SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN AMENDMENT

City of Victorville,
San Bernardino County, California

JURISDICTIONAL DELINEATION REPORT

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN AMENDMENT

CITY OF VICTORVILLE, SAN BERNARDINO COUNTY, CALIFORNIA

Jurisdictional Delineation Report

The undersigned certify that this report is a complete and accurate account of the findings and conclusions of jurisdictional wetland and non-wetland "waters of the U.S.," "waters of the State," and streambed/banks and associated riparian vegetation delineation for the above-referenced project.

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November 2018

Executive Summary

On behalf of Stirling Development, Michael Baker International (Michael Baker) has prepared this Jurisdictional Delineation Report for the proposed Southern California Logistics Airport (SCLA) Specific Plan Amendment, located in the City of Victorville, San Bernardino County, California. The SCLA Specific Plan Amendment development proposes the construction of a combination of business, industrial, and airport uses. This development will accommodate aviation and aviation-related facilities, and compatible industrial, commercial, and limited public recreational uses.

This report was prepared to document all aquatic and hydrological features identified by Michael Baker within the survey area that are potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Federal Clean Water Act (CWA), the Regional Water Quality Control Board (Regional Board) pursuant to Section 401 of the CWA and/or Section 13263 of the California Porter-Cologne Water Quality Control Act, and the California Department of Fish and Wildlife (CDFW) pursuant to Sections 1600 *et seq.* of the California Fish and Game Code (CFGC).

Jurisdictional drainages within the survey area consist of forty-two (42) unnamed ephemeral tributaries and one detention basin. These drainages primarily consist of non-vegetated, desert dry wash/ephemeral streambeds (non-wetland), with some braided channels, that are characterized by deep alluvial sediment comprised mainly of sand and gravel deposits.

Table ES-1 below provides a breakdown of total acreages of jurisdictional drainages within the survey area as they relate to each regulatory agency. Delineation methods followed the most recent, acceptable guidelines for conducting a jurisdictional delineation pursuant to the Corps Arid West Supplement (Version 2.0). However, only the regulatory agencies can make a final determination of jurisdictional limits.

Table ES-1. Jurisdictional Limits within the Survey Area

No.	Feature	Linear Feet	Jurisdictional Limits (acres)	
			Corps and Regional Board Non-Wetland WoUS	CDFW Non-Vegetated Streambed/Banks
1.	Drainage 1	1,155	0.03	0.32
2.	Drainage 2	547	0.01	0.03
3.	Drainage 3	619	0.09	0.18
4.	Drainage 4	1,046	0.10	0.20
5.	Drainage 5	4,662	0.37	0.46
6.	Drainage 5-A	64	0.001	0.003

Table ES-1. Jurisdictional Limits within the Survey Area

No.	Feature	Linear Feet	Jurisdictional Limits (acres)	
			Corps and Regional Board Non-Wetland WoUS	CDFW Non-Vegetated Streambed/Banks
7.	Drainage 5-B	115	0.003	0.005
8.	Drainage 5-C	197	0.01	0.02
9.	Drainage 5-C-1	107	0.002	0.005
10.	Drainage 5-D	281	0.03	0.04
11.	Drainage 5-E	152	0.007	0.02
12.	Drainage 5-F	95	0.002	0.004
13.	Drainage 5-G	79	0.002	0.004
14.	Drainage 5-H	358	0.02	0.02
15.	Drainage 5-I	699	0.08	0.13
16.	Drainage 5-I-1	295	0.03	0.04
17.	Drainage 5-J	162	0.003	0.01
18.	Drainage 5-K	124	0.003	0.01
19.	Drainage 5-L	645	0.15	0.23
20.	Drainage 5-L-1	355	0.08	0.05
21.	Drainage 5-L-2	232	0.02	0.03
22.	Drainage 6	814	0.51	0.74
23.	Drainage 6-A	66	0.003	0.01
24.	Drainage 6-A-1	362	0.01	0.02
25.	Drainage 6-B	573	0.06	0.09
26.	Drainage 6-B-1	140	0.004	0.01
27.	Drainage 6-C	641	0.04	0.05
28.	Drainage 6-C-1	81	0.002	0.004
29.	Drainage 6-C-2	55	0.008	0.01
30.	Drainage 6-C-3	171	0.004	0.01
31.	Drainage 6-D	170	0.004	0.008
32.	Drainage 6-E	403	0.02	0.03
33.	Drainage 6-F	205	0.009	0.01

Table ES-1. Jurisdictional Limits within the Survey Area

No.	Feature	Linear Feet	Jurisdictional Limits (acres)	
			Corps and Regional Board Non-Wetland WoUS	CDFW Non-Vegetated Streambed/Banks
34.	Drainage 6-G	109	0.003	0.01
35.	Drainage 6-H	141	0.003	0.007
36.	Drainage 6-I	267	0.006	0.01
37.	Drainage 7	98	0.00	0.005
38.	Drainage 8	192	0.004	0.009
39.	Drainage 8-A	251	0.004	0.008
40.	Drainage 8-B	279	0.006	0.01
41.	Drainage 8-B-1	256	0.006	0.01
42.	Drainage 8-C	98	0.002	0.005
43.	Basin A	NA	0.018	0.032
	TOTAL	**18,654**	**1.71**	**2.90**

The following regulatory permits/authorizations would be required prior to any project-related activities (i.e., dredging, placement of fill material, and/or alteration) commencing within the identified jurisdictional drainages:

1. Corps CWA Section 404 Nationwide Permit, in which a Pre-Construction Notification may be required, provided that impacts associated with the placement of dredge and/or fill material into non-wetland waters of the U.S. (WoUS) do not exceed 0.5 acre (or 300 linear feet, which can be waived by the District Engineer for ephemeral features); or a Standard Individual Permit, which includes an Alternatives Analysis, for impacts exceeding 0.5 acre;

2. Regional Board CWA Section 401 Water Quality Certification for impacts associated with the placement of dredge and/or fill material into WoUS; and

3. CDFW CFGC Sections 1600 *et seq.* Lake or Streambed Alteration Agreement (or other approval in-lieu of a formal Agreement such as an Operation-by-Law letter or Letter of Non-Substantial Impact) for impacts/alteration to streambed/banks and associated riparian vegetation.

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AFB	Air Force Base
amsl	above mean sea level
Applicant	Stirling Development
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
City	City of Victorville
CMP	Corrugated Metal Pipe
Corps	U.S. Army Corps of Engineers
CWA	Federal Clean Water Act
FEMA	Federal Emergency Management Agency
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
Michael Baker	Michael Baker International
Porter-Cologne	California Porter-Cologne Water Quality Control Act
Project	Southern California Logistics Airport Specific Plan Amendment
Rapanos	Rapanos v. U.S. court case
Regional Board	Regional Water Quality Control Board
Regional Supplement	Corps Wetland Delineation Manual: Arid West Region, Version 2.0
RPW	Relatively Permanent Waters
SAA	Streambed Alteration Agreement
SCLA	Southern California Logistics Airport
SWANCC	Solid Waste Agency of Northern Cook County v. Corps court case
TNW	Traditionally Navigable Waters
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WoUS	Waters of the U.S.
1987 Manual	1987 Corps Wetland Delineation Manual

Section 1 Introduction

On behalf of Stirling Development (Applicant), Michael Baker International (Michael Baker) has prepared this Jurisdictional Delineation Report to describe, map, and quantify aquatic and other hydrological features located within the survey area for Southern California Logistics Airport (SCLA) Specific Plan Amendment (Project).

This report describes the regulatory setting, methodologies, and results of the jurisdictional delineation, including recommendations for any proposed impacts to potentially jurisdictional resources. This report represents Michael Baker's professional determination of jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies; however, only the regulatory agencies can make a final determination of jurisdictional limits.

1.1 PROJECT LOCATION

The SCLA Specific Plan Amendment area is located in the southwestern portion of the Mojave Desert, approximately 5 miles west of Interstate 15, one mile east of U.S. Highway 395, and directly north of Air Expressway, in the northern portion of the City of Victorville (City), San Bernardino County, California (Figure 1, *Regional Vicinity*). Specifically, the survey area is depicted within Sections 22, 23, 24, 25, 26, and 27, Township 6 North, Range 5 West, of the U.S. Geological Survey *Adelanto* and *Victorville, California* 7.5-minute topographic quadrangle maps (Figure 2, *Site Vicinity*).

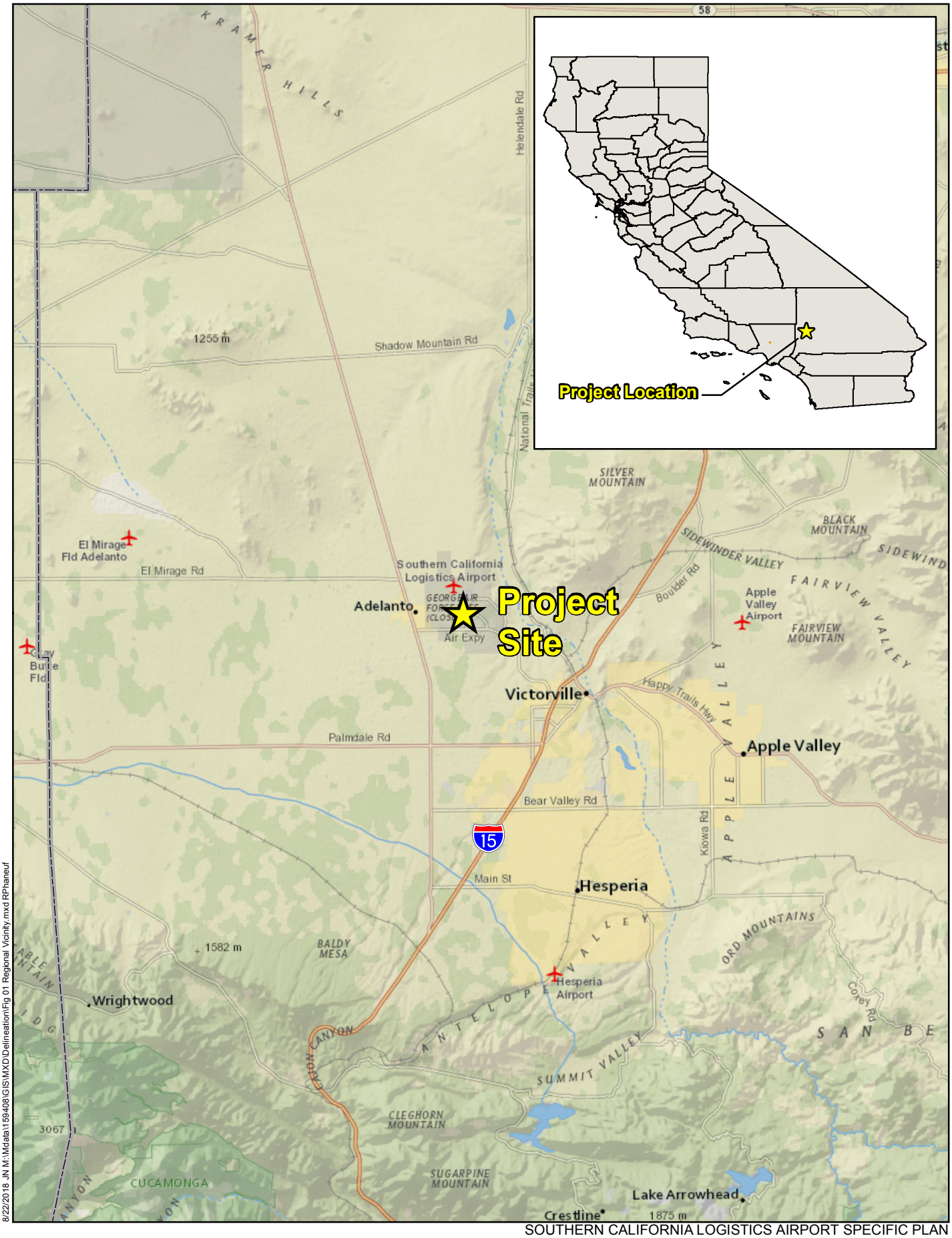
The survey area includes a commercial air facility and related uses for approximately 5,870 acres, previously known as George Air Force Base (AFB). George AFB was formerly the Victorville Army Airfield. SCLA is centrally located 60 minutes northeast of Los Angeles alongside major trucking corridors with direct access to the Burlington Northern Santa Fe freight railway and Union Pacific transcontinental railway and a two-runway airport (Figure 3, *Survey Area*). The survey area is bounded by the City of Adelanto to the west, the existing SCLA airstrips to the north, undeveloped lands and scattered industrial facilities to the south, and undeveloped slopes to the east leading to the Mojave River.

1.2 PROJECT BACKGROUND AND DESCRIPTION

The Southern California Logistics Airport (SCLA) Specific Plan covers approximately 8,611 acres in the City of Victorville. A large portion of the SCLA Specific Plan area, approximately 5,350 acres, was formerly the George Air Force Base (AFB), which was also formerly known as the Victorville Army Airfield. George AFB was officially deactivated on December 15, 1992. After closure of George AFB, the facility was annexed into the City of Victorville, and the SCLA Specific Plan became effective in March 1993. The SCLA Specific Plan provides a description

of the proposed land uses, infrastructure, and specific implementation requirements for development.

The most recent major amendment to the Specific Plan occurred in April 2004. The City of Victorville proposes to once again amend the SCLA Specific Plan to adapt more appropriately to current development conditions and market demands. As part of the Specific Plan Amendment, an approximately 2,100-acre "priority area" has been identified where development is expected to occur in the reasonably foreseeable future (approximately 20-30 years). This "priority area" is the subject of the analysis provided within this report.



Source: ArcGIS Online

8/22/2018 JN M:\Mdata\159408\GIS\MXD\Delineation\Fig 01 Regional Vicinity.mxd RPhaneuf

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
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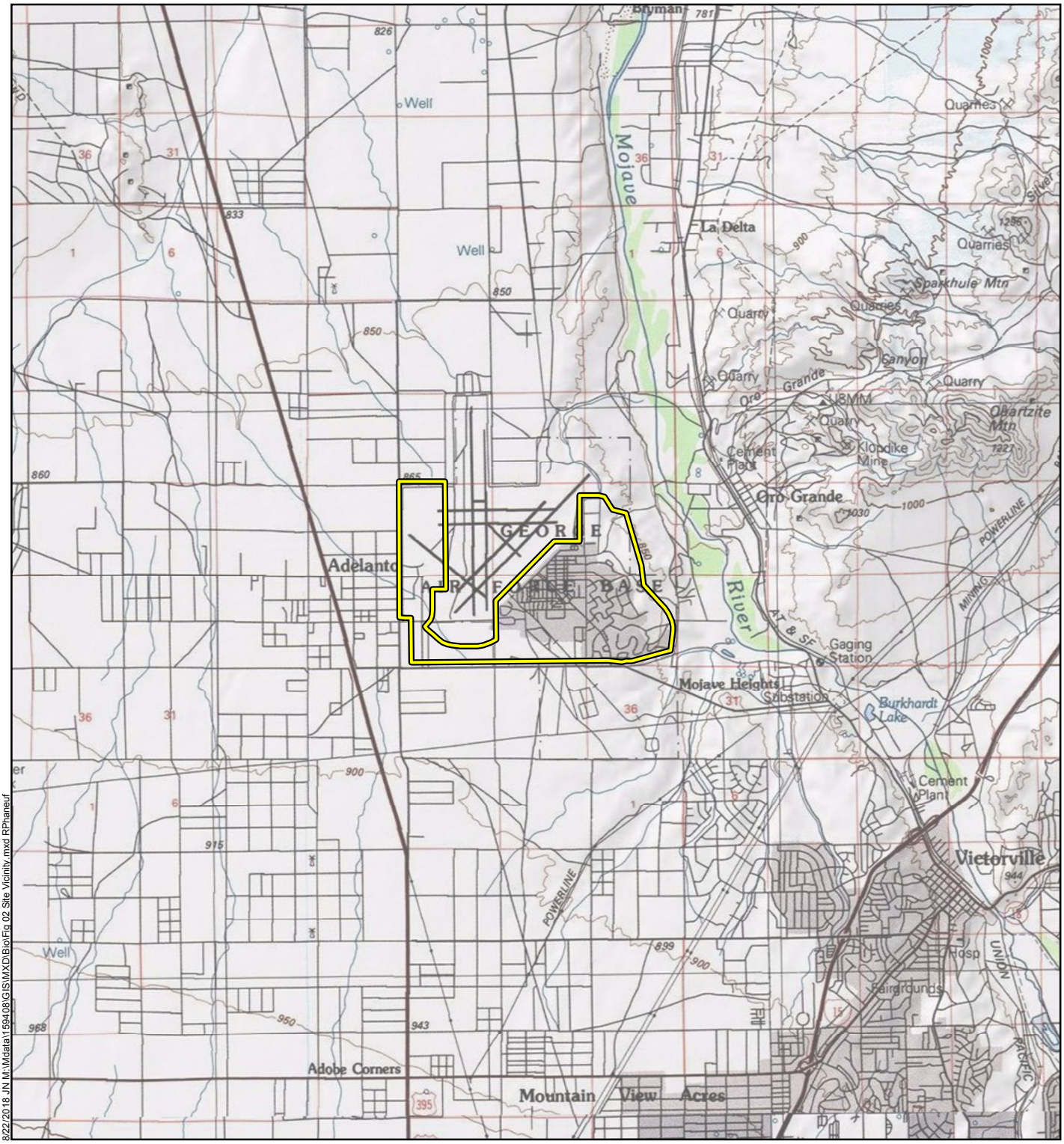
Regional Vicinity

Figure 1



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Legend

Project Site

USGS 7.5 Minute topographic quadrangle: *Adelanto, California (1993)* & *Victorville, California (1993)*

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
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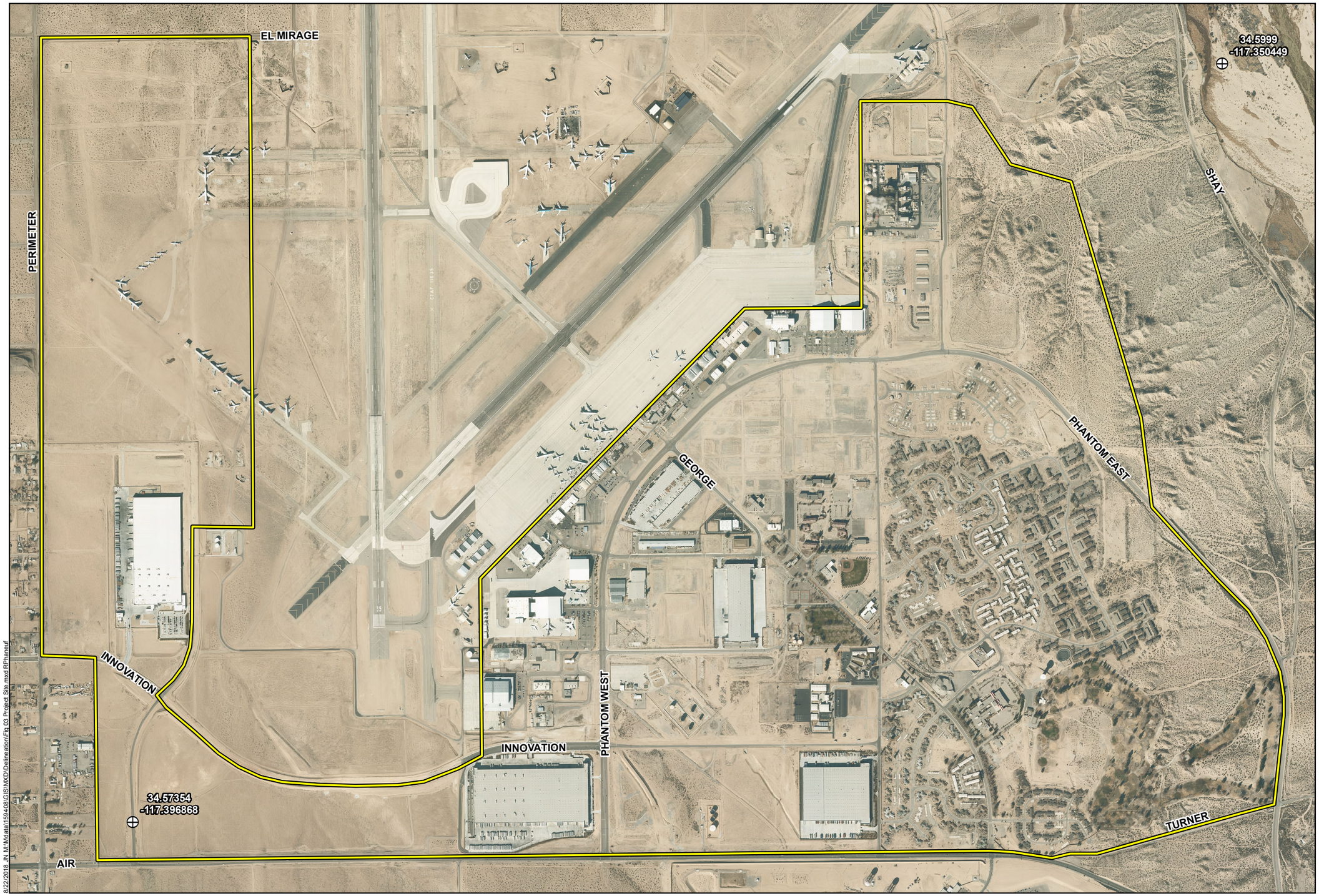
Site Vicinity

0 1 2 Miles

Source: ArcGIS Online

Figure 2



Legend

- Project Boundary
- Reference Point

August 31, 2018

0 500 1,000 Feet

Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Michael Baker INTERNATIONAL

Survey Area

Figure 3

1.3 ENVIRONMENTAL SETTING

The Victor Valley lies in the southwestern portion of the Mojave Desert in San Bernardino County, approximately 97 miles northeast of the City of Los Angeles and approximately 40 miles northwest of the City of San Bernardino. The Specific Plan area is located in the northwestern portion of the City and bound on the north and east by the City of Adelanto city limits. The western Mojave Desert is characterized by broad alluvial fans, old dissected terraces, playas, and scattered mountains. The dominant watercourse traversing the Mojave Desert Region is the Mojave River, which links the San Bernardino Mountains with the Mojave Desert, sustaining a unique combination of coastal and desert plants and animals. In general, the area is distinguished by sparse vegetation that consists of drought-resistant shrubs and cacti, and riparian features that support riparian flora and provide a critical source of water for wildlife. Refer to Appendix A, *Site Photographs*, for representative photographs of the survey area.

1.3.1 Climate

Victorville typically has a Mediterranean climate, with warmer, drier weather in the summer and cooler, wetter weather in the winter. Yearly precipitation averages around 6.18 inches and can vary considerably from year to year. More than 80 percent of all precipitation takes place from December through March. There is no snowfall in the City, though occasionally winter and springtime thunderstorms will drop small hail. Table 1 below provides a summary of monthly and annual precipitation and temperature averages.

Table 1. Climate Summary[1]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	58.5	62.2	66.8	73.7	82.0	91.4	98.0	97.1	91.1	80.5	97.5	59.2	77.3
Average Min. Temperature (°F)	30.4	33.6	37.1	41.7	48.1	54.6	61.3	60.5	54.7	45.0	35.5	29.8	44.4
Average Total Precipitation (inches)	1.02	1.04	0.83	0.34	0.15	0.05	0.16	0.20	0.20	0.32	0.50	0.72	5.60

1.3.2 Vegetation

Michael Baker reviewed the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps online (USFWS, NWI 2018). One NWI feature was noted within the survey area, located northeast of the SCLA Specific Plan Amendment area. This feature is mapped by the NWI as Riverine (R4SBJ: Riverine, Intermittent, Streambed, Intermittently Flooded). Refer to Appendix B, *National Wetlands Inventory Map*. These NWI mapped areas were only referenced during the on-site jurisdictional delineation. Plant species nomenclature

[1] Western Regional Climate Center, Victorville, CA (049325), Period of Record: 1/1/2007 to 12/31/2018.

and taxonomy below follows *The Jepson Manual: Vascular Plants of California, second edition* (Baldwin *et al.* 2012).

Within the survey area, conditions were characteristic of the arid west environment and typical of Mojave creosote bush scrub habitat. The area is comprised predominantly by creosote (*Larrea tridentata*) and rubber rabbitbrush (*Ericameria nauseosa*). Other species present include, but are not limited to, Russian thistle (*Salsola tragus*), Nevada mormon tea (*Ephedra nevadensis*), and cheese bush (*Ambrosia salsola*).

Vegetation within active channels was very sparse and in some cases absent as a result of the characteristics of high flood magnitude for these environments which produce short duration, high-intensity rainfall and subsequently substantial runoff.

1.3.3 Hydrology

The survey area is located within the Mojave Hydrologic Unit (Hydrologic Unit Code 18090208) and Upper Mojave Hydrologic Area. Located in the South Lahontan Basin, the Mojave River Watershed encompasses approximately 4,500 square miles. Within this watershed, the SCLA site contributes surface flows to two major watercourses: Fremont Wash to the north and the Mojave River to the north and east. Fremont Wash is an ephemeral tributary to the Mojave River.

The majority of the SCLA site drains directly towards the Mojave River, with the primary instrument runway and west side of the property draining to the Fremont Wash. The Mojave River drains the mountainous region located to the south. The Mojave River is approximately 125 miles long and has a gradient of about 15 feet per mile in a south to north direction. The City is located on top of a gently sloping alluvial fan situated to the northeast of the San Bernardino Mountains. The headwaters of the Mojave River are in the San Bernardino Mountains, which annually receives greater than 40 inches of precipitation at its highest elevations. Much of the winter precipitation in the San Bernardino Mountains falls in the form of snow that provides spring recharge to the Mojave River system. Historically, the annual recharge from the headwaters is approximately 75,000 acre-feet. The Mojave River channel, through both surface and subsurface flow, transects the watershed for a linear distance of approximately 120 miles, providing muted hydrologic influence on Silver Lakes (two man-made navigable lakes in the unincorporated community of Helendale) and eventually terminating within playas to the east of Baker in the central Mojave Desert. Aside from intense storm events, the Mojave River channel is typically dry downstream of the Mojave Forks Dam except in select locations where ground water is forced to the surface by geologic structures.

Michael Baker searched the Federal Emergency Management Agency (FEMA) – 100 Year Flood Zones for flood data within the survey area (ArcGIS 2018). According to FEMA, the lower southwest portion of the survey area is located within Zone X or areas subject to 0.2 percent

annual chance of flood hazard. The remainder of the survey area is located within Zone D or areas with possible but undetermined flood hazards. Refer to Appendix C, *FEMA 100-Year Flood Zone Map*.

1.3.4 Topography and Soils

The SCLA Specific Plan Amendment area is situated in the Victor Valley, a geographic sub-region of the Mojave Desert. The region is also known as the "High Desert" due to its approximate elevation of 2,800 feet above mean sea level (amsl). Much of the Specific Plan area is relatively flat, providing a suitable area for aircraft runways or other industrial/commercial facilities. The eastern portion of the Specific Plan Amendment area generally slopes toward the Mojave River, with topography ranging from gentle, well-rounded hills to locally steep, moderately rugged slopes. Surface elevations within the survey area vary between approximately 2,915 feet amsl along the southern boundary to approximately 2,735 feet amsl in the southeast corner.

On-site and adjoining soils were reviewed prior to the field visit using the Web Soil Survey (U.S. Department of Agriculture [USDA], Natural Resources Conservation Service [NRCS] 2018). Mapped soils within the survey area include the following (refer to Appendix D – *USDA/NRCS Custom Soil Resources Report*):

- Bryman loamy fine sand, 0 to 2 percent slopes (Map Unit Symbol: 105)
- Cajon sand, 2 to 9 percent slopes (113)
- Cajon sand, 9 to 15 percent slopes (114)
- Haplargids-Calciorthids Complex, 15 to 50 percent slopes (130)
- Helendale loamy sand, 0 to 2 percent slopes (131)
- Mohave variant loamy sand, 0 to 2 percent slopes (150)
- PITS (155)

Michael Baker then reviewed the National Hydric Soils List (USDA, NRCS 2015) to identify soils mapped within the survey area that are considered to be hydric. According to the soils list, there are no hydric soils mapped within the survey area. Soil textures identified on-site were generally consistent with those mapped by the Web Soil Survey.

Section 2 Summary of Regulations

Three agencies regulate activities within inland streams, wetlands, and riparian areas in California. The U.S. Army Corps of Engineers (Corps) Regulatory Division regulates activities pursuant to Section 404 of the Federal Clean Water Act (CWA). Of the State agencies, the California Department of Fish and Wildlife (CDFW) regulates activities under the California Fish and Game Code (CFGC) Sections 1600 *et seq.*, and the Regional Water Quality Control Board (Regional Board) regulates activities pursuant to CWA Section 401 and/or Section 13263 of the California Porter-Cologne Water Quality Control Act (Porter-Cologne).

2.1 U.S. ARMY CORPS OF ENGINEERS

Since 1972, the Corps and U.S. Environmental Protection Agency jointly regulate discharges of dredged or fill material into "waters of the U.S." (WoUS), including wetland and non-wetland aquatic features, pursuant to Section 404 of the CWA. Section 404 is founded on the findings of a significant nexus (or connection) between the aquatic or other hydrological feature in question and interstate commerce via Relatively Permanent Waters (RPW), and ultimately Traditional Navigable Waters (TNW), through direct or indirect connection as defined by Corps regulations. However, the limits to which this is applied have changed over time.

SWANCC and Rapanos

In 1984, the Migratory Bird Rule enabled the Corps to expand jurisdiction over isolated waters, and in 1985, the U.S. Supreme Court upheld the inclusion of adjacent wetlands in the regulatory definition of WoUS. However, in 2001, the Corps' jurisdiction was narrowly limited following the *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC) in which the U.S. Supreme Court held that the use of "isolated" non-navigable intrastate ponds by migratory birds was not, by itself, sufficient basis for the exercise of Federal regulatory authority under the CWA. In 2006, a majority of the U.S. Supreme Court overturned two Sixth Circuit Court of Appeals decisions in the consolidated cases of *Rapanos v. United States* and *Carabell v. United States* (collectively referred to as Rapanos), concluding that wetlands isolated by surface connection are WoUS nonetheless if they significantly affect the chemical, physical, and biological integrity of other covered waters.

Clean Water Rule

In 2015, the Corps and EPA published the "Clean Water Rule" clarifying the scope of coverage of the CWA. Upon issuance however, numerous lawsuits were filed and consolidated in the Sixth Circuit, immediately putting a "stay" on its implementation. In January 2018, the U.S. Supreme Court ruled that the Sixth Circuit did not have jurisdiction over the case, and in February 2018, dismissed it and dissolved the stay. Also, in February 2018, the Corps and EPA suspended the rule for two years. However, in August 2018, a Federal judge found that the

suspension failed to give an adequate public notice and therefore violated the Administrative Procedure Act. Pursuant to the court's order, the 2015 Clean Water rule is now in effect in 22 states, including California, the District of Columbia, and the U.S. territories.

Waters of the U.S.

Currently, in the State of California, jurisdictional WoUS are defined by the Clean Water Rule in eight (8) categories:

(1) TNWs;

(2) interstate waters and wetlands;

(3) territorial seas (up to 14 miles from coast);

(4) impoundments of jurisdictional waters;

(5) tributaries to types 1 through 3 (i.e., bed, bank, and ordinary high-water mark [OHWM]);

(6) all waters, including wetlands, adjacent to a water identified in types 1 through 5 including neighboring waters defined as:

   a. waters located within 100 feet of the OHWM of types 1 through 5;

   b. waters located in whole or in part in the 100-year floodplain and that are within 1,500 feet of the OHWM of types 1 through 5; and

   c. waters located within 1,500 feet of the high tide line of type 1 or 3 and waters located within 1,500 feet of the OHWM of the Great Lakes;

(7) five subcategories of isolated waters considered critical resources for the surrounding communities, such as vernal pools in California, for example; and

(8) all waters located within the 100-year floodplain of types 1 through 3 and all waters located within 4,000 feet of the high tide line or OHWM of types 1 through 5 where there is a significant nexus (determined on a case-specific basis) to types 1 through 3.

Not Regulated

Excluded waters consist of, but are not limited to the following;

A. Artificially irrigated areas that would revert to dry land should application of water to that area cease;

B. Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;

C. Artificial reflecting pools or swimming pools created in dry land;

D. Small ornamental waters created in dry land;

E. Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;

F. Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of tributary, non-wetland swales, and lawfully constructed grassed waterways; and

G. Puddles.

H. Groundwater, including groundwater drained through subsurface drainage systems.

I. Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.

J. Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

K. Ditches:

   I. Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

   II. Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.

   III. Ditches that do not flow, either directly or through another water, into waters.

While the litigation continues, the agencies are complying with the District Court's order and implementation issues that arise are being handled on a case-by-case basis.

2.2 REGIONAL WATER QUALITY CONTROL BOARD

Applicants for a Federal license or permit for activities that may discharge to WoUS must seek a Water Quality Certification (Certification) from the State or Indian tribe with jurisdiction[2]. In California, there are nine Regional Boards that issue or deny Certification for discharges within their geographical jurisdiction. Such Certification is based on a finding that the discharge will meet water quality standards, which are defined as numeric and narrative objectives in each Regional Board's Basin Plan, and other applicable requirements. The State Water Resources Control Board has this responsibility for projects affecting waters within multiple Regional Boards. The Regional Board's jurisdiction extends to all WoUS, including wetlands, and to waters of the State, described below.

Porter-Cologne gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. Porter-Cologne has become an important tool for the regulatory environment following the SWANCC and Rapanos court cases, with respect to the State's authority over isolated and otherwise insignificant waters. Generally, in the event that there is no nexus to a RPW or TNW, any person proposing to discharge waste into waters of the State that could affect its water quality must file a Report of Waste Discharge. Although "waste" is partially defined as any waste substance associated with human habitation, the Regional Board also interprets this to include fill discharged into water bodies.

2.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

CFGC Sections 1600 *et seq.* establishes a fee-based process to ensure that projects conducted in and around lakes, rivers, or streams do not adversely affect fish and wildlife resources, or when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided.

CFGC Section 1602 requires any person, State, or local governmental agency or public utility to notify CDFW before beginning any activity that will do one or more of the following:

(1) substantially obstruct or divert the natural flow of a river, stream, or lake;

(2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or

(3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

This applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State, including the maintenance of existing drain culverts, outfalls, and other structures. To avoid the

[2] Title 33, United States Code, Section 1341; Clean Water Act Section.

need for a Streambed Alteration Agreement (SAA) from CDFW, all proposed impacts should remain outside of the top of active banks and the canopy/drip line of any associated riparian vegetation, whichever is greater.

Section 3 Methodology

Review of relevant literature and materials often aids in preliminary identification of areas that potentially fall under an agency's jurisdiction, including topographic, NWI, FEMA, and USDA/NRCS soils maps. In addition, a timeline of aerial photography (Google Earth Pro 2018) was reviewed to identify changing conditions. Refer to Section 6 for a complete list of references used during this delineation.

The analysis presented in this document is supported by field surveys and verifications of current conditions within the survey area conducted by Michael Baker regulatory specialists Dan Rosie and Josephine Lim on August 14 and 15, 2018. Data were collected using the ESRI ArcGIS Collector application on an Apple iPad connected via Bluetooth to an iSX Blue II+ GNSS Global Positioning System unit with sub-meter accuracy for recording the current jurisdictional limits of hydrological features within the survey area, and for identifying any soil pit locations. These data were then transferred as shapefiles, added to the jurisdictional maps, and measurements of jurisdictional areas per agency were calculated using Geographic Information System software.

3.1 WATERS OF THE U.S.

3.1.1 Non-wetland Waters of the U.S.

In the absence of wetlands (i.e., non-wetland WoUS), the limits of Corps and Regional Board jurisdiction in non-tidal waters typically extend to the OHWM. Indicators of an OHWM are defined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Corps 2008a). An OHWM can be determined by, but not limited to, the observation of benches, breaks in bank slope, particle size distribution, sediment deposits, drift, litter, and/or changes in plant communities.

3.1.2 Wetland Waters of the U.S.

Corps and Regional Board jurisdictional wetland WoUS are delineated following the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Regional Supplement; Corps 2008b). The Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region, one of a series of Regional Supplements to the 1987 Corps Wetland Delineation Manual (1987 Manual; Environmental Laboratory 1987). According to the 1987 Manual and Regional Supplement, identification of wetlands is based on a three-parameter approach involving the predominance or prevalence of hydrophytic vegetation, and indicators of hydric soil and wetland hydrology, as follows:

- Hydrophytic vegetation is based on designations provided in *The National Wetland Plant List: 2016 wetland ratings.* (Lichvar *et al.* 2016). Designations are as follows (note: OBL, FACW, and FAC are considered hydrophytic):
    - OBL – Obligate (almost always found in wetlands)
    - FACW – Facultative Wetland (usually found in wetlands)
    - FAC – Facultative (found in wetlands as often as found in uplands)
    - FACU – Facultative Upland (usually found in uplands)
    - UPL – Upland (almost always found in uplands)
- Hydric soils on-site, identified by examining soil profile characteristics using *Munsell Soil Color Charts* (Munsell Color 2009), are those that meet hydric soil indicators as defined in the Regional Supplement. Hydric soils are those permanently or seasonally saturated by water resulting in anaerobic conditions. Hydric soils mapped by the USDA/NRCS, which are used for reference only, are listed on the *National Hydric Soils List* (2015).
- Wetland hydrology is based on the presence of at least one primary or two secondary indicators, including, but not limited to, surface water to soil saturation, soil cracks, water-stained leaves, water marks, drift and sediment deposits, and drainage patterns, as provided in the Regional Supplement.

To be considered a wetland, an area must exhibit at least minimal characteristics of these three parameters. Where wetlands are suspect (i.e., primarily areas where wetland vegetation is prevalent and evidence of current or past hydrology exists), soil samples are examined by excavating soil pits. Vegetation, soils, and hydrology data are then documented on the Corps *Wetland Determination Data Form – Arid West Region*. When wetlands are confirmed, and conditions are consistent, areas with similar vegetation and hydrological consistency are extrapolated, and are often tied to topographic conditions. Where there are changes in vegetation and/or hydrology, additional pits are examined to identify the boundaries between wetland and upland.

3.2 WATERS OF THE STATE

Hydrological features lacking a nexus to (i.e., isolated from) adjacent or downstream waters are potentially considered waters of the State. Currently for this region (Lahontan Regional Board), Regional Board jurisdiction coincides with Corps jurisdiction by defining an OHWM.

3.3 STREAMBED/BANKS AND RIPARIAN VEGETATION

CDFW jurisdiction applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State of California. CDFW regulatory authority extends to include riparian habitat (including adjacent wetlands) supported by a river, stream, or lake regardless of the presence or absence of hydric soils or saturated soil conditions. Generally, CDFW jurisdiction is mapped to

the top of the active bank of the stream or to the outer drip line of the associated riparian vegetation, whichever is greater. For SAA notification purposes, vegetated and non-vegetated streambed are distinguished when riparian vegetation is present.

Section 4 Results

The following is a discussion of the existing on-site jurisdictional resources based on the results of a formal delineation conducted within the survey area in August 2018.

4.1 HYDROLOGICAL FEATURES

The hydrological features within the survey area consist of one detention basin and forty-two (42) drainages. These drainages consist of desert dry wash/ephemeral streambeds (all non-wetland), with some braided channels, that are characterized by deep alluvial sediment comprised mainly of sand and gravel deposits. The active channels mapped during this delineation exhibited clear evidence of significant hydrology such as sediment deposition, scour along the banks, and matted vegetation. No surface waters were present at the time of the delineation. Generally, these active channel bottoms exhibited a very flat (i.e., planar) bed topography characterized by loamy fine sand deposition. Surface flows within these unnamed ephemeral features are tributary to the Mojave River, with Basin A being tributary to Fremont Wash.

Jurisdictional Features

The western portion of the survey area contained low flow channels primarily used to drain waters from SCLA maintenance roads and/or hardscape. Drainage 1 and Basin A are features constructed in the uplands to replace natural flows within the northwestern portion of the airport property. Primarily non-native grasses and forbs are present within and/or surrounding these features. The eastern portion of the survey area contained channels characterized by braided systems and low flow channels, with some areas discontinuous of an OHWM, however maintaining surface connection via sheet flow. Drainages 2 through 42 are natural drainage features in undeveloped areas primarily dominated by creosote bush and rubber rabbitbrush, unless otherwise specified.

Basin A

Basin A is an impoundment that exists within the northwestern portion of the survey area. Bare ground was present within the basin during the site visit. Basin A is used to retain excess storm water and runoff from the airport facility. Flows enter the basin via spillway and exits the survey area through a 2-foot-wide culvert that goes underneath North Perimeter Road where it ultimately connects to an ephemeral feature that is tributary to Fremont Wash.

Drainage 1

Within the survey area, Drainage 1 consists of an earthen channel, with sparse vegetation recruitment. This channel is ephemeral and generally conveys storm flows and roadside runoff north to south from an approximately 6-foot-wide culvert. Concrete rip rap and concrete levees

are placed throughout the southern portion of the channel. Flows are conveyed off-site with a direct surface and/or culverted connection to the Mojave River. The OHWM is evidenced by scour and measured at approximately 1 foot wide. CDFW banks are noted by the presence of shelving and average approximately 12 feet wide.

Drainage 2

Within the survey area, Drainage 2 consists of a low flow ephemeral channel generally conveyed east. Storm flows enter the channel with an OHWM approximately 1 foot wide by evidence of scour, with active banks averaging approximately 2 feet wide.

Drainage 3

Within the survey area, Drainage 3 is a well-defined natural arroyo feature characterized by loamy fine sand. Drainage 3 appears to convey storm water and runoff from the abandoned military housing complex located to the west. Flows enter the channel via a 6-foot-wide, partially buried corrugated metal pipe (CMP) with a concrete apron, with ephemeral flows generally conveyed east-northeast. Flows are temporarily discontinued by sheet flow but begin again downstream where they eventually terminate into sheet flow and evidential ponding at a large berm. Excess flows are conveyed through a concrete spillway and meet at the downstream confluence of Drainage 4. Flows from both drainages are conveyed off-site via a 3-foot-wide CMP located underneath Phantom East. The OHWM varies between approximately 2 and 8 feet wide by evidence of scour, with active banks averaging between approximately 3 to 20 feet wide. The dominant vegetation that exists within the drainage includes several mature individuals of Chinese elm (*Ulmus parvifolia*), and otherwise surrounded by Mojave creosote bush scrub.

Drainage 4

Within the survey area, Drainage 4 conveys ephemeral flows from storm water via a 4-foot-wide culvert, which are generally conveyed from the northwest to southeast and enter the channel where flows are carried off-site via a 3-foot-wide culvert underneath Phantom East. The OHWM is approximately 1 to 8 feet wide by evidence of scour, with active banks averaging approximately 2 to 15 feet wide.

Drainage 5

Within the survey area, Drainage 5 is an ephemeral channel characterized by a shallow, braided system and conveys flows in a southwest to northeast direction. OHWM for Drainage 5 is approximately 1 to 5 feet wide by evidence of scour, with active banks averaging approximately 2 to 6 feet wide.

Drainage 5 contains smaller tributaries, tributaries 5-A to 5-K. These tributaries are ephemeral drainages that displayed an OHWM that ranged from 1 to 10 feet wide with active banks ranging from 2 to 15 feet wide.

Drainage 6

Within the survey area, Drainage 6 is an ephemeral channel that conveys storm water and runoff generally from south to north. Flows enter Drainage 6 via a 3-foot-wide culvert that runs underneath Phantom East. Drainage 6 is characterized by a shallow braided system where the primary channel is choked with coarse debris and spills out across the soils surface until it concentrates to a new channel. The downstream portion of the channel ultimately converges with Drainage 5 where flows are conveyed off-site with a direct surface and/or culverted connection to the Mojave River. The OHWM is approximately 1 to 10 feet wide by evidence of scour, with active banks averaging approximately 2 to 15 feet wide.

Drainage 6 contains smaller tributaries, tributaries 6-A to 6-I. These tributaries are ephemeral drainages that displayed and OHWM that ranged from 1 to 6 feet wide, with active banks ranging from 2 to 10 feet wide.

Drainages 7 and 8

Within the survey area, Drainage 7 and 8 are ephemeral channels that convey storm water from west to east direction. The OHWMs are approximately 1 foot wide by evidence of scour, with active banks averaging approximately 2 feet wide. Both drainages are fed by tributaries that displayed an OHWM of approximately 1 foot wide, with an active bank of approximately 2 feet wide.

Significant Nexus Determination

The Mojave River is an intermittent stream that is considered Corps-determined WoUS. Due to its downstream muted hydrological connection to Silver Lakes (two manmade navigable lakes in the City of Helendale), the Mojave River qualifies as a navigable WoUS under 33 Code of Federal Regulations § 329 and meets the definition of a TNW. Due to the hydrologic connectivity of the tributaries, direct surface and/or culverted connection to Mojave River, these tributaries are considered jurisdictional WoUS. Fremont Wash is tributary to the Mojave River; therefore, drainages tributary to Fremont Wash are also considered jurisdictional to WoUS.

Non-Jurisdictional Features

In the northwest portion of the survey area, east of Basin, three (3) non-jurisdictional ephemeral features convey storm flows from the abandoned airport runway/industrial lot and terminate as sheet flow. These features do not display drainage patterns and are not a part of a natural ravine; therefore, these features are not considered jurisdictional to any of the regulatory agencies.

In the southeast portion of the survey area, east of Drainage 6, seven features were identified during desktop analysis and were verified in the field as non-jurisdictional features. These features do not display drainage patterns and are not a part of a natural ravine; therefore, these features are not considered jurisdictional to any of the regulatory agencies.

Further, a basin feature is located in the southwestern portion of the survey area, west of Drainage 1 and north of Air Expressway/Air Base Road. This basin is excavated in the uplands and was created to capture runoff and stormwater from the area south of Air Base Road via a series of culverts underneath the road. This area does not display any evidence of surface water connection to WoUS and therefore would not be considered as Corps or Regional Water Board jurisdiction.

4.2 JURISDICTIONAL DETERMINATION

This Jurisdictional Delineation Report has been prepared for the project to delineate the Corps, Regional Board, and CDFW jurisdictional authority within the survey area. It presents Michael Baker's professional determination of jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. However, as with any jurisdictional delineation, only the regulatory agencies can make a final determination of jurisdictional boundaries within a project site/property. Jurisdictional limits within the survey area for each regulatory agency are provided in Table 2, below.

Table 2. Summary of Aquatic Resources and Jurisdictional Limits

Feature	Cowardian Type	OHWM/Wetland Presence	CDFW Streambed Width	Dominant Vegetation	Linear Feet	Corps and Regional Board Non-Wetlands	CDFW Non-Vegetated Streambed	Longitude/Latitude
Drainage 1	Ephemeral	1'/non-wetland	12'	non-native grasses and forbs	1,155	0.03	0.32	34.58971487/ -117.366115
Drainage 2	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	547	0.01	0.03	34.5801983/ -117.3518901
Drainage 3	Ephemeral	2'-8'/non-wetland	3'-20'	creosote bush and rubber rabbitbrush	619	0.09	0.18	34.58151342/ -117.3558387
Drainage 4	Ephemeral	1'-8'/non-wetland	2'-15'	creosote bush and rubber rabbitbrush	1,046	0.10	0.20	34.58563795/ -117.355227
Drainage 5	Ephemeral	1'-5'/non-wetland	2'-6'	creosote bush and rubber rabbitbrush	4,662	0.37	0.46	34.59152014/ -117.3618883
Drainage 5-A	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	64	0.001	0.003	34.59302542/ -117.3608938
Drainage 5-B	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	115	0.003	0.005	34.59303992/ -117.3601793
Drainage 5-C	Ephemeral	3'/non-wetland	5'	creosote bush and rubber	197	0.01	0.02	34.59338834/ -117.3612298

Feature	Cowardian Type	OHWM/Wetland Presence	CDFW Streambed Width	Dominant Vegetation	Linear Feet	Corps and Regional Board Non-Wetlands	CDFW Non-Vegetated Streambed	Longitude/Latitude
				rabbitbrush				
Drainage 5-C-1	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	107	0.002	0.005	34.59358345/ -117.3613162
Drainage 5-D	Ephemeral	4'/non-wetland	6'	creosote bush and rubber rabbitbrush	281	0.03	0.04	34.59289723/ -117.3595755
Drainage 5-E	Ephemeral	2'/non-wetland	6'	creosote bush and rubber rabbitbrush	152	0.007	0.02	34.59408183/ -117.360833
Drainage 5-F	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	95	0.002	0.004	34.59399008/ -117.3597345
Drainage 5-G	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	79	0.002	0.004	34.59452056/ -117.3605165
Drainage 5-H	Ephemeral	2'/non-wetland	3'	creosote bush and rubber rabbitbrush	358	0.02	0.02	34.59382166/ -117.3592848
Drainage 5-I	Ephemeral	4'-5'/non-wetland	6'-10'	creosote bush and rubber rabbitbrush	699	0.08	0.13	34.5946529/ -117.3614804

Feature	Cowardian Type	OHWM/Wetland Presence	CDFW Streambed Width	Dominant Vegetation	Linear Feet	Corps and Regional Board Non-Wetlands	CDFW Non-Vegetated Streambed	Longitude/Latitude
Drainage 5-I-1	Ephemeral	4'/non-wetland	6'	creosote bush and rubber rabbitbrush	295	0.03	0.04	34.59400688/ -117.3618351
Drainage 5-J	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	162	0.003	0.01	34.59579667/ -117.35987
Drainage 5-K	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	124	0.003	0.01	34.59574841/ -117.3595612
Drainage 5-L	Ephemeral	10'/non-wetland	15'	creosote bush and rubber rabbitbrush	645	0.15	0.23	34.59598282/ -117.3620587
Drainage 5-L-1	Ephemeral	4'/non-wetland	6'	creosote bush and rubber rabbitbrush	355	0.08	0.05	34.59687173/ -117.3607735
Drainage 5-L-2	Ephemeral	3'/non-wetland	5'	creosote bush and rubber rabbitbrush	232	0.02	0.03	34.59654862/ -117.3605065
Drainage 6	Ephemeral	1'-10'/non-wetland	2'-15'	creosote bush and rubber rabbitbrush	814	0.51	0.74	34.58904577/ -117.3586758
Drainage 6-A	Ephemeral	2'/non-wetland	3'	creosote bush and rubber rabbitbrush	66	0.003	0.01	34.5904388/ -117.3577919

Feature	Cowardian Type	OHWM/Wetland Presence	CDFW Streambed Width	Dominant Vegetation	Linear Feet	Corps and Regional Board Non-Wetlands	CDFW Non-Vegetated Streambed	Longitude/Latitude
Drainage 6-A-1	Ephemeral	1'-3'/non-wetland	2'-4'	creosote bush and rubber rabbitbrush	362	0.01	0.02	34.59069915/ -117.3583495
Drainage 6-B	Ephemeral	3'-6'/non-wetland	4'-10'	creosote bush and rubber rabbitbrush	573	0.06	0.09	34.58982056/ -117.3563537
Drainage 6-B-1	Ephemeral	1'-3'/non-wetland	2'-4'	creosote bush and rubber rabbitbrush	140	0.004	0.01	34.59019782/ -117.3559509
Drainage 6-C	Ephemeral	1'-3'/non-wetland	2'-4'	creosote bush and rubber rabbitbrush	641	0.04	0.05	34.59186641/ -117.3586203
Drainage 6-C-1	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	81	0.002	0.004	34.59171523/ -117.3580066
Drainage 6-C-2	Ephemeral	5'/non-wetland	8'	creosote bush and rubber rabbitbrush	55	0.008	0.01	34.59191993/ -117.3578004
Drainage 6-C-3	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	171	0.004	0.01	34.59240875/ -117.3584583
Drainage 6-D	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	170	0.004	0.008	34.59179732/ -117.3562257

Feature	Cowardian Type	OHWM/Wetland Presence	CDFW Streambed Width	Dominant Vegetation	Linear Feet	Corps and Regional Board Non-Wetlands	CDFW Non-Vegetated Streambed	Longitude/Latitude
Drainage 6-E	Ephemeral	2'/non-wetland	3'	creosote bush and rubber rabbitbrush	403	0.02	0.03	34.59282899/ -117.3585178
Drainage 6-F	Ephemeral	2'/non-wetland	3'	creosote bush and rubber rabbitbrush	205	0.009	0.01	34.5920425/ -117.3559672
Drainage 6-G	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	109	0.003	0.01	34.59316802/ -117.3578477
Drainage 6-H	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	141	0.003	0.007	34.59257139/ -117.3562313
Drainage 6-I	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	267	0.006	0.01	34.59277154/ -117.3560407
Drainage 7	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	98	0.00	0.005	34.58937518/ -117.3548937
Drainage 8	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	192	0.004	0.009	34.58667773/ -117.3544106
Drainage 8-A	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	251	0.004	0.008	34.587201/ -117.3545284

Feature	Cowardian Type	OHWM/Wetland Presence	CDFW Streambed Width	Dominant Vegetation	Linear Feet	Corps and Regional Board Non-Wetlands	CDFW Non-Vegetated Streambed	Longitude/Latitude
Drainage 8-B	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	279	0.006	0.01	34.58775965/ -117.3549689
Drainage 8-B-1	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	256	0.006	0.01	34.58813226/ -117.3549602
Drainage 8-C	Ephemeral	1'/non-wetland	2'	creosote bush and rubber rabbitbrush	98	0.002	0.005	34.58858664/
Basin A	Ephemeral	-	-	Bare ground	-	0.018155	0.032334	34.60089805 /-117.393509
TOTAL					**18,654**	**1.71**	**2.90**	

4.2.1 U.S. Army Corps of Engineers and Regional Water Quality Control Board

Approximately 1.71 acres of non-wetland WoUS (a total of 18,654 linear feet) within the survey area would be subject to jurisdiction of the Corps and Regional Board pursuant to CWA Sections 404 and 401, respectively. Refer to Figure 4, *Corps/Regional Board Jurisdiction*.

4.2.2 California Department of Fish and Wildlife

Approximately 2.90 acres of non-vegetated streambed/banks within the survey area would be subject to jurisdiction of the CDFW pursuant to CFGC Sections 1600 *et seq*. Refer to Figure 5, *CDFW Jurisdiction*.

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Culvert
- Reference Point

August 31, 2018

0 500 1,000 Feet

Source: Eagle Aerial - 2014

10/18/2018 J:\N:\Ndata\159409\GIS\MXD\DelineationEx_04 Corps Overview.mxd RPhaneuf

Michael Baker INTERNATIONAL

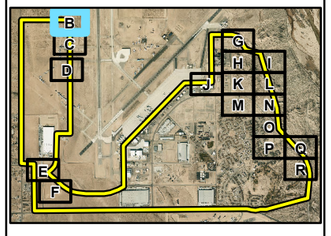
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4A

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 JN M:\Data\159408\GIS\MXD\Delineation\Ex_04 Corps Mapbook.mxd RPhaneuf

Michael Baker INTERNATIONAL

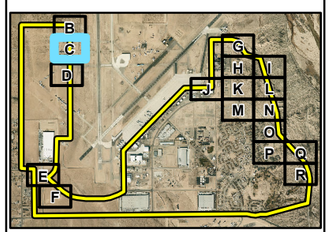
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4B

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

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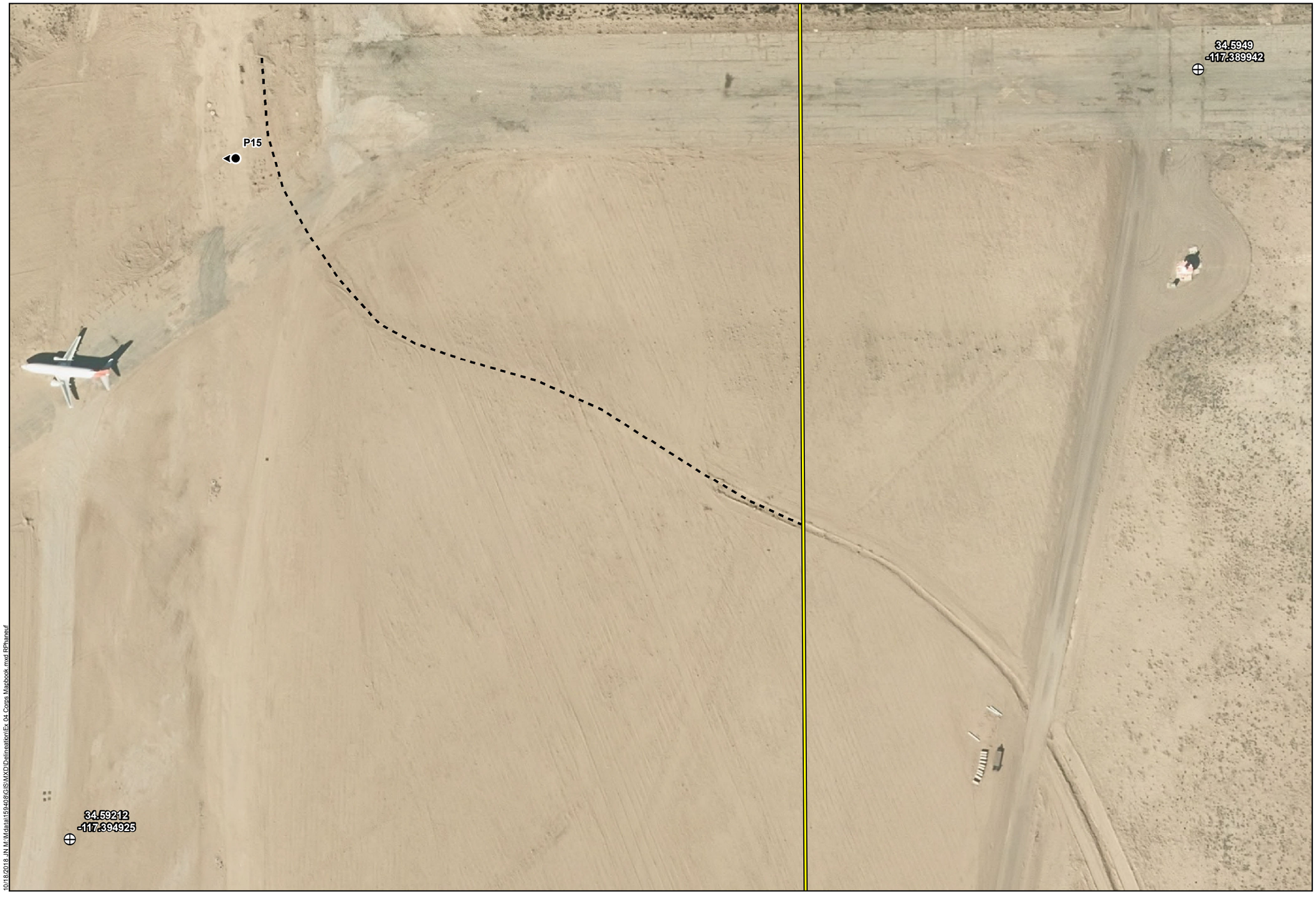
Michael Baker INTERNATIONAL

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

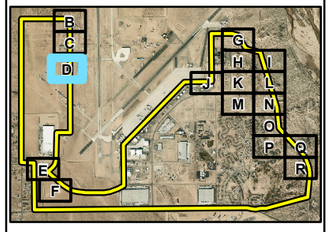
Corps/Regional Board Jurisdiction

Figure 4C



Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 JN M:\data\159408\GIS\MXD\Delineation\Ex_04_Corps_Mapbook.mxd RPhaneuf

Michael Baker INTERNATIONAL

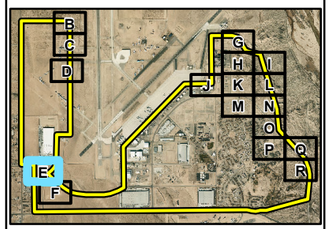
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4D

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 JN:M:\Data\1594\08GIS\MXD\Delineation\Ex 04 Corps Mapbook.mxd RPhaneuf

Michael Baker INTERNATIONAL

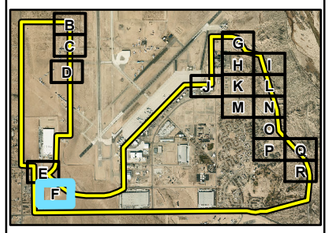
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4E

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 J:\N M\Mdata\1594\08\GIS\MXD\Delineation\Ex 04 Corps Mapbook.mxd RPhaneuf

Michael Baker INTERNATIONAL

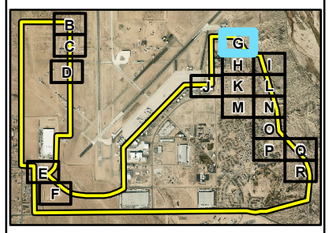
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4F

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 J:\N-M\Data\159408\GIS\MXD\Delineation\Ex 04 Corps Mapbook.mxd RPhaneuf

Michael Baker INTERNATIONAL

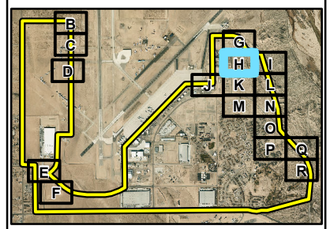
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4G

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

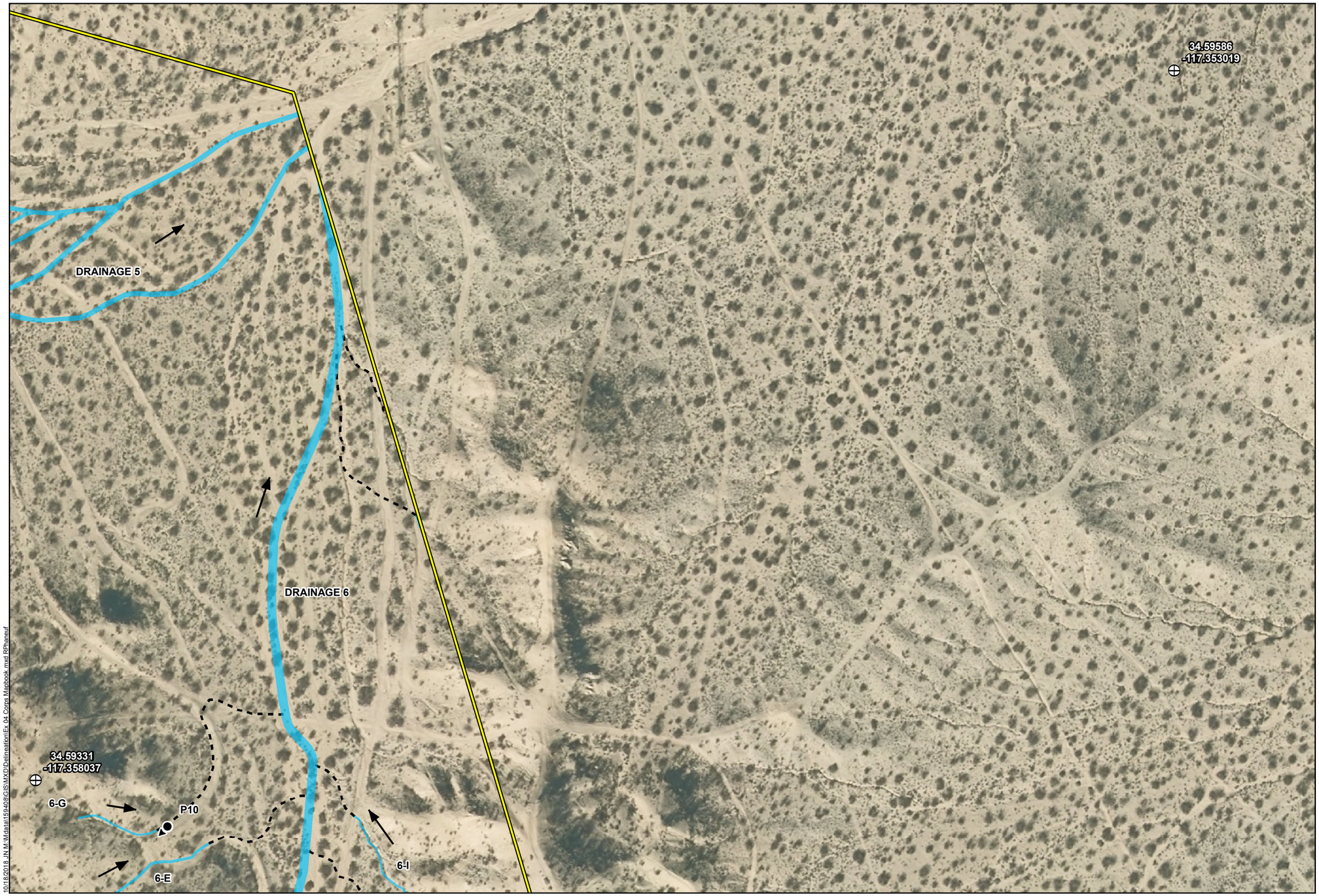
10/18/2018 JN M:\Mdata\159409\GIS\MXD\Delineation\Ex 04 Corps Mapbook.mxd RPhaneuf

Michael Baker INTERNATIONAL

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

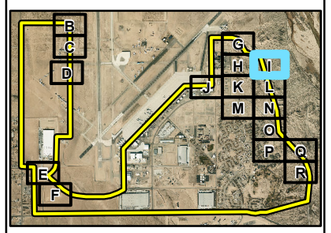
Corps/Regional Board Jurisdiction

Figure 4H



Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

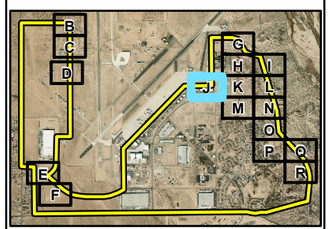
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4I

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



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Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

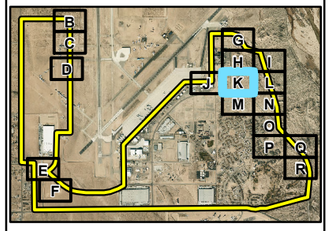
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4J

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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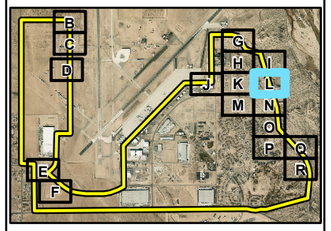
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4K

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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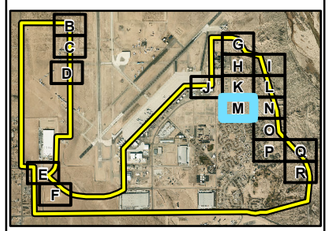
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4L

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

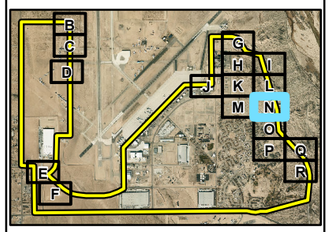
Corps/Regional Board Jurisdiction

Figure 4M

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

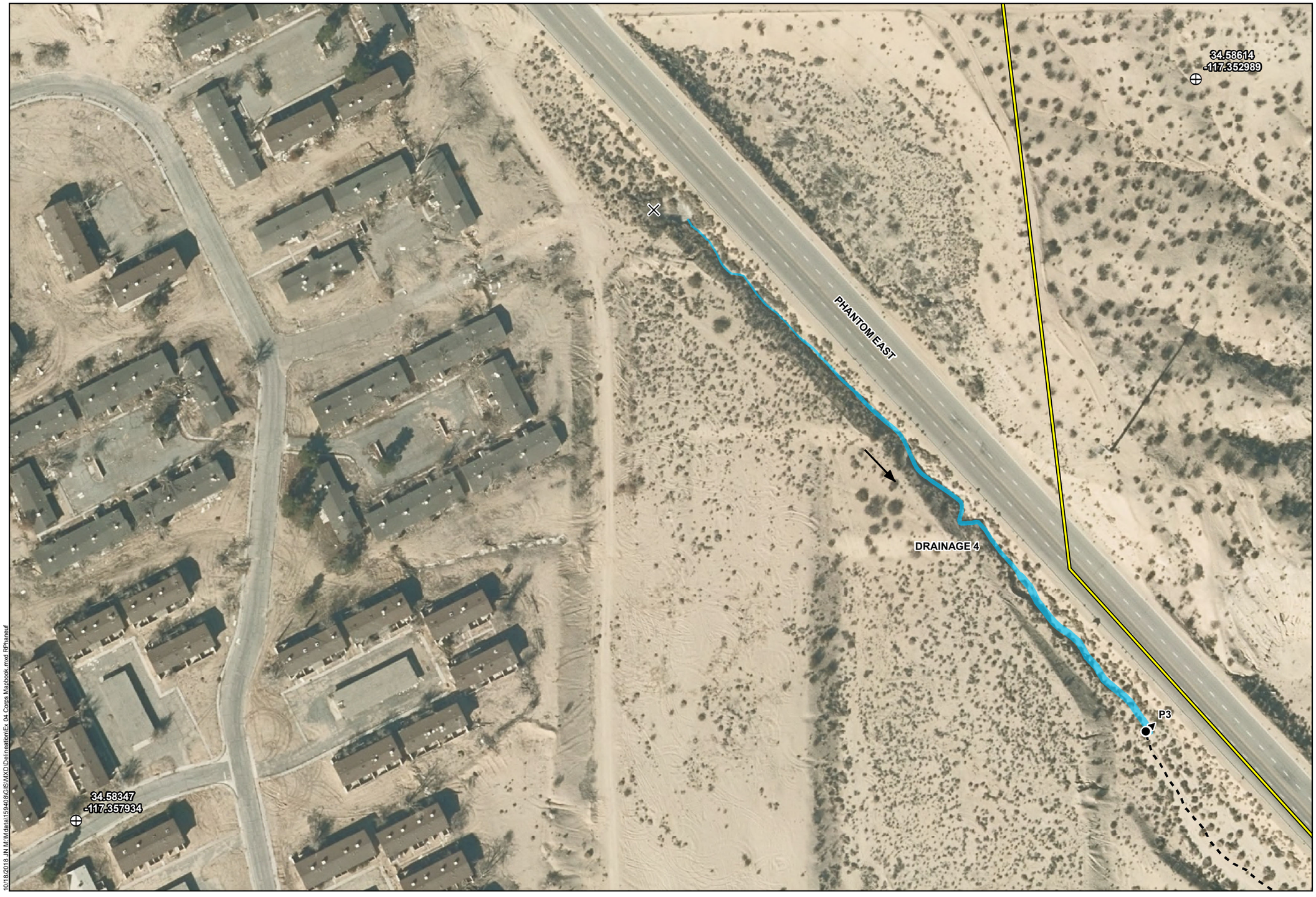
10/18/2018 JN M:\Mdata\159408\GIS\MXD\Delineation\Ex. 04 Corps Mapbook.mxd RPhaneuf

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

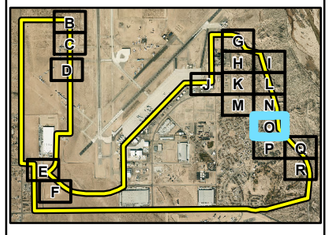
Figure 4N

Michael Baker INTERNATIONAL



Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

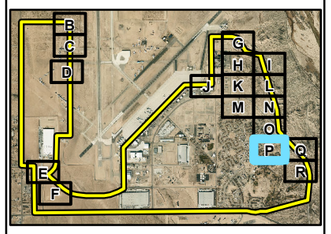
Corps/Regional Board Jurisdiction

Figure 4O

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

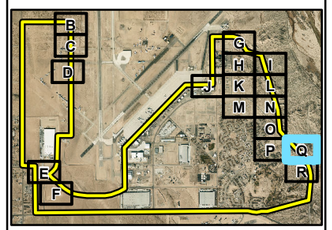
Corps/Regional Board Jurisdiction

Figure 4P

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

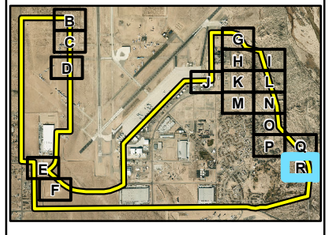
Corps/Regional Board Jurisdiction

Figure 4Q

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- Corps/Regional Board Non Wetland WoUS
- No OHWM
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Corps/Regional Board Jurisdiction

Figure 4R

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Culvert
- Reference Point

August 31, 2018

0 500 1,000
Feet

Source: Eagle Aerial - 2014

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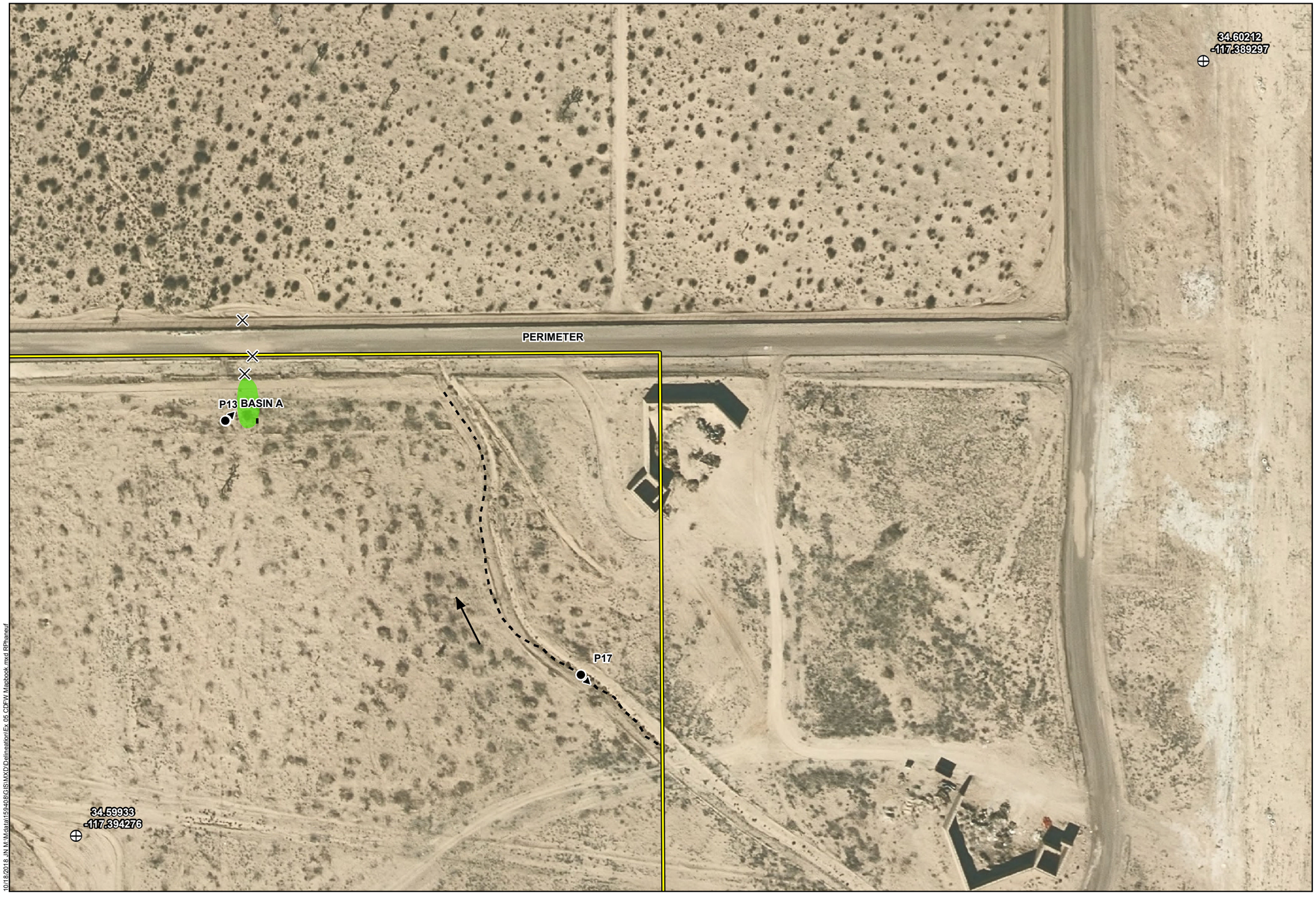
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Michael Baker INTERNATIONAL

CDFW Jurisdiction

Figure 5A



Legend

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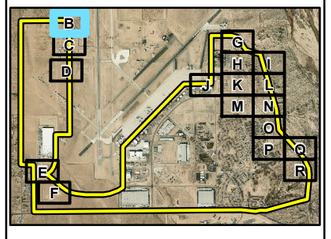
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

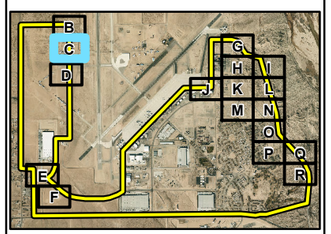
CDFW Jurisdiction

Figure 5B

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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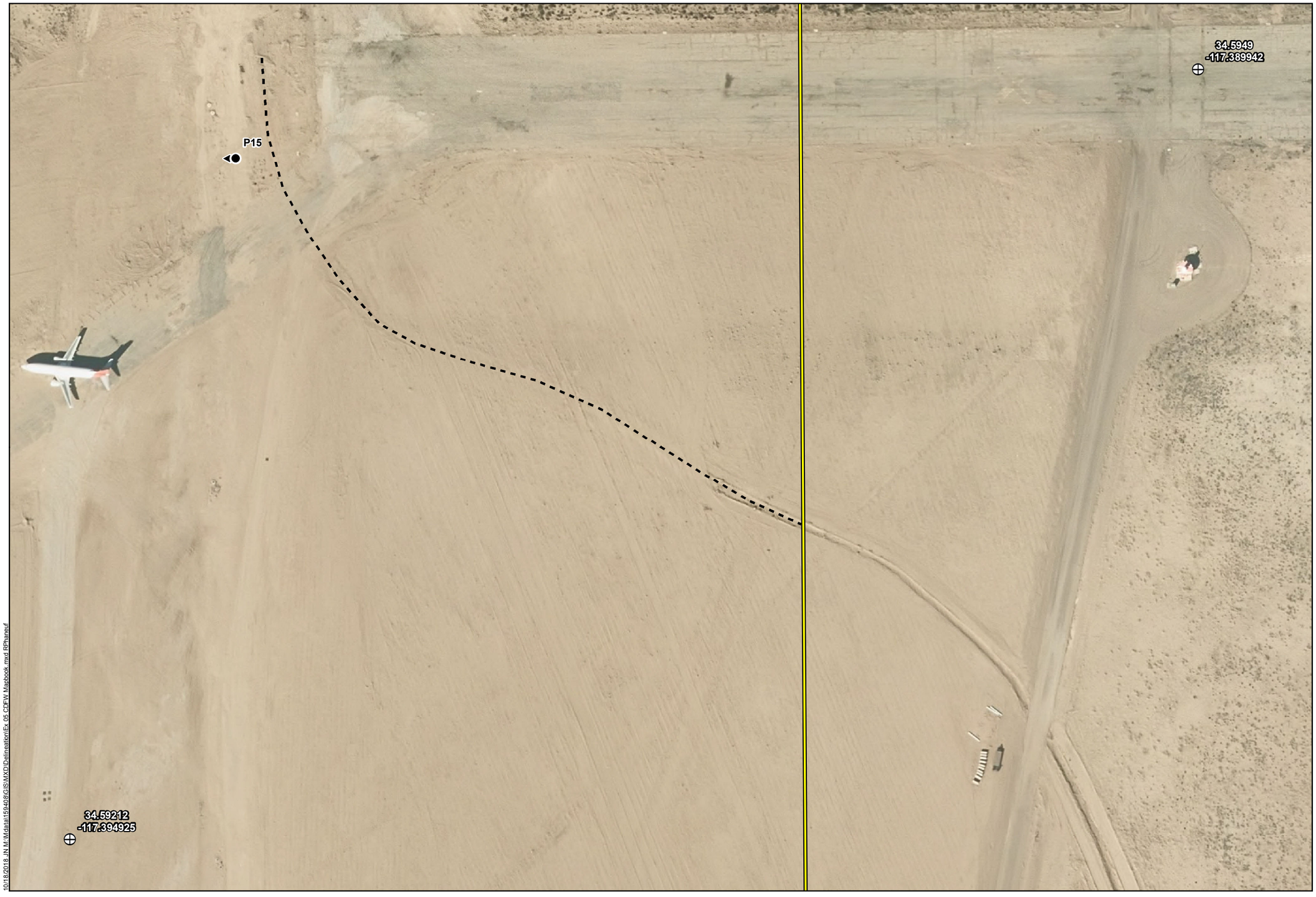
Michael Baker INTERNATIONAL

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5C



Legend

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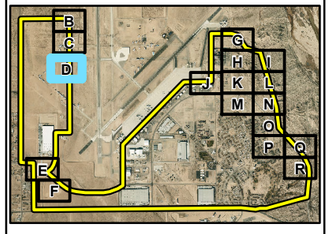
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

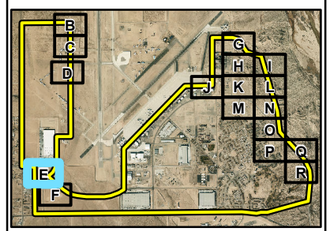
Michael Baker INTERNATIONAL

CDFW Jurisdiction

Figure 5D

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

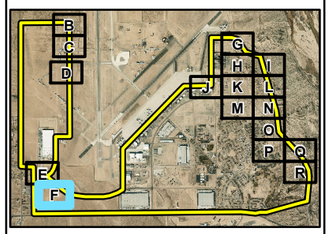
Michael Baker INTERNATIONAL

CDFW Jurisdiction

Figure 5E

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

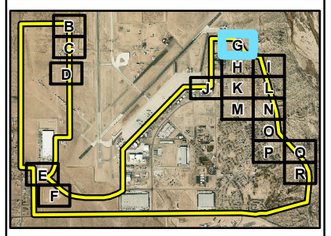
CDFW Jurisdiction

Figure 5F

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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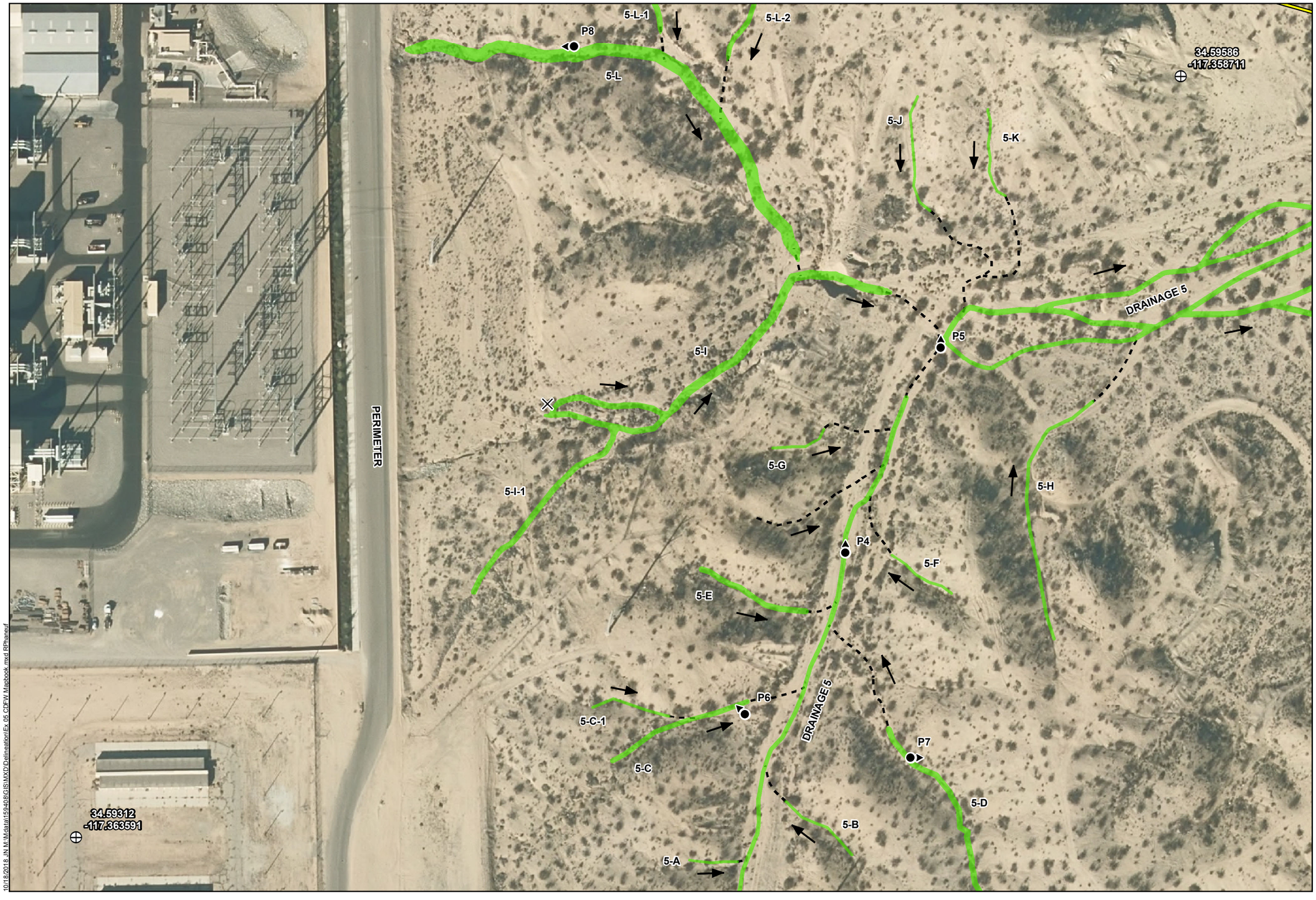
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Michael Baker INTERNATIONAL

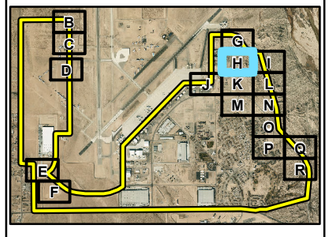
CDFW Jurisdiction

Figure 5G



Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

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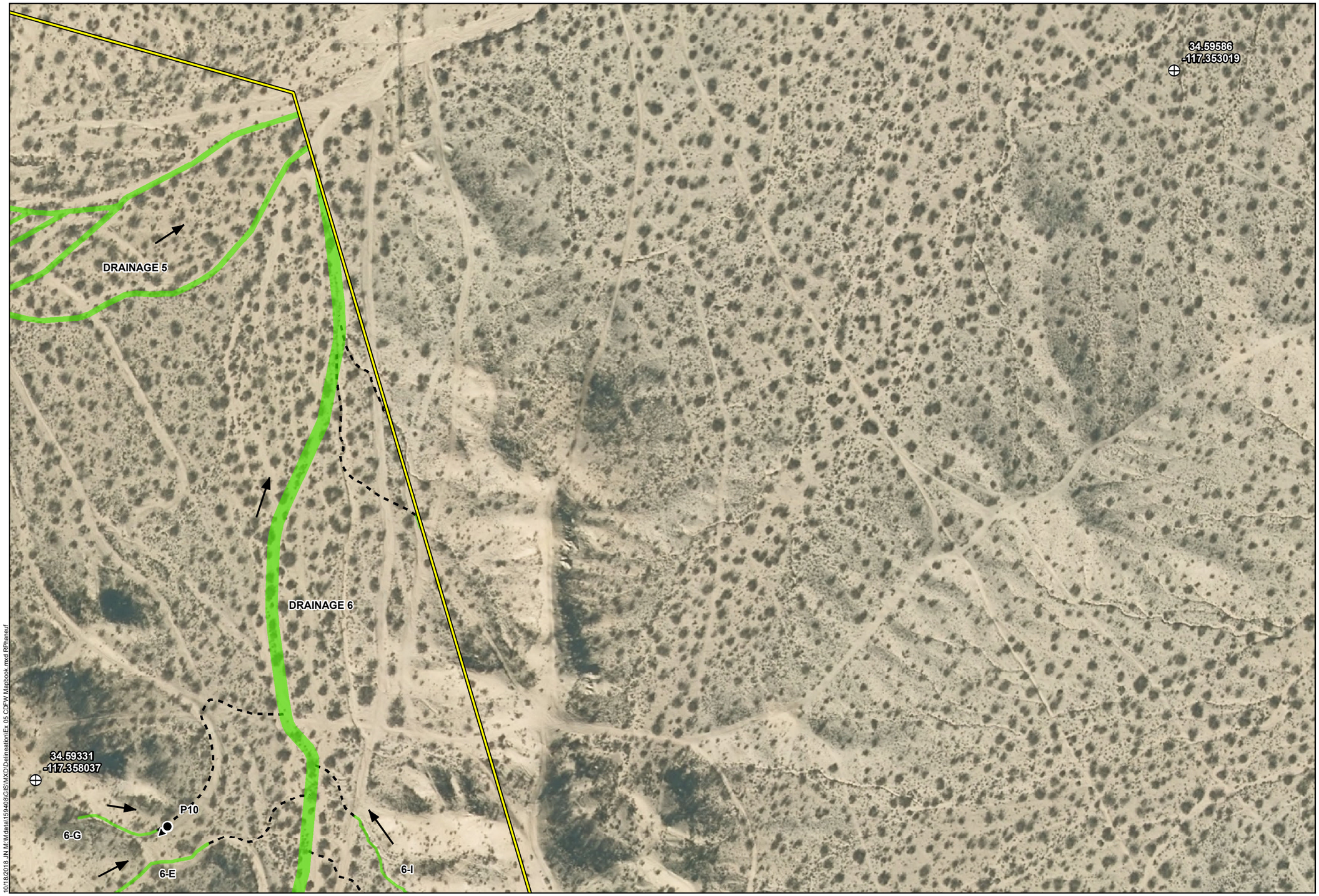
Michael Baker INTERNATIONAL

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5H



Legend

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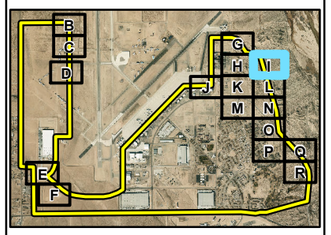
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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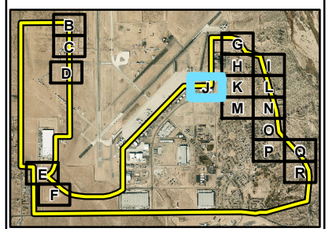
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5I

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

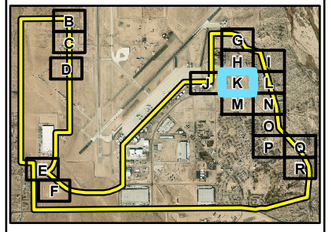
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5J

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5K

10/18/2018 JN:M:\Mdata\1594\08\GIS\MXD\Delineation\Ex 05 CDFW Mapbook.mxd RPhaneuf

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

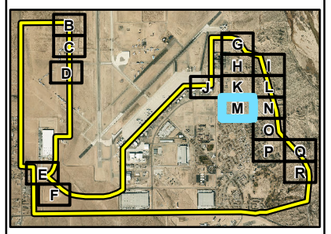
CDFW Jurisdiction

Figure 5L

Michael Baker INTERNATIONAL

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

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Source: Eagle Aerial - 2014

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SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Michael Baker INTERNATIONAL

CDFW Jurisdiction

Figure 5M

Legend

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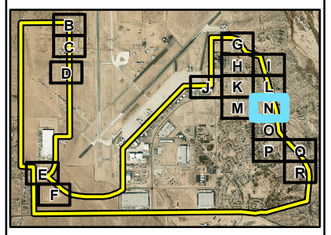
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

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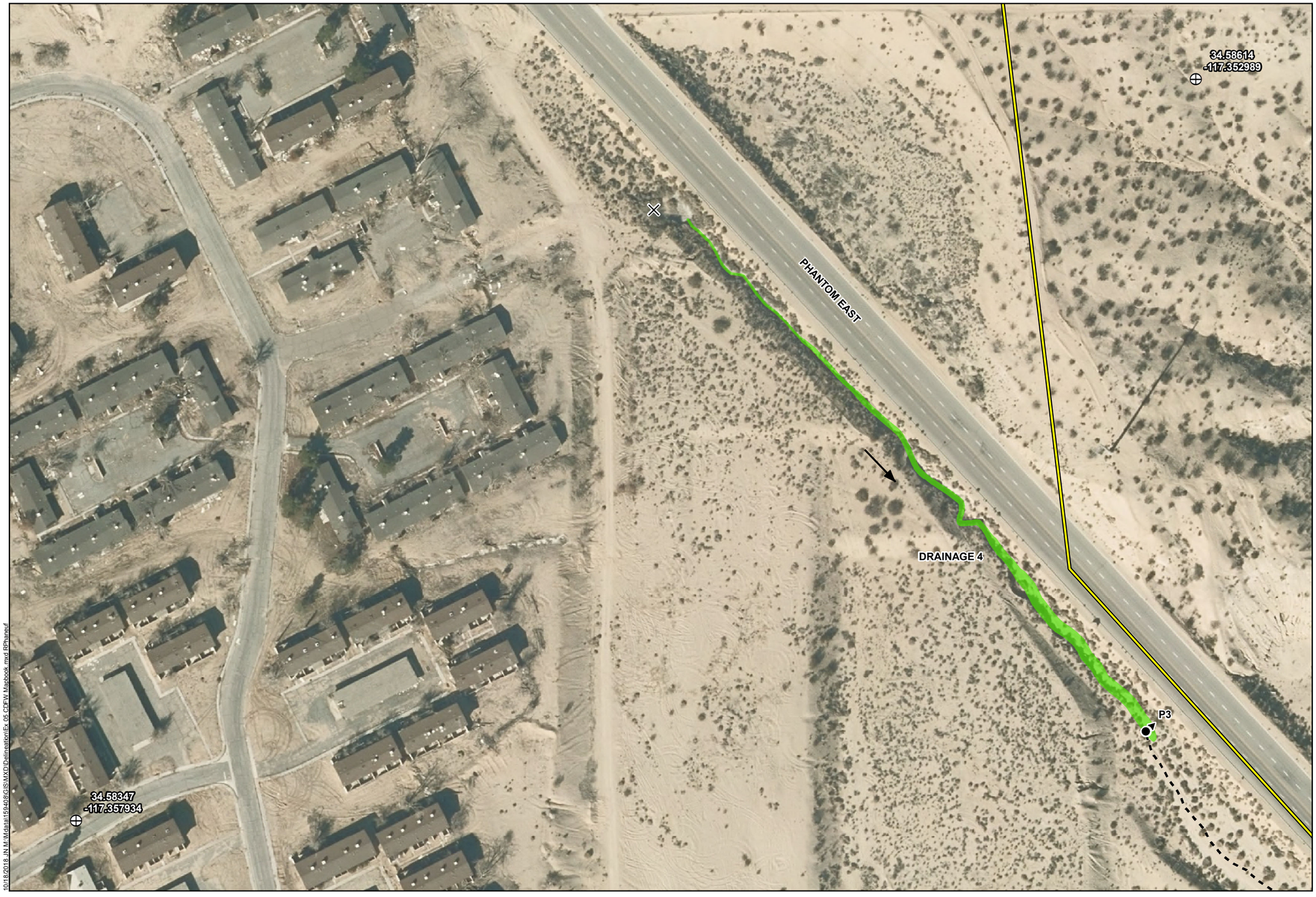
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Michael Baker INTERNATIONAL

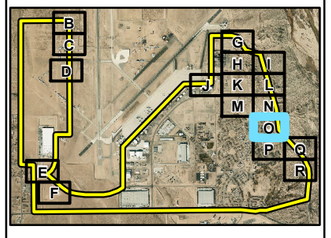
CDFW Jurisdiction

Figure 5N



Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 JN M:\Mdata\159408\GIS\MXD\Delineation\Ex. 05 CFW Mapbook.mxd RPhaneuf

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

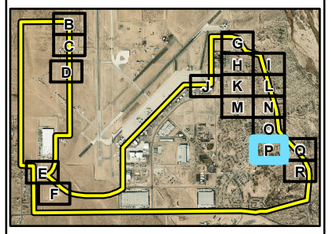
Michael Baker INTERNATIONAL

CDFW Jurisdiction

Figure 5O

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

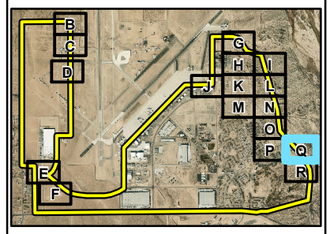
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5P

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

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Michael Baker INTERNATIONAL

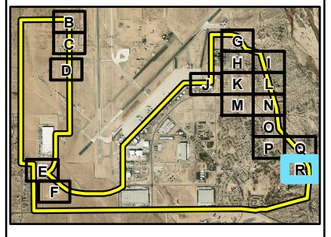
SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

CDFW Jurisdiction

Figure 5Q

Legend

- Project Boundary
- CDFW Non Vegetated Streambed
- No CDFW Streambed Present
- Flow Direction
- Photo Point and Direction
- Culvert
- Reference Point



August 31, 2018

0 100 200 Feet

Source: Eagle Aerial - 2014

10/18/2018 JN:M:\Mdata\169408\GIS\MXD\Delineation\Ex 05 CDFW Mapbook.mxd RPhaneuf

SOUTHERN CALIFORNIA LOGISTICS AIRPORT SPECIFIC PLAN
JURISDICTIONAL DELINEATION REPORT

Michael Baker INTERNATIONAL

CDFW Jurisdiction

Figure 5R

Section 5 Conclusions and Recommendations

This Jurisdictional Delineation Report has been prepared for Stirling Development to delineate the Corps, Regional Board, and CDFW jurisdictional authority within the survey area. The following sections provide a summary of the various permits/authorizations required before any temporary or permanent impacts to jurisdictional areas occur.

5.1 U.S. ARMY CORPS OF ENGINEERS DETERMINATION

The Corps regulates discharges of dredged and/or fill materials into WoUS pursuant to Section 404 of the CWA. A total of approximately 1.71 acres of non-wetland WoUS have been mapped within the survey area. Permit authorization would be required from the Corps prior to commencement if any construction activities (i.e., dredge or fill) occur within Corps delineated jurisdictional areas. Depending upon the extent of impacts to WoUS for each proposed project within the Specific Plan Amendment area, there are three permits issued by the Corps: Nationwide (0.5 acre or less), Regional General (category of activities similar in nature, with minimal cumulative), and Individual Permit (more than 0.5 acre).

5.2 REGIONAL WATER QUALITY CONTROL BOARD DETERMINATION

The Regional Board regulates discharges to surface waters of the State under Section 401 of the CWA and Section 13263 of the Porter-Cologne for those that do not. Because all drainages within the survey area have a surface connection to downstream WoUS, the total acres jurisdictional under the Regional Board mirrors that of the Corps (1.71 acres of non-wetland WoUS within the survey area). For a Corps permit to be authorized, a Water Quality Certification issued from the Regional Board would be required. The Regional Board requires that California Environmental Quality Act (CEQA) compliance be obtained prior to obtaining the Water Quality Certification. A Regional Board application fee is required with the application package, which is calculated based on the total temporary and permanent impact acreages, as well as linear feet of jurisdictional impacts.

5.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DETERMINATION

The CDFW regulates the alteration of lakes and streambeds and associated riparian vegetation pursuant to CFGC Sections 1600 *et seq.* A total of 2.90 acres of CDFW jurisdictional limits have been mapped within the survey area. The CDFW must be notified prior to activities that alter jurisdictional areas. A Notification of Lake or Streambed Alteration to CDFW, and subsequent authorization from CDFW, would be required prior to the commencement of any construction

activities within the CDFW delineated jurisdictional areas. The CDFW also requires that CEQA compliance be obtained prior to obtaining a SAA, Operation by Law letter, or similar mechanism. A CDFW application fee is required with the application package, which is calculated based on the total project costs.

Section 6 References

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Appendix A Site Photographs

Photograph 1: Northern drainage of survey area, facing north.

Photograph 2: Southwest drainage, facing east.

Photograph 3: Southwest drainage, facing northeast.

Photograph 4: Southwest drainage, facing north.

Photograph 5: Northeast drainage, facing north.

Photograph 6: Northeast drainage, facing northwest.

Photograph 7: Northeast drainage, facing east.

Photograph 8: Northeast drainage, facing west.

Photograph 9: Northeast drainage, facing southwest.

Photograph 10: Northeast drainage, facing southwest.

Photograph 11: Northwest drainage, facing southeast.

Photograph 12: Northwest drainage, facing northwest.

Photograph 13: Basin A, facing northeast.

Photograph 14: Non-jurisdictional basin feature.

Photograph 15: Non-jurisdictional feature facing west.

Photograph 16: Non-jurisdictional feature facing northwest.

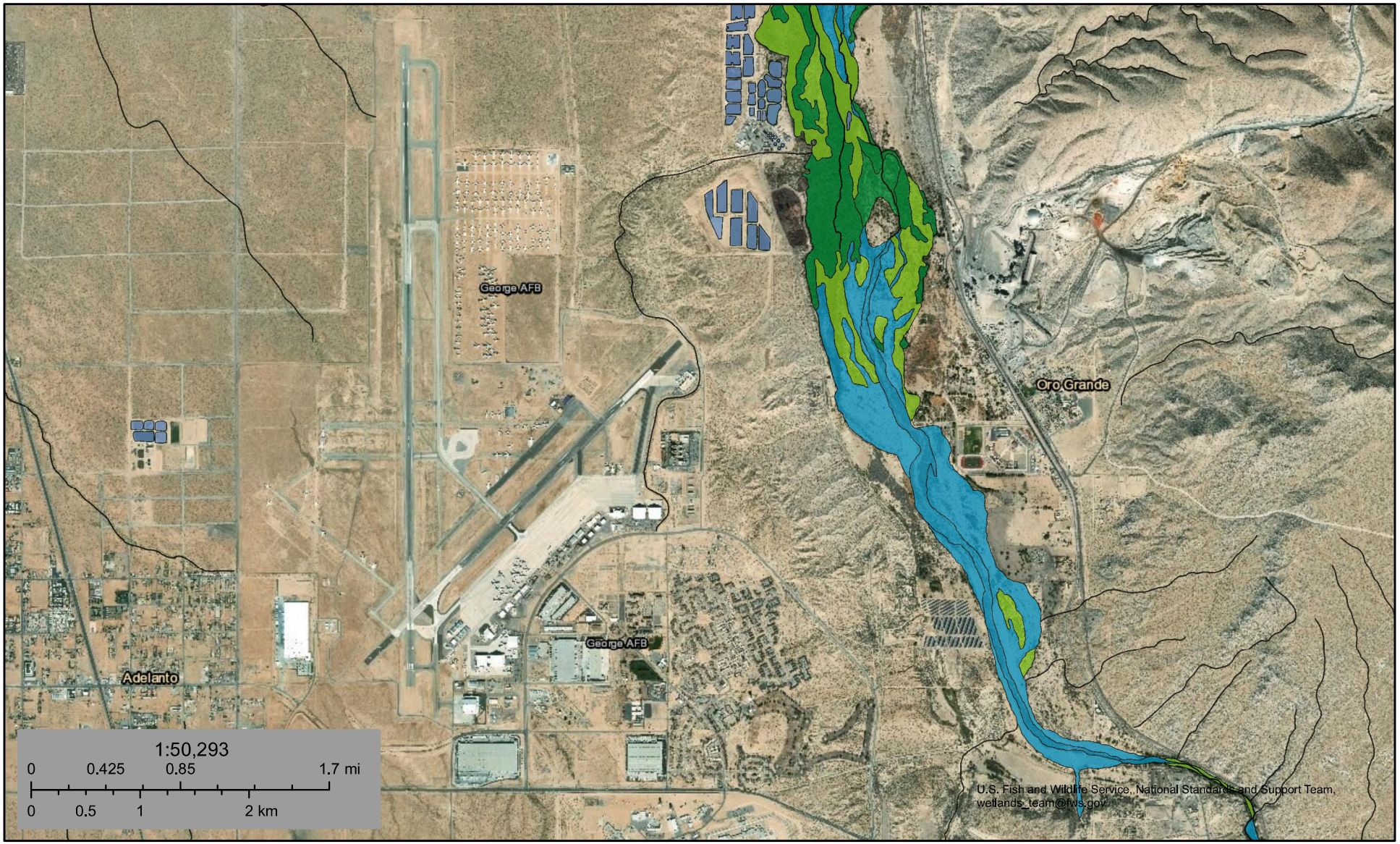
Photograph 17: Non-jurisdictional feature facing southeast.

Appendix B National Wetlands Inventory Map

U.S. Fish and Wildlife Service

National Wetlands Inventory

SCLA Specific Plan



July 27, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix C FEMA 100-Year Flood Zone Map

PIN
- Approximate location based on user input and does not represent an authoritative property location

MAP PANELS
- Selected FloodMap Boundary
- Digital Data Available
- No Digital Data Available
- Unmapped

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

Appendix D USDA/NRCS Custom Soil Resources Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for San Bernardino County, California, Mojave River Area

SCLA_Priority_Area

July 26, 2018

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

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

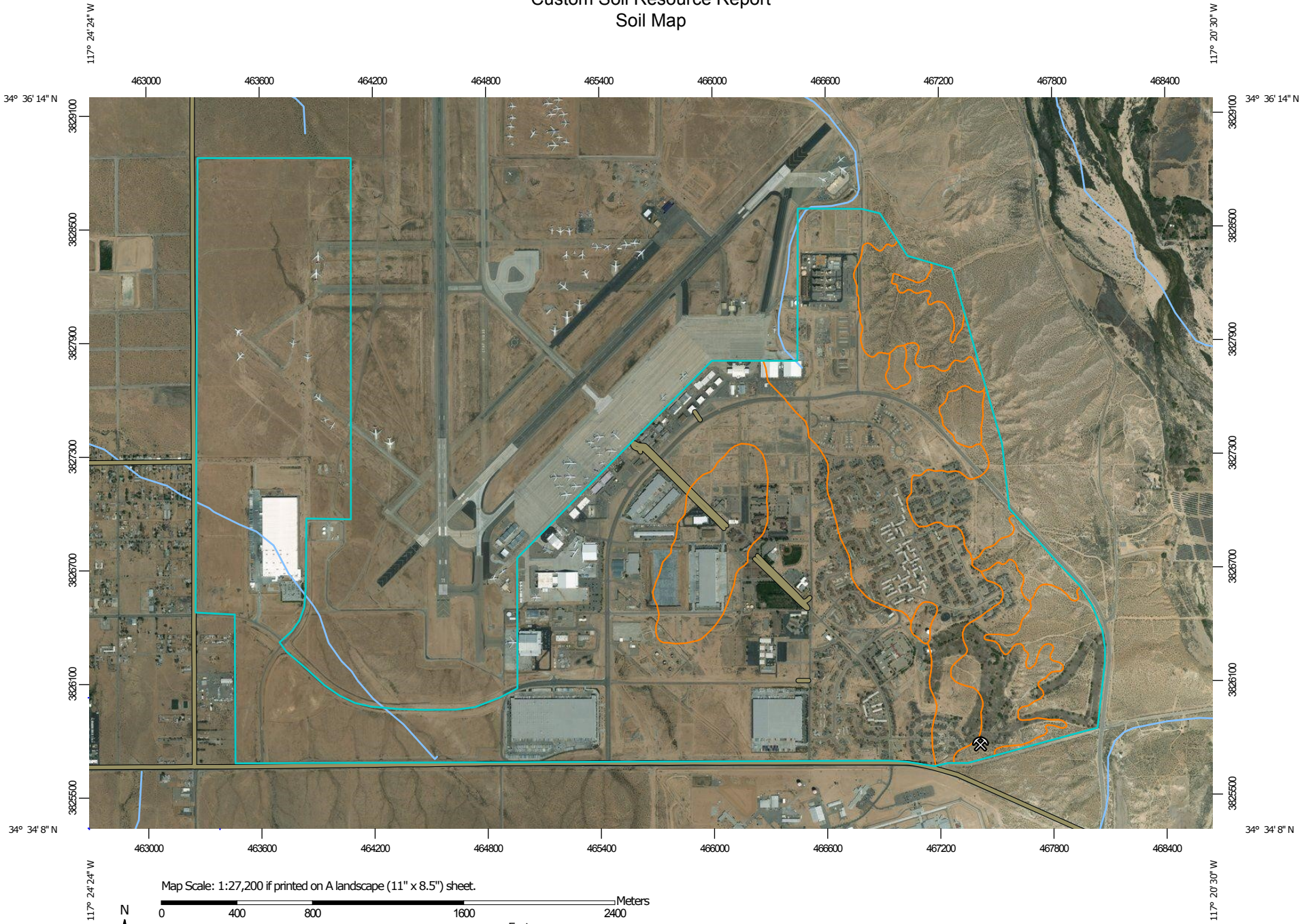
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



Map Scale: 1:27,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 400 800 1600 2400

Feet
0 1000 2000 4000 6000

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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

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

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

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

Soil Survey Area: San Bernardino County, California, Mojave River Area
Survey Area Data: Version 9, Sep 11, 2017

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

Date(s) aerial images were photographed: Mar 22, 2016—Oct 24, 2016

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
105	BRYMAN LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES	1,349.2	64.1%
113	CAJON SAND, 2 TO 9 PERCENT SLOPES	74.1	3.5%
114	CAJON SAND, 9 TO 15 PERCENT SLOPES	36.5	1.7%
130	HAPLARGIDS-CALCIORTHIDS COMPLEX, 15 TO 50 PERCENT SLOPES	185.0	8.8%
131	HELENDALE LOAMY SAND, 0 TO 2 PERCENT SLOPES	14.0	0.7%
150	MOHAVE VARIANT LOAMY SAND, 0 TO 2 PERCENT SLOPES	440.0	20.9%
155	PITS	5.0	0.2%
Totals for Area of Interest		**2,103.8**	**100.0%**

Map Unit Descriptions

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

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

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit

descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Bernardino County, California, Mojave River Area

105—BRYMAN LOAMY FINE SAND, 0 TO 2 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hkr9
Elevation: 2,800 to 3,200 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Bryman and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bryman

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 9 inches: loamy fine sand
H2 - 9 to 12 inches: sandy loam
H3 - 12 to 32 inches: sandy clay loam
H4 - 32 to 46 inches: sandy loam
H5 - 46 to 99 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Sandy (R030XF012CA)
Hydric soil rating: No

Minor Components

Cajon
Percent of map unit: 5 percent
Hydric soil rating: No

Helendale
Percent of map unit: 5 percent
Hydric soil rating: No

Mohave variant
Percent of map unit: 5 percent
Hydric soil rating: No

Bryman, gravelly surface
Percent of map unit: 5 percent
Hydric soil rating: No

113—CAJON SAND, 2 TO 9 PERCENT SLOPES

Map Unit Setting
National map unit symbol: hkrk
Elevation: 1,800 to 3,500 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 68 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Cajon and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed sources

Typical profile
A - 0 to 6 inches: sand
C1 - 6 to 25 inches: sand
C2 - 25 to 60 inches: stratified gravelly sand to sand, gravelly sand
C2 - 25 to 60 inches:

Properties and qualities
Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy (R030XF012CA)
Hydric soil rating: No

Minor Components

Cajon, gravelly surface

Percent of map unit: 5 percent
Landform: Alluvial fans

Helendale

Percent of map unit: 5 percent
Landform: Alluvial fans
Hydric soil rating: No

Kimberlina

Percent of map unit: 5 percent
Landform: Alluvial fans
Hydric soil rating: No

114—CAJON SAND, 9 TO 15 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hkrl
Elevation: 1,800 to 4,000 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 66 degrees F
Frost-free period: 180 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Cajon, slope, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cajon, Slope

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 6 inches: sand
H2 - 6 to 42 inches: sand
H3 - 42 to 60 inches: gravelly sand

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Available water storage in profile: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Sandy (R030XF012CA)
Hydric soil rating: No

Minor Components

Arizo

Percent of map unit: 5 percent
Hydric soil rating: No

Cajon, gravelly surface

Percent of map unit: 5 percent
Hydric soil rating: No

Cajon, steep

Percent of map unit: 5 percent
Hydric soil rating: No

130—HAPLARGIDS-CALCIORTHIDS COMPLEX, 15 TO 50 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hks3
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Haplargids and similar soils: 50 percent
Minor components: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Haplargids

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Alluvium derived from granite sources

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: No

Minor Components

Calciorthids

Percent of map unit: 25 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Badland

Percent of map unit: 5 percent

Hydric soil rating: No

Cajon

Percent of map unit: 5 percent
Hydric soil rating: No

Bryman

Percent of map unit: 3 percent
Hydric soil rating: No

Mohave varient, s

Percent of map unit: 2 percent
Hydric soil rating: No

131—HELENDALE LOAMY SAND, 0 TO 2 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hks4
Elevation: 2,500 to 3,800 feet
Mean annual precipitation: 3 to 6 inches
Mean annual air temperature: 59 to 63 degrees F
Frost-free period: 180 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Helendale and similar soils: 85 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Helendale

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 4 inches: loamy sand
H2 - 4 to 30 inches: sandy loam
H3 - 30 to 66 inches: sandy loam
H4 - 66 to 70 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: Sandy (R030XF012CA)
Hydric soil rating: No

Minor Components

Bryman

Percent of map unit: 5 percent
Hydric soil rating: No

Kimberlina

Percent of map unit: 5 percent
Hydric soil rating: No

Cajon

Percent of map unit: 3 percent
Hydric soil rating: No

150—MOHAVE VARIANT LOAMY SAND, 0 TO 2 PERCENT SLOPES

Map Unit Setting

National map unit symbol: hksr
Elevation: 2,700 feet
Mean annual precipitation: 3 to 5 inches
Mean annual air temperature: 63 to 66 degrees F
Frost-free period: 200 to 290 days
Farmland classification: Not prime farmland

Map Unit Composition

Mohave variant and similar soils: 85 percent
Minor components: 13 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mohave Variant

Setting

Landform: Fan remnants
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Alluvium derived from granite sources

Typical profile

H1 - 0 to 7 inches: loamy sand
H2 - 7 to 26 inches: sandy clay loam
H3 - 26 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 6.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: C
Ecological site: Sandy (R030XF012CA)
Hydric soil rating: No

Minor Components

Nebona

Percent of map unit: 5 percent
Hydric soil rating: No

Cuddeback

Percent of map unit: 5 percent
Hydric soil rating: No

Mohave variant

Percent of map unit: 3 percent
Hydric soil rating: No

155—PITS

Map Unit Composition

Pits: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits

Setting

Landform: Alluvial fans, stream terraces
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank, side slope, tread
Down-slope shape: Linear
Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Arizo

Percent of map unit: 5 percent
Hydric soil rating: No

Cajon

Percent of map unit: 3 percent
Hydric soil rating: No

Yermo

Percent of map unit: 2 percent
Hydric soil rating: No

Riverwash

Percent of map unit: 2 percent
Landform: Channels
Hydric soil rating: Yes

Trigger

Percent of map unit: 1 percent
Hydric soil rating: No

Sparkhule

Percent of map unit: 1 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 1 percent
Hydric soil rating: No

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