

APPENDIX A

*Biological Technical Report for North City Project
Components on MCAS Miramar*

APPENDIX A

**Biological Technical Report for North City Project
Components on MCAS Miramar,
City of San Diego, California
PTS #499621**

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1 INTRODUCTION

1.1 Purpose of the Report

The Integrated Natural Resources Management Plan (INRMP) provides an analysis of the natural resources program on Marine Corps Air Station (MCAS) Miramar (MCAS Miramar INRMP 2011). The INRMP includes information to help ensure compliance with regulatory and planning processes, such as required by the Sikes Act, National Environmental Policy Act, Endangered Species Act, Clean Water Act, Department of Defense (DoD), and Marine Corps policies and legal requirements. Additional documents used to produce the natural resource management plan for MCAS Miramar include Fish and Wildlife Management Plan (USFWS 1993), Outdoor Recreation Management Plan (NAS Miramar 1991), and Vernal Pool Management Plan (Bauder and Wier 1991). The MCAS Miramar INRMP developed Management Areas (MAs) for conserving and planning natural resource management actions. The five MAs are designated areas to support the conservation and management of special-status species, wetlands, and other identified sensitive areas.

Since the North City Project crosses through MCAS Miramar lands, which are excluded from the MSCP Subarea Plan, an analysis of impacts within the context of the INRMP is required. The focus of this report is to analyze the North City Project impacts within each MA and provide appropriate mitigation for the North City Project components occurring within MCAS Miramar. Mitigation for the North City Project on MCAS Miramar will comply with the INRMP, unless the City of San Diego (City) has more stringent standards as provided in the San Diego Municipal Code, Land Development Code—Biology Guidelines (City of San Diego 2012). This report will serve as an appendix to the 2017 Biological Resources Report for the North City Project prepared by Dudek. The North City Project components within MCAS Miramar include: (1) the majority of the proposed Landfill Gas (LFG) Pipeline; (2) the impacts associated with air and blow-off valves along an existing 36-inch recycled water pipeline (San Vicente Pipeline – Repurposed 36-inch Recycled Water Line) which would be repurposed to convey purified water; (3) a small portion of the North City Pure Water Pipeline (North City Pipeline) that runs along Miramar Road; and (4) the entire existing Metro Biosolids Center (MBC). The LFG Pipeline would intersect all five MAs identified by the INRMP; the MBC intersects MAs 2, 4, and 5; and the North City Pipeline would intersect only MA 5. The San Vicente–repurposed pipeline is existing but there are proposed impacts from air and blow-off valves that would occur within all five MAs.

1.2 Project Description and Location

The North City Project is comprised of two alternatives, the Miramar Reservoir Alternative and the San Vicente Reservoir Alternative, and a variety of components including facilities and pipelines.

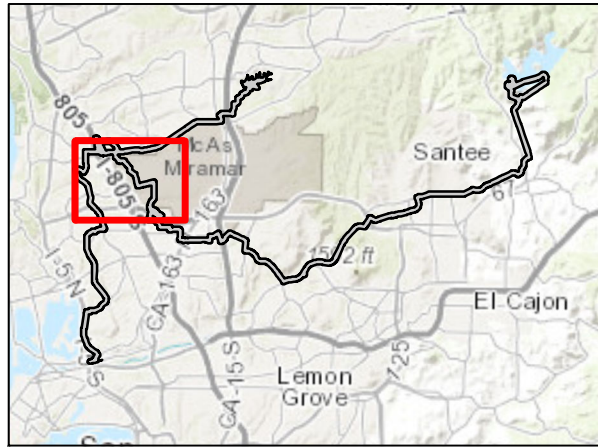
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The components are located throughout the central and coastal areas of San Diego County in the North City geographic area. The majority of proposed components in the North City Project occur within developed land and/or along existing paved streets. The components were designed and sited to avoid and minimize impacts to biological resources to the full extent possible. Pipelines would traverse a number of local jurisdictions, including the communities of University, Clairemont Mesa, and Linda Vista within the City of San Diego; the City of Santee; and the community of Lakeside in unincorporated San Diego County, and federal lands within ~~Marine Corps Air Station~~ (MCAS) Miramar (Figure 1). Only the North City Project components relevant to the INRMP are discussed below. The applicable components for the Miramar Reservoir Alternative include LFG Pipeline, North City Pipeline and the MBC. The applicable components for the San Vicente Reservoir Alternative include LFG Pipeline, air and blow-off valves associated with the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line, and the MBC.

Landfill Gas Pipeline

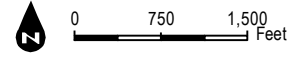
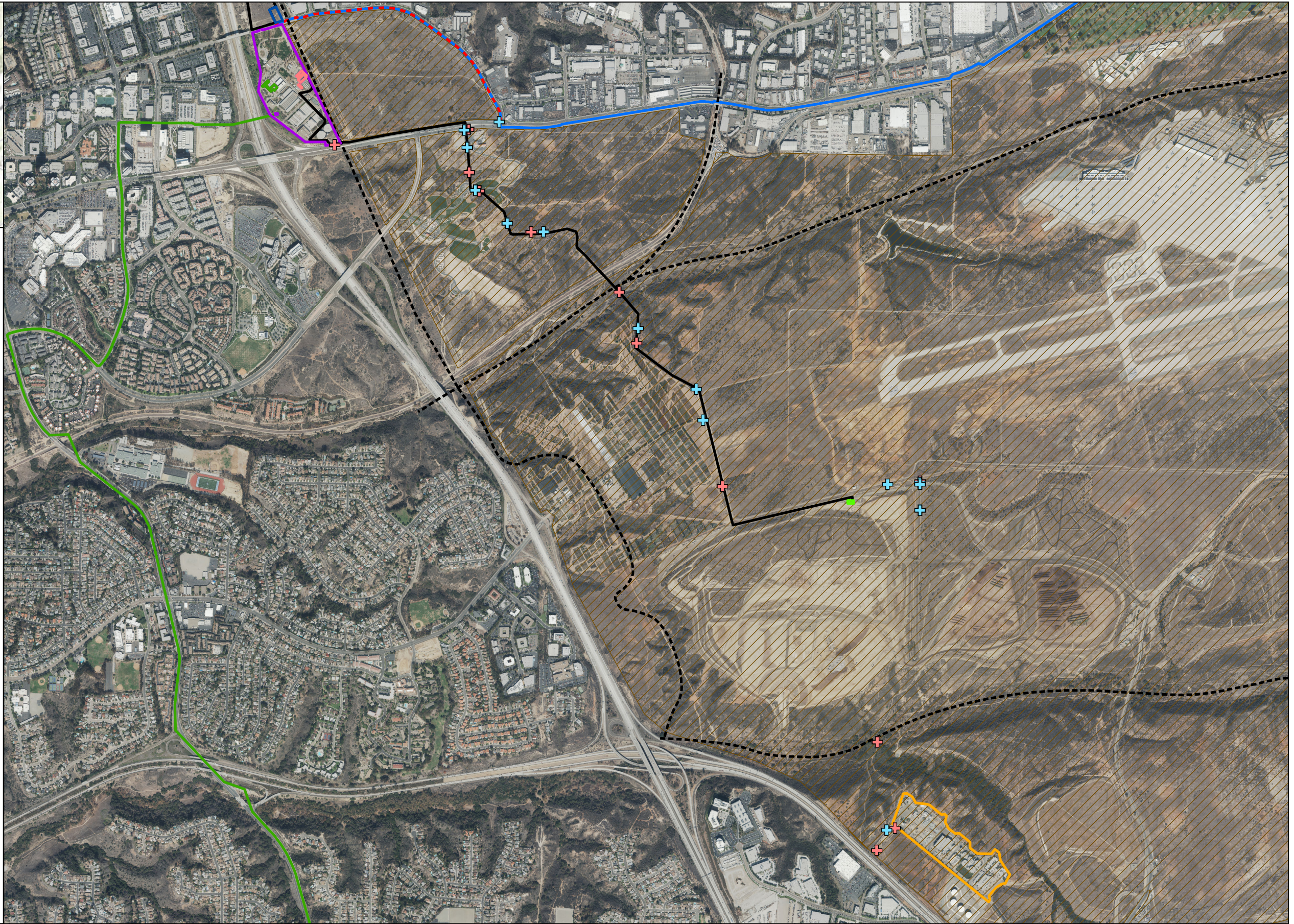
The proposed LFG Pipeline would run from the existing Miramar Landfill north along the western end of the MCAS Miramar property to the North City Water Reclamation Plant (NCWRP) site. The Project Alternatives include a new renewable energy facility that would be constructed to provide power to other components of the North City Project. The renewable energy facility would receive landfill gas from the City's Miramar Landfill gas collection system via a new 12-inch diameter gas pipeline. The new gas pipeline would parallel an existing 10-inch gas pipeline that conveys landfill gas from the landfill to fuel the existing emergency power generation units at NCWRP. The new LFG Pipeline would be constructed within the limits of the City's existing 40-foot utility easement where it crosses the Veteran's Administration (VA) Miramar National Cemetery. An expanded additional 10-foot easement is planned along the remainder of the alignment outside of the VA Miramar National Cemetery to facilitate construction and future maintenance activities.

A new gas compressor station would be sited immediately adjacent to an existing gas compressor station at the Miramar Landfill in order to pressurize and convey the landfill gas from the landfill to NCWRP.



LEGEND

- North City Pure Water Pipeline
 - North City Pure Water Pipeline and San Vicente Reservoir Pure Water Pipeline
 - Morena Wastewater Forcemain and Brine/Centrates Line
 - Landfill Gas Pipeline
 - North City Pure Water Facility
 - North City Pure Water Pump Station
 - North City Water Reclamation Plant Expansion
 - Metro Biosolids Center
 - North City Pure Water Renewable Energy Facility
 - North City Water Reclamation Plant Expansion - Influent Pump Station
 - NCCF LFG Compressor Station and Expansion
 - + Air Valve (For San Vicente Reservoir Alternative)
 - + Blow-Off Valve (For San Vicente Reservoir Alternative)
 - MCAS Miramar
- Wildlife Corridors**
- Conceptual Regional Wildlife Corridors on Western MCAS Miramar



SOURCE: City of San Diego 2016, 2017; SANDAG



Biological Technical Report for the North City Project Components on MCAS Miramar

FIGURE 1
North City Components on MCAS Miramar Overview Map

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San Vicente–Repurposed Pipeline

The existing 36-inch diameter recycled water pipeline (San Vicente–repurposed pipeline) runs along the west side of MCAS Miramar and impacts would only occur along its length if the San Vicente Reservoir Alternative was implemented. Impacts that would occur along the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line would include twelve air valves, twelve blow-off valves and the associated 10-foot by 10-foot work areas for each valve. Within the project area, the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line runs between Miramar Road at the north end to Copley Drive, southwest of State Route-52, at the southern end. The northern portion of the San Vicente–repurposed pipeline, from Miramar Road to Johnson Road within MCAS Miramar, shares the same alignment with the proposed LFG Pipeline. Since the pipeline is existing, only the impacts from the air and blow-off valves will be discussed further in this document.

North City Pipeline

The North City Pipeline would connect from the North City Pump Station and convey purified water approximately 8 miles to the Miramar Reservoir. The pipeline is proposed to travel through the Scripps Miramar Ranch and Mira Mesa communities. The North City Pipeline would be designed for an average daily flow of 30 MGD, with a minimum daily flow of 23 MGD and a maximum daily flow of 33 MGD. The North City Pipeline alignment would begin at Eastgate Mall and would head in a northeasterly direction toward the Miramar Reservoir via both open cut sections and trenchless segments. The final segment of the pipeline would consist of a subaqueous pipeline within Miramar Reservoir. This segment of pipeline would begin at the Miramar WTP site and discharge at the far, east bank of Miramar Reservoir. The pipeline would be a submerged, 4,800-foot-long HDPE pipe ranging in diameter from 8 inches to 54 inches, with 14 subaqueous diffusers along the bottom of Miramar Reservoir.

Metro Biosolids Center Improvements

The MBC is an existing facility located north of State Route 52 (SR-52), adjacent to the Miramar Landfill. Upgrades at the MBC are required to handle the additional brine and sludge produced by the NCWRP and advanced water purification process. Diverting additional wastewater flows to the NCWRP ultimately changes the relative contribution of biosolids received at the MBC from the NCWRP and the Point Loma Wastewater Treatment Plant. Projected flows of raw solids from the NCWRP would increase, while projected flows of digested solids from Point Loma Wastewater Treatment Plant would remain roughly constant such that the MBC would be required to provide on-site anaerobic digestion for a greater percentage of the system's biosolids output.

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Improvements at the MBC would include expanding the existing closed-loop grit removal system; replacement of the existing thickening centrifuges (a total of six new centrifuges would be installed); upgrades to digesters, including replacing the existing digester gas laterals with larger lines and larger gas handling appurtenances, and replacing existing biogas booster blowers with three new blowers and increasing the size of the biogas feed line from the blowers to the cogeneration facility; upgrading the sludge feed pumps and polymer feed pumps; installing four new centrate pumps (three would replace existing pumps and one would be new); adding a fourth off-the-shelf replacement peristaltic pump; and minor reconfiguration of existing hot water supply and hot water return piping systems.

The current centrate pump station at MBC would require pumps to be upgraded to be capable of higher flows and pressure. In addition, the centrate force main would need regular maintenance to clean the pipe and restore capacity to its full potential. As part of the pipe cleaning, existing plug valves would need to be replaced with full port valves. Launching and receiving pits may need to be constructed.

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2 PHYSICAL CHARACTERISTICS

2.1 Landfill Gas Pipeline

The proposed LFG Pipeline runs for approximately 2.6 miles through the open space of MCAS Miramar. Adjacent land uses include existing commercial development, residential to the west and north, and open space areas contained within the MHPA to the west.

The topography generally slopes down from the center of the LFG Pipeline towards the north and south ends. The LFG Pipeline ranges in elevation, from approximately 272 feet AMSL at the northern and southern ends, to 412 feet AMSL at the center within MCAS Miramar.

The following soil types are mapped within the LFG Pipeline: Altamont clay (9 to 15 percent slopes), Altamont clay (15 to 30 percent slopes), Carlsbad gravelly loamy sand (2 to 5 percent slopes), Chesterton fine sandy loam (2 to 5 percent slopes), Chesterton fine sandy loam (9 to 15 percent slopes, eroded), Olivenhain cobbly loam (9 to 30 percent slopes), Redding cobbly loam (9 to 30 percent slopes), Redding gravelly loam (2 to 9 percent slopes), Riverwash, and Terrace escarpments (USDA 2016).

2.2 North City Pipeline

The proposed North City Pipeline would begin at the North City Pure Water Facility and head northeast until it ends at the Miramar Reservoir. The proposed pipeline runs for approximately 39,490 linear feet, mainly along the following streets: Meanley Drive, Scripps Ranch, Carroll Canyon Boulevard, Businesspark Avenue, Kearny Villa Road, Miramar Road, La Jolla Village Drive, and Eastgate Mall. Only the portion of the North City pipeline (approximately 4,000 linear feet) that runs along Miramar Road is within MCAS Miramar jurisdiction.

The topography generally slopes from east to west. The extent of the roads range in elevation from approximately 360 feet AMSL at the western end along Eastgate Mall to 720 feet AMSL at the northeastern end at the Miramar Reservoir. The majority of the proposed pipeline would occur within existing developed roads and only occasionally within vegetated communities. Adjacent land uses include existing commercial development, residential, and the Miramar Reservoir contained within the MHPA.

The following soil types are mapped within the North City Pipeline: Redding-Urban land complex (2 to 9 percent slopes), Redding cobbly loam (9 to 30 percent slopes), Redding gravelly loam (2 to 9 percent slopes), Riverwash, Terrace escarpments, and Water (USDA 2016).

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2.3 Metro Biosolids Center

The MBC is located north of SR-52, adjacent to the Miramar Landfill and the entire site is within MCAS Miramar. Adjacent land uses include open space, existing commercial development, residential to the west and north, and MHPA lands to the west. The topography of the MBC is generally flat with ranges in elevation from approximately 400 to 440 feet AMSL.

The following soil types are mapped within the MBC: Chesterton fine sandy loam (2 to 5 percent slopes); Loamy alluvial land-Huerhuero complex (9 to 50 percent slopes), severely eroded; Redding cobbly loam, dissected (15 to 50 percent slopes); Redding gravelly loam (2 to 9 percent slopes); and Terrace escarpments (USDA 2016).

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3 BIOLOGICAL RESOURCES

The biological resources occurring within the North City Project components that overlap the MCAS Miramar INRMP (study area) are discussed below. All biological resources identified within the study area are spatially represented on Figures 2 through 89.

In addition to the sources outlined within Section 1.1, biological resources identified below include literature and studies reviewed and obtained for the North City Project. These include:

- U.S. Department of Agriculture Web Soil Survey (USDA 2016)
- CDFW California Natural Diversity Database (CDFW 2016)
- California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2016)
- MSCP Subarea Plan (City of San Diego 1997)
- San Diego Municipal Code, Land Development Code—Biology Guidelines (City of San Diego 2012)
- U.S. Fish and Wildlife Service (USFWS) Species Occurrence Data (USFWS 2016a)
- San Diego Geographic Information Source (SanGIS) database (SanGIS 2013)
- Existing Conditions Letter Report for the Pure Water San Diego Program North City Water Purifications Project (HELIX 2016a)
- Pure Water San Diego Program North City Water Purification Project, Dry Season Fairy Shrimp Survey and Hatching Report (HELIX 2016b)
- Surveys for Coastal California Gnatcatcher (*Polioptila californica californica*) at Marine Corps Air Station Miramar, California (SDNHM 2016)
- Surveys for Least Bell's Vireo (*Vireo bellii pusillus*) and Southwestern Willow Flycatcher (*Empidonax traillii extimus*) at Marine Corps Air Station Miramar, California (SDNHM 2017)
- USFWS National Wetlands Inventory (USFWS 2016b)
- USGS National Hydrography Dataset (USGS 2016)
- Overview of San Diego Watershed Management Areas (SDRWQCB 2002)
- Aerial maps from the San Diego Association of Governments (SANDAG 2014) and Bing (Microsoft 2016)
- Topographic maps (Google Earth 2016)

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3.1 Vegetation Communities/Land Cover Types

Vegetation communities and land uses on and within the study area were mapped in the field directly onto a 200-foot-scale (1 inch = 200 feet), aerial photograph–based field map. The vegetation mapping was conducted within the North City Project components footprint and a 500-foot surrounding buffer. Following completion of the fieldwork, all vegetation polygons were transferred to a topographic base and digitized using ArcGIS, and a geographic information system (GIS) coverage was created. Once in ArcGIS, the acreage of each vegetation community and land cover present within the study area was determined.

The vegetation community and land cover mapping follows the Preliminary Descriptions of the Terrestrial Natural Communities of California described by Holland (1986) as modified by the County and noted in Draft Vegetation Communities of San Diego County (Oberbauer et al. 2008). The INRMP ranks each vegetation type (Tier I- highest value, to Tier V- lowest value) based on rarity within the region, rankings were adopted from the Multiple Species Conservation Plan (City of San Diego 1996). Areas on site supporting less than 20% native plant species cover were mapped as disturbed land, and areas supporting at least 20% native plant species, but fewer than 50% native cover, were mapped as a disturbed native vegetation community (e.g., disturbed coastal sage scrub-chaparral). The vegetation communities and/or land cover types that occur within the North City Project components study area within MCAS Miramar are described below and shown on Figures 2 3 through 89. Table 1 provides a summary of the vegetation communities within each MA.

Table 1
Vegetation Communities and Land Cover Types in the
North City Project Components Study Area within MCAS Miramar (Acres)

Vegetation Community/Land Cover Type (Holland/Oberbauer Code)	Management Areas					Total Acres
	1	2	3	4	5	
<i>Landfill Gas Pipeline</i>						
Chamise Chaparral (37200)	6.32	1.86	0	12.60	20.02	40.80
Coastal and Valley Freshwater Marsh (52410)	0.41	0.96	0	0.09	0	1.46
Coastal Sage-Chaparral Transition (37G00)	0	2.18	0	0	0.01	2.19
Diegan Coastal Sage Scrub (32500)	19.96	25.95	11.30	7.41	10.04 10.07	74.67 74.70
Diegan Coastal Sage Scrub: Baccharis-Dominated (32530)	12.62	1.68	0	0	0.22	14.51
Diegan Coastal Sage Scrub: Baccharis-Dominated (disturbed) (32530)	1.30	0	0	0	0	1.30
Diegan Coastal Sage Scrub – Restored (32500)	0	0	0	0	0.46	0.46
Diegan Coastal Sage Scrub (disturbed) (32500)	22.33	0.45	0	1.71	0.99	25.49
Flat-topped Buckwheat (32800)	0.17	0	1.37	0	0.86	2.40

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Table 1
Vegetation Communities and Land Cover Types in the
North City Project Components Study Area within MCAS Miramar (Acres)

Vegetation Community/Land Cover Type (Holland/Oberbauer Code)	Management Areas					Total Acres
	1	2	3	4	5	
Flat-Topped Buckwheat (disturbed) (32800)	1.62	0	0	0	0.12	1.74
Disturbed Habitat (11300)	2.17	0.33	0.64	1.52	<u>17.29</u> 17.46	<u>21.95</u> 21.82
Extensive Agriculture – Field/Pasture, Row Crops (18300)	1.63	0.12	0.11	0	<u>31.35</u> 31.46	<u>33.21</u> 33.32
Mulefat Scrub (63310)	0	0	0	0.42	0.01	0.43
Non-native Grassland (42200)	<u>9.25</u> 9.24	2.34	0	1.82	<u>17.49</u> 17.53	30.90
Non-native Vegetation (11000)	0	0	0	0	6.21	6.21
Non-vegetated Channel or Floodway (64200)	0.28	0.63	0	0	0	0.91
Southern Mixed Chaparral (37120)	0.60	8.27	3.52	0	0.97	13.36
Southern Willow Scrub (63320)	0	0.43	0	0.08	0	0.51
Urban/Developed (12000)	<u>1.00</u> 0.92	1.06	0.03	0.21	<u>16.10</u> 16.48	18.41
Vernal Pool (44000)	1.61	0	0	0	0.02	1.63
<i>Subtotal for the LFG Pipeline</i>	<u>81.27</u> 81.15	46.27	16.98	25.85	<u>122.16</u> 122.29	292.54
<i>North City Pipeline</i>						
Chamise Chaparral (37200)	13.91	0	0	0	4.96	18.87
Diegan Coastal Sage Scrub (32500)	1.85	0	0	0	0	1.85
Diegan Coastal Sage Scrub (disturbed) (32500)	32.07	0	0	0	0	32.07
Disturbed Habitat (11300)	2.13	0	0	0	0.18	2.31
Non-native Grassland (42200)	<u>19.53</u> 19.49	0	0	0	<u>0.23</u> 0.27	19.76
Urban/Developed (12000)	<u>0.53</u> 0.03	0	0	0	<u>2.42</u> 2.92	2.95
Vernal Pool (44000)	0.38	0	0	0	0	0.38
<i>Subtotal for the North City Pipeline</i>	<u>70.78</u> 70.23	0	0	0	<u>7.78</u> 8.33	78.56
<i>Metro Biosolids Center</i>						
Coastal Sage-Chaparral Transition (37G00)	0	0.02	0	13.80	0.91	14.73
Diegan Coastal Sage Scrub (32500)	0	14.09	0	1.36	8.23	23.68
Disturbed Habitat (11300)	0	0.30	0.22	3.26	0.79	4.57
Non-native Grassland (42200)	0	0	0	0	2.62	2.62
Non-native Vegetation (11000)	0	0	0	0	0.06	0.06
Southern Mixed Chaparral (37120)	0	0.34	2.16	26.45	0	28.95
Southern Willow Scrub (63320)	0	0.03	0.63	0	0	0.65
Urban/Developed (12000)	0	0.06	0	4.39	36.17	40.61

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Table 1
Vegetation Communities and Land Cover Types in the
North City Project Components Study Area within MCAS Miramar (Acres)

Vegetation Community/Land Cover Type (Holland/Oberbauer Code)	Management Areas					Total Acres
	1	2	3	4	5	
Vernal Pool (44000)	0	0	0	0	0.03	0.03
<i>Subtotal for the Metro Biosolids Center</i>	<i>0</i>	<i>14.83</i>	<i>3.01</i>	<i>49.25</i>	<i>48.81</i>	<i>115.91</i>
Total¹	<u>152.07</u> <u>451.58</u>	61.10	19.99	75.11	<u>178.74</u> <u>479.43</u>	487.01

Note:

¹ Totals may not sum due to rounding.

3.2 Sensitive Plant Species

For purposes of this INRMP analysis, plant species are considered sensitive if they have been listed or proposed for listing by the federal and/or the California government as rare, endangered, threatened, or are candidates (“listed species”); or have a California Rare Plant Ranking (CRPR) of 1–4.

Sensitive plant surveys were conducted within the study area on MCAS Miramar, which includes the North City Project components footprint and a 100-foot buffer within areas of suitable habitat (survey area). Figures 2–3 through 8–9 show all sensitive plants species observed within the survey area. Prior to special-status plant species surveys, an evaluation of known records in the La Jolla, Del Mar, and Poway quadrangles and the surrounding nine quadrangles, including Encinitas, Rancho Santa Fe, Escondido, San Pasqual, San Vicente Reservoir, El Cajon, La Mesa, National City, and Point Loma (CDFW 2016; CNPS 2016; USFWS 2016a) was conducted and is included as Appendix A. Also included in Appendix A is an evaluation of the special-status species from the quadrangles above and a determination of the potential for these species to occur based on available MCAS Miramar data, Dudek’s knowledge of biological resources and regional distribution of each species, as well as elevation, habitat, and soils present within the study area.

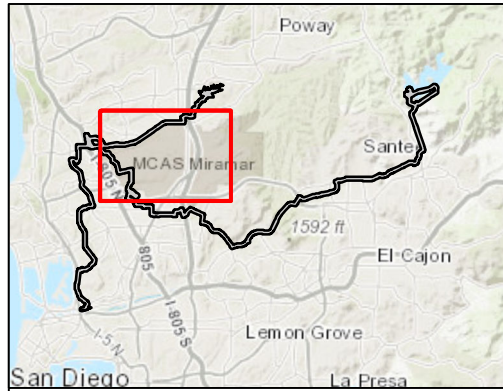
There were no federal or state listed plant species identified within the North City Project sensitive plant survey area. The following sensitive plant species were directly observed within the study area and have a CRPR of 1–4 and/or are an MSCP Covered Species: ~~San Diego sagewort~~ (*Artemisia palmeri*) (CRPR 4.2), Orcutt’s brodiaea (*Brodiaea orcuttii*) (CRPR 1B.1 and an MSCP Covered Species), wart-stemmed ceanothus (*Ceanothus verrucosus*) (CRPR 2B.2 and an MSCP Covered Species), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*) (CRPR 1B.2), graceful tarplant (*Holocarpha virgata* ssp. *elongata*) (CRPR 4.2), decumbent goldenbush (*Isocoma menziesii* var. *decumbens*) (CRPR 1B.2), San Diego marsh-elder (*Iva hayesiana*) (CRPR 2B.2), small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*) (CRPR 4.2), Robinson’s pepper-grass (*Lepidium virginicum* var. *robinsonii*) (CRPR 4.3), golden-rayed

Appendix A, Biological Technical Report for North City Project Components on MCAS Miramar

pentachaeta (*Pentachaeta aurea* ssp. *aurea*) (CRPR 4.2), Nuttall's scrub oak (*Quercus dumosa*) (CRPR 1B.1), ashy spike-moss (*Selaginella cinerascens*) (CRPR 4.1), and San Diego County viguiera (*Bahiopsis* (= *Viguiera*) *laciniata*) (CRPR 4.2). Sensitive plant species observed are described in detail below and are shown on Figures ~~2-3~~ through ~~89~~. No USFWS Critical Habitat for plant species occurs within or immediately adjacent to the study area on MCAS Miramar.

Appendix A, Biological Technical Report for North City Project Components on MCAS Miramar

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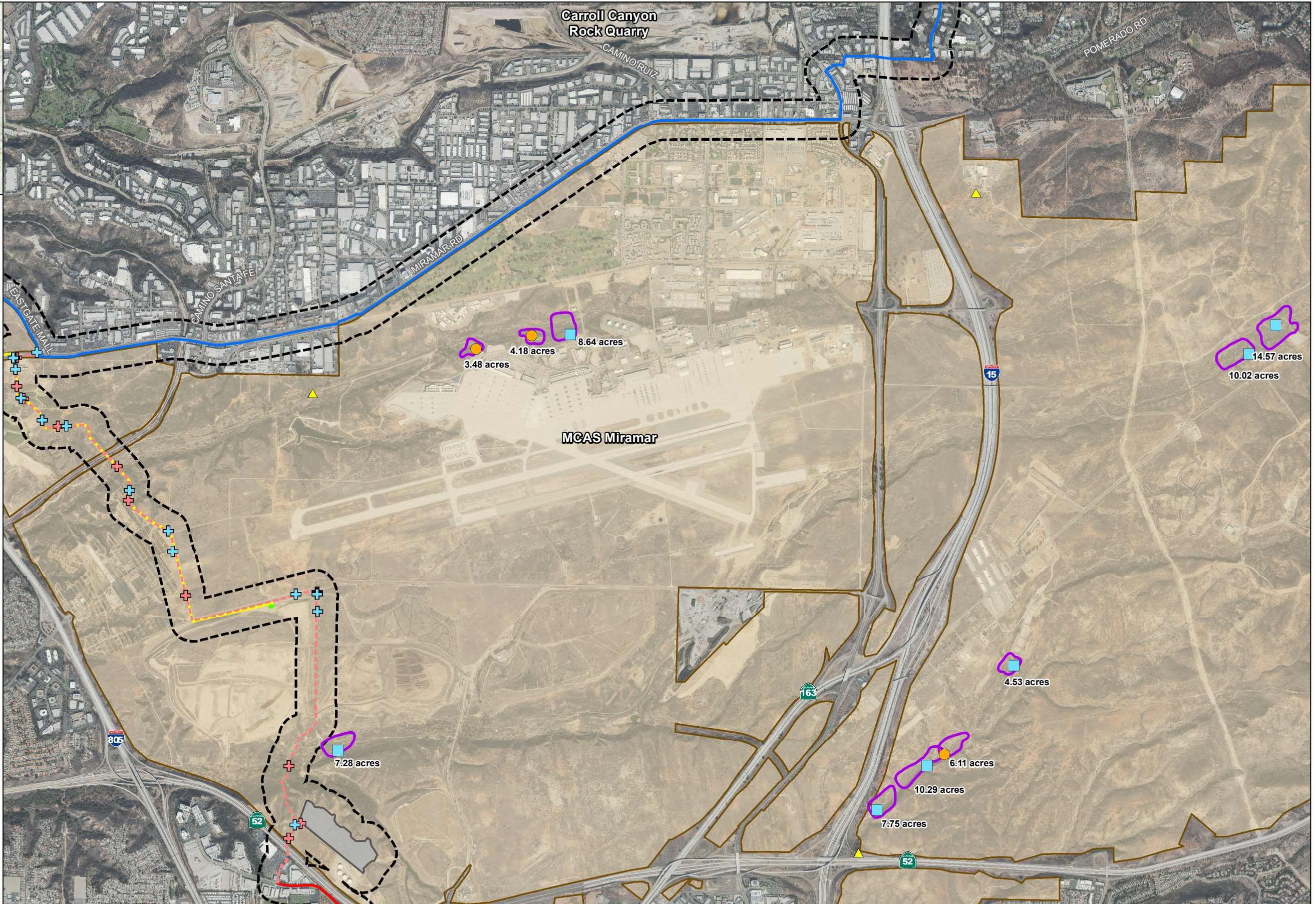
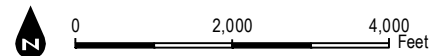


2017 Final Report for MCAS Miramar

- Pair
- Single Male
- ▲ Transient Male
- Least Bell's Vireo Territory Boundary

- Project Study Area
- North City Pure Water Pipeline
- San Vicente Pure Water Pipeline
- Landfill Gas Pipeline
- Repurposed Existing 36" Pipeline *
- Metro Biosolids Center Improvements
- Landfill Gas Pipeline Compressor Station
- + Air Valve (For San Vicente Reservoir Alternative)
- + Blow-Off Valve (For San Vicente Reservoir Alternative)
- MCAS Miramar

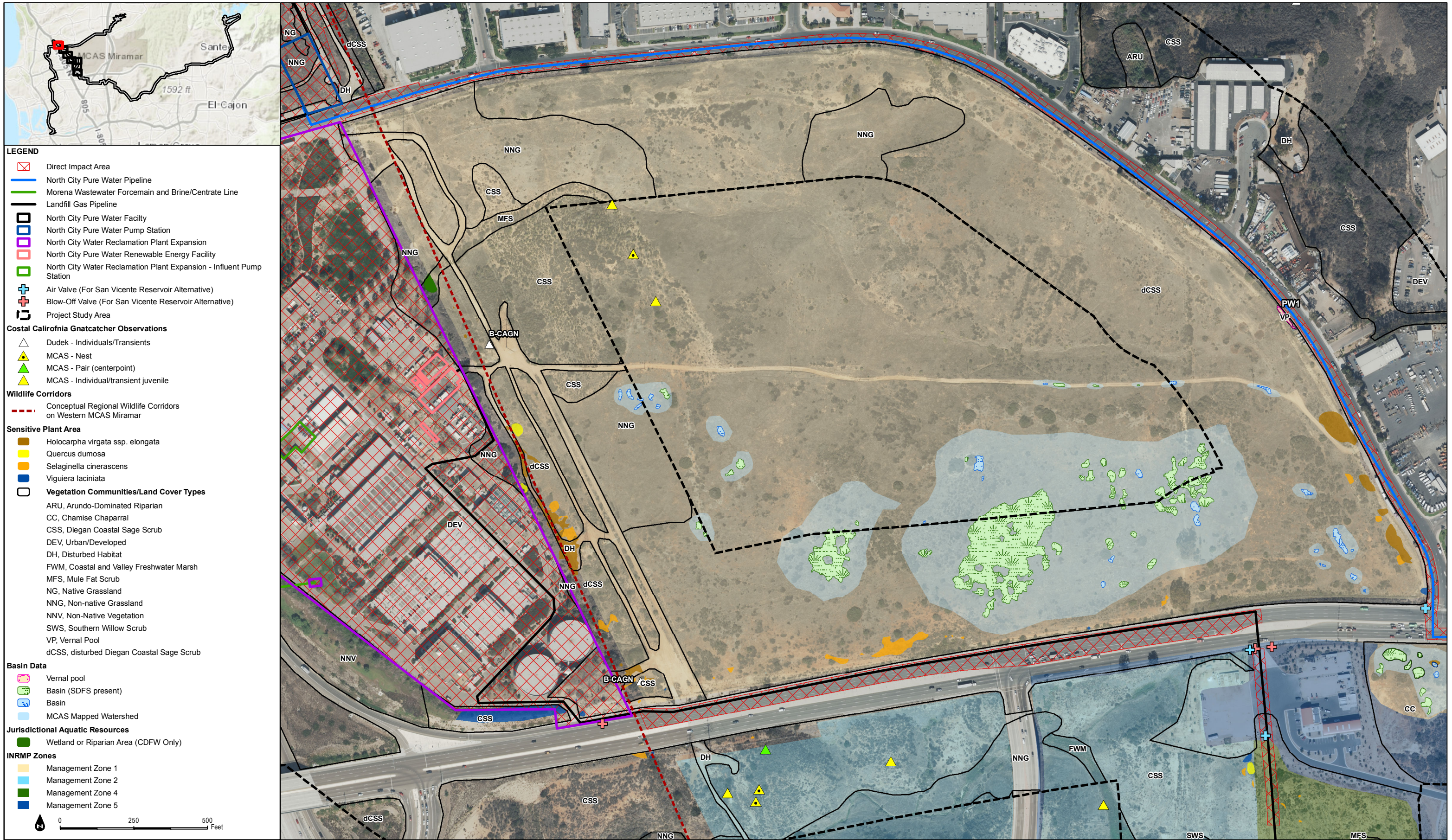
* Impacts along the Repurposed Pipeline are from the San Vicente Reservoir Alternative only. No impacts occur along the Repurposed Pipeline under the Miramar Reservoir Alternative.



SOURCE: San Diego Natural History Museum, 2017; SANDAG 2014, SanGIS 2017

FIGURE 2
Least Bell's Vireo Observations and Use Areas

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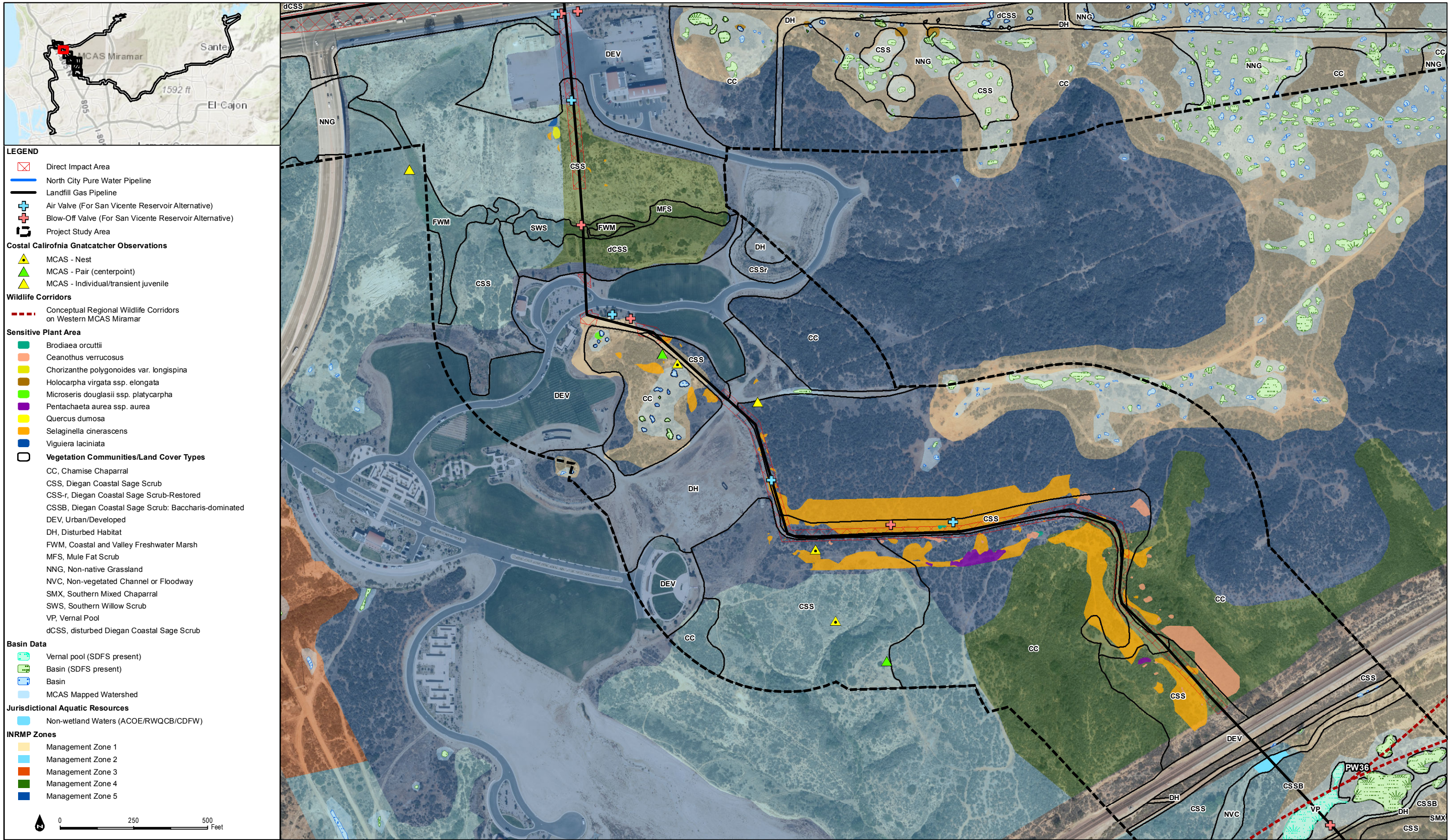
SOURCE: City of San Diego 2016, 2017; Helix 2016; SANDAG; SDNHM 2017



Biological Technical Report for the North City Project Components on MCAS Miramar

FIGURE 3
MCAS Miramar Biological Resources and Impacts

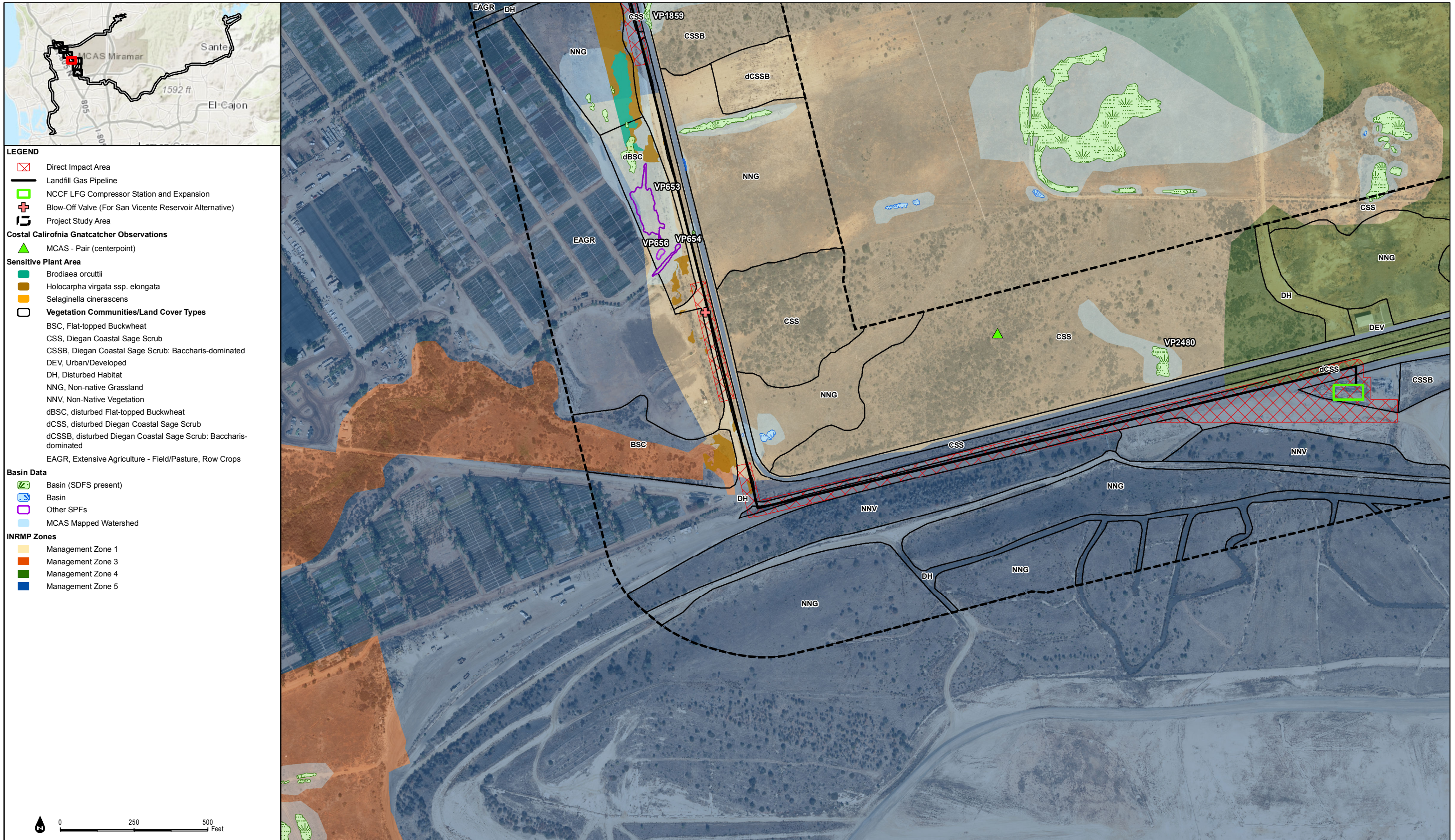
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SOURCE: City of San Diego 2016, 2017; Helix 2016; SANDAG; SDNHM 2017

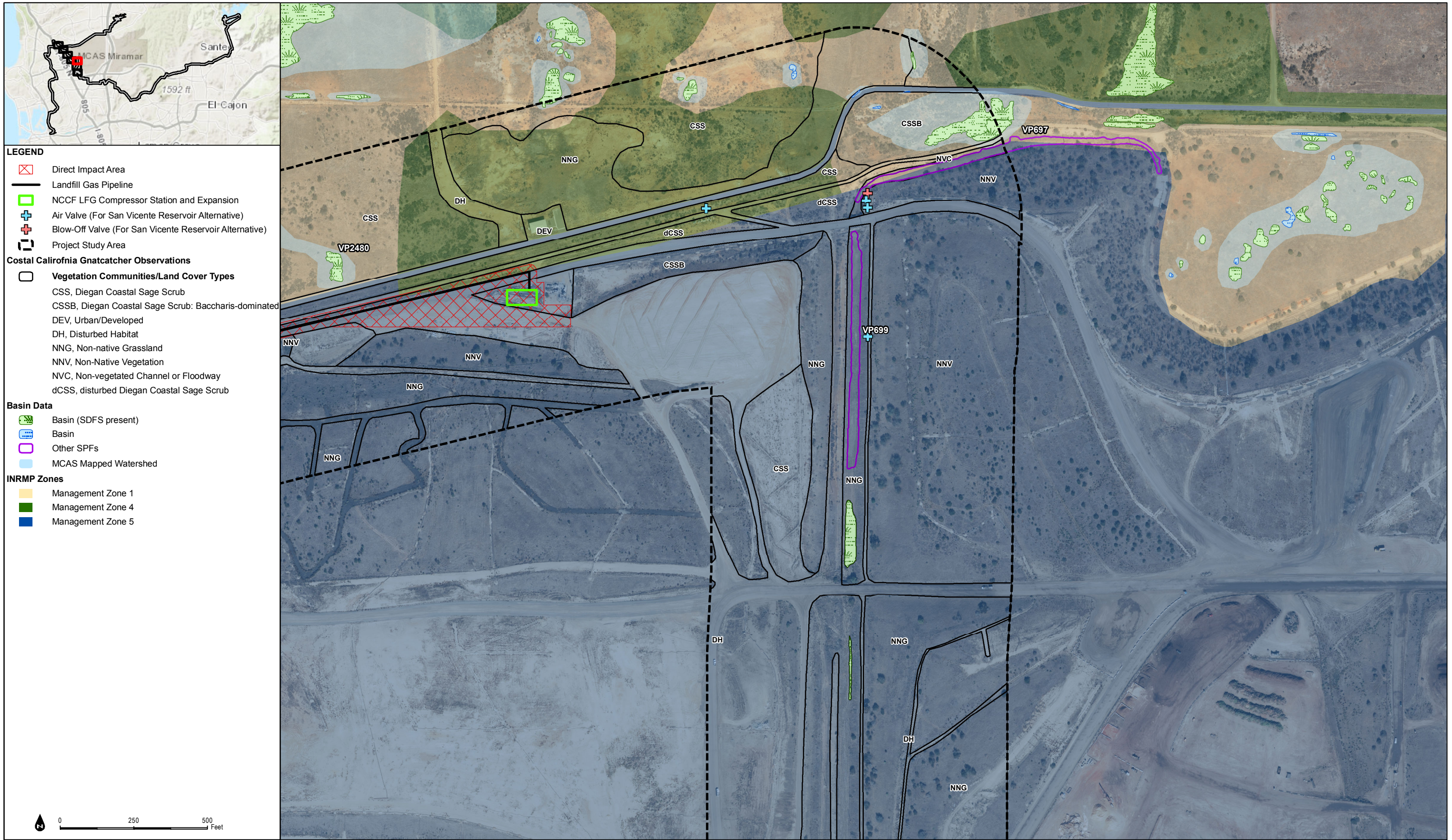
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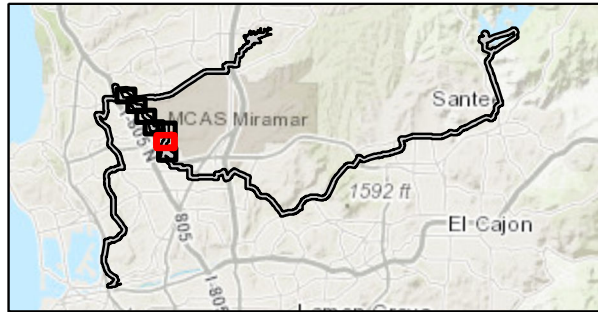
SOURCE: City of San Diego 2016, 2017; Helix 2016; SANDAG; SDNHM 2017

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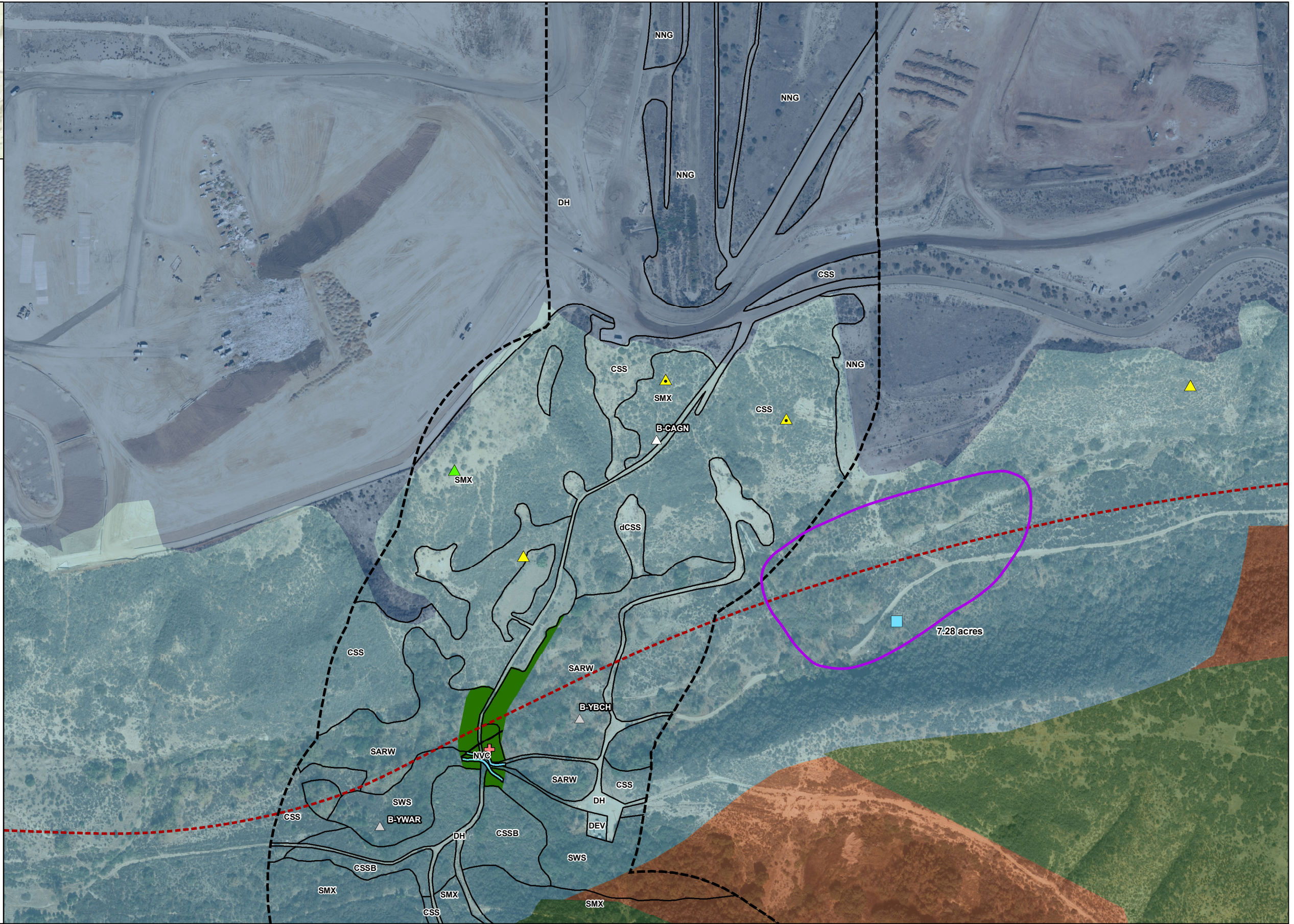
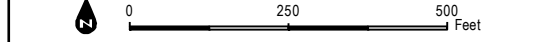
SOURCE: City of San Diego 2016, 2017; Helix 2016; SANDAG; SDNHM 2017

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LEGEND

- Direct Impact Area
- Blow-Off Valve (For San Vicente Reservoir Alternative)
- Project Study Area
- Costal California Gnatcatcher Observations**
- Dudek - Individuals/Transients
- MCAS - Nest
- MCAS - Pair (centerpoint)
- MCAS - Individual/transient juvenile
- 2017 Final Report for MCAS Miramar**
- Pair
- Least Bell's Vireo Territory Boundary
- Special-Status Wildlife Observations
- B-YBCH, yellow-breasted chat
- B-YWAR, yellow warbler
- Wildlife Corridors**
- Conceptual Regional Wildlife Corridors on Western MCAS Miramar
- Vegetation Communities/Land Cover Types**
- CSS, Diegan Coastal Sage Scrub
- CSSB, Diegan Coastal Sage Scrub: Baccharis-dominated
- DEV, Urban/Developed
- DH, Disturbed Habitat
- NNG, Non-native Grassland
- NVC, Non-vegetated Channel or Floodway
- SARW, Southern Sycamore-Alder Riparian Woodland
- SMX, Southern Mixed Chaparral
- SWS, Southern Willow Scrub
- dCSS, disturbed Diegan Coastal Sage Scrub
- Jurisdictional Aquatic Resources**
- Non-wetland Waters (ACOE/RWQCB/CDFW)
- Wetland or Riparian Area (CDFW Only)
- INRMP Zones**
- Management Zone 2
- Management Zone 3
- Management Zone 4
- Management Zone 5



SOURCE: City of San Diego 2016, 2017; Helix 2016; SANDAG; SDNHM 2017

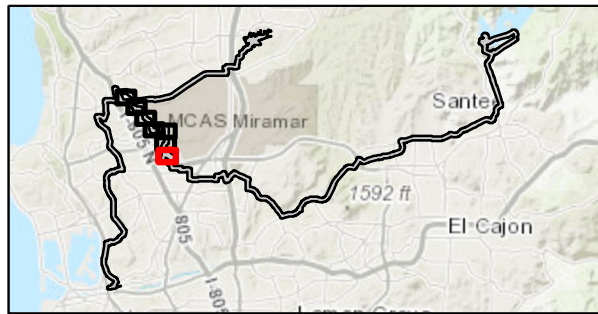


Biological Technical Report for the North City Project Components on MCAS Miramar

FIGURE 8

MCAS Miramar Biological Resources and Impacts

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LEGEND

- Direct Impact Area
- San Vicente Pure Water Pipeline
- Metro Biosolids Center
- Air Valve (For San Vicente Reservoir Alternative)
- Blow-Off Valve (For San Vicente Reservoir Alternative)
- Project Study Area

Costal California Gnatcatcher Observations

- Dudek - Individuals/Transients
- MCAS - Nest
- MCAS - Pair (centerpoint)
- MCAS - Individual/transient juvenile
- Special-Status Wildlife Observations
- B-WIFL, willow flycatcher
- B-YBCH, yellow-breasted chat
- B-YWAR, yellow warbler

Sensitive Plant Area

- Ceanothus verrucosus
- Chorizanthe polygonoides var. longispina
- Holocarpha virgata ssp. elongata
- Isocoma menziesii var. decumbens
- Quercus dumosa
- Selaginella cinerascens

Vegetation Communities/Land Cover Types

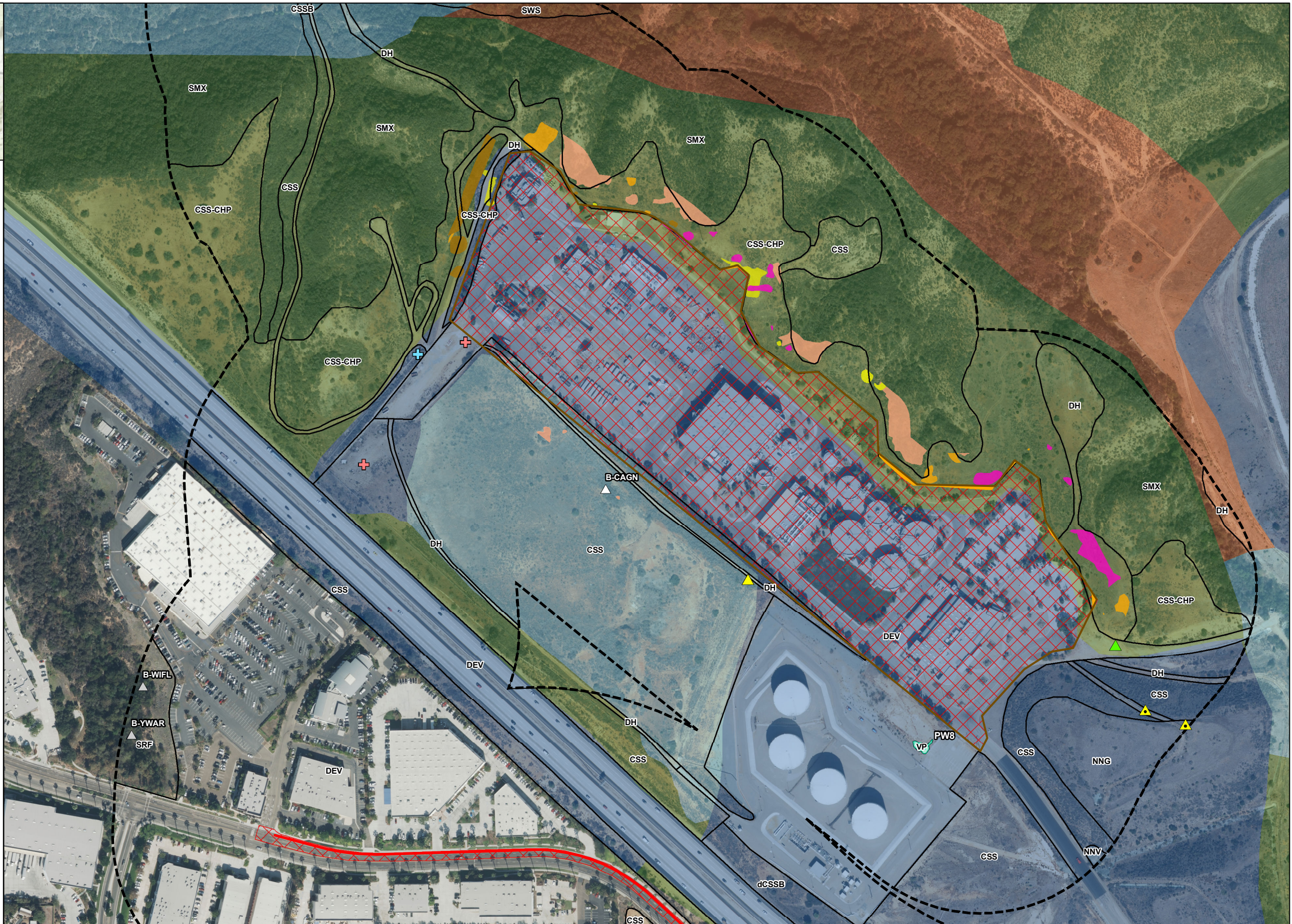
- CSS, Diegan Coastal Sage Scrub
- CSS-CHP, Coastal Sage-Chaparral Transition
- CSSB, Diegan Coastal Sage Scrub: Baccharis-dominated
- DEV, Urban/Developed
- DH, Disturbed Habitat
- NNG, Non-native Grassland
- NNV, Non-Native Vegetation
- SMX, Southern Mixed Chaparral
- SRF, Southern Riparian Forest
- SWS, Southern Willow Scrub
- VP, Vernal Pool
- dCSSB, disturbed Diegan Coastal Sage Scrub: Baccharis-dominated

Basin Data

- Vernal pool (SDFS present)

INRMP Zones

- Management Zone 2
- Management Zone 3
- Management Zone 4
- Management Zone 5



SOURCE: City of San Diego 2016, 2017; Helix 2016; SANDAG; SDNHM 2017



Biological Technical Report for the North City Project Components on MCAS Miramar

FIGURE 9
MCAS Miramar Biological Resources and Impacts

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Appendix A, Biological Technical Report for North City Project Components on MCAS Miramar

3.2.1 Landfill Gas Pipeline

The following sensitive plant species were observed in the LFG Pipeline survey area during the 2016 and 2017 surveys and have a CRPR of 1–4 and/or are an MSCP Covered Species: Orcutt’s brodiaea (~~2,010~~430 individuals), wart-stemmed ceanothus (~~34~~353 individuals), graceful tarplant (~~660~~716,191 individuals), ashy spike-moss (~~17~~43 polygons¹), Nuttall’s scrub oak (4 individuals), ~~San Diego sagewort~~ (11 individuals), small-flowered microseris (100 individuals), Robinson’s pepper-grass (100 individuals), golden-rayed pentachaeta (~~467~~2,989 individuals), long-spined spineflower (~~326~~300 individuals), and San Diego County viguiera (13 individuals). There were no federal or state listed plant species observed within the LFG Pipeline survey area, and there are no other sensitive plant species that have a moderate to high potential to occur in the LFG Pipeline survey area. Figures ~~2~~3 through ~~8~~7 show all sensitive plants species observed within the LFG Pipeline survey area.

3.2.2 North City Pipeline

~~One~~Three sensitive plant species, graceful tarplant (1,208 individuals), ashy spike-moss (1 polygon), and San Diego County viguiera (3 individuals) ~~were~~was observed within the North City Pipeline survey area on MCAS (Figure ~~4~~3). There are no other sensitive plant species that have a moderate to high potential to occur in North City Pipeline study survey area on MCAS Miramar.

3.2.3 Metro Biosolids Center

The following sensitive plant species were observed in MBC survey area and have a CRPR of 1– 4 and/or are an MSCP Covered Species: wart-stemmed ceanothus (~~21~~647 individuals), long-spined spineflower (~~724~~707 individuals), graceful tarplant (~~405~~390 individuals), decumbent goldenbush (~~399~~193 individuals), Robinson’s pepper-grass (206 individuals), Nuttall’s scrub oak (~~29~~13 individuals), and ashy spike-moss (~~7~~4 polygons). There were no federal or state listed plant species observed within the MBC survey area, and there are no other sensitive plant species that have a moderate to high potential to occur in the MBC survey area. Figure ~~7~~9 shows all sensitive plants species observed within the MBC survey area.

¹ This number represents the number of polygons mapped. This species is a fern and grows as a continuous mat, which makes it difficult provide accurate population counts.

Appendix A, Biological Technical Report for North City Project Components on MCAS Miramar

3.3 Sensitive Wildlife Species Surveys and Results

For purposes of this INRMP analysis, sensitive wildlife species are those that are listed as federally/state endangered or threatened, proposed for listing; USFWS Species of Special Concern; California Species of Special Concern; species of limited distribution (i.e. mule deer and mountain lion); or protected by the Bald Eagle Protection Act. Protocol level surveys were conducted by Dudek, unless otherwise noted, in the study area for the following sensitive wildlife species: coastal California gnatcatcher (conducted by MCAS Miramar; SDNHM 2016), southwestern willow flycatcher (*Empidonax traillii extimus*), and least Bell's vireo (*Vireo bellii pusillus*) (see Appendix F of the Biological Resources Report for the North City Project, also conducted by MCAS Miramar; SDNHM 2017). Habitat assessments and focused surveys were conducted, including: four-passes for Quino checkerspot butterfly (*Euphydryas editha quino*) (Appendix D of the Biological Resources Report for the North City Project), larval host plant surveys for Quino checkerspot butterfly, wet and dry season surveys for San Diego and Riverside fairy shrimp (*Branchinecta sandiegonensis*; *Streptocephalus woottoni*) (conducted by HELIX; Appendix B and C of the Biological Resources Report for the North City Project), burrowing owl (*Athene cunicularia*); and Hermes copper butterfly (*Lycaena hermes*). Sensitive wildlife species that had a protocol-level or focused survey are described below in detail and shown on Figures 2 through 89.

No burrowing owls, southwestern willow flycatchers, Hermes copper butterfly, Quino checkerspot butterfly, or least Bell's vireo were observed within the North City Project components survey areas on MCAS Miramar during 2016 focused surveys. Additionally, the San Diego Natural History Museum conducted surveys on MCAS Miramar in 2017 for least Bell's vireo and southwestern willow flycatcher within areas of suitable habitat (SDNHM 2017). Results of those surveys, shown on Figure 2, determined no least Bell's vireos occur within the North City Project components survey areas and no southwestern willow flycatchers were detected on MCAS Miramar.

According to the INRMP 2011–2015 studies (MCAS Miramar INRMP 2011), no Quino checkerspot butterflies have been reported within MCAS Miramar; however, there was one sighting in 2017 on east MCAS Miramar near Mission Trails Regional Park (Boyer, pers. comm. 2017). Hermes copper butterflies were observed at five sites in east MCAS Miramar outside of the study area during 1996–1998 lepidoptera surveys (San Diego Natural History Museum 2004). However, surveys conducted in 2010 were unable to observe Hermes copper butterfly on MCAS Miramar. ~~Least Bell's vireo was observed during focused surveys in 1998, 2001, 2002, 2008, and 2011 within MCAS Miramar, and one individual was observed north of Miramar Road within an area mapped as coastal sage scrub (MCAS Miramar INRMP 2011).~~

Appendix A, Biological Technical Report for North City Project Components on MCAS Miramar

3.3.1 Sensitive Wildlife Species with Potential to Occur

Sensitive wildlife species directly observed in the study area during focused surveys, or those known to occur in the surrounding region, are described in Appendix B of this report. Appendix B describes the potential for each species to occur based on their general biology (primary habitat associations, range, and known elevation range) and known occurrences within the La Jolla, Del Mar, and Poway quadrangles and the surrounding nine quadrangles, including Encinitas, Rancho Santa Fe, Escondido, San Pasqual, San Vicente Reservoir, El Cajon, La Mesa, National City, and Point Loma (CDFW 2016; USFWS 2016a), as well as Dudek's knowledge of biological resources in the area and regional distribution of each species.

3.3.1.1 Landfill Gas Pipeline

The following federally listed wildlife species were observed or previously documented within the LFG Pipeline study area: San Diego fairy shrimp and coastal California gnatcatcher. Contracted MCAS Miramar biologists conducted coastal California gnatcatcher surveys in 2016 (SDNHM 2016). Draft findings indicate a total of six individuals or transients, five nests, and four pairs of coastal California gnatcatcher were observed along the LFG Pipeline. San Diego fairy shrimp were observed during surveys conducted by HELIX and MCAS Miramar. HELIX mapped vernal pools within the VA Miramar National Cemetery and PW36 containing San Diego fairy shrimp along the LFG Pipeline within MCAS Miramar. MCAS Miramar mapped three occupied other seasonally ponded features (VP653, VP656, and VP654) and three basins (VP657, VP1859, and VP2480) adjacent to the area mapped as extensive agriculture-field/pasture, row crops along the LFG Pipeline (MCAS Miramar 2016). Other seasonally ponded features (OSPF) are not classified as "pools" because they are the result of human disturbance (i.e., road ruts, puddles, or impoundments).

Other sensitive wildlife species, those not federally or state listed, that have a moderate to high potential to occur in the LFG Pipeline study area include: yellow warbler (*Setophaga petechia*) (CDFW SSC), yellow-breasted chat (*Icteria virens*) (CDFW SSC), Blainville's horned lizard (*Phrynosoma blainvillii*) (CDFW SSC and an MSCP Covered Species), red diamondback rattlesnake (*Crotalus ruber*) (CDFW SSC), San Diegan tiger whiptail (*Aspidoscelis tigris stejnegeri*) (CDFW SSC), grasshopper sparrow (*Ammodramus savannarum*) (CDFW SSC), Cooper's hawk (*Accipiter cooperii*) (State Watch List (WL) and an MSCP Covered Species), white-tailed kite (*Elanus leucurus*) (State FP), California horned lark (*Eremophila alpestris actia*) (State WL), western bluebird (*Sialia mexicana*) (MSCP Covered Species), southern California rufous-crowned sparrow (State WL and an MSCP Covered Species), pallid bat (*Antrozous pallidus*) (CDFW SSC and WBWG: H), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) (CDFW SSC), mule deer (*Odocoileus hemionus*) (MSCP Covered Species), western

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spadefoot (*Spea hammondi*) (CDFW SSC), orangethroat whiptail (*Aspidoscelis hyperythra*) (State WL and an MSCP Covered Species), and monarch (*Danaus plexippus*) (CDFW SS) (Appendix B). No USFWS Critical Habitat occurs within or immediately adjacent to the LFG Pipeline study area.

3.3.1.2 North City Pipeline

The following federally listed wildlife species was documented within the North City Pipeline study area: San Diego fairy shrimp. HELIX mapped vernal pools or road ruts (not assigned identifiers) within MCAS Miramar, south of the proposed location for the North City Pipeline along Miramar Road. Only a portion of these basins were found to be occupied with San Diego fairy shrimp.

One federally threatened species, coastal California gnatcatcher, has moderate potential to occur within the North City Pipeline study area.

Other sensitive wildlife species, those not federally or state listed, that have a moderate to high potential to occur in the North City Pipeline study area include coastal California gnatcatcher, orangethroat whiptail, Southern California rufous-crowed sparrow, red diamondback rattlesnake, San Diegan tiger whiptail, Cooper's hawk, pallid bat, and monarch (Appendix B).

No USFWS Critical Habitat occurs within or immediately adjacent to the North City Pipeline study area.

3.3.1.3 Metro Biosolids Center

The following federally listed wildlife species was documented within the MBC study area: coastal California gnatcatcher. Contracted MCAS Miramar biologists conducted coastal California gnatcatcher surveys in 2016 (SDNHM 2016). Draft findings indicate a total two individuals or transients, two nests, and one pair of coastal California gnatcatcher were observed adjacent to the MBC.

Other sensitive wildlife species, those not federally or state listed, that have a moderate to high potential to occur in the MBC study area include orangethroat whiptail (State WL and an MSCP Covered Species), San Diegan tiger whiptail (CDFW SSC), white-tailed kite (State FP), yellow-breasted chat (CDFW SSC), southern California rufous-crowned sparrow (State FP and an MSCP Covered Species), and mule deer (MSCP Covered Species) (Appendix B).

No USFWS Critical Habitat occurs within or immediately adjacent to the MBC study area.

3.4 Jurisdictional Resources

The results of the jurisdictional delineation conducted by Dudek in 2016 determined that there are a total of 0.21 acre of wetlands and non-wetland waters in the North City Project components study

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area within MCAS Miramar under the jurisdiction of the U.S. Army Corps of Engineers (ACOE)/Regional Water Quality Control Board (RWQCB), and 0.21 acre of streambeds and associated riparian areas under CDFW jurisdiction, and 0.81 acre of wetlands regulated by the City of San Diego. Jurisdictional aquatic resources mapped in the study area² are shown on Figures 2-3 through 8-9 and the following sections provide a summary of these resources under the jurisdiction of the ACOE, RWQCB, CDFW, and/or City of San Diego.

3.4.1 Landfill Gas Pipeline

ACOE- and RWQCB-jurisdictional areas within the LFG Pipeline study area total 0.21 acre, including 0.12 acre of wetlands (Level IV MA) and 0.09 acre of non-wetland stream channels (Level II MA). CDFW-jurisdictional areas within the LFG Pipeline study area total 0.21 acre, including 0.12 acre of riparian habitat (Level IV MA) and 0.09 acre of streambed (Level II MA). All of the jurisdictional aquatic resources are considered wetlands by the City of San Diego, as well as 0.45 acre of vernal pool occurring south of the railroad tracks (PW36) and with the Miramar National Cemetery (basins were unoccupied and not assigned identifiers). These basins all occur within the Level I MA. Table 2 summarizes these features.

Table 2
Jurisdictional Aquatic Resources in the LFG Pipeline Study Area (Acres)

Jurisdictional Aquatic Resource	ACOE/RWQCB ¹	CDFW ¹	City of San Diego Wetlands ¹
<i>Wetland or Riparian Areas</i>			
Coastal and Valley Freshwater Marsh	0.02	0.02	0.02
Mulefat Scrub	0.03	0.03	0.03
Southern Willow Scrub	0.07	0.07	0.07
Vernal Pool	—	—	0.45 ³
<i>Total Riparian/Wetlands</i>	<i>0.12</i>	<i>0.12</i>	<i>0.57</i>
<i>Non-wetland Waters/Streambed</i>			
Ephemeral Stream Channel	0.09	0.09	0.09
<i>Total Non-wetland Waters/Streambed</i>	<i>0.09</i>	<i>0.09</i>	<i>0.09</i>
Total jurisdictional area²	0.21	0.21	0.66

Notes:

- ¹ The acreages listed in the ACOE/RWQCB, CDFW, and City of San Diego Wetlands columns overlap and should not be summed together.
- ² Acreage may not total due to rounding.
- ³ This 0.45 acre of vernal pool is also potentially regulated by the RWQCB.

² The study area for the wetland delineation is defined in Appendix G-I of the Biological Resources Report for the North City Project.

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3.4.2 North City Pipeline

The only jurisdictional resource within the portion of the North City Pipeline study area that occurs within MCAS Miramar is 0.12 acre of vernal pools considered to be ACOE/RWQCB and/or City wetlands (Table 3). There is one vernal pool (0.02 acre) along Eastgate Mall, which is only under City jurisdiction, and 0.10 acre of basins south of Miramar Road, which are under ACOE/RWQCB/City jurisdiction. These basins (vernal pools or road ruts not assigned identifiers) ~~occur south of Miramar Road~~ are all within the Level I MA.

Table 3
Jurisdictional Aquatic Resources in the North City Pipeline Study Area (Acres)

Jurisdictional Aquatic Resource	ACOE/RWQCB ¹	CDFW ¹	City of San Diego Wetlands ¹
<i>Wetland or Riparian Areas</i>			
Vernal Pool	—0.10	—	0.12
Total jurisdictional area	—0.10	—	0.12²

Notes:

¹ The acreages listed in the ACOE/RWQCB, CDFW, and City of San Diego Wetlands columns overlap and should not be summed together.

² This 0.12 acre of vernal pool is also potentially regulated by the RWQCB.

3.4.3 Metro Biosolids Center

City-jurisdictional areas within the MBC study area total 0.03 acre of vernal pools within the Level V MA (Table 4). One pool, PW8, was surveyed by Dudek during the 2016/2017 wet season and was determined to be occupied by non-listed fairy shrimp and the vernal pool plant indicator species pale spike rush (*Eleocharis macrostachya*). Therefore, this pool meets the criteria outlined in the Draft Final City of San Diego Vernal Pool Habitat Conservation Plan (VPHCP) (City of San Diego ~~2016a~~2017) to be designated as a vernal pool under City jurisdiction.

Table 4
Jurisdictional Aquatic Resources in the Metro Biosolids Center Study Area (Acres)

Jurisdictional Aquatic Resource	ACOE/RWQCB ¹	CDFW ¹	City of San Diego Wetlands ¹
<i>Wetland or Riparian Areas</i>			
Vernal Pool	—	—	0.03
Total jurisdictional area	—	—	0.03²

Notes:

¹ The acreages listed in the ACOE/RWQCB, CDFW, and City of San Diego Wetlands columns overlap and should not be summed together.

² This 0.03 acre of vernal pool is also potentially regulated by the RWQCB.

3.5 Wildlife Corridors

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the immigration and emigration of animals. Wildlife corridors contribute to

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population viability by (1) ensuring the continual exchange of genes between populations, which helps maintain genetic diversity; (2) providing access to adjacent habitat areas, representing additional territory for foraging and mating; (3) allowing for a greater carrying capacity; and (4) providing routes for colonization of habitat lands following local population extinctions or habitat recovery from ecological catastrophes (e.g., fires).

Figure 4.5a of the INRMP identifies two wildlife corridors, Rose Canyon and San Clemente Canyon, that connect the east and west sides of MCAS Miramar and are within the North City Project study area. (MCAS Miramar INRMP 2011). Rose Canyon contains coastal sage scrub and chaparral with documented use by mule deer, bobcat (*Lynx rufus*), and mountain lion (*Puma concolor*). San Clemente Canyon contains coastal sage scrub, chaparral, wetland, and riparian vegetation with use by mule deer. Both canyons have intermittent water flow. The Miramar Reservoir Alternative has two components that are within the vicinity of these two wildlife corridors. The LFG Pipeline crosses over Rose Canyon, and the MBC sits just south of the western end of San Clemente Canyon. The wildlife corridors for the San Vicente Reservoir Alternative are similar to those for the Miramar Reservoir Alternative with the exception of the impacts associated with the San Vicente–repurposed pipeline.

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4 IMPACTS

The North City Project – Miramar Reservoir Alternative would impact ~~42.02~~43.34 acres within ~~14-13~~ vegetation communities and/or land cover types within all five MA Levels. The majority of those impacts, ~~31.93~~31.83 acres, would occur within urban/developed land, and impacts to jurisdictional wetlands would be avoided (Figures ~~2-3~~ through ~~89~~). The San Vicente Reservoir Alternative would impact the same 13 vegetation communities with additional impacts occurring within southern willow scrub (jurisdictional wetland) from the air and blow-off valves along the San Vicente–repurposed pipeline. Additionally, both alternatives would impact occupied coastal California gnatcatcher habitat, but only the San Vicente Reservoir Alternative would have impacts within occupied vernal pool watersheds. Direct impacts to vegetation communities would be in compliance within the INRMP through the biological mitigation measures provided in the INRMP Tables 6.2.2.2a and 6.2.2.2b (MCAS Miramar INRMP 2011).

4.1 Level I Management Area - Vernal Pools and Associated Watersheds

Level I MAs (2,638 acres total) receive the highest conservation priority (MCAS Miramar INRMP 2011). The Level I MAs support nearly all vernal pool habitat basins and watersheds and some closely associated coastal California gnatcatcher territories. Proactive measures and special conservation requirements are instated to prevent damage to vernal pool habitat, which are designed to be incorporated into Station Orders and the National Environmental Policy Act planning process (MCAS Miramar INRMP 2011).

4.1.1 Vernal Pools and Associated Watersheds

HELIX mapped vernal pools (pools were unoccupied and not assigned identifiers) adjacent to the LFG Pipeline, near the Veterans Administration within the Level I MA (Figure ~~34~~). Direct impacts to these pools would be avoided using trenchless construction methods. During project planning, the location of the jurisdictional resources was avoided to the maximum extent feasible. However, the INRMP states that impacts, including an increase or decrease of water quantity, sediment transport, and change in water quality runoff to pool basin, to a vernal pool watershed should be minimized or avoided (MCAS Miramar INRMP 2011). The City typically applies a 100-foot wide avoidance buffer surrounding these resources to ensure the value and function of the watershed is maintained and therefore, impacts to the surrounding buffer must be analyzed (City of San Diego 2012). As such, there would be impacts within the 100-buffer of these unoccupied vernal pools from the LFG Pipeline and from air valves associated with the San Vicente–repurposed pipeline if the San Vicente Reservoir Alternative is implemented. However, this area contains a topographical barrier (i.e., a slope approximately 2-3 feet above the impact area) that would prevent indirect

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impacts to these vernal pools. MCAS Miramar mapped three other seasonally ponded features (VP653, VP656, and VP654; OSPF are not classified as “pools” because they are the result of human disturbance (i.e. road ruts or basins)) and three basins (VP657, VP1859, and VP2480) adjacent to the area mapped as extensive agriculture-field/pasture, row crops along the LFG Pipeline but these pools and their associated watershed would be avoided (Figure 56). There would be no direct or indirect impacts to the unnamed HELIX vernal pools, or to VP653, VP656, or VP654 within the Level I MA with project implementation. Mitigation measures taken directly from the VPHCP MM-BIO-109(a) through MM-BIO-109(gg), ~~MM-BIO-10(j)~~, and ~~MM-BIO-10(k)~~ would still be implemented to ensure that no indirect impacts occur in these pools.

HELIX mapped 67 vernal pools or road ruts (not assigned identifiers) within the Level I MA south of Miramar Road, which contains the proposed North City Pipeline corridor (Figure 34). A portion of the pools are occupied with San Diego fairy shrimp (*Branchinecta sandiegonensis*) and the remaining pools are unoccupied. Although work is contained with Miramar Road and no direct impacts are expected to occur to these pools, there would be indirect impacts within the pools 100-foot buffer from the North City Pipeline corridor. However, this area is an existing impermeable road and does not provide valuable transitional upland habitat that serves in slowing and absorbing flood waters for flood and erosion control, sediment filtration, water purification, or ground water recharging. Therefore, indirect impacts to these pools is not expected. Mitigation measures taken directly from the VPHCP MM-BIO-109(a) through MM-BIO-109(gg), ~~MM-BIO-10(j)~~, and ~~MM-BIO-10(k)~~ would still be implemented to ensure that no indirect impacts occur in these pools.

HELIX also mapped vernal pool (PW36) containing the federally endangered species San Diego fairy shrimp within the Level I MA along the LFG Pipeline (Figure 45). However, there would be no direct or indirect impacts from the LFG Pipeline to this feature due to the use of trenchless construction methods. Although no impacts are anticipated, mitigation measures MM-BIO-109(a) through MM-BIO-109(gg), ~~MM-BIO-10(j)~~, and ~~MM-BIO-10(k)~~ taken directly from the VPHCP would still be implemented to ensure that no indirect impacts occur in these pools. There would be permanent indirect impacts within the PW36 watershed from an air and blow-off valve associated with the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line only if the San Vicente Reservoir Alternative is implemented. Mitigation for permanent impacts to an occupied watershed would be mitigated through MM-BIO-87.

There are 74 vernal pools (the majority are occupied by San Diego fairy shrimp) north of Miramar Road mapped by MCAS Miramar in 2008 and shown on Figure 23. These vernal pools are outside the City’s 100-foot wide avoidance buffer, and therefore no direct or indirect impacts would occur.

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4.1.2 Vegetation

Impacts would occur in the Level I MA to the following vegetation communities and/or land cover types including: Diegan coastal sage scrub, Diegan coastal sage scrub: Baccharis-dominated, flat-topped buckwheat (including disturbed), extensive agriculture, urban/developed, and disturbed habitat (Table 5). The total impact to the Level I MA is 0.85-70 acre, including 0.85-70 acre of temporary impacts along the LFG Pipeline and <0.01 acre of permanent impacts along the San Vicente–repurposed pipeline (Figures 2-3 through 67).

Table 5
Impacts to Vegetation Communities and Land Cover Types
within Level I Management Area (Acres)

Vegetation Community/Land Cover Type	MSCP Tier ¹	LFG Pipeline		San Vicente– Repurposed Pipeline Air and Blow-Off Valves (San Vicente Reservoir Alternative only)		Total Acreage
		Temp	Perm	Temp	Perm	
Diegan Coastal Sage Scrub	II	<u>0.370.33</u>	0	0	<0.01	<u>0.370.33</u>
Diegan Coastal Sage Scrub: Baccharis-Dominated	II	0.03	0	0	<0.01	0.03
Flat-Topped Buckwheat	II	<0.01	0	0	0	<0.01
Flat-Topped Buckwheat (disturbed)	II	0.01	0	0	0	0.01
<i>Coastal Sage Scrub Subtotal²</i>		<u>0.440.37</u>	0	0	<0.01	<u>0.440.37</u>
Extensive Agriculture – Field/Pasture, Row Crops	IV	0.11	0	0	0	0.11
Urban/Developed	IV	<0.01	0	0	0	<0.01
Disturbed Habitat	IV	<u>0.330.23</u>	0	0	<0.01	<u>0.330.23</u>
<i>Land Cover Subtotal²</i>		<u>0.430.33</u>	0	0	<0.01	<u>0.430.33</u>
Total²		<u>0.850.70</u>	0	0	<0.01	<u>0.850.70</u>

Notes:

¹ MSCP Tiers are used to rank vegetation based on rarity within San Diego County (City of San Diego 1996).

² Totals may not sum due to rounding.

Within the Level I MA, there would be 0.44-0.37 acre of temporary impacts to sensitive vegetation communities (Diegan coastal sage scrub (including baccharis-dominated), and flat-topped buckwheat (including disturbed)) from the LFG Pipeline. These impacts would occur under either alternative and would be reduced through MM-BIO-2, which would provide restoration following the completion of construction. Permanent impacts to <0.01 acre of coastal sage scrub habitat (Diegan coastal sage scrub and Diegan coastal sage scrub: baccharis-dominated) from an air and blow-off valve associated with the San Vicente–repurposed pipeline only if the San Vicente Reservoir Alternative is implemented would be mitigated through MM-BIO-1a, which would

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provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Impacts to unoccupied developed or disturbed lands would occur under either alternative and would be mitigated through implementation of erosion and sediment control (MM-BIO-109(j)).

4.1.3 Federally Threatened or Endangered Wildlife Species

A total of 19 coastal California gnatcatchers, including 9 individuals or transients (including 5 individuals mapped by Dudek or HELIX) and 5 pairs, and 7 nests were observed within the North City Project components study area (SDNHM 2016). Of that total, three individuals or transients, two pairs, and one nest occur within the Level I MA (Figures 2-3 through 67). Since this species is capable of movement, no direct impacts to adult coastal California gnatcatchers would occur; however, there would be direct impacts to suitable habitat. Permanent impacts to suitable, coastal sage scrub habitat would occur from an air and blow-off valve associated with the San Vicente-repurposed pipeline only if the San Vicente Reservoir Alternative is implemented and would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Temporary impacts from the LFG Pipeline to suitable habitat for coastal California gnatcatcher would be mitigated through MM-BIO-2, which would provide restoration following the completion of construction. Potential impacts to any active nests or the young of nesting coastal California gnatcatcher through direct grading of suitable habitat within MCAS Miramar would be mitigated through MM-BIO-4b, which requires pre-construction surveys for coastal California gnatcatcher. The City would satisfy mitigation requirements outlined in the INRMP through implementation of MM-BIO-4b. If surveys determine presence of occupied habitat, no habitat-disturbing activities would occur between February 15 and August 31.

4.1.4 Federally Threatened or Endangered Plant Species

There are no threatened or endangered plant species located in the impact footprint within the Level I MA, therefore no mitigation is required.

4.1.5 Wildlife Corridors

Rose Canyon is partially within the Level I MA. The LFG Pipeline crosses over Rose Canyon as it runs through MCAS Miramar. Implementation of trenchless construction methods along the LFG Pipeline over Rose Canyon would greatly reduce impacts within this wildlife corridor. Additionally, all LFG Pipeline impacts are temporary with no permanent structures placed within the footprint; therefore, impacts from the LFG Pipeline would not affect wildlife movement through the Rose Canyon wildlife corridor. There would be permanent impacts to <0.01 acre of coastal sage

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scrub: baccharis-dominated on the slope above Rose Canyon from an air and blow-off valve that would only occur if the San Vicente Reservoir Alternative was implemented. These impacts are minimal and would not affect wildlife movement; therefore, no mitigation is required.

4.2 Level II Management Area - Non-Vernal Pool Threatened/Endangered Species

Level II MAs (5,824 acres total) support conservation needs for non-vernal pool, federally listed species (MCAS Miramar INRMP 2011). Level II MAs' conservation goal to maintain and enhance populations include, and not limited to, the following species: coastal California gnatcatchers, least Bell's vireo, willowy monardella, and Del Mar manzanita. Management considerations include avoidance of adverse effects on species by limiting activities within the MAs during breeding season, and implementing site-specific measures.

4.2.1 Vernal Pools and Associated Watersheds

There are no vernal pools located in the impact footprint within the Level II MA. However, there are impacts to jurisdictional resources within San Clemente Canyon. The San Vicente-repurposed pipeline would permanently impact <0.01 acre of CDFW-jurisdictional southern willow scrub, from a blow-off valve work area. This impact would only occur if the San Vicente Reservoir Alternative was implemented (Figure 78). Compliance with Level II MA would be achieved through the implementation of MM-BIO-1c and MM-BIO-98, which would provide mitigation for impacts to jurisdictional resources through allocation of credit from an existing Public Utilities Department (PUD) wetland mitigation site and by obtaining the required regulatory permits. All mitigation would occur within the MSCP's MHPA and would be implemented in accordance with City/ACOE/CDFW/RWQCB guidelines.

4.2.2 Vegetation

Impacts would occur in the Level II MA to the following vegetation communities and/or land cover types including: Diegan coastal sage scrub, coastal sage-chaparral transition, disturbed habitat, and southern willow scrub (Table 6). The total impact to the Level II MA is 0.91 acres, including 0.54 acres of temporary impacts from the LFG Pipeline, 0.36 acres of permanent impacts within the MBC, and <0.01 acres of permanent impacts from the San Vicente-repurposed pipeline (Figures 2-3 through 89).

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Table 6
Impacts to Vegetation Communities and Land Cover Types
within Level II Management Area (Acres)

Vegetation Community/ Land Cover Type	MSCP Tier ¹	LFG Pipeline		MBC		San Vicente– Repurposed Pipeline Air and Blow-Off Valves (San Vicente Reservoir Alternative only)		Total Acreage
		Temp	Perm	Temp	Perm	Temp	Perm	
Diegan Coastal Sage Scrub	II	0.38	0	0	0.32 ³	0	<0.01	0.71
Coastal Sage-Chaparral Transition	II	0.14	0	0	0	0	0	0.14
<i>Coastal Sage Scrub Subtotal²</i>		<i>0.52</i>	<i>0</i>	<i>0</i>	<i>0.32</i>	<i>0</i>	<i><0.01</i>	<i>0.84</i>
Disturbed Habitat	IV	0.02	0	0	0.04	0	0	0.06
<i>Land Cover Subtotal²</i>		<i>0.02</i>	<i>0</i>	<i>0</i>	<i>0.04</i>	<i>0</i>	<i>0</i>	<i>0.06</i>
Southern Willow Scrub	Wetland	0	0	0	0	0	<0.01	<0.01
<i>Riparian Subtotal²</i>		<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i><0.01</i>	<i><0.01</i>
Total²		0.54	0	0	0.36	0	<0.01	0.91

Notes:

- ¹ MSCP Tiers are used to rank vegetation based on rarity within San Diego County (City of San Diego 1996).
- ² Totals may not sum due to rounding.
- ³ This acreage has been previously mitigated.

Within the Level II MA, there would be 0.52 acre of temporary impacts to sensitive vegetation communities (Diegan coastal sage scrub and coastal sage-chaparral transition) from the LFG Pipeline. These impacts would occur under either alternative and would be reduced through MM-BIO-2, which would provide restoration following the completion of construction. Permanent impacts to 0.32 acre of Diegan coastal sage scrub occurring at the MBC have been adequately addressed and mitigated for in the MBC Programmatic Environmental Impact Statement (PEIS) (City of San Diego 1994). The Goat Mesa parcel was purchased for impacts to uplands at the MBC, and therefore the previous mitigation would reduce impacts to coastal sage scrub at the MBC to a less-than-significant level. Impacts to unoccupied developed or disturbed lands would be mitigated through implementation of erosion and sediment control (MM-BIO-109(j)). Permanent impacts to <0.01 acre of southern willow scrub from an air and blow-off valve would only occur under the San Vicente Reservoir Alternative, and would be mitigated through MM-BIO-1c and MM-BIO-98, which would provide mitigation for impacts to jurisdictional resources through allocation of credit from an existing PUD wetland mitigation site and by obtaining the required regulatory permits.

4.2.3 Federally Threatened or Endangered Wildlife Species

A total of 19 coastal California gnatcatchers, including 9 individuals or transients (including five individuals mapped by Dudek) and 5 pairs, and 7 nests were observed within the study area (SDNHM

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2016). Of that total two pairs, five individuals or transients, and three nests occur within the Level II MA (Figures 2-3 through 89). Since this species is capable of movement, no direct impacts to adult coastal California gnatcatchers would occur; however, there would be direct impacts to suitable habitat. Permanent impacts to suitable, occupied coastal sage scrub habitat would occur under both alternatives at the MBC and from air and blow-off valves associated with the San Vicente Reservoir Alternative. The previous mitigation at the MBC has preserved suitable habitat for this species, and permanent impacts from the air and blow-off valves would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Temporary impacts from the LFG Pipeline to suitable habitat for coastal California gnatcatcher would be mitigated through MM-BIO-2, which would provide restoration following the completion of construction. Potential impacts to any active nests or the young of nesting coastal California gnatcatcher through direct grading of suitable habitat within MCAS Miramar would be mitigated through MM-BIO-4b, which requires pre-construction surveys for coastal California gnatcatcher. The City would satisfy mitigation requirements outlined in the INRMP through implementation of MM-BIO-4b. If surveys determine presence of occupied habitat, no habitat-disturbing activities would occur between February 15 and August 31.

Although least Bell's vireo and southern willow flycatcher were not observed during surveys, pre-construction surveys for least Bell's vireo and southwestern willow flycatcher would be conducted in areas of suitable habitat prior to construction (MM-BIO-6). If surveys determine presence of occupied habitat, no habitat-disturbing activities would occur during the least Bell's vireo breeding season (March 15 to September 15) and/or southwestern willow flycatcher breeding season (May 1 to September 1). Permanent impacts to suitable habitat (i.e., southern willow scrub) for riparian birds from an air and blow-off valve would only occur under the San Vicente Reservoir Alternative and would be mitigated through MM-BIO-1c and MM-BIO-98, which would provide mitigation for impacts to jurisdictional resources through allocation of credit from an existing PUD wetland mitigation site and by obtaining the required regulatory permits.

4.2.4 Federally Threatened or Endangered Plant Species

There are no threatened or endangered plant species located in the impact footprint within the Level II MA, therefore no mitigation is required.

4.2.5 Wildlife Corridors

Rose Canyon and San Clemente Canyon are within the Level II MA. No impacts from either alternative would occur in the portion of Rose Canyon within the Level II MA. No impacts would occur from the Miramar Reservoir Alternative within San Clemente Canyon. All impacts at the MBC, which sits just south of the western end of San Clemente Canyon, would occur within existing

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development and would not result in impacts to wildlife movement. There would be permanent impacts to <0.01 acre of southern willow scrub within San Clemente Canyon from an air and blow-off valve that would only occur if the San Vicente Reservoir Alternative was implemented. These impacts are minimal and would not affect wildlife movement; therefore, no mitigation is required.

4.3 Level III Management Area - Habitat Linkages/ Riparian Vegetation

Level III MAs (1,785 acres total) provides conservation measures for riparian vegetation, wildlife movement corridors, and habitat linkages, not contained within Level I and II MAs (MCAS Miramar INRMP 2011). The habitat linkages, including all undeveloped areas, within Level III MAs are also identified as local and regional wildlife corridors. Level III MAs provide management considerations for wetlands, including vernal marshes, freshwater marshes, and portions of some riparian vegetation types.

4.3.1 Vernal Pools and Associated Watersheds

There are no vernal pools or any other jurisdictional resource located in the impact footprint within the Level III MA, therefore no mitigation is required.

4.3.2 Vegetation

Impacts would occur in the Level III MA to the following vegetation communities and/or land cover types including: Diegan coastal sage scrub, extensive agriculture, southern mixed chaparral, and disturbed habitat (Table 7). The total impact to the Level III MA is 1.45 acres, including 1.45 acres of temporary impact from the LFG Pipeline, and <0.01 acre of permanent impact from the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line (Figures 3-4 through 89).

Table 7
Impacts to Vegetation Communities and Land Cover Types
within the Level III Management Area (Acres)

Vegetation Community/Land Cover Type	MSCP Tier ¹	LFG Pipeline		San Vicente– Repurposed Pipeline Air and Blow-Off Valves (San Vicente Reservoir Alternative only)		Total Acreage
		Temp	Perm	Temp	Perm	
Diegan Coastal Sage Scrub	II	1.07	0	0	<0.01	1.07
<i>Coastal Sage Scrub Subtotal²</i>		1.07	0	0	<0.01	1.07
Extensive Agriculture – Field/Pasture, Row Crops	IV	0.02	0	0	0	0.02
Disturbed Habitat	IV	0.36	0	0	<0.01	0.36
<i>Land Cover Subtotal²</i>		0.38	0	0	<0.01	0.38

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Table 7
Impacts to Vegetation Communities and Land Cover Types
within the Level III Management Area (Acres)

Vegetation Community/Land Cover Type	MSCP Tier ¹	LFG Pipeline		San Vicente– Repurposed Pipeline Air and Blow-Off Valves (San Vicente Reservoir Alternative only)		Total Acreage
		Temp	Perm	Temp	Perm	
Southern Mixed Chaparral	IIIA	<0.01	0	0	0	<0.01
<i>Chaparral Subtotal</i> ²		<0.01	0	0	0	<0.01
Total ²		1.45	0	0	<0.01	1.45

Notes:

¹ MSCP Tiers are used to rank vegetation based on rarity within San Diego County (City of San Diego 1996).

² Totals may not sum due to rounding.

Within the Level III MA, there would be 1.07 acres of temporary impacts to coastal sage scrub with from the LFG Pipeline. These impacts would occur under either alternative and would be reduced through MM-BIO-2, which would provide restoration following the completion of construction. Additionally, there would be temporary impacts to <0.01 acre of unoccupied southern mixed chaparral, and mitigation would occur through MM-BIO-2. Permanent impacts from the air and blow-off valves associated with only the San Vicente Reservoir Alternative to <0.01 acre of Diegan coastal sage scrub would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Impacts to unoccupied developed or disturbed lands would be mitigated through implementation of erosion and sediment control (MM-BIO-409(j)).

4.3.3 Federally Threatened or Endangered Wildlife Species

The coastal sage scrub within the Level III MA impact footprint was surveyed for coastal California gnatcatchers during the MCAS Miramar focused surveys. There were no coastal California gnatcatcher observations within the Level III MA impact footprint. Therefore, impacts to coastal California gnatcatcher at the Level III MA are not anticipated. However, because the impact footprint within the Level III MA supports coastal sage scrub and southern mixed chaparral, a nesting bird survey should be completed prior to construction to reduce impacts to nesting birds to less than significant (MM-BIO-3). Permanent and temporary impacts to suitable habitat for coastal California gnatcatcher would be mitigated through MM-BIO-1a and MM-BIO-2, respectively.

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4.3.4 Federally Threatened or Endangered Plant Species

There are no threatened or endangered plant species located in the impact footprint within the Level III MA, therefore no mitigation is required.

4.3.5 Wildlife Corridors

There are no wildlife corridors located in the impact footprint within the Level III MA; therefore, no mitigation is required.

4.4 Level IV Management Area - Remaining Undeveloped Areas

Level IV MAs (7,532 acres total) supports the remaining undeveloped areas not in Levels I, II, and III MAs (MCAS Miramar INRMP 2011). Level IV MAs do not support substantial high value/regulated natural resources, and the high value/regulated resources that do occur are very isolated. Management considerations for Level IV MAs high value regulated natural resources are conserved with site-specific management. Areas of high value regulated natural resources are avoided for impacts; however, Level IV MAs are commonly considered for new uses consistent with the Draft MCAS Miramar Master Plan (Southwest Division, Naval Facilities Engineering Command, in preparation) (MCAS Miramar INRMP 2011).

4.4.1 Vernal Pools and Associated Watersheds

There are no vernal pools located in the impact footprint within the Level IV MA. However, there are impacts to jurisdictional resources within the VA Miramar National Cemetery. The San Vicente–repurposed pipeline would permanently impact <0.01 acre of ACOE- RWQCB- and CDFW-jurisdictional southern willow scrub, from a blow-off valve work area associated only with the San Vicente Reservoir Alternative (Figure 34). Compliance with the Level IV MA would be achieved through the implementation of MM-BIO-1c and MM-BIO-98, which would provide mitigation for impacts to jurisdictional resources through allocation of credit from an existing PUD wetland mitigation site and by obtaining the required regulatory permits. All mitigation would occur within the MSCP’s MHPA and would be implemented in accordance with City/ACOE/CDFW/RWQCB guidelines.

4.4.2 Vegetation

Impacts would occur in the Level IV MA to the following vegetation communities and/or land cover types including: Diegan coastal sage scrub (including disturbed), chamise chaparral, coastal sage-chaparral transition, urban/developed, disturbed habitat, and southern willow scrub (Table 8). The total impact to Level IV MAs is 5.32 acres, including 1.20 acres of temporary

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impacts from the LFG Pipeline, 4.11 acres of permanent impact within the MBC, and <0.01 acre of permanent impact from the San Vicente–repurposed pipeline (Figures 2–3 through 89).

Table 8
Impacts to Vegetation Communities and Land Cover Types
within the Level IV Management Area (Acres)

Vegetation Community/Land Cover Type	MSCP Tier ¹	LFG Pipeline		MBC		San Vicente–Repurposed Pipeline Air and Blow-Off Valves (San Vicente Reservoir Alternative only)		Total Acreage
		Temp	Perm	Temp	Perm	Temp	Perm	
Diegan Coastal Sage Scrub	II	0.65	0	0	0	0	<0.01	0.66
Diegan Coastal Sage Scrub (disturbed)	II	0.18	0	0	0	0	0	0.18
Coastal Sage-Chaparral Transition	II	0	0	0	0.12 ³	0	0	0.12
<i>Coastal Sage Scrub Subtotal²</i>		<i>0.83</i>	<i>0</i>	<i>0</i>	<i>0.12</i>	<i>0</i>	<i><0.01</i>	<i>0.96</i>
Chamise Chaparral	IIIA	0.12	0	0	0	0	0	0.12
<i>Chaparral Subtotal²</i>		<i>0.12</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0.12</i>
Urban/Developed	IV	0	0	0	3.96	0	0	3.96
Disturbed Habitat	IV	0.25	0	0	0.03	0	0	0.28
<i>Land Cover Subtotal²</i>		<i>0.25</i>	<i>0</i>	<i>0</i>	<i>3.99</i>	<i>0</i>	<i>0</i>	<i>4.24</i>
Southern Willow Scrub	Wetland	0	0	0	0	0	<0.01	<0.01
<i>Riparian Subtotal²</i>		<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i><0.01</i>	<i><0.01</i>
Total¹		1.20	0	0	4.11	0	<0.01	5.32

Notes:

- ¹ MSCP Tiers are used to rank vegetation based on rarity within San Diego County (City of San Diego 1996).
- ² Totals may not sum due to rounding.
- ³ This acreage has been previously mitigated.

Within the Level IV MA, there would be 0.83 acre of temporary impacts to coastal sage scrub (including disturbed) and 0.12 acre of impacts chamise chaparral with project implementation. These impacts would be reduced through MM-BIO-2, which would provide restoration following the completion of construction. Permanent impacts to 0.12 acre of coastal sage-chaparral transition occurring at the MBC have been adequately addressed and mitigated for in the MBC PEIS (City of San Diego 1994). The Goat Mesa parcel was purchased for impacts to uplands at the MBC, and therefore the previous mitigation would reduce impacts to coastal sage-chaparral transition at the MBC to a less-than-significant level. Permanent impacts to <0.01 acre of coastal sage scrub from an air and blow-off valve would only occur under the San Vicente Reservoir Alternative, and would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Impacts to unoccupied developed or

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disturbed lands would be mitigated through implementation of erosion and sediment control (MM-BIO-109(j)). Permanent impacts to <0.01 acre of southern willow scrub from an air and blow-off valve would only occur under the San Vicente Reservoir Alternative, and would be mitigated through MM-BIO-1c and MM-BIO-98, which would provide mitigation for impacts to jurisdictional resources through allocation of credit from an existing PUD wetland mitigation site and by obtaining the required regulatory permits.

4.4.3 Federally Threatened or Endangered Wildlife Species

A total of 19 coastal California gnatcatchers, including 9 individuals or transients and 5 pairs, and 7 nests were observed within the study area (SDNHM 2016). Of that total, one pair occurs within the Level IV MA (Figure 89). Since this species is capable of movement, no direct impacts to adult coastal California gnatcatchers would occur; however, there would be direct impacts to suitable habitat. Permanent impacts to suitable, occupied coastal sage scrub habitat would occur under both alternatives at the MBC and from air and blow-off valves associated with the San Vicente Reservoir Alternative. The previous mitigation at the MBC has preserved suitable habitat for this species, and permanent impacts from the air and blow-off valves would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Temporary impacts from the LFG Pipeline to suitable habitat for coastal California gnatcatcher would be mitigated through MM-BIO-2, which would provide restoration following the completion of construction. Potential impacts to any active nests or the young of nesting coastal California gnatcatcher through direct grading of suitable habitat within MCAS Miramar would be mitigated through MM-BIO-4b, which requires pre-construction surveys for coastal California gnatcatcher. The City would satisfy mitigation requirements outlined in the INRMP through implementation of MM-BIO-4b. If surveys determine presence of occupied habitat, no habitat-disturbing activities would occur between February 15 and August 31.

Although least Bell's vireo or southern willow flycatcher were not observed during surveys, pre-construction surveys for least Bell's vireo and southwestern willow flycatcher would be conducted in areas of suitable habitat prior to construction (MM-BIO-6). If surveys determine presence of occupied habitat, no habitat-disturbing activities would occur between during the least Bell's vireo breeding season (March 15 to September 15) and/or southwestern willow flycatcher breeding season (May 1 to September 1). Permanent impacts to suitable habitat (i.e. southern willow scrub) for riparian birds would be mitigated through MM-BIO-1c and MM-BIO-98, which would provide mitigation for impacts to jurisdictional resources through allocation of credit from an existing PUD wetland mitigation site and by obtaining the required regulatory permits.

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4.4.4 Federally Threatened or Endangered Plant Species

There are no federally threatened or endangered plant species located in the impact footprint within the Level IV MA; therefore, no mitigation is required.

4.4.5 Wildlife Corridors

There are no wildlife corridors located in the impact footprint within the Level IV MA; therefore, no mitigation is required.

4.5 Level V Management Area - Developed Areas

Level V MAs (5,259 acres total) include developed land and support few unaltered natural landscapes (MCAS Miramar INRMP 2011). Level V MAs have the least valued natural resources, and therefore are considered for placement of new facilities and other new land uses that would be likely to impact regulated resources. Management considerations for Level V MAs include discouraging the using of invasive plants, conducting flightline mowing practices consistent with the Bird and Animal Air Strike Hazard (BAASH) program, and keeping pesticide use to a minimum.

4.5.1 Vernal Pools and Associated Watersheds

MCAS Miramar mapped two OSPF (VP697 and VP699) containing the federally endangered species San Diego fairy shrimp within the Level V MA along the San Vicente–repurposed pipeline (Figure 67). There would be permanent indirect impacts within the watershed of the two OSPFs from air and blow-off valves associated with the San Vicente–repurposed pipeline only if the San Vicente Reservoir Alternative is implemented. Mitigation for permanent indirect impacts to an occupied watershed would occur through implementation of MM-BIO-87.

4.5.2 Vegetation

Impacts would occur in the Level V MA to the following 9 vegetation communities and/or land cover types including: Diegan coastal sage scrub (including disturbed), chamise chaparral, coastal sage-chaparral transition, extensive agriculture, urban/developed, non-native grassland, non-native vegetation, and disturbed habitat (Table 9). The total impact to the Level V MA is ~~35.14~~ 35.02 acres. Of that total, 25.27 acres of developed lands are from the MBC, which is an existing facility. Other impacts include 1.83 acres of temporary impact to an existing road from the North City Pipeline, ~~7.52~~ 7.40 acres of impacts (~~7.40~~ 7.28 acres of temporary impacts and 0.12 acres of permanent impacts) from the LFG Pipeline, and 0.04 acres of permanent impacts from the San Vicente–repurposed pipeline (Figures ~~2-3~~ through 89).

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Table 9
Impacts to Vegetation Communities and Land Cover Types
within the Level V Management Area (Acres)

Vegetation Community/ Land Cover Type	MSCP Tier ¹	North City Pipeline		LFG Pipeline		MBC		San Vicente– Repurposed Pipeline Air and Blow-Off Valves (San Vicente Reservoir Alternative only)		Total Acreage
		Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	
Diegan Coastal Sage Scrub	II	0	0	1.49 <u>1.44</u>	0	0	0.28 ³	0	0.01	1.77 <u>1.73</u>
Diegan Coastal Sage Scrub (disturbed)	II	0	0	0.50	0	0	0	0	0	0.50
Coastal Sage-Chaparral Transition	II	0	0	0	0	0	0.19 ³	0	<0.01	0.19
Non-native Grassland	IIIB	0	0	0.03	0	0	0	0	<0.01	0.03
<i>Coastal Sage Scrub Subtotal²</i>		<i>0</i>	<i>0</i>	<i>2.01</i> <u><i>1.97</i></u>	<i>0</i>	<i>0</i>	<i>0.46</i>	<i>0</i>	<i>0.01</i>	<i>2.49</i> <u><i>2.44</i></u>
Chamise Chaparral	IIIA	0	0	0.38	0	0	0	0	<0.01	0.38
<i>Chaparral Subtotal²</i>		<i>0</i>	<i>0</i>	<i>0.38</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i><0.01</i>	<i>0.38</i>
Extensive Agriculture – Field/Pasture, Row Crops	IV	0	0	0.32 <u>0.21</u>	0	0	0	0	0	0.32 <u>0.21</u>
Urban/Developed	IV	1.83	0	0.65	0.12	0	25.27	0	0.01	27.88
Non-native Vegetation	IV	0	0	0.04	0	0	0	0	0.01	0.04
Disturbed Habitat	IV	0	0	4.00 <u>4.04</u>	0	0	0.02	0	<0.01	4.03 <u>4.06</u>
<i>Land Cover Subtotal²</i>		<i>1.83</i>	<i>0</i>	<i>5.01</i> <u><i>4.94</i></u>	<i>0.12</i>	<i>0</i>	<i>25.29</i>	<i>0</i>	<i>0.02</i>	<i>32.27</i> <u><i>32.20</i></u>
Total²		1.83	0	7.40 <u>7.28</u>	0.12	0	25.75	0	0.04	35.14 <u>35.02</u>

Notes:

- ¹ MSCP Tiers are used to rank vegetation based on rarity within San Diego County (City of San Diego 1996).
- ² Totals may not sum due to rounding.
- ³ This acreage has been previously mitigated.

Within the Level V MA, there would be ~~2.39~~2.34 acres of temporary impacts to coastal sage scrub and chaparral communities from the LFG Pipeline under both alternatives with project implementation. These impacts would be reduced through MM-BIO-2, which would provide restoration following the completion of construction. Permanent impacts occurring at the MBC have

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been adequately addressed and mitigated for in the MBC PEIS (City of San Diego 1994). The Goat Mesa parcel was purchased for impacts to uplands at the MBC, and therefore the previous mitigation would reduce impacts to coastal sage scrub and coastal sage-chaparral transition at the MBC to a less-than-significant level. Permanent impacts to <0.01 acre of unoccupied chamise chaparral from air and blow-off valves only associated with the San Vicente Reservoir Alternative would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Impacts to unoccupied developed or disturbed lands would be mitigated through implementation of erosion and sediment control (MM-BIO-109(j)).

4.5.3 Federally Threatened and Endangered Wildlife Species

A total of 19 coastal California gnatcatchers, including 9 individuals or transients and 5 pairs, and 7 nests were observed within the study area (SDNHM 2016). Of that total, one individual or transient and three nests occur within the Level V MA (Figures 3-4 and 89). Since this species is capable of movement, no direct impacts to adult coastal California gnatcatchers would occur; however, there would be direct impacts to suitable habitat. Permanent impacts to suitable, occupied coastal sage scrub habitat would occur under both alternatives at the MBC and from air and blow-off valves associated with the San Vicente Reservoir Alternative. The previous mitigation at the MBC has preserved suitable habitat for this species and permanent impacts from the air and blow-off valves would be mitigated through MM-BIO-1a, which would provide restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site or through allocation of credit at an existing approved mitigation site. Temporary impacts from the LFG Pipeline to suitable habitat for coastal California gnatcatcher would be mitigated through MM-BIO-2, which would provide restoration following the completion of construction. Potential impacts to any active nests or the young of nesting coastal California gnatcatcher through direct grading of suitable habitat within MCAS Miramar would be mitigated through MM-BIO-4b, which requires pre-construction surveys for coastal California gnatcatcher. The City would satisfy mitigation requirements outlined in the INRMP through implementation of MM-BIO-4b. If surveys determine presence of occupied habitat, no habitat-disturbing activities would occur between February 15 and August 31.

4.5.4 Federally Threatened and Endangered Plant Species

There are no threatened or endangered plant species located in the impact footprint within the Level V MA, therefore no mitigation is required.

4.5.5 Wildlife Corridors

There are no wildlife corridors located in the impact footprint within the Level V MA; therefore, no mitigation is required.

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5 MITIGATION

This section describes proposed mitigation measures that would mitigate adverse impacts to biological resources resulting from the proposed North City Project and addresses INRMP requirements. The following mitigation measures address the North City Project's effects on INRMP within MCAS Miramar on rare vegetation, sensitive species and jurisdictional aquatic resources. With implementation of the proposed mitigation, compliance with the INRMP will be obtained. It should be noted that for consistency the mitigation measures are numbered to match the Biological Resources Report and therefore may not be sequential in this document. Table 10 summarizes each project component and the mitigation required based on the INRMP.

Table 10
Summary of Impacts to Sensitive Vegetation Communities and Applicable Mitigation

North City Project Component	MA Level Impacted	General Vegetation Type Impacted	Applicable Mitigation Measure	Impact Type	Total Impact Acreage
<i>Miramar Reservoir Alternative Components</i>					
LFG Pipeline	I-V	Coastal Sage Scrub, Chaparral	MM-BIO-2, MM-BIO-3, MM-BIO-4b, MM-BIO-5, MM-BIO-6	Temporary	<u>5.345.25</u>
MBC	II, IV, V	Coastal Sage Scrub	MM-BIO-3, MM-BIO-4b, MM-BIO-5, MM-BIO-6	Permanent	0.91*
<i>San Vicente Reservoir Alternative Components</i>					
LFG Pipeline	I-V	Coastal Sage Scrub, Chaparral	MM-BIO-2, MM-BIO-3, MM-BIO-4b, MM-BIO-5, MM-BIO-6	Temporary	<u>5.345.25</u>
MBC	II, IV, V	Coastal Sage Scrub	MM-BIO-3, MM-BIO-4b, MM-BIO-5, MM-BIO-6	Permanent	0.91*
San Vicente Pipeline - Repurposed 36-inch Recycled Water Line (Air and Blow-off Valves)	I-V	Watershed, Coastal Sage Scrub, Riparian Habitat, Chaparral	MM-BIO-1, MM-BIO-1c, MM-BIO-3, MM-BIO-4b, MM-BIO-5, MM-BIO-6, MM-BIO- 98 , MM-BIO- 87	Permanent	0.03

Note:

* Direct impacts to sensitive vegetation communities (including Diegan coastal sage scrub and chaparral) at the MBC have been adequately addressed and mitigated for in the MBC PEIS (City of San Diego 1994). The Goat Mesa parcel was purchased for impacts to uplands at the MBC, and therefore the previous mitigation would reduce impacts to coastal sage scrub and coastal sage-chaparral transition at the MBC to a less-than-significant level.

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5.1 Sensitive Vegetation Communities

The City of San Diego would ensure that the North City Project would include mitigation that is consistent with both the INRMP and the City and would therefore require mitigation for impacts to sensitive vegetation communities (i.e., Tier I–III and wetlands).

As required under the INRMP Table 6.2.2.2b, mitigation for permanent direct impacts to sensitive vegetation communities would include implementing temporary disturbance requirements (outlined under MM-BIO-409(j)); pre-construction surveys for coastal California gnatcatcher, least Bell’s vireo, and southwestern willow flycatcher (MM-BIO-4b and MM-BIO-6); wetland permits (MM-BIO-98); and habitat compensation at a 2:1 or 1:1 ratio depending on the MA where the vegetation community occurs (Tables 11 and 12). Implementation of these measures will satisfy the INRMP requirements. Table 11 outlines the mitigation requirements for those permanent impacts within the MCAS Miramar under the Miramar Reservoir Alternative and Table 10 outlines the mitigation requirements for permanent impacts within MCAS Miramar under the San Vicente Reservoir Alternative.

**Table 11
Permanent Impacts to Vegetation Communities and
Land Cover Types – Miramar Reservoir Alternative (Acres)**

Vegetation Community/ Land Cover Type	Subarea Plan Designation	Impact Acreage within MCAS Miramar	Mitigation [^]	
			Mitigation Ratio	Mitigation Acres
<i>Uplands Tier II- Uncommon Uplands</i>				
Coastal Sage-Chaparral Transition (Level IV, V MA)	II	0.30 (0.00)*	2:1	—
Diegan Coastal Sage Scrub (Level II, V MA)	II	0.60 (0.00)*	2:1	—
<i>Tier IV – Other Uplands</i>				
Urban/Developed (Level IV, V MA)	IV	29.34	No mitigation required.	
Disturbed Habitat (Level II, IV, V MA)	IV	0.09		
Total		30.34	No mitigation required.	

Note:

- [^] The only permanent impacts to sensitive vegetation communities under the Miramar Reservoir Alternative within MCAS Miramar would occur at the MBC (0.91 acre); however, these impacts have been previously mitigated.
- * The acreage in parenthesis is the corrected total after the previously mitigated acreage (0.91 acre) from the MBC has been removed and should be used as the corrected total to be mitigated.
- *[^] Mitigation ratios for permanent impacts within MCAS Miramar are based on Table 6.2.2.2b in the INRMP and consideration is given to the Management Area where the vegetation community occurs.

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Table 12
Permanent Impacts to Vegetation Communities and
Land Cover Types – San Vicente Reservoir Alternative (Acres)

Vegetation Community/ Land Cover Type	Subarea Plan Designation	Impact Acreage within MCAS Miramar	Mitigation	
			Mitigation Ratio ^A	Mitigation Acres
<i>Tier II- Uncommon Uplands</i>				
Coastal Sage-Chaparral Transition (Level IV, V MA)	II	0.31 (<0.01)*	2:1	<0.01
Diegan Coastal Sage Scrub (Level I-V MA)	II	0.62 (0.01)*	2:1	0.03
Diegan Coastal Sage Scrub: Baccharis-Dominated (Level I MA)	II	<0.01	2:1	0.01
<i>Tier III – Common Uplands</i>				
Chamise Chaparral (Level V MA)	IIIA	<0.01	1:1	<0.01
Non-native Grassland (Level V MA)	IIIB	<0.01	1:1	<0.01
<i>Subtotal for Sensitive Uplands Tier II-III (MM-BIO-1a)</i>			<i>0.04</i>	
<i>Tier IV – Other Uplands</i>				
Urban/Developed (Level IV, V MA)	IV	29.35	No mitigation required	
Non-native Vegetation (Level V MA)	IV	0.01		
Disturbed Habitat (Level I-V MA)	IV	0.10		
<i>Wetlands</i>				
Southern Willow Scrub (Level II MA, CDFW-only jurisdiction; Level IV MA, ACOE- RWQCB- and CDFW-jurisdiction)	Wetland	<0.01	2:1**	0.01
<i>Subtotal for Wetlands (MM-BIO-1c)</i>			<i>0.01</i>	
Total		30.39	—	0.05

Notes:

- ^A Mitigation ratios for permanent impacts within MCAS Miramar are based on Table 6.2.2.2b in the INRMP and consideration is given to the Management Area where the vegetation community occurs.
- * The acreage in parenthesis is the corrected total after the previously mitigated acreage from the MBC (0.91 acre) has been removed and should be used as the corrected total to be mitigated.
- ** The INRMP calls for a 1:1 ratio for unoccupied riparian habitat but the City typically uses a 2:1 ratio for wetlands; therefore, the more conservative ratio would be used.

MM-BIO-1a Mitigation for Upland Impacts. No permanent impacts to sensitive vegetation communities within MCAS Miramar would occur under the Miramar Reservoir Alternative that have not already been previously mitigated. In order to offset permanent impacts to sensitive vegetation communities under the San Vicente Reservoir Alternative, 0.04 acre of mitigation would be provided through restoration and preservation of uplands at the SANDER Vernal Pool and Upland Mitigation Site. All mitigation would occur within the Multiple Species Conservation Program’s (MSCP’s) Multi-Habitat Planning Area (MHPA).

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MM-BIO-1c Mitigation for Impacts to Jurisdictional Aquatic Resources. No permanent impacts to jurisdictional resources within MCAS Miramar would occur under Miramar Reservoir Alternative. In order to offset permanent impacts to jurisdictional resources, 0.01 acre of mitigation associated with the San Vicente Reservoir Alternative, would be mitigated at the SANDER Mitigation site (subject to the satisfaction of ACOE and RWQCB) or through allocation of credit at the San Diego River Mitigation Site subject to ACOE and RWQCB approval. All mitigation would occur within the MSCP's MHPA and is in accordance with City/ACOE/CDFW/RWQCB guidelines.

Construction may result in the recruitment of non-native plant species within the temporary disturbance areas and the removal of native plant species, which would be significant absent mitigation. All temporary construction areas in sensitive habitat communities would require restoration following the completion of construction. Post construction erosion control in temporary impact areas to non-sensitive habitat such as dirt roads and/or non-native vegetation would be returned to pre-existing conditions. As required under the INRMP Table 6.2.2.2a, mitigation for temporary direct impacts to sensitive habitat communities would include: implementing temporary disturbance requirements (outlined under MM-BIO-409(j)); restoration at a 1:1 ratio with additional habitat enhancement (Table 13); and minimizing habitat-disturbing activities between February 15 and August 31 by conducting pre-construction surveys for coastal California gnatcatcher (MM-BIO-4b). Implementation of these measures would satisfy the INRMP requirements. Table 13 outlines the restoration requirements for temporary impacts within MCAS Miramar for the Miramar and San Vicente Reservoir Alternative. A total of ~~5.34~~5.25 acres of restoration would occur within MCAS Miramar under both alternatives. To satisfy the INRMP habitat enhancement requirement for temporary impacts to sensitive communities, the City would conduct ~~6.27~~6.14 acres of habitat enhancement within MCAS Miramar ~~adjacent to habitat revegetation activities along the LFG Pipeline, to the greatest extent feasible.~~ The ~~6.27~~6.14 acres of enhancement would occur within disturbed habitat types and would include invasive plant control, trash removal, erosion control, and seeding and/or supplemental planting as necessary in accordance with the Conceptual Revegetation Plan (Appendix S-P of the Biological Resources Report). All restoration for both alternatives would be implemented in accordance with City/ACOE/CDFW/RWQCB guidelines summarized in MM-BIO-2.

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Table 13
**Temporary Impacts to Vegetation Communities and Land Cover Types – Miramar and
San Vicente Reservoir Alternatives**

Vegetation Community/ Land Cover Type	Subarea Plan Designation	Impact Acreage	Within MCAS Miramar Restoration Acres*	Enhancement Occurring within MCAS Miramar ¹	
				Ratio ²	Enhancement Acreage
<i>Uplands Tier II- Uncommon Uplands</i>					
Coastal Sage-Chaparral Transition (Level II MA)	II	0.14	0.14	2:1	0.27
Diegan Coastal Sage Scrub (Level I-II MA)	II	3.96 <u>3.88</u>	3.96 <u>3.88</u>	2:1 (Level I, II MA)	1.51 <u>1.43</u>
				1:1 (Level III-V MA)	3.24 <u>3.16</u>
Diegan Coastal Sage Scrub (disturbed) (Level IV-V MA)	II	0.68	0.68	1:1	0.68
Diegan Coastal Sage Scrub: Baccharis-Dominated (Level I MA)	II	0.03	0.03	2:1	0.05
Flat-Topped Buckwheat (Level I MA)	II	<0.01	<0.01	2:1	<0.01
Flat-Topped Buckwheat (disturbed) (Level I MA)	II	0.01	0.01	2:1	0.02
<i>Tier III – Common Uplands</i>					
Chamise Chaparral (Level IV, V MA)	IIIA	0.50	0.50	1:1	0.50
Southern Mixed Chaparral (Level III MA)	IIIA	<0.01	<0.01	1:1	<0.01
Non-native Grassland (Level V MA)	IIIB	0.03	0.03	1:1	0.03
<i>Tier IV – Other Uplands</i>					
Urban/Developed	IV	2.49	Temporary disturbance requirements would be implemented through MM-BIO-409(j). No habitat restoration required, however these land covers would be included in the Landscape Plan. Roadways, parking areas, and other active use areas will not be included in the Conceptual Revegetation Plan.		
Non-native Vegetation	IV	0.04			
Extensive Agriculture – Field/Pasture, Row Crops	IV	0.45 <u>0.33</u>			
Disturbed Habitat	IV	4.96 <u>4.90</u>			
Total		13.00<u>13.00</u>	5.34<u>5.25</u>	—	6.27<u>6.14</u>

Notes:

- ¹ To satisfy the INRMP requirements, the City will be conducting ~~6.27~~6.14 acres of habitat enhancement, in addition to the restoration of ~~5.34~~5.25 acres of temporary impact areas within MCAS Miramar.
- ² Enhancement ratios for temporary impacts within MCAS Miramar are based on Table 6.2.2.2a in the INRMP and consideration is given to the Management Area where the vegetation community occurs.

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MM-BIO-2 Habitat Revegetation. Habitat revegetation and erosion control treatments will be installed within temporary disturbance areas in native habitat, in accordance with the San Diego Municipal Code, Land Development Code—Biology Guidelines (City of San Diego 2012) and the San Diego Municipal Code, Land Development Code—Landscape Standards (City of San Diego 2016b). A Habitat Revegetation Plan will be prepared by a Qualified Biological or Restoration Specialist. Habitat revegetation will feature native species that are typical of the area, and erosion control features will include silt fence and straw fiber rolls, where appropriate. The revegetation areas will be monitored and maintained for 25 months to ensure adequate establishment and sustainability of the plantings/seedings.

Revegetation Plan(s) and Specifications:

1. Landscape Construction Documents (LCD) shall be prepared on D-sheets and submitted to the City of San Diego Development Services Department, Landscape Architecture Section (LAS) for review and approval. LAS shall consult with Mitigation Monitoring Coordination (MMC) and obtain concurrence prior to approval of LCD. The LCD shall consist of revegetation, planting, irrigation and erosion control plans; including all required graphics, notes, details, specifications, letters, and reports as outlined below.
2. Landscape Revegetation Planting and Irrigation Plans shall be prepared in accordance with the San Diego Land Development Code (LDC) Chapter 14, Article 2, Division 4, the LDC Landscape Standards submittal requirements, and Attachment “B” (General Outline for Revegetation/ Restoration Plans) of the City of San Diego’s LDC Biology Guidelines (April 2012). The Principal Qualified Biologist (PQB) shall identify and adequately document all pertinent information concerning the revegetation goals and requirements, such as but not limited to, plant/seed palettes, timing of installation, plant installation specifications, method of watering, protection of adjacent habitat, erosion and sediment control, performance/success criteria, inspection schedule by City staff, document submittals, reporting schedule, etc. The LCD shall also include comprehensive graphics and notes addressing the ongoing maintenance requirements (after final acceptance by the City). For areas where a water source is not available, irrigation can be completed by a water truck. Additionally, it is recommended that planting/seeding occur in the fall or early winter, to the maximum extent practical, in order to minimize the amount of water truck visits needed.

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3. The Revegetation Installation Contractor (RIC), Revegetation Maintenance Contractor (RMC), PQB, Construction Manager (CM) and Grading Contractor (GC), where applicable shall be responsible to insure that for all grading and contouring, clearing and grubbing, installation of plant materials, and any necessary maintenance activities or remedial actions required during installation and the 120-day plant establishment period are done per approved LCD. The following procedures at a minimum, but not limited to, shall be performed:
 - a. The RMC shall be responsible for the maintenance of the upland mitigation area for a minimum period of 120 days.
 - b. At the end of the 120-day period the PQB shall review the revegetation area to assess the completion of the short-term plant establishment period and submit a report for approval by MMC. If the 120-day plant establishment period success criteria has not been met, an extension may be warranted at the discretion of the PQB.
 - c. MMC would provide approval in writing to begin the 25-month maintenance and monitoring program.
 - d. Existing indigenous/native species shall not be pruned, thinned or cleared in the revegetation/mitigation area.
 - e. The revegetation site shall not be fertilized.
 - f. The RIC is responsible for reseeding (if applicable) if weeds are not removed, within one week of written recommendation by the PQB.
 - g. Weed control measures shall include the following: (1) hand removal, (2) cutting, with power equipment, and (3) chemical control. Hand removal of weeds is the most desirable method of control and would be used wherever possible.
 - h. Damaged areas shall be repaired immediately by the RIC/RMC. Insect infestations, plant diseases, herbivory, and other pest problems would be closely monitored throughout the 25-month maintenance period. Protective mechanisms such as metal wire netting shall be used as necessary. Diseased and infected plants shall be immediately disposed of off site in a legally-acceptable manner at the discretion of the PQB or Qualified Biological Monitor (City approved). Where possible, biological controls would be used instead of pesticides and herbicides.

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5.2 Sensitive Wildlife Species

Per the San Diego Municipal Code, Land Development Code—Biology Guidelines and the MCAS Miramar INRMP, direct impacts to vegetation communities used by wildlife would be conserved or restored through the implementation of MM-BIO-1a, MM-BIO-1c, and MM-BIO-2, which provide mitigation or restoration for impacts to sensitive vegetation as described in Section 5.1. Special consideration should be given to the timing of construction work. Wildlife is more susceptible to damage or harassment during their growing or breeding season. To minimize impacts to wildlife during active growing and breeding seasons, Section 6.2.2.2 of the INRMP emphasizes the importance of planning construction to avoid performing work during breeding or growing seasons. For vernal pool species the growing/breeding season occurs when soil is wet which depends on annual rainfall typically occurring November through May. For other threatened and endangered species, the growing/breeding season is generally February 15 through August 31. If possible, construction should be planned to avoid the growing/breeding season. Construction-related direct and indirect noise impacts may occur to breeding wildlife, including the federally threatened coastal California gnatcatcher, and other avian species if construction occurs during the breeding season (i.e., February 15 through August 31 for coastal California gnatcatcher, March 15 through September 15 for least Bell's vireo, and February 1 through September 15 for other breeding species). Indirect impacts to wildlife species would be mitigated to a less-than-significant level through MM-BIO-409(a) through MM-BIO-409(i), and MM-BIO-409(k). In addition, the following mitigation measures will be implemented to further reduce indirect impacts to sensitive wildlife species: MM-BIO-2 (provided in Section 5.1), MM-BIO-3, MM-BIO-4b, and MM-BIO-6 provided below.

MM-BIO-3 Nesting Birds. To avoid any direct impacts any species identified as a candidate, sensitive, or special status species in the MSCP or other local or regional plans, policies or regulations, or by the CDFW or USFWS, removal of habitat that supports active nests in the proposed area of disturbance should occur outside of the breeding season for these species (February 1 to September 15). If removal of habitat in the proposed area of disturbance must occur during the breeding season, the Qualified Biologist shall conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction survey shall be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). The applicant shall submit the results of the pre-construction survey to City Development Services Department for review and approval prior to initiating any construction activities. If nesting birds are detected, a letter report or mitigation plan in conformance with the City's Biology Guidelines and applicable state and federal law (i.e.,

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appropriate follow up surveys, monitoring schedules, and construction barriers/buffers, etc.) shall be prepared and include proposed measures to be implemented to ensure that take of birds or eggs is avoided. The report or mitigation plan shall be submitted to the City for review and approval, and implemented to the satisfaction of the City. The City's MMC Section and Biologist shall verify and approve that all measures identified in the report or mitigation plan are in place prior to and/or during construction.

Mitigation requirements outlined in the Section 6.2.2.3 of the INRMP, for construction noise on MCAS Miramar, would be satisfied through implementation of MM-BIO-4b. Potential impacts to any active nests or the young of nesting coastal California gnatcatcher through direct grading of suitable habitat within MCAS Miramar would be mitigated through MM-BIO-4b, which requires preconstruction surveys for coastal California gnatcatcher.

MM-BIO-4b Coastal California Gnatcatcher. Ambient noise levels on MCAS Miramar, in particular in the vicinity of the airfield, exceed typical construction noise level. On MCAS Miramar, construction noise levels are not anticipated to exceed ambient noise levels. Potential impacts associated with construction activities on MCAS Miramar would be mitigated through the following:

1. Qualified Biologist (possessing a valid federal Endangered Species Act (FESA) Section 10(a)(1)(a) Recovery Permit) shall conduct a pre-construction survey within suitable habitat. Between February 15 and August 31, no clearing, grubbing, or grading of occupied coastal California gnatcatcher habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a Qualified Biologist; and
2. For potential impacts associated with construction noise; presence or absence of coastal California gnatcatcher would be determined by pre-construction surveys conducted by a Qualified Biologist adjacent to the Project area. Coastal sage scrub outside of the impact area would be flagged to protect it from construction equipment as directed by the Project Biologist. Between February 15 and August 31 no noise-generating construction activities that exceed ambient noise levels would occur in close proximity to occupied habitat. If necessary other measures shall be implemented in consultation with the Project Biologist as necessary, to reduce noise levels. Measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

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MM-BIO-5 Burrowing Owl. The following is a species-specific mitigation measure, required to meet MSCP Subarea Plan Conditions of Coverage. The mitigation measure would reduce potential impacts to burrowing owl and associated habitat located outside the MHPA (burrowing owl and associated habitat impacts within the MHPA must be avoided).

Prior to Permit or Notice to Proceed Issuance:

1. As this project has been determined to have burrowing owl occupation potential, the Permit Holder shall submit evidence to the Assistant Deputy Director of the City's Entitlements verifying that a Biologist possessing qualifications pursuant to the "Staff Report on Burrowing Owl Mitigation," State of California Natural Resources Agency, California Department of Fish and Game (hereafter referred as CDFG 2012, Staff Report), has been retained to implement a burrowing owl construction impact avoidance program.
2. The Qualified Biologist shall attend the pre-construction meeting to inform construction personnel about the City's burrowing owl requirements and subsequent survey schedule.

Prior to Start of Construction:

1. The Permit Holder and Qualified Biologist must ensure that initial pre-construction/take avoidance surveys of the Project "site" are completed between 14 and 30 days before initial construction activities, including brushing, clearing, grubbing, or grading of the Project site; regardless of the time of the year. "Site" means the Project site and the area within a radius of 450 feet of the Project site. A report detailing the results of the surveys shall be submitted and approved by the Wildlife Agencies and/or City MSCP staff prior to construction or burrowing owl eviction(s) and shall include maps of the Project site and burrowing owl locations on aerial photos.
2. The pre-construction survey shall follow the methods described in CDFG 2012, Staff Report, Appendix D.
3. 24 hours prior to commencement of ground-disturbing activities, the Qualified Biologist shall ~~verify~~ update and report results of pre-construction/take avoidance surveys. Verification shall be provided to the City's MMC Section. If results of the pre-construction surveys have changed and burrowing owl are present in areas not previously identified, immediate notification to the City and Wildlife Agencies shall be provided prior to ground-disturbing activities.

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During Construction:

1. Best Management Practices shall be employed, as burrowing owls are known to use open pipes, culverts, excavated holes, and other burrow-like structures at construction sites. Legally permitted active construction projects which are burrowing owl occupied and have followed all protocol in this mitigation section, or sites within 450 feet of occupied burrowing owl areas, should undertake measures to discourage burrowing owls from recolonizing previously occupied areas or colonizing new portions of the site. Such measures include, but are not limited to, ensuring that the ends of all pipes and culverts are covered when they are not being worked on, and covering rubble piles, dirt piles, ditches, and berms.
2. Ongoing burrowing owl detection—If burrowing owls or active burrows are not detected during the pre-construction surveys, Section “a” below shall be followed. If burrowing owls or burrows are detected during the pre-construction surveys, Section “b” shall be followed. Neither the MSCP Subarea Plan nor this mitigation section allows for any burrowing owls to be injured or killed outside or within the MHPA; in addition, impacts to burrowing owls within the MHPA must be avoided.
 - a. **Post Survey Follow Up if Burrowing Owls and/or Signs of Active Natural or Artificial Burrows Are Not Detected During the Initial Preconstruction Survey.** Monitoring the site for new burrows is required using the protocol in Appendix D of the Burrowing Owl Staff Report (CDFG 2012) for the period following the initial pre-construction survey, until construction is scheduled to be complete and is complete. (NOTE: Using a projected completion date (that is amended if needed) will allow development of a monitoring schedule which adheres to the required number of surveys in the detection protocol.)
 - i. If no active burrows are found but burrowing owls are observed to occasionally (1–3 sightings) use the site for roosting or foraging, they should be allowed to do so with no changes in the construction or construction schedule.
 - ii. If no active burrows are found but burrowing owls are observed, during follow up monitoring to repeatedly (4 or more sightings), using the site for roosting or foraging, the City’s MMC Section shall be notified, and any portion of the site where owls have been sighted and that has not been graded or otherwise disturbed shall be avoided until further notice.

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- iii. If a burrowing owl begins using a burrow on the site at any time after the initial pre-construction survey, procedures described in Section b must be followed.
 - iv. Any actions other than these require the approval of the City and the Wildlife Agencies.
- b. **Post-Survey Follow Up if Burrowing Owls and/or Active Natural or Artificial Burrows are detected during the Initial Preconstruction Survey.** Monitoring the site for new burrows is required using the protocol in Appendix D of the Burrowing Owl Staff Report (CDFG 2012) for the period following the initial pre-construction survey, until construction is scheduled to be complete and is complete. (NOTE: Using a projected completion date (that is amended if needed) will allow development of a monitoring schedule which adheres to the required number of surveys in the detection protocol.)
- i. This section (b) applies only to sites (including biologically defined territory) wholly outside of the MHPA; all direct and indirect impacts to burrowing owls within the MHPA SHALL be avoided.
 - ii. If one or more burrowing owls are using any burrows (including pipes, culverts, debris piles etc.) on or within 300 feet of the proposed construction area, the City's MMC Section shall be contacted. The City's MMC Section shall contact the Wildlife Agencies regarding eviction/collapsing burrows and enlist the appropriate City biologist for ongoing coordination with the Wildlife Agencies and the qualified consulting burrowing owl biologist. No construction shall occur within 300 feet of an active burrow without written concurrence from the Wildlife Agencies. This distance may increase or decrease, depending on the burrow's location in relation to the site's topography and other physical and biological characteristics.
 - 1. Outside the Breeding Season: If the burrowing owl is using a burrow on site outside the breeding season (i.e., September 1 – January 31), the burrowing owl may be evicted after the qualified burrowing owl biologist has determined via fiber optic camera or other appropriate device, that no eggs, young, or adults are in the burrow and written concurrence from the Wildlife Agencies for eviction is obtained prior to implementation.
 - 2. During Breeding Season: If a burrowing owl is using a burrow on site during the breeding season (February 1 to August 31), construction

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shall not occur within 300 feet of the burrow until the young have fledged and are no longer dependent on the burrow, at which time the burrowing owls can be evicted. Eviction requires written concurrence from the Wildlife Agencies prior to implementation.

3. Survey Reporting During Construction: Details of construction surveys and evictions (if applicable) carried out shall be immediately (within 5 working days or sooner) reported to the City's MMC Section and the Wildlife Agencies and must be provided in writing (as by e-mail) and acknowledged to have been received by the required Wildlife Agencies and Development Services Department Staff member(s).

Post Construction:

1. Details of all the surveys and actions undertaken on site with respect to burrowing owls (i.e., occupation, eviction, locations etc.) shall be reported to the City's MMC Section and the Wildlife Agencies within 21 days post-construction and prior to the release of any grading bonds. This report must include summaries of all previous reports for the site and maps of the Project site and burrowing owl locations on aerial photos.

Project construction within 500 feet of Rose Canyon, San Clemente Canyon and any other sensitive riparian areas with suitable habitat may have adverse indirect impacts on least Bell's vireo, southwestern willow flycatcher, and other riparian species if construction occurs during the breeding season from March 15 through September 15 for least Bell's vireo, and May 1 through September 1 for southwestern willow flycatcher, and the species are determined to be present.

MM-BIO-6 Riparian Bird. Prior to the pre-construction meeting, the ADD/MMC shall verify that MHPA boundaries and the project requirements regarding the least Bell's vireo and southwestern willow flycatcher, as specified below, are shown on the construction plans. Additionally, the INRMP states that noisy construction activities should be kept at least 500-feet away from least Bell's vireo nests. This would be implemented through the following mitigation measure.

No clearing, grubbing, grading, or other construction activities shall occur during the least Bell's vireo breeding season (March 15 to September 15) and southwestern willow flycatcher breeding season (May 1 to September 1) until the following requirements have been met to the satisfaction of the ADD/MMC:

1. A Qualified Biologist (possessing a valid Endangered Species Act Section 10(a)(1)(a) Recovery Permit) shall survey those habitat areas within the MHPA

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that would be subject to construction noise levels exceeding 60 decibels [dB(a)] hourly average for the presence of the least Bell's vireo and southwestern willow flycatcher. Surveys for least Bell's vireo and southwestern willow flycatcher, shall be conducted pursuant to the protocol survey guidelines established by the USFWS within the breeding season prior to the commencement of any construction. If least Bell's vireo or southwestern willow flycatcher are present, then the following conditions must be met:

- a. Between March 15 to September 15 for least Bell's vireo and May 1 to September 1 for southwestern willow flycatcher, no clearing, grubbing, or grading of occupied habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a Qualified Biologist; and
- b. Between March 15 to September 15 for least Bell's vireo and May 1 to September 1 for southwestern willow flycatcher, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 dB(A) hourly average at the edge of occupied habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB(A) hourly average at the edge of occupied habitat must be completed by a Qualified Acoustician (possessing current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the ADD/MMC at least 2 weeks prior to the commencement of construction activities. Prior to the commencement of construction activities during the breeding season, areas restricted from such activities shall be staked or fenced under the supervision of a Qualified Biologist; or
- c. At least 2 weeks prior to the commencement of construction activities, under the direction of a Qualified Acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities would not exceed 60 dB(A) hourly average at the edge of habitat occupied by the least Bell's vireo, and/or southwestern willow flycatcher. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB(A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the Qualified Acoustician or Biologist, then the associated construction activities shall cease until such time that adequate noise

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attenuation is achieved or until the end of the breeding season (August 16). Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the Biologist and the ADD/MMC, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

2. If least Bell's vireo, and/or southwestern willow flycatcher are not detected during the protocol survey, the Qualified Biologist shall submit substantial evidence to the ADD/MMC and applicable resource agencies which demonstrates whether or not mitigation measures such as noise walls are necessary between March 15 to September 15 for least Bell's vireo, and May 1 to September 1 for southwestern willow flycatcher, adherence to the following is required:
 - a. If this evidence indicates that the potential is high for least Bell's vireo and/or southwestern willow flycatcher to be present based on historical records or site conditions, then Condition 1(a) shall be adhered to as specified above.
 - b. If this evidence concludes that no impacts to this species are anticipated, no mitigation measures would be necessary.

MM-BIO-8-7 Vernal Pool Watershed. There would be permanent indirect impacts within the PW36, VP697, and VP699 watersheds from air and blow-off valves associated with the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line only if the San Vicente Reservoir Alternative is implemented. As required under the Integrated Natural Resources Management Plan (INRMP), mitigation for permanent indirect impacts from the San Vicente Reservoir Alternative to an occupied watershed (PW36, VP697, and VP699) within the Level I and Level V Management Areas (MAs) would include, enhancement of remaining portions of watershed (protection by temporary fencing or other means, enlarge another portion); monitoring species in pool basin may be necessary to document extent of actual impacts to threatened or endangered species; if impacts are documented to threatened or endangered species, then additional action would be required for indirect impacts to the threatened or endangered species by habitat enhancement, possibly elsewhere; and

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no work around the vernal pool during the rainy season or when ground is wet (about November 1 to June 1). The City typically applies a 100-foot-wide avoidance buffer surrounding wetland resources; however, the width of the buffer may be determined on a case-by-case basis depending on the need and value. Therefore, no work within a 100-foot buffer around the vernal pool is permitted during the rainy season or when the ground is wet (about November 1 to June 1), unless it is determined that a reduced buffer is more appropriate.

5.3 Jurisdictional Resources

Implementation of San Vicente Reservoir Alternative would result in the permanent loss of jurisdictional aquatic resources under the jurisdiction of the ACOE, RWQCB and/or CDFW as well as wetlands under the jurisdiction of the City of San Diego. No impacts to jurisdictional resources would occur under the Miramar Reservoir Alternative. Unavoidable impacts would be mitigated in accordance with the ratios defined by the City's Biology Guidelines (see Section 5.1). Indirect impacts to jurisdictional resources would be mitigated to a less-than-significant level through AMM - BIO-1 through MM-BIO-109(g), MM-BIO-109(j) and MM-BIO-109(k), provided in Section 5.5. In addition, mitigation measure MM-BIO-1c would be implemented to further reduce impacts to jurisdictional resources (see Section 5.1).

MM-BIO-98 The owner/permittee shall provide evidence that all required regulatory permits, such as those required under Section 404 of the federal Clean Water Act, Section 1600 of the California Fish and Game Code, and the Porter-Cologne Water Quality Control Act, have been obtained.

5.4 Wildlife Corridors

Table 6.2.2.2b in the INRMP states that mitigation for permanent habitat loss within chaparral, coastal sage scrub and riparian habitat types would require maintaining a minimum width of 500 feet for wildlife movement corridors within MA Levels I, II, and III. There would be permanent impacts only from the San Vicente Reservoir Alternative within both Rose Canyon and San Clemente Canyon in both the Level I and II MA. However, these impacts are very minimal (<0.01 acre) and would not obstruct or prevent wildlife movement in either canyon; therefore, no mitigation is required.

5.5 Mitigation Measures for Indirect Impacts

Potential indirect impacts to biological resources as a result of the current North City Project are related to overall project construction activities and may include dust, construction-related noise, general human presence, introduction of non-native species, and construction-related soil erosion and runoff. Indirect impacts to vegetation communities would be avoided with the implementation of the

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following mitigation measures provided in MM-BIO-409(a) through MM-BIO-409(g), MM-BIO-409(j), and MM-BIO-409(k). In addition, MM-BIO-2 which requires the restoration of temporarily disturbed areas (see Section 5.1), would be implemented to further reduce indirect impacts to sensitive vegetation communities. Wildlife may also be indirectly affected by construction-related noise, which can disrupt normal activities, cause lasting stress, and subject wildlife to higher predation risks. Indirect impacts to sensitive wildlife would be avoided with the implementation of the follow mitigation measures provided in MM-BIO-409(a) through MM-BIO-409(i), and MM-BIO-409(k), as well as MM-BIO-4 and MM-BIO-6 provided in Section 5.2. A biological monitor will be present during construction within or adjacent to sensitive resources. Through the mitigation measures described in MM-BIO-409(a) through MM-BIO-409(g), the biological monitor would ensure that project adheres to and implements the appropriate measures to protect sensitive resources. All areas that contain steep-walled trenches or excavations left open overnight could entrap wildlife moving through the site, which would be significant but would be reduced with implementation of MM-BIO-409(h). Additionally, construction-related nighttime lighting could affect nocturnal species but would be reduced to less than significant with implementation of MM-BIO-409(i). Indirect impacts to vernal pools along the North City Pipeline, MBC, LFG Pipeline, and the San Vicente Pipeline - Repurposed 36-inch Recycled Water Line would be avoided through implementation of avoidance and minimization measures MM-BIO-9(l) through MM-BIO-9(q), which were taken directly from the Final VPHCP.

In order to avoid and minimize indirect impacts to sensitive resources, the following mitigation measures would be implemented throughout the North City Project:

MM-BIO-409 The following measures will be included in the design and construction documents for each Project component to reduce potential impacts to sensitive resources:

- a. **Qualified Biologist.** The owner/permittee shall provide a letter to the City's Mitigation Monitoring Coordination (MMC) section stating that a Project Biologist (Qualified Biologist) as defined in the City of San Diego Municipal Code, Land Development Code—Biology Guidelines (City of San Diego 2012), has been retained to implement the project's biological monitoring program. The letter shall include the names and contact information of all persons involved in the biological monitoring of the project.
- b. **Preconstruction Meeting.** The Qualified Biologist shall attend the pre-construction meeting, discuss the project's biological monitoring program, and arrange to perform any follow up mitigation measures and reporting including site-specific monitoring, restoration or revegetation, and additional fauna/flora surveys/salvage.

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- c. **Documentation.** The Qualified Biologist shall submit all required documentation to MMC verifying that any special mitigation reports including but not limited to, maps, plans, surveys, survey timelines, or buffers are completed or scheduled per City Biology Guidelines, Multiple Species Conservation Program (MSCP), Environmentally Sensitive Lands Ordinance, project permit conditions; California Environmental Quality Act (CEQA); National Environmental Policy Act (NEPA); endangered species acts (federal Endangered Species Act and California Endangered Species Act); and/or other local, state or federal requirements.
- d. **Biological Construction Mitigation/Monitoring Exhibit.** The Qualified Biologist shall present a Biological Construction Mitigation/Monitoring Exhibit (BCME), which includes the biological documents above. In addition, the BCME would include: restoration/revegetation plans, plant salvage/relocation requirements (e.g. burrowing owl exclusions, etc.), avian or other wildlife surveys/survey schedules (including general avian nesting and U.S. Fish and Wildlife (USFWS) protocol), timing of surveys, wetland buffers, avian construction avoidance areas/noise buffers/ barriers, other impact avoidance areas, and any subsequent requirements determined by the Qualified Biologist and the City Assistant Deputy Director (ADD)/MMC. The BCME shall include a site plan, written and graphic depiction of the Project's biological mitigation/monitoring program, and a schedule. The BCME shall be approved by MMC and referenced in the construction documents.
- e. **Construction Fencing.** Prior to construction activities, the Qualified Biologist shall supervise the placement of orange construction fencing or equivalent along the limits of disturbance adjacent to sensitive biological habitats and verify compliance with any other project conditions as shown on the BCME. This phase shall include flagging plant specimens and delineating buffers to protect sensitive biological resources (e.g., habitats/flora & fauna species, including nesting birds) during construction. Appropriate steps/care should be taken to minimize attraction of nest predators to the site.
- f. **On-site Education.** Prior to commencement of construction activities, the Qualified Biologist shall meet with the owner/permittee or designee and the construction crew and conduct an on-site educational session regarding the need to avoid impacts outside of the approved construction area and to protect sensitive flora and fauna (e.g., explain the avian and wetland buffers, flag system for removal of invasive species or retention of sensitive plants, and clarify acceptable access routes/methods and staging areas).

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- g. **Biological Monitoring.** During construction, a Qualified Biologist would be present to assist in the avoidance of impacts to native vegetation, jurisdictional aquatic resources, sensitive plants and wildlife, and nesting birds. Specific biological monitoring and or mitigation measures for sensitive wildlife, sensitive vegetation communities, and jurisdictional aquatic resources are described further in the mitigation measures.
- h. **Cover Trenches.** General biological monitoring shall include verifying that the contractor has covered all steep-walled trenches or excavations over night or after shift. If trenches or excavations cannot be covered, the monitor would verify that the contractor has installed exclusionary fencing (e.g., silt fence) around the trenches or excavation areas or installed ramps to prevent entrapment of wildlife (e.g., reptiles and mammals). If animals are encountered within any trenches or excavated areas, they would be removed by the biological monitor, if possible, or provided with a means of escape (e.g., a ramp or sloped surface) and allowed to disperse. In addition, the biological monitor would provide training to construction personnel to increase awareness of the possible presence of wildlife beneath vehicles and equipment and to use best judgment to avoid killing or injuring wildlife. The biological monitor would be available to assist with moving wildlife, if necessary.
- i. **Nighttime Construction.** To reduce impacts to nocturnal species in those areas where they have a potential to occur, nighttime construction activity within undeveloped areas containing sensitive biological resources would be minimized whenever feasible and shielded lights would be utilized when necessary. Construction nighttime lighting would be subject to City Outdoor Lighting Regulations per San Diego Land Development Code (LDC) Section 142.0740.
- j. **BMPs/Erosion/Runoff.** The City will incorporate methods to control runoff, including a Stormwater Pollution Prevention Plan (SWPPP) to meet National Pollutant Discharge Elimination System (NPDES) regulations or batch discharge permit from the City. Implementation of stormwater regulations are expected to substantially control adverse edge effects (e.g., erosion, sedimentation, habitat conversion) during and following construction both adjacent and downstream from the study area. Typical construction best management practices (BMPs) specifically related to reducing impacts from dust, erosion, and runoff generated by construction activities would be implemented. During construction, material stockpiles shall be placed such that they cause minimal interference with on-site drainage patterns. This will protect sensitive vegetation from being inundated with sediment-laden runoff. Dewatering shall be conducted in accordance with

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standard regulations of the Regional Water Quality Control Board (RWQCB). An NPDES permit, issued by the RWQCB to discharge water from dewatering activities, shall be required prior to start of dewatering. This will minimize erosion, siltation, and pollution within sensitive communities. Design of drainage facilities shall incorporate long-term control of pollutants and stormwater flow to minimize pollution and hydrologic changes.

- k. **Toxics/Project Staging Areas/Equipment Storage.** No trash, oil, parking, or other construction/development-related material/activities shall be allowed outside any approved construction limits. Where applicable, this requirement shall be incorporated into leases on publicly owned property when applications for renewal occur.
- l. **Silt Fencing.** Covered projects shall require temporary fencing (with silt barriers) of the limits of project impacts (including construction staging areas and access routes) to prevent additional vernal pool impacts and prevent the spread of silt from the construction zone into adjacent vernal pools. Fencing shall be installed in a manner that does not impact habitats to be avoided. Final construction plans shall include photographs that show the fenced limits of impact and all areas of vernal pools to be impacted or avoided. If work inadvertently occurs beyond the fenced or demarcated limits of impact, all work shall cease until the problem has been remedied to the satisfaction of the City. Temporary construction fencing shall be removed upon project completion.
- m. **Dust.** Impacts from fugitive dust that may occur during construction grading shall be avoided and minimized through watering and other appropriate measures.
- n. **Vernal Pool Biologist.** A qualified monitoring biologist that has been approved by the City shall be on-site during project construction activities to ensure compliance with all mitigation measures identified in the CEQA environmental document. The biologist shall be knowledgeable of vernal pool species biology and ecology. The biologist shall perform the following duties:
 - a. Oversee installation of and inspect the fencing and erosion control measures within or upslope of vernal pool restoration and/or preservation areas a minimum of once per week and daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately.
 - b. Periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust.

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- c. Train all contractors and construction personnel on the biological resources associated with this project and ensure that training is implemented by construction personnel. At a minimum, training shall include (1) the purpose for resource protection; (2) a description of the vernal pool species and their habitat(s); (3) the conservation measures that must be implemented during project construction to conserve the vernal pool species, including strictly limiting activities, and vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the project site by fencing); (4) environmentally responsible construction practices as outlined in measures 5, 6 and 7; (5) the protocol to resolve conflicts that may arise at any time during the construction process; and (6) the general provisions of the project's mitigation monitoring and reporting program (MMRP), the need to adhere to the provisions of FESA, and the penalties associated with violating FESA.
- d. Halt work, if necessary, and confer with the City to ensure the proper implementation of species and habitat protection measures. The biologist shall report any violation to the City within 24 hours of its occurrence.
- e. Submit regular (e.g., weekly) letter reports to the City during project construction and a final report following completion of construction. The final report shall include as-built construction drawings with an overlay of habitat that was impacted and avoided, photographs of habitat areas that were avoided, and other relevant summary information documenting that authorized impacts were not exceeded and that general compliance with all conservation measures was achieved.
- o. **Limits of Work.** The following conditions shall be implemented during project construction:
 - a. Employees shall strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint.
 - b. The project site shall be kept as clean of debris as possible. All food-related trash items shall be enclosed in sealed containers and regularly removed from the site.
 - c. Disposal or temporary placement of excess fill, brush, or other debris shall be limited to areas within the fenced project footprint.

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- p. **Equipment Staging.** All equipment maintenance, staging, and dispensing of fuel, oil, coolant, or any other such activities shall occur in designated areas within the fenced project impact limits. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner as to prevent any runoff from entering the vernal pools or their watersheds, and shall be shown on the construction plans. Fueling of equipment shall take place within existing paved areas greater than 100 feet from the vernal pools or their watersheds. Contractor equipment shall be checked for leaks prior to operation and repaired as necessary. A spill kit for each piece of construction equipment shall be on-site and must be used in the event of a spill. “No-fueling zones” shall be designated on construction plans.
- q. **Grading Activities.** Grading activities immediately adjacent to vernal pools shall be timed to avoid wet weather to minimize potential impacts (e.g., siltation) to the vernal pools unless the area to be graded is at an elevation below the pools. To achieve this goal, grading adjacent to avoided pools shall comply with the following:
- a. Grading shall occur only when the soil is dry to the touch both at the surface and 1 inch below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and 1 inch below indicates whether the soil is dry.
 - b. After a rain of greater than 0.2 inch, grading shall occur only after the soil surface has dried sufficiently as described above, and no sooner than 2 days (48 hours) after the rain event ends.
 - c. To prevent erosion and siltation from storm water runoff due to unexpected rains, best management practices (i.e., silt fences) shall be implemented as needed during grading.
 - d. If rain occurs during grading, work shall stop and resume only after soils are dry, as described above.
 - e. Grading shall be done in a manner to prevent runoff from entering preserved vernal pools.
 - f. If necessary, water spraying shall be conducted at a level sufficient to control fugitive dust but not to cause runoff into vernal pools.
 - g. If mechanized grading is necessary, grading shall be performed in a manner to minimize soil compaction (i.e., use the smallest type of equipment needed to feasibly accomplish the work).

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6 COMPLIANCE AND ENFORCEMENT

6.1 Compliance

MCAS Miramar has developed Marine Station Order 5090.4 (Chapter 10), Environmental Compliance Program Standard Operating Procedures (ECPSOP) to provide a clear and concise document, in the form of environmental compliance and protection standard operating procedures, to assist Station activities and tenant commands/units in complying with pertinent environmental programs so that they may perform their missions in an environmentally sound manner and in accordance with installation-unique requirements.

MCAS Miramar Station Order 5090.4 states that persons operating aboard MCAS Miramar have a responsibility to protect and conserve natural resources by observing the following restrictions and reporting violations to the Director, Natural Resources Division or higher level in the Station chain of command:

- a. Reference the Environmental Management Department Sensitive Resources Map prior to conducting activities outside of developed areas of the Station.
- b. Units conducting military training shall comply with the MCAS Miramar Training Regulations.
- c. Do not dig, alter, fill or contaminate wetlands or stream channels without Environmental Management Department approval and applicable CWA permits.
- d. Restrict vehicular traffic to maintained roadways (dirt or paved) and fuel breaks in East Miramar. Avoid driving off of improved road surfaces, particularly during periods when the ground is wet or saturated.
- e. Submit plans for any facility or grounds alterations to the Environmental Management Department for review and approval.
- f. Ensure proper planning so that all necessary ESA consultations and CWA permits are completed prior to undertaking an action that may affect threatened and/or endangered species, wetlands, or other waterways (including ephemeral and intermittent stream channels).
- g. Ensure that any commitments made by the Section 7, ESA consultations and/or CWA permits are included and funded as a part of any applicable proposed actions (projects, maintenance, real estate agreement, etc.).
- h. Incorporate locally adapted, native plants or other climatically adapted species into landscaping plans to reduce maintenance and watering requirements and prohibit use

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of invasive plant species. Incorporate removal of invasive species with project plans, where feasible.

- i. Do not harm or damage native species of plants or wildlife. Harassment of threatened, endangered, or other wildlife is prohibited except when presenting an imminent danger to the safety of personnel.
- j. Contact the Public Works Trouble Desk for assistance with removal of rattlesnakes, pests, and injured wildlife.
- k. Coordinate with the Station Wildlife Biologist regarding bird nesting problems and methods to discourage or exclude nesting in problematic areas. Focused harassment and or relocation of birds in problem areas may be authorized by the Station Wildlife Biologist.
- l. An SOP for Dead and Injured Large Wildlife is posted on the Natural Resources Program page of the MCAS Miramar EMS website.
- m. Do not dispose of green waste or surplus soil in undeveloped lands of the Station.
- n. Report vandalism or habitat destruction to the Director, Natural Resources Division.

6.2 Enforcement

The Environmental Management Department provides technical support to plan for and address environmental compliance for all Station activities. Compliance for project implementation and maintenance activities is achieved through the Public Works Division site approval process, including compliance with NEPA, ESA, Migratory Bird Treaty Act, National Historic Preservation Act, and the Archaeological Resources Protection Act. Compliance with natural and cultural resources laws and regulations needed for accidental or unintentional impacts will be achieved through the Environmental Management Department, in coordination with the responsible parties, legal counsel, and the Provost Marshal's Office, as appropriate.

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APPENDIX A

*Sensitive Plant Species Potential to Occur
in the North City Project Components Study Area
within MCAS Miramar*

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Sensitive Plant Species Potential to Occur in the North City Project Components Study Area within MCAS Miramar

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Abronia maritima</i>	red sand- verbena	None/None/4.2/None/None	Coastal dunes/perennial herb/Feb–Nov/0–328	X	X	X	X	Not expected to occur. No suitable coastal dune vegetation present.
<i>Acanthomintha ilicifolia</i>	San Diego thorn- mint	FT/CE/1B.1/Covered, Narrow Endemic/Listed	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay, openings/annual herb/Apr–June/33–3150	X	X	L	L	Low potential to occur in project components with suitable vegetation and clay soils. However, focused surveys for this species were negative. Not expected to occur in project components lacking suitable vegetation and/or clay soils.
<i>Acmispon prostratus</i>	Nuttall's acmispon	None/None/1B.1/Covered/None	Coastal dunes, coastal scrub (sandy)/annual herb/Mar–June (July)/0–33	X	X	X	X	Not expected to occur along project components farther from the coast.
<i>Adolphia californica</i>	California adolphia	None/None/2B.1/None/None	Chaparral, coastal scrub, valley and foothill grassland; clay/perennial deciduous shrub/Dec– May/148–2428	X	X	L	L	Low potential to occur in project components with suitable vegetation and clay soils. This perennial shrub would likely have been observed during surveys if present. Not expected to occur in project components lacking suitable vegetation and/or clay soils.
<i>Agave shawii</i> var. <i>shawii</i>	Shaw's agave	None/None/2B.1/Covered, Narrow Endemic/None	Coastal bluff scrub, coastal scrub/perennial leaf succulent/Sep–May/33–394	L	L	L	L	Low potential to occur within project components with suitable coastal scrub habitat. The project site has suitable vegetation and soils, but closest occurrences within San Diego County are only at two localities, Point Loma and Tijuana. Not expected to occur within project components lacking suitable coastal scrub habitat or outside of the species' known elevation range.
<i>Ambrosia chenopodiifolia</i>	San Diego bur-sage	None/None/2B.1/None/None	Coastal scrub/perennial shrub/Apr–June/180– 509	L	L	L	L	Low potential to occur in project components with coastal scrub. However, this perennial shrub would have been observed during surveys if present. Not expected to occur in project components lacking coastal scrub habitat or Miramar Wastewater Treatment Plant Improvements, which is outside of the species' known elevation range.
<i>Ambrosia monogyra</i>	singlewhorl burrobrush	None/None/2B.2/None/None	Chaparral, Sonoran desert scrub; sandy/perennial shrub/Aug–Nov/33–1640	X	L	L	L	Low potential to occur in components with suitable sandy chaparral habitat; however, this perennial shrub would likely have been observed if present. Not expected to occur in project components lacking sandy chaparral.
<i>Ambrosia pumila</i>	San Diego ambrosia	FE/None/1B.1/Covered, Narrow Endemic/Listed	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; sandy loam or clay, often in disturbed areas, sometimes alkaline/perennial rhizomatous herb/Apr– Oct/66–1362	L	L	L	L	Low potential to occur in project components with suitable vegetation and sandy loam or clay soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable vegetation and/or sandy loam or clay soils.
<i>Aphanisma blitoides</i>	aphanisma	None/None/1B.2/Covered/None	Coastal bluff scrub, coastal dunes, coastal scrub; sandy or gravelly/annual herb/Mar– June/3–1001	X	X	X	X	Low potential to occur along the Morena Pipelines. Not expected to occur in other project components farther from the coast.
<i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i>	Del Mar manzanita	FE/None/1B.1/Covered/Listed	Chaparral (maritime, sandy)/perennial evergreen shrub/Dec–June/0–1198	X	X	X	X	Not expected to occur. No maritime chaparral present.
<i>Arctostaphylos otayensis</i>	Otay manzanita	None/None/1B.2/Covered/None	Chaparral, cismontane woodland; metavolcanic/perennial evergreen shrub/Jan– Apr/902–5577	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Artemisia palmeri</i>	San Diego sagewort	None/None/4.2/None/Listed	Chaparral, coastal scrub, riparian forest, riparian scrub, riparian woodland; sandy, mesic/perennial deciduous shrub/(Feb) May– Sep/49–3002	L	L	<u>DL</u>	<u>DL</u>	Observed along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur within the other components; would have been observed during surveys if present. Not expected to occur within project components lacking suitable habitat.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Asplenium vesperinum</i>	western spleenwort	None/None/4.2/None/None	Chaparral, cismontane woodland, coastal scrub; rocky/perennial rhizomatous herb/Feb–June/591–3281	L	X	X	X	Low potential to occur in project components with suitable vegetation within the known elevation range of the species. Focused surveys were negative for this species. Not expected to occur within project components lacking suitable habitat and/or outside the known elevation range of the species.
<i>Astragalus deanei</i>	Dean's milk-vetch	None/None/1B.1/None/None	Chaparral, cismontane woodland, coastal scrub, riparian forest/perennial herb/Feb–May/246–2280	L	L	L	L	Low potential to occur within project components with suitable habitat within the species' known elevation range. The most recent (since 1995) occurrences for this species occur with the Cleveland National Forest or Dehesa. Not expected to occur within project components lacking suitable habitat or outside of the species' known elevation range.
<i>Astragalus oocarpus</i>	San Diego milk-vetch	None/None/1B.2/None/None	Chaparral (openings), cismontane woodland/perennial herb/May–Aug/1001–5000	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Astragalus tener</i> var. <i>titi</i>	coastal dunes milk-vetch	FE/CE/1B.1/Covered, Narrow Endemic/None	Coastal bluff scrub (sandy), coastal dunes, coastal prairie (mesic); often vernal mesic areas/annual herb/Mar–May/3–164	X	X	X	X	Not expected to occur. No suitable vegetation present and this species generally occurs along the coast.
<i>Atriplex coulteri</i>	Coulter's saltbush	None/None/1B.2/None/None	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland; alkaline or clay/perennial herb/Mar–Oct/10–1509	L	X	L	L	Low potential to occur in project components with suitable vegetation within the known elevation range of the species. Focused surveys were negative for this species. Not expected to occur within project components lacking suitable habitat and/or outside the known elevation range of the species.
<i>Atriplex pacifica</i>	South Coast saltscale	None/None/1B.2/None/None	Coastal bluff scrub, coastal dunes, coastal scrub, playas/annual herb/Mar–Oct/0–459	L	L	L	L	Low potential to occur in project components with suitable vegetation within the known elevation range of the species. Focused surveys were negative for this species. Not expected to occur within project components lacking suitable habitat and/or outside the known elevation range of the species.
<i>Atriplex parishii</i>	Parish's brittlescale	None/None/1B.1/None/None	Chenopod scrub, playas, vernal pools; alkaline/annual herb/June–Oct/82–6234	X	X	L	L	Low potential to occur within project components with vernal pools. Not expected to occur in other project components due to lack of suitable vegetation.
<i>Baccharis vanessae</i>	Encinitas baccharis	FT/CE/1B.1/Covered/Listed	Chaparral (maritime), cismontane woodland; sandstone/perennial deciduous shrub/Aug–Nov/197–2362	X	X	X	X	Not expected to occur. Perennial shrub would have been observed during surveys if present and all occurrences of this species are north of the project alignment (CDFW 2016).
<i>Berberis nevini</i>	Nevin's barberry	FE/CE/1B.1/Covered/None	Chaparral, cismontane woodland, coastal scrub, riparian scrub; sandy or gravelly/perennial evergreen shrub/Mar–June/230–2707	L	L	L	L	Low potential to occur in areas with suitable vegetation and soils. Perennial shrub would have been observed during surveys if present.
<i>Bergerocactus emoryi</i>	golden-spined cereus	None/None/2B.2/None/None	Closed-cone coniferous forest, chaparral, coastal scrub; sandy/perennial stem succulent/May–June/10–1296	L	L	L	L	Low potential to occur in areas with suitable vegetation and soils. Perennial shrub would have been observed during surveys if present.
<i>Bloomeria clevelandii</i>	San Diego goldenstar	None/None/1B.1/Covered/Listed	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay/perennial bulbiferous herb/Apr–May/164–1526	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Brodiaea filifolia</i>	thread-leaved brodiaea	FT/CE/1B.1/Covered/None	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools; often clay/perennial bulbiferous herb/Mar–June/82–3675	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Brodiaea orcuttii</i>	Orcutt's brodiaea	None/None/1B.1/Covered/Listed	Closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools; mesic, clay, sometimes serpentinite/perennial bulbiferous herb/May-July/98-5551	L	L	D	D	Observed along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in most other project components. Species would have been observed during surveys if present. Not expected to occur in project components lacking suitable habitat.
<i>Calamagrostis koelerioides</i>	Fire reedgrass	None/None/None/Covered/None	Chaparral, meadows and seeps; slopes, dry hills, ridges/perennial grass/June-Aug/0-7546	L	L	L	L	Low potential to occur in components with suitable chaparral habitat; however, this species was not observed during focused surveys. Not expected to occur in project components lacking chaparral.
<i>Calandrinia breweri</i>	Brewer's calandrinia	None/None/4.2/None/None	Chaparral, coastal scrub; sandy or loamy, disturbed sites and burns/annual herb/Mar-June/33-4003	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>California macrophylla</i>	round-leaved filaree	None/None/1B.2/None/None	Cismontane woodland, valley and foothill grassland; clay/annual herb/Mar-May/49-3937	L	X	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Calochortus dunnii</i>	Dunn's mariposa lily	None/CR/1B.2/Covered/None	Closed-cone coniferous forest, chaparral, valley and foothill grassland; gabbroic or metavolcanic, rocky/perennial bulbiferous herb/(Feb) Apr-June/607-6004	L	X	X	X	Low potential to occur along the NCPW Pipeline; not observed during focused surveys. Not expected to occur in project components below the species' known elevation range.
<i>Camissoniopsis lewisii</i>	Lewis' evening-primrose	None/None/3/None/None	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy or clay/annual herb/Mar-May (June)/0-984	L	L	L	L	Low potential to occur in project components with suitable habitat. Species would have been observed during surveys if present.
<i>Castilleja plagiotoma</i>	Mojave paintbrush	None/None/4.3/None/None	Great Basin scrub (alluvial), Joshua tree woodland, lower montane coniferous forest, pinyon and juniper woodland/perennial herb (hemiparasitic)/Apr-June/984-8202	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present.
<i>Caulanthus heterophyllus</i>	California mustard	None/None/None/Covered/None	Coastal scrub, chaparral; dry, open, generally after fire, disturbance/annual herb/Mar-May/0-4593	L	L	L	L	Low potential to occur in project components with suitable habitat. Species would have been observed during surveys if present.
<i>Ceanothus cyaneus</i>	Lakeside ceanothus	None/None/1B.2/Covered/None	Closed-cone coniferous forest, chaparral/perennial evergreen shrub/Apr-June/771-2477	X	X	X	X	Not expected to occur to occur. This site is outside of the species' known elevation range.
<i>Ceanothus otayensis</i>	Otay Mountain ceanothus	None/None/1B.2/None/Listed	Chaparral (metavolcanic or gabbroic)/perennial evergreen shrub/Jan-Apr/1969-3609	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Ceanothus verrucosus</i>	wart-stemmed ceanothus	None/None/2B.2/Covered/Listed	Chaparral/perennial evergreen shrub/Dec-May/3-1247	L	D	D	D	Observed within the buffer around the Metropolitan Biosolids Center and along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in all other components with chaparral habitat where focused surveys were negative. Not expected to occur in project components lacking chaparral.
<i>Centromadia parryi</i> ssp. <i>australis</i>	southern tarplant	None/None/1B.1/None/None	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), vernal pools/annual herb/May-Nov/0-1575	L	X	L	L	Low potential to occur due to limited suitable vernal mesic habitat and because it was not observed during 2016 rare plant surveys. In addition, all occurrences of southern tarplant are north of the project site (CDFW 2016). Not expected to occur in project components lacking suitable habitat.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Centromadia pungens</i> ssp. <i>laevis</i>	smooth tarplant	None/None/1B.1/None/None	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland; alkaline/annual herb/Apr–Sep/0–2100	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>	Orcutt's pincushion	None/None/1B.1/None/None	Coastal bluff scrub (sandy), coastal dunes/annual herb/Jan–Aug/0–328	X	X	X	X	Not expected to occur. No suitable vegetation present. This species generally occurs along the coast.
<i>Chamaebatia australis</i>	southern mountain misery	None/None/4.2/None/None	Chaparral (gabbroic or metavolcanic)/perennial evergreen shrub/Nov–May/984–3346	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>	salt marsh bird's-beak	FE/CE/1B.2/Covered/None	Coastal dunes, marshes and swamps (coastal salt)/annual herb (hemiparasitic)/May–Oct/0–98	X	X	X	X	Not expected to occur. No suitable coastal dune or coastal salt marsh vegetation present.
<i>Chorizanthe leptotheca</i>	Peninsular spineflower	None/None/4.2/None/None	Chaparral, coastal scrub, lower montane coniferous forest; alluvial fan, granitic/annual herb/May–Aug/984–6234	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Chorizanthe orcuttiana</i>	Orcutt's spineflower	FE/CE/1B.1/None/Listed	Closed-cone coniferous forest, chaparral (maritime), coastal scrub; sandy openings/annual herb/Mar–May/10–410	X	L	L	L	Low potential to occur within project components with chaparral and coastal sage scrub and sandy soils. However, focused surveys for this species were negative. Not expected to occur within project components lacking suitable sandy habitat.
<i>Chorizanthe polygonoides</i> var. <i>longispina</i>	long-spined spineflower	None/None/1B.2/None/Listed	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools; often clay/annual herb/Apr–July/98–5020	L	D	D	D	Observed within the buffer around the Metropolitan Biosolids Center and along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in all other components that have chaparral, coastal scrub, grassland, or vernal pools with clay soils. Not expected to occur in project components that lack such suitable habitat.
<i>Cistanthe maritima</i>	seaside cistanthe	None/None/4.2/None/None	Coastal bluff scrub, coastal scrub, valley and foothill grassland; sandy/annual herb/(Feb) Mar–June (Aug)/16–984	X	X	X	X	Not expected to occur in other project components that are farther from the coast since this species is known to occur at locales with moist sea breezes (Reiser 2001).
<i>Clarkia delicata</i>	delicate clarkia	None/None/1B.2/None/None	Chaparral, cismontane woodland; often gabbroic/annual herb/Apr–June/771–3281	X	X	X	X	Not expected to occur in project components because they are below the species' known elevation range.
<i>Clinopodium chandleri</i>	San Miguel savory	None/None/1B.2/Covered/None	Chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland; rocky, gabbroic, or metavolcanic/perennial shrub/Mar–July/394–3527	L	L	L	L	Low potential to occur in project components that contain suitable habitat within the correct elevation range due to negative focused surveys due to limited suitable habitat and not observed during 2016 rare plant surveys. Not expected to occur in project components that lack suitable habitat and/or that are outside the known elevation range for this species.
<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>	summer holly	None/None/1B.2/None/Listed	Chaparral, cismontane woodland/perennial evergreen shrub/Apr–June/98–2592	L	L	L	D	Observed along the Repurposed 36" Pipeline. Low potential to occur in most project components with chaparral or oak woodland because this shrub would have been observed during if present. Not expected to occur in components without suitable chaparral or oak woodland habitat.
<i>Convolvulus simulans</i>	small-flowered morning-glory	None/None/4.2/None/None	Chaparral (openings), coastal scrub, valley and foothill grassland; clay, serpentinite seeps/annual herb/Mar–July/98–2297	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Corethrogyne filaginifolia</i> var. <i>incana</i>	San Diego sand aster	None/None/1B.1/None/None	Coastal bluff scrub, chaparral, coastal scrub/perennial herb/June–Sep/10–377	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils and within the elevation range of this species. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat and/or outside the known elevation range for this species.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Corethrogyne filaginifolia</i> var. <i>linifolia</i>	Del Mar Mesa sand aster	None/None/1B.1/Covered/None	Coastal bluff scrub, chaparral (maritime, openings), coastal scrub; sandy/perennial herb/May-Sep/49-492	L	L	L	L	Low potential to occur. Coastal sage scrub present in many components, but Del Mar Mesa sand aster occurrences are all north of the proposed project and focused surveys were negative.
<i>Cryptantha wigginsii</i>	Wiggins' cryptantha	None/None/1B.2/None/None	Coastal scrub; often clay/annual herb/Feb-June/66-902	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Cylindropuntia californica</i> var. <i>californica</i>	snake cholla	None/None/1B.1/Covered, Narrow Endemic/None	Chaparral, coastal scrub/perennial stem succulent/Apr-May/98-492	L	L	L	L	Low potential to occur in project components with suitable chaparral and/or coastal scrub. Perennial succulent would have been observed during surveys if present.
<i>Deinandra conjugens</i>	Otay tarplant	FT/CE/1B.1/Narrow Endemic/None	Coastal scrub, valley and foothill grassland; clay/annual herb/May-June/82-984	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Deinandra paniculata</i>	paniculate tarplant	None/None/4.2/None/None	Coastal scrub, valley and foothill grassland, vernal pools; usually vernal mesic, sometimes sandy/annual herb/Apr-Nov/82-3084	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Dichondra occidentalis</i>	western dichondra	None/None/4.2/None/None	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland/perennial rhizomatous herb/(Jan) Mar-July/164-1640	L	L	L	L	Low potential to occur in most project components due to negative focused surveys. Not expected to occur in project components lacking suitable habitat.
<i>Dicranostegia orcuttiana</i>	Orcutt's bird's-beak	None/None/2B.1/Covered/None	Coastal scrub/annual herb (hemiparasitic)/(Mar) Apr-July (Sep)/33-1148	L	L	L	L	Low potential to occur in project components with suitable coastal scrub. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable coastal scrub.
<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	Blochman's dudleya	None/None/1B.1/None/None	Coastal bluff scrub, chaparral, coastal scrub, valley and foothill grassland; rocky, often clay or serpentinite/perennial herb/Apr-June/16-1476	L	L	L	L	Low potential to occur within components with suitable habitat. Species would have been observed during surveys if present. Not expected to occur in project components with no suitable habitat.
<i>Dudleya brevifolia</i>	short-leaved dudleya	None/CE/1B.1/Covered, Narrow Endemic/None	Chaparral (maritime, openings), coastal scrub; Torrey sandstone/perennial herb/Apr-May/98-820	X	X	X	X	Not expected to occur. No Torrey sandstone soils within the proposed project.
<i>Dudleya variegata</i>	variegated dudleya	None/None/1B.2/Covered, Narrow Endemic/Listed	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/perennial herb/Apr-June/10-1903	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Dudleya viscida</i>	sticky dudleya	None/None/1B.2/Covered/None	Coastal bluff scrub, chaparral, cismontane woodland, coastal scrub; rocky/perennial herb/May-June/33-1804	L	L	L	L	Low potential to occur within components with suitable habitat. Species would have been observed during surveys if present. Not expected to occur in project components with no suitable habitat.
<i>Ericameria palmeri</i> var. <i>palmeri</i>	Palmer's goldenbush	None/None/1B.1/Covered/None	Chaparral, coastal scrub; mesic/perennial evergreen shrub/(July) Sep-Nov/98-1969	L	L	L	L	Low potential to occur within components with suitable habitat. Species would have been observed during surveys if present. Not expected to occur in project components with no suitable habitat.
<i>Eryngium aristulatum</i> var. <i>parishii</i>	San Diego button-celery	FE/CE/1B.1/Covered/Listed	Coastal scrub, valley and foothill grassland, vernal pools; mesic/annual / perennial herb/Apr-June/66-2034	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Erysimum ammophilum</i>	sand-loving wallflower	None/None/1B.2/Covered/None	Chaparral (maritime), coastal dunes, coastal scrub; sandy, openings/perennial herb/Feb-June/0-197	X	X	X	X	Not expected to occur in project components because they are above the species' known elevation range.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Euphorbia misera</i>	cliff spurge	None/None/2B.2/None/None	Coastal bluff scrub, coastal scrub, Mojavean desert scrub; rocky/perennial shrub/Dec–Aug (Oct)/33–1640	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Perennial shrub would likely have been observed if present. Not expected to occur in project components lacking suitable habitat.
<i>Ferocactus viridescens</i>	San Diego barrel cactus	None/None/2B.1/Covered/Listed	Chaparral, coastal scrub, valley and foothill grassland, vernal pools/perennial stem succulent/May–June/10–1476	L	L	L	D	Observed along the Repurposed 36" Pipeline. Low potential to occur in all other components due to lack of observations during focused surveys or not expected to occur due to lack of suitable habitat.
<i>Frankenia palmeri</i>	Palmer's frankenia	None/None/2B.1/None/None	Coastal dunes, marshes and swamps (coastal salt), playas/perennial herb/May–July/0–33	X	X	X	X	Not expected to occur. No suitable vegetation present.
<i>Fremontodendron mexicanum</i>	Mexican flannelbush	FE/CR/1B.1/None/None	Closed-cone coniferous forest, chaparral, cismontane woodland; gabbroic, metavolcanic, or serpentinite/perennial evergreen shrub/Mar–June/33–2349	L	L	L	L	Low potential to occur within components that have chaparral vegetation. Not expected to occur in remaining project components. No suitable vegetation present.
<i>Geothallus tuberosus</i>	Campbell's liverwort	None/None/1B.1/None/None	Coastal scrub (mesic), vernal pools; soil/ephemeral liverwort/N.A./33–1969	L	L	L	L	Low potential to occur in project components with suitable coastal scrub or vernal pools. Focused surveys were negative for this species. Not expected to occur in project components lacking suitable habitat.
<i>Githopsis diffusa</i> ssp. <i>filicaulis</i>	Mission Canyon bluecup	None/None/3.1/None/Listed	Chaparral (mesic, disturbed areas)/annual herb/Apr–June/1476–2297	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Grindelia hallii</i>	San Diego gumplant	None/None/1B.2/None/None	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland/perennial herb/May–Oct/607–5725	L	X	X	X	Low potential to occur along the NCPW Pipeline where there is suitable chaparral or grassland habitat; however, focused surveys for this species were negative. Not expected to occur in the remaining project components because they are below the species' known elevation range.
<i>Harpagonella palmeri</i>	Palmer's grapplinghook	None/None/4.2/None/Listed	Chaparral, coastal scrub, valley and foothill grassland; clay/annual herb/Mar–May/66–3133	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.
<i>Hazardia orcuttii</i>	Orcutt's hazardia	FC/CT/1B.1/None/None	Chaparral (maritime), coastal scrub; often clay/perennial evergreen shrub/Aug–Oct/262–279	X	X	L	L	Low potential to occur along the LFG Pipeline due to suitable sandy chaparral and coastal scrub, but lack of observations during focused surveys. Not expected to occur in the remaining project components because they are outside the species' known elevation range.
<i>Hesperocyparis forbesii</i>	Tecate cypress	None/None/1B.1/Covered/None	Closed-cone coniferous forest, chaparral; clay, gabbroic or metavolcanic/perennial evergreen tree/N.A./262–4921	X	X	X	X	Not expected to occur. Perennial tree would have been observed during surveys if present.
<i>Heterotheca sessiliflora</i> ssp. <i>sessiliflora</i>	beach goldenaster	None/None/1B.1/None/None	Chaparral (coastal), coastal dunes, coastal scrub/perennial herb/Mar–Dec/0–4019	X	X	X	X	Low potential to occur along the Morena Pipelines due to lack of observations during focused surveys. Not expected to occur within project components farther from the coast.
<i>Holocarpha virgata</i> ssp. <i>elongata</i>	graceful tarplant	None/None/4.2/None/None	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland/annual herb/May–Nov/197–3609	L	D	D	D	Observed within the buffer around the Metropolitan Biosolids Center and along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in other project components due to negative focused surveys. Not expected to occur in project components that lack suitable habitat.
<i>Hordeum intercedens</i>	vernal barley	None/None/3.2/None/None	Coastal dunes, coastal scrub, valley and foothill grassland (saline flats and depressions), vernal pools/annual herb/Mar–June/16–3281	L	L	L	L	Low potential to occur in project components with suitable vegetation. Focused surveys for this species were negative. Not expected to occur in project components lacking suitable habitat.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Horkelia truncata</i>	Ramona horkelia	None/None/1B.3/None/None	Chaparral, cismontane woodland; clay, gabbroic/perennial herb/May–June/1312–4265	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Isocoma menziesii</i> var. <i>decumbens</i>	decumbent goldenbush	None/None/1B.2/None/None	Chaparral, coastal scrub (sandy, often in disturbed areas)/perennial shrub/Apr–Nov/33–443	L	D	D	D	Observed within the buffer around the Metropolitan Biosolids Center and along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in all other components. Perennial shrub would likely have been observed during surveys if present. Not expected to occur in project components lacking suitable habitat.
<i>Iva hayesiana</i>	San Diego marsh-elder	None/None/2B.2/None/None	Marshes and swamps, playas/perennial herb/Apr–Oct/33–1640	L	X	L	L	Low potential to occur within project components with suitable freshwater marsh habitat where this perennial herb would likely have been observed during surveys if present. Although a portion of the NCPW Pipeline contains areas of freshwater marsh that were not surveyed, the area is surrounded by development. Not expected to occur with the other components.
<i>Juglans californica</i>	Southern California black walnut	None/None/4.2/None/None	Chaparral, cismontane woodland, coastal scrub; alluvial/perennial deciduous tree/Mar–Aug/164–2953	X	X	X	X	Not expected to occur in other project components. Perennial tree would have been observed during surveys if present.
<i>Juncus acutus</i> ssp. <i>leopoldii</i>	southwestern spiny rush	None/None/4.2/None/None	Coastal dunes (mesic), meadows and seeps (alkaline seeps), marshes and swamps (coastal salt)/perennial rhizomatous herb/(Mar) May–June/10–2953	X	X	X	X	Not expected to occur. This conspicuous perennial species would have been observed during surveys if present.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	None/None/1B.1/None/None	Marshes and swamps (coastal salt), playas, vernal pools/annual herb/Feb–June/3–4003	X	X	L	L	Low potential to occur within vernal pools on site; focused surveys were negative. Not expected to occur in project components without vernal pools.
<i>Lepechinia cardiophylla</i>	heart-leaved pitcher sage	None/None/1B.2/Covered/None	Closed-cone coniferous forest, chaparral, cismontane woodland/perennial shrub/Apr–July/1706–4495	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Lepechinia ganderi</i>	Gander's pitcher sage	None/None/1B.3/Covered/None	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland; gabbroic or metavolcanic/perennial shrub/June–July/1001–3297	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Lepidium virginicum</i> var. <i>robinsonii</i>	Robinson's pepper-grass	None/None/4.3/None/None	Chaparral, coastal scrub/annual herb/Jan–July/3–2904	L	D	D	D	Observed within the buffer around the Metropolitan Biosolids Center and along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in other project components due to lack of observations during focused surveys. Not expected to occur in project components lacking suitable habitat.
<i>Leptosiphon grandiflorus</i>	large-flowered leptosiphon	None/None/4.2/None/None	Coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland; usually sandy/annual herb/Apr–Aug/16–4003	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils; focused surveys were negative. Not expected to occur in project components lacking suitable vegetation and sandy soils.
<i>Leptosyne maritima</i>	sea dahlia	None/None/2B.2/None/None	Coastal bluff scrub, coastal scrub/perennial herb/Mar–May/16–492	X	X	X	X	Not expected to occur. Species prefers sandstone cliffs near the ocean, which do not occur within the project site and focused surveys were negative for this species.
<i>Lycium californicum</i>	California box-thorn	None/None/4.2/None/None	Coastal bluff scrub, coastal scrub/perennial shrub/(Dec) Mar–Aug/16–492	L	L	L	L	Low potential to occur. Perennial shrub would have been observed during surveys if present. Not expected to occur within project components lacking suitable habitat.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Microseris douglasii</i> ssp. <i>platycarpa</i>	small-flowered microseris	None/None/4.2/None/None	Cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/annual herb/Mar–May/49–3510	L	L	L	L	Observed along the LFG Pipeline. Low potential to occur in project components with suitable vegetation and soils; focused surveys were negative. Not expected to occur in project components lacking suitable vegetation and sandy soils.
<i>Mimulus clelandii</i>	Cleveland's bush monkeyflower	None/None/4.2/Covered/None	Chaparral, cismontane woodland, lower montane coniferous forest; gabbroic, often in disturbed areas, openings, rocky/perennial rhizomatous herb/Apr–July/1476–6562	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Mimulus aurantiacus</i> var. <i>aridus</i>	low bush monkeyflower	None/None/4.3/None/None	Chaparral (rocky), Sonoran desert scrub/perennial evergreen shrub/Apr–July/2461–3937	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Mimulus diffusus</i>	Palomar monkeyflower	None/None/4.3/None/None	Chaparral, lower montane coniferous forest; sandy or gravelly/annual herb/Apr–June/4003–6004	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Mobergia calculiformis</i>	light gray lichen	None/None/3/None/None	Coastal scrub (?); on rocks/crustose lichen (saxicolous)/N.A./33–33	X	X	X	X	There is only one historical occurrence within the City of San Diego immediately south of Balboa Park (Consortium of North American Lichen Herbaria). The project site is approximately 4 miles north of Balboa Park. Not expected to occur in other project components due to lack of suitable coastal scrub habitat and/or elevations above the species' known elevation range.
<i>Monardella hypoleuca</i> ssp. <i>lanata</i>	felt-leaved monardella	None/None/1B.2/Covered/None	Chaparral, cismontane woodland/perennial rhizomatous herb/June–Aug/984–5167	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Monardella viminea</i>	willowy monardella	FE/CE/1B.1/Covered/Listed	Chaparral, coastal scrub, riparian forest, riparian scrub, riparian woodland; alluvial ephemeral washes/perennial herb/June–Aug/164–738	X	X	X	X	Not expected to occur. No suitable alluvial ephemeral washes present.
<i>Mucronea californica</i>	California spineflower	None/None/4.2/None/None	Chaparral, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy/annual herb/Mar–July (Aug)/0–4593	X	X	X	X	Low potential to occur along the Morena Pipelines due to suitable vegetation and sandy soils. However, this species was not observed during focused surveys. Not expected to occur in project components lacking suitable habitat, including sandy soils.
<i>Myosurus minimus</i> ssp. <i>apus</i>	little mousetail	None/None/3.1/None/Listed	Valley and foothill grassland, vernal pools (alkaline)/annual herb/Mar–June/66–2100	L	L	L	L	Low potential to occur in the project site due to limited suitable habitat and not observed during 2016 rare plant surveys. Historical occurrences are known from three localities, San Onofre, Camp Pendelton and Otay Mesa. Not expected to occur within project components lacking suitable vegetation.
<i>Nama stenocarpa</i>	mud nama	None/None/2B.2/None/None	Marshes and swamps (lake margins, riverbanks)/annual/perennial herb/Jan–July/16–1640	L	X	L	L	Low potential to occur in project components with marshes and/or riverbanks with suitable habitat. Not expected to occur in project components lacking suitable habitat.
<i>Navarretia fossalis</i>	spreading navarretia	FT/None/1B.1/Covered, Narrow Endemic/Listed	Chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, vernal pools/annual herb/Apr–June/98–2149	L	X	L	L	Low potential to occur in project components with suitable vegetation and clay soils. Closest occurrence is within the MCAS Miramar, east of the Miramar Landfill and north SR-52. Not expected to occur within project components lacking suitable habitat.
<i>Navarretia prostrata</i>	prostrate vernal pool navarretia	None/None/1B.1/None/None	Coastal scrub, meadows and seeps, valley and foothill grassland (alkaline), vernal pools; mesic/annual herb/Apr–July/10–3970	L	L	L	L	Low potential to occur. Species would have been observed during surveys if present. Historical occurrences are known from Kearny Mesa off of Kearny Villa Road but not with the project site. Not expected to occur within project components lacking suitable vegetation.

APPENDIX A (Continued)

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<i>Nemacaulis denudata</i> var. <i>denudata</i>	coast woolly-heads	None/None/1B.2/None/None	Coastal dunes/annual herb/Apr–Sep/0–328	X	X	X	X	Not expected to occur. No suitable coastal dune habitat present.
<i>Nemacaulis denudata</i> var. <i>gracilis</i>	slender cottonheads	None/None/2B.2/None/None	Coastal dunes, desert dunes, Sonoran desert scrub/annual herb/(Mar) Apr–May/-164–1312	X	X	X	X	Not expected to occur. No suitable vegetation present.
<i>Nolina interrata</i>	Dehesa nolina	None/CE/1B.1/Covered/None	Chaparral (gabbroic, metavolcanic, or serpentinite)/perennial herb/June–July/607–2805	X	X	X	X	Not expected to occur. Limited suitable gabbroic, metavolcanic, or serpentinite chaparral present and this perennial herb would have been observed during surveys if present.
<i>Ophioglossum californicum</i>	California adder's-tongue	None/None/4.2/None/None	Chaparral, valley and foothill grassland, vernal pools (margins); mesic/perennial rhizomatous herb/(Dec) Jan–June/197–1722	L	L	L	L	Low potential to occur in project components with suitable vegetation. Focused surveys for this species were negative. Not expected to occur within project components lacking suitable habitat.
<i>Orcuttia californica</i>	California Orcutt grass	FE/CE/1B.1/Covered, Narrow Endemic/Listed	Vernal pools/annual herb/Apr–Aug/49–2165	X	X	L	L	Low potential to occur along the LFG Pipeline where vernal pools are present, but the species was not observed during focused surveys. Not expected to occur within project components lacking suitable vernal pool habitat.
<i>Orobanche parishii</i> ssp. <i>brachyloba</i>	short-lobed broomrape	None/None/4.2/None/None	Coastal bluff scrub, coastal dunes, coastal scrub; sandy/perennial herb (parasitic)/Apr–Oct/10–1001	X	X	X	X	Not expected to occur in project components lacking suitable habitat, including sandy soils.
<i>Packera ganderi</i>	Gander's ragwort	None/CR/1B.2/Covered/None	Chaparral (burns, gabbroic outcrops)/perennial herb/Apr–June/1312–3937	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Pentachaeta aurea</i> ssp. <i>aurea</i>	golden-rayed pentachaeta	None/None/4.2/None/None	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, riparian woodland, valley and foothill grassland/annual herb/Mar–July/262–6070	L	L	D	D	Observed along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in all other components with negative survey results. Not expected to occur in project components lacking suitable habitat.
<i>Phacelia ramosissima</i> var. <i>austrolitoralis</i>	south coast branching phacelia	None/None/3.2/None/None	Chaparral, coastal dunes, coastal scrub, marshes and swamps (coastal salt); sandy, sometimes rocky/perennial herb/Mar–Aug/16–984	L	L	L	L	Low potential to occur in project components with suitable vegetation. Focused surveys for this species were negative. Not expected to occur within project components lacking suitable habitat.
<i>Phacelia stellaris</i>	Brand's star phacelia	FC/None/1B.1/None/None	Coastal dunes, coastal scrub/annual herb/Mar–June/3–1312	L	L	L	L	Low potential to occur in project components with suitable vegetation. Focused surveys for this species were negative. Not expected to occur within project components lacking suitable habitat.
<i>Pinus torreyana</i> ssp. <i>torreyana</i>	Torrey pine	None/None/1B.2/Covered/None	Closed-cone coniferous forest, chaparral; sandstone/perennial evergreen tree/N.A./246–525	X	X	X	X	Not expected to occur. Perennial tree would have been observed during surveys if present.
<i>Piperia cooperi</i>	chaparral rein orchid	None/None/4.2/None/None	Chaparral, cismontane woodland, valley and foothill grassland/perennial herb/Mar–June/49–5200	L	L	L	L	Low potential to occur in project components with suitable vegetation. Focused surveys for this species were negative. Not expected to occur within project components lacking suitable habitat.
<i>Pogogyne abramsii</i>	San Diego mesa mint	FE/CE/1B.1/Covered, Narrow Endemic/Listed	Vernal pools/annual herb/Mar–July/295–656	X	X	L	L	Low potential to occur along the LFG Pipeline where vernal pools are present, but the species was not observed during focused surveys. Not expected to occur within project components lacking suitable vernal pool habitat.
<i>Pogogyne nudiuscula</i>	Otay Mesa mint	FE/CE/1B.1/Covered, Narrow Endemic/None	Vernal pools/annual herb/May–July/295–820	X	X	L	L	Low potential to occur along the LFG Pipeline where vernal pools are present, but the species was not observed during focused surveys. Not expected to occur within project components lacking suitable vernal pool habitat.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Polygala cornuta</i> var. <i>fishiae</i>	Fish's milkwort	None/None/4.3/None/None	Chaparral, cismontane woodland, riparian woodland/perennial deciduous shrub/May–Aug/328–3281	L	L	L	L	Low potential to occur in project components with suitable habitat, but this perennial deciduous shrub would likely have been observed during surveys if present. Not expected to occur in project components lacking suitable habitat or outside the species' known elevation range.'
<i>Pseudognaphalium leucocephalum</i>	white rabbit-tobacco	None/None/2B.2/None/None	Chaparral, cismontane woodland, coastal scrub, riparian woodland; sandy, gravelly/perennial herb/(July) Aug–Nov (Dec)/0–6890	L	L	L	L	Low potential to occur in project components with suitable vegetation. Focused surveys for this species were negative. Not expected to occur within project components lacking suitable habitat.
<i>Quercus cedrosensis</i>	Cedros Island oak	None/None/2B.2/None/None	Closed-cone coniferous forest, chaparral, coastal scrub/perennial evergreen tree/Apr–May/837–3150	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Quercus dumosa</i>	Nuttall's scrub oak	None/None/1B.1/None/Listed	Closed-cone coniferous forest, chaparral, coastal scrub; sandy, clay loam/perennial evergreen shrub/Feb–Apr (Aug)/49–1312	L	D	<u>L</u> <u>D</u>	D	Observed within the buffer around the Metropolitan Biosolids Center, LFG Pipeline, and along the Repurposed 36" Pipeline. Low potential to occur in all other components because this evergreen shrub would likely have been observed during surveys if present. Not expected to occur within project components lacking suitable habitat.
<i>Quercus engelmannii</i>	Engelmann oak	None/None/4.2/None/None	Chaparral, cismontane woodland, riparian woodland, valley and foothill grassland/perennial deciduous tree/Mar–June/164–4265	X	X	X	X	Not expected to occur. Perennial tree would have been observed during surveys if present.
<i>Rosa minutifolia</i>	small-leaved rose	None/CE/2B.1/Covered/None	Chaparral, coastal scrub/perennial deciduous shrub/Jan–June/492–525	L	X	X	X	Low potential to occur in components at higher elevation with suitable chaparral or coastal scrub habitat. However, perennial shrub would likely have been observed during surveys if present. Not expected to occur in project components below the species' known elevation range.
<i>Salvia munzii</i>	Munz's sage	None/None/2B.2/None/None	Chaparral, coastal scrub/perennial evergreen shrub/Feb–Apr/377–3494	L	L	L	L	Low potential to occur in most project components because this shrub would likely have been observed during surveys if present. Not expected to occur within project components lacking suitable habitat.
<i>Selaginella cinerascens</i>	ashy spike-moss	None/None/4.1/None/None	Chaparral, coastal scrub/perennial rhizomatous herb/N.A./66–2100	L	D	D	D	Observed within the buffer around the Metropolitan Biosolids Center and the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in all other components due to lack of observations during focused surveys. Not expected to occur within project components lacking suitable vegetation.
<i>Senecio aphanactis</i>	chaparral ragwort	None/None/2B.2/None/None	Chaparral, cismontane woodland, coastal scrub; sometimes alkaline/annual herb/Jan–Apr/49–2625	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils; focused surveys were negative. Not expected to occur in project components lacking suitable vegetation and sandy soils.
<i>Solanum xanti</i>	Purple nightshade	None/None/None/Covered/None	Coastal scrub, chaparral, cismontane woodland, lower montane coniferous forest/perennial herb/perennial shrub/June–July/0–8858	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils; focused surveys were negative. Not expected to occur in project components lacking suitable vegetation and sandy soils.
<i>Sphaerocarpos drewei</i>	bottle liverwort	None/None/1B.1/None/None	Chaparral, coastal scrub; openings, soil/ephemeral liverwort/N.A./295–1969	L	L	L	L	Low potential to occur in project components with suitable vegetation and soils within the elevation range of the species; focused surveys were negative. Not expected to occur in project components lacking suitable vegetation and sandy soils.

APPENDIX A (Continued)

Scientific Name	Common Name	Status (Federal/State/CRPR/MSCP/INRMP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	NCPW Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36" Pipeline	Potential to Occur Discussion
<i>Stemodia durantifolia</i>	purple stemodia	None/None/2B.1/None/None	Sonoran desert scrub (often mesic, sandy)/perennial herb/Jan–Dec/591–984	X	X	X	X	Not expected to occur. No suitable desert scrub habitat present.
<i>Stipa diegoensis</i>	San Diego County needle grass	None/None/4.2/None/None	Chaparral, coastal scrub; rocky, often mesic/perennial herb/Feb–June/33–2625	L	L	L	L	Low potential to occur. Species would have been observed during surveys if present. Not expected to occur in project components lacking suitable vegetation.
<i>Streptanthus bernardinus</i>	Laguna Mountains jewelflower	None/None/4.3/None/None	Chaparral, lower montane coniferous forest/perennial herb/May–Aug/2198–8202	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Stylocline citroleum</i>	oil neststraw	None/None/1B.1/None/None	Chenopod scrub, coastal scrub, valley and foothill grassland; clay/annual herb/Mar–Apr/164–1312	L	L	L	L	Low potential to occur. Species would have been observed during surveys if present. Not expected to occur in project components lacking suitable vegetation.
<i>Suaeda esteroa</i>	estuary seablite	None/None/1B.2/None/None	Marshes and swamps (coastal salt)/perennial herb/May–Oct (Jan)/0–16	X	X	X	X	Not expected to occur. No suitable coastal salt marsh present.
<i>Suaeda taxifolia</i>	woolly seablite	None/None/4.2/None/None	Coastal bluff scrub, coastal dunes, marshes and swamps (margins of coastal salt)/perennial evergreen shrub/Jan–Dec/0–164	X	X	X	X	Not expected to occur. No suitable coastal habitat present.
<i>Tetracoccus dioicus</i>	Parry's tetracoccus	None/None/1B.2/Covered/None	Chaparral, coastal scrub/perennial deciduous shrub/Apr–May/541–3281	L	X	X	X	Low potential to occur in components at higher elevation with suitable chaparral or coastal scrub habitat. However, perennial shrub would likely have been observed during surveys if present. Not expected to occur in project components below the species' known elevation range.
<i>Texosporium sancti-jacobi</i>	woven-spored lichen	None/None/3/None/None	Chaparral (openings); on soil, small mammal pellets, dead twigs, and on Selaginella spp./crustose lichen (terricolous)/N.A./951–2165	X	X	X	X	Not expected to occur. The site is outside of the species' known elevation range.
<i>Triquetrella californica</i>	coastal triquetrella	None/None/1B.2/None/None	Coastal bluff scrub, coastal scrub; soil/moss/N.A./33–328	L	X	L	L	Low potential to occur along the Morena Pipelines. Not expected to occur in other project components farther from the coast. Known in California from fewer than ten small coastal occurrences.
<i>Viguiera laciniata</i>	San Diego County viguiera	None/None/4.2/None/Listed	Chaparral, coastal scrub/perennial shrub/Feb–June (Aug)/197–2461	D	L	D	D	Observed within the buffer around the NCPW Pipeline and along the LFG Pipeline and Repurposed 36" Pipeline. Low potential to occur in all other components that have suitable habitat, but where focused surveys were negative. Not expected to occur within project components lacking suitable habitat.
<i>Xanthisma junceum</i>	rush-like bristleweed	None/None/4.3/None/None	Chaparral, coastal scrub/perennial herb/June–Jan/787–3281	X	X	X	X	Not expected to occur in other project components because they are below the species' known elevation range.

Notes:

X = not expected (no suitable habitat and/or outside elevation range)

D = detected within the component or 100-foot buffer

L = low potential (suitable habitat but surveys were negative)

Status Legend:

FE: Federally listed as endangered

FT: Federally listed as threatened

FC: Federal Candidate for listing

DL: Delisted

CE: State listed as endangered

CT: State listed as threatened

CR: State Rare

CRPR 1A: Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere

CRPR 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere

CRPR 2A: Plants Presumed Extirpated in California, But More Common Elsewhere

CRPR 2B: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

CRPR 3: Plants About Which More Information is Needed - A Review List

CRPR 4: Plants of Limited Distribution - A Watch List

- .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)

APPENDIX B

*Sensitive Wildlife Species Potential to Occur
in the North City Project Components Study Area
within MCAS Miramar*

APPENDIX B
Sensitive Wildlife Species Potential to Occur in the North City Project Components Study Area within MCAS Miramar

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
<i>Amphibians</i>								
California red-legged frog	<i>Rana draytonii</i>	FT/SSC/None/Covered/None	Lowland streams, wetlands, riparian woodlands, livestock ponds; dense, shrubby or emergent vegetation associated with deep, still or slow-moving water; uses adjacent uplands	X	X	X	X	Not expected to occur throughout due to being outside of accepted geographic range of species.
western spadefoot	<i>Spea hammondi</i>	None/SSC/None/None/Listed	Primarily grassland and vernal pools, but also in ephemeral wetlands that persist at least 3 weeks in chaparral, coastal scrub, valley-foothill woodlands, pastures, and other agriculture	X	L	M	H	High potential to occur within the 500-foot buffer of the Repurposed 36-inch Pipeline due to the presence of vernal pools. Moderate potential to occur within the 500-foot buffer of the LFG Pipeline. Low potential to occur within the 500-foot buffer of the MBC. Not expected to occur in the areas that lack suitable habitat.
arroyo toad	<i>Anaxyrus californicus</i>	FE/SSC/None/Covered/None	Semi-arid areas near washes, sandy riverbanks, riparian areas, palm oasis, Joshua tree, mixed chaparral and sagebrush; stream channels for breeding (typically third order); adjacent stream terraces and uplands for foraging and wintering	X	X	X	X	Not expected to occur throughout due to populations only occurring upstream of the reservoirs in San Diego.
<i>Reptiles</i>								
western pond turtle	<i>Actinemys marmorata</i>	None/SSC/None/Covered/Listed	Slow-moving permanent or intermittent streams, ponds, small lakes, and reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter	X	X	X	X	Not expected to occur in areas that lack suitable habitat or the impact footprint.
coast patch-nosed snake	<i>Salvadora hexalepis virgulata</i>	None/SSC/None/None/Listed	Brushy or shrubby vegetation; requires small mammal burrows for refuge and overwintering sites	L	X	L	L	Low potential to occur in the 500-foot buffer of the North City Pipeline, LFG Pipeline, and Repurposed 36-inch Pipeline due to limited habitat. Not expected to occur in areas that lack suitable habitat or in the impact footprint.
orangethroat whiptail	<i>Aspidoscelis hyperythra</i>	None/WL/None/Covered/Listed	Low-elevation coastal scrub, chaparral, and valley-foothill hardwood	M	M	H	H	High potential to occur within 500-foot buffer of the LFG Pipeline and Repurposed 36-inch Pipeline. Moderate potential to occur within the 500-foot buffer of North City Pipeline, and MBC. Not expected to occur in areas that lack suitable habitat.
Coronado Island skink	<i>Plestiodon skiltonianus interparietalis</i>	None/WL/None/None/Listed	Woodlands, grasslands, pine forests, and chaparral; rocky areas near water	L	L	L	L	Low potential to occur in the 500-foot buffer of the LFG Pipeline, North City Pipeline, and MBC. Not expected to occur in areas that lack suitable habitat or in the impact footprint.
rosy boa	<i>Lichanura trivirgata</i>	None/None/None/None/Listed	Desert and chaparral habitats with rocky soils in coastal canyons and hillsides, desert canyons, washes, and mountains	X	X	M	M	Moderate potential to occur within 500-foot buffer of the LFG Pipeline and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat. The site is outside of the species' known geographic range.
green turtle	<i>Chelonia mydas</i>	FT/None/None/None/None	Shallow waters of lagoons, bays, estuaries, mangroves, eelgrass, and seaweed beds	X	X	X	X	Not expected to occur in 500-foot survey buffer or impact footprints. No suitable habitat present.
San Diego ringneck snake	<i>Diadophis punctatus similis</i>	None/None/None/None/None	Moist habitats including wet meadows, rocky hillsides, gardens, farmland grassland, chaparral, mixed-conifer forest, and woodland habitats	L	L	L	L	Low potential to occur in the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline due to limited habitat. Not expected to occur in areas that lack suitable habitat.
silvery legless lizard	<i>Anniella pulchra pulchra</i>	None/SSC/None/None/Listed	Stabilized dunes, beaches, dry washes, chaparral, scrubs, and pine, oak, and riparian woodlands; associated with sparse vegetation and sandy or loose, loamy soils	L	L	L	L	Low potential to occur in the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline due to limited habitat. Not expected to occur in areas that lack suitable habitat.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	None/SSC/None/Covered/Listed	Open areas of sandy soil in valleys, foothills, and semi-arid mountains including coastal scrub, chaparral, valley-foothill hardwood, conifer, riparian, pine-cypress, juniper, and annual grassland habitats	L	L	M	M	Moderate potential to occur in the 500-foot buffer of the LFG Pipeline and Repurposed 36-inch Pipeline. Low potential to occur within the 500-foot buffer of the North City Pipeline and MBC due to limited habitat. Not expected to occur in areas that lack suitable habitat.
red diamondback rattlesnake	<i>Crotalus ruber</i>	None/SSC/None/None/Listed	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	M	L	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, LFG Pipeline, and Repurposed 36-inch Pipeline. Low potential to occur within the 500-foot buffer of the MBC due to limited habitat. Not expected to occur in areas that lack suitable habitat.
San Diegan tiger whiptail	<i>Aspidoscelis tigris stejnegeri</i>	None/SSC/None/None/None	Open areas in semiarid grasslands, scrublands, and woodlands	M	M	H	H	High potential to occur within 500-foot buffer of the LFG Pipeline and Repurposed 36-inch Pipeline. Moderate potential to occur within the 500-foot buffer of the North City Pipeline, and MBC. Not expected to occur in areas that lack suitable habitat.
two-striped gartersnake	<i>Thamnophis hammondi</i>	None/SSC/None/None/Listed	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools	X	X	X	X	Not expected to occur in areas that lack suitable habitat.
<i>Birds</i>								
burrowing owl	<i>Athene cunicularia</i> (burrow sites and some wintering sites)	BCC/SSC/None/Covered/Listed	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows	L	L	L	L	Low potential to occur in the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline due to limited habitat. No BUOW or sign observed during 2016 focused surveys.
California black rail	<i>Laterallus jamaicensis coturniculus</i>	BCC/ST, FP/None/None/None	Tidal marshes, shallow freshwater margins, wet meadows, and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra Nevada foothill populations	X	X	X	X	Not expected to occur in the 500-foot buffer or impact footprints.
ferruginous hawk	<i>Buteo regalis</i> (wintering)	BCC/WL/None/Covered/Listed	Winters and forages in open, dry country, grasslands, open fields, agriculture	X	X	X	X	Not expected to winter within 500-foot buffer throughout study area.
grasshopper sparrow	<i>Ammodramus savannarum</i> (nesting)	None/SSC/None/None/None	Nests and forages in moderately open grassland with tall forbs or scattered shrubs used for perches	L	L	M	M	Moderate potential to occur within 500-foot buffer of the LFG Pipeline, and Repurposed 36-inch Pipeline. Low potential to nest within the 500-foot buffer of the North City Pipeline, and MBC. Species may use surrounding suitable habitat to forage. Not expected to nest in areas that lack suitable habitat or impact footprints.
northern harrier	<i>Circus cyaneus</i> (nesting)	None/SSC/None/Covered/Listed	Nests in open wetlands including marshy meadows, wet lightly-grazed pastures, old fields, freshwater and brackish marshes, but also in drier habitats such as grassland and grain fields; forages in variety of habitats, including grassland, scrubs, rangelands, emergent wetlands, and other open habitats	L	L	L	L	Low potential to nest within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to nest in areas that lack suitable habitat or impact footprints.
Swainson's hawk	<i>Buteo swainsoni</i> (nesting)	BCC/ST/None/Covered/None	Nests in open woodland and savanna, riparian, and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture	X	X	X	X	Not expected to nest within 500-foot buffer of the study area.
tricolored blackbird	<i>Agelaius tricolor</i> (nesting colony)	BCC/SSC/None/Covered/Listed	Nests near freshwater, emergent wetland with cattails or tules, but also in Himalayan blackberry; forages in grasslands, woodland, and agriculture	X	X	X	X	Not expected to occur in 500-foot survey buffer or impact footprints due to lack of suitable habitat.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
yellow warbler	<i>Setophaga petechia</i> (nesting)	BCC/SSC/None/None/Listed	Nests and forages in riparian and oak woodlands, montane chaparral, open ponderosa pine, and mixed-conifer habitats	L	X	H	H	High potential to occur within the 500-foot buffer of the LFG Pipeline, and Repurposed 36-inch Pipeline. Low potential to nest or forage within the 500-foot buffer of the North City Pipeline due to limited suitable habitat. Not expected to nest or forage in areas that lack suitable habitat or impact footprints.
American peregrine falcon	<i>Falco peregrinus anatum</i> (nesting)	FDL, BCC/SDL, FP/None/Covered/Listed	Nests on cliffs, buildings, and bridges; forages in wetlands, riparian, meadows, croplands, especially where waterfowl are present	X	X	X	X	Not expected to nest or forage in areas that lack suitable habitat or impact footprints.
bald eagle	<i>Haliaeetus leucocephalus</i> (nesting and wintering)	FDL, BCC/SE, FP/None/Covered/None	Nests in forested areas adjacent to large bodies of water, including seacoasts, rivers, swamps, large lakes; winters near large bodies of water in lowlands and mountains	X	X	X	X	Not expected to nest or winter in the 500-foot buffer or component impact footprints. No suitable habitat present.
Cooper's hawk	<i>Accipiter cooperii</i> (nesting)	None/WL/None/Covered/Listed	Nests and forages in dense stands of live oak, riparian woodlands, or other woodland habitats often near water	M	X	M	M	Moderate potential to nest or forage within the 500-foot buffer of North City Pipeline, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to nest or forage in areas that lack suitable habitat or impact footprints.
coastal cactus wren	<i>Campylorhynchus brunneicapillus sandiegensis</i> (San Diego and Orange Counties only)	BCC/SSC/None/Covered/Listed	Southern cactus scrub patches	X	X	X	X	Not expected to occur in the 500-foot buffer or component impact footprints.
coastal California gnatcatcher	<i>Polioptila californica californica</i>	FT/SSC/None/Covered/Listed	Nests and forages in various sage scrub communities, often dominated by California sagebrush and buckwheat; generally avoids nesting in areas with a slope of greater than 40%; majority of nesting at less than 1,000 feet above mean sea level	M	H	H	H	Observed within the 500-foot buffer of the MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. High potential to occur within the 500-foot buffer of the North City Pipeline. Not likely to occur in areas lacking suitable habitat.
least Bell's vireo	<i>Vireo bellii pusillus</i> (nesting)	FE/SE/None/Covered/Listed	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	L	X	L	L	Low potential to nest within the 500-foot buffer of the North City Pipeline, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to nest or forage in areas that lack suitable habitat or impact footprints.
southwestern willow flycatcher	<i>Empidonax traillii extimus</i> (nesting)	FE/SE/None/Covered/Listed	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration	L	X	X	X	Low potential to nest or forage in suitable habitat within the 500-foot buffer of the North City Pipeline. Not expected to nest or forage in areas that lack suitable habitat or the component impact footprints.
white-tailed kite	<i>Elanus leucurus</i> (nesting)	None/FP/None/None/None	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands	L	M	M	M	Moderate potential to nest within 500-foot buffer of the MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Low potential to nest within the 500-foot buffer of the North City Pipeline. Not expected to nest or forage in areas that lack suitable habitat or impact footprint
yellow-breasted chat	<i>Icteria virens</i> (nesting)	None/SSC/None/None/Listed	Nests and forages in dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush	L	M	H	H	High potential to occur within the 500-foot buffer of the LFG Pipeline, and Repurposed 36-inch Pipeline. Moderate potential to nest within 500-foot buffer of the MBC. Low potential to nest within the 500-foot buffer of the North City Pipeline. Not expected to nest or forage in areas that lack suitable habitat

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
golden eagle	<i>Aquila chrysaetos</i> (nesting and wintering)	BCC/FP, WL/None/Covered/Listed	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas and forages in open habitats	L	X	L	L	Low potential to nest and winter within the 500-foot buffer of the North City Pipeline, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to areas lacking suitable habitat or the impact footprints.
prairie falcon	<i>Falco mexicanus</i> (nesting)	BCC/WL/None/None/Listed	Forages in grassland, savanna, rangeland, agriculture, desert scrub, alpine meadows; nest on cliffs or bluffs	X	X	X	X	Not expected to nest or forage in the 500-foot survey buffer or impact footprint. No suitable nesting habitat present.
southern California rufous-crowned sparrow	<i>Aimophila ruficeps canescens</i>	None/WL/None/Covered/Listed	Nests and forages in open coastal scrub and chaparral with low cover of scattered scrub interspersed with rocky and grassy patches	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
Belding's savannah sparrow	<i>Passerculus sandwichensis beldingi</i>	None/SE/None/Covered/None	Nests and forages in coastal saltmarsh dominated by pickleweed (<i>Salicornia</i> spp.)	X	X	X	X	Not expected to occur in the 500-foot buffer or component impact footprint. No suitable nesting habitat present.
Bell's sage sparrow	<i>Artemisiospiza belli belli</i>	BCC/WL/None/None/Listed	Nests and forages in coastal scrub and dry chaparral; typically in large, unfragmented patches dominated by chamise; nests in more dense patches but uses more open habitat in winter	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur areas lacking suitable habitat.
California brown pelican	<i>Pelecanus occidentalis californicus</i> (nesting colonies and communal roosts)	FDL/SDL, FP/None/Covered/None	Forages in warm coastal marine and estuarine environments; in California, nests on dry, rocky offshore islands	X	X	X	X	Not expected to occur in the 500-foot buffer or component impact footprint. No suitable nesting habitat present.
California horned lark	<i>Eremophila alpestris actia</i>	None/WL/None/None/None	Nests and forages in grasslands, disturbed lands, agriculture, and beaches; nests in alpine fell fields of the Sierra Nevada	L	L	M	M	Moderate potential to forage within 500-foot buffer of the LFG Pipeline, and Repurposed 36-inch Pipeline. Low potential to forage within the 500-foot buffer of the North City Pipeline, and MBC. Not expected to occur in areas lacking suitable habitat.
California least tern	<i>Sternula antillarum browni</i> (nesting colony)	FE/SE, FP/None/Covered/None	Forages in shallow estuaries and lagoons; nests on sandy beaches or exposed tidal flats	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
double-crested cormorant	<i>Phalacrocorax auritus</i> (nesting colony)	None/WL/None/None/None	Nests in riparian trees near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines; winter habitat includes lakes, rivers, and coastal areas	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
elegant tern	<i>Thalasseus elegans</i> (nesting colony)	None/WL/None/Covered/None	Inshore coastal waters, bays, estuaries, and harbors; forages over open water	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
large-billed savannah sparrow	<i>Passerculus sandwichensis rostratus</i> (wintering)	None/SSC/None/Covered/None	Nests and forages in open, low saltmarsh vegetation, including low halophytic scrub	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
least bittern	<i>Ixobrychus exilis</i> (nesting)	BCC/SSC/None/None/None	Nests in freshwater and brackish marshes with dense, tall growth of aquatic and semi-aquatic vegetation	L	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
long-billed curlew	<i>Numenius americanus</i> (nesting)	BCC/WL/None/Covered/Listed	Nests in grazed, mixed grass, and short-grass prairies; localized nesting along the California coast; winters and forages in coastal estuaries, mudflats, open grassland, and cropland	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
mountain plover	<i>Charadrius montanus</i> (wintering)	BCC/SSC/None/Covered/None	Winters in shortgrass prairies, plowed fields, open sagebrush, and sandy deserts	X	X	X	X	Not expected to winter in the 500-foot buffer or component impact footprints due to poor habitat quality.
osprey	<i>Pandion haliaetus</i> (nesting)	None/WL/None/None/Listed	Large waters (lakes, reservoirs, rivers) supporting fish; usually near forest habitats, but widely observed along the coast	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints.
western snowy plover	<i>Charadrius alexandrinus nivosus</i> (nesting)	FT, BCC/SSC/None/Covered/None	On coasts nests on sandy marine and estuarine shores; in the interior nests on sandy, barren or sparsely vegetated flats near saline or alkaline lakes, reservoirs, and ponds	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i> (nesting)	FT, BCC/SE/None/None/None	Nests in dense, wide riparian woodlands and forest with well-developed understories	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
white-faced ibis	<i>Plegadis chihi</i> (nesting colony)	None/WL/None/Covered/None	Nests in shallow marshes with areas of emergent vegetation; winter foraging in shallow lacustrine waters, flooded agricultural fields, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
Canada goose	<i>Branta canadensis</i>	None/None/None/Covered/None	Lakes, rivers, ponds, and other bodies of water; yards, park lawns, and agricultural fields	X	X	L	L	Low potential to occur in the 500-foot buffer or component impact footprints of the LFG Pipeline and Repurposed 36-inch Pipeline. No suitable habitat present.
reddish egret	<i>Egretta rufescens</i>	None/None/None/Covered/None	Freshwater marsh with emergent vegetation; in the Central Valley primarily nests and forages in rice fields and other flooded agricultural fields with weeds and other residual aquatic vegetation	X	X	X	X	Not expected to nest in the 500-foot buffer or component impact footprints. No suitable nesting habitat present.
western bluebird	<i>Sialia mexicana</i>	None/None/None/Covered/None	Nests in old-growth red fir, mixed-conifer, and lodgepole pine habitats near wet meadows used for foraging	L	L	M	M	Moderate potential to occur within 500-foot buffer of the LFG Pipeline and Repurposed 36-inch Pipeline. Low potential to occur within 500-foot buffer of the North City Pipeline, and MBC. Not expected to nest or forage in areas that lack suitable nesting habitat present.
Ridgway's rail	<i>Rallus obsoletus levipes</i>	FE/SE, FP/None/Covered/None	Coastal wetlands, brackish areas, coastal saline emergent wetlands	X	X	X	X	Not expected to nest or forage in areas that lack suitable nesting habitat present.
loggerhead shrike	<i>Lanius ludovicianus</i> (nesting)	None/SSC/None/Listed	Nests and forages in open habitats with scattered shrubs, trees, or other perches	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
bank swallow	<i>Riparia riparia</i> (nesting)	None/ST/None/Listed	Nests in riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with sandy soils; open country and water during migration	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
long-eared owl	<i>Asio otus</i> (nesting)	None/SSC/None/Listed	Nests in riparian habitat, live oak thickets, other dense stands of trees, edges of coniferous forest; forages in nearby open habitats	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
merlin	<i>Falco columbarius</i> (wintering)	None/WL/None/Listed	Forages in semi-open areas, including coastline, grassland, agriculture, savanna, woodland, lakes, and wetlands	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
sharp-shinned hawk	<i>Accipiter striatus</i> (nesting)	None/WL/None/Listed	Nests in coniferous forests, ponderosa pine, black oak, riparian deciduous, mixed conifer, Jeffrey pine; winters in lowland woodlands and other habitats	M	X	M	M	Moderate potential to nest or forage within the 500-foot buffer of North City Pipeline, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to nest or forage in areas that lack suitable habitat or impact footprints.
Allen's hummingbird	<i>Selasphorus sasin</i> (nesting)	None/None/None/Listed	Nests in coastal scrub, valley-foothill hardwood, and valley-foothill riparian habitats; migrates in woodland and scrub habitats	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
black swift	<i>Cypseloides niger</i> (nesting)	None/SSC/None/Listed	Nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons; forages over a wide range of habitats	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
Costa's hummingbird	<i>Calypte costae</i> (nesting)	None/None/None/Listed	Nests and forages in desert wash, edges of riparian and valley-foothill riparian, coastal scrub, desert scrub, desert succulent scrub, lower-elevation chaparral, and palm oasis	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
lark sparrow	<i>Chondestes grammacus</i> (nesting)	None/None/None/Listed	Nests and forages in open habitats and ecotones; foothill woodlands, open mixed chaparral and grasslands with scattered trees and shrubs	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
Lawrence's goldfinch	<i>Spinus lawrencei</i> (nesting)	None/None/None/Listed	Nests and forages in open oak, arid woodlands, and chaparral near water	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
olive-sided flycatcher	<i>Contopus cooperi</i> (nesting)	None/SSC/None/Listed	Nests in mixed-conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine habitats; usually close to water	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
rufous hummingbird	<i>Selasphorus rufus</i> (nesting)	None/None/None/Listed	Does not nest in California; migrates through a wide variety of habitats including coastal scrub, valley-foothill hardwood, and valley-foothill riparian habitats, and residential areas with feeders	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
short-eared owl	<i>Asio flammeus</i> (nesting)	None/SSC/None/Listed	Grassland, prairies, dunes, meadows, irrigated lands, and saline and freshwater emergent wetlands	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
summer tanager	<i>Piranga rubra</i> (nesting)	None/SSC/None/Listed	Nests and forages in mature desert riparian habitats dominated by cottonwoods and willows	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
Vaux's swift	<i>Chaetura vauxi</i> (nesting)	None/SSC/None/Listed	Late-stage conifer forest and mixed-conifer/deciduous forest; nests in redwood (<i>Sequoia sempervirens</i>), Douglas-fir (<i>Pseudotsuga</i> spp.), and other conifers, and occasionally buildings and chimneys	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
willow flycatcher	<i>Empidonax traillii</i> (nesting)	None/SE/None/Listed	Nests in wet meadow and montane willow riparian	L	L	L	L	Moderate potential to migrate through San Diego County. Low potential to nest within the 500-foot buffer of the
Lewis's woodpecker	<i>Melanerpes lewis</i> (nesting)	None/None/None/Listed	Winters in open oak woodland and savanna; nests in open ponderosa pine forest and logged or burned pine forest	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
Nuttall's woodpecker	<i>Picoides nuttallii</i>	None/None/None/Listed	Oak woodlands and riparian woodlands	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
California thrasher	<i>Toxostoma redivivum</i>	None/None/None/Listed	Lowland and coastal chaparral; riparian woodland thickets.	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.
<i>Mammals</i>								
Pacific pocket mouse	<i>Perognathus longimembris pacificus</i>	FE/SSC/None/None/None	Fine-grained sandy substrates in open coastal strand, coastal dunes, and river alluvium	X	X	X	X	Not expected to occur in the 500-foot buffer or component impact footprints due to lack of suitable habitat.
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	None/SSC/None/None/Listed	Coastal scrub, desert scrub, chaparral, cacti, rocky areas	X	X	X	X	Not expected to occur in the 500-foot buffer or component impact footprints due to lack of suitable habitat.
big free-tailed bat	<i>Nyctinomops macrotis</i>	None/SSC/WBVG:MH/None/Listed	Rocky areas; roosts in caves, holes in trees, buildings, and crevices on cliffs and rocky outcrops; forages over water	X	X	X	X	Not expected to roost or forage within the 500-foot buffer or component impact footprints due to limited suitable habitat present.
long-eared myotis	<i>Myotis evotis</i>	None/None/WBVG:M/None/None	Nearly all brush, woodland, and forest habitats from sea level to 9,000 feet above mean sea level, but prefers coniferous habitats; forages along habitat edges, in open habitats, and over water; roosts in buildings, crevices, under bark, and snags; uses caves as night roosts	L	X	X	X	Low potential to occur within the 500-foot buffer of the North City Pipeline due to limited habitat. Not expected to occur in areas that lack suitable habitat or in the impact footprint.
pallid bat	<i>Antrozous pallidus</i>	None/SSC/WBVG:H/None/Listed	Grasslands, shrublands, woodlands, forests; most common in open, dry habitats with rocky outcrops for roosting, but also roosts in man-made structures and trees	M	X	M	M	Moderate potential to forage within the 500-foot buffer of the LFG Pipeline, Repurposed 36-inch Pipeline, and North City Pipeline. Not expected to occur in areas lacking suitable habitat and impact footprints.
western small-footed myotis	<i>Myotis ciliolabrum</i>	None/None/WBVG:M/None/Listed	Arid woodlands and shrublands, but near water; roosts in caves, crevices, mines, abandoned buildings	L	X	X	X	Low potential to forage within the 500-foot buffer of the North City Pipeline. Not expected to occur in areas lacking suitable habitat and component impact footprints.
Yuma myotis	<i>Myotis yumanensis</i>	None/None/WBVG:LM/None/Listed	Riparian, arid scrublands and deserts, and forests associated with water (streams, rivers, tinajas); roosts in bridges, buildings, cliff crevices, caves, mines, and trees	X	X	X	X	Not expected to occur in areas lacking suitable habitat and component impact footprints.
American badger	<i>Taxidea taxus</i>	None/SSC/None/Covered/None	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, and pastures, especially with friable soils	X	L	L	L	Low potential to forage within the 500-foot buffer of the LFG Pipeline, Repurposed 36-inch Pipeline, and MBC. Not expected to occur in areas lacking suitable habitat and component impact footprints.
Dulzura pocket mouse	<i>Chaetodipus californicus femoralis</i>	None/SSC/None/None/Listed	Open habitat, coastal scrub, chaparral, oak woodland, chamise chaparral, mixed-conifer habitats; disturbance specialist; 0 to 3,000 feet above mean sea level	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas lacking suitable habitat.
hoary bat	<i>Lasiurus cinereus</i>	None/None/WBVG:M/None/None	Forest, woodland riparian, and wetland habitats; also juniper scrub, riparian forest, and desert scrub in arid areas; roosts in tree foliage and sometimes cavities, such as woodpecker holes	L	X	X	X	Low potential to occur within the 500-foot buffer of the North City Pipeline. There is limited suitable habitat present.
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>	None/SSC/WBVG:H/None/Listed	Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon-juniper woodland; roosts in caves, mines, and buildings	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact footprints due to lack of suitable habitat. No suitable habitat present.
northwestern San Diego pocket mouse	<i>Chaetodipus fallax fallax</i>	None/SSC/None/None/Listed	Coastal scrub, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas lacking suitable habitat.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
pocketed free-tailed bat	<i>Nyctinomops femorosaccus</i>	None/SSC/WBVG:M/None/Listed	Pinyon–juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oases; roosts in high cliffs or rock outcrops with dropoffs, caverns, and buildings	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact footprints due to lack of suitable habitat. No suitable habitat present.
San Diego black-tailed jackrabbit	<i>Lepus californicus bennettii</i>	None/SSC/None/None/Listed	Arid habitats with open ground; grasslands, coastal scrub, agriculture, disturbed areas, and rangelands	L	L	M	M	Moderate potential to occur within 500-foot buffer of the LFG Pipeline and Repurposed 36-inch Pipeline. Low potential to occur within the 500-foot buffer of the North City Pipeline, and MBC. Not expected to occur in areas lacking suitable habitat .
silver-haired bat	<i>Lasionycteris noctivagans</i>	None/None/WBVG:M/None/None	Old-growth forest, maternity roosts in trees (primarily woodpecker hollows), large-diameter snags 50 feet aboveground; hibernates in hollow trees, under sloughing bark, in rock crevices, and occasionally in buildings, mines, and caves; forages in or near coniferous or mixed deciduous forest, often following stream or river drainages	X	X	X	X	Not expected to occur due to lack of suitable habitat.
spotted bat	<i>Euderma maculatum</i>	None/SSC/WBVG:H/None/None	Foothills, mountains, desert regions of southern California, including arid deserts, grasslands, and mixed-conifer forests; roosts in rock crevices and cliffs; feeds over water and along washes	X	X	X	X	Not expected to occur due to lack of suitable habitat.
Stephens' kangaroo rat	<i>Dipodomys stephensi</i>	FE/ST/None/None/None	Annual and perennial grassland habitats, coastal scrub or sagebrush with sparse canopy cover, or in disturbed areas	X	X	X	X	Not expected to occur. This study area is outside of this species' geographic range.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	None/SC, SSC/WBVG:H/None/Listed	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, man-made structures, and tunnels	L	X	X	X	Low potential to occur within the 500 foot buffer of the North City Pipeline. Not expected to occur in areas lacking suitable habitat.
western mastiff bat	<i>Eumops perotis californicus</i>	None/SSC/WBVG:H/None/None	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees, and tunnels	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas lacking suitable habitat.
western red bat	<i>Lasiurus blossevillei</i>	None/SSC/WBVG:H/None/None	Forest, woodland, riparian, mesquite bosque, and orchards, including fig, apricot, peach, pear, almond, walnut, and orange; roosts in tree canopy	L	X	X	X	Low potential to occur within the 500-foot buffer of the North City Pipeline. There is limited suitable habitat present.
western yellow bat	<i>Lasiurus xanthinus</i>	None/SSC/WBVG:H/None/None	Valley–foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 feet above mean sea level; roosts in riparian and palms	X	X	X	X	Not expected to occur in the 500-foot buffer or component impact footprints due to lack of suitable habitat.
cougar	<i>Puma concolor</i>	None/None/None/Covered	Scrubs, chaparral, riparian, woodland, and forest; rests in rocky areas and on cliffs and ledges that provide cover; most abundant in riparian areas and brushy stages of most habitats throughout California, except deserts	X	L	L	L	Low potential to occur within the 500-foot area buffer of the MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas lacking suitable habitat.
mule deer	<i>Odocoileus hemionus</i>	None/None/None/Covered/None	Coastal sage scrub, chaparral, riparian, woodlands, and forest; often browses in open area adjacent to cover throughout California, except deserts and intensely farmed areas	L	M	M	M	Moderate potential to occur within the 500-foot buffer for the MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Low potential to occur within the 500-foot buffer of the North City Pipeline. Not expected to occur in areas with lack of suitable habitat or in component impact footprints.
Southern grasshopper mouse	<i>Onychomys torridus ramona</i>	None/SSC/None/Listed	Grassland and sparse coastal scrub	M	M	M	M	Moderate potential to occur within the 500-foot buffer of the North City Pipeline, MBC, LFG Pipeline, and Repurposed 36-inch Pipeline. Not expected to occur in areas that lack suitable habitat.

APPENDIX B (Continued)

Common Names	Scientific Name	Status (Federal/State/Other/MSCP/INRMP)	Habitat	North City Pipeline	Metro Biosolids Center (MBC)	Landfill Gas Pipeline (LFG Pipeline)	Repurposed 36-inch Pipeline	Potential to Occur
<i>Invertebrates</i>								
Riverside fairy shrimp	<i>Streptocephalus woottoni</i>	FE/None/None/Covered/Listed	Vernal pools, non-vegetated ephemeral pools	X	X	X	X	Not expected to occur within 500-foot buffer or component impact areas. Would have been observed during focused survey.
San Diego fairy shrimp	<i>Branchinecta sandiegonensis</i>	FE/None/None/Covered/Listed	Vernal pools, non-vegetated ephemeral pools	X	X	X	X	Not expected to occur within 500-foot buffer or component impact areas. Would have been observed during focused survey.
obscure bumble bee	<i>Bombus caliginosus</i>	None/None/SS/None/None	Relatively humid or foggy areas of the Pacific coast south to central California. Food plants include Baccharis, Cirsium, Grindelia, Phacelia, Arctostaphylos, Eriodictyon, Ceanothus, Adenostoma, and Mimulus.	X	X	X	X	Not expected to occur within 500-foot buffer or component impact areas due to lack of suitable habitat.
Crotch bumble bee	<i>Bombus crotchii</i>	None/None/SS/None/None	Open scrub habitats and grassland in coastal California east to the Sierra-Cascade crest and south into Mexico. Food plants include Asclepias, Chaenactis, Lupinus, Medicago, Phacelia, and Salvia.	L	L	L	L	Low potential to occur within the 500-foot buffer of the North City Pipeline, LFG Pipeline, MBC, and Repurposed 36-inch Pipeline. Not expected to occur in areas lacking suitable habitat and component impact footprints.
globose dune beetle	<i>Coelus globosus</i>	None/None/SS/None/None	Inhabitant of coastal sand dune habitat; erratically distributed from Ten Mile Creek in Mendocino County south to Ensenada, Mexico	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
mesa shoulderband	<i>Helminthoglypta coelata</i>	None/None/SS/None/None	Known only from a few locations in coastal San Diego County	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
mimic tryonia (=California brackishwater snail)	<i>Tryonia imitator</i>	None/None/SS/None/None	Inhabits coastal lagoons, estuaries, and saltmarshes, from Sonoma County south to San Diego County	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
sandy beach tiger beetle	<i>Cicindela hirticollis gravida</i>	None/None/SS/None/None	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
senile tiger beetle	<i>Cicindela senilis frosti</i>	None/None/SS/None/None	Inhabits marine shoreline, from Central California coast south to saltmarshes of San Diego; also found at Lake Elsinore	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
Thorne's hairstreak	<i>Callophrys thornei</i>	None/None/SS/Covered/None	Interior cypress woodland dominated by host plant <i>Hesperocyparis forbesii</i> (Tecate cypress)	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
western beach tiger beetle	<i>Cicindela latesignata latesignata</i>	None/None/SS/None/None	Mudflats and beaches in coastal Southern California	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
western tidal-flat tiger beetle	<i>Cicindela gabbii</i>	None/None/SS/None/None	Inhabits estuaries and mudflats along the coast of Southern California	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
California mellitid bee	<i>Melitta californica</i>	None/None/SS/None/None	Desert regions of southwestern Arizona, southeastern California, and Baja California, Mexico; also collected from Torrey Pines, San Diego County	X	X	X	X	Not expected to occur within the 500-foot buffer or component impact areas due to lack of suitable habitat.
Hermes copper	<i>Lycaena hermes</i>	FC/None/None/None/Listed	Mixed woodlands, chaparral, and coastal scrub	X	X	L	L	Low potential to occur in suitable habitat with host plants (<i>Rhamnus crocea</i> and <i>Eriogonum fasciculatum</i>) within the 500-foot buffer LFG Pipeline and Repurposed 36-inch Pipeline. Would have been observed during focused surveys. Not expected to occur in areas lacking suitable habitat.

APPENDIX B

Existing Conditions Letter Report

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November 7, 2016

SDD-21.24

Ms. Summer Adleberg
City of San Diego
Public Utilities Department
9192 Topaz Way, MS 901A
San Diego, CA 92123

Subject: Existing Conditions Letter Report for the Pure Water San Diego Program North City Water Purifications Project

Dear Ms. Adleberg:

This letter report presents the results of biological surveys conducted by HELIX Environmental Planning, Inc. (HELIX) and subconsultant Rocks Biological Consulting, Inc. (Rocks) for the proposed North City Pure Water Facility Project (project) located in San Diego County, California. The surveys were conducted to assess existing biological conditions and provide the City of San Diego (City) with information necessary to determine project impacts to biological resources.

INTRODUCTION

Project Location

The study area includes six distinct sites located throughout San Diego County: 1) Sander East; 2) Marine Corps Air Station (MCAS) Miramar; 3) Mast Boulevard; 4) Pueblo North; 5) Pueblo Central; and 6) Pueblo South (Figure 1). The three Pueblo sites are located in the City of San Diego, east of Interstate (I-) 805, just west of the MCAS Miramar, and south of Carroll Canyon Road. Pueblo North encompasses a 14.0-acre area, Pueblo Central encompasses a 33-acre area, and Pueblo South encompasses a 29-acre area. Pueblo North is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian U.S. Geological Survey (USGS) 7.5-minute Del Mar quadrangle map (Figure 2a). Pueblo Central is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (in part) and the Del Mar

quadrangle map (in part) (Figure 2a). Pueblo South is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2a).

Sander East encompasses an approximate 30-acre area located in the community of Kearny Mesa in the City of San Diego, south of State Route 52, and north of Mercury Street. The site is located in unsectioned land within Townships 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2b).

Mast Boulevard encompasses an approximate two-acre area located on the border of the City of Santee and an unincorporated part of San Diego County, south of El Nopal, and north of Hillcreek Road. The site is located in unsectioned land within Townships 15 South, Range 1 West on the San Bernardino Base and Meridian USGS 7.5-minute El Cajon quadrangle map (Figure 2c).

MCAS Miramar encompasses an approximate 95-acre area located on MCAS Miramar, east of I-805. The site is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2d).

Pueblo North, Pueblo Central, Pueblo South, and Sander East occur within the City's Multiple Species Conservation Program (MSCP) Subarea Plan (City 1997); however, Pueblo Central is the only site located within the Multi-Habitat Planning Area (MHPA; Figure 3). All six sites are located outside of the Coastal Overlay Zone.

Environmental Setting

The six sites are located throughout San Diego County and have unique environmental settings. Elevations in the MCAS Miramar site range from approximately 246 feet (ft) above mean sea level (amsl) to approximately 478 ft amsl. Soil types mapped within this study area include Redding gravelly loam (2 to 9 percent slopes), riverwash, terrace escarpments, Chesterton fine sandy loam (2 to 5 percent slopes), Olivenhain cobbly loam (9 to 30 percent slopes), and Carlsbad gravelly loamy sand (2 to 5 percent slopes). Elevations in the three Pueblo sites range from approximately 260 ft amsl to approximately 394 ft amsl. Soil types mapped within the Pueblo sites include Altamont clay (15 to 30 percent slopes and 30 to 50 percent slopes), Huerhuero loam (15 to 30 percent slopes, eroded), Redding cobbly loam (9 to 30 percent slopes and 2 to 9 percent slopes), Redding gravelly loam (2 to 9 percent slopes), and Olivenhain cobbly loam (30 to 50 percent slopes). Elevations in the Sander East site range from approximately 362 ft amsl to approximately 412 ft amsl. Soil types mapped within this study area include Redding cobbly loam (9 to 30 percent slopes) and Redding gravelly loam (2 to 9 percent slopes). Elevations in the Mast Boulevard site range from approximately 366 ft amsl to approximately 382 ft amsl. One soil type was mapped within this site: Visalia sandy loam (0 to 2 percent slopes) (Bowman 1973).

Project Description

The Pure Water San Diego Program (Pure Water Program) is the City Public Utilities Department's proposed program to provide a safe, secure, and sustainable local drinking water supply for San Diego. Advanced water purification technology will be used to produce potable water from recycled water. The Pure Water Program consists of the design and construction of new advanced water treatment facilities, wastewater treatment facilities, pump stations, transmission lines, and pipelines. In support of the Pure Water Program, the City is proposing to build a new advanced water treatment facility, referred to as the North City Pure Water Facility (NCPWF). The NCPWF project would include expansion of the existing North City Water Reclamation Plant (North City Plant), construction of a new full-scale advanced water purification facility adjacent to the North City Plant, pipelines, electrical transmission lines, and support facilities such as pump stations.

METHODS

Prior to conducting biological field surveys, HELIX conducted searches of the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDDB), U.S. Fish and Wildlife Service (USFWS) sensitive species database, California Native Plant Society (CNPS) online database for the Del Mar, La Jolla, and El Cajon USGS topographic quadrangles, and the City's MSCP Subarea Plan for information regarding sensitive species known to occur within the vicinity of the survey area. The biological study area that is part of this existing conditions report includes the six sites surveyed, including the additional survey areas shown in Figures 4a-4f. Pueblo South, Pueblo Central, and Sander East are potential mitigation sites for the project.

General Biological Survey

An initial site assessment of the Pueblo North, Pueblo Central, Pueblo South, Sander East, and Mast sites was conducted on September 24, 2015 by Summer Adleberg (City), Shelby Howard (HELIX), and Jim Rocks (Rocks). An initial site assessment of the MCAS Miramar site was conducted on November 4, 2015 by Ms. Adleberg, Mr. Howard, and Mr. Rocks. The purpose of the initial assessment was to evaluate site conditions and discuss the approach to the site surveys. General biological surveys of all six sites were conducted by HELIX biologist Erica Harris and Rocks biologists Lee Ripma, Brian Lohstroh, Marty Lewis, Shannon Walsh, Jim Rocks, and Brenda Bennett. Surveys took place between October 7, 2015 and September 1, 2016. The surveys consisted of mapping vegetation communities, conducting habitat assessments for sensitive species, documenting the locations of sensitive plant and animal species observed, evaluating potentially jurisdictional habitats/drainages, as well as mapping potential ponding basins. The surveys were conducted on foot, and binoculars were used as necessary. Vegetation communities were mapped in accordance with the City's Biology Guidelines (City 2012).

Plant and animal species observed or otherwise detected during the survey were recorded (Attachments A and B). Animal identifications were made in the field by direct, visual observation, or indirectly by detection of calls, burrows, tracks, or scat. Plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs. However, the lists of species identified are not necessarily comprehensive accounts of all species that occur on the site, as species that are nocturnal, secretive, or seasonally restricted may not have been observed.

Wet Season Fairy Shrimp

Rocks permitted biologists Jim Rocks (TE-063230-4), Melanie Rocks (TE-082908-2), Lee Ripma (TE-221290-3), Marty Lewis (authorized individual TE-221290-3), and Brian Lohstroh (TE-063608-5) conducted the wet season survey according to USFWS protocol (USFWS 2015) to determine the presence/absence of San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*). HELIX biologist Erica Harris assisted with the sampling as a supervised individual. Site visits were conducted between October 7, 2015 and June 14, 2016. Out of a total of 82 mapped basins, 41 were inundated long enough for sampling during the 2015-2016 wet season.

Samples were taken in water-holding basins using fine mesh aquarium nets. When possible, fairy shrimp were identified in the field and immediately returned to their pool of origin. In some instances, fairy shrimp were collected and identified using the key in Eriksen and Belk (1999) with aid of a dissecting scope. The USFWS protocol requires that no more than 20 specimens of each species from each feature, or less than 50 percent of the estimated subpopulation for each feature, be collected (whichever is the lesser amount). Care was taken to ensure that nets were cleaned after each basin was sampled. Basin depth, area, water temperature, air temperature, habitat condition, and species present were noted and recorded on USFWS vernal pool data sheets. A species list was recorded at each basin observed on site. Data sheets were not filled out when a basin was dry during a survey visit. Representative site photos and data sheets are provided in the wet season fairy shrimp survey report (Rocks 2016).

Dry Season Fairy Shrimp

HELIX permitted biologist Jason Kurnow (Permit TE-778195-13), along with HELIX biologist Amy Mattson who served as a supervised individual, collected the dry season soil samples according to USFWS protocol (USFWS 2015) on June 17, 28, and 29, 2016. Representative photos of the sites are included in the dry season fairy shrimp survey report (*in prep*). Approximate depth, area, and habitat condition of each sampled basin were noted and recorded on a USFWS Vernal Pool Data Sheet.

Following soil collection, the samples were brought to the HELIX lab for analysis by Mr. Kurnow. HELIX biologists Summer Schlageter, Hannah Sadowski and Ms. Mattson assisted with the soil processing as supervised individuals. Samples were prepared by dissolving the soil samples in water and sequentially sieving the material through 710-, 355-, and 212- μ m pore size screens. The small size of these screens ensures that cysts from the target fairy shrimp species are

retained. The portion of each sample retained in the screen was dispersed in a brine solution to separate the organic from the inorganic material. The organic fraction was decanted, dried, and examined under a microscope. Cysts were identified to genus level based on surface characteristics. Multiple species of the *Branchinecta* genus can occur in San Diego County, but cannot be identified past genus level based on cyst characteristics.

Soil from the three basins containing *Branchinecta* cysts on Pueblo North and 12 of the 21 basins containing *Branchinecta* cysts on MCAS Miramar (see the Results section below for details) was sent to D. Christopher Rogers (University of Kansas) for hatching, in accordance with the current USFWS protocol. Soil samples were prepared for examination by Mr. Rogers in a laboratory at the University of Kansas by dissolving soil clumps containing resting eggs (also referred to as cysts) in distilled water. Adult shrimp were reared from the recovered cysts using methods following U.S. Environmental Protection Agency (1985), Eng et al. (1990), Maeda-Martinez et al. (1995a and 1995b), and Jawahar and Dumont (1995). Hatched shrimp were fed a standard Daphnia food that includes: fish food, fish oil, baker's yeast, and the alga *Selenastrum capricornutum*. The shrimp were reared to maturity. Adult *Branchinecta* reared from culture were killed in 90 percent ethyl alcohol and examined under a stereo dissection microscope. Identifications were made by Mr. Rogers based upon comparisons with specimens in University of Kansas collections, the original species descriptions, and professional experience.

Rare Plant Surveys

Rare plant surveys were conducted by Rocks biologists Jim Rocks, Brenda Bennett, and Lee Ripma on April 12, 13, and 25, May 4, 11, and 13, August 11, and September 1, 2016. The sites were traversed by foot and inspected for the presence of rare plant species. Opportunistic inspections for rare plants were also performed during other surveys conducted in 2015 and 2016. Rare plants investigated include those that are listed as threatened or endangered by the USFWS or CDFW, designated as Rank 1-4 plant species by the CNPS, listed in Attachment A of the City Biology Guidelines (City 2012), narrow endemic species (City 2012), and vernal pool indicator species (Bauder et al. 2009).

Nomenclature

Nomenclature used in this report follows the conventions used in the City's Biology Guidelines (City 2012) and the MSCP (City 1997). Nomenclature also follows Baldwin et al. (2012) for plants; Holland (1986) and Oberbauer (2008) for vegetation communities; the American Ornithologists' Union (2014) for birds; Collins and Taggart (2002) for reptiles; and Baker et al. (2003) for mammals. Plant species status is taken from the CNPS (2015). Animal species status is from CDFW (2015a and b). Habitat sensitivity is based on the City's Biology Guidelines (City 2012).

RESULTS

Vegetation Communities/Habitats: Pueblo North, MCAS Miramar, and Mast Boulevard Sites

The Pueblo North, Mast Boulevard, and MCAS Miramar sites support 21 vegetation communities/habitats: vernal pool, southern willow scrub, mulefat scrub, riparian woodland, freshwater marsh, herbaceous wetland, disturbed wetland, open water, nonvegetated channel/floodway, coast live oak woodland, native grassland, scrub oak chaparral, coastal sage-chaparral transition (including disturbed), Diegan coastal sage scrub (including disturbed), Diegan coastal sage scrub: baccharis-dominated, chamise chaparral (including disturbed), southern mixed chaparral, non-native grassland, disturbed habitat, non-native vegetation, and developed (Figures 4a, 4e, 4f-1 through 4f-12; Table 1).

Table 1 EXISTING VEGETATION COMMUNITIES/HABITATS PUEBLO NORTH, MCAS MIRAMAR, MAST BOULEVARD SITES					
VEGETATION COMMUNITY/HABITAT	MSCP TIER[†]	PUEBLO NORTH*	MCAS MIRAMAR	MAST BOULE VARD^α	TOTAL
Vernal pool	Wetland	0.04	1.97 [±]	-	2.01
Vernal pool – previously documented by MCAS Miramar ^π	Wetland	-	0.29	-	0.29
Southern willow scrub	Wetland	-	1.52	0.01	1.53
Mulefat scrub	Wetland	-	0.32	0.03	0.35
Riparian woodland	Wetland	-	1.64	-	1.64
Freshwater marsh	Wetland	-	0.36	-	0.36
Herbaceous wetland	Wetland	-	-	1.34	1.34
Disturbed wetland	Wetland	-	-	0.02	0.02
Open water	Wetland	-	0.30	-	0.30
Non-vegetated channel/floodway	Wetland	-	0.70	-	0.70
<i>Wetlands Subtotal</i>		0.04	7.10	1.40	8.54
Coast live oak woodland	I	-	1.0	-	1.0
Native grassland	I	1.3	-	-	1.3
Scrub oak chaparral	I	-	4.5	-	4.5
Coastal sage-chaparral transition	II	-	4.1	-	4.1
Diegan coastal sage scrub	II	3.2	24.0	0.1	27.3

Table 1 (cont.) EXISTING VEGETATION COMMUNITIES/HABITATS PUEBLO NORTH, MCAS MIRAMAR, MAST BOULEVARD SITES					
VEGETATION COMMUNITY/HABITAT	MSCP TIER[†]	PUEBLO NORTH*	MCAS MIRAMAR	MAST BOULE VARD^α	TOTAL
Diegan coastal sage scrub: baccharis-dominated	II	-	9.8	0.2	10.0
Chamise chaparral	IIIA	-	2.4	-	2.4
Southern mixed chaparral	IIIA	-	0.5	-	0.5
Non-native grassland	IIIB	7.5	11.0	1.9	20.4
Disturbed habitat	IV	2.0	10.1	0.6	12.7
Non-native vegetation	IV	-	0.2	-	0.2
Developed	N/A	-	21.6	0.5	22.1
<i>Uplands Subtotal</i>		14.0	89.2	3.3	106.5
TOTAL		14.04	96.30	4.70	115.04

[†] Tiers refer to City MSCP Subarea Plan habitat classification system.

* Acreage of Pueblo North includes an additional study area, which consists of the following communities: 0.4 native grassland, 2.5 non-native grassland, <0.1 Diegan coastal sage scrub, 1.7 disturbed habitat

[±] One vernal pool (PW 34) was mapped just offsite of MCAS Miramar, and is included in the vegetation community acreages: 0.61 PW 34

^α Acreage of Mast Boulevard includes an additional study area, which consists of the following communities: 0.01 southwestern willow scrub, 0.02 mulefat scrub, 0.34 herbaceous wetland, 0.01 disturbed wetland, 0.14 Diegan coastal sage scrub, 0.07 Diegan coastal sage scrub: baccharis-dominated, 1.1 non-native grassland, 0.3 disturbed habitat, 0.3 developed

^π Indicates basins previously mapped by MCAS Miramar which are documented to contain vernal pool indicator plant species but which did not pond during the 2015-2016 survey season.

Vernal Pool

Vernal pools are a highly specialized plant habitat that supports a unique flora. Vernal pools are associated with two important physical conditions: a subsurface hardpan or claypan that inhibits the downward percolation of water and a topography characterized by a series of low hummocks called mima mounds and low depressions (the vernal pools), which prevent above ground water runoff. As the result of these two physical conditions, water collects in these depressions during the rainy season. As the rainy season ends and the dry season begins, the water that has collected in these vernal pools is gradually evaporated. As water evaporates from these pools, a gradient of low soil water availability to high soil water availability is created from the periphery of the pool margins to the center of the pool. The chemical composition of the remaining pool water becomes more concentrated as the pool water is evaporated, creating a gradient of low ion concentration at the pool periphery to high ion concentration at the pool center. A temporal succession of plant species will occur at the receding pool margins, depending upon the physical and chemical microenvironmental characteristics of the pool. Vernal pool indicator species observed within these pools include hyssop loosestrife (*Lythrum hyssopifolia*), long leaf plantain (*Plantago elongata*), and woolly marbles (*Psilocarphus brevissimus*) (Attachment A). Seven

vernal pools, totaling 0.04 acre, were identified within the Pueblo North site, and 12 vernal pools, totaling 1.97 acres, were identified within and adjacent to the MCAS Miramar site (four additional vernal pools were previously mapped by MCAS Miramar, totaling 0.29 acre) (Figures 4a and 4f; Tables 3 and 4).

Southern Willow Scrub

Southern willow scrub consists of dense, broadleaved, winter-deciduous stands of trees dominated by shrubby willows (*Salix* sp.) in association with mulefat (*Baccharis salicifolia*), and with scattered emergent cottonwood (*Populus fremontii*) and western sycamores (*Platanus racemosa*). This vegetation community occurs on loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. Frequent flooding maintains this early seral community, preventing succession to a riparian woodland or forest (Holland 1986). In the absence of periodic flooding, this early seral type would be succeeded by southern cottonwood or western sycamore riparian forest. Approximately 1.52 acres of southern willow scrub occur within the MCAS Miramar site, and approximately 0.01 acre occurs within the Mast Boulevard site.

Mulefat Scrub

Mulefat scrub is an under-developed, shrubby riparian scrub community dominated by mulefat and interspersed with small willows. This vegetation community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. This early seral community is maintained by frequent flooding, the absence of which would lead to a cottonwood or sycamore dominated riparian woodland or forest (Holland 1986). In some environments, limited hydrology may favor the persistence of mulefat. Approximately 0.32 acre of mulefat scrub occurs within the MCAS Miramar site, and approximately 0.03 acre occurs within the Mast Boulevard site and associated study area.

Riparian Woodland

Southern riparian woodlands are composed of winter-deciduous trees that require water near the soil surface. Willow (*Salix* sp.), cottonwood (*Populus* sp.), and western sycamore (*Platanus racemosa*) form a dense medium height woodland or forest in moist canyons and drainage bottoms. Associated understory species include mulefat, stinging nettle (*Urtica dioica* ssp. *holosericea*), and wild grape (*Vitis girdiana*; Beauchamp 1986). There may be large canopy gaps within the upper tree stratum. Approximately 1.64 acres of riparian woodland occur within the MCAS Miramar site.

Freshwater Marsh

Coastal and valley freshwater marsh is dominated by perennial, emergent monocots, five to 13 feet tall, forming incomplete to completely closed canopies. This vegetation type occurs along the coast and in coastal valleys near river mouths and around the margins of lakes and springs, freshwater or brackish marshes. These areas are semi- or permanently flooded yet lack a

significant current (Holland 1986). Dominant species include cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.), along with umbrella sedges (*Cyperus* sp.), rushes (*Juncus* sp.), and spike-sedge (*Eleocharis* sp.). Approximately 0.36 acre of freshwater marsh occurs within the MCAS Miramar site.

Herbaceous Wetland

Herbaceous wetland is a low-growing, herbaceous community that is dominated by a variety of native wetland species. It typically occurs in seasonally wet areas with heavy soils. Dominant species usually include wrinkled rush (*Juncus rugulosus*), toad rush (*Juncus bufonius*), and wetland grasses. Common species of this habitat observed on site include cocklebur and western ragweed. Approximately 1.34 acres of herbaceous wetland occur within the Mast Boulevard site and associated study area.

Disturbed Wetland

Disturbed wetlands are dominated by exotic wetland species that invade areas that have been previously disturbed or undergone periodic disturbances. These non-natives become established more readily following natural or human-induced habitat disturbance than the native wetland flora. Approximately 0.02 acre of disturbed wetland occurs within the Mast Boulevard site and is made up of a maintained storm water channel outfall and generally lacks vegetation, but includes some non-native grasses (*Bromus* spp.) re-establishing.

Open Water

Open water is a category describing year-round bodies of water. This includes those portions of water bodies that are usually covered by water and contain less than 10 percent vegetative cover. Approximately 0.30 acre of open water occurs within the MCAS Miramar site.

Non-vegetated Channel/Floodway

Non-vegetated channel/floodway includes the sandy, gravelly, or rocky fringe of waterways or flood channels. These areas are unvegetated on a regularly permanent basis. Variable water lines inhibit the growth of vegetation, although some weedy species of grasses may grow along the outer edges of the wash. Vegetation may exist here but it is usually less than 10 percent total cover. Approximately 0.70 acre of non-vegetated channel/floodway occurs within the MCAS Miramar site.

Coast Live Oak Woodland

Coast live oak woodland is an open to dense evergreen woodland or forest community dominated by coast live oak (*Quercus agrifolia*) that may reach a height of 35 to 80 feet. The shrub layer consists of toyon (*Heteromeles arbutifolia*), Mexican elderberry (*Sambucus mexicana*), spreading snowberry (*Symphoricarpos mollis*), fuchsia-flowered gooseberry (*Ribes speciosum*), and poison oak (*Toxicodendron diversilobum*). A dense herbaceous understory is

dominated by miner's lettuce (*Claytonia perfoliata* var. *perfoliata*) and chickweed (*Stellaria media*). Approximately 1.0 acre of coast live oak woodland occurs within the MCAS Miramar site.

Native Grassland

Native grassland is a community dominated by perennial bunchgrasses such as purple needle grass (*Nassella pulchra*) with annual and perennial forbs such as common golden stars (*Bloomeria crocea* ssp. *crocea*) and California blue-eyed grass (*Sisyrinchium bellum*). Native grasslands generally occur on fine-textured soils that exclude the annual, exotic grasses. Native grasslands occur throughout California as small isolated islands. Approximately 1.3 acres of native grassland occur within the Pueblo North site and associated study area.

Scrub Oak Chaparral

Scrub oak chaparral is a dense, evergreen chaparral up to 20 feet tall, dominated by scrub oak (*Quercus dumosa*) with considerable mountain mahogany (*Cercocarpus betuloides*). Scrub oak chaparral occurs in somewhat more mesic areas than many other chaparrals, such as north facing slopes, and recovers more rapidly from fires than other chaparrals due to resprouting capabilities of scrub oak (Holland 1986). Approximately 4.5 acres of scrub oak chaparral occur within the MCAS Miramar site.

Coastal Sage-Chaparral Transition

Coastal sage-chaparral scrub transition is a mixture of sclerophyllous chaparral shrubs and drought-deciduous sage scrub species regarded as an ecotone (transition) between two vegetation communities. This singular community contains floristic elements of both communities including California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum* ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), chamise (*Adenostoma fasciculatum*), inland scrub oak (*Quercus berberidifolia*), and ceanothus (*Ceanothus* spp.). This community varies in species composition but always contains coastal sage and chaparral species. Approximately 4.1 acres of coastal sage-chaparral scrub occur within the MCAS Miramar site.

Diegan Coastal Sage Scrub

Diegan coastal sage scrub is the wide-spread coastal sage scrub in coastal southern California. This vegetation community occupies xeric sites characterized by shallow soils. The Diegan coastal sage scrub on site is dominated by California sagebrush, California buckwheat, laurel sumac, lemonadeberry (*Rhus integrifolia*), and black and white sage (*Salvia mellifera* and *S. apiana*). Approximately 24.0 acres of Diegan coastal sage scrub occur within the MCAS Miramar site, approximately 3.2 acres occur within the Pueblo North site and associated study area, and approximately 0.1 acre occurs within the Mast Boulevard site and associated study area.

Diegan Coastal Sage Scrub: baccharis-dominated

Diegan coastal sage scrub: baccharis-dominated is similar to Diegan Coastal Sage Scrub but dominated by *Baccharis* species. It is typically found on disturbed sites or those with nutrient-poor soils. This habitat is often found within other forms of Diegan Coastal Sage Scrub and on upper terraces of river valleys. Dominant species include broom baccharis (*Baccharis sarothroides*) and/or coyote brush (*Baccharis pilularis*), and may also include California sagebrush, California buckwheat, sawtooth goldenbush (*Hazardia squarrosa*), Menzies' goldenbush (*Isocoma menziesii*), and black sage in lesser amounts. Approximately 9.8 acres of disturbed habitat occur within the MCAS Miramar site and approximately 0.2 acre occurs within the Mast Boulevard site and associated study area.

Chamise Chaparral

Chamise chaparral is the most widely distributed chaparral shrub and is dominated by the species chamise. This vegetation community is found from Baja to northern California in pure or mixed stands. Chamise chaparral's ubiquitous distribution may be the result of chamise being the only chaparral species that regenerates from fire from both an underground root crown and the production of seeds (Rundel 1986). It often dominates at low elevations and on xeric south facing slopes with 60 to 90 percent canopy cover. Mission manzanita (*Xylococcus bicolor*) and black sage are minor plant species associated within this vegetation community. Approximately 2.4 acres of chamise chaparral occur within the MCAS Miramar site.

Southern Mixed Chaparral

Southern mixed chaparral is composed of broad-leaved sclerophyllous shrubs that can reach six to 10 feet in height and form dense often nearly impenetrable stands with poorly developed understories. In this mixed chaparral the shrubs are generally tall and deep rooted, with a well-developed soil litter layer, high canopy coverage, low light levels within the canopy, and lower soil temperatures. This vegetation community occurs on dry, rocky, often steep north-facing slopes with little soil. Depending upon relative proximity to the coast, southern mixed chaparral is dominated by chamise, mission manzanita, coast white lilac (*Ceanothus verrucosus*), Ramona lilac (*Ceanothus tomentosus*), white-stem wild-lilac (*Ceanothus leucodermis*), big-berry manzanita (*Arctostaphylos glauca*), and scrub oak. Approximately 0.5 acre of southern mixed chaparral occurs within the MCAS Miramar site.

Non-native Grassland

Non-native grassland is characterized by a sparse to dense cover of annual grasses and is often associated with numerous species of showy-flowered, non-native, annual forbs. Most of the introduced, annual species that make up the majority of species and biomass within non-native grassland originate from the Mediterranean region. Characteristic species observed within this vegetation community include oats (*Avena* spp.), bromes (*Bromus* spp.), and rye grasses (*Festuca* spp.). Approximately 11.0 acres of non-native grassland occur within the MCAS

Miramar site, approximately 7.5 acres occur within the Pueblo North site and associated study area, and approximately 1.9 acres occur within the Mast Boulevard site and associated study area.

Disturbed Habitat

Disturbed habitat includes land cleared of vegetation (e.g., dirt roads), land containing a preponderance of non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance (previously cleared or abandoned landscaping), or land showing signs of past or present animal usage that removes any capability of providing viable habitat. Approximately 10.1 acres of disturbed habitat occur within the MCAS Miramar site, approximately 2.0 acres occur within the Pueblo North site and associated study area, and approximately 0.6 acre occurs within the Mast Boulevard site and associated study area.

Non-native Vegetation

Non-native vegetation is a category describing stands of naturalized trees and shrubs (e.g., acacia [*Acacia* sp.], peppertree [*Schinus* sp.]), many of which are also used in landscaping. Approximately 0.2 acre of non-native vegetation occurs within the MCAS Miramar site.

Developed

Developed land is where permanent structures and/or pavement have been placed, which prevents the growth of vegetation, or where landscaping is clearly tended and maintained. Approximately 21.6 acres of developed land occur within the MCAS Miramar site; and approximately 0.5 acre occurs within the Mast Boulevard site and associated study area.

Plants

A total of 147 plant species were observed across all six sites during the biological surveys (Attachment A).

Animals

A total of 51 animal species, including seven invertebrate, four amphibian, three reptile, and 37 bird species, were observed or detected across all six sites during the biological survey (Attachment B).

Sensitive Resources: Pueblo North, MCAS Miramar, and Mast Boulevard Sites

Sensitive Vegetation Communities

Sensitive vegetation communities are considered either rare within the region or sensitive by CDFW; are listed as sensitive under the MSCP (City 1997a) or the City's Biology Guidelines

(2012); or support sensitive plants or animals. They are considered sensitive because they have been depleted, are naturally uncommon, or support sensitive species.

Sensitive vegetation communities that occur within the study areas include chamise chaparral, coast live oak woodland, coastal sage-chaparral scrub transition, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, native grassland, non-native grassland, scrub oak chaparral, southern mixed chaparral, and vernal pool. Mitigation in accordance with the MSCP regulations is required for impacts to sensitive vegetation communities.

Sensitive Plants

Sensitive plant species are considered uncommon or limited in that they (1) are only found in the San Diego region, (2) are a local representative of a species or association of species not otherwise found in the region, or (3) are severely depleted within their ranges or within the region. Specifically, sensitive plants would include federal and state listed species, MSCP covered species, City narrow endemic species, and CNPS Rank 1-4 species.

No federally or state listed plant species, or MSCP covered species, were observed within the study areas. Two sensitive plant species were observed within the study areas: graceful tarplant (*Holocarpha virgata* spp. *elongata*) and San Diego sagewort (*Artemisia palmeri*). Neither of these species is MSCP covered nor a City narrow endemic species.

Graceful tarplant (*Holocarpha virgata* spp. *elongata*)

Status: --/--; CRPR 4.2

Distribution: San Diego, Orange, and Riverside

Habitat(s): Chaparral, valley grassland, foothill woodland, and coastal sage scrub

Status on site: Approximately 153 individuals were estimated on the MCAS Miramar site and approximately 45 individuals were documented on the Pueblo North site (Figures 5a and 5e).

San Diego sagewort (*Artemisia palmeri*)

Listing: --/--; CNPS List 4.2

Distribution: Coastal San Diego County; Baja California, Mexico

Habitat: Stream courses, often within coastal sage scrub and southern mixed chaparral

Status on site: A total of 27 individuals were observed on the MCAS Miramar site (Figure 5e).

No other sensitive plant species, including City narrow endemic species, were observed during the biological surveys that took place between October 2015 and September 2016.

Sensitive Animals

Sensitive animal species are considered those listed as federal/state endangered or threatened, proposed for listing, fully protected by CDFW, MSCP covered species, or California species of special concern. Five sensitive animal species were observed or detected within the study areas during the biological surveys: white-tailed kite, coastal California gnatcatcher, Belding's orange-throated whiptail, two-striped garter snake, and San Diego fairy shrimp.

White-tailed kite (*Elanus leucurus*)

Status: --/Fully Protected

Distribution: Primarily occurs throughout coastal slopes of San Diego County

Habitat(s): Riparian woodlands and oak or sycamore groves adjacent to grassland

Status on site: A white-tailed kite was observed on multiple site visits foraging on and adjacent to the Pueblo North site. There is not any suitable nesting habitat on or directly adjacent to the site for this species; therefore, it is not expected to nest on the site (Figure 5a).

Coastal California gnatcatcher (*Polioptila californica californica*)

Status: FT/SSC

Distribution: In San Diego County, occurs throughout coastal lowlands

Habitat(s): Coastal sage scrub

Status on site: Four individuals were detected within or adjacent to the northern portion of the MCAS Miramar site (Figure 5e).

Belding's orange-throated whiptail (*Aspidoscelis hyperythrus beldingi*)

Status: --/SSC, MSCP Covered, MHCP Covered, MSHCP Covered

Distribution: Southern Orange and southern San Bernardino counties, south through Baja California

Habitat(s): Coastal sage scrub, chaparral, edges of riparian woodlands, and washes. Also found in weedy, disturbed areas adjacent to these habitats. Important habitat requirements include open, sunny areas, shaded areas, and abundant insect prey base, particularly termites (*Reticulitermes* sp.).

Status on site: Two individuals were observed within the northern portion of the MCAS Miramar site (Figure 5e).

Two-striped gartersnake (*Thamnophis hammondi*)

Status: --/SSC

Distribution: Monterey County south through the coastal ranges into northwestern Baja California

Habitat(s): Occurs along permanent and intermittent streams bordered by dense riparian vegetation, but occasionally associated with vernal pools or stock ponds

Status on site: Three individuals were observed within the northern portion of the MCAS Miramar site (Figure 5e).

San Diego fairy shrimp (*Branchinecta sandiegonensis*)

Status: FE/--

Distribution: San Diego County and extreme northern Baja California, Mexico.

Habitat(s): Seasonally astatic pools which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral.

Status on site: San Diego fairy shrimp were observed within one vernal pool on the MCAS Miramar site during the 2015-2016 sampling season, and were documented within 10 additional pools during the 2008 surveys (Figure 5e).

Vegetation Communities/Habitats: Pueblo Central, Pueblo South, and Sander East Sites

The Pueblo Central, Pueblo South, and Sander East sites support 14 vegetation communities/habitats: vernal pool, southern willow scrub, disturbed wetland, native grassland, scrub oak chaparral, coastal sage-chaparral transition, Diegan coastal sage scrub (including disturbed), Diegan coastal sage scrub: baccharis-dominated, chamise chaparral, non-native grassland, eucalyptus woodland, disturbed habitat, non-native vegetation, and developed (Figures 4b, 4c, 4d; Table 2).

**Table 2
EXISTING VEGETATION COMMUNITIES/HABITATS
PUEBLO CENTRAL, PUEBLO SOUTH, AND SANDER EAST SITES**

VEGETATION COMMUNITY/HABITAT	MSCP TIER[†]	PUEBLO CENTRAL[*]	PUEBLO SOUTH[±]	SANDER EAST^α	TOTAL
Vernal pool	Wetland	0.01	0.04	0.02	0.06
Southern willow scrub	Wetland	-	0.23	-	0.23
Disturbed wetland	Wetland	-	-	1.93	1.93
Wetlands Subtotal		0.01	0.27	1.95	2.23
Native grassland	I	0.1	-	-	0.1
Scrub oak chaparral	I	7.4	-	1.1	8.5
Coastal sage-chaparral transition	II	-	-	14.6	14.6
Diegan coastal sage scrub	II	5.0	9.5	1.5	16.0
Diegan coastal sage scrub: baccharis-dominated	II	1.9	-	1.2	3.1
Chamise chaparral	IIIA	16.6	15.9	2.5	35.0
Non-native grassland	IIIB	1.1	2.9	-	4.0
Eucalyptus woodland	IV	0.1	1.5	0.4	2.0
Disturbed habitat	IV	3.5	3.9	10.7	18.1
Non-native vegetation	IV	0.6	3.8	0.1	4.5
Developed	N/A	0.4	3.0	1.7	5.1
Uplands Subtotal		36.7	40.5	33.8	111.0
TOTAL		36.71	40.77	35.75	113.23

[†] Tiers refer to City MSCP Subarea Plan habitat classification system.

^{*} Acreage of Pueblo Central includes an additional study area, which consists of the following communities: 0.01 vernal pool, 0.7 scrub oak chaparral, 1.1 Diegan coastal sage scrub, 0.2 Diegan coastal sage scrub: baccharis-dominated, 1.8 chamise chaparral, 0.2 non-native grassland, 0.1 Eucalyptus woodland, 0.8 disturbed habitat, 0.5 non-native vegetation, 0.4 developed

[±] Acreage of Pueblo South includes an additional study area, which consists of the following communities: 0.01 vernal pool, 0.02 southern willow scrub, 2.5 Diegan coastal sage scrub, 0.3 chamise chaparral, 0.4 non-native grassland, 0.5 Eucalyptus woodland, 1.5 disturbed habitat, 0.7 non-native vegetation, 1.4 developed

^α Acreage of Sander East includes an additional study area, which consists of the following communities: 0.1 disturbed wetland, 1.0 coastal sage-chaparral transition, 0.6 Diegan coastal sage scrub, 0.1 Eucalyptus woodland, 2.4 disturbed habitat, 1.7 developed

Vernal Pool

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Six vernal pools were documented within the Pueblo Central site, totaling 0.01 acre; six vernal pools were documented within the Pueblo South site, totaling 0.04 acre, and three vernal pools were documented within the Sander East site, totaling 0.02 acre (Figures 4b-d; Tables 2 and 3).

Southern Willow Scrub

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 0.23 acre of southern willow scrub occurs within the Pueblo South site and associated study area (Figure 4c; Table 2).

Disturbed Wetland

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. The disturbed wetland on the Sander East site comprises approximately 1.92 acres and is dominated by pampas grass (*Cortaderia* spp.), tamarisk (*Tamarix* spp.), eucalyptus (*Eucalyptus* spp.), date palm (*Phoenix* spp.), Washington fan palm (*Washingtonia robusta*), and Bermuda grass (*Cynodon dactylon*). Approximately 1.93 acres of disturbed wetland occur within the Sander East site and associated study area (Figure 4d; Table 2).

Native Grassland

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Less than 0.1 acre of native grassland occurs within the Pueblo Central site and associated study area. Approximately 0.1 acre of native grassland occurs within the Pueblo Central site and associated study area (Figure 4c; Table 2).

Scrub Oak Chaparral

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 7.4 acres of scrub oak chaparral occur within the Pueblo Central site and associated study area and approximately 1.1 acres occur within the Sander East site and associated study area (Figures 4b and 4d; Table 2).

Coastal Sage-Chaparral Transition

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 14.6 acres of coastal sage- chaparral transition occur within the Sander East site and associated study area (Figure 4d; Table 2).

Diegan Coastal Sage Scrub

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 5.0 acres of Diegan coastal sage scrub occur within the Pueblo Central site and associated study area, approximately 9.5 acres occur within the Pueblo South site and associated study area, and approximately 1.5 acres occur within the Sander East site and associated study area (Figures 4b-d; Table 2).

Diegan coastal sage scrub: baccharis-dominated

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 1.9 acres of Diegan coastal sage scrub: baccharis-dominated habitat occur within the Pueblo Central site and associated study area and approximately 1.2 acres occur within the Sander East study area (Figures 4b and 4d; Table 2).

Chamise Chaparral

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 16.6 acres of chamise chaparral occur within the Pueblo Central site and associated study area, approximately 15.9 acres occur within the Pueblo South site and associated study area, and approximately 2.5 acres occur within the Sander East site (Figures 4b-d; Table 2).

Non-native Grassland

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 1.1 acres of non-native grassland occur within the Pueblo Central site and associated study area and approximately 2.9 acres occur within the Pueblo South site and associated study area (Figures 4b and 4c; Table 2).

Eucalyptus Woodland

Eucalyptus woodland is dominated by eucalyptus (*Eucalyptus* sp.), an introduced species that has often been planted purposely for wind blocking, ornamental, and hardwood production purposes. Most groves are monotypic with the most common species being either the blue gum (*Eucalyptus gunnii*) or red gum (*E. camaldulensis* ssp. *obtusa*). The understory within well-established groves is usually very sparse due to the closed canopy and allelopathic nature of the abundant leaf and bark litter. If sufficient moisture is available, this species becomes naturalized and is able to reproduce and expand its range. Approximately 0.1 acre of eucalyptus woodland occurs within the Pueblo Central site and associated study area, approximately 1.5 acres occur within the Pueblo South site and associated study area, and approximately 0.4 acre occurs within the Sander East site and associated study area (Figures 4b-d; Table 2).

Disturbed habitat

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 3.5 acres of disturbed habitat occur within the Pueblo Central site and associated study area, approximately 3.9 acres occur within the Pueblo South site and associated study area, and approximately 10.7 acres occur within the Sander East site and associated study area (Figures 4b-d; Table 2).

Non-native Vegetation

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 0.6 acre of non-native vegetation occurs within the Pueblo Central site and associated study area, approximately 3.8 acres occur within the Pueblo South site and associated study area, and approximately 0.1 acre occurs within the Sander East site and associated study area (Figures 4b-d; Table 2).

Developed

See description in the Pueblo North/MCAS Miramar/Mast Boulevard results section above. Approximately 0.4 acre of developed land occurs within the Pueblo Central site and associated study area, approximately 3.0 acres occur within the Pueblo South site and associated study area, and approximately 1.7 acres occur within the Sander East site and associated study area (Figures 4b-d; Table 2).

Sensitive Resources: Pueblo Central, Pueblo South, and Sander East Sites

Sensitive Vegetation Communities

Sensitive vegetation communities that occur within the Pueblo Central, Pueblo South, and Sander East sites include native grassland, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, non-native grassland, chamise chaparral, and scrub oak chaparral.

Sensitive Plants

No federally or state listed plant species were observed within the Pueblo Central, Pueblo South, and Sander East sites. Seven sensitive plant species were observed: Orcutt's brodiaea (*Brodiaea orcuttii*), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), San Diego barrel cactus (*Ferocactus viridescens*), Nuttall's scrub oak (*Quercus dumosa*), ashy spike-moss (*Selaginella cinerascens*), San Diego County viguiera (*Viguiera laciniata*), and graceful tarplant (*Holocarpha virgata* spp. *elongata*).

Orcutt's brodiaea (*Brodiaea orcuttii*)

Listing: --/--; CNPS List 1B.1; City MSCP Covered

Distribution: Riverside and San Bernardino counties south to Baja California, Mexico

Habitat: Vernal moist grasslands, mima mound topography, and vernal pool periphery are preferred habitat. Occasionally will grow on streamside embankments in clay soils.

Status on site: A total of 130 individuals were estimated within the Sander East site (Figure 5d).

San Diego barrel cactus (*Ferocactus viridescens*)

Listing: --/--; CNPS List 2.1; City MCSP Covered

Distribution: San Diego County; Baja California, Mexico

Habitat: Optimal habitat for this cactus appears to be Diegan coastal sage scrub hillsides, often at the crest of slopes and growing among cobbles. Occasionally found on vernal pool periphery and mima mound topography in Otay Mesa.

Status on site: One individual was documented in the western portion of the Sander East site (Figure 5d).

Nuttall's scrub oak (*Quercus dumosa*)

Listing: --/--; CNPS List 1B.1

Distribution: San Diego, Orange, and Santa Barbara counties; Baja California, Mexico

Habitat: Chaparral with a relatively open canopy cover is the preferred habitat in flat terrain (also found in coastal scrub). On north-facing slopes, may grow in dense monotypic stands. Sandy or clay loam soils

Status on site: A total of 432 individuals were estimated within the Sander East site (Figure 5d).

Ashy spike-moss (*Selaginella cinerascens*)

Listing: --/--; CNPS List 4.1

Distribution: Orange and San Diego counties; northwestern Baja California, Mexico

Habitat: Flat mesas in coastal sage scrub and chaparral. A good indicator of site degradation, as it rarely inhabits disturbed soils.

Status on site: A total of 2,921 individuals were estimated within the Sander East site (Figure 5d).

San Diego County viguiera (*Viguiera laciniata*)

Listing: --/--; CNPS List 4.2

Distribution: San Diego and Orange County; Baja California, Mexico

Habitat: Diegan coastal sage scrub. Generally, shrub cover is more open than at mesic, coastal locales supporting sage scrub. Occurs on a variety of soil types.

Status on site: One individual was documented within the western portion of the Sander East site (Figure 5d).

Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*)

Listing: --/--; CNPS List 1B.2

Distribution: Western Riverside, San Diego, and Santa Barbara counties; Baja California, Mexico

Habitat: This small annual is typically found on clay lenses largely devoid of shrubs and can be occasionally seen on vernal pool peripheries.

Status on site: A minimum of 15,992 individuals were estimated within the Sander East site (Figure 5d).

Graceful tarplant (*Holocarpha virgata* spp. *elongata*)

Status: --/--; CRPR 4.2

Distribution: San Diego, Orange, and Riverside

Habitat(s): Chaparral, valley grassland, foothill woodland, and coastal sage scrub

Status on site: A total of 101 individuals were estimated within the Pueblo South site and 160 individuals were estimated within the Pueblo Central site (Figures 5b and 5c).

No other sensitive plant species, including City narrow endemic species, were observed during the biological surveys that took place between October 2015 and September 2016.

Sensitive Animals

Sensitive animal species are considered those listed as federal/state endangered or threatened, proposed for listing, fully protected by CDFW, MSCP covered species, or California species of special concern. Two sensitive animal species were observed or detected within the Pueblo Central, Pueblo South, and Sander East sites during the biological surveys: San Diego fairy shrimp and western spadefoot toad.

San Diego fairy shrimp (*Branchinecta sandiegonensis*)

Status: FE/--

Distribution: San Diego County and extreme northern Baja California, Mexico.

Habitat(s): Seasonally astatic pools which occur in tectonic swales or earth slump basins and other areas of shallow, standing water often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral

Status on site: San Diego fairy shrimp were observed within two vernal pools on the Sander East site and four ponding areas within the Pueblo South site, three of which are classified as vernal pools and one of which contained no vernal pool indicator plant species (Table 3, Figures 5c and 5d).

Western spadefoot (*Spea hammondi*)

Status: --/SSC

Distribution: Throughout the Central Valley and San Francisco Bay area south along the coast to northwestern Baja California

Habitat: Occurs in open coastal sage scrub, chaparral, and grassland, along sandy or gravelly washes, floodplains, alluvial fans, or playas; require temporary pools for breeding and friable soils for burrowing; generally excluded from areas with bullfrogs (*Rana catesbiana*) or crayfish (*Procambarus* sp)

Status on site: One individual was observed on the eastern portion of the Sander East site (Figure 5d).

Wet Season Fairy Shrimp

Out of a total of 82 mapped basins, 41 were inundated long enough for sampling during the 2015-2016 wet season; however five of these pools were not sampled due to the documentation of SDFS in 2008 (MCAS Miramar 2016). Fairy shrimp were collected from 11 of the 36 sampled basins on the survey sites. Three basins were sampled at Sander East; two basins contained San Diego fairy shrimp and one basin did not contain fairy shrimp (Figure 6a). Twenty-one basins were sampled at MCAS Miramar; one basin contained San Diego fairy shrimp, two basins contained versatile fairy shrimp, one basin contained a single unidentified female *Branchinecta*, and 19 basins contained no fairy shrimp (Figure 6b). The single basin that contained an unidentified female *Branchinecta*, PW 47, has been documented to contain versatile fairy shrimp (personal communication between Charles Black and Summer Adleberg, September 6, 2016). MCAS Miramar data shows that 19 basins within the study area have been documented to contain San Diego fairy shrimp (MCAS Miramar 2016). Of these 19 basins, 10 were mapped by Rocks (PW 31, 33, 34, 35, 36, 37, 38, 39, 40, and 41) during 2015-2016, and were not sampled for San Diego fairy shrimp due to the known presence of this species (Table 4). However, five of these basins (PW31, 34, 38, 40, and 41) were sampled for Riverside fairy shrimp and no individuals of this species were found. No Riverside fairy shrimp have been previously documented in any of the sampled basins that occur within the footprint of the MCAS Miramar site (MCAS Miramar 2016). Two basins were sampled at Mast Boulevard and neither contained any fairy shrimp (Figure 6c). One basin was sampled at Pueblo North and contained versatile fairy shrimp (Figure 6d). One basin was sampled at Pueblo Central and did not contain fairy shrimp (Figure 6e). Eight basins were sampled at Pueblo South; four basins contained San Diego fairy shrimp and four basins did not contain fairy shrimp (Figure 6f). No Riverside fairy shrimp were documented during the 2015-2016 surveys. Results are summarized in Tables 3 and 4.

In addition to the 36 sampled basins, 46 other basins are present on the survey sites. These basins were inundated for less than seven days and therefore not sampled for fairy shrimp this season. One basin, PW28, was eliminated from sampling on February 15, 2016 because it was filled in with gravel. This area is known only to have supported *Branchinecta lindahli* and was filled with gravel as part of regular road maintenance and to prevent the spread of *B. lindahli* to adjacent basins (personal communication between Ms. Adleberg and Charles Black [MCAS Miramar] August 25, 2016).

In addition, USFWS granted permission to discontinue sampling at five *B. sandiegonensis* occupied basins before reaching 120 days of continuous inundation. Permission to discontinue sampling at PW25 (Sander East) was received on December 14, 2015 and permission to discontinue sampling at PW72, PW73, PW74, and PW75 (Pueblo South) was received on January 22, 2016 (Rocks 2016).

Dry Season Fairy Shrimp

HELIX documented *Branchinecta* cysts within the Sander East, MCAS Miramar, Pueblo North, Pueblo Central, and Pueblo South study areas (Tables 3 and 4). Soil from the three Pueblo North basins containing cysts, PW 55, 56, and 57, was sent to D. Christopher Rogers to complete the hatching protocol, and all cultures produced the non-listed fairy shrimp *Branchinecta lindahli* (dry season report *in prep*). Within the MCAS Miramar study area, *Branchinecta* cysts were observed in 21 basins. Of the 21 basins containing cysts, previous wet season surveys identified San Diego Fairy Shrimp in 9 of them. Cysts from these basins were not sent for hatching, as they are assumed to be from San Diego fairy shrimp. Cultures from the remaining 12 basins containing cysts, PW 28, 29, 43, 46-50, 52, 80, 81, and 82, were sent for hatching and produced the non-listed fairy shrimp *B. lindahli*.

Vernal Pool Mapping

Vernal pools were mapped in accordance with the City's Land Development Code Biology Guidelines (City 2012). Additional information was provided by MCAS Miramar regarding previous vernal pool mapping efforts within MCAS Miramar jurisdiction (Black 2009). The MCAS Miramar Vernal Pool Geographic Information System Database classifies vernal pool resources into "type" categories, with the "pool" type referring to vernal pools. All other types are referred to as "other seasonally ponded features" (OSPF). MCAS Miramar's "pool" definition differs from the City's Land Biology Guidelines in that it requires that the pool originate from natural processes "or purposeful creation/restoration activities" (Black 2009). As a result, within MCAS Miramar land, road ruts and basins that are a result of human disturbance are not classified as "pools" regardless if they contain vernal pool indicator plant species and/or threatened/endangered fairy shrimp species. Historical data provided by MCAS is included in conjunction with 2015-2016 vernal pool sampling results (Table 4, Figure 7).

Table 3						
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR						
BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS¹ (Y/N)	Presence of VFS¹ (Y/N)	<i>Branchinecta</i> cysts present		
Sander East						
PW1	N	-	-	N	Y	Y
PW2	N	-	-	N	Y	Y
PW3	N	-	-	N	N	N
PW4	N	-	-	N	Y	Y
PW5	N	-	-	N	N	N
PW6	N	-	-	N	Y	Y
PW7	N	-	-	N	Y	Y
PW8	N	-	-	N	Y	Y
PW9	N	-	-	N	Y	Y
PW10	N	-	-	Y	Y	Y
PW11	N	-	-	Y	Y	Y
PW12	N	-	-	N	Y	Y
PW13	N	-	-	Y	N	N
PW14	N	-	-	N	N	N
PW15	N	-	-	N	N	N
PW16	Y	Y	N	Y	Y	Y
PW17	N	-	-	N	Y	Y
PW18	N	-	-	N	Y	Y
PW19	N	-	-	N	N	N
PW20	N	-	-	N	Y	Y

Table 3 (cont.)						
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR						
BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS¹ (Y/N)	Presence of VFS¹ (Y/N)	<i>Branchinecta</i> cysts present		
Sander East (cont.)						
PW21	N	-	-	N	Y	Y
PW22	N	-	-	N	Y	Y
PW23	N	-	-	N	Y	Y
PW24	N	-	-	N	Y	Y
PW25	Y	Y	N	Y	Y	Y
PW26	N	-	-	N	N	N
PW27	N	-	-	N	Y	Y
PW78	Y	N	N	N	Y	Y
Mast Boulevard						
PW53	N	-	-	N	N	N
PW54	Y	N	N	N	N	N
PW79	Y	N	N	N	N	N
Pueblo North						
PW1	N	-	-	N	N	N
PW5	N	-	-	N	Y	Y
PW6	N	-	-	N	Y	Y
PW7	N	-	-	N	N	N
PW8	N	-	-	N	Y	Y
PW9	N	-	-	N	N	N
PW55	N	-	-	Y [†]	Y	Y

Table 3 (cont.)						
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR						
BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS¹ (Y/N)	Presence of VFS¹ (Y/N)	<i>Branchinecta</i> cysts present		
Pueblo North (cont.)						
PW56	Y	N	Y	Y [†]	Y	Y
PW57	N	-	-	Y [†]	Y	Y
PW58	N	-	-	N	Y	Y
PW59	N	-	-	N	N	N
Pueblo Central						
PW60	Y	N	N	Y	Y	Y
PW61	Y	N	N	N	Y	Y
PW62	Y	N	N	N	Y	Y
PW63	Y	N	N	N	Y	Y
PW64	Y	N	N	Y	Y	Y
PW65	Y	N	N	N	N	N
PW66	Y	N	N	N	N	N
PW67	Y	N	N	N	Y	Y

Table 3 (cont.)						
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR ALL SITES EXCEPT MCAS MIRAMAR						
BASIN NUMBER	WET SEASON			DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	CLASSIFIED AS VERNAL POOL* (Y/N)
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS¹ (Y/N)	Presence of VFS¹ (Y/N)	<i>Branchinecta</i> cysts present		
Pueblo South						
PW68	Y	N	N	N	Y	Y
PW69	Y	N	N	N	N	N
PW70	Y	N	N	Y	Y	Y
PW71	Y	N	N	Y	Y	Y
PW72	Y	Y	N	Y	Y	Y
PW73	Y	Y	N	Y	Y	Y
PW74	Y	Y	N	Y	N	N
PW75	Y	Y	N	Y	Y	Y

*Based on presence of obligate plant species (Bauder et al. 2009)

¹SDFS=San Diego fairy shrimp; VFS=versatile fairy shrimp

[†]Hatching results yielded the versatile fairy shrimp in each of the samples that were cultured

**Table 4
2016 WET SEASON/DRY SEASON SURVEY RESULTS FOR MCAS MIRAMAR**

VERNAL POOL NUMBER	2016 WET SEASON			2016 DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT IN 2016(Y/N)	CLASSIFIED AS CITY VERNAL POOL* (Y/N)	PREVIOUSLY MAPPED BY MCAS MIRAMAR (Y/N)	ACCORDING TO MIRAMAR DATABASE				
	Inundated for 7 or more days in 2016 (Y/N)	Presence of SDFS ¹ (Y/N)	Presence of VFS ¹ (Y/N)	<i>Branchinecta</i> cysts present				PRESENCE OF SDFS ¹ (Y/N)	PRESENCE OF VFS ¹ (Y/N)	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	LISTED PLANT SPECIES	MCAS MIRAMAR BASIN TYPE ¹
PW28	Y	N	Y	Y [†]	N	Y	Y	N	Y	Y	N	OSPF
PW29	N	-	-	Y [†]	N	Y	Y	N	Y	Y	N	OSPF
PW30	N	-	-	N	N	N	Y	N	N	N	N	OSPF
PW31	Y	N	N	Y	N	N	Y	Y	N	N	N	OSPF
PW32	Y	N	N	N	Y	Y	N	N	N	N	N	OSPF
PW33	Y	not sampled		Y	N	Y	Y	Y	N	Y	N	OSPF
PW34	Y	N	N	Y	Y	Y	Y	Y	N	Y	N	OSPF
PW35	Y	not sampled		Y	Y	Y	Y	Y	N	Y	N	OSPF
PW36	Y	not sampled		Y	Y	Y	Y	Y	N	Y	N	OSPF
PW37	Y	not sampled		Y	N	N	Y	Y	Y	N	N	OSPF
PW38	Y	N	N	Y	N	N	Y	Y	N	N	N	OSPF
PW39	Y	not sampled		Y	Y	Y	Y	Y	N	Y	N	OSPF
PW40	Y	N	N	N	Y	Y	Y	Y	N	Y	N	OSPF
PW41	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	VP
PW42	Y	N	N	N	Y	Y	N	N	N	N	N	OSPF
PW43	Y	N	N	Y [†]	N	Y	Y	N	N	Y	N	OSPF
PW44	Y	N	N	N	N	N	N	N	N	N	N	OSPF
PW45	Y	N	N	N	Y	Y	N	N	N	N	N	OSPF
PW46	Y	N	N	Y [†]	N	Y	Y	N	Y	Y	N	OSPF
PW47	Y	U	U	Y [†]	Y	Y	Y	N	Y	Y	N	OSPF
PW48	Y	N	Y	Y [†]	Y	Y	Y	N	Y	N	N	OSPF
PW49	Y	N	N	Y [†]	N	N	Y	N	N	N	N	OSPF
PW50	Y	N	N	Y [†]	Y	Y	Y	N	N	N	N	OSPF
PW51	Y	N	N	N	N	N	N	N	N	N	N	OSPF
PW52	Y	N	N	Y [†]	N	N	Y	N	N	N	N	OSPF
PW76	N	-	-	N	N	N	N	N	N	N	N	OSPF
PW77	N	-	-	N	N	N	N	N	N	N	N	OSPF
PW80	Y	N	N	Y [†]	N	N	N	N	N	N	N	OSPF
PW81	Y	N	N	Y [†]	N	N	N	N	N	N	N	OSPF
PW82	Y	N	N	Y [†]	N	N	N	N	N	N	N	OSPF

Table 4 (cont.) MIRAMAR VERNAL POOL SURVEY RESULTS												
VERNAL POOL NUMBER	2016 WET SEASON			2016 DRY SEASON	VERNAL POOL INDICATOR PLANT SPECIES PRESENT IN 2016(Y/N)	CLASSIFIED AS CITY VERNAL POOL 2016*	PREVIOUSLY MAPPED BY MCAS MIRAMAR (Y/N)	ACCORDING TO MIRAMAR DATABASE				
	Inundated in 2016 (Y/N)	Presence of SDFS ¹ (Y/N)	Presence of VFS ¹ (Y/N)	<i>Branchinecta</i> cysts present				PRESENCE OF SDFS ¹ (Y/N)	PRESENCE OF VFS ¹ (Y/N)	VERNAL POOL INDICATOR PLANT SPECIES PRESENT (Y/N)	LISTED PLANT SPECIES	MCAS MIRAMAR BASIN TYPE ¹
Additional "Other Seasonally Ponged Features: previously mapped by MCAS Miramar												
VP656	-	-	-	-	-	Y [±]	Y	Y	N	Y	N	OSPF
VP654	-	-	-	-	-	Y [±]	Y	Y	N	Y	N	OSPF
VP653	-	-	-	-	-	Y [±]	Y	Y	N	Y	N	OSPF
VP631	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP697	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP699	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP700	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP432	-	-	-	-	-	N	Y	Y	N	N	N	OSPF
VP582	-	-	-	-	-	Y [±]	Y	Y	N	Y	N	OSPF

*Based on presence of obligate plant species (Bauder et al. 2009) that were observed during 2016 surveys and in prior years by MCAS Miramar

¹OSPF=Other Seasonally Ponged Features (MCAS Miramar 2016); SDFS=San Diego fairy shrimp; VFS=versatile fairy shrimp

[†]Hatching results yielded the versatile fairy shrimp in each of the samples that were cultured

[±]Displayed on separate line in Table 1, indicating basins which are classified as vernal pools by City of San Diego's Land Development Code Biology Guidelines (City of San Diego, 2012)

Jurisdictional Waters and Wetlands

A formal jurisdictional delineation was not conducted for the Pueblo North site, but HELIX and Rocks evaluated the site for potential jurisdictional drainages and none were identified. The vernal pools mapped on the Pueblo North site are considered isolated from navigable waters with no federal nexus that would allow these pools to be considered jurisdictional wetlands by the U.S. Army Corps of Engineers (USACE) under the federal Clean Water Act. The Regional Water Quality Control Board (RWQCB) may try to assert jurisdiction over the vernal pools as wetland waters of the State under the Porter Cologne Act; however, these pools are small, isolated, and contain limited biological value given that they do not support listed species. Finally the vernal pools would be considered City wetlands in accordance with the City's Biological Guidelines.

HELIX relied on previous data from MCAS Miramar for jurisdictional information on the MCAS Miramar site because a formal jurisdictional delineation was not conducted. Several jurisdictional features were identified within the boundaries of the MCAS Miramar study area and are displayed in Figures 8a-c. Areas identified as wetlands by MCAS Miramar intersect the study area in the northern and central portions of the site. Additionally, MCAS Miramar's database included several areas that were classified as planning level waters of the U.S., including a drainage that crosses the northern portion of the study area. The MCAS Miramar database also included several smaller drainages that were classified as non-wetland WUS, and those drainages cross the study area throughout the length of the MCAS Miramar site.

Herbaceous wetland habitat was mapped at the Mast Boulevard site and a portion of it may be jurisdictional. A drainage containing disturbed wetland crosses the Sander East site and may be considered jurisdictional. Other unvegetated drainages may occur at the other sites. A formal jurisdictional delineation was not conducted for any of the other sites and would be needed to assess whether the areas contain any jurisdictional waters or wetlands that would be under the jurisdiction of USACE, RWQCB, and/or CDFW.


CONCLUSION

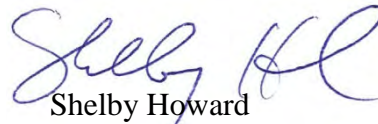
Ten sensitive vegetation communities occur within the Pueblo North, MCAS Miramar, and Mast Boulevard sites (chamise chaparral, coast live oak woodland, coastal sage-chaparral scrub transition, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, native grassland, non-native grassland, scrub oak chaparral, southern mixed chaparral, and vernal pool) and six occur within the Pueblo Central, Pueblo South, and Sander East sites (native grassland, Diegan coastal sage scrub, Diegan coastal sage scrub: baccharis-dominated, non-native grassland, chamise chaparral, and scrub oak chaparral). All potential basins that ponded on all six sites were surveyed and sampled for fairy shrimp species and San Diego fairy shrimp was documented within the MCAS Miramar, Sander East, and Pueblo South sites. The basins that were determined to meet the City's definition of City vernal pools (based on the presence of vernal pool indicator plant species) included 7 at Pueblo North, 21 at MCAS Miramar, 0 at Mast Boulevard, 6 at Pueblo Central, 6 at Pueblo South, and 21 at Sander East. Eight low sensitivity rare plant species were found at the sites (Orcutt's brodiaea, long-spined spineflower, San Diego barrel cactus, Nuttall's scrub oak, ashy spike-moss, San Diego county viguiera, San Diego

sagewort, and graceful tarplant). Six sensitive animal species were observed or detected within the sites (white-tailed kite, coastal California gnatcatcher, Belding's orange-throated whiptail, two-striped garter snake, western spadefoot, and San Diego fairy shrimp).

Please do not hesitate to call either of us at (619) 462-1515 if you have any questions.

Sincerely,


Summer Schlageter
Biologist


Shelby Howard
Principal Biologist

Enclosures:

Figure 1	Regional Location Map
Figures 2a - d	Project Vicinity (USGS Topography)
Figure 3	Aerial with MHPA
Figures 4a - f	Vegetation
Figures 5a - e	Special Status Species
Figures 6a - f	Wet Season Fairy Shrimp Survey Results
Figure 7	Basins Previously Mapped by MCAS Miramar
Figures 8a - c	MCAS Miramar Jurisdictional Information
Attachment A	Plant Species Observed
Attachment B	Animal Species Observed or Detected

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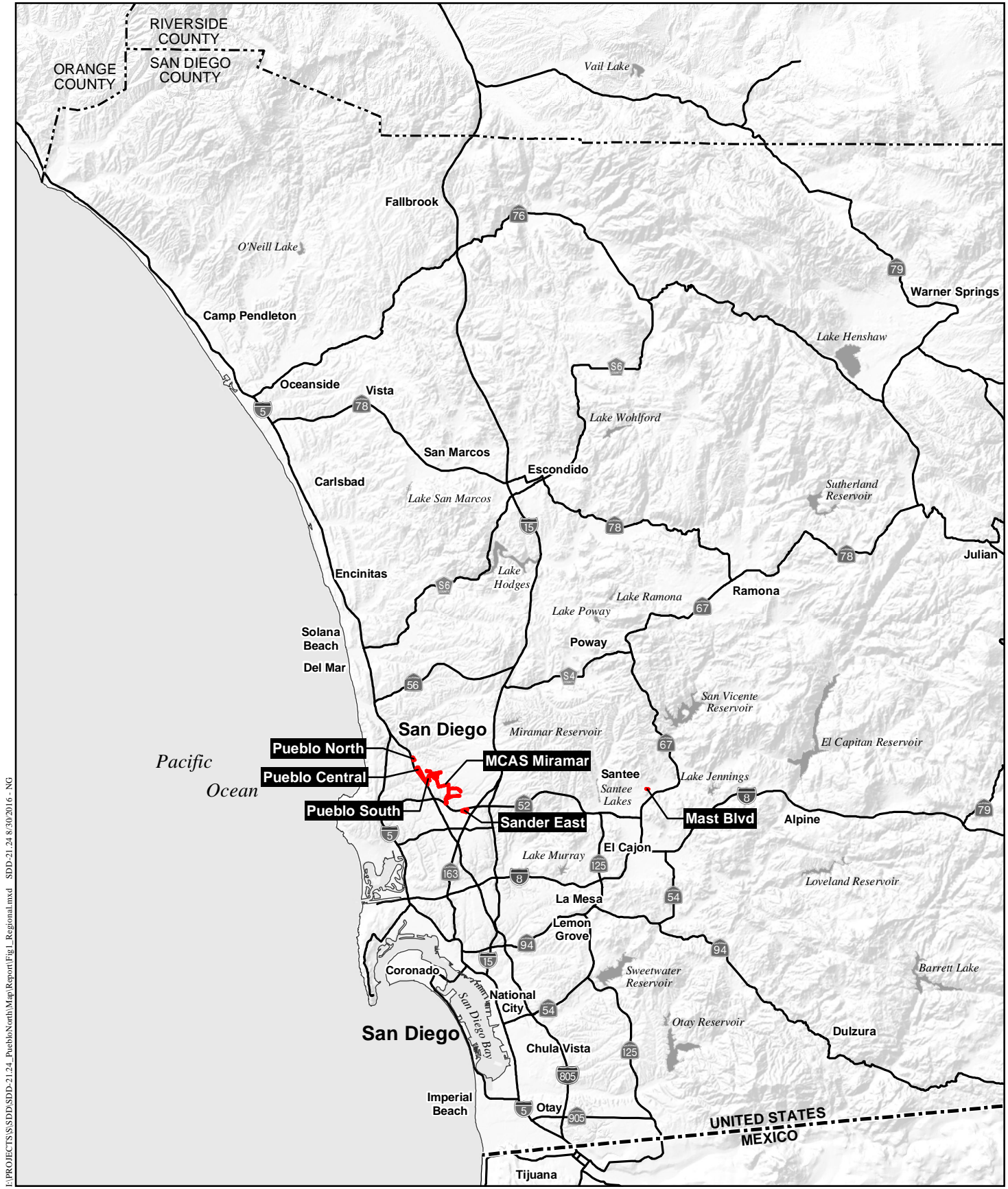
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Letter to Ms. Summer Adleberg
November 7, 2016

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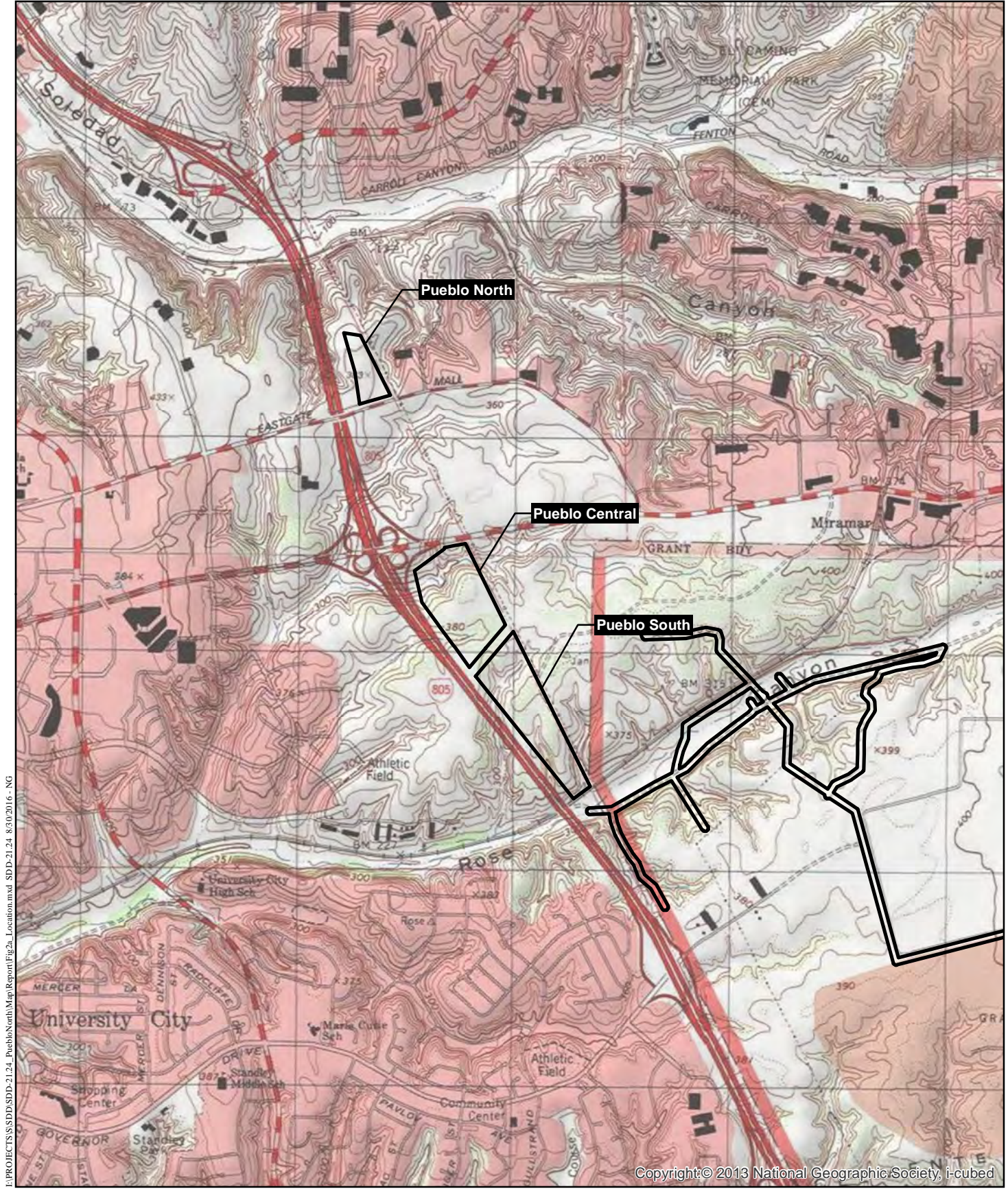


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Regional Location Map

PURE WATER

Figure 1



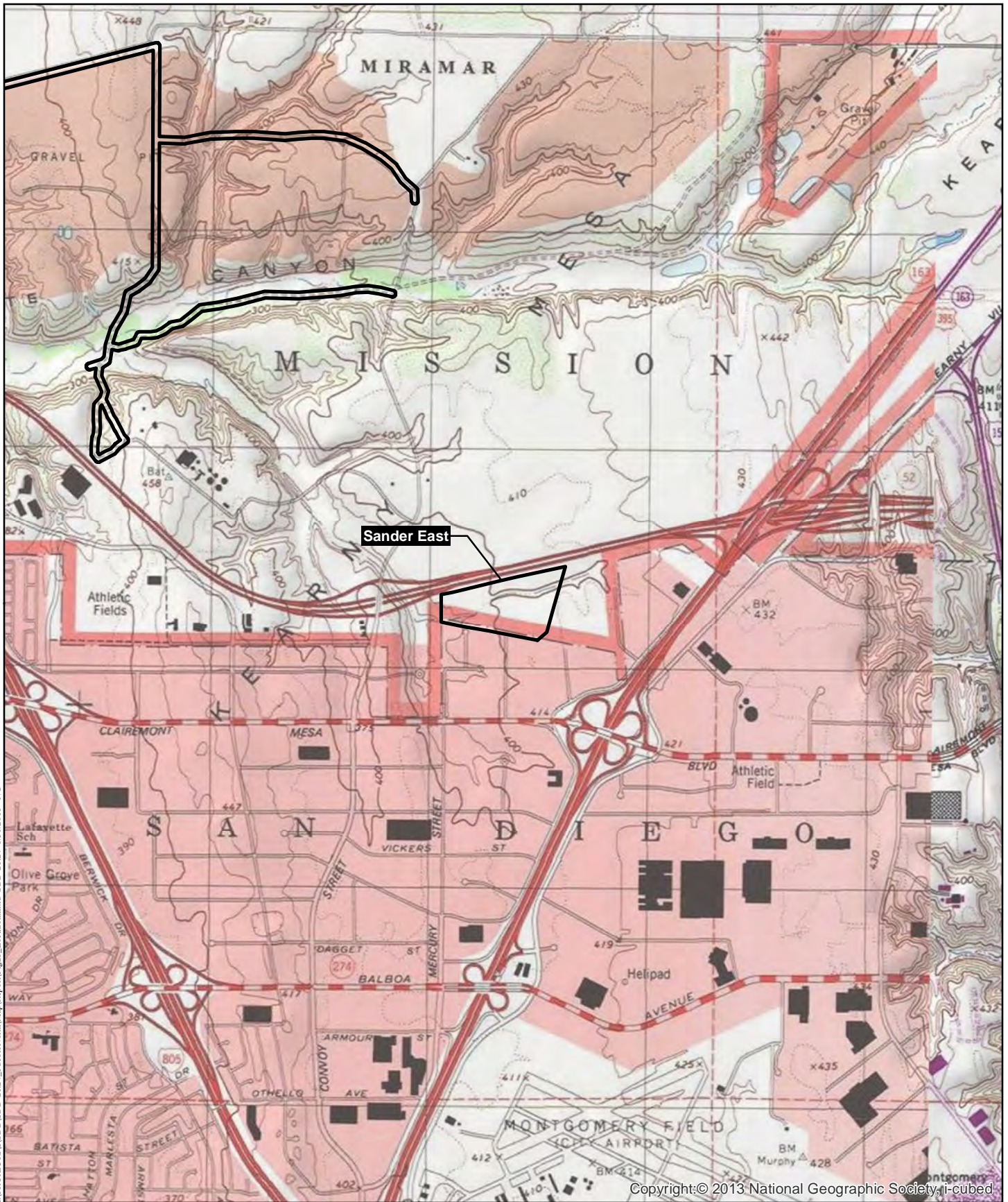
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Site Locations

PURE WATER

Figure 2a



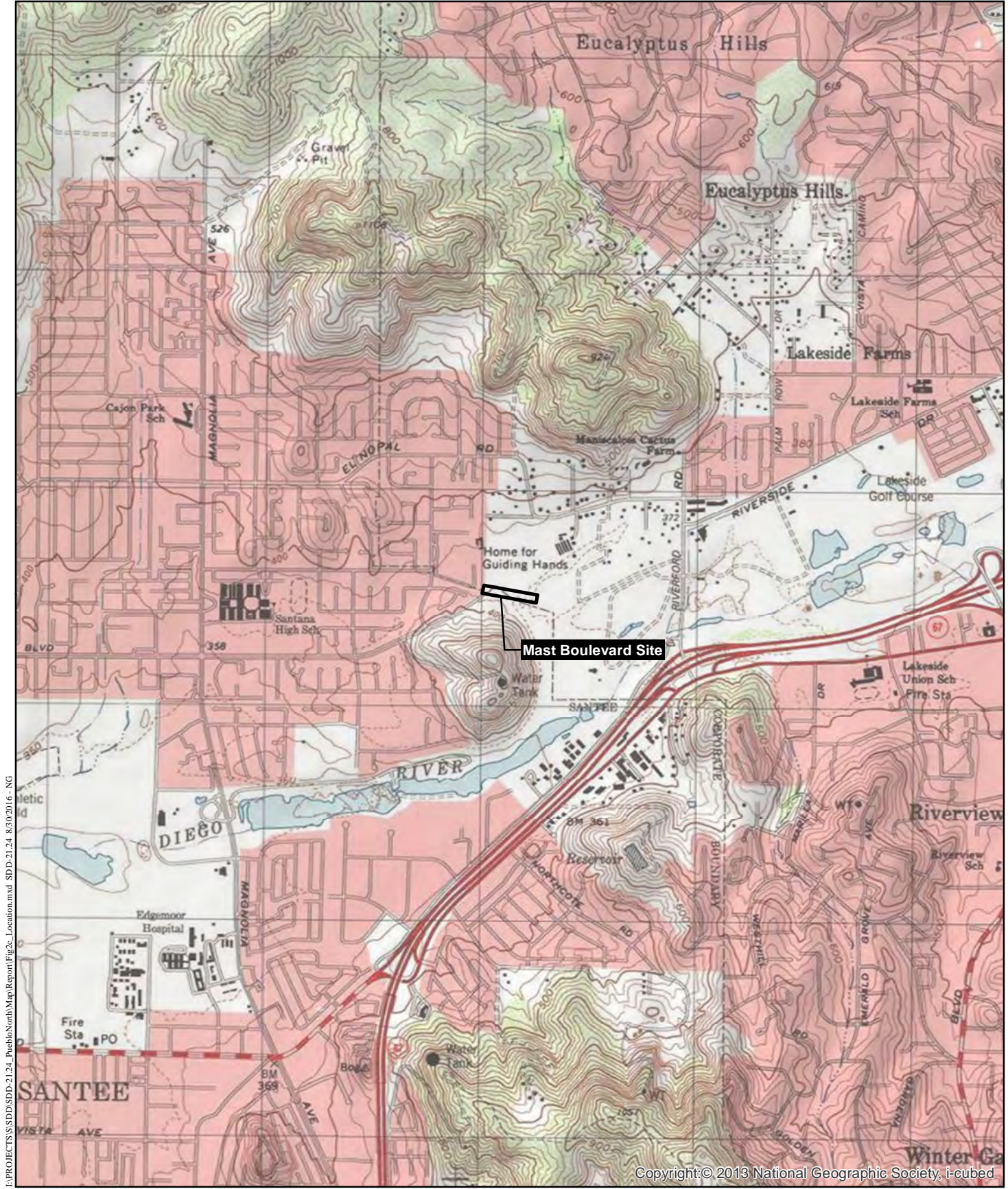
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Site Locations

PURE WATER

Figure 2b



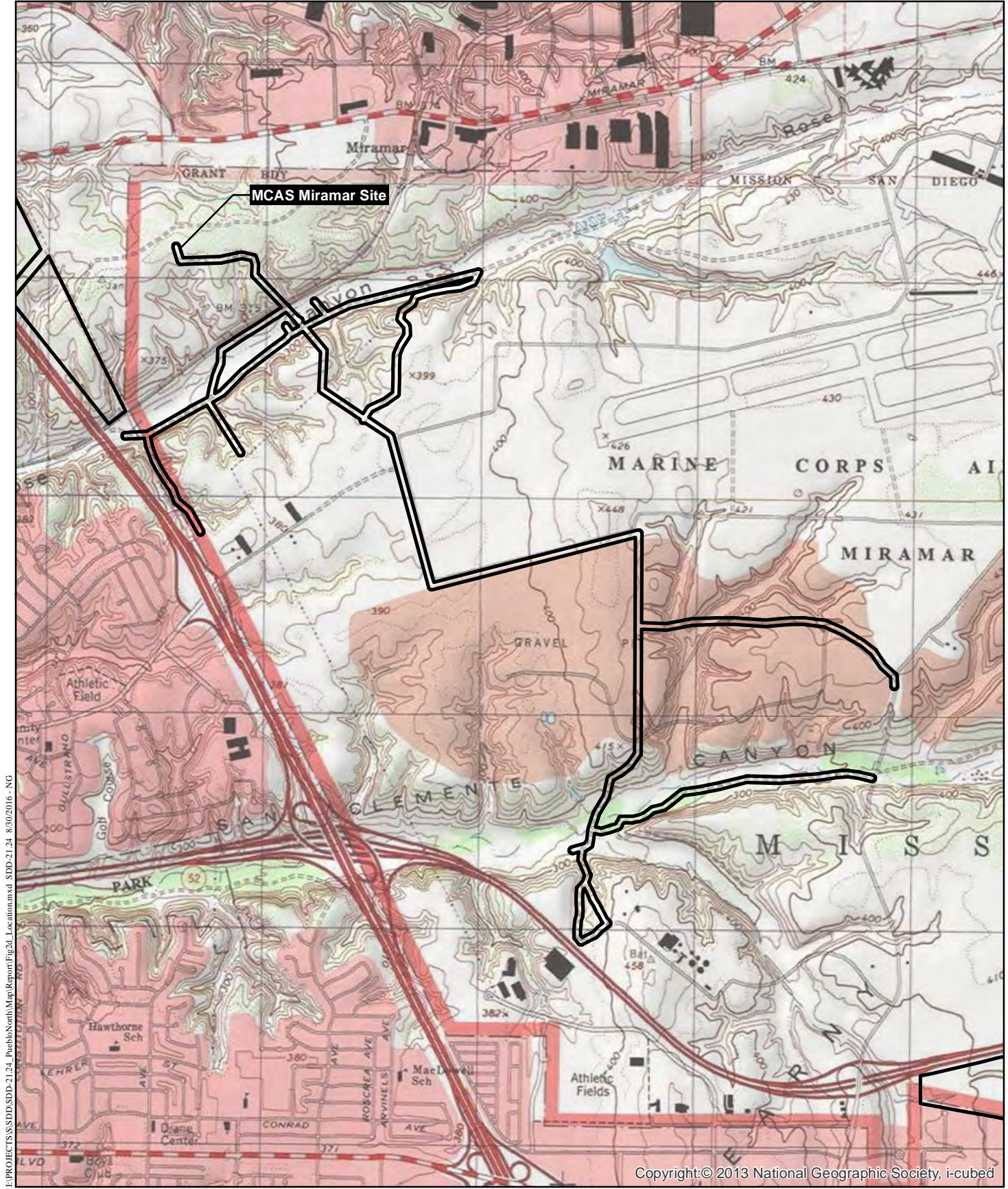
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Site Locations

PURE WATER

Figure 2c

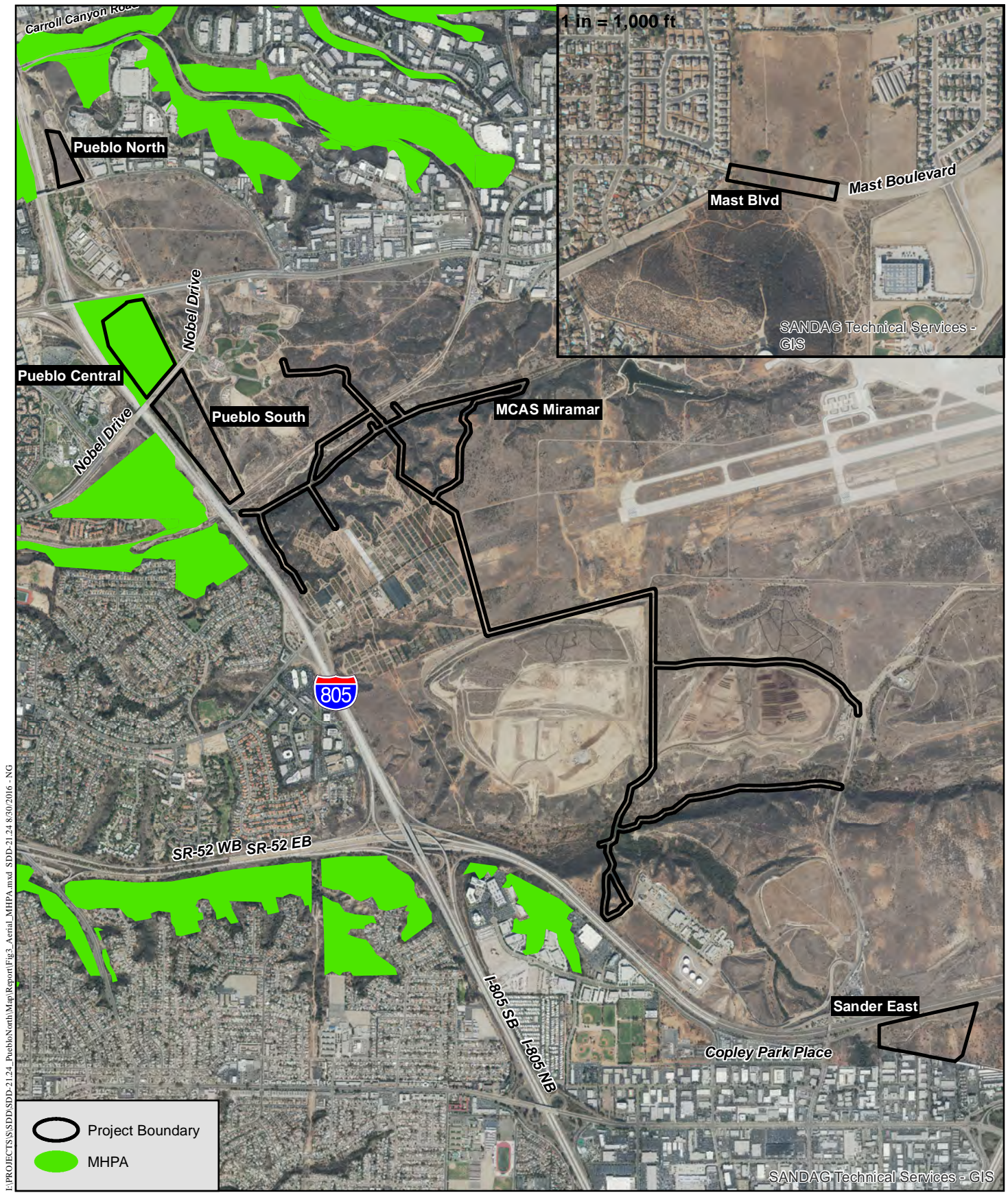


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Site Locations

PURE WATER

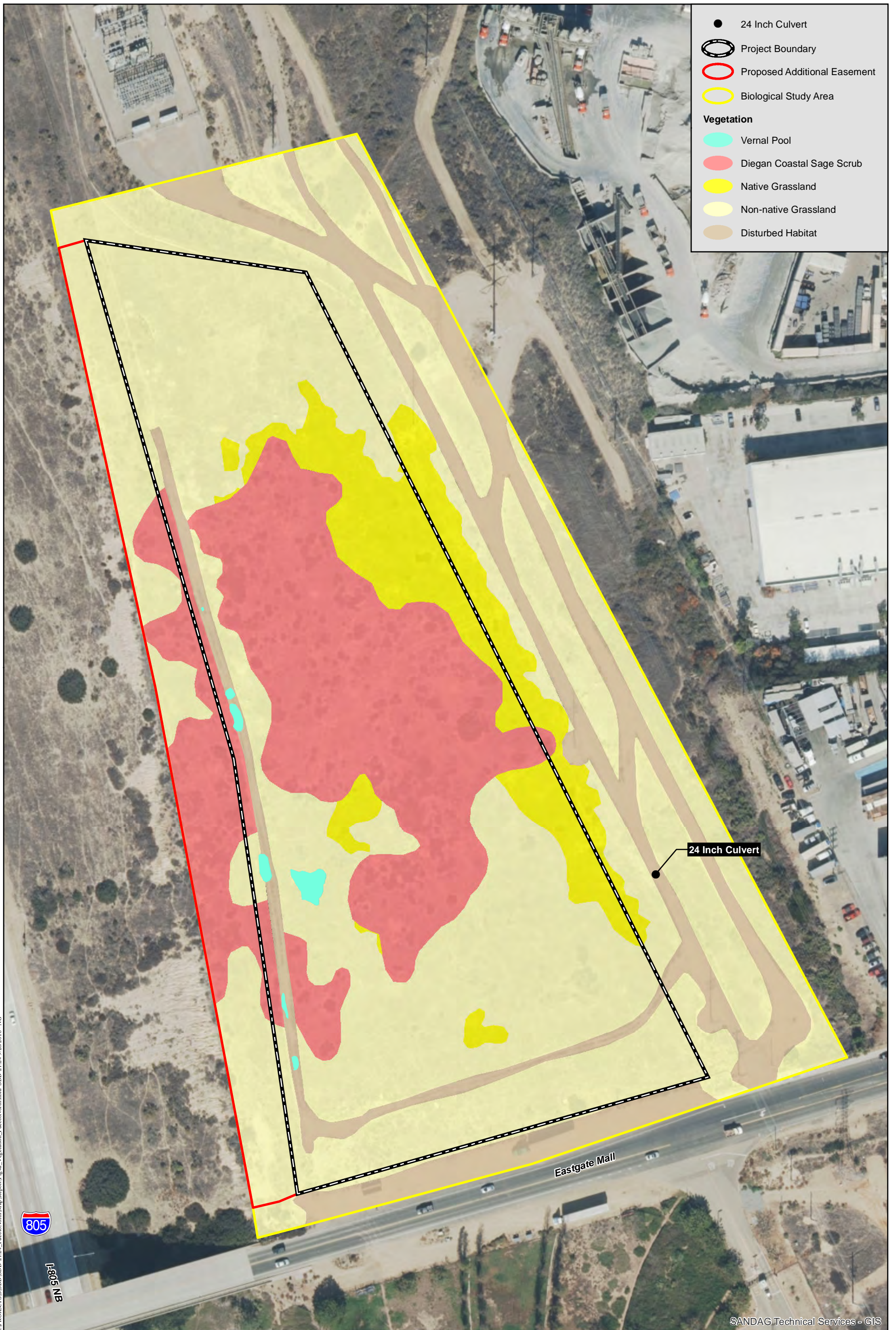
Figure 2d



Project Vicinity (Aerial Photograph)

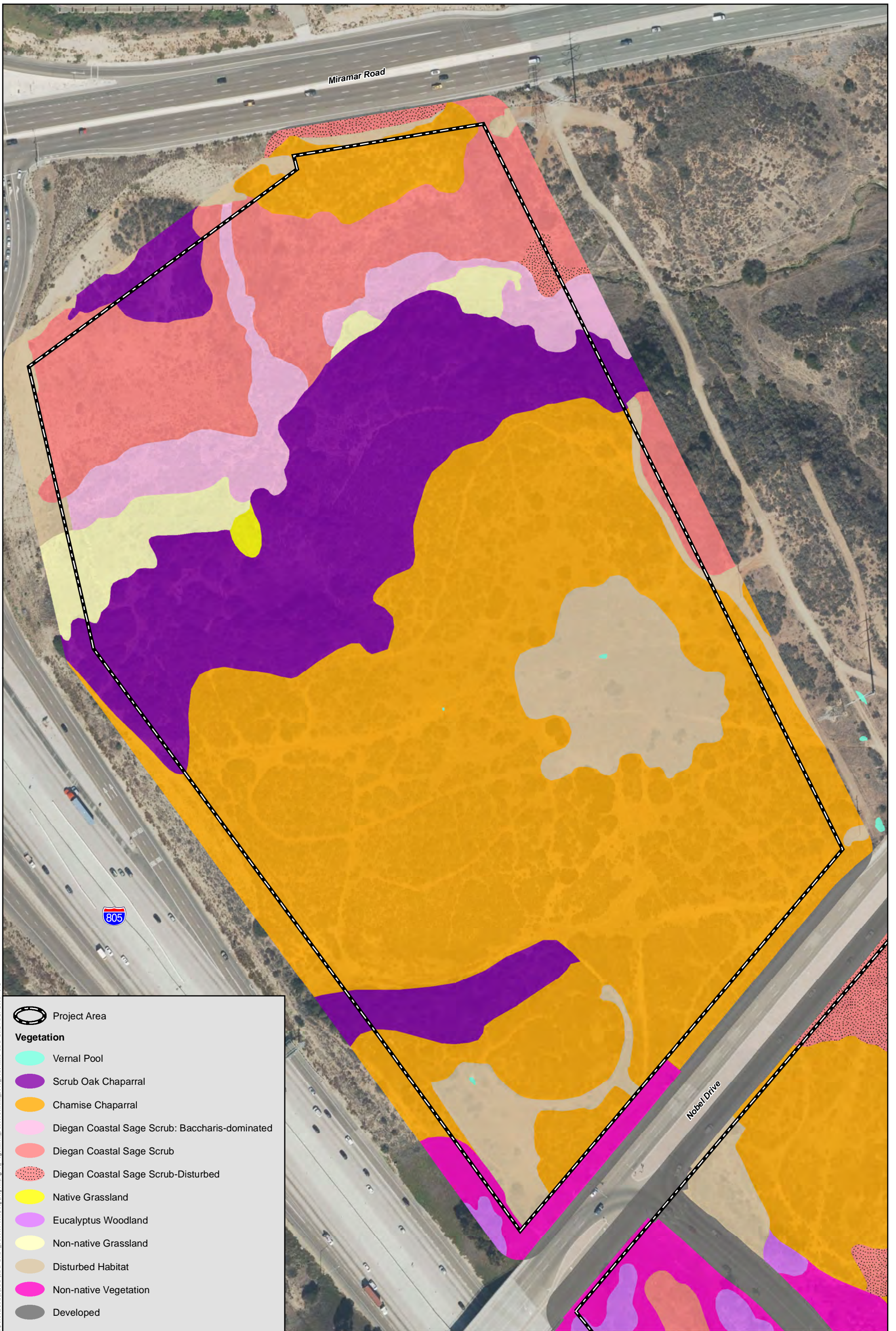
PUEBLO NORTH

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Vegetation - Pueblo North

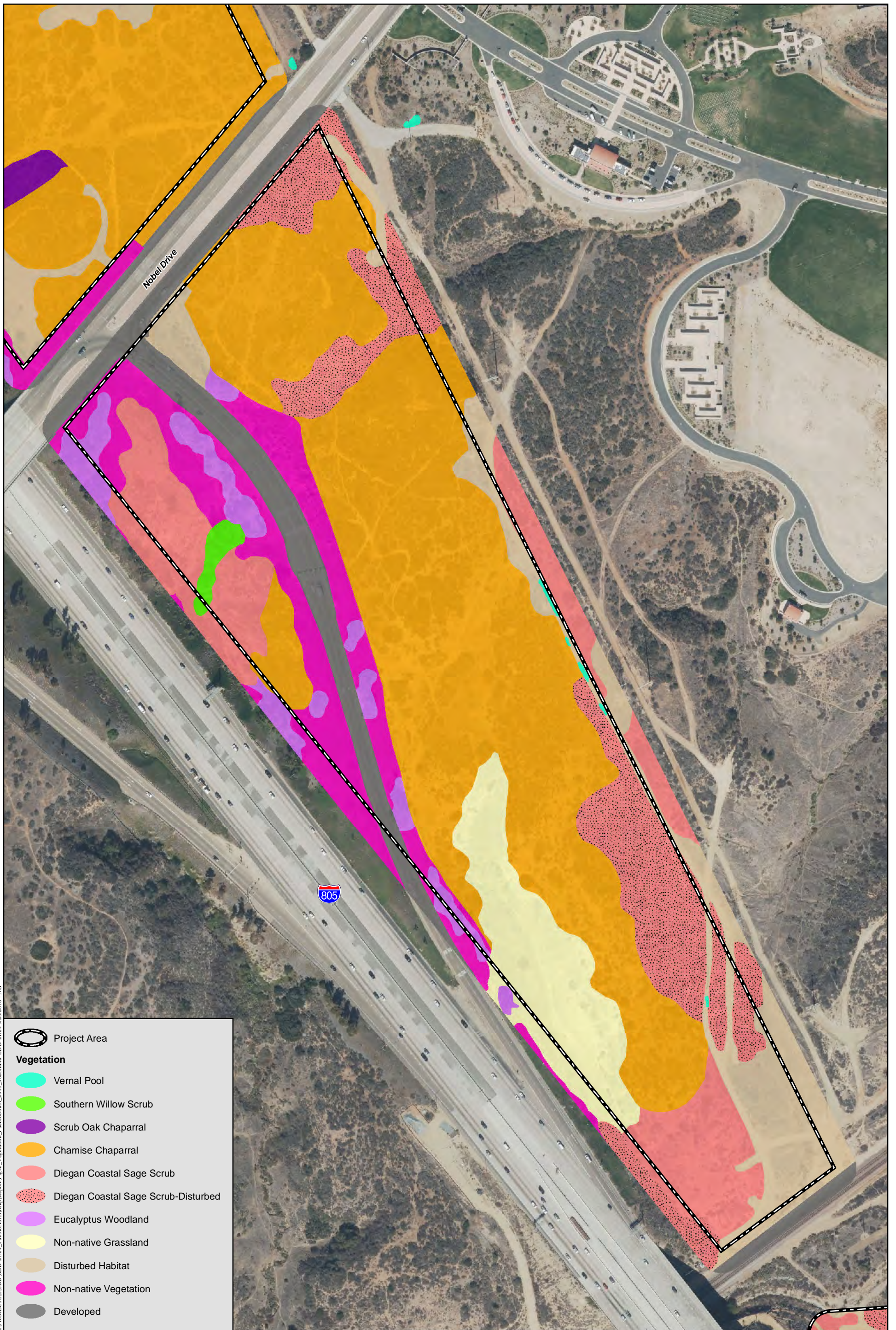
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Vegetation - Pueblo Central

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Figure 4b

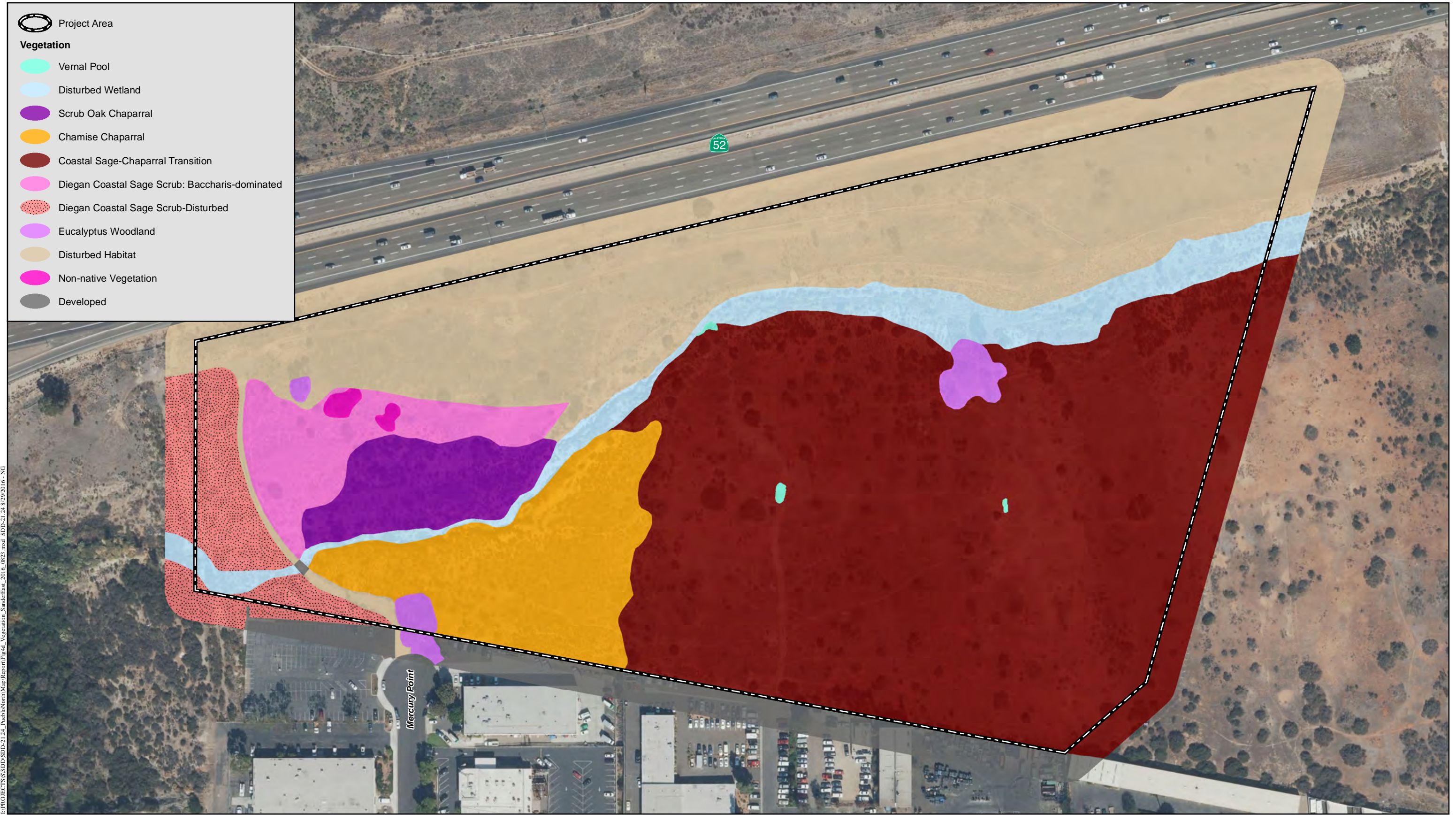


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	Project Area
Vegetation	
	Vernal Pool
	Southern Willow Scrub
	Scrub Oak Chaparral
	Chamise Chaparral
	Diegan Coastal Sage Scrub
	Diegan Coastal Sage Scrub-Disturbed
	Eucalyptus Woodland
	Non-native Grassland
	Disturbed Habitat
	Non-native Vegetation
	Developed

Vegetation - Pueblo South

PURE WATER



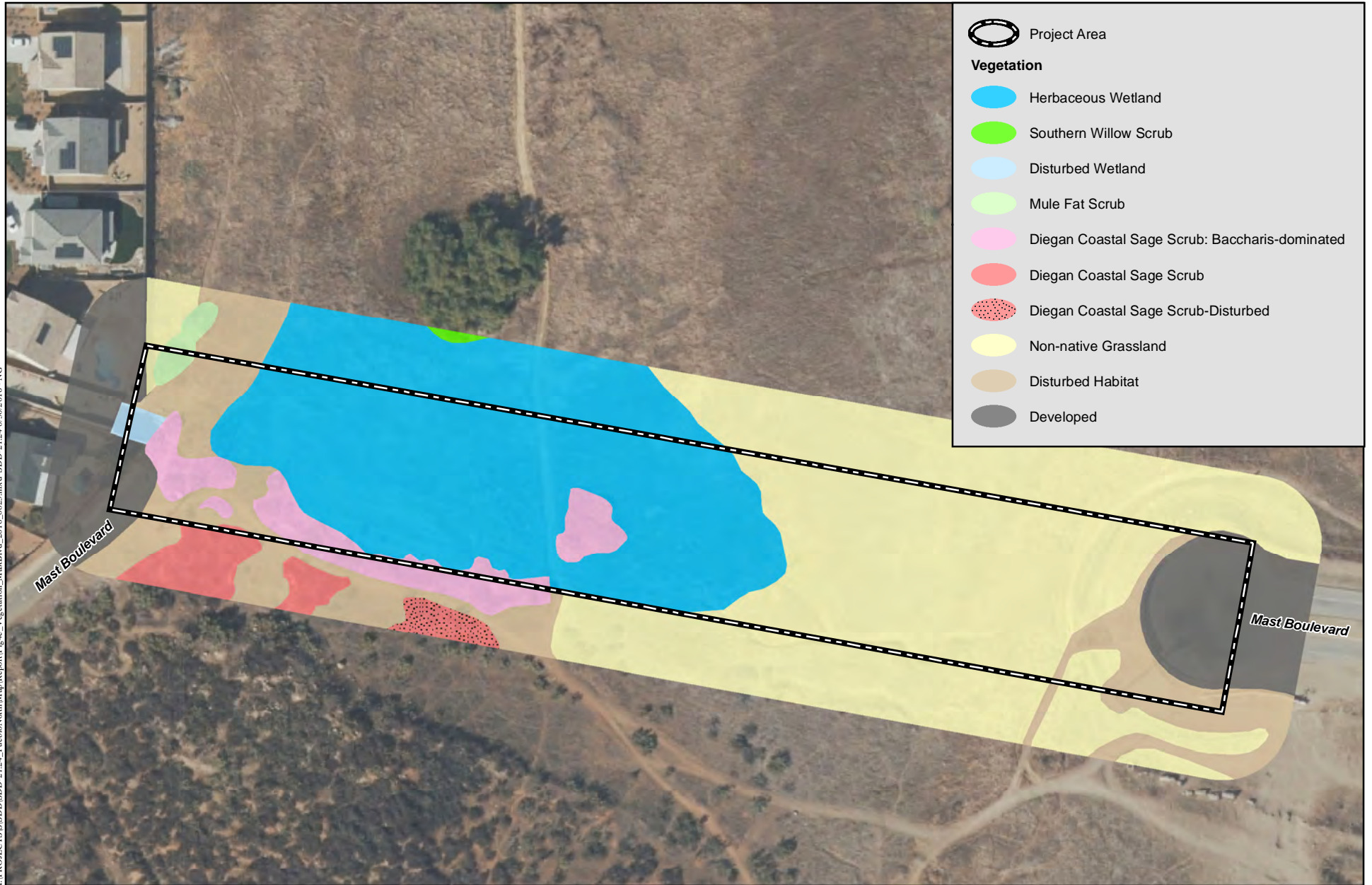
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Vegetation - Sander East

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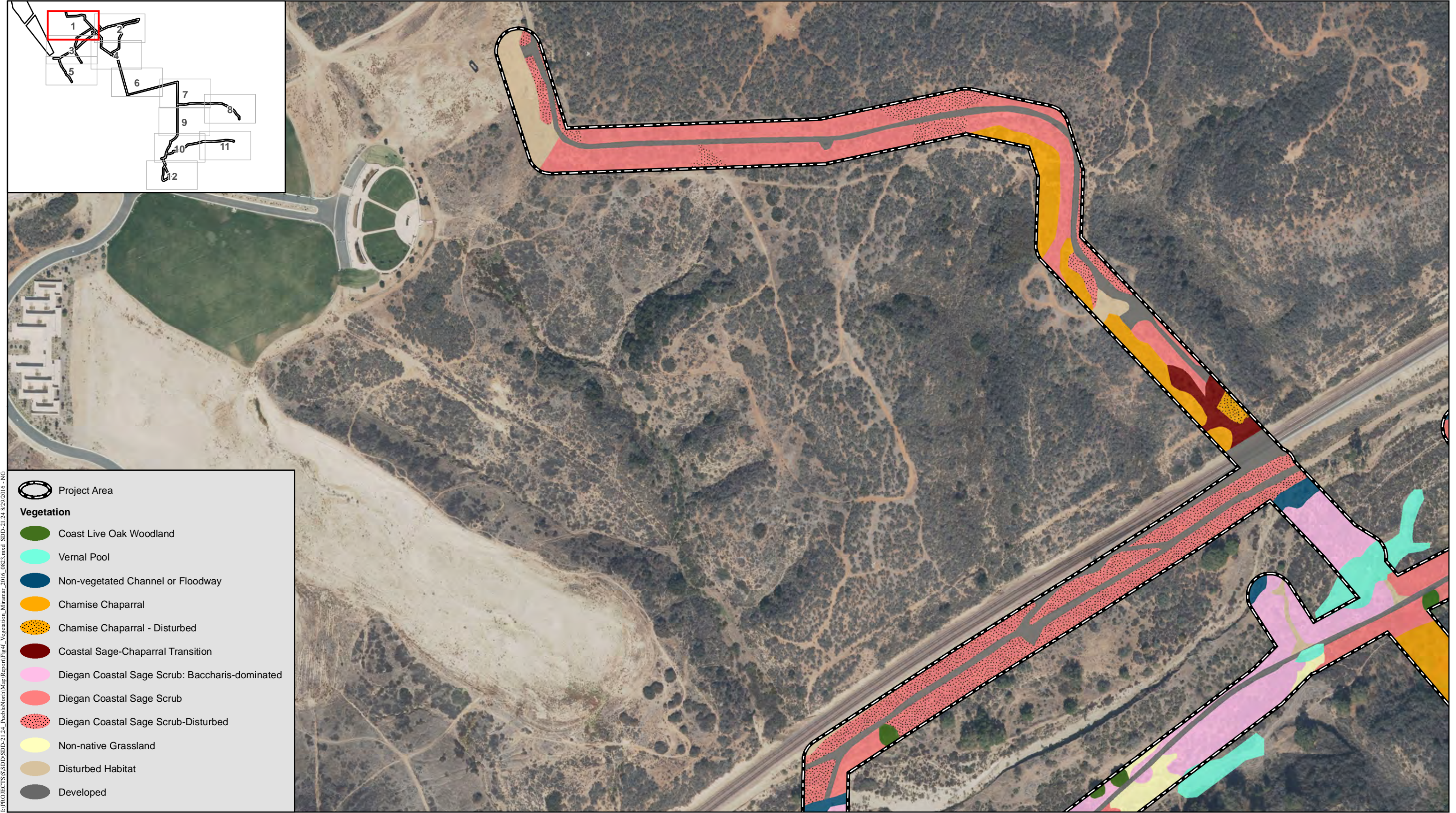
Figure 4d

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Vegetation - Mast Boulevard

PURE WATER

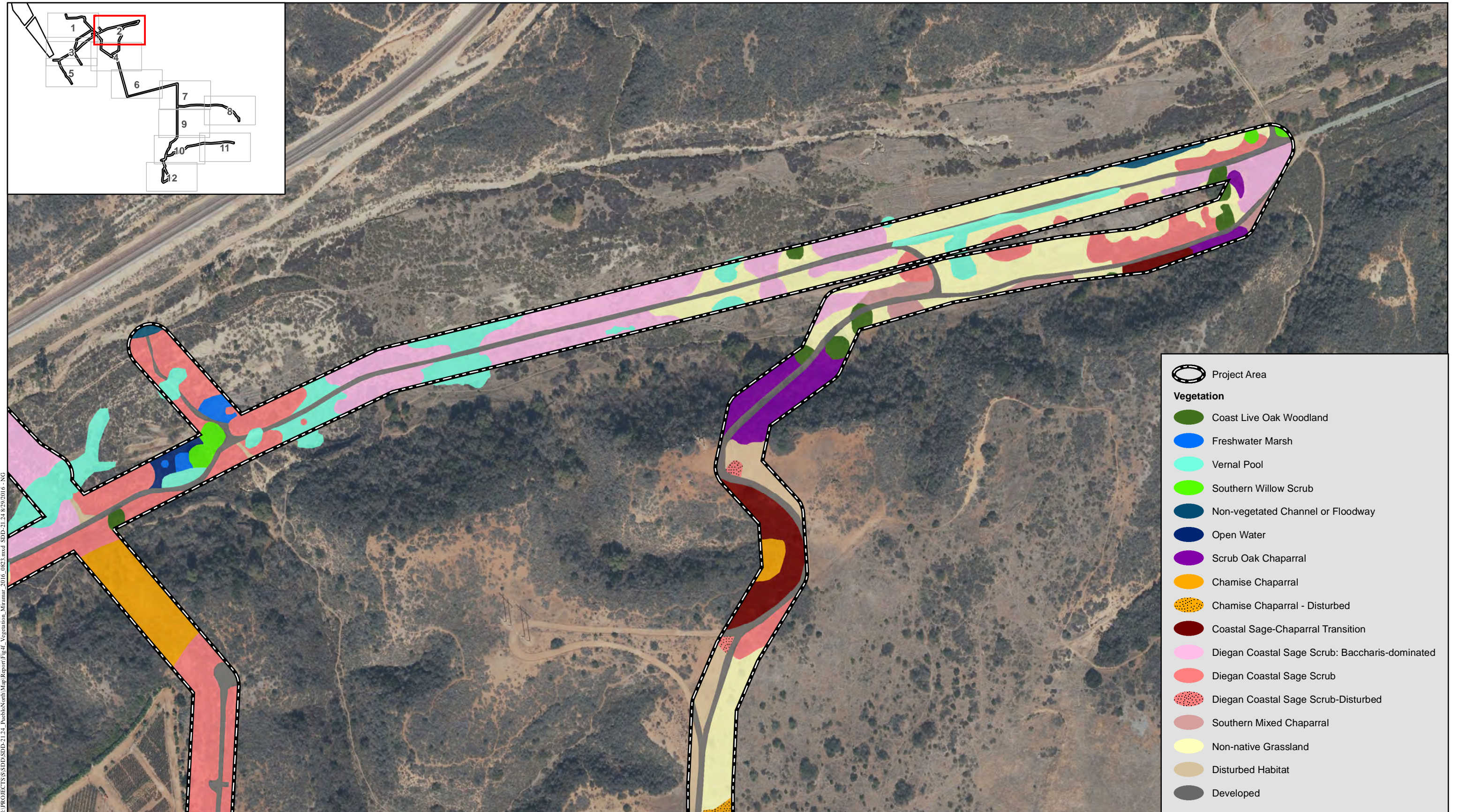


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Vegetation - MCAS Miramar

PURE WATER

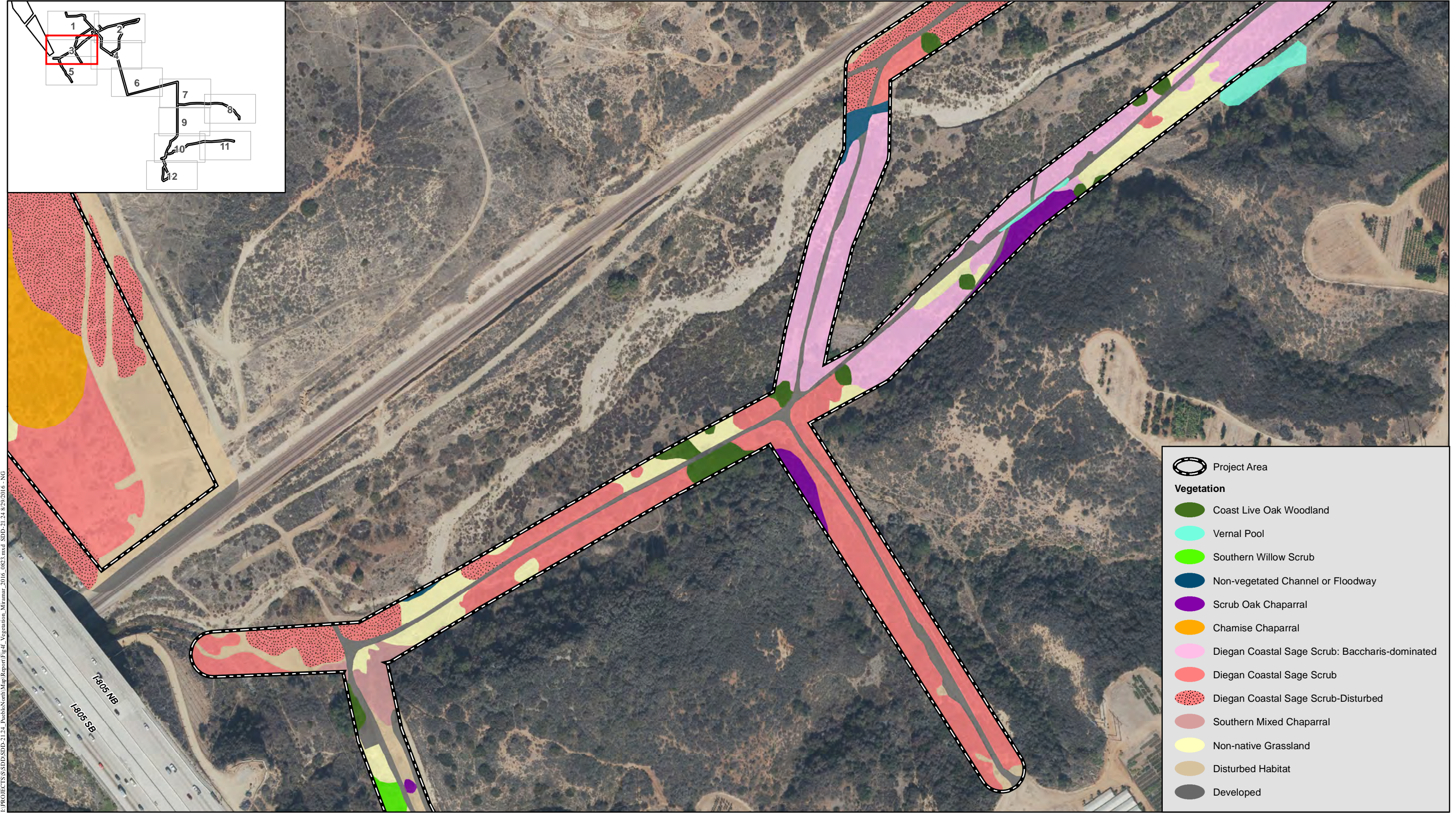
Figure 4f-1



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Vegetation - MCAS Miramar

PURE WATER



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	Project Area
Vegetation	
	Coast Live Oak Woodland
	Vernal Pool
	Southern Willow Scrub
	Non-vegetated Channel or Floodway
	Scrub Oak Chaparral
	Chamise Chaparral
	Diegan Coastal Sage Scrub: Baccharis-dominated
	Diegan Coastal Sage Scrub
	Diegan Coastal Sage Scrub-Disturbed
	Southern Mixed Chaparral
	Non-native Grassland
	Disturbed Habitat
	Developed

Vegetation - MCAS Miramar

PURE WATER

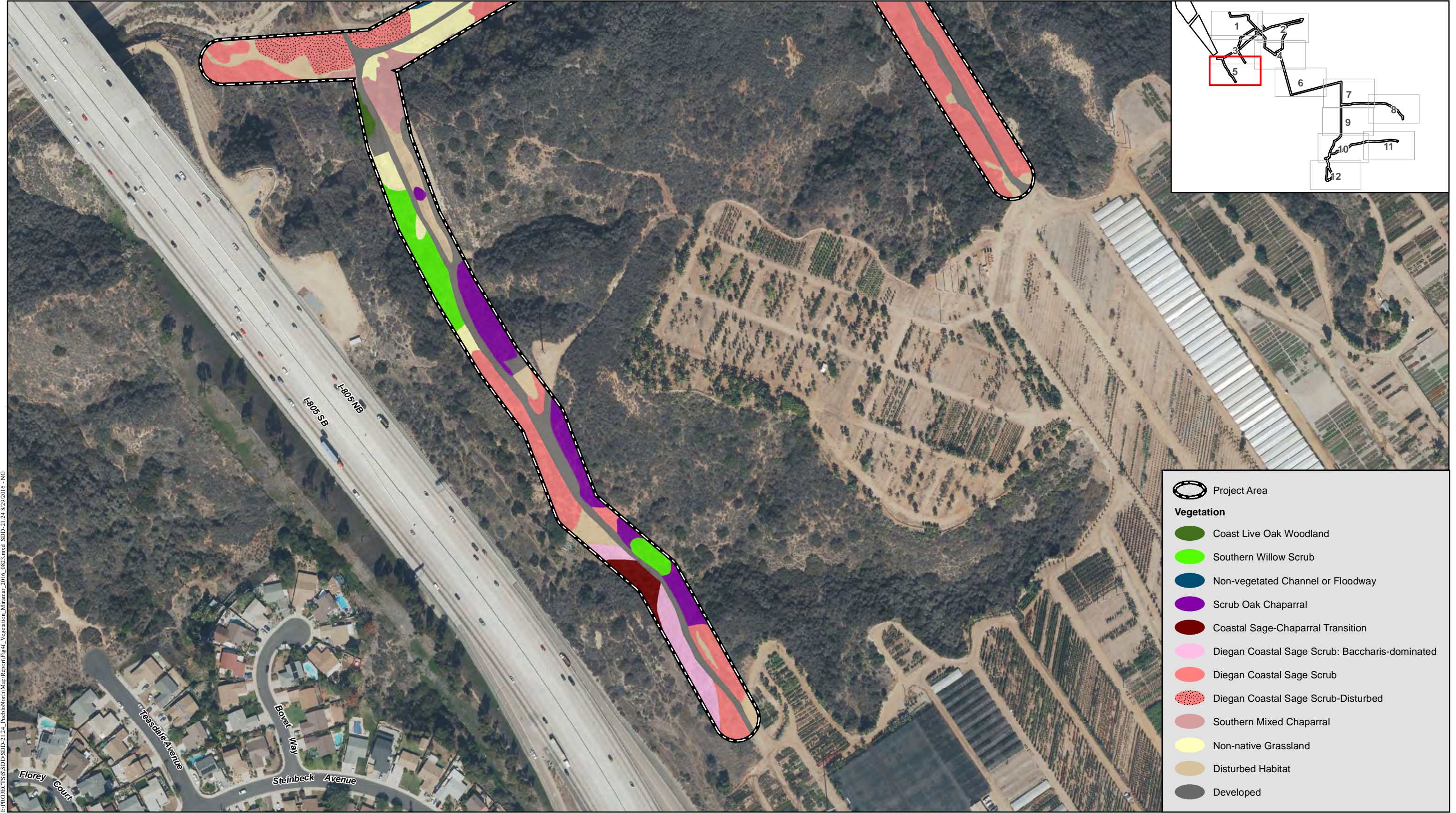
Figure 4f-3



Vegetation - MCAS Miramar

PURE WATER

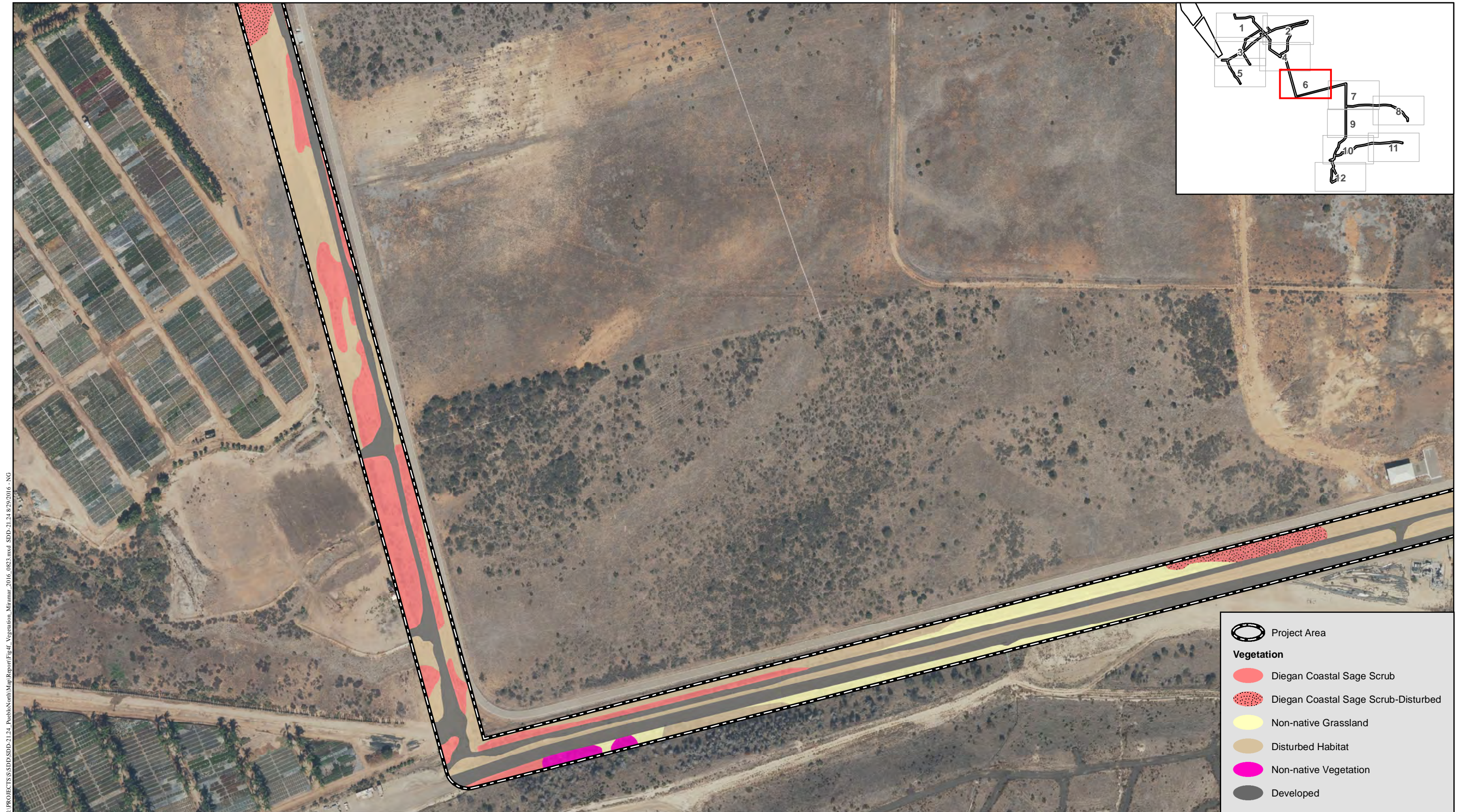
Figure 4f-4



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-  Project Area
- Vegetation**
-  Coast Live Oak Woodland
-  Southern Willow Scrub
-  Non-vegetated Channel or Floodway
-  Scrub Oak Chaparral
-  Coastal Sage-Chaparral Transition
-  Diegan Coastal Sage Scrub: Baccharis-dominated
-  Diegan Coastal Sage Scrub
-  Diegan Coastal Sage Scrub-Disturbed
-  Southern Mixed Chaparral
-  Non-native Grassland
-  Disturbed Habitat
-  Developed

Vegetation - MCAS Miramar

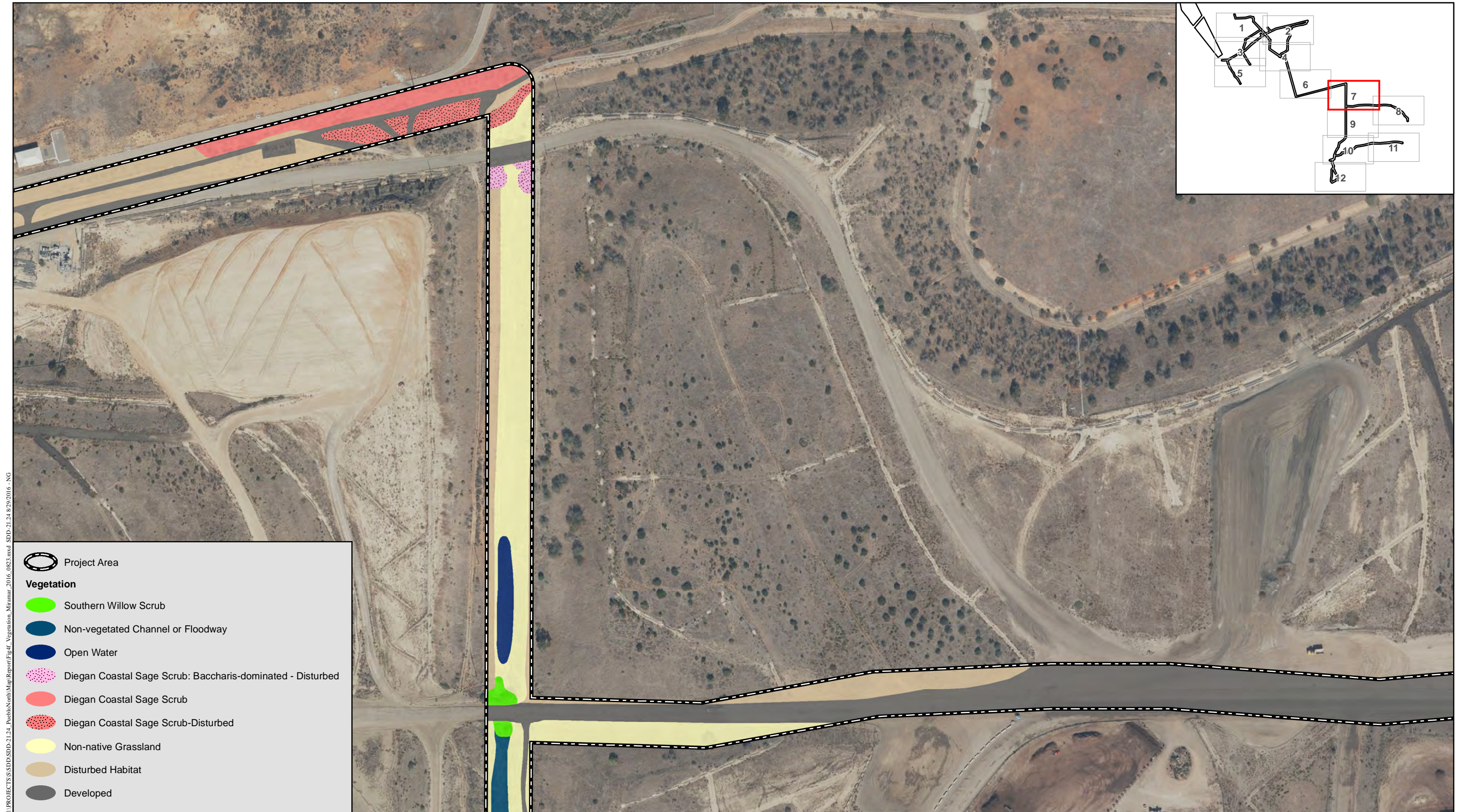


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Vegetation - MCAS Miramar

PURE WATER

Figure 4f-6

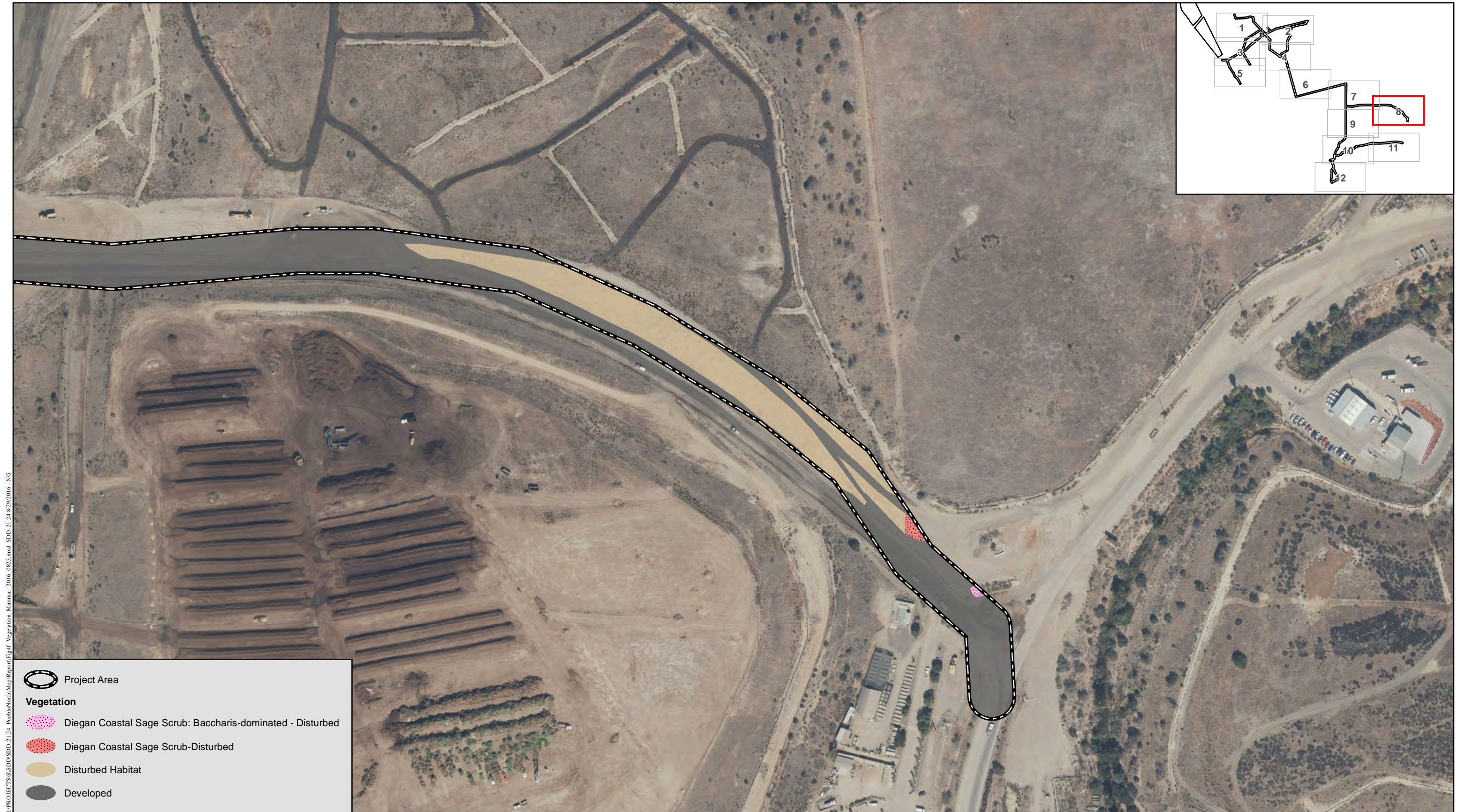


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Vegetation - MCAS Miramar

PURE WATER

Figure 4f-7



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Vegetation - MCAS Miramar

PURE WATER

Figure 4f-8

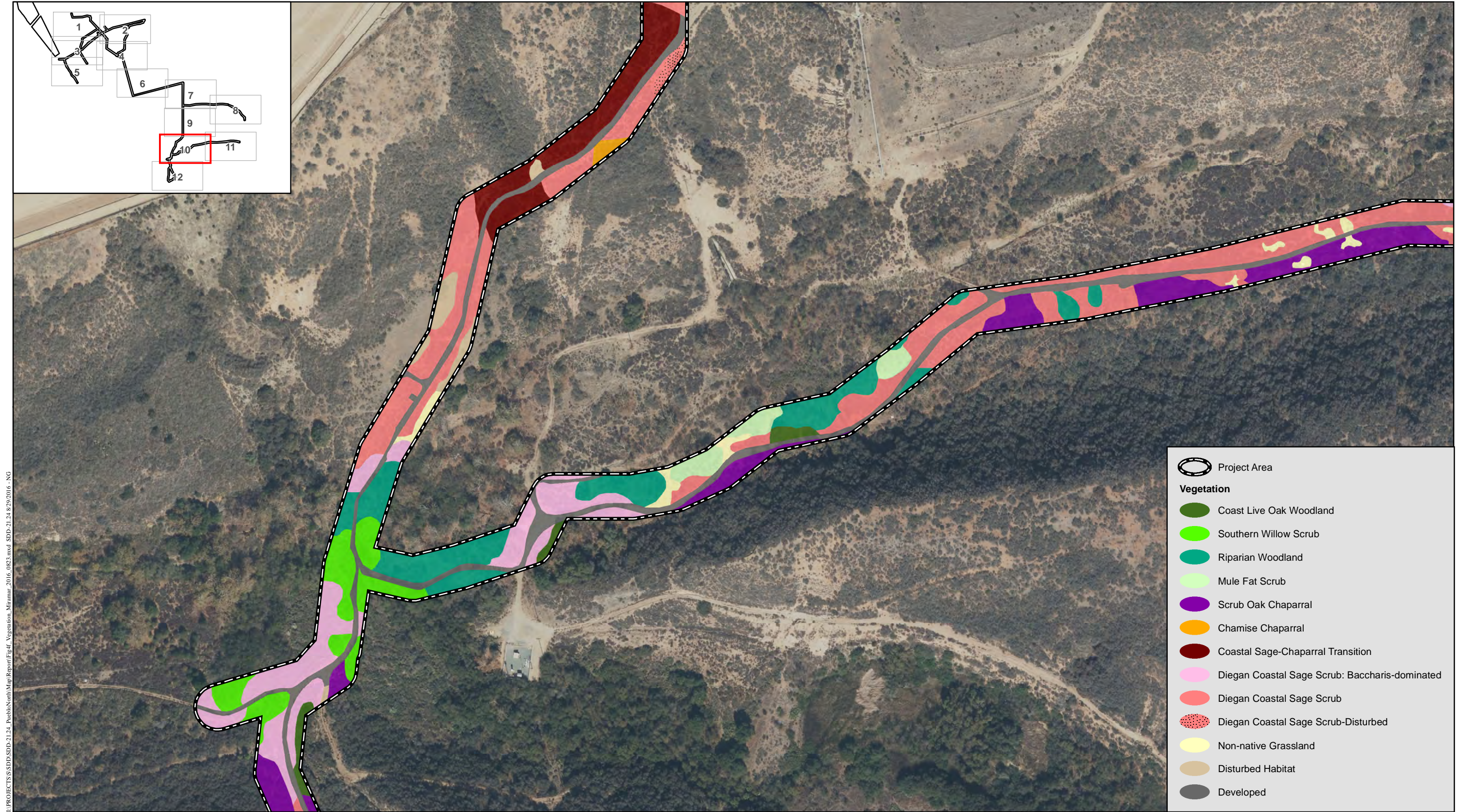


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Vegetation - MCAS Miramar

PURE WATER

Figure 4f-9

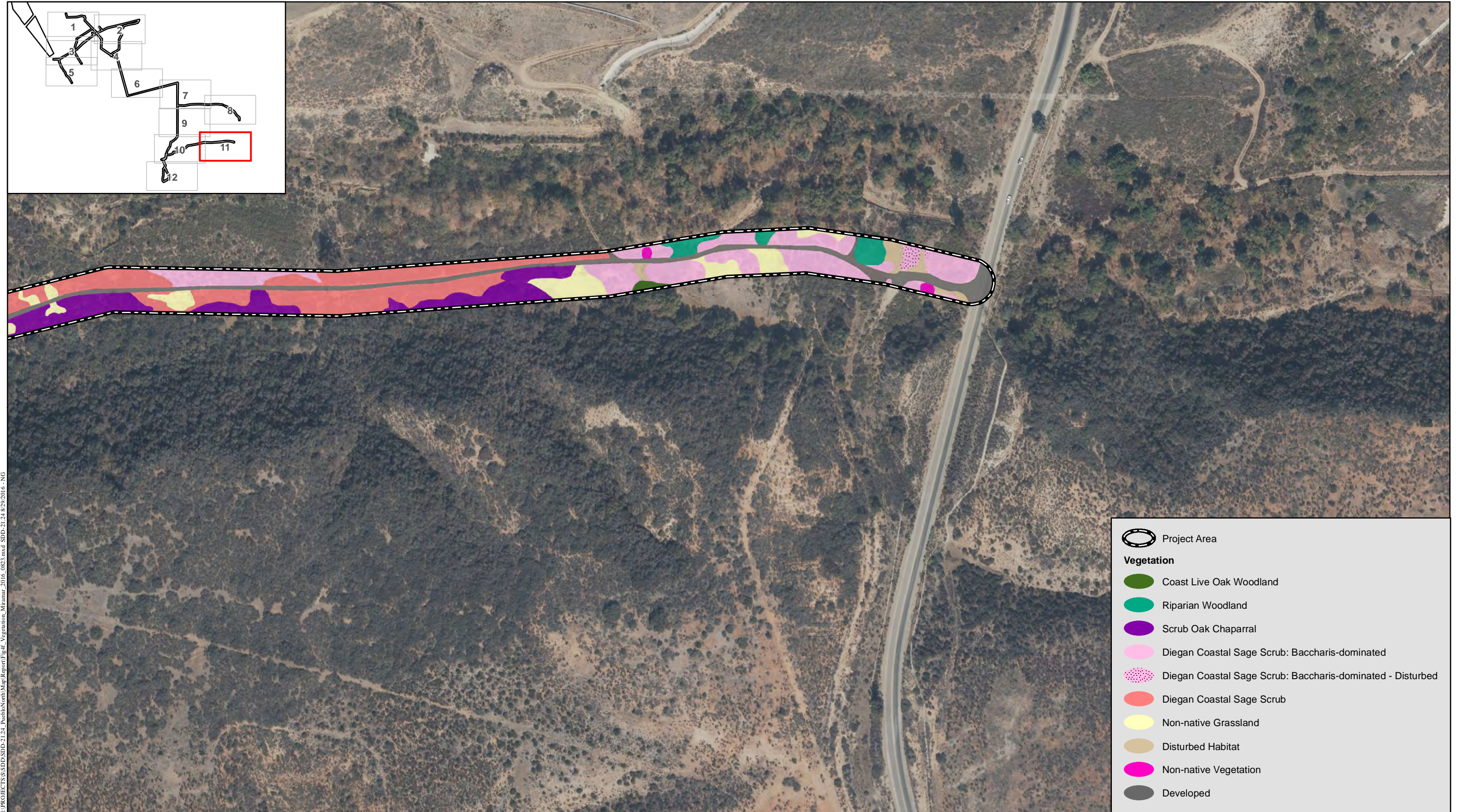


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Vegetation - MCAS Miramar

PURE WATER

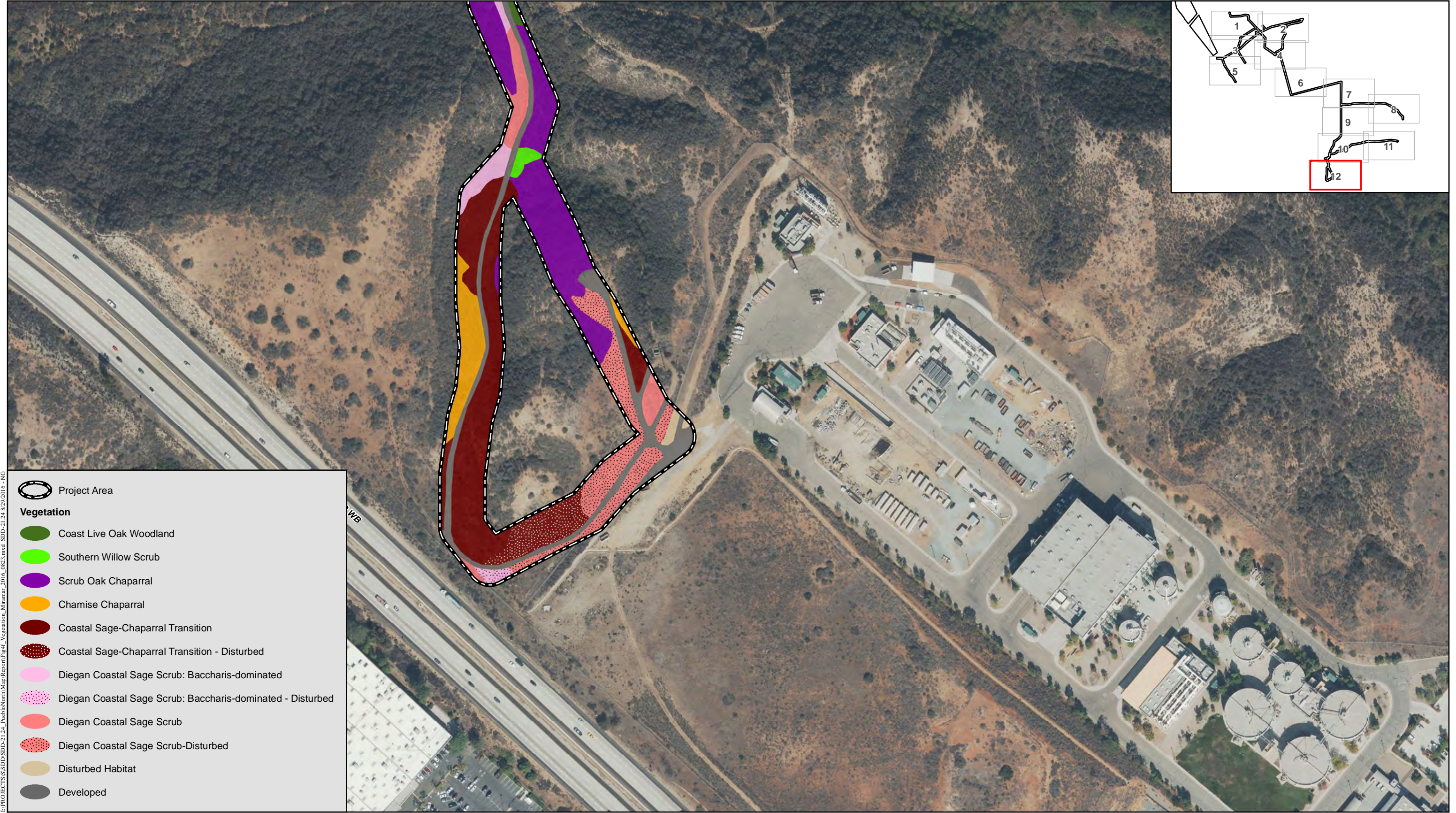
Figure 4f-10



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	Project Area
Vegetation	
	Coast Live Oak Woodland
	Riparian Woodland
	Scrub Oak Chaparral
	Diegan Coastal Sage Scrub: Baccharis-dominated
	Diegan Coastal Sage Scrub: Baccharis-dominated - Disturbed
	Diegan Coastal Sage Scrub
	Non-native Grassland
	Disturbed Habitat
	Non-native Vegetation
	Developed

Vegetation - MCAS Miramar



- PROJECTS\SDD-2124_PueblitoNorthMap\ReportFig4f_Vegetation_Miramar_2016_0823.mxd_SDD-2124_8/29/2016 - NG
- Project Area
 - Vegetation**
 - Coast Live Oak Woodland
 - Southern Willow Scrub
 - Scrub Oak Chaparral
 - Chamise Chaparral
 - Coastal Sage-Chaparral Transition
 - Coastal Sage-Chaparral Transition - Disturbed
 - Diegan Coastal Sage Scrub: Baccharis-dominated
 - Diegan Coastal Sage Scrub: Baccharis-dominated - Disturbed
 - Diegan Coastal Sage Scrub
 - Diegan Coastal Sage Scrub-Disturbed
 - Disturbed Habitat
 - Developed

Vegetation - MCAS Miramar

PURE WATER

Figure 4f-12



Project Area

Rare Plant Survey Results



Graceful tarplant (*Holocarpha virgata* ssp. *elongata*) - 45 Individuals - CRPR 4.2

Special Status Animal Survey Results



White-tailed Kite (*Elanus leucurus*) - Fully Protected



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SANDAG Technical Services - GIS

2016 Special Status Species - Pueblo North

PURE WATER



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2016 Special Status Species - Pueblo Central

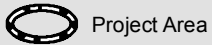
PURE WATER



2016 Special Status Species - Pueblo South

PURE WATER

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Project Area

Rare Plant Survey Results

- Orcutt's Brodiaea (*Brodiaea orcuttii*)-CRPR 1B.1
- Long-spined Spineflower (*Chorizanthe polygonoides*var.*longispina*)-CRPR 1B.2
- San Diego Barrel Cactus (*Ferocactus viridescens*)-CRPR 2B.1
- Nuttall's Scrub Oak (*Quercus dumosa*)-CRPR 1B.1
- Ashy Spike-moss (*Selaginella cinerascens*)-CRPR 4.1
- San Diego County Bahiopsis (*Bahiopsis laciniata*)-CRPR 4.2

Rare Plant Survey Results

- Orcutt's Brodiaea (*Brodiaea orcuttii*)-CRPR 1B.1
- Long-spined Spineflower (*Chorizanthe polygonoides*var.*longispina*)-CRPR 1B.2
- Nuttall's Scrub Oak (*Quercus dumosa*)-CRPR 1B.1

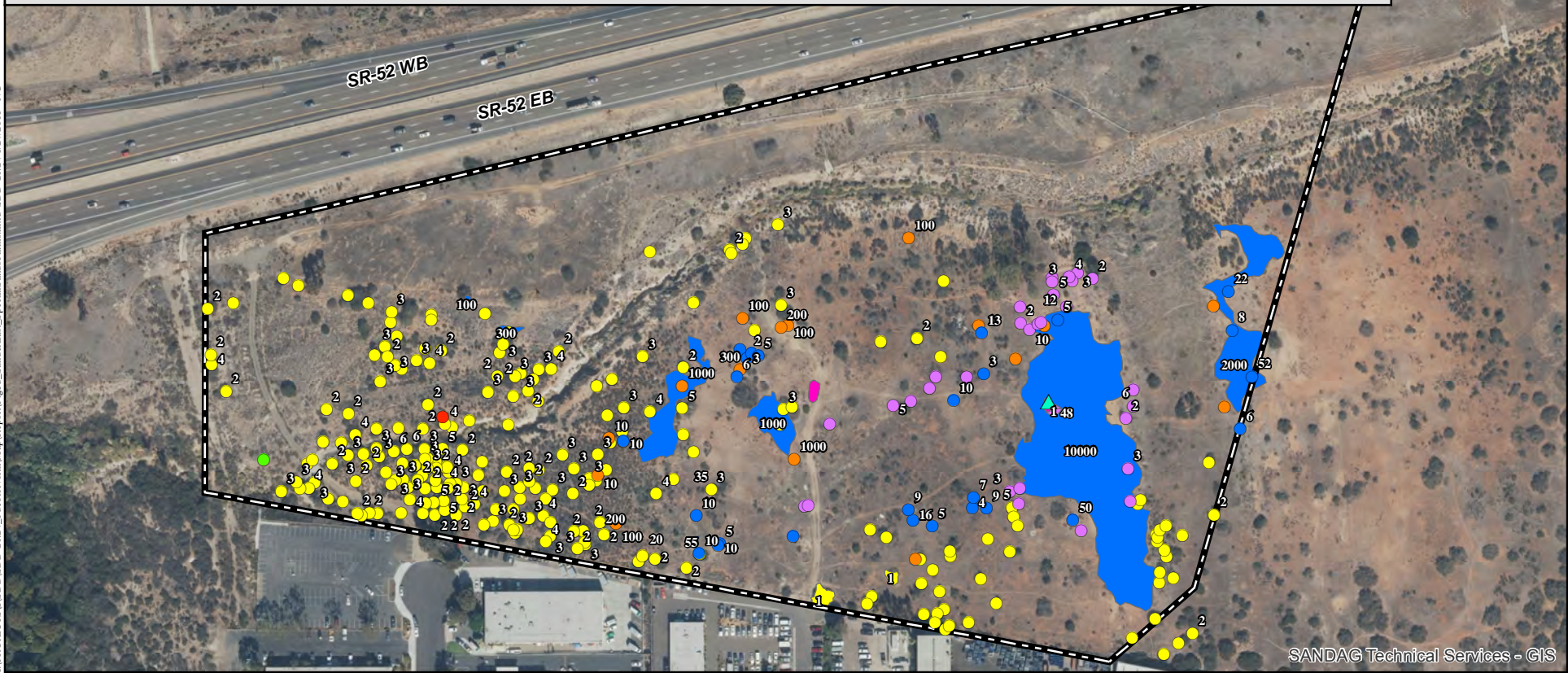
Special Status Animal Survey Results

- ▲ Western Spadefoot Toad (*Spea hammondi*) - CDFW Species of Special Concern

Vernal Pool Fairy Shrimp Results

- San Diego Fairy Shrimp (*Branchinecta sandiegonensis*) - Federally Endangered

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SANDAG Technical Services - GIS

2016 Special Status Species - Sander East

PURE WATER



Project Area

Special Status Animal Survey Results



Coastal California Gnatcatcher (*Poliophtila californica californica*)
Federally Threatened; CDFW Species of Special Concern

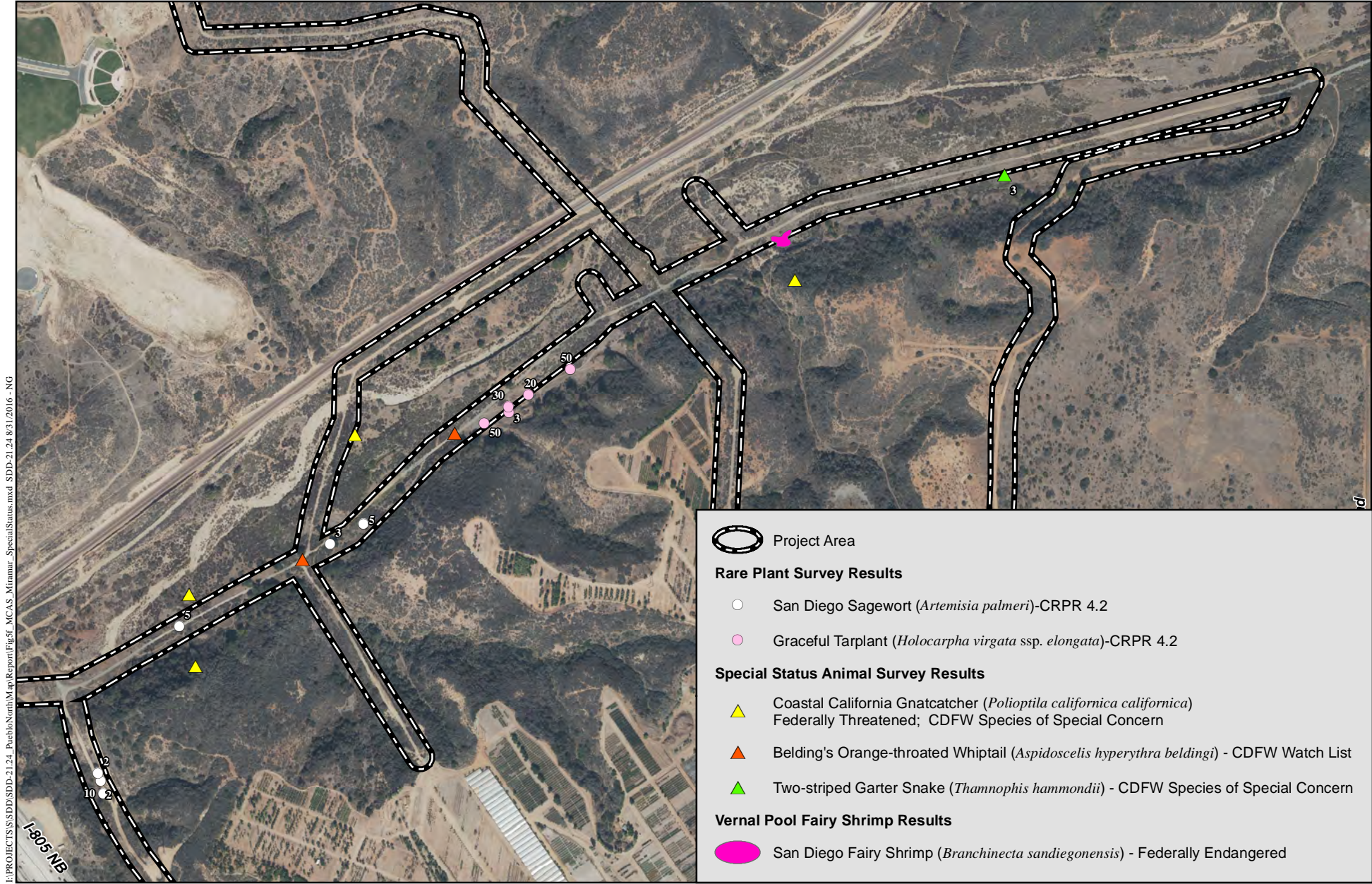


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SANDAG Technical Services - GIS

2016 Special Status Species - Mast Boulevard

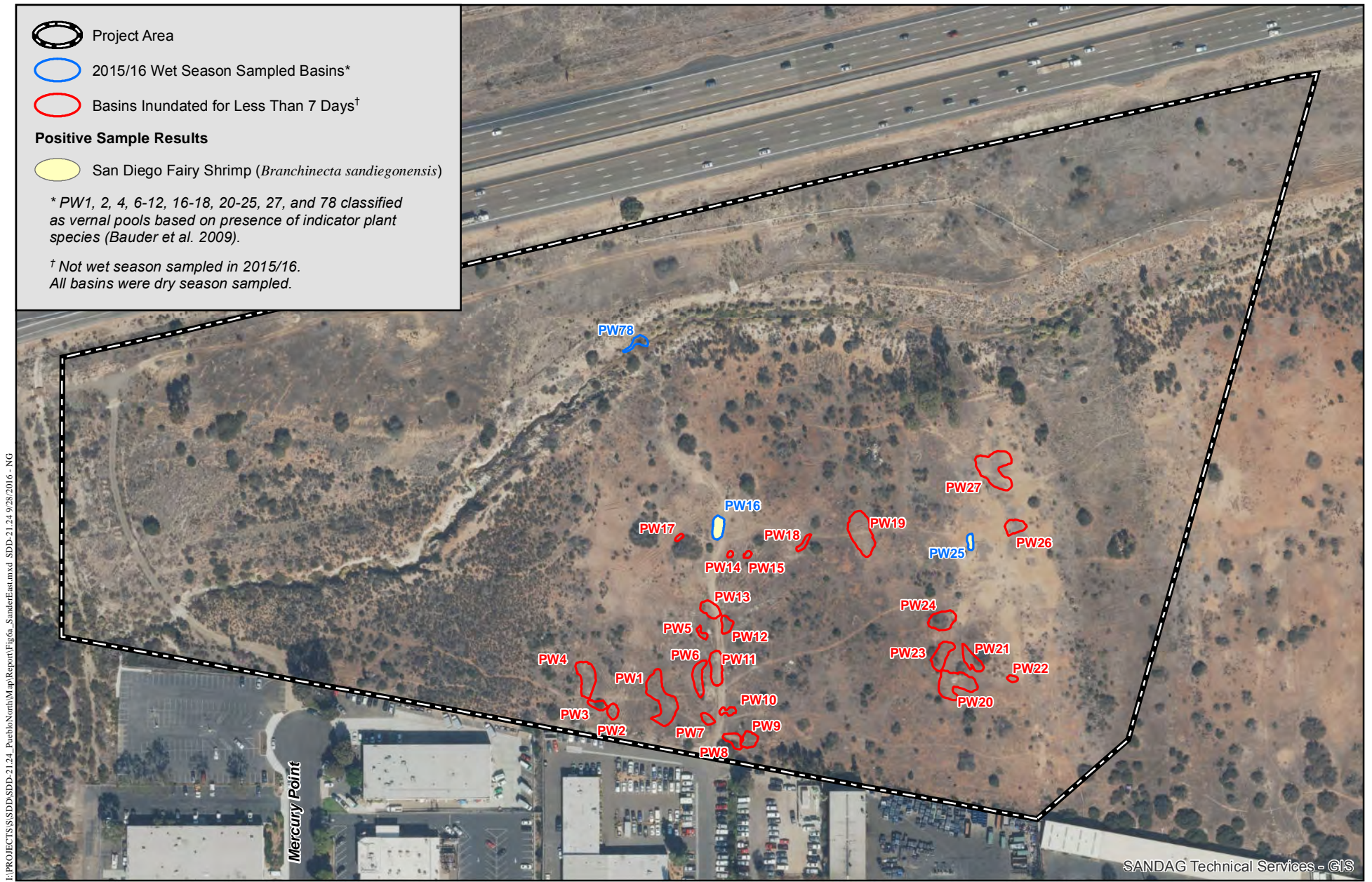
PURE WATER



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2016 Special Status Species - MCAS Miramar

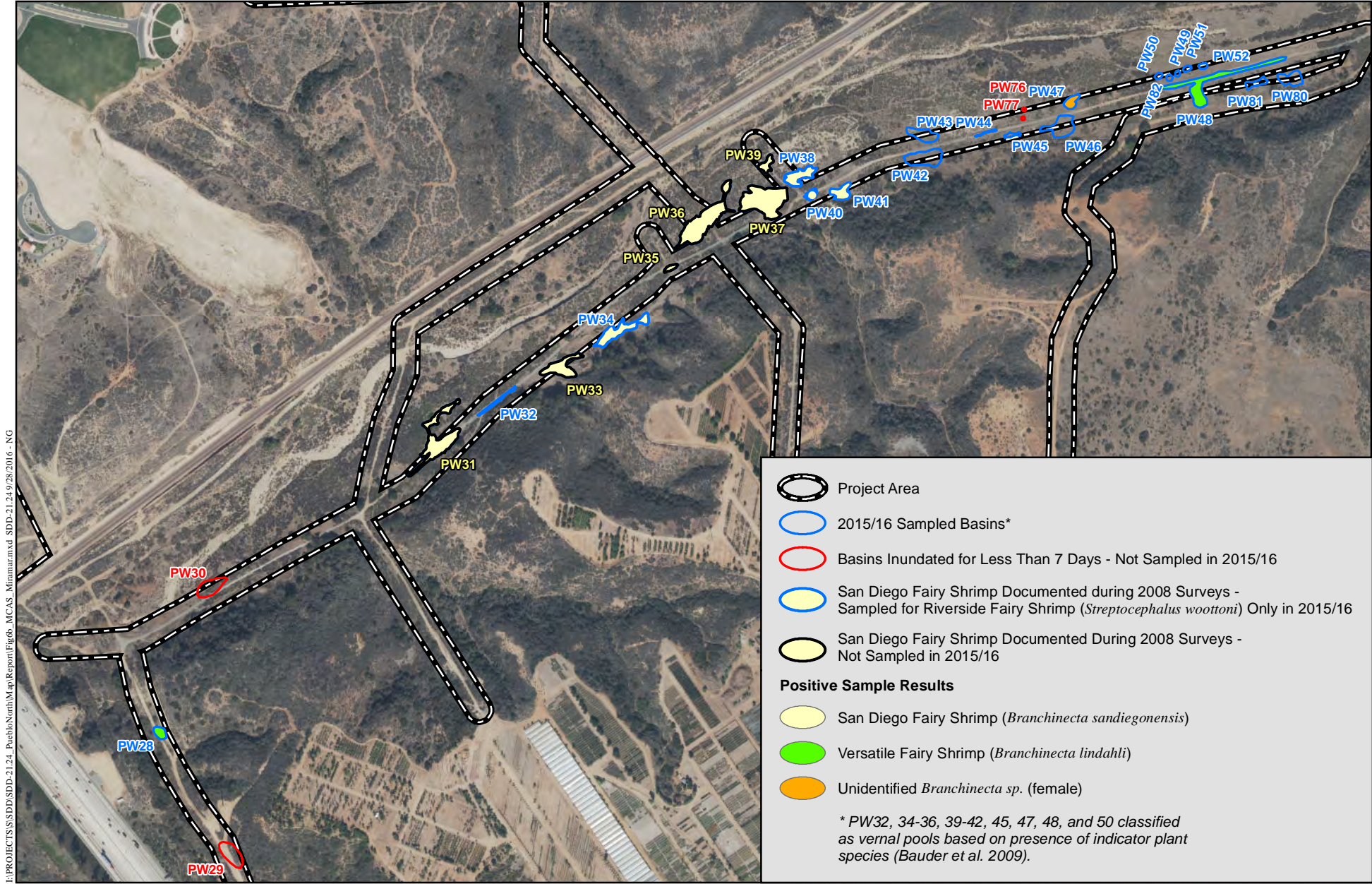
PURE WATER



2016 Wet Season Fairy Shrimp Survey - Sander East

PURE WATER

Figure 6a



2016 Wet Season Fairy Shrimp Survey - MCAS Miramar

PURE WATER



2016 Wet Season Fairy Shrimp Survey - Mast Boulevard

PURE WATER



2016 Wet Season Fairy Shrimp Survey - Pueblo North

PURE WATER



2016 Wet Season Fairy Shrimp Survey - Pueblo Central

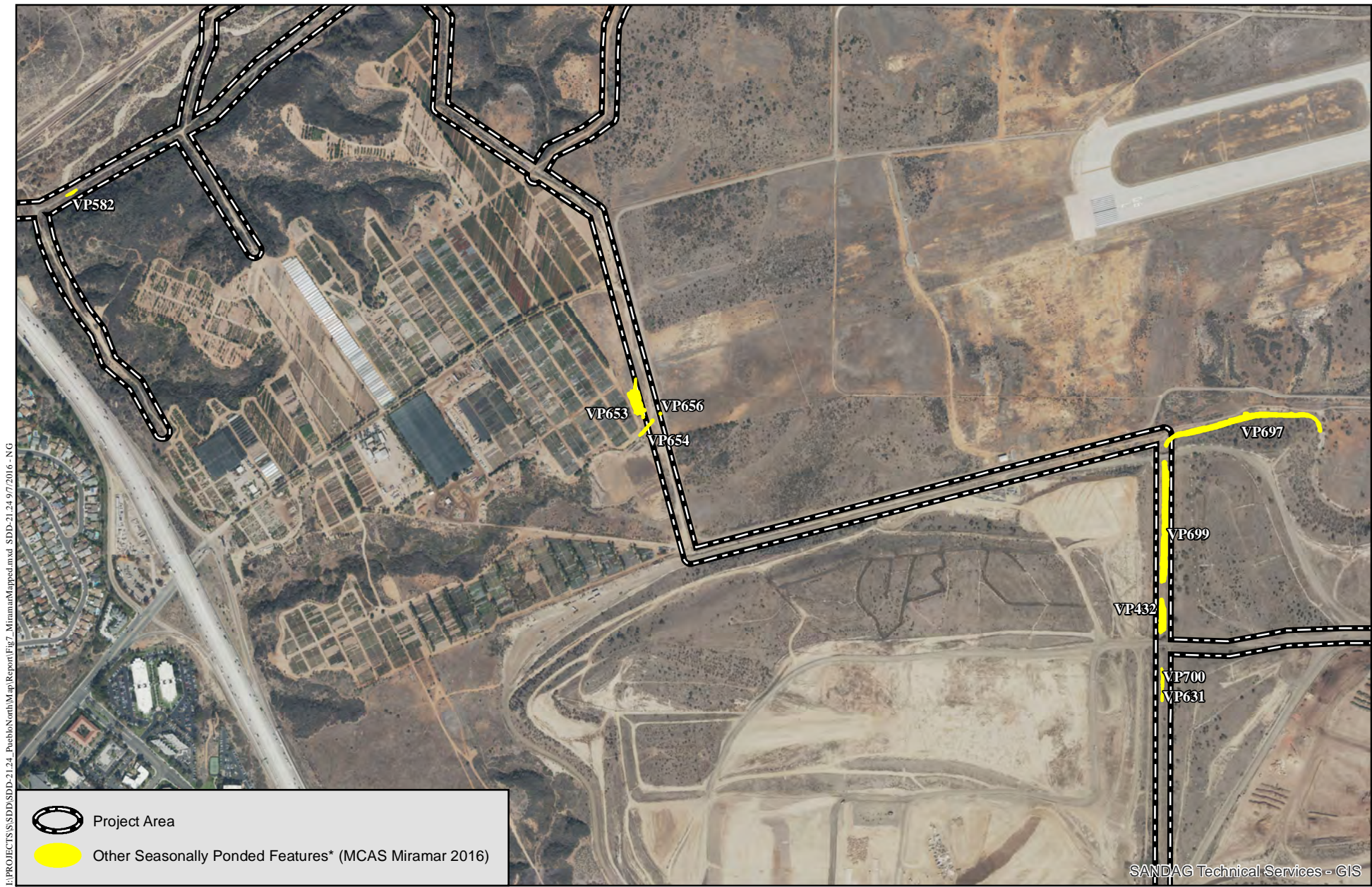
PURE WATER





2016 Wet Season Fairy Shrimp Survey - Pueblo South

PURE WATER

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 Project Area
 Other Seasonally Pooled Features* (MCAS Miramar 2016)

SANDAG Technical Services - GIS

* Labels refer to MCAS Miramar's basin ID numbers

Basins Previously Mapped by MCAS Miramar

PURE WATER


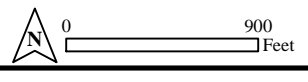
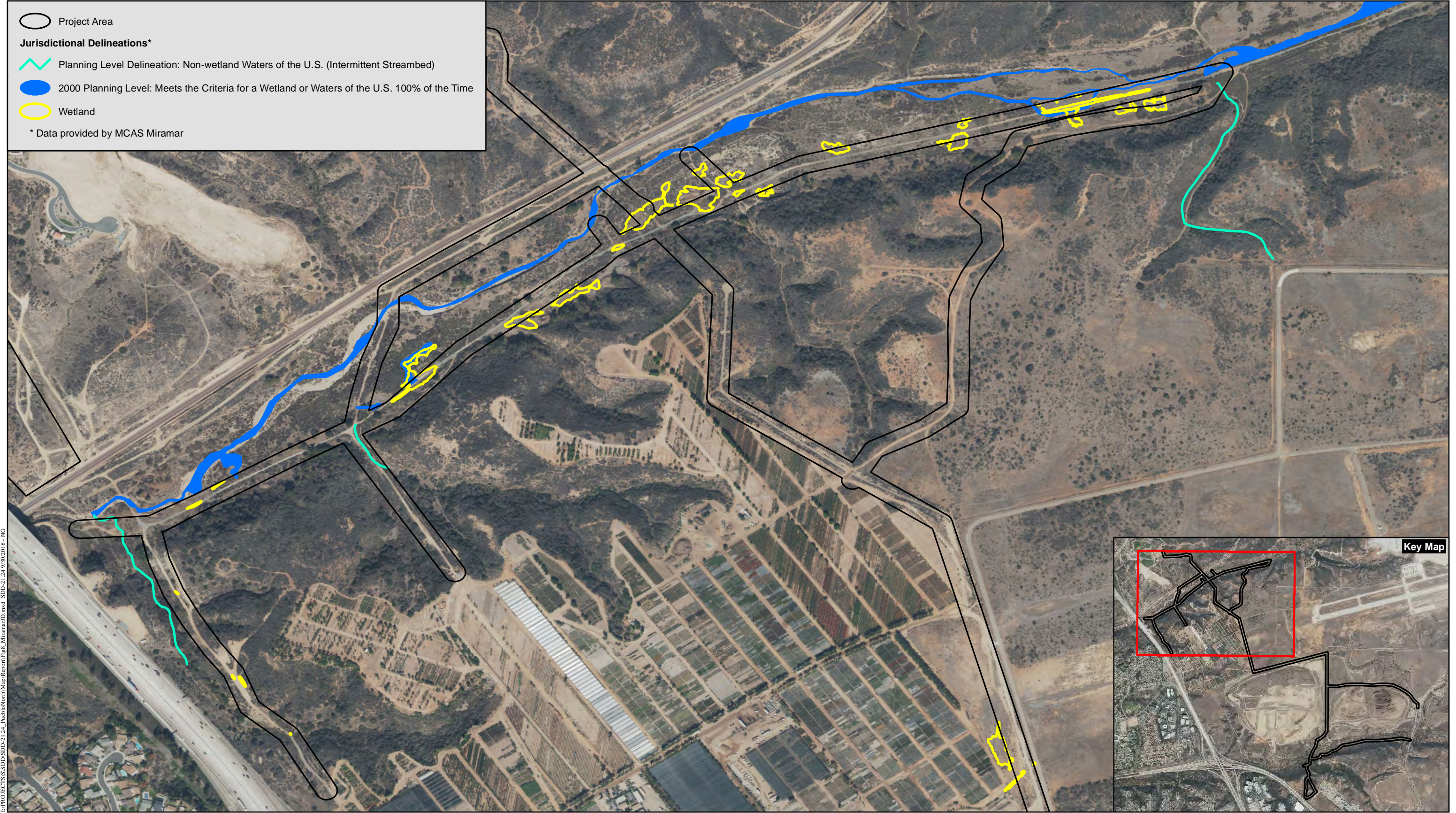







Figure 7



 Project Area
Jurisdictional Delineations*
 Planning Level Delineation: Non-wetland Waters of the U.S. (Intermittent Streambed)
 2000 Planning Level: Meets the Criteria for a Wetland or Waters of the U.S. 100% of the Time
 Wetland
 * Data provided by MCAS Miramar

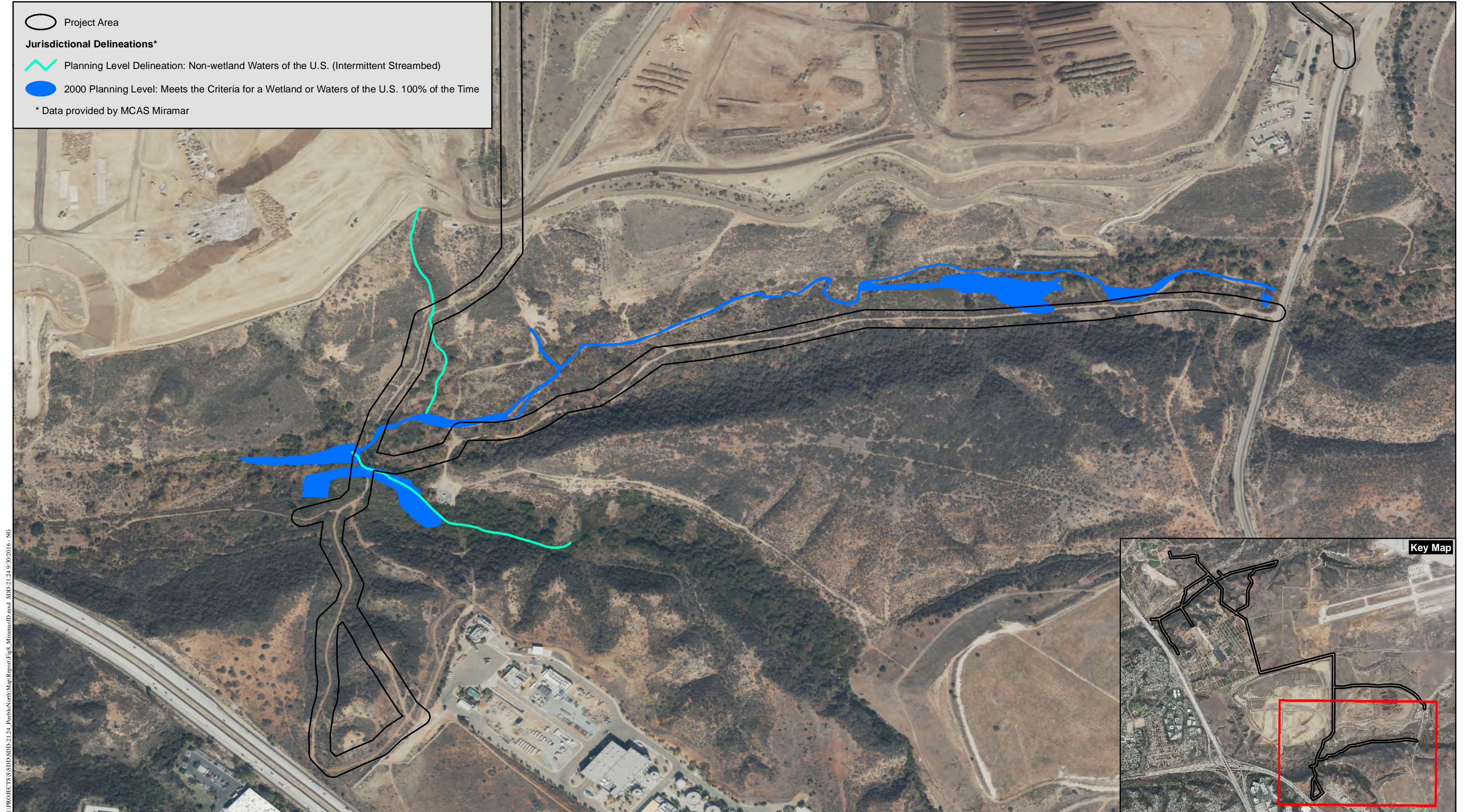
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MCAS Miramar Jurisdictional Information



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MCAS Miramar Jurisdictional Information



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MCAS Miramar Jurisdictional Information

PURE WATER

Attachment A
PLANT SPECIES OBSERVED

<u>Family</u>	<u>Scientific Name</u>	<u>Common Name</u>
Adoxaceae	<i>Sambucus nigra</i>	blue elderberry
Agavaceae	<i>Chlorogalum parviflorum</i>	small-flower soap-plant
	<i>Yucca schidigera</i>	Mohave Yucca
Aizoaceae	<i>Carpobrotus edulis</i> *	hottentot-fig
	<i>Mesembryanthemum nodiflorum</i> *	slender leaved ice plant
Anacardiaceae	<i>Malosma laurina</i>	laurel sumac
	<i>Rhus integrifolia</i>	lemonadeberry
	<i>Schinus terebinthifolius</i> *	Brazilian Pepper tree
	<i>Toxicodendron diversilobum</i>	Western poison-oak
Apiaceae	<i>Daucus pusillus</i>	rattlesnake weed
Apocynaceae	<i>Asclepias californica</i>	California milkweed
Asteraceae	<i>Ambrosia psilostachya</i>	western ragweed
	<i>Artemisia californica</i>	California sagebrush
	<i>Artemisia palmeri</i> †	Palmer's sagewort
	<i>Baccharis pilularis</i>	coyote bush
	<i>Baccharis sarothroides</i>	broom baccharis
	<i>Centaurea melitensis</i> *	totalote
	<i>Corethrogyne filaginifolia</i> var. <i>filaginifolia</i>	California sand-aster
	<i>Deinandra fasciculata</i>	clustered tarweed
	<i>Dittrichia graveolens</i> *	stinkwort
	<i>Erigeron bonariensis</i> *	flax-leaf fleabane
	<i>Erigeron canadensis</i>	Canada horseweed
	<i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i>	long-stem golden-yarrow
	<i>Glebionis coronaria</i> *	crown daisy
	<i>Hazardia squarrosa</i> var. <i>grindelioides</i>	Southern sawtooth goldenbush
	<i>Heterotheca grandiflora</i>	telegraph weed
	<i>Holocarpha virgata</i> ssp. <i>elongata</i> †	graceful tarplant
	<i>Hypochaeris glabra</i>	smooth cat's ear
	<i>Isocoma menziesii</i> var. <i>menziesii</i>	Menzies' goldenbush
	<i>Lactuca serriola</i> *	prickly lettuce
	<i>Logfia gallica</i> *	narrowleaf cottonrose
	<i>Pluchea odorata</i> var. <i>orodata</i>	salt marsh fleabane
	<i>Pseudognaphalium biolettii</i>	bicolor cudweed
	<i>Pseudognaphalium californicum</i>	Ladies' tobacco
	<i>Pseudognaphalium luteoalbum</i> *	fragrant everlasting cudweed
	<i>Pseudognaphalium stramineum</i>	cotton-batting plant
	<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i> ^π	dwarf woolly marbles
	<i>Psilocarphus tenellus</i> ^π	slender woolly-marbles
	<i>Sonchus asper</i> ssp. <i>asper</i> *	prickly sow-thistle

**Attachment A (cont.)
PLANT SPECIES OBSERVED**

<u>Family</u>	<u>Scientific Name</u>	<u>Common Name</u>
Asteraceae (cont.)	<i>Sonchus oleraceus</i> *	common sow-thistle
	<i>Stylocline gnaphaloides</i>	everlasting nest-straw
	<i>Xanthium strumarium</i>	cocklebur
Boraginaceae	<i>Cryptantha intermedia</i> var. <i>johnstonii</i>	Johnston's cryptantha
	<i>Cryptantha microstachys</i>	tejon cryptantha
	<i>Eriodictyon crassifolium</i> var. <i>crassifolium</i>	felt-leaf yerba santa
	<i>Plagiobothrys acanthocarpus</i> ^π	adobe popcornflower
Brassicaceae	<i>Brassica nigra</i> *	black mustard
	<i>Hirschfeldia incana</i> *	short podded mustard
Cactaceae	<i>Ferocactus viridescens</i> var. <i>viridescens</i> †	coast barrel cactus
	<i>Opuntia littoralis</i>	coast prickly-pear
Caprifoliaceae	<i>Lonicera subspicata</i> var. <i>denudata</i>	johnston's honeysuckle
Caryophyllaceae	<i>Polycarpon tetraphyllum</i> ssp. <i>tetraphyllum</i> *	four-leaf allseed
	<i>Silene gallica</i> *	common catchfly
	<i>Silene laciniata</i> ssp. <i>laciniata</i>	southern pink
	<i>Spergularia bocconi</i> *	Boccone's sand-spurrey
	<i>Spergularia</i> sp.	spurrey species
Chenopodiaceae	<i>Atriplex semibaccata</i> *	Australian saltbush
	<i>Atriplex lindleyi</i>	Lindley's saltbush
	<i>Salsola australis</i> *	Australian tumbleweed
Cistaceae	<i>Crocanthemum scoparium</i> var. <i>vulgare</i>	coast peak rush-rose
Convolvulaceae	<i>Calystegia macrostegia</i>	Island false bindweed
Crassulaceae	<i>Crassula connata</i>	pigmy weed
Cucurbitaceae	<i>Marah macrocarpa</i>	wild-cucumber
Cyperaceae	<i>Cyperus eragrostis</i>	tall flatsedge
	<i>Eleocharis macrostachya</i>	common spikerush
Ericaceae	<i>Xylococcus bicolor</i>	mission manzanita
Euphorbiaceae	<i>Croton setiger</i>	turkey-mullein
	<i>Euphorbia maculata</i> *	spotted spurge
	<i>Euphorbia peplus</i> *	petty spurge
	<i>Euphorbia polycarpa</i>	small-seed sandmat
	<i>Ricinus communis</i> *	castor bean
Fabaceae	<i>Acacia pycnantha</i> *	golden wattle
	<i>Acmispon americanus</i> var. <i>americanus</i>	Spanish-clover
	<i>Acmispon glaber</i> var. <i>glaber</i>	deerweed
	<i>Acmispon micranthus</i>	grab lotus
	<i>Caesalpinia gilliesii</i> *	bird-of-paradise shrub
	<i>Medicago polymorpha</i> *	bur clover
	<i>Melilotus indicus</i> *	Indian sweetclover

**Attachment A (cont.)
PLANT SPECIES OBSERVED**

<u>Family</u>	<u>Scientific Name</u>	<u>Common Name</u>
Fabaceae (cont.)	<i>Quercus dumosa</i> † <i>Quercus xacutidens</i>	Nuttall's scrub oak Torrey's scrub oak
Gentianaceae	<i>Zeltnera venusta</i>	canchalagua
Geraniaceae	<i>Erodium botrys</i> * <i>Erodium cicutarium</i> * <i>Erodium moschatum</i> * <i>Geranium dissectum</i> *	long beaked filaree red-stem filaree white-stemmed filaree cut-leaf geranium
Juncaceae	<i>Juncus bufonius</i>	toad rush
Lamiaceae	<i>Marrubium vulgare</i> * <i>Salvia columbariae</i> <i>Salvia mellifera</i>	horehound chia black sage
Liliaceae	<i>Calochortus splendens</i>	splendid mariposa lily
Lythraceae	<i>Lythrum hyssopifolia</i> *π	hyssop loosestrife
Malvaceae	<i>Malacothamnus fasciculatus</i>	chaparral mallow
Myrsinaceae	<i>Anagallis arvensis</i> *	scarlet pimpernel
Myrtaceae	<i>Eucalyptus camaldulensis</i> *	river red gum
Onagraceae	<i>Camissoniopsis hirtella</i>	field sun cup
Plantaginaceae	<i>Antirrhinum nuttallianum</i> ssp. <i>nuttallianum</i> <i>Plantago coronopus</i> * <i>Plantago elongata</i> π <i>Plantago erecta</i>	Nuttall's snapdragon cut leaf plantain long leaf plantain dot-seed plantain
Platanaceae	<i>Platanus racemosa</i>	California sycamore
Poaceae	<i>Avena barbata</i> * <i>Avena fatua</i> * <i>Brachypodium distachyon</i> * <i>Bromus diandrus</i> * <i>Bromus hordeaceus</i> * <i>Bromus madritensis</i> * <i>Bromus sterilis</i> * <i>Cortaderia selloana</i> * <i>Cynodon dactylon</i> * <i>Deschampsia danthonioides</i> π <i>Festuca bromoides</i> * <i>Festuca myuros</i> * <i>Festuca perennis</i> * <i>Hordeum murinum</i> ssp. <i>leporinum</i> *	slender oat wild oat purple false brome riggut brome soft chess red brome poverty brome selloa pampas grass Bermuda grass annual hairgrass brome fescue rattail sixweeks grass Italian rye grass foxtail barley
Poaceae	<i>Lamarckia aurea</i> * <i>Polypogon monspeliensis</i> * <i>Schismus barbatus</i> * <i>Stipa lepida</i> <i>Stipa pulchra</i>	goldentop grass annual beard grass Mediterranean grass foothill needle grass purple needlegrass
Polemoniaceae	<i>Navarretia hamata</i> ssp. <i>leptantha</i>	hooked pincushion plant

**Attachment A (cont.)
PLANT SPECIES OBSERVED**

<u>Family</u>	<u>Scientific Name</u>	<u>Common Name</u>	
Polygonaceae	<i>Chorizanthe fimbriata</i> var. <i>fimbriata</i>	fringed spineflower	
	<i>Chorizanthe polygonoides</i> var. <i>longispina</i> †	knotweed spineflower	
	<i>Chorizanthe procumbens</i>	prostrate spineflower	
	<i>Eriogonum fasciculatum</i> var. <i>fasciculatum</i>	coast California buckwheat	
	<i>Polygonum aviculare</i> *	knotweed	
	<i>Pterostegia drymarioides</i>	fairy mist	
	<i>Rumex crispus</i> *	curly docks	
	<i>Rumex salicifolius</i>	willow dock	
	Portulacaceae	<i>Portulaca oleracea</i> *	common purslane
		Rhamnaceae	<i>Ceanothus tomentosus</i>
<i>Rhamnus crocea</i>	spiny redberry		
Rosaceae	<i>Adenostoma fasciculatum</i> var. <i>obtusifolium</i>	San Diego chamise	
	<i>Cercocarpus minutiflorus</i>	San Diego mountain-mahogany	
	<i>Heteromeles arbutifolia</i>	toyon	
	<i>Prunus ilicifolia</i>	holly-leaf cherry	
Rubiaceae	<i>Galium porrigens</i> var. <i>porrigens</i>	climbing/oval-leaf bedstraw	
Rutaceae	<i>Cneoridium dumosum</i>	coast spine bush	
Salicaceae	<i>Salix laevigata</i>	red willow	
	<i>Salix lasiolepis</i>	arroyo willow	
Selaginellaceae	<i>Selaginella cinerascens</i> †	Mesa spike-moss	
Solanaceae	<i>Datura wrightii</i>	jimsonweed	
	<i>Nicotiana glauca</i> *	tree tobacco	
	<i>Solanum parishii</i>	Parish's nightshade	
Themidaceae	<i>Bloomeria crocea</i> var. <i>crocea</i>	common goldenstar	
	<i>Brodiaea orcuttii</i> †	Orcutt's brodiaea	
	<i>Dichelostemma capitatum</i>	blue dicks	
	<i>Muilla maritima</i>	common muilla	

* Non-native/invasive species

† Sensitive species

π *Vernal pool indicator species (Bauder et al. 2009)*

Attachment B
ANIMAL SPECIES OBSERVED OR DETECTED

<u>Order</u>	<u>Family</u>	<u>Scientific Name</u>	<u>Common Name</u>		
INVERTEBRATES					
Anostraca	Branchinectidae	<i>Branchinecta lindahli</i> <i>Branchinecta sandiegonensis</i> †	versatile fairy shrimp San Diego fairy shrimp		
Lepidoptera	Lycaenidae	<i>Brephidium exilis</i> <i>Glaucopsyche lygdamus</i>	western pygmy blue silvery blue		
	Nymphalidae	<i>Adelpha californica</i> <i>Vanessa annabella</i>	California sister west coast lady		
	Riodinidae	<i>Apodemia mormo virgulti</i>	Behr's metalmark		
VERTEBRATES					
<u>Amphibians</u>					
Anura	Bufonidae	<i>Anaxyrus boreas</i>	western toad		
	Hylidae	<i>Pseudacris hypochondriaca</i>	Baja California treefrog		
	Ranidae	<i>Lithobates catesbeianus</i>	American bullfrog		
	Scaphiopodidae	<i>Spea hammondi</i> †	western spadefoot toad		
<u>Birds</u>					
Accipitriformes	Accipitridae	<i>Accipiter cooperii</i> <i>Buteo jamaicensis</i> <i>Elanus leucurus</i> †	Cooper's hawk red-tailed hawk white-tailed kite		
		Anseriformes	Anatidae	<i>Anas cyanoptera</i> <i>Anas platyrhynchos</i> <i>Bucephala albeola</i>	cinnamon teal mallard bufflehead
				Apodiformes	Trochilidae
Caprimulgiformes	Caprimulgidae				
Charadriiformes	Scolopacidae	<i>Gallinago delicata</i>	Wilson's snipe		
Columbiformes	Columbidae	<i>Zenaida macroura</i>	mourning dove		
		Passeriformes	Aegithalidae	<i>Psaltriparus minimus</i>	bushtit
Corvidae	<i>Aphelocoma californica</i> <i>Corvus brachyrhynchos</i> <i>Corvus corax</i>			western scrub-jay American crow common raven	
	Emberizidae		<i>Melospiza melodia</i> <i>Melospiza crissalis</i> <i>Pipilo maculatus</i> <i>Zonotrichia leucophrys</i>	song sparrow California towhee spotted towhee white-crowned sparrow	
			Fringillidae	<i>Haemorhous mexicanus</i> <i>Spinus psaltria</i>	house finch lesser goldfinch
				Icteridae	<i>Agelaius phoeniceus</i> <i>Quiscalus mexicanus</i> <i>Sturnella neglecta</i>
			Mimidae		<i>Mimus polyglottus</i>
	Paridae		<i>Baeolophus inornatus</i>		oak titmouse
Parulidae	<i>Geothlypis trichas</i>		common yellowthroat		

Attachment B (cont.)
ANIMAL SPECIES OBSERVED OR DETECTED

<u>Order</u>	<u>Family</u>	<u>Scientific Name</u>	<u>Common Name</u>	
VERTEBRATES (cont.)				
<u>Birds</u> (cont.)				
Passeriformes (cont.)	Parulidae (cont.)	<i>Oreothlypis celata</i>	orange-crowned warbler	
		<i>Setophaga coronata</i>	yellow-rumped warbler	
		<i>Polioptila californica californica</i> †	coastal California gnatcatcher	
	Poliptilidae	<i>Regulus calendula</i>	ruby-crowned kinglet	
	Regulidae	<i>Sturnus vulgaris</i>	European starling	
	Sturnidae	<i>Chamaea fasciata</i>	wrentit	
	Sylviidae	<i>Thryomanes bewickii</i>	Bewick's wren	
	Troglodytidae	<i>Sayornis nigricans</i>	black phoebe	
	Tyrannidae		<i>Sayornis saya</i>	Say's phoebe
		Piciformes	Picidae	<i>Colaptes auratus</i>
<i>Dryobates nuttallii</i>				Nuttall's woodpecker
<u>Reptiles</u>				
Squamata	Colubridae	<i>Thamnophis hammondi</i> †	two-striped garter snake	
	Teiidae	<i>Aspidooscelis hyperythra beldingi</i> †	Belding's orange-throated whiptail	

† Sensitive species

APPENDIX C

Dry Season Fairy Shrimp Survey and Hatching Report

Pure Water San Diego Program North City Water Purification Project

Dry Season Fairy Shrimp Survey and Hatching Report

December 8, 2016

Prepared for:

City of San Diego
Public Utilities Department

9192 Topaz Way, MS 901A
San Diego, CA 92123

Prepared by:

HELIX Environmental Planning, Inc.

7578 El Cajon Boulevard
La Mesa, CA 91942

I certify that the information in this survey report and attached exhibits
fully and accurately represent my work:



Jason Kurnow

Pure Water San Diego Program North City Water Purification Project Dry Season Fairy Shrimp Survey and Hatching Report

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1.0 INTRODUCTION

This report presents the findings of the 2016 dry season fairy shrimp sampling (survey) conducted by HELIX Environmental Planning, Inc. (HELIX) for the Pure Water San Diego Program's proposed North City Water Purification Project (project) located in San Diego County, California. The purpose of the dry season survey was to determine the presence of fairy shrimp cysts within the study area, which consists of 6 distinct sites. A wet season fairy shrimp survey was conducted for this project during the 2015-2016 rain season (Rocks 2016).

1.1 STUDY AREA LOCATION

The study area includes 6 distinct sites located throughout San Diego County: 1) Sander East; 2) Marine Corps Air Station (MCAS) Miramar; 3) Mast Boulevard; 4) Pueblo North; 5) Pueblo Central; and 6) Pueblo South (Figure 1). Sander East encompasses an approximate 30-acre area located in the community of Kearny Mesa in the City of San Diego, south of State Route 52, and north of Mercury Street. The site is located in unsectioned land within Townships 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2a).

MCAS Miramar encompasses an approximate 95-acre area located on MCAS Miramar, east of I-805. The site is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2b).

Mast Boulevard encompasses an approximate 2-acre area located on the border of the City of Santee and an unincorporated part of San Diego County, south of El Nopal, and north of Hillcreek Road. The site is located in unsectioned land within Townships 15 South, Range 1 West on the San Bernardino Base and Meridian USGS 7.5-minute El Cajon quadrangle map (Figure 2c).

The 3 Pueblo sites are located in the City of San Diego, east of Interstate (I-) 805, just west of the MCAS Miramar, and south of Carroll Canyon Road. Pueblo North encompasses a 14.0-acre area, Pueblo Central encompasses a 33-acre area, and Pueblo South encompasses a 29-acre area. Pueblo North is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian U.S. Geological Survey (USGS) 7.5-minute Del Mar quadrangle map (Figure 2d). Pueblo Central is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (in part) and the Del Mar quadrangle map (in part) (Figure 2d). Pueblo South is located in unsectioned land within Township 15 South, Range 3 West on the San Bernardino Base and Meridian USGS 7.5-minute La Jolla quadrangle map (Figure 2d).

1.2 SPECIES INFORMATION

There are 3 species of fairy shrimp with potential to occur within the study area: San Diego fairy shrimp (*Branchinecta sandiegonensis*), Riverside fairy shrimp (*Streptocephalus woottoni*), and versatile fairy shrimp (*Branchinecta lindahli*). The San Diego and Riverside fairy shrimp are

federally listed as endangered, while the versatile fairy shrimp is relatively common and is not listed or considered sensitive. San Diego fairy shrimp are found in San Diego and Orange counties and occur in vernal pools and other ephemeral ponds or basins. Riverside fairy shrimp can be found in Riverside, Orange, and San Diego counties and occur in vernal pools and other ephemeral basins with long inundation times. The versatile fairy shrimp is common in pools throughout California and can co-occur with both San Diego and Riverside fairy shrimp.

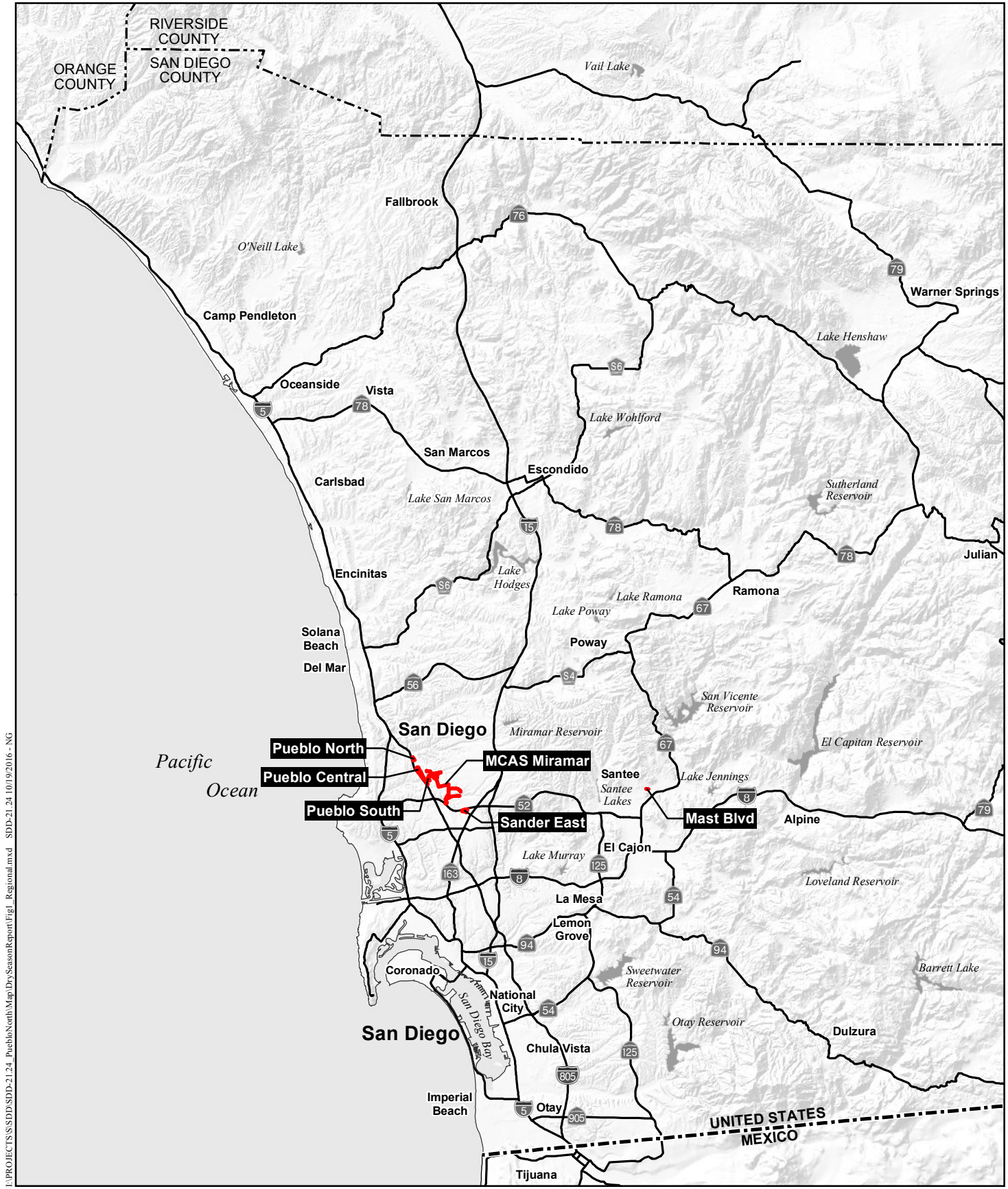
Fairy shrimp are adapted for variable and uncertain rainfall patterns. When fertilized by males of their species, female fairy shrimp produce “resting eggs,” called cysts, which are dormant embryos surrounded by hard-shelled membranes capable of remaining viable in the soil for long periods of time. Dry season fairy shrimp surveys are designed to detect, collect, and identify cysts present in the soil. The surface characteristics of these cysts can be used to differentiate the genus and potentially the species of fairy shrimp.

2.0 METHODS

HELIX permitted biologist Jason Kurnow (Permit TE778195-13) led the dry season sampling effort in accordance with U.S. Fish and Wildlife Service (USFWS) protocol (USFWS 2015). Soil collection was conducted by Mr. Kurnow and HELIX permitted biologist Amy Mattson (Permit TE778195-13). Soil collection for the Pueblo North site occurred on June 17, 2016, on July 28, 2016 for Sander East, on July 29, 2016 for Mast Boulevard, on July 27 and 29, 2016 for MCAS Miramar, and on August 1, 2016 for Pueblo Central and Pueblo South. Representative photos of each of the 6 sites are included with this report (Appendix A). The USFWS Data Sheets for Dry Season Sample Analysis for Listed Large Branchiopods are included as Appendix B.

Following soil collection, the samples were transferred to the HELIX laboratory for analysis. Soil processing was conducted by HELIX permitted biologist Jason Kurnow, or under the supervision of Mr. Kurnow. Supervised individuals consisted of HELIX biologists Amy Mattson, Hannah Sadowski, and Summer Schlageter. Microscope work was solely conducted by Mr. Kurnow. Samples were prepared by dissolving the soil samples in water and sequentially sieving the material through 710- and 75- μ m pore size screens. The small size of these screens ensures that cysts from the target fairy shrimp species are retained. The portion of each sample retained in the screen was dispersed in a brine solution to separate the organic from the inorganic material. The organic fraction was decanted, dried, and examined under a microscope. Cysts were identified to genus level based on surface characteristics. Multiple species of the *Branchinecta* genus can occur in San Diego County, but cannot be identified past genus level based on cyst characteristics. The relative amount of cyst abundance was estimate for each sample and the total egg abundance for each basin is provided in the Results section, according to the guidelines provided in the USFWS Survey Guidelines: Low (estimate of 1-10 cysts/100 mL soil); Medium (estimate of 11-50 cysts/100 mL soil); and High (estimate of more than 50 cysts/100 mL of soil).

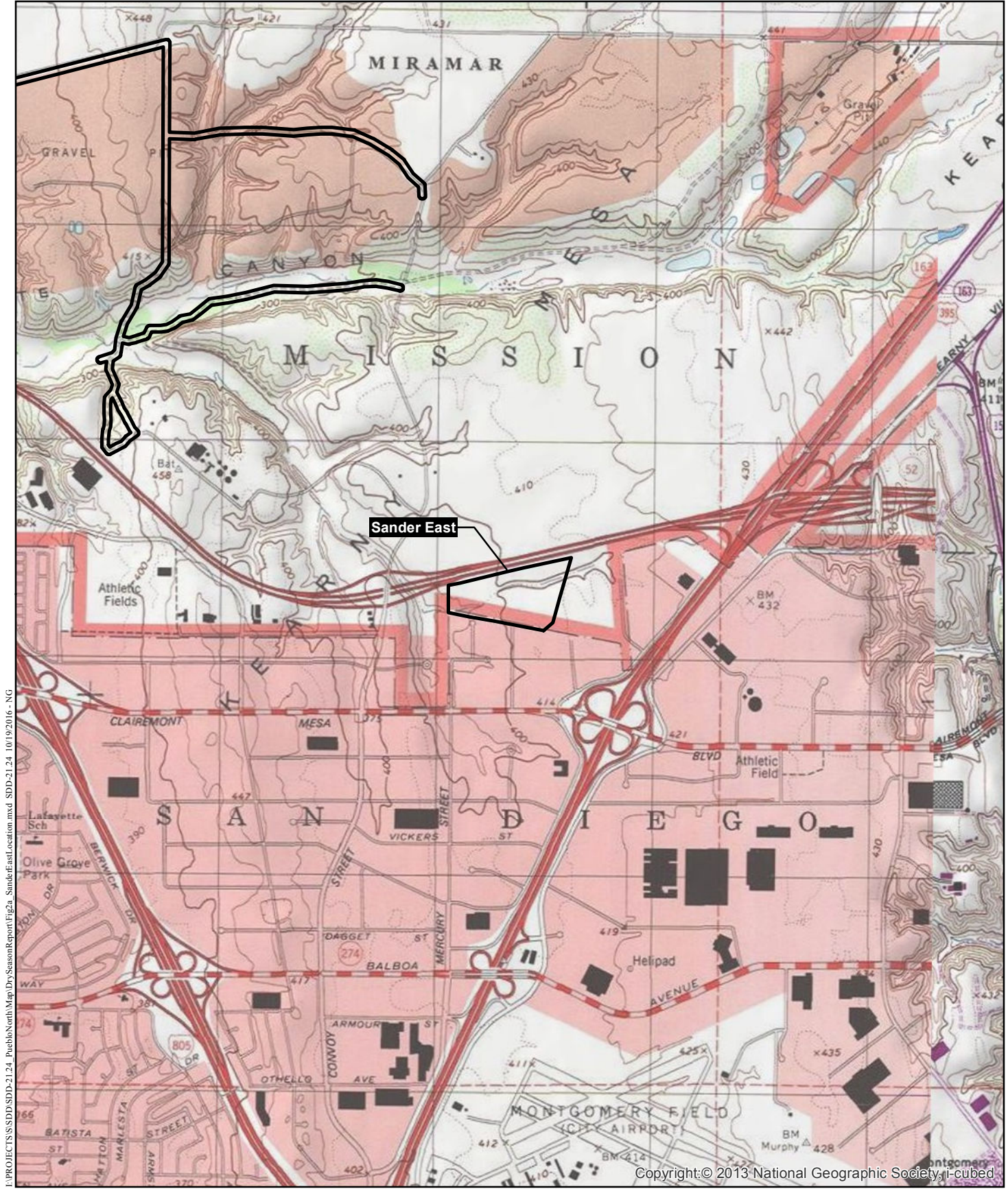
To supplement the dry season sampling, a hatching effort was conducted for the MCAS Miramar and Pueblo North sites. This was done to provide adult specimens that could be identified to



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Regional Location Map

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT



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Site Location

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT

HELIX
Environmental Planning

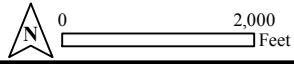
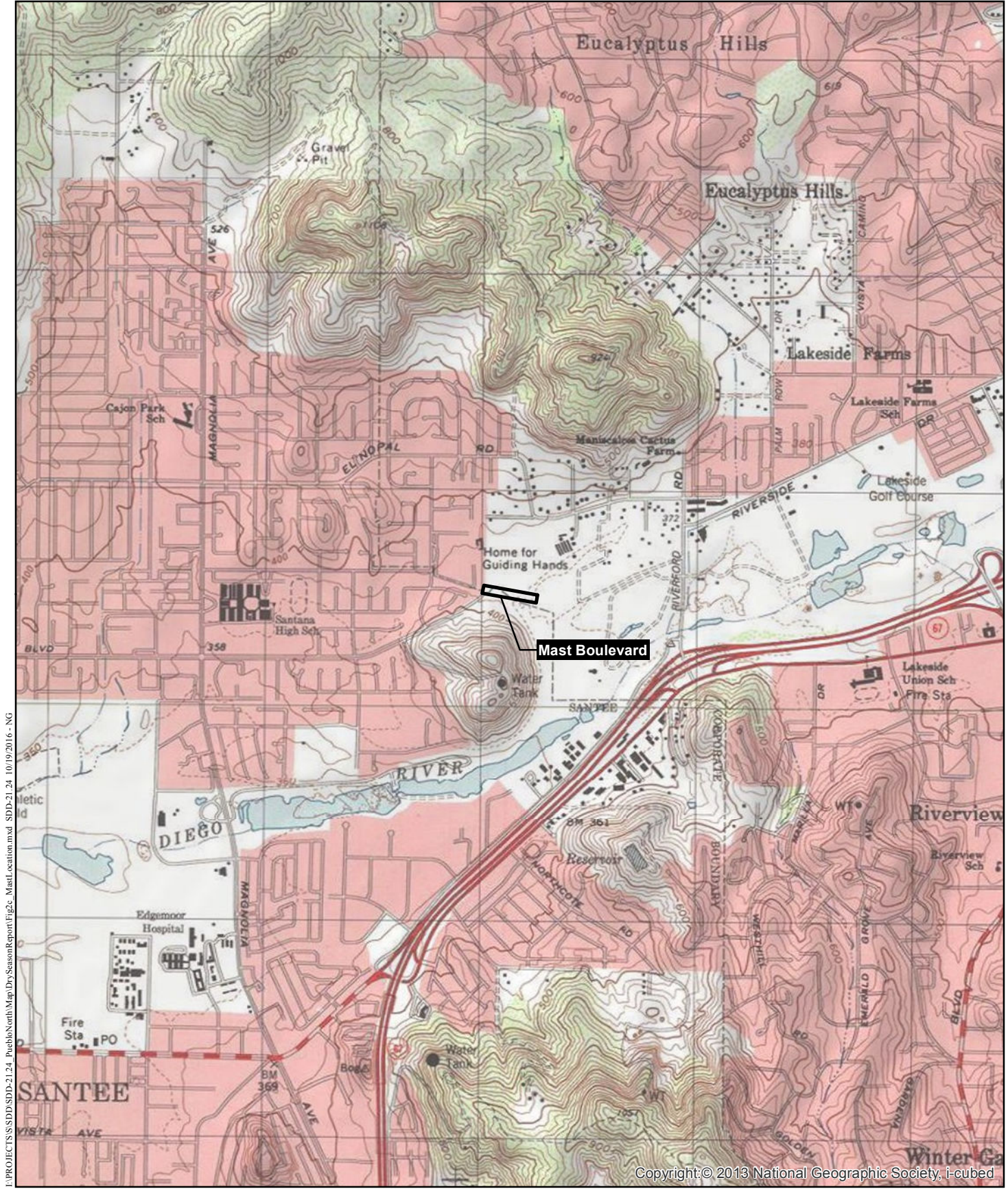


Figure 2a



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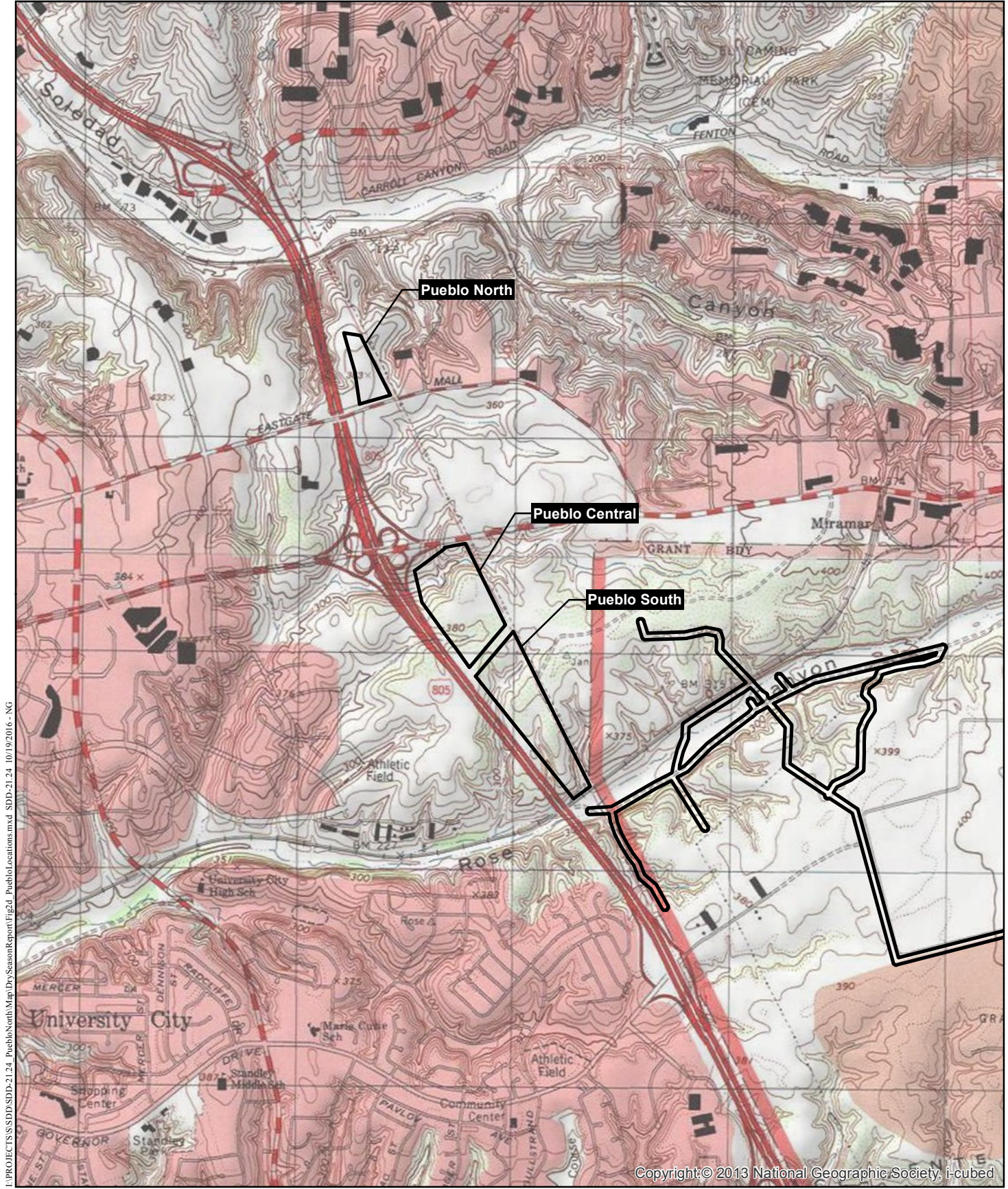
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Site Location

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT



Figure 2c



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Site Locations

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT

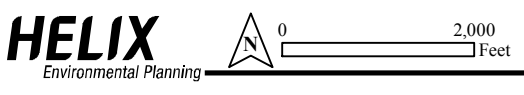


Figure 2d

species level. In anticipation of this, a small amount of soil from each basin associated with these 2 sites was set aside prior to processing. Following USFWS notification, soil samples from basins containing cysts that were not known to contain the federally listed as endangered San Diego fairy shrimp were sent out for hatching. Hatching was conducted by permitted fairy shrimp specialist, D. Christopher Rogers, using the established methods for hatching. Methodologies for hatching are detailed in the hatching reports, which are included as Appendices C1 and C2.

3.0 RESULTS

Sander East

Twenty-eight basins were sampled for the presence of fairy shrimp cysts (Figure 3a). *Branchinecta* cysts were observed in 5 of the 28 basins (Appendix D). The 5 basins containing *Branchinecta* cysts are: PW10, PW11, PW13, PW16, and PW25. *Streptocephalus* sp. cysts were not observed in any of the sampled basins.

MCAS Miramar

Thirty basins were sampled for the presence of fairy shrimp cysts (Figure 3b). *Branchinecta* cysts were observed in 21 of the 30 basins (Appendix D). The 21 basins containing *Branchinecta* cysts are: PW28, PW29, PW31, PW33 – PW39, PW41, PW43, PW46 – PW50, PW52, and PW80 – PW82. *Streptocephalus* sp. cysts were not observed in any of the sampled basins.

Of the 21 basins containing cysts, previous wet season surveys identified SDFS in 9 of them (Figure 3b). Basins where SDFS have been identified during wet season surveys are: PW31, PW33-39, and PW41. Cultures from the remaining 12 basins containing *Branchinecta* cysts produced the non-listed fairy shrimp *B. lindahli* (Appendix C1, Appendix D).

Mast Boulevard

Three basins were sampled for the presence of fairy shrimp cysts (Figure 3c). Neither *Branchinecta* sp. cysts nor *Streptocephalus* sp. cysts were observed in any of the sampled basins (Appendix D).

Pueblo North

Eleven basins were sampled for the presence of fairy shrimp cysts (Figure 3d). *Branchinecta* cysts were observed in 3 of the 11 basins (Appendix D). The 3 basins containing *Branchinecta* cysts are: PW55, PW56, and PW57. *Streptocephalus* sp. cysts were not observed in any of the sampled basins.

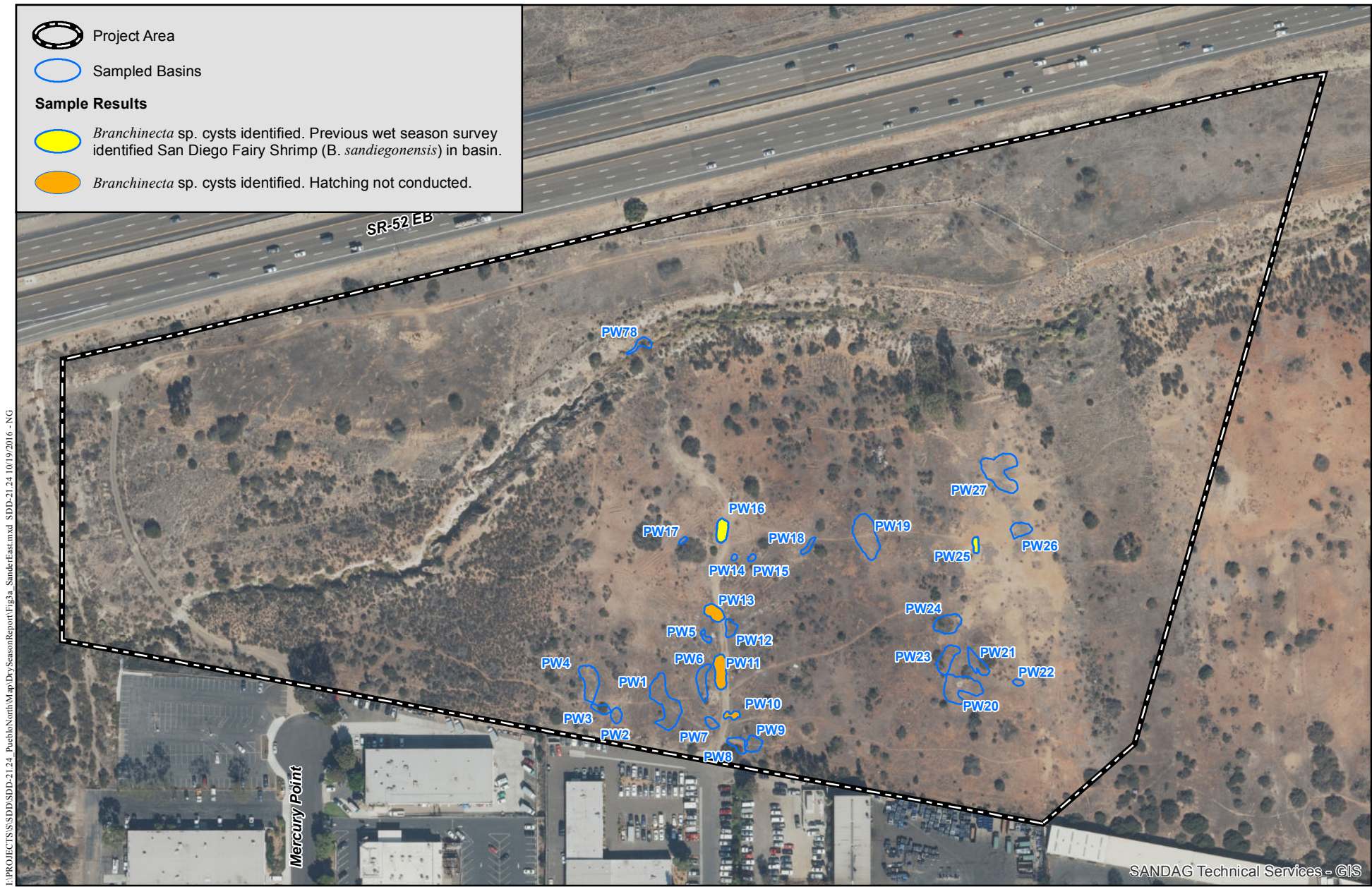
Cultures from all 3 of the basins containing *Branchinecta* cysts produced the non-listed fairy shrimp *B. lindahli* (Appendix C2, Appendix D).

Pueblo Central

Eight basins were sampled for the presence of fairy shrimp cysts (Figure 3e). *Branchinecta* cysts were observed in 2 of the 8 basins (Appendix D). The 2 basins containing *Branchinecta* cysts are: PW60, and PW64. *Streptocephalus* sp. cysts were not observed in any of the sampled basins.

Pueblo South

Eight basins were sampled for the presence of fairy shrimp cysts (Figure 3f). *Branchinecta* cysts were observed in 6 of the 8 basins (Appendix D). The 6 basins containing *Branchinecta* cysts are: PW70 – PW75. *Streptocephalus* sp. cysts were not observed in any of the sampled basins.



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SANDAG Technical Services - GIS

Sampled Basins

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT - SANDER EAST SITE

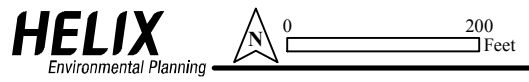
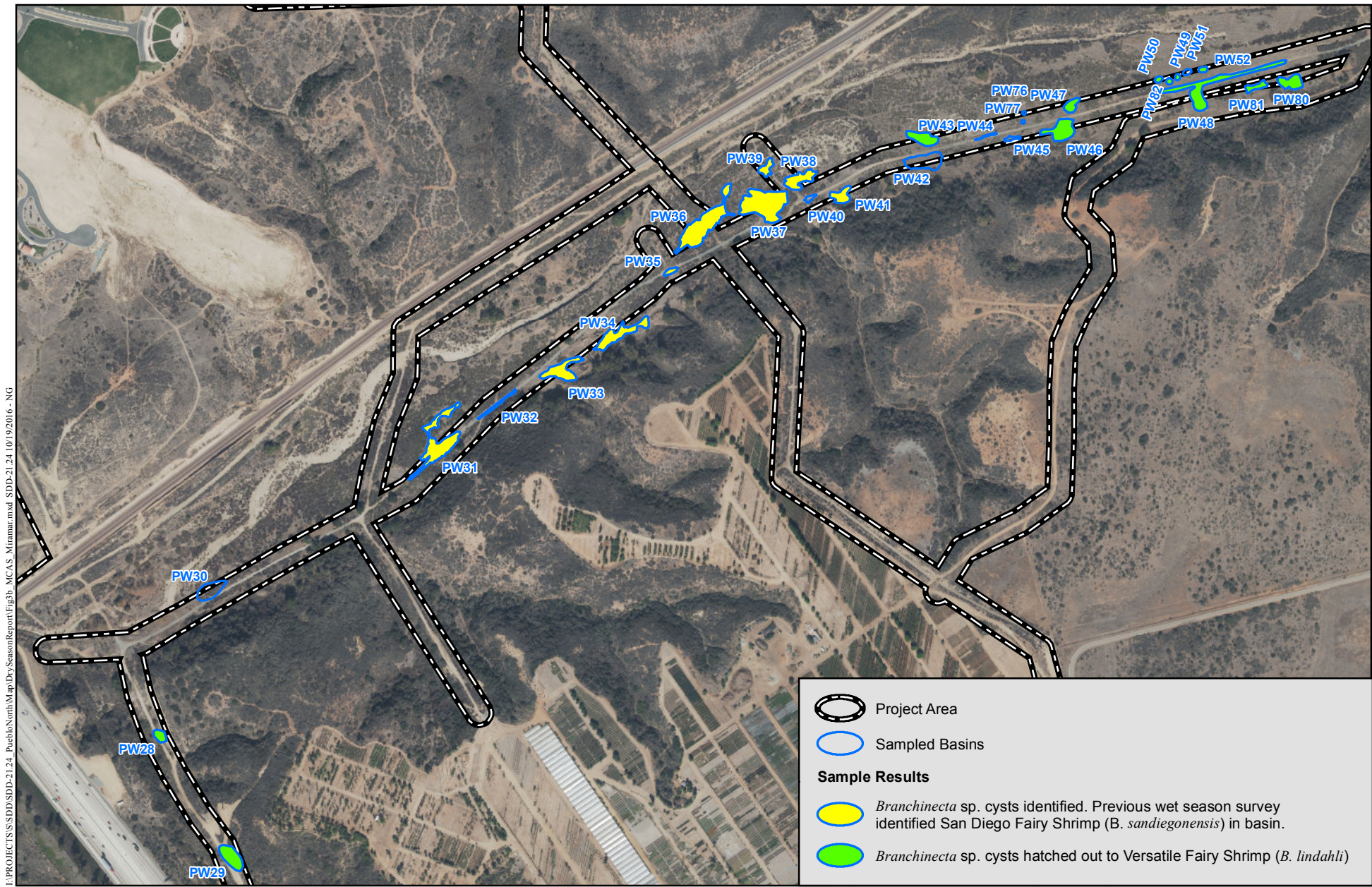


Figure 3a



Sampled Basins

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT - MCAS MIRAMAR SITE



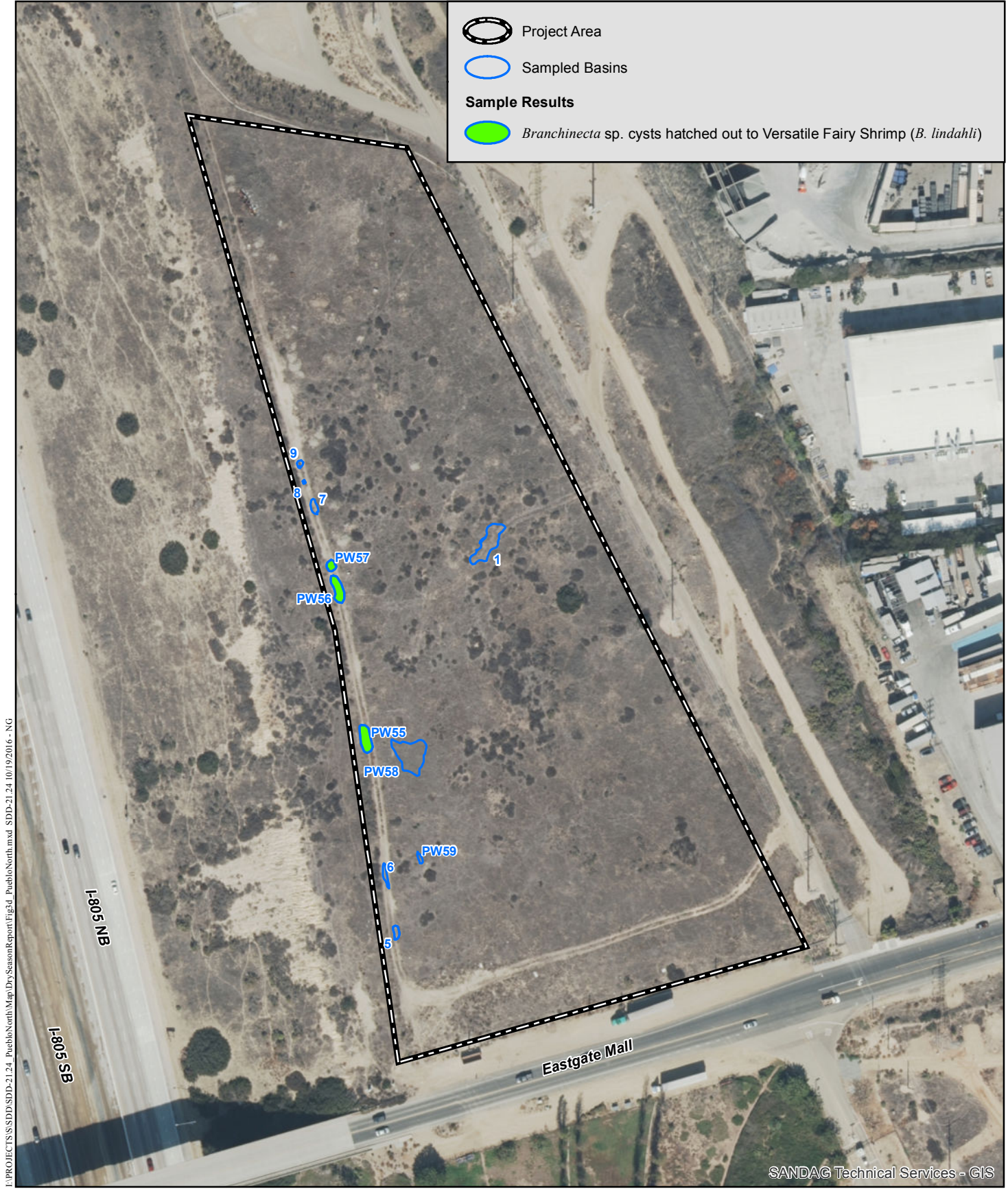
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SANDAG Technical Services - GIS

Sampled Basins

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT - MAST BOULEVARD SITE

 Project Area
 Sampled Basins
Sample Results
 *Branchinecta* sp. cysts hatched out to Versatile Fairy Shrimp (*B. lindahli*)



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SANDAG Technical Services - GIS

Sampled Basins

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT - PUEBLO NORTH SITE



Sampled Basins

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT - PUEBLO CENTRAL SITE



SANDAG Technical Services - GIS

Sampled Basins

PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT - PUEBLO SOUTH SITE

4.0 REFERENCES

- Marine Corps Air Station (MCAS) Miramar. 2016. GIS Database files, “Natural Resources.” Data provided to City of San Diego on August 30, 2016.
- Rocks Biological Consulting. 2016. 90-Day Wet Season Results, Vernal Pool Branchiopod Surveys for the Pure water Program Project, San Diego, California. September 13.
- U.S. Fish and Wildlife Service (USFWS). 2015. Survey Guidelines for the Listed Large Branchiopods. May 31.

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Appendix A

REPRESENTATIVE SITE PHOTOS





Basins PW8 and PW9 – Sander East Site – 7/28/16 - JK



Basins PW14 to PW16 – Sander East Site – 7/28/16 - JK



Basins PW20 to PW24 – Sander East Site – 7/28/16 - JK



Basin PW32 – MCAS Miramar Site – 7/29/16 - AM

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Representative Site Photos

2016 DRY SEASON FAIRY SHRIMP SURVEY AND HATCHING REPORT FOR THE
PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT



Basin PW33 – MCAS Miramar Site – 7/29/16 - AM



Basin PW46– MCAS Miramar Site – 7/29/16 - AM



Basin PW53– Mast Blvd Site – 7/29/16 – JK



Basin PW55– Pueblo North Site – 6/17/16 – JK

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Representative Site Photos

2016 DRY SEASON FAIRY SHRIMP SURVEY AND HATCHING REPORT FOR THE
PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT



Basin PW56– Pueblo North Site – 6/17/16 – JK



Basin PW63– Pueblo Central Site – 8/1/16 –AM



Basin PW74– Pueblo South Site – 8/1/16 –AM



Appendix B

USFWS DATA SHEETS FOR DRY SEASON
SAMPLING FOR LARGE BRANCHIOPODS



Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>Pure Water SD - Sander East Site</u>		Quad: <u>La Jolla</u>		Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):			
USFWS Project Number:		Township: <u>15 south</u>		Soil Collection: <u>Jason Kurnow (TE 778195-13)</u>			
County: <u>San Diego</u>		Range: <u>3 west</u>		Soil Processing: <u>Amy Mattson (TE 778195-13)*, Hannah Badowski*, Summer Schlegel*</u>			
Lat: <u>32° 50' 15" N</u>		Section: <u>Unsectioned</u>		Soil Analysis/Cysts ID: <u>Jason Kurnow (TE 778195-13)</u>			
Long: <u>117° 09' 42" W</u>				Soil Collection Date: <u>7/29/16</u>			

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments	
	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts						Hydracarina Live	Nematoda	Collembola	Other Species		
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wooloni</i>	<i>Linderiella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>						
PW 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 16	-	-	-	-	-	385	-	-	-	-	-	-	-	-	-	-	↓
PW 17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 25	-	-	-	-	-	751	-	-	-	-	-	-	-	-	-	-	
PW 26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

* Supervised Individual

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>Pure Water SD- Sander East Site</u>	Quad: <u>La Jolla</u>	Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):					
USFWS Project Number:	Township: <u>15 south</u>	Soil Collection: <u>Jason Kurnow (TE 778195-13)</u>					
County: <u>San Diego</u>	Range: <u>3 west</u>	Soil Processing: <u>Amy Mattson (TE 778195-13)*, Hannah Sadowski*, Summer Schlyder*</u>					
Lat: <u>32° 50' 15" N</u>	Section: <u>Unsectioned</u>	Soil Analysis/Cysts ID: <u>Jason Kurnow (TE 778195-13)</u>					
Long: <u>117° 08' 42" W</u>		Soil Collection Date: <u>7/29/16</u>					

Pool/ Habitat/ Basin No.	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Invertebrates Present (X)						Hydracarina Live	Nematoda	Collembola	Other Species	Comments
						Number of Large Branchiopod Cysts										
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wooloni</i>	<i>Linderiella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>					
PW 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	↓
PW 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 10	-	-	-	-	-	27	-	-	-	-	-	-	-	-	-	
PW 11	-	-	-	-	-	309	-	-	-	-	-	-	-	-	-	
PW 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PW 13	-	-	-	-	-	28	-	-	-	-	-	-	-	-	-	
PW 14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

* Supervised Individual

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>River Water 50- MCAS Miramar Site</u>		Quad: <u>La Jolla</u>		Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):			
USFWS Project Number: _____		Township: <u>15 south</u>		Soil Collection: <u>Amy Mattson (TE 778195-13)*</u>			
County: <u>San Diego</u>		Range: <u>3 west</u>		Soil Processing: <u>Amy Mattson (TE 778195-13)* Hannah Sudaowski* Summer Schlagter*</u>			
Lat: <u>32° 52' 10" N</u>		Section: <u>unsectioned</u>		Soil Analysis/Cysts ID: <u>Jason Kurnow (TE 778195-13)</u>			
Long: <u>117° 10' 43" W</u>				Soil Collection Date: <u>7/27/16 & 7/29/16</u>			

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments	
	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts						Hydracarina Live	Nematoda	Collembola	Other Species		
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wootoni</i>	<i>Linderiella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>						
PW 28	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	Hatched to <i>B. lindahli</i>
PW 29	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	Hatched to <i>B. lindahli</i> ?
PW 30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 31	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	Prew. wet season survey had <i>B. sandiegensis</i>
PW 32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 33	-	-	-	-	-	68	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 34	-	-	-	-	-	181	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 35	-	-	-	-	-	68	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 36	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 37	-	-	-	-	-	167	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 38	-	-	-	-	-	145	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 39	-	-	-	-	-	232	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>
PW 40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 41	-	-	-	-	-	1080	-	-	-	-	-	-	-	-	-	-	Prew wet season survey had <i>B. sandiegensis</i>

* Authorized to conduct wet season fairy shrimp surveys. Also knowledgeable of the methods used for soil collection under 2015 guidelines

x Supervised Individual

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>Raw Water SO - MCAS Miramar Site</u>	Quad: <u>La Jolla</u>	Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):					
USFWS Project Number:	Township: <u>15 south</u>	Soil Collection: <u>Amy Mattson (TE 778195-13)*</u>					
County: <u>San Diego</u>	Range: <u>3 west</u>	Soil Processing: <u>Amy Mattson (TE 778195-13)*, Hannah Sadowski*, Summer Schlegler*</u>					
Lat: <u>32° 52' 10" N</u>	Section: <u>unsectioned</u>	Soil Analysis/Cysts ID: <u>Jason Kurnow (TE 778195-13)</u>					
Long: <u>117° 10' 43" W</u>		Soil Collection Date: <u>7/27/16 & 7/29/16</u>					

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments
	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts						Hydracarina Live	Nematoda	Collembola	Other Species	
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wooloni</i>	<i>Lindieriella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>					
PW 42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 43	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 46	-	-	-	-	-	45	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 47	-	-	-	-	-	55	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 48	-	-	-	-	-	72	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 49	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 50	-	-	-	-	-	68	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 52	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli
PW 76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 80	-	-	-	-	-	15	-	-	-	-	-	-	-	-	-	Hatched to B. lindahli

* Authorized to conduct wet season fairy shrimp surveys. Also knowledgeable of the methods used for soil collection under 2015 guidelines

x Supervised Individual

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>Pure Water SD - Pueblo North Site</u>		Quad: <u>Del Mar</u>		Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):			
USFWS Project Number:		Township: <u>15 south</u>		Soil Collection: <u>Jason Kurnow (TE 77895-13)</u>			
County: <u>San Diego</u>		Range: <u>3 west</u>		Soil Processing: <u>Jason Kurnow (TE 77895-13)</u>			
Lat: <u>32° 52' 57" N</u>		Section: <u>Unsectioned</u>		Soil Analysis/Cysts ID: <u>Jason Kurnow (TE 77895-13)</u>			
Long: <u>117° 12' 00" W</u>				Soil Collection Date: <u>6/17/16</u>			

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments
	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts						Hydracarina Live	Nematoda	Collembola	Other Species	
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wootoni</i>	<i>Lindleriella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>					
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 56	-	-	-	-	-	110	-	-	-	-	-	-	-	-	-	Hatched to <i>B. lindahli</i>
PW 57	-	-	-	-	-	47	-	-	-	-	-	-	-	-	-	Hatched to <i>B. lindahli</i>
PW 58	-	-	-	-	-	56	-	-	-	-	-	-	-	-	-	Hatched to <i>B. lindahli</i>
PW 59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>Pure Water SD - Rabbit Central Site</u>		Quad: <u>La Jolla & Del Mar</u>		Name of Person(s) Who Conducted the Following Tasks and Permit Number(s):			
USFWS Project Number:		Township: <u>15 South</u>		Soil Collection: <u>Amy Mattson (TE 778195)*</u>			
County: <u>San Diego</u>		Range: <u>3 West</u>		Soil Processing: <u>Hannah Sadowski X</u>			
Lat: <u>32° 52' 25" N</u>		Section: <u>Unsectioned</u>		Soil Analysis/Cysts ID: <u>Jason Kinnon (TE 778195)</u>			
Long: <u>117° 11' 43" W</u>				Soil Collection Date: <u>8/1/16</u>			

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments	
	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts						Hydracarina Live	Nematoda	Collembola	Other Species		
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wooloni</i>	<i>Linderiella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>						
PW 60	-	-	-	-	-	123	-	-	-	-	-	-	-	-	-	-	None
PW 61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	↓
PW 62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
PW 63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
PW 64	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-		
PW 65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
PW 66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
PW 67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

* Authorized to conduct wet season fairy shrimp surveys. Also knowledgeable of the methods used for soil collection under 2016 guideline
 X Supervised Individual

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information				Biologist Information			
Project Name: <u>Pure Water SD - Pueblo South Site</u>		Quad: <u>La Jolla</u>		Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):			
USFWS Project Number:		Township: <u>15 south</u>		Soil Collection: <u>Amy Mattson (TE 778195-13)*</u>			
County: <u>San Diego</u>		Range: <u>3 west</u>		Soil Processing: <u>Hannah Sadowski*</u>			
Lat: <u>32°52'12" N</u>		Section: <u>unsectioned</u>		Soil Analysis/Cysts ID: <u>Jason Kurnow (TE 778195-13)</u>			
Long: <u>117°11'31" W</u>				Soil Collection Date: <u>8/11/16</u>			

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments	
	Insect Exo- Skeletons	Micro- Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts						Hydracarina Live	Nematoda	Collembola	Other Species		
						<i>Branchinecta</i> sp.	<i>Lepidurus</i> <i>packardii</i>	<i>Streptocephalus</i> <i>wootoni</i>	<i>Linderiella</i> <i>occidentalis</i>	<i>Lynceus</i> <i>brachyurus</i>	<i>Cyzicus</i> <i>californicus</i>						
PW 68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	None
PW 69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	↓
PW 70	-	-	-	-	-	27	-	-	-	-	-	-	-	-	-		
PW 71	-	-	-	-	-	107	-	-	-	-	-	-	-	-	-		
PW 72	-	-	-	-	-	455	-	-	-	-	-	-	-	-	-		
PW 73	-	-	-	-	-	45	-	-	-	-	-	-	-	-	-		
PW 74	-	-	-	-	-	91	-	-	-	-	-	-	-	-	-		
PW 75	-	-	-	-	-	14	-	-	-	-	-	-	-	-	-		

* Authorized to conduct wet season fairy shrimp surveys. Also knowledgeable of the methods used for soil collection under 2015 guidelines
 x Supervised Individual



Appendix C1

CULTURE RESULTS OF SOIL SAMPLES COLLECTED FROM THE PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT (MCAS MIRAMAR SITE), SAN DIEGO, CALIFORNIA



The University of Kansas

Kansas Biological Survey

13 October 2016

Shelby Howard
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
Suite 200
La Mesa, CA 91942

SUBJECT: Culture Results of Soil Samples Collected from the Pure Water San Diego Program North City Water Purification Project (MCAS Miramar Site), San Diego, California.

Dear Mr. Howard,

HELIX Environmental Planning, Inc. (HELIX) biologists collected soil samples from 12 potential special status shrimp habitats within the MCAS Miramar site associated with the City of San Diego's Pure Water San Diego Program North City Water Purification Project, San Diego County, California. Soil samples were collected from previously identified habitat determined to contain anostracan eggs, which were judged to be potentially suitable for special status shrimp species. All cultures produced the nonlisted fairy shrimp *Branchinecta lindahli*.

Kansas Biological Survey understands that HELIX will submit this report and all other pertinent materials and information to the US Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW), as required by the USFWS guidelines for a protocol level survey.

Definitions

For the purpose of this report, special status shrimp are defined to include shrimp species listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species). Two special status fairy shrimp species (*Branchinecta sandiegonensis* Fugate, 1993, and *Streptocephalus woottoni* Eng, Belk, & Eriksen, 1990) have the potential to occur within the vicinity of the MCAS Miramar project site. In addition, the nonlisted fairy shrimp species *Branchinecta lindahli* Packard, 1883 is known from the site vicinity.

Methods

HELIX collected dry soil samples from 12 potential special status shrimp habitats at the MCAS Miramar site. These 12 habitats are identified as PW28, PW 29, PW 43, PW46, PW47, PW48, PW49, PW50, PW52, PW80, PW81, and PW 82. The soil samples were placed in a plastic ziplock bag, labeled with the locality number, and submitted to the Kansas Biological Survey laboratory for culture.

The University of Kansas

Laboratory Analysis

The soil was prepared for examination in the laboratory by dissolving the clumps of soil in distilled water. Adult shrimp were reared from the recovered eggs using methods following U.S. Environmental Protection Agency (1985), Belk, et al. (1990), Maeda-Martinez, et al., (1995a and 1995b), and Jawahar & Dumont (1995). Hatched shrimp were fed a standard *Daphnia* food that includes; fish food, fish oil, baker's yeast, and the alga *Selenastrum capricornutum*. The shrimp were reared to maturity. Adult *Branchinecta* reared from culture were killed in 90% ethyl alcohol, and examined under a stereo dissection microscope. Identifications were made based upon comparisons with specimens in our collections, the original species descriptions and professional experience.

Results

The nonlisted fairy shrimp *Branchinecta lindahli* was cultured from all 12 samples (PW28, PW 29, PW 43, PW46, PW47, PW48, PW49, PW50, PW52, PW80, PW81, and PW 82).

If you have any questions please call me.

Sincerely,



D. Christopher Rogers
785.864.1714
Crustacean Taxonomist and Ecologist
Kansas Biological Survey and The Biodiversity Institute
Kansas University, Higuchi Hall
2101 Constant Avenue, Lawrence, KS 66047-3759 USA

Literature Cited

Belk, D., G. Anderson & S-Y. Hsu. 1990. Additional observations on variations in egg size among populations of *Streptocephalus sealii* (Anostraca). *Journal of Crustacean Biology* 10: 128-133.

Federal Register. 1994. 19 September: Fish & Wildlife Service, Interior. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status and Withdrawal of Proposal to Give Endangered Status; Final Rule and Proposed Rule; Determination of Endangered Status for the Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, and the Vernal

The University of Kansas

Pool Tadpole Shrimp; and Threatened Status for the Vernal Pool Fairy Shrimp. 59 CFR (17): 48153-48185.

Jawahar, A. & H. J. Dumont. 1995. Larviculture of the fairy shrimp, *Streptocephalus probocideus* (Crustacea: Anostraca): effect of food concentration and physical and chemical properties of the culture medium. *Hydrobiologia* 298: 159-165.

Maeda-Martinez, A. M., H. Obregón-Barboza & H. J. Dumont. 1995a. Food-dependant color patterns in *Thamnocephalus platyurus* Packard (Branchiopoda: Anostraca); a laboratory study. *Hydrobiologia* 298: 133-139.

Maeda-Martinez, A. M., H. Obregón-Barboza & H. J. Dumont. 1995b. Laboratory culture of fairy shrimps using baker's yeast as basic food in a flow-through system. *Hydrobiologia* 298: 141-157.

U. S. Environmental Protection Agency. 1985. Methods for measuring the acute toxicity of effluents too freshwater and marine organisms. EPA/600/4-85/013/. Environmental Research Laboratory, Duluth, MN, 216 pp.

U. S. Fish & Wildlife Service. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under the Endangered Species Act for the Listed Vernal Pool Branchiopods. Sacramento, CA.



Appendix C2

CULTURE RESULTS OF SOIL SAMPLES COLLECTED FROM THE PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT (PUEBLO NORTH SITE), SAN DIEGO, CALIFORNIA



The University of Kansas

Kansas Biological Survey

16 August 2016

Shelby Howard
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
Suite 200
La Mesa, CA 91942

SUBJECT: Culture Results of Soil Samples Collected from the Pure Water San Diego Program North City Water Purification Project (Pueblo North Site), San Diego, California.

Dear Mr. Howard,

HELIX Environmental Planning, Inc. (HELIX) biologists collected 3 soil samples from potential special status shrimp habitats within the Pueblo North site associated with the City of San Diego's Pure Water San Diego Program North City Water Purification Project, San Diego County, California. Soil samples were collected from previously identified habitat determined to contain anostracan eggs, which were judged to be potentially suitable for special status shrimp species. All cultures produced the nonlisted fairy shrimp *Branchinecta lindahli*.

Kansas Biological Survey understands that HELIX will submit this report and all other pertinent materials and information to the US Fish and Wildlife Service (USFWS), and the California Department of Fish and Wildlife (CDFW), as required by the USFWS guidelines for a protocol level survey.

Definitions

For the purpose of this report, special status shrimp are defined to include shrimp species listed as threatened or endangered under the federal Endangered Species Act (ESA) (50 CFR 17.11 for listed animals and various Federal Register notices for proposed species). Two special status fairy shrimp species (*Branchinecta sandiegonensis* Fugate, 1993, and *Streptocephalus woottoni* Eng, Belk, & Eriksen, 1990) have the potential to occur within the vicinity of the Pueblo North site. In addition, the nonlisted fairy shrimp species *Branchinecta lindahli* Packard, 1883 is known from the proposed site vicinity.

Methods

HELIX collected dry soil samples from 3 potential special status shrimp habitats at the Pueblo North site. These three habitats are identified as PW55, PW56, and PW 57. The soil samples were placed in a plastic ziplock bag, labeled with the locality number, and submitted to the Kansas Biological Survey laboratory for culture.

Laboratory Analysis

The University of Kansas

The soil was prepared for examination in the laboratory by dissolving the clumps of soil in distilled water. Adult shrimp were reared from the recovered eggs using methods following U.S. Environmental Protection Agency (1985), Belk, et al. (1990), Maeda-Martinez, et al., (1995a and 1995b), and Jawahar & Dumont (1995). Hatched shrimp were fed a standard *Daphnia* food that includes; fish food, fish oil, baker's yeast, and the alga *Selenastrum capricornutum*. The shrimp were reared to maturity. Adult *Branchinecta* reared from culture were killed in 90% ethyl alcohol, and examined under a stereo dissection microscope. Identifications were made based upon comparisons with specimens in our collections, the original species descriptions and professional experience.

Results

The nonlisted fairy shrimp *Branchinecta lindahli* was cultured from all three samples (PW 55, PW 56, and PW 57).

If you have any questions please call me.

Sincerely,



D. Christopher Rogers
785.864.1714
Crustacean Taxonomist and Ecologist
Kansas Biological Survey and The Biodiversity Institute
Kansas University, Higuchi Hall
2101 Constant Avenue, Lawrence, KS 66047-3759 USA

Literature Cited

Belk, D., G. Anderson & S-Y. Hsu. 1990. Additional observations on variations in egg size among populations of *Streptocephalus sealii* (Anostraca). *Journal of Crustacean Biology* 10: 128-133.

Federal Register. 1994. 19 September: Fish & Wildlife Service, Interior. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status and Withdrawal of Proposal to Give Endangered Status; Final Rule and Proposed Rule; Determination of Endangered Status for the Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, and the Vernal Pool Tadpole Shrimp; and Threatened Status for the Vernal Pool Fairy Shrimp. 59 CFR (17): 48153-48185.

The University of Kansas

Jawahar, A. & H. J. Dumont. 1995. Larviculture of the fairy shrimp, *Streptocephalus probocideus* (Crustacea: Anostraca): effect of food concentration and physical and chemical properties of the culture medium. *Hydrobiologia* 298: 159-165.

Maeda-Martinez, A. M., H. Obregón-Barboza & H. J. Dumont. 1995a. Food-dependant color patterns in *Thamnocephalus platyurus* Packard (Branchiopoda: Anostraca); a laboratory study. *Hydrobiologia* 298: 133-139.

Maeda-Martinez, A. M., H. Obregón-Barboza & H. J. Dumont. 1995b. Laboratory culture of fairy shrimps using baker's yeast as basic food in a flow-through system. *Hydrobiologia* 298: 141-157.

U. S. Environmental Protection Agency. 1985. Methods for measuring the acute toxicity of effluents too freshwater and marine organisms. EPA/600/4-85/013/. Environmental Research Laboratory, Duluth, MN, 216 pp.

U. S. Fish & Wildlife Service. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under the Endangered Species Act for the Listed Vernal Pool Branchiopods. Sacramento, CA.



Appendix D

DRY SEASON/HATCHING RESULTS TABLES



Appendix D
DRY SEASON/HATCHING RESULTS TABLES

Table D-1
DRY SEASON/HATCHING RESULTS FOR SANDER EAST

Basin	<i>Branchinecta</i> sp. Present	Abundance¹	Hatching Results	<i>Streptocephalus</i> sp. Present	Abundance
PW1	No	---	---	No	---
PW2	No	---	---	No	---
PW3	No	---	---	No	---
PW4	No	---	---	No	---
PW5	No	---	---	No	---
PW6	No	---	---	No	---
PW7	No	---	---	No	---
PW8	No	---	---	No	---
PW9	No	---	---	No	---
PW10	Yes	Low	Not Hatched	No	---
PW11	Yes	Medium	Not Hatched	No	---
PW12	No	---	---	No	---
PW13	Yes	Low	Not Hatched	No	---
PW14	No	---	---	No	---
PW15	No	---	---	No	---
PW16	Yes	Medium	Not Hatched ²	No	---
PW17	No	---	---	No	---
PW18	No	---	---	No	---
PW19	No	---	---	No	---
PW20	No	---	---	No	---
PW21	No	---	---	No	---
PW22	No	---	---	No	---
PW23	No	---	---	No	---
PW24	No	---	---	No	---
PW25	Yes	High	Not Hatched ²	No	---
PW26	No	---	---	No	---
PW27	No	---	---	No	---
PW78	No	---	---	No	---

¹ Low (estimate of 1-10 cysts/100 mL soil); Medium (estimate of 11-50 cysts/100 mL soil); and High (estimate of more than 50 cysts/100 mL of soil)

² Hatching was not conducted for Sander East. Wet season sampling from 2015/2016 previously detected *Branchinecta sandiegonensis* in Basins PW 16 and PW 25.

Appendix D (cont.)
DRY SEASON/HATCHING RESULTS TABLES

Table D-2
DRY SEASON/HATCHING RESULTS FOR MCAS MIRAMAR

Basin	<i>Branchinecta</i> sp. Present	Abundance¹	Hatching Results²	<i>Streptocephalus</i> sp. Present	Abundance
PW28	Yes	Low	<i>B. lindahli</i>	No	---
PW29	Yes	Low	<i>B. lindahli</i>	No	---
PW30	No	---	---	No	---
PW31	Yes	Low	Not Hatched ²	No	---
PW32	No	---	---	No	---
PW33	Yes	Low	Not Hatched ²	No	---
PW34	Yes	Low	Not Hatched ²	No	---
PW35	Yes	Low	Not Hatched ²	No	---
PW36	Yes	Low	Not Hatched ²	No	---
PW37	Yes	Low	Not Hatched ²	No	---
PW38	Yes	Low	Not Hatched ²	No	---
PW39	Yes	Low	Not Hatched ²	No	---
PW40	No	---	---	No	---
PW41	Yes	Medium	Not Hatched ²	No	---
PW42	No	---	---	No	---
PW43	Yes	Low	<i>B. lindahli</i>	No	---
PW44	No	---	---	No	---
PW45	No	---	---	No	---
PW46	Yes	Low	<i>B. lindahli</i>	No	---
PW47	Yes	Low	<i>B. lindahli</i>	No	---
PW48	Yes	Low	<i>B. lindahli</i>	No	---
PW49	Yes	Low	<i>B. lindahli</i>	No	---
PW50	Yes	Low	<i>B. lindahli</i>	No	---
PW51	No	---	---	No	---
PW52	Yes	Low	<i>B. lindahli</i>	No	---
PW76	No	---	---	No	---
PW77	No	---	---	No	---
PW80	Yes	Low	<i>B. lindahli</i>	No	---
PW81	Yes	Low	<i>B. lindahli</i>	No	---
PW82	Yes	Low	<i>B. lindahli</i>	No	---

¹ Low (estimate of 1-10 cysts/100 mL soil); Medium (estimate of 11-50 cysts/100 mL soil); and High (estimate of more than 50 cysts/100 mL of soil)

² Hatching was not conducted for basins where San Diego fairy shrimp were detected during wet season surveys. Cysts from these basins are assumed to be from San Diego fairy shrimp.

Appendix D (cont.)
DRY SEASON/HATCHING RESULTS TABLES

Table D-3 DRY SEASON/HATCHING RESULTS FOR MAST BOULEVARD					
Basin	<i>Branchinecta</i> sp. Present	Abundance	Hatching Results	<i>Streptocephalus</i> sp. Present	Abundance
PW53	No	---	---	No	---
PW54	No	---	---	No	---
PW79	No	---	---	No	---

Table 4 PURE WATER SAN DIEGO PROGRAM NORTH CITY WATER PURIFICATION PROJECT DRY SEASON/HATCHING RESULTS FOR PUEBLO NORTH					
Basin	<i>Branchinecta</i> sp. Present	Abundance¹	Hatching Results	<i>Streptocephalus</i> sp. Present	Abundance
1	No	---	---	No	---
5	No	---	---	No	---
6	No	---	---	No	---
7	No	---	---	No	---
8	No	---	---	No	---
9	No	---	---	No	---
PW55	Yes	Low	<i>B. lindahli</i>	No	---
PW56	Yes	Low	<i>B. lindahli</i>	No	---
PW57	Yes	Low	<i>B. lindahli</i>	No	---
PW58	No	---	---	No	---
PW59	No	---	---	No	---

¹ Low (estimate of 1-10 cysts/100 mL soil); Medium (estimate of 11-50 cysts/100 mL soil); and High (estimate of more than 50 cysts/100 mL of soil)

Table D-5 DRY SEASON/HATCHING RESULTS FOR PUEBLO CENTRAL					
Basin	<i>Branchinecta</i> sp. Present	Abundance¹	Hatching Results²	<i>Streptocephalus</i> sp. Present	Abundance
PW60	Yes	Low	Not Hatched	No	---
PW61	No	---	---	No	---
PW62	No	---	---	No	---
PW63	No	---	---	No	---
PW64	Yes	Low	Not Hatched	No	---
PW65	No	---	---	No	---
PW66	No	---	---	No	---
PW67	No	---	---	No	---

¹ Low (estimate of 1-10 cysts/100 mL soil); Medium (estimate of 11-50 cysts/100 mL soil); and High (estimate of more than 50 cysts/100 mL of soil)

² Hatching was not conducted for Pueblo Central.

Appendix D (cont.)
DRY SEASON/HATCHING RESULTS TABLES

Table D-6
DRY SEASON/HATCHING RESULTS FOR PUEBLO SOUTH

Basin	<i>Branchinecta</i> sp. Present	Abundance¹	Hatching Results²	<i>Streptocephalus</i> sp. Present	Abundance
PW68	No	---	---	No	---
PW69	No	---	---	No	---
PW70	Yes	Low	Not Hatched	No	---
PW71	Yes	Medium	Not Hatched	No	---
PW72	Yes	Medium	Not Hatched ²	No	---
PW73	Yes	Low	Not Hatched ²	No	---
PW74	Yes	Low	Not Hatched ²	No	---
PW75	Yes	Low	Not Hatched ²	No	---

¹ Low (estimate of 1-10 cysts/100 mL soil); Medium (estimate of 11-50 cysts/100 mL soil); and High (estimate of more than 50 cysts/100 mL of soil)

² Hatching was not conducted for Pueblo South. Wet season sampling from 2015/2016 previously detected *Branchinecta sandiegonensis* in Basins PW72, PW73, PW74, and PW75.