	<i>Rumex salicifolius</i>	Polygonaceae	herb	FACW	CD
9/21/2021	VP2	white horse-nettle	<i>Solanum elaeagnifolium</i> *	Solanaceae	herb	-	C
9/21/2021	VP2	saltcedar	<i>Tamarix ramosissima</i> *	Tamaricaceae	tree/shrub	-	IF
9/21/2021	weedy area, North of VP2, weedy areas	tocalote	<i>Centaurea melitensis</i> *	Asteraceae		-	C
9/21/2021	weedy area, North of VP2, weedy areas	slender wild oat	<i>Avena barbata</i> *	Poaceae		-	C
10/14/2021	VP2	stinkwort	<i>Dittrichia graveolens</i> *	Asteraceae	herb	-	CD
10/14/2021	VP2, eastern edge above culvert	cheeseweed	<i>Malva parviflora</i> *	Malvaceae	herb	-	IF
12/10/2021	VP1	redstem filaree	<i>Erodium cicutarium</i> *	Geranaceae	herb	-	C
12/10/2021	VP2	redstem filaree	<i>Erodium cicutarium</i> *	Geranaceae	herb	-	C
12/15/2021	VP2	rye grass	<i>Festuca perennis</i> *	Poaceae	grass	FACU	IF
2/16/2022	VP2	common sow thistle	<i>Sonchus oleraceus</i> *	Asteraceae	herb	UPL	IF
4/4/2022	VP2	purple vetch	<i>Vicia benghalensis</i> *	Fabaceae	herb/vine	-	IF
4/29/2022	VP2	mayweed	<i>Anthemis cotula</i> *	Asteraceae	herb	FACU	IF
4/29/2022	VP2	salt marsh sand-spurrey	1	Caryophyllaceae	herb	FACW	CD

CD = codominant

C = common

IF= infrequent

APPENDIX H
PHOTOGRAPHS



PHOTO 1: VP1 at east boundary near culvert. Water visible in mid-center. View is northwest (October 14, 2021).



PHOTO 2: VP1 near east boundary. Mud cracks visible in foreground; fairy shrimp pond visible in midground. View is northwest (October 14, 2021).



PHOTO 3: VP2 and VP1. View is southeast toward culvert (October 14, 2021).



PHOTO 4: Culvert at eastern boundary. View is east (December 10, 2021).



PHOTO 5: VP1 mud cracks near culvert. View is west (December 10, 2021).



PHOTO 6: VP2 and VP1 merged after large precipitation event. View is southeast (December 15, 2021).

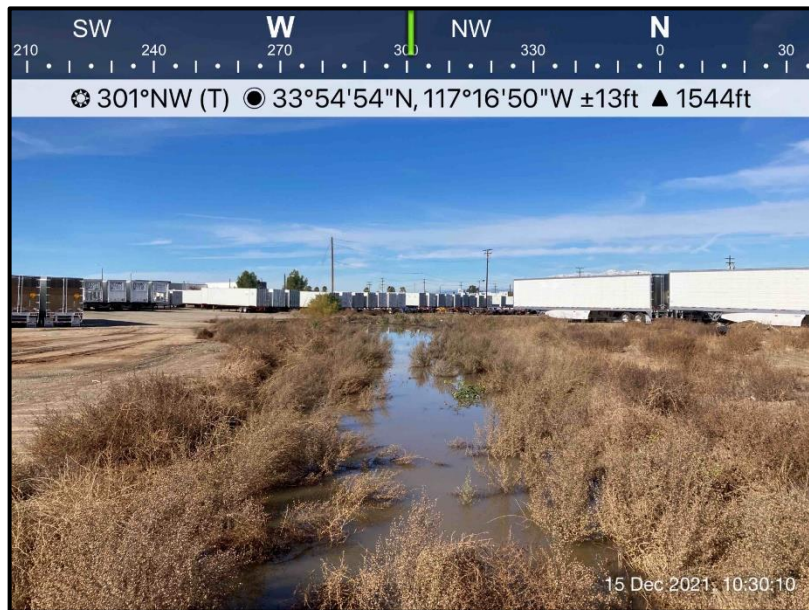


PHOTO 7: VP1 following large precipitation event. View is northwest (December 15, 2021).

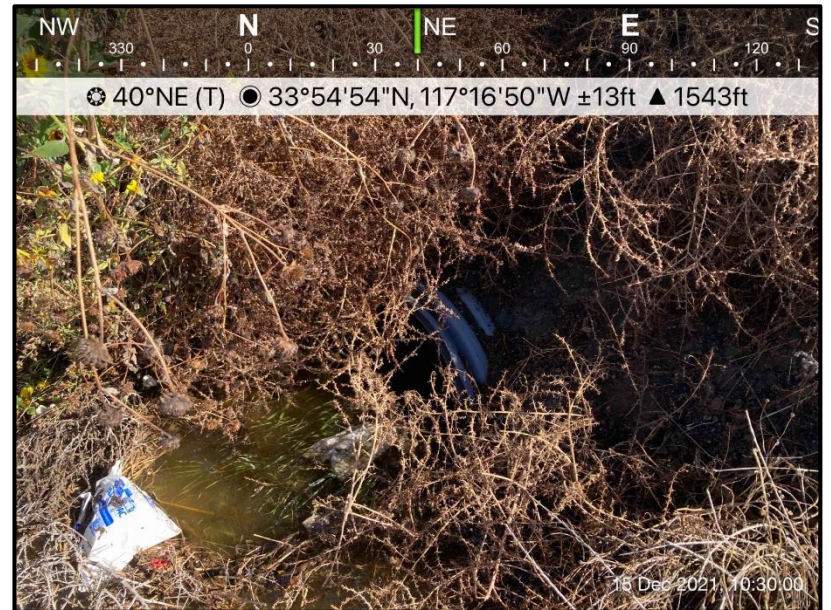


PHOTO 8: Culvert at eastern boundary showing water presence following large precipitation event. View is northeast (December 15, 2021).



PHOTO 9: VP2. View is northwest from between pools (March 3, 2022).



PHOTO 10: VP2, Red car in background is adjacent to VP1. Note encroachment of white trailer to VP2 and VP1. View is east (March 10, 2022).



PHOTO 11: VP1, south of culvert. Notice encroachment of trailers on VP2 and VP1. Water is visible in VP1 beneath the last trailer. View is northwest (April 8, 2022).



PHOTO 12: VP2 and VP1. Note mud cracks in VP2, right foreground. View is southeast (May 2, 2022).

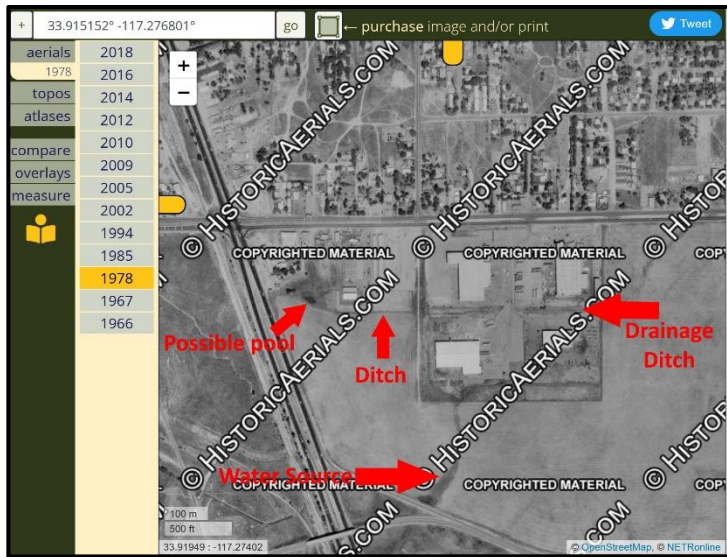


PHOTO 13: Project area, 1978. Open ditch between buildings on the right channeled water inline with existing culvert toward existing vernal pool area (NETROnline. 2022).



PHOTO 14: Surface water visible in aerial imagery, March 9, 2011 (Google Earth 2022a).



PHOTO 15: Surface water visible in aerial imagery, April 27, 2014 (Google Earth 2022a).



PHOTO 16: Surface water visible in aerial imagery, December 2, 2018 (Google Earth 2022a).

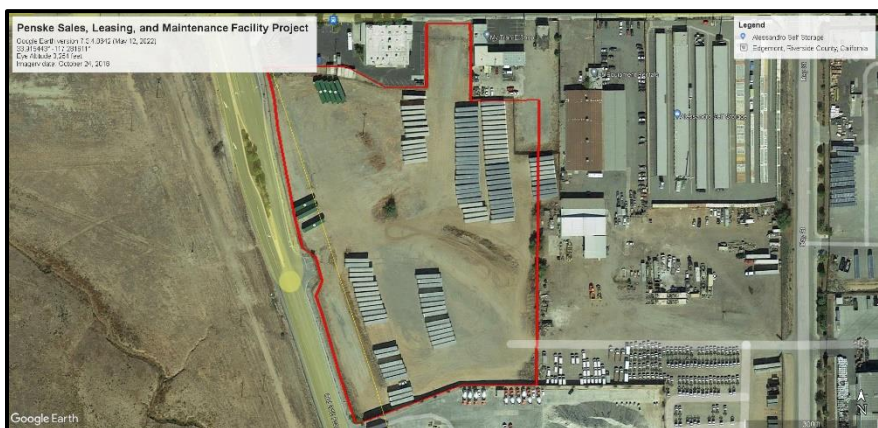


PHOTO 17: Attempt has been made to fill in vernal pools, October 24, 2016 (Google Earth 2022b).

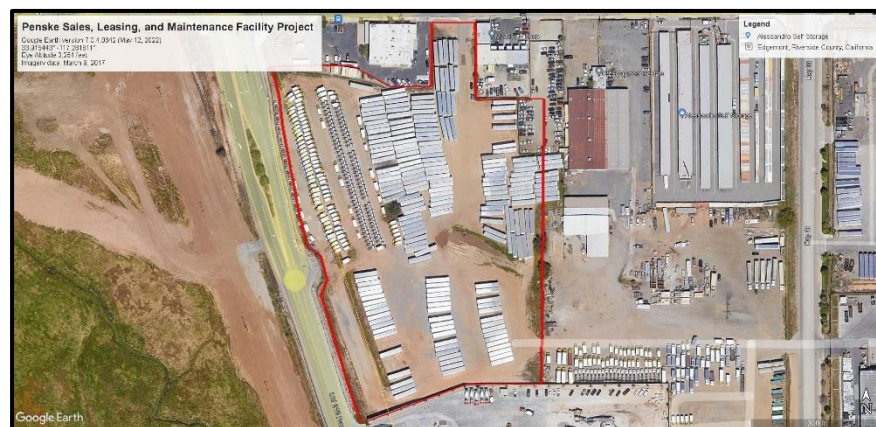


PHOTO 18: VP1 and VP2 re-establishing, March 9, 2017 (Google Earth 2022a).



PHOTO 19: Attempt made to fill in vernal pools, August 15, 2019 (Google Earth 2022b).



PHOTO 20: VP1 and VP2 re-establishing, April 23, 2020 (Google Earth 2022a).