# APPENDIX 5.4 BIG-1

## BIOLOGICAL RESOURCES TECHNICAL REPORT

# APPENDIX 5.4 BIG-1

## BIOLOGICAL RESOURCES TECHNICAL REPORT

*PART 1

# *Appendix 5.4 BIG-1: Barstow International Gateway Biological Resources Technical Report*

**November 2025**

# TABLE OF CONTENTS

**1.0 EXECUTIVE SUMMARY ..... 1**

**2.0 PROJECT SUMMARY ..... 3**

2.1 Project Location and Setting ..... 3
2.2 Project Components ..... 10
Rail Yard ..... 10
Off-Site Improvements ..... 18
Maintenance Activities ..... 20
2.3 Project Construction Activities and Phasing ..... 20
Demolition and Grading ..... 21
Construction of Rail Yard (Intermodal Facility and Block Swap Yard) ..... 22
Solar Farm Construction ..... 22
Construction of Transload Warehouse Center ..... 23
Construction of On-Site Bridges and Roadway Improvements ..... 23
Construction of Off-Site Rail Improvements ..... 23
Construction of Off-Site Non-Rail Improvements ..... 23

**3.0 LAWS, REGULATIONS, AND ORDERS ..... 24**

3.1 Federal ..... 24
Federal Endangered Species Act ..... 24
Fish and Wildlife Coordination Act ..... 24
Migratory Bird Treaty Act ..... 24
Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds ..... 25
Bald and Golden Eagle Protection Act ..... 25
Clean Water Act, Section 404 ..... 25
Clean Water Act, Section 402 ..... 25
Clean Water Act, Section 401 ..... 25
Executive Order 11990: Protection of Wetlands ..... 26
Executive Order 13112: Invasive Species ..... 26
West Mojave Plan ..... 26
3.2 State ..... 26
California Endangered Species Act ..... 26
Natural Community Conservation Planning Act ..... 27
California Fish and Game Code Sections 1600-1602 ..... 27
California Fish and Game Code Sections 4000-4012 (Furbearing Mammal) ..... 27

California Fish and Game Code Sections 3503, 3511, 3513, 3801, 4700, 5050, 5515, and 2081.15 (Fully Protected Species) ..... 27
California Desert Native Plants Act ..... 27
California Native Plant Protection Act ..... 28
Porter-Cologne Water Quality Control Act ..... 28
3.3 Regional and Local ..... 28
San Bernardino County Burrowing Owl Overlay Zone ..... 28
San Bernardino County General Plan ..... 29
San Bernardino County Code ..... 29
City of Barstow 2020 General Plan ..... 30
**4.0 METHODS FOR EVALUATING EFFECTS ..... 31**
4.1 Literature Review ..... 33
4.2 Vegetation Mapping, General Biological Surveys, and Habitat Assessments ..... 34
4.3 Aquatic Resources Delineation ..... 35
4.4 Special-Status Species Surveys ..... 36
Desert Tortoise Surveys ..... 37
Least Bell's Vireo Surveys ..... 38
Mojave Fringe-Toed Lizard Surveys ..... 38
Mohave Ground Squirrel Surveys ..... 39
Southwestern Willow Flycatcher Surveys ..... 39
Bat Habitat Assessment and Anabat Surveys ..... 39
Swainson's Hawk Surveys ..... 40
Western Burrowing Owl Surveys ..... 40
Western Yellow-Billed Cuckoo Surveys ..... 41
Special-Status Plant Species Surveys and Reference Population Checks ..... 41
4.5 Wildlife Corridors ..... 43
CEHC Project – Essential Connectivity Area and Potential Riparian Connections ..... 44
Terrestrial Connectivity ACE ..... 44
California Desert Connectivity Project - Desert Linkage Corridors ..... 45
Missing Linkages in California's Landscape ..... 45
Wildlife Movement Camera Study ..... 45
4.6 Impact Analysis ..... 47
4.7 Determining Significance under California Environmental Quality Act ..... 47
**5.0 ENVIRONMENTAL SETTING ..... 49**
5.1 Physical Setting ..... 49

Historical Land Use ..... 49
Surrounding Land Use ..... 49
5.2 Vegetation Communities and Land Covers ..... 50
5.3 Ambrosia dumosa Shrubland Alliance ..... 52
5.4 Atriplex canescens Shrubland Alliance ..... 52
5.5 Atriplex canescens Shrubland Alliance – Disturbed ..... 53
5.6 Atriplex polycarpa Shrubland Alliance ..... 53
5.7 Atriplex polycarpa Shrubland Alliance – Disturbed ..... 54
5.8 Brassica tournefortii – Malcolmia africana Provisional Herbaceous Semi-natural Alliance ..... 54
5.9 Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance ..... 55
5.10 Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Disturbed/Stabilized ..... 56
5.11 Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Partially Stabilized ..... 56
5.12 Larrea tridentata – Ambrosia dumosa Shrubland Alliance ..... 57
5.13 Larrea tridentata – Ambrosia dumosa Shrubland Alliance – Disturbed ..... 58
5.14 Larrea tridentata Shrubland Alliance ..... 58
5.15 Larrea tridentata Shrubland Alliance – Disturbed ..... 59
5.16 Tamarix spp. Shrubland Semi-natural Alliance ..... 59
5.17 Unvegetated Channel ..... 59
5.18 Developed Land ..... 60
5.19 Disturbed Habitat ..... 60
5.20 Soils 61
5.21 Hydrology ..... 66
5.22 Jurisdictional Aquatic Resources ..... 67
5.23 Plants and Wildlife ..... 68
Special-Status Plant Species ..... 68
Special-Status Wildlife Species ..... 81
Critical Habitat ..... 118
Wildlife Corridors ..... 118
**6.0 IMPACT ANALYSIS ..... 123**
**7.0 CUMULATIVE IMPACTS ON BIOLOGICAL RESOURCES ..... 171**
**8.0 MITIGATION MEASURES ..... 171**
Mitigation Measures ..... 171
**9.0 REFERENCES ..... 195**

## TABLES

Table 1: Existing Land Uses ..... 4
Table 2: BIG Intermodal Facility Structures ..... 11
Table 3: BIG Construction Schedule ..... 21

Table 4: CWP Policy Plan Relevant Goals and Policies ..... 29
Table 5: 2020 General Plan Relevant Goals and Policies ..... 30
Table 6: Summary of Surveys Conducted for BIG ..... 32
Table 7: CRPR Definitions ..... 41
Table 8: Summary of Vegetation Communities and Land Covers within BIG ..... 51
Table 9: Soils Mapped within BIG ..... 62
Table 10: Total Acreages of Delineated Aquatic Resources within BIG Aquatic Resources Delineation Report Review Area ..... 67
Table 11: Special-Status Plant Species Potential to Occur within BIG ..... 70
Table 12: Special-Status Plant Species 2023-2025 Reference Population Check or Botanical Record Results ..... 74
Table 13: Special-Status Wildlife Species with Potential to Occur within BIG ..... 83
Table 14: BIG Vegetation Community/Land Cover Impacts ..... 161
Table 15: Potential Aquatic Resource Impacts ..... 164

## FIGURES

Figure 1: Regional Vicinity Map ..... 5
Figure 2: Local Vicinity Map ..... 6
Figure 3: Barstow International Gateway Conceptual Site Plan ..... 7
Figure 4: BIG Offsite Improvements, West ..... 8
Figure 5: BIG Off-Site Improvements, East ..... 9
Figure 3.1-1. CNDDB Plants and Wildlife
Figure 3.1-2. USFWS Plants and Wildlife
Figure 3.1-3. National Wetland Inventory
Figure 3.1-4. National Hydrography Dataset
Figure 3.5-1. Wildlife Corridors and CEHC Project
Figure 4.2-1. Vegetation
Figure 4.3-1. Soils
Figure 4.4-1. Watersheds
Figure 4.5-1. USACE/RWQCB Jurisdictional Aquatic Resources
Figure 4.5-2. CDFW Jurisdictional Aquatic Resources
Figure 4.6-1. Special-Status Plants Survey Results
Figure 4.6-2. Desert Tortoise Survey Results
Figure 4.6-3. Riparian Birds Survey Results
Figure 4.6-4. Swainson's Hawk Survey Results
Figure 4.6-5. Mohave Ground Squirrel Trapping Locations
Figure 4.6-6. Western Burrowing Owl Survey Results

Figure 4.6-7. Mojave Fringe-Toed Lizard Survey Results

Figure 4.6-8. Other Special-Status Species Observations

Figure 4.7-1A. Wildlife Movement Study – Period 1

Figure 4.7-1B. Wildlife Movement Study – Period 2

Figure 4.7-1C. Wildlife Movement Study – Period 3

Figure 4.7-1D. Wildlife Movement Study – Period 4

Figure 4.7-1E. Wildlife Movement Study – Period 5

Figure 4.7-1F. Wildlife Movement Study – Period 6

Figure 5.1-1. Special-Status Plant Impacts

Figure 5.1-2. Desert Tortoise Impacts

Figure 5.1-3. Riparian Birds Impacts

Figure 5.1-4. Swainson's Hawk Impacts

Figure 5.1-5. Swainson's Hawk Foraging Habitat

Figure 5.1-6. Western Burrowing Owl Impacts

Figure 5.1-7. Mojave Fringe-Toed Lizard Impacts

Figure 5.2-1. Vegetation Impacts

Figure 5.3-1. USACE/RWQCB Jurisdictional Aquatic Resources Impacts

Figure 5.3-2. CDFW Jurisdictional Aquatic Resources Impacts

Figure 5.4-1. Wildlife Corridor Impacts

## ATTACHMENTS

Attachment A - Site Photographs

Attachment B - Plant and Wildlife Species Observed within the Barstow International Gateway Project Site

Attachment C - Barstow International Gateway (BIG) Project August 2025 Aquatic Resources Delineation Report (ARDR) Addendum

Attachment D - Burrowing Owl Survey Results Passes 1 and 2 BNSF Alternatives Feasibility Assessment, Barstow, California, December 2021

Attachment E - Burrowing Owl Survey Results Passes 3 and 4 BNSF Alternatives Feasibility Assessment, Barstow, California, February 2021

Attachment F - Focused Burrowing owl Survey Report 345, 172, and 246 Acres BNSF Alternatives Feasibility Assessment, Barstow, California, August 2022

Attachment G - Burrowing Owl Survey Report – 2023 Breeding Season – Barstow International Gateway

Attachment H - Results of Focused Burrowing Owl Surveys for the Barstow International Gateway – Tortilla Substation Project, Barstow, San Bernardino County, California

Attachment I - Barstow International Gateway - East Solar Farm Project Protocol Presence/ Absence 2024 Survey Report for Burrowing Owl (Athene cunicularia)

Attachment J - Desert Tortoise Presence/ Absence Survey Report, BNSF Alternatives Feasibility Assessment, Barstow, California, December 2021

Attachment K - Desert Tortoise Presence/ Absence Survey Report, BNSF Alternatives Feasibility Assessment, Barstow, California, March 2022

Attachment L - Desert Tortoise Presence/ Absence Survey Report, BNSF Alternatives Feasibility Assessment, Barstow, California, June 2022

Attachment M - Desert Tortoise Presence/ Absence Survey Report, BNSF Alternatives Feasibility Assessment, 246 Acres – Barstow, California, August 2022

Attachment N - Protocol Desert Tortoise Survey Results for the Barstow International Gateway Project in and adjacent to Barstow, San Bernardino County, California

Attachment O - Protocol Desert Tortoise Survey Results for the Tortilla Substation Project in Barstow, San Bernardino County, California

Attachment P - Protocol Desert Tortoise Survey Results for the Barstow International Gateway – Solar East and Additional Project Areas in and adjacent to Barstow, California

Attachment Q - Desert Tortoise Survey Report - Barstow International Gateway Project

Attachment R - 45-Day Report for Least Bell's Vireo Surveys for the BNSF Barstow International Gateway Project, San Bernardino County, California, August 2021

Attachment S - Focused Presence/ Absence Survey for Least Bell's Vireo, Communities of Lenwood and Hodge, San Bernardino County, California September 26, 2022

Attachment T - 2023 Focused Presence/ Absence Survey for Least Bell's Vireo, Barstow International Gateway, Community of Hodge, San Bernardino County, California

Attachment U - Mohave Ground Squirrel Habitat Assessment, BNSF Railway Company (BNSF) Barstow International Gateway (BIG) Project, Phil Brylski, Ph.D., February 22, 2022

Attachment V - Mohave Ground Squirrel Survey for the BNSF Barstow International Gateway (BIG) Project, San Bernardino County, California, Phil Brylski, Ph.D., December 27, 2022

Attachment W - 2025 Mohave Ground Squirrel Survey for the BNSF Barstow International Gateway (BIG) Project, San Bernardino County, California, Phil Brylski, Ph.D.

Attachment X - Bat Assessment at the Barstow International Gateway Project

Attachment Y - Focused Presence/ Absence Survey for Southwestern Willow Flycatcher, Communities of Lenwood and Hodge, San Bernardino County, California, August 4, 2021

Attachment Z - Focused Presence/ Absence Survey for Southwestern Willow Flycatcher, Communities of Lenwood and Hodge, San Bernardino County, California, September 20, 2022

Attachment AA - 2023 Focused Presence/ Absence Survey for Southwestern Willow Flycatcher, Barstow International Gateway, Community of Hodge, San Bernardino County, California

Attachment BB - Barstow International Gateway Project Protocol Presence/Absence 2024 Survey Report for Swainson's Hawk (Buteo swainsoni)

Attachment CC - Barstow International Gateway Project Protocol Presence/Absence 2025 Survey Report for Swainson's Hawk (Buteo swainsoni)

Attachment DD - Focused Presence/ Absence Survey for Yellow-Billed Cuckoo, Barstow International Gateway, Communities of Lenwood and Hodge, San Bernardino County, California, October 13, 2022

Attachment EE - 2023 Focused Presence/ Absence Survey for Yellow-Billed Cuckoo, Barstow International Gateway, Community of Hodge, San Bernardino County, California

Attachment FF - Barstow International Gateway Project Western Joshua Tree Census Report

Attachment GG - Barstow International Gateway Project - Wildlife Movement Study and Camera Trapping Report

Attachment HH - Aquatic Resource Impacts Summary Tables

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACE | Area of Conservation Emphasis |
| ACEC | Area of Critical Environmental Concern |
| APLIC | Avian Power Line Interaction Committee |
| Barstow/City | City of Barstow |
| County | Unincorporated areas of San Bernadino County |
| BCC | Bird of Conservation Concern |
| BIG | Barstow International Gateway |
| BIOS | Biogeographic Information and Observation System |
| BLM | Bureau of Land Management |
| BMP | Best Management Practices |
| BNSF | BNSF Railway Company |
| CCR | California Code of Regulations |
| CDFW | California Department of Fish and Wildlife |
| CEHC | California Essential Habitat Connectivity |
| CESA | California Endangered Species Act |
| CEQA | California Environmental Quality Act |
| CFGC | California Fish and Game Code |
| CMP | Compensatory Mitigation Plan |
| CNDDB | California Natural Diversity Database |
| CNPS | California Native Plant Society |
| County | San Bernardino County |
| CRPR | California Rare Plant Rank |
| CWA | Clean Water Act |
| CWP | Countywide Plan |
| dBA | A-weighted decibels |
| EIR | environmental impact report |
| FAC | Food and Agriculture Code |
| FBM | Furbearing Mammal |
| FE | Federally Endangered |
| FESA/ESA | federal Endangered Species Act |
| FP | Fully Protected |
| FT | Federally Threatened |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HCP | habitat conservation plan |
| HUC | Hydrologic Unit CodeA |

| | |
|---|---|
| IP | Individual Permit |
| IPaC | Information for Planning and Consultation |
| kV | Kilovolta |
| LRWQCB | Lahontan Regional Water Quality Control Board |
| MBTA | Migratory Bird Treaty Act |
| MCV2 | The Manual of California Vegetation, 2nd Edition |
| MM | mitigation measure |
| MP | Mile Post |
| NCCP | Natural Community Conservation Plan |
| NPPA | Native Plant Protection Act |
| NRCS | National Resources Conservation Service |
| RBC | Rocks Biological Consulting |
| RWQCB | Regional Water Quality Control Board |
| SE | State Endangered |
| SSC | Species of Special Concern |
| ST | State Threatened |
| SWRCB | State Water Resources Control Board |
| USACE | U.S. Corps of Engineers |
| U.S.C. | U.S. Code |
| USDA | United States Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| WEAP | Worker Environmental Awareness Program |
| WJTCA | Western Joshua Tree Conservation Act |
| WL | Watch List |
| WMP | West Mojave Plan |
| WQC | Water Quality Certification |

# 1.0 EXECUTIVE SUMMARY

This Biological Resources Technical Report for the proposed BNSF Railway Company (BNSF) Barstow International Gateway (BIG) Project provides an evaluation of the biological and aquatic resources potentially affected by BIG. Rocks Biological Consulting (RBC) has prepared this Biological Resources Technical Report to support documentation for compliance with the California Environmental Quality Act (CEQA), the federal Endangered Species Act (FESA), the California Endangered Species Act (CESA), Sections 404 and 401 of the Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act, California Fish and Game Code (CFGC) § 1600 et seq., and other regulations that pertain to biological and aquatic resources.

BIG supports a limited diversity of vegetation communities and a low to moderate diversity of plant and wildlife species, including 183 plant species, 12 invertebrate species, 14 reptile species, 102 bird species, and 17 mammal species.

One federally and state-listed as threatened species, desert tortoise (*Gopherus agassizii*), was observed within BIG during focused surveys. One federally threatened and state-listed as endangered species, western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), was observed adjacent BIG during focused surveys. The state-listed as endangered willow flycatcher (*Empidonax traillii*) was documented adjacent BIG during 2022 focused surveys; at that time, it could not be confirmed as the federally listed as endangered subspecies southwestern willow flycatcher (*E. t. extimus*). The state-listed as threatened tricolored blackbird (*Agelaius tricolor*) was observed adjacent BIG during focused riparian bird surveys in 2023. The state-listed as threatened Swainson's hawk (*Buteo swainsoni*) was also observed flying over BIG during surveys conducted in 2023 through 2025; an active nest was documented within one mile from BIG in 2024 and 2025. Western burrowing owl (*Athene cunicularia* ssp. *hypugaea*), a candidate for listing under CESA, was also documented on site during the 2021-2022 and 2024-2025 non-breeding season; however, western burrowing owl has not been observed breeding on site. No other federally or state-listed endangered or threatened wildlife species were documented within BIG during general or focused surveys. Focused surveys for least Bell's vireo (*Vireo bellii pusillus*) were negative. Focused surveys for Mohave ground squirrel (*Xerospermophilus mohavensis*) were negative in 2022 and 2025. Focused surveys for special-status plant species were negative for federally and state-listed and California Rare Plant Rank (CRPR) 1 and 2 plant species, with the exception of western Joshua tree (*Yucca brevifolia*) present as ornamental plantings. Additional special-status plant surveys will be conducted in spring 2026 for the off-site 33 kilovolt (kV) alignment corridor.

Twenty non-listed special-status wildlife species were documented within BIG and surrounding areas during general and focused surveys, including: Mojave fringe-toed lizard (*Uma scoparia*), Bell's sparrow (*Artemisiospiza belli*), black-tailed gnatcatcher (*Polioptila melanura*), Cooper's hawk (*Accipiter cooperii*), Costa's hummingbird (*Calypte costae*), golden eagle (*Aquila chrysaetos*), Le Conte's thrasher (*Toxostoma lecontei*), loggerhead shrike (*Lanius ludovicianus*), long-eared owl (*Asio otus*), Lucy's warbler (*Leiothlypis luciae*), northern harrier (*Circus hudsonius*), olive-sided flycatcher (*Contopus cooperii*), osprey (*Pandion haliaetus*), prairie falcon (*Falco mexicanus*), sharp-shinned hawk (*Accipiter striatus*), tricolored blackbird (*Agelaius tricolor*), vermillion flycatcher (*Pyrocephalus rubinus*), yellow warbler (*Setophaga petechia*),

American beaver (*Castor canadensis*), and desert kit fox (*Vulpes macrotis arsipus*). Though not observed within BIG, there is a moderate to high potential for ferruginous hawk (*Buteo regalis*), merlin (*Falco columbarius*), yellow-breasted chat (*Icteria virens*), American badger (*Taxidea taxus*), California leaf-nosed bat (*Macrotus californicus*), pallid bat (*Antrozous pallidus*), Townsend's big eared bat (*Corynorhinus townsendii*), and Yuma myotis (*Myotis yumanensis*) to occur within BIG.

BIG supports approximately 142.79 acres (259,504 linear feet) of potential non-wetland waters of the U.S./State jurisdictional by the U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB), respectively, and approximately 594.43 acres of unvegetated streambed, 58.98 acres of vegetated streambed (259,504 linear feet of vegetated and unvegetated streambed combined), and 62.97 acres of watercourse jurisdictional by the California Department of Fish and Wildlife (CDFW). No Section 10 navigable waters of the U.S. were identified within BIG (33 U.S. Code [U.S.C.] § 403).

No U.S. Fish and Wildlife Service (USFWS)-designated critical habitat is present within BIG; however, critical habitat for desert tortoise occurs within 3 miles of BIG. Five wildlife movement corridors are mapped within BIG, including a California Essential Habitat Connectivity (CEHC) Essential Connectivity Area, Terrestrial Connectivity Area of Conservation Emphasis (ACE), CEHC Potential Riparian Connection, and California Desert Linkage Network, and the Mojave River – Barstow/Camp Cody.

Mitigation measures (MMs) for potential impacts on sensitive biological and aquatic resources would avoid, minimize, or reduce the potential direct and indirect impacts on biological and aquatic resources identified within this report. The successful incorporation of MMs would substantially decrease BIG's degree of effects on sensitive biological and aquatic resources.

# 2.0 PROJECT SUMMARY

This Biological Resources Technical Report has been prepared to analyze the proposed Barstow International Gateway ("BIG") and associated off-site improvements. BIG is located in the City of Barstow ("City") and in unincorporated territory in the County of San Bernardino ("County"), California (see **Figure 1: Regional Vicinity Map** and **Figure 2: Local Vicinity Map**). BIG consists of a rail yard with an intermodal facility[1] and "block swap" facility[2], a transload warehouse center[3], and a solar farm.

Additionally, to serve the proposed rail yard and transload warehouse center, BNSF Railway Company (BNSF) proposes off-site rail improvements (including lead track extensions), and off-site non-rail improvements (including drainage, utilities, and roadways).

BIG's proposed components are depicted on **Figure 3: Barstow International Gateway Conceptual Site Plan** and **Figure 4: BIG Offsite Improvements, West** and off-site improvements are depicted on **Figure 5: BIG Off-Site Improvements, East**.

## 2.1 Project Location and Setting

BIG totals approximately 5,000 acres[4], and includes approximately 680 acres which would remain ungraded/undisturbed ("Mojave River buffer area"). BIG's Specific Plan area totals approximately 4,300 acres and is generally bounded by the Mojave River to the north, Main Street (also referred to as National Trails Highway or Route 66) to the south, Lenwood Road to the east, and Hinkley Road to the west.

Most of the BIG footprint is within unincorporated County lands, while the remainder is within Barstow City limits. The BIG footprint is generally flat and gradually slopes north to the Mojave River. Off-site improvements are generally within existing BNSF rail and City/County street rights-of-way. The BIG footprint is primarily vacant undeveloped land, which is traversed by an existing BNSF railroad, and which contains scattered residential, commercial, and industrial land uses. This area is mostly devoid of tall vegetation and trees, with structures and other elements of the built environment scattered throughout. Existing land uses within BIG's footprint are listed in **Table 1: Existing Land Uses**. There are approximately 108 dwelling units and approximately 94,000 square feet of non-residential land uses (i.e., commercial and industrial) within the BIG footprint. Additionally, a private airstrip ("Depue Airport") is within BIG's proposed solar farm footprint. Under BIG, this private airstrip would be demolished and replaced with the proposed solar farm.

[1] "Intermodal facility" refers to a rail yard where containerized goods are transferred between trains and trucks. Trucks arrive to either pick up containers from arriving trains or deliver containers for departing trains. However, unlike traditional intermodal facilities, at BIG the majority of containers would arrive by train and be transferred to and from electric hostlers.

[2] "Block Swap" refers to transferring a block of intermodal train cars between trains. In effect, the entire block of cars remains coupled together and is moved en masse to another train.

[3] "Transload" refers to the transfer of goods from one container to another. In this document, it specifically refers to the transfer of goods from 40-foot international containers to 53-foot domestic containers. The transload warehouse center at the BIG is designed to serve goods transported to and from the intermodal facility by rail.

[4] Although the BIG Specific Plan acreage is 4,335 acres, throughout this technical report, the BIG Specific Plan acreage is referred to as 4,300 acres. Note: all acreages in this report are preliminary and based on GIS data. Acreages will be refined with site survey.

| Table 1: Existing Land Uses | | | | | |
|---|---|---|---|---|---|
| **Description** | **Residential (DU)** | **Commercial (SF)** | **Industrial (SF)** | **TOTAL (DU)** | **TOTAL (SF)** |
| Existing Land Use | 108 | 85,887 | 7,837 | 108 | 93,724 |

Regional vehicular access to BIG is provided by Main Street from the south, Interstate-15 from the southeast, and State Route-58 from the east. Local access to BIG is primarily provided by Lenwood Road and Hinkley Road from the east and west, respectively, in addition to various unpaved roads along Main Street. Regional rail access is provided from the north by BNSF's Mojave subdivision, from the west by BNSF's Cajon subdivision, and from the east by BNSF's Needles subdivision.

**Figure 1: Regional Vicinity Map**

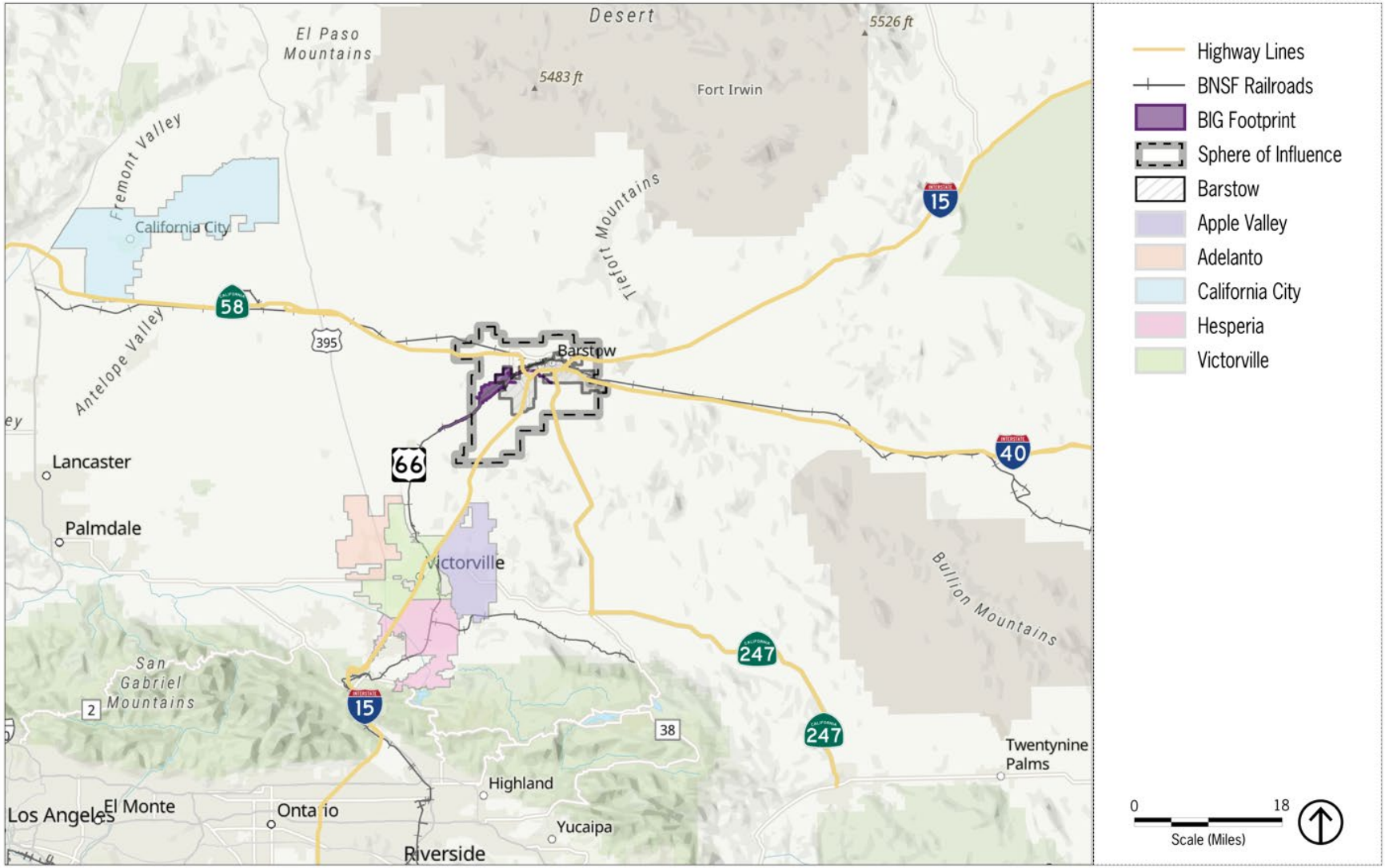


**Figure 2: Local Vicinity Map**

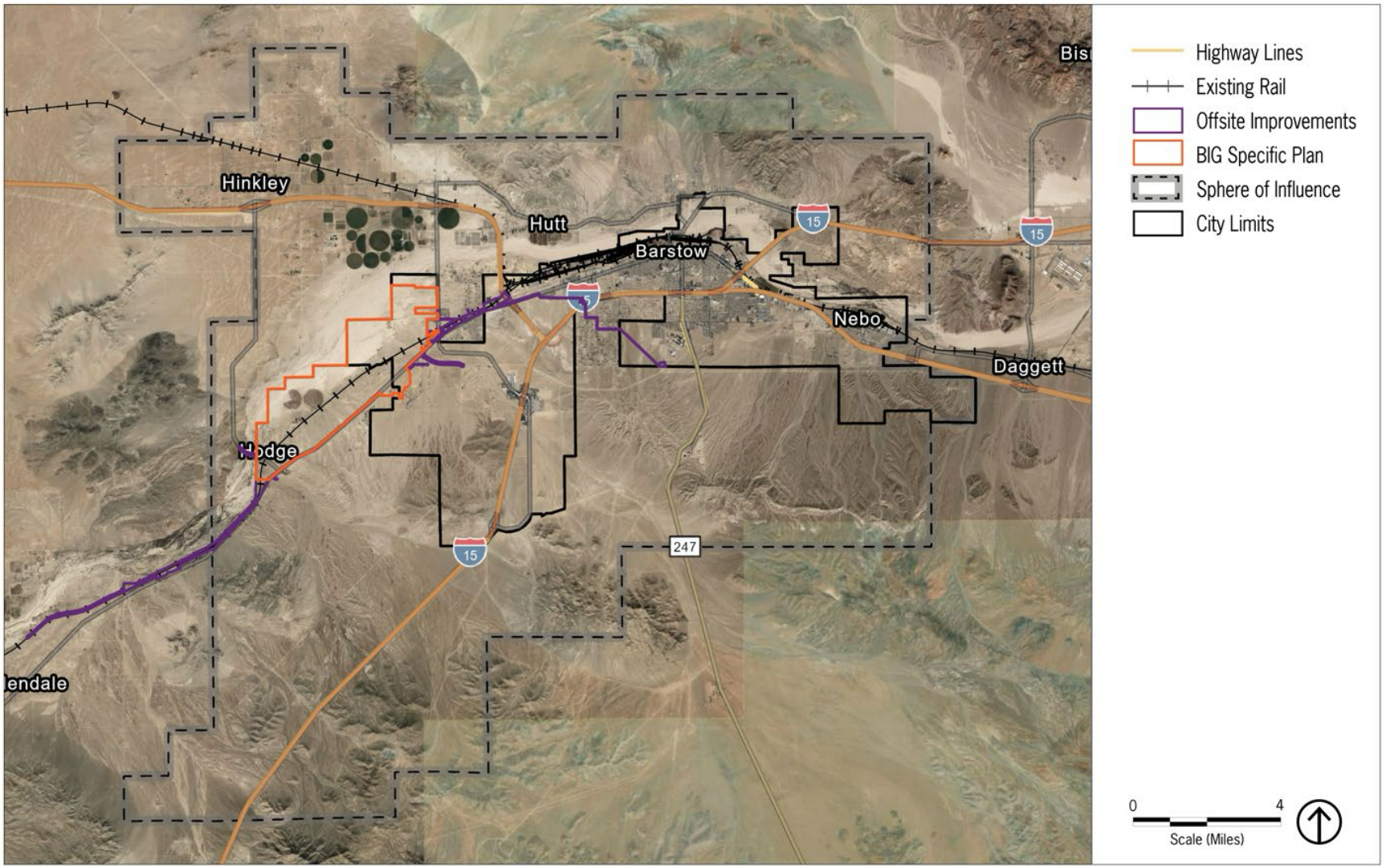


**Figure 3: Barstow International Gateway Conceptual Site Plan**

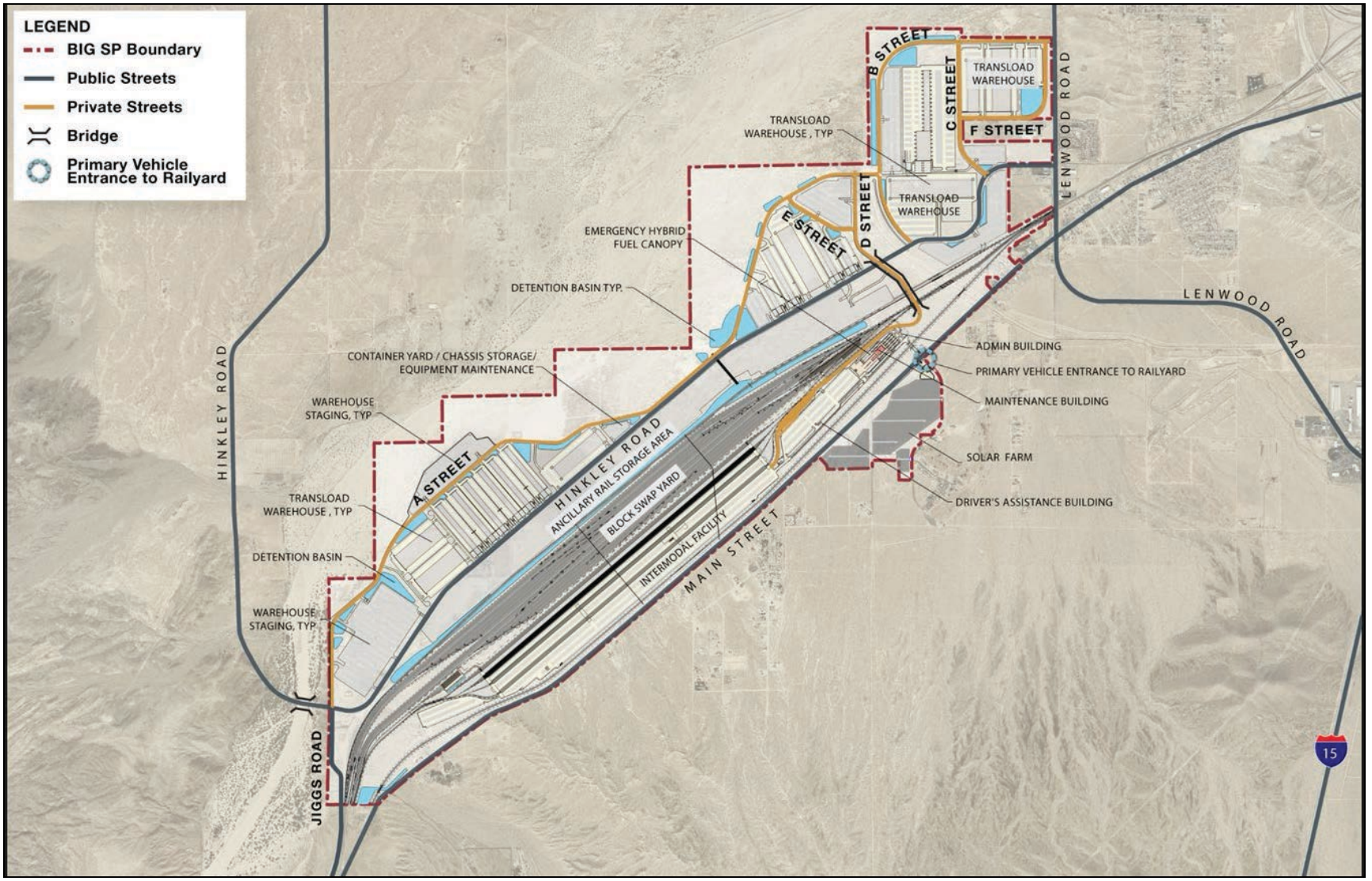


**Figure 4: BIG Off-Site Improvements, West**

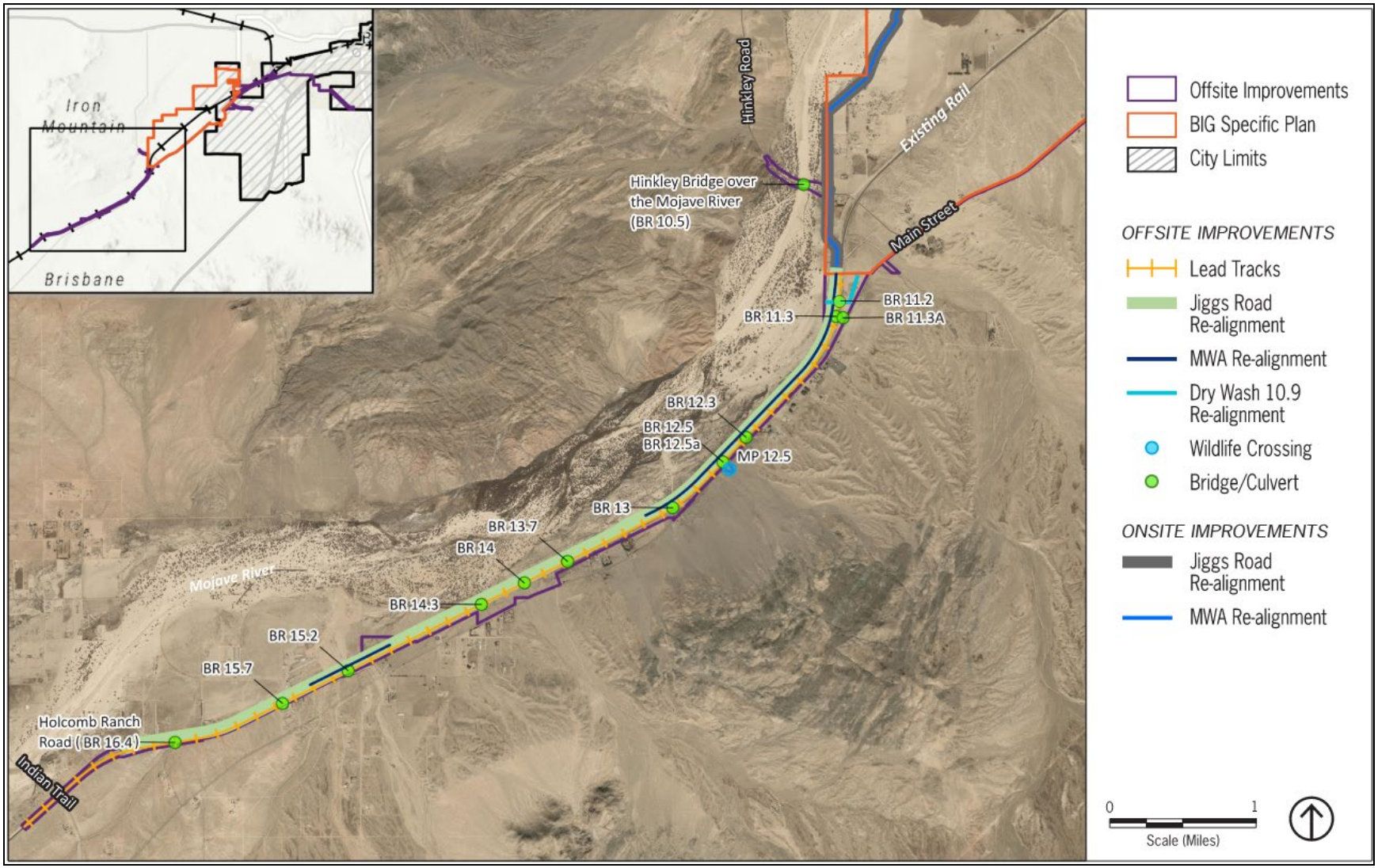
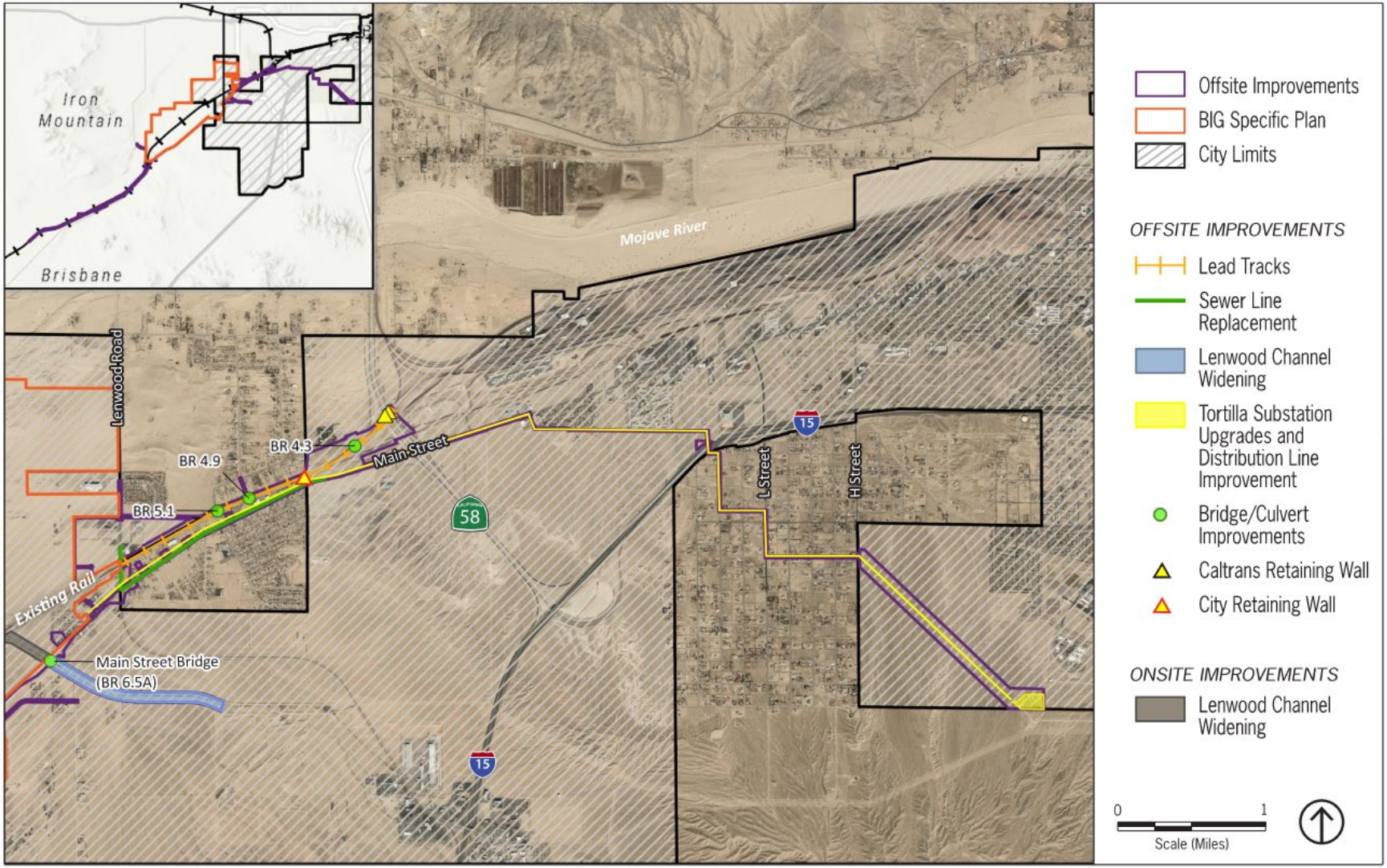


**Figure 5: BIG Off-Site Improvements, East**



## 2.2 Project Components

### *Rail Yard*

#### Overview

The rail yard would be generally bound by the existing mainline to the north, Main Street to the south, Lenwood Road to the east, and Hinkley Road to the west. The rail yard would consist of an intermodal facility (i.e., where cross-dock intermodal operations and other intermodal facility operations would occur and where support intermodal facility uses would be located), a block swap yard, and ancillary rail areas (i.e., container yard, chassis storage, and ancillary rail storage area), as described below.

BIG's proposed rail yard would operate 24 hours per day, 365 days per year. The rail yard would have approximately 860 employees during Opening Year (2028), 1,010 employees in Interim Year (2033), and 1,125 employees during Horizon Year (2048)[5], which would accommodate both the block swap yard and intermodal facility operations. Employees would be split evenly between three shifts.

While the block swap yard would change the number of trains that would arrive or depart BIG by optimizing for end destinations, it would not increase the number of containers. BIG's intermodal facility would, through the cross-dock intermodal operation, add a new volume to the BNSF network, totaling approximately 3.2 trains per day on average in 2028, approximately 4.3 trains per day on average in 2033, and approximately 4.9 trains per day on average in 2048. These train counts include eastbound and westbound trains, and as described elsewhere, trains between the Ports and the BIG intermodal facility would be comprised of dedicated Tier 4 locomotives.

#### Intermodal Facility

BIG's intermodal facility is proposed at the southern extent of the BIG Specific Plan area and its operations would consist of two types: cross-dock intermodal and "other" operations. BIG's intermodal facility would operate differently than typical intermodal facilities in that most of the containers processed at BIG intermodal facility would not arrive or leave externally by heavy-duty trucks. Instead, almost all of the containers would arrive or leave by train and be processed via BIG's unique "cross-dock intermodal" operation. The intermodal facility's primary purpose would be to transfer containers between railcars and electric hostlers[6] for cross-dock movements at the on-site proposed transload warehouse center, and vice versa, though a small portion would arrive by heavy-duty truck. The electric hostlers would be used to transport containers within the rail yard, and between the rail yard and transload warehouse center. The electric hostlers would be zero-emission and would not leave BIG. This differs from the operations at a traditional intermodal facility where the primary purpose is to transfer containers from heavy-duty trucks[7] to railcars, and vice versa (defined as "other" operations). BIG also includes a dedicated fleet of Tier 4 linehaul locomotives[8] to move containers between the Ports and the BIG intermodal facility.

[5] A "Horizon Year" is the last year of analysis. BIG's Horizon Year is 20 years after opening.
[6] Electric hostlers are trucks used for moving trailers and containers short distances within freight terminals, rail yards, and warehouses. Electric holsters would not use public roadways outside of BIG footprint.
[7] "Heavy-duty" trucks are conventional highway trucks that travel on public roads and carry containers intra- and inter-state.
[8] "Tier" refers to emissions standards set by regulatory agencies for engine emissions, with Tier 0 referring to the oldest and having the highest emissions, while Tier 4 is the latest, more stringent standard with the fewest emissions.

BIG's intermodal facility would be composed of various components including railroad tracks, cargo handling equipment, an automated gate system, circulation roadways, yard equipment parking, container parking, stormwater detention ponds, electric vehicle charging stations, and buildings and ancillary rail facilities. Containers would be stored in parking spaces and low stacks at the intermodal facility, along with the ancillary rail area, and transload warehouse center (each described further below). Although electric lift equipment would be utilized to the extent commercially feasible within BIG's intermodal facility, a small 5,000-square-foot fuel canopy would be constructed in the electric hostler maintenance area to accommodate fueling of hybrid equipment. Hybrid and diesel equipment would include rubber-tired gantry cranes, seven air compressors, welders, railcar wheel change machines, and heavy-duty truck transport refrigeration units. The fuel canopy would be served by a 10,000-gallon unleaded fuel aboveground storage tank and a 20,000-gallon diesel fuel aboveground storage tank, with both controlled by an electronic fuel control system. In addition, starting in BIG opening year 2028, BNSF would increase the renewable diesel composition within their existing southern California fueling sites, including the existing fueling sites at the Ports and Barstow classification yard from 1 percent to 10 percent, a 900 percentage point increase in renewable diesel. This would improve the emissions of all BNSF trains fueling at the Ports, including those BNSF trains that would not stop at BIG.

BIG's intermodal facility proposes approximately 134,000 square feet of support buildings and structures, as detailed in **Table 2: BIG Intermodal Facility Structures**. As described below, final building sizes may vary slightly, this EIR conservatively analyzes up to 150,000 SF of support buildings and structures.

**Table 2: BIG Intermodal Facility Structures**

| Building/Canopy | Square Footage |
|---|---|
| Administration Building | 23,000 |
| Electric Hostler Employee and Maintenance Building | 39,000 |
| Drivers Assist Building | 5,000 |
| Crane Maintenance Employee and Storage Building | 5,000 |
| Crane Maintenance Canopies | 22,500 |
| Container Safe Haven Canopies | 2,500 |
| Quick Repair Canopy | 10,000 |
| AGS Kiosk Canopies | 20,000 |
| AGS Portals | 2,000 |
| Emergency Fuel Station Canopy for Hybrid Vehicles | 5,000 |
| *Total* | *134,000* |
| *Assumed Building Total for Final Design* | *150,000* |

Note:
The square footage described is an estimate and may vary up to 10% depending on the final engineering, therefore, the total square footage for planning purposes is estimated at approximately 150,000 sf.

### Block Swap Yard

The block swap yard is proposed within the middle portion of the BIG Specific Plan area, on approximately 410 acres of the rail yard's total approximately 1,950 acres. The proposed block swap yard would allow for the transfer of multiple railcars, or "blocks" of intermodal rail cars between trains via Tier 4 switcher locomotives. A block is defined as rail cars of a similar type moving to a similar destination that are already connected and can be combined with other blocks intended for similar destinations to produce more

efficient train movements. The entire block of rail cars would remain coupled together and be moved en masse, permitting the synchronizing of blocks to their destinations, so that each train would be compiled of rail car blocks travelling to similar destinations. Blocks could be assembled from inbound trains or trains processed at the intermodal facility carrying containers processed at the transload warehouse center. Certain train blocks may stage at the block swap yard until another train arrives with similar destination. The block swap yard would facilitate switching and transfer of lengthy rail car blocks between tracks for assembling departing trains. Thus, by synchronizing trains to their destinations, the block swap yard would improve train efficiency eastbound and westbound. The rail car blocks within the block swap yard would include containers from BIG's intermodal facility and containers processed at the transload warehouse center, combining as needed based on their destination.

The block swap yard's function is unique compared to a typical classification yard, such as the existing Barstow classification yard. Classification yards are where trains being processed are made up of non-intermodal railcars (i.e., individual boxcars, gondolas, open and closed hopper cars, automobile railcars, and tank cars), rather than intermodal railcars. BNSF designates these types of trains with a different train identification than those that would be processed at BIG. Further, BNSF uses different equipment to process these trains than would be used at BIG. While there is a small intermodal facility component adjacent to the existing Barstow classification yard, that intermodal facility is only used to process overflow from other BNSF intermodal facilities. By contrast, BIG's block swap yard would disassemble and assemble lengthy blocks of railcars with intermodal containers to similar destinations utilizing Tier 4 switcher locomotives. The existing Barstow classification yard also utilizes switcher locomotives as part of its operations, although they are currently Tier 0/0+/1+ switchers. Starting in BIG opening year 2028, BNSF will voluntarily retire all existing Tier 0/0+/1+ switcher locomotives at the unrelated existing Barstow classification yard, and in their place add six Tier 4 switcher locomotives.

### Ancillary Rail Area

The ancillary rail storage area is an approximately 400-acre area north of the existing mainline and would be graded and covered with aggregate to be used for numerous purposes, including a container yard, truck chassis storage, and storage of maintenance equipment. A container yard would support the storage of empty containers awaiting loading while chassis storage would be used to provide parking for empty chassis awaiting use for loading, unloading, or draying of containers. The ancillary rail storage area would also be used for storage of spare parts and equipment for track maintenance, including rail, ties, turnouts, and other track material.

### Mainline Improvements

BIG would retain the existing two rail mainlines ("north mainlines") within their current alignments, except at bridge crossings, which would be upgraded. BIG also proposes to construct two new mainlines ("south mainlines"), which would traverse the proposed rail yard in an east-west orientation, extending from Lenwood Road on the east to Hinkley Road on the west. During the construction phase, the south mainlines would be used to divert train traffic from the existing mainlines while they are upgraded. During BIG operations, half of the trains which would bypass BIG would use the north mainlines and half would use the south mainlines to balance train counts between the mainlines. BIG would also upgrade various

bridge crossings including replacement of the crossing at Lenwood Channel to accommodate the proposed Lenwood Channel widening; removal of existing culverts[9] to accommodate proposed culverts for the overall rail yard; and replacement of two structures to meet BNSF standards regarding 50- and 100-year flood conditions.

### Transload Warehouse Center

The transload warehouse center is proposed at the northern extent of the BIG Specific Plan area, on approximately 1,330 acres of BIG SP's total approximately 4,300 acres. The transload warehouses would be designed to process the contents of containers from cross-dock intermodal operations, with a small percentage dedicated to processing the contents of containers that have a portion destined for the Inland Empire (the remainder of the container's contents would be placed on trains destined eastward). A small percentage of containers processed at the transload warehouse center would arrive/leave by heavy-duty trucks, primarily from/to the Inland Empire. The transload warehouse center would process most of the containers within an on-site "closed loop" operation between BIG's intermodal facility and the transload warehouse center. The transload warehouse center would include approximately 9.0 million square feet of transload warehouses. The transload warehouse center would be fully built during construction, but operations would gradually increase as customers relocate to BIG. Transload warehouse center operations would include approximately 2,767 employees in Opening Year, approximately 3,660 employees in Interim Year, and 4,248 employees in Horizon Year.

The transload warehouse center would be composed of multiple buildings of various configurations and sizes, depending on tenant needs. As such, **Figure 4** provides a conceptual site plan for illustrative purposes showing potential transload warehouse buildings, locations, and sizes. Final transload warehouse buildings, locations, and sizes may differ from those proposed and would be processed with the City, as development occurs. Each transload warehouse would include container parking/storage areas, employee parking, stormwater/hydrology improvements, and landscaping. Finally, emergency generators are proposed throughout the transload warehouse center to provide electric power in the event of a power outage.

There would also be several areas distributed around the transload warehouse center, adding up to approximately 275 acres, for staging/overflow parking of containers accessing the transload warehouse center. These warehouse staging areas would be for truck containers only; truck "hoteling"[10] would not occur, as electric hostlers would transfer containers to/from these areas, thus, heavy-duty truck trailers would not enter or exit these areas.

### Hydrology/Stormwater Drainage Improvements

BIG would construct various infiltration basins and drainage outlets to the Mojave River that would be designed for 100-year flood events. Preliminarily, BIG proposes detention ponds of various sizes throughout BIG footprint totaling approximately 165 acre-feet of storage volume, which would accommodate the 100-year flood conditions.

[9] Culverts are drainage features, typically a pipe or arch, used to convey water under a road or rail tracks.
[10] Truck "hoteling" refers to when a heavy-duty truck parks for the driver to rest within the cab.

In addition to various ephemeral washes throughout BIG footprint, three other primary hydrologic features traverse BIG footprint, as detailed below.

**Unnamed Stream (Milepost 10.9):** This feature is a dry wash from Main Street to the Mojave River that includes a sharp western bend. This feature would be realigned to accommodate track mains, sidings, and support tracks and improved with a combination of bridges and box culverts spanning the channel (Bridge 10.9a and Bridge 11.2, respectively).

**Hinkley Road Bridge at Mojave River (Milepost 10.5):** The existing Hinkley Road Bridge, which the County owns and maintains, is at a narrowed section of the Mojave River and crosses via a concrete pier structure. Based on discussions with the County, the existing Hinkley Road Bridge over the Mojave River is experiencing structural issues and is at risk of being over-topped from seasonal flooding. Hydrology and hydraulic analyses have indicated the existing bridge is undersized. To maintain a roadway connection to Hinkley Road from the transload warehouse center, BIG proposes to replace the existing bridge with a longer structure to better match the channel width of the Mojave River at that location. The channel beneath, and immediately adjacent to, the existing bridge would be excavated and widened to match the natural channel width more closely. Portions of Hinkley Road immediately east and west of the bridge would be raised to reduce exposure to Mojave River flood events. These proposed improvements at Hinkley Road Bridge would reduce flooding compared to existing conditions. As part of the improvements, the existing at-grade crossing would be abandoned, and vehicles would instead utilize the proposed Hinkley Road extension through the transload warehouse center.

**Lenwood Channel (Milepost 6.5):** A portion of the BIG footprint along Lenwood Channel is currently within the FEMA 100-year flood zone due to existing flooding concerns. Lenwood Channel is a north-south earthen channel used to convey water from the southeast to the Mojave River and maintained by San Bernardino County Flood District. Lenwood Channel would be widened by approximately 60 to 100 feet throughout the Specific Plan area for a length of 1.1 miles, continuing offsite south of Main Street, for an additional 1 mile. The widened channel would improve flooding compared to existing conditions. Preliminary BIG design requires the Lenwood Channel to be spanned at three locations for additional track east leads, mains, and sidings, as well as three roadway crossings: Main Street, Hinkley Road, and the private road between the intermodal facility and transload warehouse center.

### Utility Improvements

To accommodate the proposed rail yard and transload warehouse center, BIG would require both relocations of existing facilities and construction of new/expanded facilities (i.e., water, wastewater, electric power, natural gas, and telecommunications). The utility improvements proposed within BIG's footprint are discussed below.

### Water

BIG's construction phase water demand includes non-potable water for construction activities and potable water for on-site construction workers. To provide non-potable water during the construction phase, up to eight new private on-site temporary groundwater wells would be constructed within BIG's transload warehouse center portion.

Temporary aboveground connections from Golden State Water Company existing mains within Main Street to BIG would be constructed to supply potable water to the construction sites. Additionally, Mojave Water Agency owns and operates a 48-inch recharge water line that crosses the BIG Specific Plan area. BIG proposes to relocate this existing line to the north to avoid conflict with rail yard and transload warehouse center improvements.

Operational potable water and fire flow water would be provided by directly connecting to facilities owned and operated by the Golden State Water Company. Fire flow would be supplemented by on-site water tanks and fire pumps if necessary to meet the fire flow requirements. Power to water tanks and fire pumps would be supported by the transload warehouse diesel backup generators in the case of an emergency. Water tanks would be placed entirely within the BIG footprint. The transload warehouse center would connect to an existing water main in Jasper Road on the east end of the BIG Specific Plan area. The rail yard would connect to an existing water main on the east end of the BIG Specific Plan area near Lenwood Road on the south side of Main Street. A new public 12- to 16-inch looped water main would be constructed from the existing connection in Main Street, extending west to the edge of rail yard, north to Hinkley Rd, and then continue east in Hinkley Road to the existing connection point near Lenwood Road. A second connection from the looped water main would be provided at the northeast corner of the Specific Plan at Lenwood Road. The new on-site public water mains total approximately 10 miles in length.

### Wastewater

BIG's construction-related wastewater generation would be from construction workers. Temporary portable facilities (i.e., portable restrooms and portable handwash stations) would be utilized during the construction phase.

BIG's operational wastewater generation would be from transload warehouse center and rail yard employees, and the rail yard wash bays and track pans. Wastewater generated by BIG would discharge to the City's existing wastewater system at three connection points. The transload warehouse center would discharge to the proposed new sewer main in Hinkley Road. A new 8-inch wastewater line is proposed within the Hinkley Road extension from the west end of the transload warehouse center to the northeast end of the transload warehouse center and would connect to the existing sewer main in Lenwood Road. Within the transload warehouse center, west of the Lenwood Channel, 8-inch lines would extend north in C Street to serve the transload warehouses connecting to Lenwood Road via B Street. The rail yard would include new wastewater lines and force mains at the southern portion of the rail yard, conveying wastewater to the east and connecting to the existing sanitary sewer main in Main Street near Country Club Drive. BIG's wastewater would be conveyed by gravity flow to and treated at the Barstow Regional Wastewater Treatment Facility (WWTF), which is owned and operated by the City. Wastewater conveyance and treatment would be coordinated with the City.

### Electrical Power

BIG construction activities would generate temporary electric power demand from construction equipment, tools, lighting, and other necessary facilities (e.g., temporary offices). The electric power for construction activities would be supplied through connections to existing Southern California Edison (SCE) facilities.

BIG operations would generate permanent electric power demand from the transload warehouse center (lighting, electric vehicle charging for material handling, and forklifts) and rail yard (lighting, buildings, cranes, and electric hostlers (used to move containers between the rail yard and the transload warehouse center). BIG operational electric power demand would be met through connecting to the SCE Tortilla Substation and supplemented with on-site electrical generation (i.e., an approximately 140-acre, approximately 21 megawatts solar power generation facility (i.e., solar farm), which is described further below. BIG proposes to construct the following on-site electric power facilities to serve BIG:

- Three substations: two substations at the eastern and western extents of the rail yard; and one substation within the solar farm.
- Additional 33kV distribution lines connecting via underground duct banks in a loop around the west end of the intermodal facility and north end of the transload warehouse center. These proposed 33KV distribution lines would total 23 miles of ductbank within the BIG Specific Plan area.
- An approximately 140-acre solar farm is proposed south of BIG rail yard, at the southwest corner of the Main Street at Country Club Drive intersection. The solar farm is estimated to generate approximately 21 megawatts to serve BIG. The solar farm would include a battery electric storage system and a new substation at the northwest corner to route power from the solar farm to BIG rail yard. The solar farm would be fenced to prevent trespass and would include internal roadways for maintenance vehicles. The solar farm would require minimal grading to level the site as existing topography is utilized wherever possible and excavation limited primarily to stormwater detention to capture runoff. Additionally, BIG would comply with CalGreen regulations requiring that rooftop solar generation be installed on the industrial warehouse rooftops (Title 24, Section 140.10). Based on 9.0 MSF of transload warehouse, BIG would include approximately 6.4 megawatts of rooftop solar generation for Title 24 compliance.
- Emergency diesel generators are proposed at various locations across the rail yard and transload warehouse center to provide backup power in the event of Tortilla Substation service interruptions. Rail yard generators would only be used if a power outage were to occur at nighttime, as the proposed solar farm would provide sufficient power during daytime in the event of a power outage. The rail yard would include up to 10 generators at the far western extent, while the transload warehouse center would include up to 29 generators dispersed throughout. Generators would require up to 50 hours of testing and maintenance operations per year.

Solar farm maintenance would consist of cleaning, inspecting, and replacing solar panels, equipment, and other system components. Maintenance trips associated with these activities would be limited to trucks transporting materials, equipment, and supplies to and from the farm. To maintain uninterrupted power generation for BIG, maintenance activities would occur incrementally. The solar farm would also require vegetative maintenance (e.g., mowing and weeding, and other grass control measures). No grading would occur during solar farm maintenance.

### Natural Gas

BIG construction activities would not require construction of new natural gas facilities, although protection in place or relocation of existing natural gas facilities would be required to accommodate BIG.

### Stormwater

To collect stormwater runoff, BIG proposes stormwater basins that would detain any stormwater in excess of predevelopment flows then discharge to existing drainageways through stormwater best management practices. BIG would include various outlets to the Mojave River. Exact sizing and locations of transload warehouse center basins would be dependent on final transload warehouse location, layout, and sizing. In addition, Lenwood Channel would be modified as discussed above.

### Solid Waste

BIG would result in solid waste generation from construction (demolition debris, broken or excess materials, packaging, and other construction waste), as well as during operations from the rail yard and transload warehouse center. BIG's solid waste would be collected within on-site trash bins and be disposed of at the Barstow Sanitary Landfill, with 65 percent being recycled (for instance, demolished concrete foundations can be crushed and re-used onsite as aggregate).

### Telecommunications

Telecommunication lines cross BIG footprint along Lenwood Road and along the southern edge of the existing tracks. Underground utilities may also be present. All underground communication facilities are assumed to have shallow depths except those crossing under existing features such as underpasses and creeks. Lines within BIG footprint may be relocated adjacent to/within existing and proposed rights of way or abandoned. In addition, BNSF Telecommunications would install approximately 12 communication towers with heights generally between 100 - 120 feet, though two communication towers would be 160 feet tall. Additionally, various existing telecommunications lines owned by Frontier Communications and Lumen would be removed from within BIG footprint, and, in their place, new communications line would be run beginning at the Jasper Road at Lenwood Road intersection, running to the western extent of the BIG Specific Plan area, and then running eastward back to Lenwood Road in a "loop."

### On-Site Circulation Improvements

BIG would include various on-site circulation improvements as discussed below.

**Hinkley Road Realignment**: BIG would vacate Hinkley Road between the south side of the Mojave River bridge crossing and Main Street, closing the existing at-grade rail crossing. Hinkley Road would be realigned beginning at the north side of the Mojave River bridge crossing to connect through the transload warehouse center to the Jasper Road/Lenwood Road intersection. Transload warehouse center employees and heavy-duty trucks destined for the transload warehouse center would enter from the Lenwood Road/Hinkley Road/Jasper Road intersection.

**Internal private roadways:** In addition to the realigned public Hinkley Road (discussed above), BIG would include four dedicated internal private roadways for electric hostlers (private streets A, B, D, and E), and two internal private roadways for employee, visitor, and truck access (private streets C and F).

**Country Club Drive:** Country Club Drive would be widened along the solar farm frontage for approximately 400 feet to the proposed realignment of Sweeten Lane. A new stop-controlled intersection is proposed at the Country Club Drive at Sweeten Lane intersection.

**Main Street**: Rail yard employees and heavy-duty trucks destined for the intermodal facility would enter BIG's rail yard from a new driveway on Main Street across from Country Club Road. Main Street would be widened from two lanes to four lanes for approximately 0.5 miles east of Country Club, resulting in a consistent four-lane roadway width through Barstow. Additionally, the existing two-lane Main Street over Lenwood Channel low water crossing would be replaced with a new four-lane bridge that accommodates the 100-year flood condition, substantially reducing the existing flood conditions. Main Street would be raised over Lenwood channel, modifying the vertical alignment of Main Street for approximately 0.8 mile. The intent of this design is to keep flood waters contained in Lenwood Channel and convey the flow to the Mojave River under the bridge at MP 6.5, avoiding the overflow of the bank that can occur under existing conditions.

To accommodate BIG, various on-site public rights-of-way within the City and unincorporated San Bernardino County would also need to be vacated.

## *Off-Site Improvements*

In addition to the on-site improvements described above, BIG also proposes off-site rail and non-rail improvements, as discussed below:

### Off-Site Rail Improvements

BIG proposes lead track extensions to the east of approximately two miles and lead track extensions to the west of approximately seven miles ("east lead track" and "west lead track"). These off-site rail improvements would be primarily within existing BNSF right-of-way. These improvements would enable trains to safely enter and exit the mainline at mainline speeds, rather than slower "yard" speeds and risk fouling the track.[11] BIG east and west lead tracks would require modifications to existing culverts within the footprint; see also *Stormwater Drainage* discussion below.

### Off-Site Non-Rail Improvements

BIG proposes ancillary and related stormwater drainage, utility (i.e., water, sewer, electric power, natural gas, and telecommunications), and circulation/roadway improvements and modifications, described below.

**Water**. North of transload warehouse center, an existing Mojave Water Agency 48-inch recharge line would be relocated. The relocated line would stretch along the north side of the transload warehouse center to the west end of the BIG Specific Plan area, then continue along the north side of the mainline and lead tracks for a total of 8.3 miles.

[11] "Fouling the track" means the placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or on-track equipment, or in any case is within four feet of the field side of the near running rail (49 CFR Part 214). When a rail network becomes congested, trains can foul the track by moving slower than a train behind them.

**Wastewater.** An existing approximately 27-inch sanitary sewer line is within existing BNSF ROW for approximately 1.6 miles between Lenwood Road and Pettit Road. This line includes multiple north/south lateral connections to serve the land uses between Main Street and the existing BNSF tracks. BIG would relocate this line at Phillips Street south to within Main Street. Additionally, the transload warehouse center will connect to City sewer via a new 27-inch sewer line within Jasper Road extending to north of Paris Avenue.

**Electric Power**. Electrical demand would be handled through connecting to the Southern California Edison Tortilla Substation, located approximately 0.4 mile south of the Veterans Parkway at Diamond Avenue intersection. Three underground duct banks with electrical conductors would connect BIG to the Tortilla Substation utilizing existing franchise agreements with the City and County on a route following Main Street, Sunrise Road, N Street, and Bonanza Road before utilizing existing easements between Bonanza Road and the substation. This proposed 33KV distribution route would extend approximately 7.1 miles underground from the Tortilla Substation to the intermodal facility's eastern extent at Country Club drive, then continue overhead approximately 3.5 miles from Country Club Drive to approximately Hinkley Road. For the 33kv line segment from Tortilla Substation to BIG, the 33kv circuits would be in underground utility lines resulting in an approximately 30-foot-wide disturbance to account for construction access and temporary spoils. From Tortilla substation to H Street (approximately 1.2 miles), the 33kv conduit could occur within a 450-foot-wide corridor, inclusive of the existing 150-foot wide SCE easement along Bonanza Road. However, the exact alignment is presently unknown and is being coordinated with SCE. Therefore, this EIR analyzes an approximately 30-foot wide disturbance within the 450-feet wide corridor ("33kv distribution corridor"). This EIR analyzes the "worst-case" environmental impacts within the 33kv distribution corridor. SCE would make modifications, which include constructing new feeders and new power distribution lines. Within the Tortilla Substation's existing fence line, SCE would also make modifications to supply the new feeders from their existing 115kV-33kV transformers. Various off-site existing electric power lines could be relocated, modified, or extended to accommodate BIG improvements.

**Natural Gas.** Various off-site existing natural gas lines could be relocated to accommodate BIG improvements.

**Telecommunications.** No off-site telecommunications improvements are proposed. Various minor existing telecommunications lines would be relocated toward the eastern end of the lead track improvements. Existing telecommunications lines passing through the intermodal facility and block swap yard would be relocated to the north side of the Main Street ROW.

**Stormwater Drainage.** As described above, the Lenwood Channel widening would continue offsite, south of Main Street. It would be widened by approximately 60 to 100 feet for a total of approximately 2.1 miles (of which 1 mile would be offsite) to improve flooding compared to existing conditions. At the Main Street crossing at Lenwood Channel, BIG would replace 0.8-mile of the existing Main Street low water crossing of Lenwood Channel with a bridge and raise and widen the road through this stretch west to the new intermodal facility entrance. These improvements accommodate the City/County master plan and improve flooding compared to existing conditions.

**Other**. To accommodate wildlife crossings from south of Main Street to the Mojave River without potential conflict with vehicular or train traffic, BIG proposes an underground wildlife crossing under Main Street west of the existing Hinkley Road.

**Circulation/Roadway.** Jiggs Road would be realigned generally from just east of Indian Trail to Hinkley Road to maintain emergency access from Indian Trails to Hinkley Road. In addition, a maintenance road would be constructed alongside the mainline to provide maintenance access to the tracks, generally from just east of Indian Trail to Hinkley Road. Various circulation and roadway improvements and modifications are proposed outside the BIG Specific Plan area. All circulation improvements would be permanent, except a temporary Main Street bypass. The temporary bypass would be constructed to maintain access along Main Street during Lenwood Channel Bridge reconstruction. To maintain access for adjacent residents, the temporary Main Street bypass would include private driveways for adjacent residential uses and would be open for the approximately 18-month bridge reconstruction period. Once the Lenwood Channel Bridge reconstruction is complete, the bypass would be removed and the site restored to its original condition. Additionally, construction of additional lead tracks over Pettit Road (approximately 1,100 feet west of State Route-58) would require the road to be lowered by approximately 2.0 feet. BIG would also vacate various ROW within the City and County. Finally, Sweeten Lane would be vacated and realigned to eliminate the existing unimproved intersection with Main Street. A new paved access would extend from Country Club east approximately 1,000 feet and connect to the unimproved Sweeten Lane.

### *Maintenance Activities*

While "light maintenance activities" [12] could occur at BIG, major maintenance activities[13] would still occur at the existing Barstow classification yard, thus, requiring short-distance trips via BNSF's existing mainline to and from the existing Barstow classification yard for heavy maintenance. Locomotive trips associated with maintenance activities would be based on the number of linehaul locomotives needed to move trains between the Ports and BIG intermodal facility, and the number of switcher locomotives needed to haul rail cars within BIG intermodal facility and block swap yard. All switcher locomotives at BIG would be Tier 4 locomotives, and BNSF would also retire all existing Tier 0/0+/1+ locomotives at the unrelated existing Barstow yard and, in their stead, add six Tier 4 switcher locomotives.

## 2.3 Project Construction Activities and Phasing

For analysis purposes, construction is anticipated to occur over approximately 34 months beginning in the third quarter of 2025 and ending in the third quarter of 2028. The entirety of BIG's construction activities, including off-site improvements, are analyzed in this report and described below. The anticipated construction phase timing is shown in **Table 3: BIG Construction Schedule**. However, the current construction schedule anticipates that BIG construction would begin approximately August 2026, and end approximately July 2029, for an approximate 13-month shift from the schedule shown in **Table 3: BIG Construction Schedule** and analyzed in this technical report. However, construction duration (34 months)

[12] "Light maintenance activities" means routine locomotive servicing (e.g., window washing, fueling, inspecting fluid levels and topping off fluids, stocking cabins with crew equipment such as water and trash bags, toilet servicing) and minor railcar servicing (e.g., wheel changes, brake and friction shoes, and loose or missing bolts)

[13] "Major maintenance activities" means repair of railing and platform, railcar suspension, hitches, engine, etc.

would remain unchanged. Further, given fleet turnover and compliance with increased regulatory requirements, construction and operational air quality emissions would improve over time as is reflected in CalEEMod, the California Air Resource Board's air quality emissions modeling platform.

During peak construction periods, work would be under way at several locations within BIG footprint simultaneously, with overlapping construction of various elements. Construction working hours and the number of workers present at any time would vary depending on the activities being performed. BIG construction would require approximately 8,177 construction workers per year.[14]

**Table 3: BIG Construction Schedule**

| Phase | Start Date | End Date |
|---|---|---|
| South Mainlines | 8/7/2025 | 10/2/2026 |
| Intermodal Facility | 8/7/2025 | 1/4/2027 |
| Block Swap Yard | 1/22/2026 | 6/8/2028 |
| North Mainlines | 5/27/2027 | 6/8/2028 |
| Transload Warehouse | 2/5/2026 | 12/6/2027 |
| 33 kV Distribution Undergrounding | 9/13/2025 | 5/7/2027 |
| Solar Site | 3/20/2026 | 2/27/2027 |

Nighttime construction could occur throughout the BIG footprint except where within 300 feet of sensitive receptors (along the 33kv distribution line). To avoid potential noise and vibration impacts from pile driving, BIG proposes to establish a buffer of 1,800 feet for nighttime pile driving and 500 feet for daytime pile driving from sensitive receptors. Additionally, nighttime construction would be necessary for track work adjacent to the existing mainline where lead tracks would tie into the mainline. All construction activities would occur within BIG footprint.

BIG components would involve the following construction activities:

## *Demolition and Grading*

The BIG footprint is primarily vacant, undeveloped land traversed by an existing BNSF railroad and containing scattered residential, commercial, and industrial land uses. Existing land uses within BIG's footprint are listed in **Table 1**. All existing land uses not demolished during acquisition to avoid trespassing and safety concerns would be demolished prior to, or during, mass grading. In addition, existing utilities (underground and aboveground) within BIG footprint would be removed or temporarily relocated as needed.

Six culverts/bridges would need to be demolished within the existing BIG footprint. Demolition would involve excavators to break apart bridge abutments and foundations.

Mass grading would occur in one phase across the BIG footprint and require approximately 26 million cubic yards of cut and fill. Mass grading would be typified by large construction equipment establishing the area's general grading contours. For locations supporting future buildings, roadways, or track, mass grading would include watering and compaction of soil to provide a stable subgrade. Earthwork onsite

[14] Based on 23,200 construction worker "job years"

would be balanced, with excess cut from the rail yard being used as fill within the transload warehouse center.

Fine grading would include site-specific grading for the transload warehouse center, as well as finish grading around buildings, parking areas, curb and gutter, etc.

### *Construction of Rail Yard (Intermodal Facility and Block Swap Yard)*

The likely sequence for BIG rail yard construction (intermodal facility and block swap yard) would include mass grading; compacting the rail bed and internal roadways/parking areas; installing underground improvements/utilities; fine grading; installing crushed rock subballast; laying track and ballast; and installing train signals and communications systems. To reduce construction trucking, BIG would bring rail ties, welded rail, and rail ballast in via train.

Rail yard construction elements would include surface and elevated track work where the track would cross a water feature, a grade-separated roadway crossing for electric hostlers to access (and return from) the transload warehouse center, and installation of an intermodal facility. Major construction activities would include grading and excavation support, underground utility installation, systems construction, bridge construction, and railway systems construction (including trackwork, signaling, and communications). High-mast lights (up to 120 feet in height) would be constructed throughout the rail yard, including foundation work, conduits, and security camera positions. Rail yard construction would also include foundations and tracks for gantry cranes.

Furthermore, the proposed rail yard area would be excavated to result in a nearly-level grade between the east and west ends. With the proposed grading, most of the rail yard would be approximately 30-45 feet below Main Street. Various key BIG elements are also shown below.

Rail materials such as rail ties, welded rails, and ballast would be delivered by train. As noted above, the two existing north mainlines would be protected in place except at the bridge crossings, and two new south mainlines constructed. The south mainlines would be constructed first, and, during the first year of construction, existing rail traffic would use the new south mainlines so that the existing mainlines can be rebuilt and their bridge crossings upgraded. Mainline, rail yard, and lead track construction would utilize a Track-Laying Machine for approximately 20 months to lay track.

Intermodal facility construction would include various administrative and support buildings and substantial paving for the container parking and storage.

### *Solar Farm Construction*

Solar farm construction, which would occur in a single phase, would require minimal grading to level the site as existing topography is utilized wherever possible and excavation limited primarily to stormwater detention to capture runoff. Fencing would be installed around the solar farm's perimeter of the solar farm, internal drive-aisles would be graded and paved, and the proposed substation would be constructed per SCE standards.

### *Construction of Transload Warehouse Center*

Construction elements for the transload warehouse center would include grading, over-excavation,[15] footing and foundation excavation and pouring, tilt-up panel concrete construction, parking lot grading and paving, utility installation and undergrounding, and hydrology/drainage improvements.

### *Construction of On-Site Bridges and Roadway Improvements*

Railroad bridge and roadway construction may use various methods including segmented pre-cast, cast-in-place, box girder or pre-cast, and span-by-span techniques.

Pre-construction activities would occur during final design and would include geotechnical investigations, identification of staging areas, initiation of site preparation and demolition, relocation of utilities, and implementation of temporary, long-term, and permanent road closures. Two bridges would be constructed over Lenwood Channel (BR 6.5D, 6.5E, and BR 6.5F) to enable traffic to flow from either side of Lenwood Channel.

### *Construction of Off-Site Rail Improvements*

Off-site rail improvements would include clearing and grubbing, bridge crossing construction, ballast placement, track laying, and connection to the mainline. Off-site rail improvements would parallel the existing mainline and primarily be within existing BNSF right-of-way. BIG's rail deliveries of rail ties and ballast would include materials for construction of off-site rail improvement.

### *Construction of Off-Site Non-Rail Improvements*

Off-site non-rail improvements would include construction of drainage, utility, and roadway improvements.

**Drainage**. Lenwood Channel improvements would consist of scouring and widening the channel. Construction equipment would be within Lenwood Channel in order to accomplish the widening.

**Utilities**. Additionally, off-site construction would include utility improvements including the 33kv distribution/Tortilla Substation improvements. Construction processes are anticipated to include clearing and grubbing, saw cuts and demolition of existing pavement, excavation to approximately 10 feet below ground surface, installation of temporary shoring, placement of circuits and distribution lines, fill placement and removal of temporary shoring, and roadway repair.

**Roadways/Intersections.** A bridge over Lenwood Channel for Main Street would be constructed to replace the existing low water crossing and accommodate widening of Main Street in that immediate area. Additionally, BIG proposes roadway/intersection improvements/modifications, including the installation of traffic signals at various intersections. Typical construction processes for these off-site non-rail improvements would include clearing and grubbing, over-excavation, bridge construction, traffic signals with associated underground conduits and cabling, and restriping and asphalt or concrete pavement placement, where needed.

[15] "Over-excavation" refers to removal and re-compaction of soil.

# 3.0 LAWS, REGULATIONS, AND ORDERS

Federal, State, and local laws, regulations, orders, or plans relevant to biological and aquatic resources that apply to BIG are presented below.

## 3.1 Federal

### *Federal Endangered Species Act*

The federal ESA (FESA) of 1973 (16 U.S.C. § 1531 et seq.), as amended, was enacted to provide for conservation of threatened and endangered species and the ecosystems they depend on. The FESA applies to proposed projects that may cause "take" of a federally listed fish or wildlife species or that may result in the destruction or adverse modification of designated critical habitat.

Section 9 of the FESA prohibits the "take" of federally listed fish or wildlife species. "Take" under the FESA is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 U.S.C. § 1532[19]). The definition of "harass" and "harm" includes significant habitat modification or degradation that results in, or is reasonably expected to result-in, death or injury to wildlife by substantially impairing essential behavioral patterns, including breeding, feeding, sheltering, spawning, rearing, and migrating (50 Code of Federal Regulations [CFR], §§ 17.3 and 222.102).

USFWS has jurisdiction over terrestrial wildlife and plant species, as well as freshwater fish species and some marine mammal species. Section 7 of the FESA requires federal agencies to consult with USFWS on proposed federal actions (including permits) that "may affect" any endangered, threatened, or proposed (for listing) species or critical habitat that may support the species. The FESA Section 7 process includes a Biological Opinion and accompanying incidental take statement as the mechanism for authorizing take of federally listed species for actions authorized, funded, or carried out by a federal agency. Section 10 of the FESA provides for issuance of an incidental take permit to non-federal and private parties during lawful activities with the development of a habitat conservation plan (HCP) to minimize impacts to the species. Incidental take is defined as take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant (40 CFR § 402.02).

### *Fish and Wildlife Coordination Act*

The Fish and Wildlife Coordination Act (16 U.S.C § 661-666[e] et seq.), as amended in 1964, was enacted to protect fish and wildlife when federal actions control or modify a natural stream or body of water. The law requires federal agencies to consider the effect of such proposed projects on fish and wildlife resources. The agencies must consult and coordinate with USFWS and state wildlife agencies to identify ways to prevent the loss of and damage to fish and wildlife resources, and to further develop and improve these resources.

### *Migratory Bird Treaty Act*

The Migratory Bird Treaty Act (MBTA; 16 U.S.C. § 703 et seq.) is a federal statute that implements treaties with several countries on the conservation and protection of migratory birds. The number of bird species covered by the MBTA is extensive and listed at 50 CFR 10.13. The USFWS enforces the MBTA, which

prohibits "by any means or in any manner, to pursue, hunt, take, capture, [or] kill" any migratory bird, or attempt such actions, except as permitted by regulation.

### *Executive Order 13186: Responsibilities of Federal Agencies to Protect Migratory Birds*

Executive Order 13186 (January 10, 2001) directs federal agencies that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a memorandum of understanding with USFWS to promote the conservation of migratory bird populations. The memorandum of understanding should include implementation actions and reporting procedures that would be followed through each agency's formal planning process, such as resource management plans and fisheries management plans.

### *Bald and Golden Eagle Protection Act*

With some exceptions, this Act (16 USC § 668–668(d)) prohibits take of bald eagles and golden eagles. The Act defines take as "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing," with "disturb" further defined (50 CFR § 22.3) as ''to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

### *Clean Water Act, Section 404*

Pursuant to CWA Section 404 (33 U.S.C. § 1344), USACE is authorized to regulate any activity that would result in the discharge of dredged or fill material into waters of the U.S. (including wetlands), which include those waters listed in 33 CFR 328.3 (88 FR 61964, September 8, 2023; Revised Definition of "Waters of the United States"; Conforming). USACE, with oversight from the U.S. Environmental Protection Agency (USEPA), has the principal authority to issue CWA Section 404 permits. USACE requires a Standard Individual Permit (IP) for what they consider more than minimal impacts to waters of the U.S. (e.g., typically impacts to more than half of an acre of waters of the U.S.). Projects with minimal individual and cumulative adverse effects on the environment may meet the conditions of an existing Nationwide Permit.

### *Clean Water Act, Section 402*

Pursuant to CWA Section 402 (33 U.S.C. 1342), the National Pollutant Discharge Elimination System is the permitting program for discharge of pollutants into surface waters of the U.S. The RWQCB issues Section 402 permits for actions such as ground-disturbance associated with construction activities.

### *Clean Water Act, Section 401*

Pursuant to CWA Section 401 (33 U.S.C. § 1341), federal licenses or permits that authorize an activity that may result in a discharge of a pollutant into waters of the U.S. must obtain a Section 401 Water Quality Certification (WQC), or a waiver, from the state or tribe in which the discharge would originate (40 CFR 121.3). The nine separate RWQCBs, a division of the State Water Resources Control Board (SWRCB),

provides oversight of the Section 401 WQC process in California. The SWRCB and RWQCB also implement California's Porter-Cologne Water Quality Control Act (as described below).

### *Executive Order 11990: Protection of Wetlands*

Executive Order 11990 aims to avoid direct or indirect impacts on wetlands from federal or federally approved projects when a practicable alternative is available. If wetland impacts cannot be avoided, all practicable measures to minimize harm must be included.

### *Executive Order 13112: Invasive Species*

Executive Order 13112, issued in 1999, directs federal agencies to prevent and control the introduction and spread of invasive nonnative species in a cost effective, environmentally sound manner to minimize their effects on economic, ecological, and human health. The Executive Order was intended to build on existing laws, such as the FESA.

### *West Mojave Plan*

The West Mojave Plan (WMP) is a federal land use plan amendment for the California Desert Conservation Area Plan implemented by the Bureau of Land Management (BLM) for approximately 3.3 million acres of public lands administered by the BLM's California Desert District, located in Inyo, Kern, Los Angeles, and San Bernardino Counties (2006 BLM Record of Decision). The HCP component of the plan provides a comprehensive strategy to conserve and protect federally and state-listed species, as well as other special-status species and their habitats, for 9.3 million acres of private and public land within the counties of San Bernardino, Kern, Los Angeles, and Inyo (Bureau of Land Management 2004). The HCP component of the plan was not approved, but the West Mojave Plan does serve as a land use plan amendment under the California Desert Conservation Area Plan for BLM lands. BIG falls within the WMP planning area, and the City of Barstow and San Bernardino County are plan collaborators and signatories on the WMP EIR.

## 3.2 State

### *California Endangered Species Act*

The CESA of 1984 (CFGC § 2050 et seq.), in combination with the California Native Plant Protection Act (NPPA) of 1977 (CFGC § 1900 et seq.), regulates the listing and take of plant and animal species designated as endangered, threatened, or rare within the state. California also lists species of special concern based on limited distribution; declining populations; diminishing habitat; or unusual scientific, recreational, or educational value. CDFW is responsible for assessing development projects for their potential to impact listed species and their habitats. CESA § 2081 allows CDFW to issue permits for the minor and incidental take of species by an individual or permitted activity listed under the Act. If a species is listed by both FESA and CESA, CESA § 2080.1 allows CDFW to issue a consistency determination for an applicant who has obtained take authorization under Section 7 or 10 of FESA. Note that some CESA-listed species are also Fully Protected Species (see California Fish and Game Code Sections 3503, 3511, 3513, 3801, 4700, 5050, 5515, and 2081.15 (Fully Protected Species) for further details).

### *Natural Community Conservation Planning Act*

In 1991, the California Natural Community Conservation Planning (NCCP) Act (CFGC § 2800 et seq.) was approved "to provide for regional protection and perpetuation of natural wildlife diversity while allowing compatible land use and appropriate development and growth." The NCCP Act encourages preparation of plans that address habitat conservation and management on an ecosystem basis rather than one species or habitat at a time. Subsequently, the NCCP Coastal Sage Scrub program and associated Conservation Guidelines were initiated in Southern California, including San Bernardino County.

### *California Fish and Game Code Sections 1600-1602*

Pursuant to CFGC § 1602, Division 2, Chapter 6, CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream or lake that supports fish or wildlife. A Notification of Lake or Streambed Alteration must be submitted to CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake" (CFGC § 1602). CDFW has jurisdiction over riparian habitats associated with watercourses and wetland habitats supported by a river, lake, or stream. Jurisdictional waters are delineated by the outer edge of riparian vegetation (i.e., drip line) or at the top of the bank of streams or lakes, whichever is wider. CDFW jurisdiction under CDFW § 1602 does not include tidal areas or isolated resources (e.g., riparian or wetland areas not supported by a river, lake, or stream). CDFW issues a Lake or Streambed Alteration Agreement for projects in CDFW § 1602 jurisdictional areas.

### *California Fish and Game Code Sections 4000-4012 (Furbearing Mammal)*

Desert kit fox is protected by the California Code of Regulations (Title 14, California Code of Regulations [CCR] § 460) and CFGC §§ 4000-4012 as a furbearing mammal. Both regulations prohibit take of the species.

### *California Fish and Game Code Sections 3503, 3511, 3513, 3801, 4700, 5050, 5515, and 2081.15 (Fully Protected Species)*

Certain species are considered fully protected, meaning that the CFGC will only authorize take of these species, resulting from the implementation of specified projects (as defined in § 2081.15), if certain conditions are met, including but not limited to, the conditions which precede the issuance of an incidental take permit. The following sections of the CFGC address fully protected species: CFGC § 3511 (birds), CFGC § 4700 (mammals), CFGC § 5050 (reptiles and amphibians), and CFGC § 5515 (fish). In addition, the protection of birds is provided for in CFGC § 3503 (nests and eggs of all birds), CFGC § 3503.5 (birds of prey), CFGC § 3513 (migratory birds), and CFGC § 3800 (non-game birds) of the CFGC. Note that some Fully Protected Species are also listed under the CESA.

### *California Desert Native Plants Act*

The California Desert Native Plants Act (California Food and Agriculture Code [FAC] § 80001 et seq.) prohibits the removal of certain species of California desert native plants on public and privately owned lands without a valid permit from the sheriff or commissioner of the county where collecting would occur.

This act applies within the boundaries of Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties.

### *California Native Plant Protection Act*

The California NPPA of 1977 (CFGC §§ 1900-1913) is intended to preserve, protect, and enhance endangered or rare native plants in the state. A species is endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes. A species is rare when, although not threatened with immediate extinction, it is present in such small numbers throughout its range that it may become endangered with further impacts to its habitat.

The CFGC designates native plants as rare or endangered per the NPPA and CESA. CDFW enforces the NPPA through its incidental take permitting program under CESA (California Code of Regulations [CCR] 14 §§ 783.0-783.8 and 786.9). Also, like CESA, take and possession of native, rare, and endangered plants under NPPA is prohibited, except as authorized by CDFW.

CDFW maintains the Special Vascular Plants, Bryophytes, and Lichens List for California as part of the CNDDB. The list is updated quarterly and is reviewed and updated by rare-plant status expert review groups managed jointly by CDFW and the California Native Plant Society (CNPS). Plant species, subspecies, or varieties are assigned a California Rare Plant Rank based on their level of endangerment. Plants with CRPR 1A, 1B, or 2 meet definitions of CFGC § 1901 and may qualify for state listing. For plants with a CRPR 3 rank, CDFW and CNPS lack sufficient information to assign them another code, and CRPR 4 indicates a plant has a limited distribution and it may become rare in the future.

### *Porter-Cologne Water Quality Control Act*

The Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.) provides for statewide coordination of water quality regulations. The SWRCB was established as the statewide authority on waters of the state and nine separate RWQCBs were developed to oversee water quality on a day-to-day basis.

Pursuant to the Porter-Cologne Water Quality Control Act, waters of the state are defined as any surface water or groundwater, including saline waters, within the boundaries of the state. The SWRCB and RWQCBs also establish and protect beneficial uses of waters of the state. These beneficial uses may include protection of uses of water that support terrestrial ecosystems, aquatic ecosystems, and habitat for special-status species. As such, any entity proposing to discharge waste into waters of the state must first file a Report of Waste Discharge, if a Section 404 permit is not required for the activity. “Waste” is partially defined as any waste substance associated with human habitation, including fill material discharged into water bodies.

## 3.3 Regional and Local

### *San Bernardino County Burrowing Owl Overlay Zone*

BIG is within the Burrowing Owl Overlay Zone per the San Bernardino County Museum Biological Species Database and General Plan (County of San Bernardino, 2012). The overlay map outlines habitat of state

listed, federally listed, and other special-status species for preservation in alignment with the biotic resource conservation measures set forth in the General Plan. Per § 82.11.03 of the San Bernardino Municipal Code, "If land use is proposed, or an existing land use is increased by more than 25 percent of disturbed area within a BR [Biotic Resources] Overlay, the land use application shall include a biotic resources report."

## *San Bernardino County General Plan*

The County adopted the Countywide Plan (CWP) in October 2020. The CWP Policy Plan addresses the physical, social, and economic issues facing the County's unincorporated portions. **Table 4: CWP Policy Plan Relevant Goals and Policies** includes the following biological-related goals and policies relevant to BIG (County of San Bernardino, 2020):

**Table 4: CWP Policy Plan Relevant Goals and Policies**

| Number | Goal or Policy |
|---|---|
| **RESOURCES CONSERVATION AND OPEN SPACE ELEMENT** | |
| **Goal NR 5** | **Biological Resources.** An interconnected landscape of open spaces and habitat areas that promotes biodiversity and healthy ecosystems, both for their intrinsic value and for the value placed on them by residents and visitors. |
| **Policy NR-5.5** | **Mitigation and Future Responsibilities**. We require that new development satisfy habitat conservation responsibilities without shifting conservation responsibilities onto military property. |
| **Policy NR 5.7** | **Development Review, Entitlement, and Mitigation**. We comply with federal and state regulations regarding protected species of animals and vegetation through the development review, entitlement, and environmental clearance processes. |
| **Policy NR-5.8** | **Invasive Species**. We require the use of non-invasive plant species with new development and encourage the management of existing invasive plant species that degrade ecological function. |

Sources: County of San Bernardino. (2020). Countywide Plan.

## *San Bernardino County Code*

The San Bernardino County Code (County Code) contains regulations pertaining to biological resources that are relevant to BIG.

**Chapter 88.01: Plant Protection and Management**. County Code §§ 88.01.010 through 88.01.090 outline provisions to preserve San Bernardino County's native trees and plants in certain areas of public and private property (San Bernardino County Code, 2007). Per §§ 88.01.050, a Tree or Plant Removal Permit or consideration of impacts during project entitlement/environmental review is required for the removal of the following desert native plants:

- *Dalea spinosa* (with stems two inches or greater in diameter or six feet or greater in height)
- All species of the genus *Prosopis* (with stems two inches or greater in diameter or six feet or greater in height)
- All species of the family *Agavaceae*
- Creosote rings (10 feet or greater in diameter)
- All Joshua trees

- *Olneya tesota* (any part, living or dead)
- All species of the genus *Prosopis* (any part, living or dead)
- All species of the genus *Cercidium* (any part, living or dead)

## *City of Barstow 2020 General Plan*

The City adopted the City of Barstow 2015 to 2020 General Plan (2020 General Plan) in February 2015 (City, 2015). The 2020 General Plan is the overarching guide for implementation of the Development Code, which defines development regulations and establishes zoning districts throughout the City. **Table 5: 2020 General Plan Relevant Goals and Policies** includes the biological resources-related goals and policies relevant to BIG.

**Table 5: 2020 General Plan Relevant Goals and Policies**

| Number | Goal or Policy |
|---|---|
| **NATURAL RESOURCES ELEMENT** | |
| **Goal 3** | Seek to preserve biological resources within the Planning Area. |
| **Policy 3A** | Conserve suitable habitat for threatened and endangered species found in the region and facilitate mitigation of impacts where unavoidable. |
| **Strategy 3.A.1** | Perform site-specific studies prior to development activities to determine the precise mitigation necessary to preserve and enhance biological resources, with particular attention given to the preservation of areas identified as having a high biological significance and sensitivity. |
| **Policy 3.A.2** | Establish corridors for the movement of wildlife between the established Desert Wildlife Management Areas and Desert Tortoise Critical Habitat. |
| **Policy 3.A.3** | Strive to maintain native riparian and associated natural habitats along the Mojave River. When applicable, require a U.S. Army Corps of Engineers 404 Permit |
| **Policy 3.A.4** | Maintain the Mojave River as a travel and watershed corridor, retaining the link between natural areas to the north and south of Barstow. |

Sources: City of Barstow. (2015). 2020 General Plan 2015-2020.

# 4.0 METHODS FOR EVALUATING EFFECTS

RBC conducted vegetation mapping, general biological surveys, habitat assessments, and focused surveys for special-status species including but not limited to desert tortoise, least Bell's vireo, Mohave ground squirrel, Mojave fringe-toed lizard, southwestern willow flycatcher, Swainson's hawk, western burrowing owl, yellow-billed cuckoo, and special-status plants within BIG. Additionally, RBC conducted formal aquatic resources delineations within BIG for aquatic resources that may be considered jurisdictional by USACE pursuant to Section 404 of the CWA, by the RWQCB pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act, and by the CDFW pursuant to CFGC § 1602. RBC also assessed BIG for its functionality as a regional and local wildlife corridor.

Field assessments and focused surveys for special-status plants and wildlife and aquatic resources, as well as special-status natural communities and habitats of concern began in November 2018 for initial due diligence purposes. This initial effort was conducted within an area that included only a portion of the current BIG footprint. Since the initial field investigations were conducted, BIG has increased in size to the now approximately 5,000-acre site. Landforms, dominant vegetation communities, and aquatic resource types documented during the initial site investigations were reassessed in 2021, 2022, 2023, 2024, and 2025 to evaluate whether the observed conditions substantially changed from the previous findings. Additional focused surveys, habitat assessments, and aquatic resources delineations were conducted from 2021 to 2025 within areas not previously surveyed as land acquisition and site access allowed; focused surveys were also repeated in areas previously surveyed in 2018-2020 to obtain and update the species database. Survey dates and types are presented in **Table 6: Summary of Surveys Conducted for BIG** below. Detailed survey methods are provided in the following sections and in the focused survey reports as **Attachments C - GG**, which also provide additional survey details.

The biological surveys outlined herein also included survey buffers which varied in size depending on the type of resource being surveyed. Surveyors directly accessed survey buffer areas on foot only when access was authorized and buffers could be accessed safely; buffer areas were surveyed via binoculars when access was not approved and/or safety concerns were present. The purpose of all biological surveys outlined herein was to inventory biological resources within and immediately adjacent to BIG for analysis of potential impacts of BIG. As such, only the BIG footprint information is included in report impact calculations and tables, while buffers are discussed for informational purposes and edge effects analysis only. In particular, survey buffer areas are included in this analysis exclusively to assess the potential for special-status species or resources in areas adjacent to the BIG footprint that could be impacted by BIG. Such information should not be considered comprehensive for all biological or aquatic resources that may occur in buffer areas, and buffer mapping is intended only for the BIG analysis outlined herein; this information is not intended for impact analysis of any future projects within or adjacent to BIG buffer areas.

| Table 6: Summary of Surveys Conducted for BIG | |
|---|---|
| **Date(s)** | **Survey Type(s)** |
| November 26-27, 2018 | General Biological Survey; Vegetation Mapping; Special-Status Plant and Wildlife Species Habitat Assessments |
| December 10-12, 2018 | Formal Aquatic Resources Delineation; Special-Status Plant and Wildlife Species Habitat Assessments |
| March 22, 2019 | General Biological Survey; Special-Status Plant and Wildlife Species Habitat Assessments |
| August 21, 2019 | Formal Aquatic Resources Delineation; Special-Status Plant and Wildlife Species Habitat Assessments |
| March 18 – July 8, 2020 | Least Bell's Vireo Habitat Assessment, Focused Surveys |
| June 25, 2020 | Aquatic Resources Delineation; Special-Status Plant and Wildlife Species Habitat Assessments |
| April 19 – July 15, 2021 | Focused Least Bell's Vireo and Southwestern Willow Flycatcher Surveys |
| August 10, 2021 | General Biological Survey; Vegetation Mapping; Special-Status Plant and Wildlife Species Habitat Assessments; Aquatic Resource Assessment |
| October 16-21, 2021 | Desert Tortoise Focused Surveys |
| October 16, 2021 – January 12, 2022 | Focused Western Burrowing Owl Surveys |
| October 20, 2021 | Formal Aquatic Resources Delineation |
| November 9, 2021 | Mohave Ground Squirrel Habitat Assessment |
| December 1, 2021 | Formal Aquatic Resources Delineation |
| January 3, 2022 | Mohave Ground Squirrel Habitat Assessment |
| February 21-23, 2022 | Focused Desert Tortoise Surveys |
| March 16, 2022 | Formal Aquatic Resources Delineation |
| March 23-24, 2022 | Formal Aquatic Resources Delineation |
| April 6 – August 11, 2022 | Focused Western Burrowing Owl Surveys |
| April 12-13, 2022 | Formal Aquatic Resources Delineation |
| April 13—July 2, 2022 | Mohave Ground Squirrel Focused Trapping |
| April 15, 2022 | Formal Aquatic Resources Delineation |
| April 25 – August 11, 2022 | Focused Least Bell's Vireo, Southwestern Willow Flycatcher, Yellow-billed Cuckoo Surveys |
| May 17, 2022 | Formal Aquatic Resources Delineation |
| May 18-19, 2022 | Desert Tortoise Focused Surveys |
| June 15-16, 2022 | Desert Tortoise Focused Surveys |
| June 20, 2022 | Formal Aquatic Resources Delineation |
| January 4-5, 2023 | General Biological Survey; Vegetation Mapping; Special-Status Plant and Wildlife Species Habitat Assessments |
| March 23 – July 14, 2023 | Focused Western Burrowing Owl Surveys |
| April 18, 2023 | Formal Aquatic Resources Delineation |
| April 24 – 29, 2023 | Focused Desert Tortoise Surveys |
| April 10 – August 10, 2023 | Focused Least Bell's Vireo, Southwestern Willow Flycatcher, Yellow-billed Cuckoo Surveys |
| May 8 – 19, 26, 2023 | Focused Special-Status Plant Surveys |
| June 6, 2023 – October 9, 2023 | Focused Mojave Fringe-Toed Lizard Surveys |
| June 14, 2023 | Formal Aquatic Resources Delineation |
| June 27 – 29, 2023 | Formal Aquatic Resources Delineation |
| July 19 – 20, 2023 | Formal Aquatic Resources Delineation |
| October 10 – 11, 2023 | Focused Desert Tortoise Surveys |

| Table 6: Summary of Surveys Conducted for BIG | |
|---|---|
| **Date(s)** | **Survey Type(s)** |
| October 25, 2023 | Focused Desert Tortoise Survey |
| March 17, 2024 – March 18, 2025 | Wildlife Movement Study |
| March 20 – July 18, 2024 | Focused Swainson's Hawk Surveys |
| April 11 – 12, 2024 | Formal Aquatic Resources Delineation |
| April 12, 2024 | Focused Desert Tortoise Survey |
| April 12 – July 10, 2024 | Focused Western Burrowing Owl Surveys |
| May 2, 2024 | Focused Special-Status Plant Survey |
| May 3, 2024 | Focused Desert Tortoise Survey |
| May 14 – 16, 2024 | Vegetation Mapping |
| September 9 – October 16, 2024 | Focused Desert Tortoise Survey |
| October 17, 2024 | Western Joshua Tree Census |
| January 22, 2025 | Formal Aquatic Resources Delineation |
| January 28, 2025 | Formal Aquatic Resources Delineation |
| February 19, 2025 | Formal Aquatic Resources Delineation |
| February 26, 2025 | Formal Aquatic Resources Delineation |
| March 7 and 16, 2025 | Mohave Ground Squirrel Habitat Assessment |
| March 30 – April 15, 2025 | Mohave Ground Squirrel Visual/Auditory Surveys |
| March 31 – April 29, 2025;<br>May 1 – May 30, 2025;<br>June 1 – July 6, 2025 | Mohave Ground Squirrel Focused Live-Trapping |
| March 31 – May 13, 2025 | Focused Special-Status Plant Surveys |
| March 20 – July 17, 2025 | Focused Swainson's Hawk Surveys |
| June 30 - July 1, 2025 | Bat Habitat Assessment and Anabat Surveys |
| August 13 – 14, 2025 | Formal Aquatic Resources Delineation |

## 4.1 Literature Review

Existing information regarding biological and aquatic resources present or potentially present within BIG and adjacent lands was obtained through a review of pertinent literature and databases, including, but not limited to:

- CDFW California Natural Diversity Database (CNDDB; CDFW, 2025a); see Figure 3.1-1. CNDDB Plants and Wildlife
- CDFW Biogeographic Information and Observation System (BIOS) Database (CDFW, 2025b)
- California Native Plant Society (CNPS) Electronic Inventory (CNPS, 2025)
- USFWS Special-Status Species Database (USFWS, 2025a); see Figure 3.1-2. USFWS Plants and Wildlife
- USFWS Information for Planning and Consultation (IPaC) Database (USFWS, 2025b)
- USFWS National Wetlands Inventory Database (USFWS, 2025c); see Figure 3.1-3. National Wetland Inventory
- USGS National Hydrography Dataset Database (USGS, 2025a); see Figure 3.1-4. National Hydrography Dataset
- Google Earth Pro (Google Earth Pro, 2025)

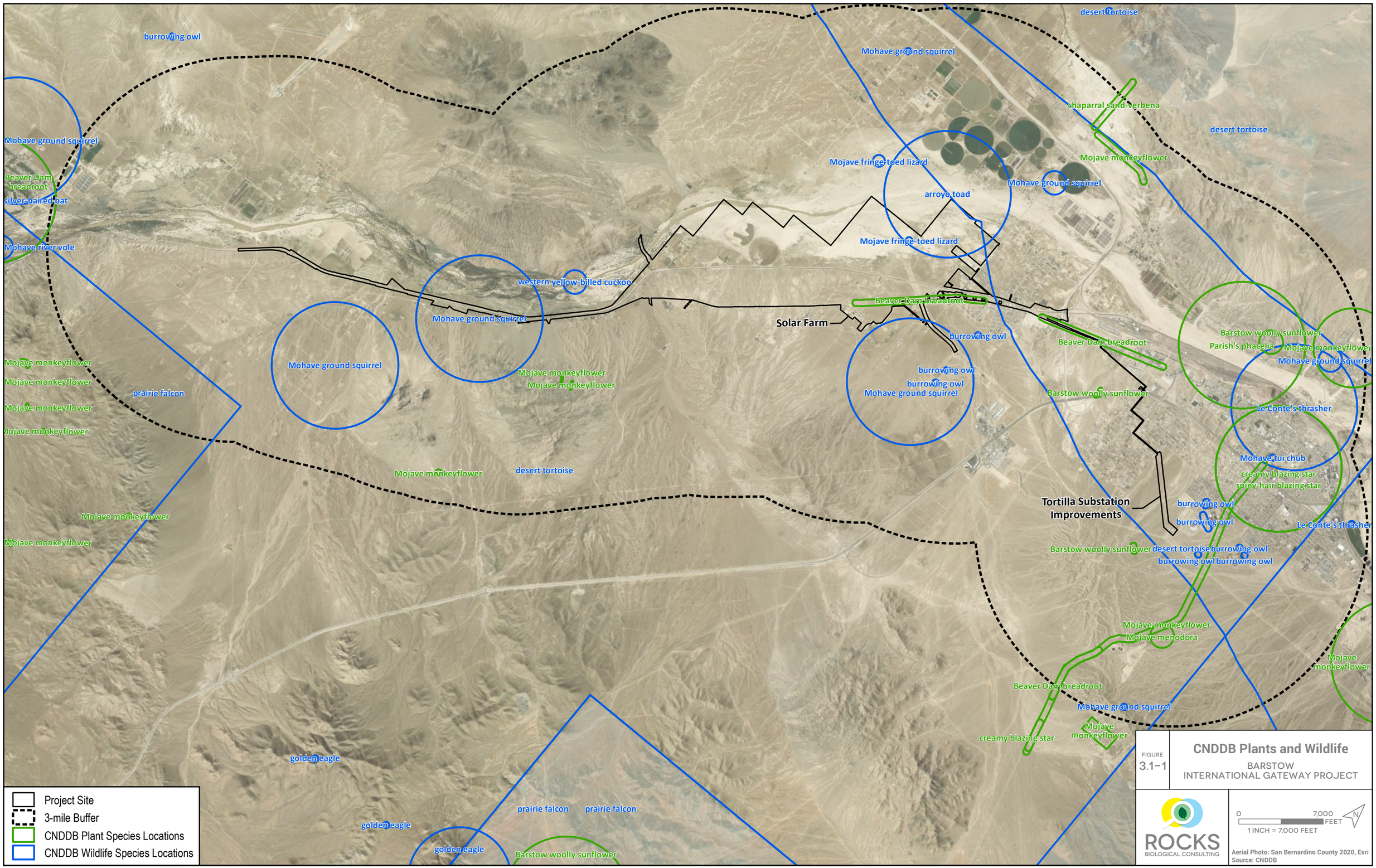



FIGURE 3.1-1

# CNDDB Plants and Wildlife

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 7,000 FEET

1 INCH = 7,000 FEET

N

Aerial Photo: San Bernardino County 2020, Esri
Source: CNDDB

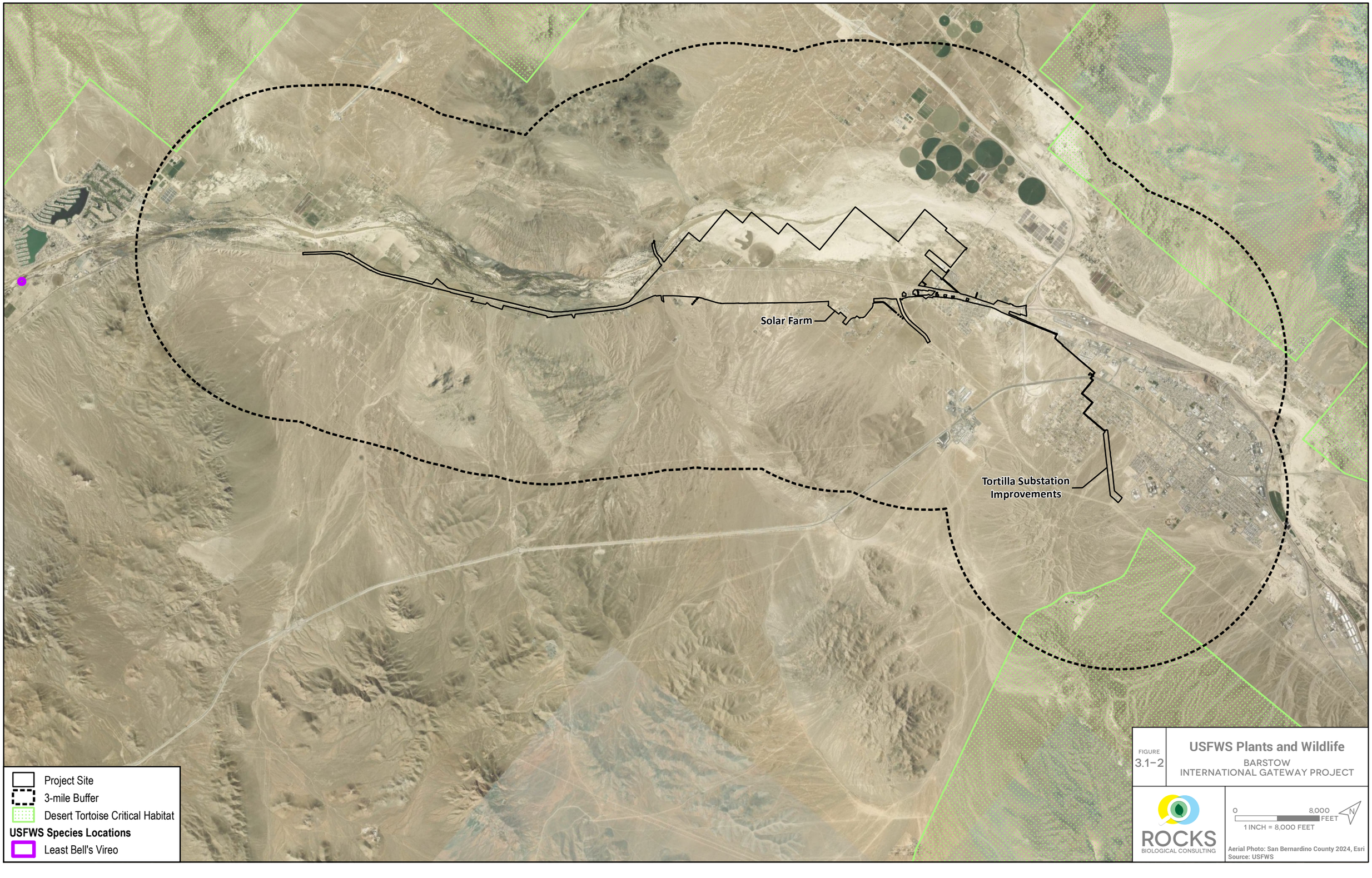



FIGURE 3.1-2

# USFWS Plants and Wildlife

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 8,000 FEET

1 INCH = 8,000 FEET

N

Aerial Photo: San Bernardino County 2024, Esri
Source: USFWS

Project Site

**National Wetlands Inventory (NWI)**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Riverine
- Freshwater Pond
- Lake

FIGURE 3.1-3

# National Wetlands Inventory

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 5,500 FEET
1 INCH = 5,500 FEET

N

Aerial Photo: San Bernardino County 2024, Esri
Source: USFWS NWI 2019; USDA NRCS 2018

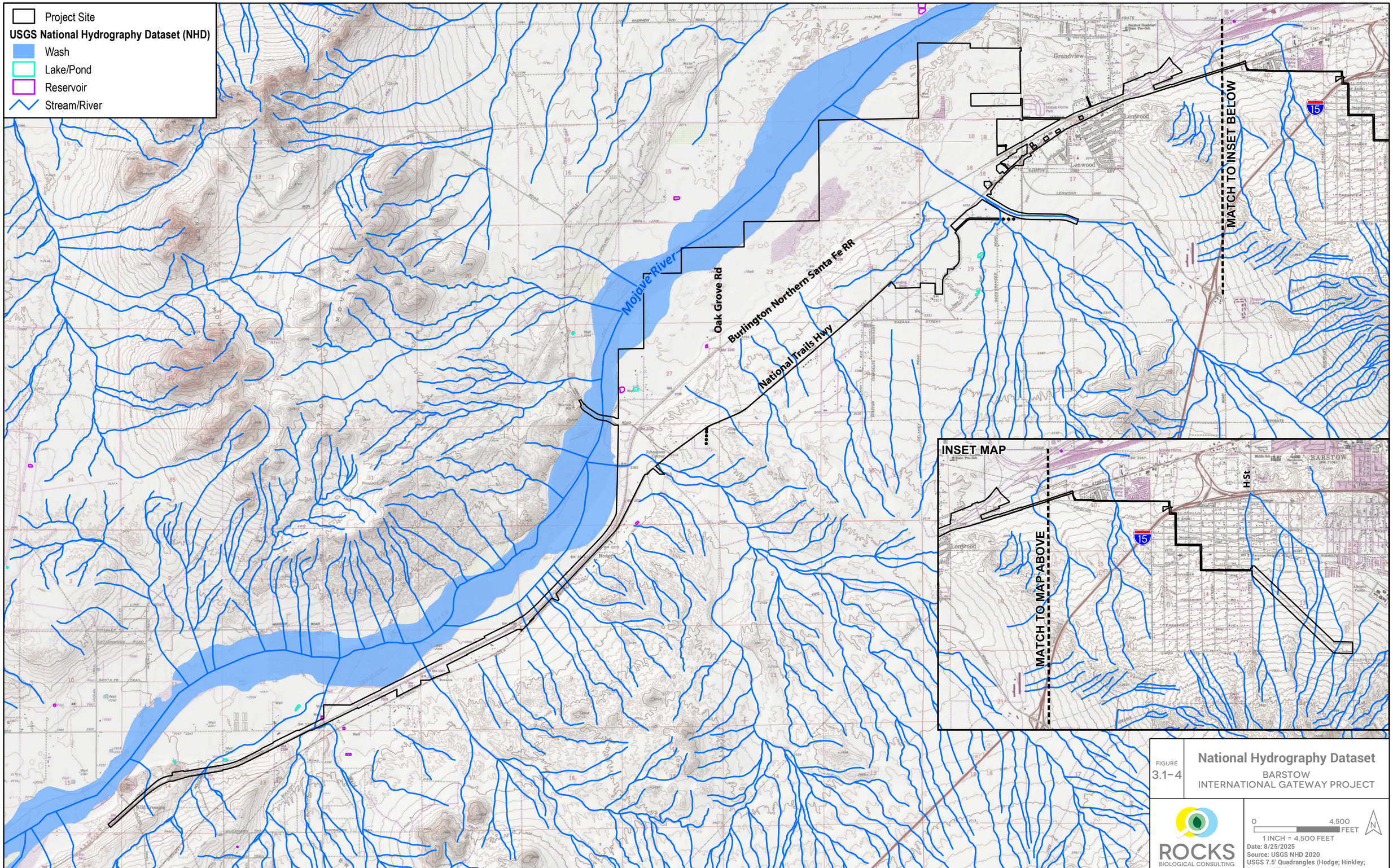



FIGURE 3.1-4

**National Hydrography Dataset**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,500 FEET

1 INCH = 4,500 FEET

Date: 8/25/2025

Source: USGS NHD 2020

USGS 7.5' Quadrangles (Hodge; Hinkley; Barstow SE; Barstow)

Database results, along with local biological knowledge, were used to assess special-status species' potential for occurrence on or adjacent the BIG footprint (**Table 11: Special-Status Plant Species Potential to Occur within BIG** and **Table 13: Special-Status Wildlife Species with Potential to Occur within BIG**) include federally and state-listed species, candidate species, and other federal and state-designated special-status species that have been reported within three miles of BIG (CNDDB and USFWS Special-Status Species Database); federally listed species identified as having potential to occur based on their known or expected ranges (IPaC); and all species with a CRPR of 1 or 2 that occur within CNPS Electronic Inventory search for the Hodge, Hinkley, Barstow SE, and Barstow U.S. Geological Survey (USGS) 7.5' quadrangles containing BIG and the 14 surrounding USGS 7.5' quadrangles, within BIG's elevation range of 2,200 to 2,730 feet above mean sea level (amsl) (USGS, 2025b; CNPS, 2025). The potential for special-status species to occur within BIG was refined by considering the habitat affinities of each species, field habitat assessments, vegetation mapping, and local biological knowledge.

Special-status biological resources discussed within this report are defined as follows: 1) species that have been given special recognition by federal, state, or local conservation agencies and organizations due to limited, declining, or threatened/endangered population sizes; 2) species and their associated habitat types recognized by local and regional resource agencies as sensitive; 3) habitat areas or vegetation communities that are unique, are of relatively limited distribution, or are of particular value to wildlife; 4) wildlife corridors and habitat linkages; and/or 5) biological resources that may or may not be considered sensitive, but are regulated under local, state, and/or federal laws.

## 4.2 Vegetation Mapping, General Biological Surveys, and Habitat Assessments

RBC biologists conducted vegetation mapping, general biological surveys, and habitat assessments for special-status plants and wildlife for BIG between November 2018 and July 2025. Vegetation mapping was conducted in the field to provide a baseline of the habitats and other biological resources that occur or have potential to occur within BIG. RBC conducted vegetation mapping by traversing the site and mapping vegetation communities on aerial photographs at a 1:4800 scale (1 inch = 400 feet) within BIG and a 100-foot buffer (vegetation mapping buffer). The extent of each habitat type (delineated as a habitat polygon on the vegetation maps) was calculated using the Geographic Information System (GIS) program ArcGIS. Vegetation communities were classified using the keys and descriptions in The Manual of California Vegetation, 2nd Edition (MCV2; Sawyer et al., 2009). Plant species density was estimated using percent absolute cover (i.e., the percent of ground covered by each plant taxa) rather than relative cover (i.e., percentage of the total vegetative cover, excluding bare ground and other non-live plant covers). Dominant plant species, plant absolute covers, and membership rules were used to determine alliances using the MCV2 Online Edition (CNPS, 2025). Some initial vegetation mapping was based on the dominant and characteristic plant species as outlined in *Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland, 1986)* prior to mapping all of BIG using MCV2 in May 2024. Of the vegetation communities mapped on site, sensitive communities were identified by their state ranking as determined by CDFW's VegCAMP; rank levels range from 1 (very rare and threatened) to 5 (demonstrably secure) and state ranks of S1 – S3 are considered sensitive (CDFW 2025c).

RBC conducted general biological surveys for plants and wildlife concurrently with vegetation mapping. Surveys occurred over several months between November 2018 and July 2025 (with surveys occurring at least once during each calendar month), therefore surveys were likely to have caught seasonal variations in species activity and migratory species. Representative site photographs of BIG and adjacent areas are included in **Attachment A**. Plant species encountered during field surveys were identified and recorded in a field notebook. Plant species that could not be identified were brought to the laboratory for identification using the dichotomous keys in the Jepson Manual (Baldwin et al. 2012). A list of the vascular plant species observed is presented in **Attachment B** and includes species observed during general biological surveys as well as those observed during focused surveys for special-status species and formal aquatic resource delineations. Note that for flora that could not be identified to species or subspecies level due to phenological restrictions, such species were identified to the lowest taxonomic classification possible and recorded.

Wildlife species were documented during field surveys by sight, calls, tracks, scat, or other signs, and were recorded in a field notebook. Binoculars (8 or 10X42 magnification) were used to aid in the identification of wildlife. Wildlife species were also identified visually through review of wildlife camera footage to the extent feasible. A list of the wildlife species observed is presented in **Attachment B** and includes wildlife species observed during general biological surveys and wildlife movement studies as well as those observed during focused surveys for special-status species; scientific and common names of wildlife follow CDFW California's Wildlife (2025d) and the Cornell Lab of Ornithology (2025).

The location of observed biological resources designated as special-status by the USFWS, CDFW, BLM, and/or CNPS were recorded in a field notebook, on aerial maps, and/or a handheld Global Positioning System (GPS) device. RBC also assessed BIG for habitat with the potential to support special-status plant and wildlife species and/or species that are rare or unique to the region, even if not observed during surveys. Potential presence of special-status species was assessed based on the results of the species database queries, known habitat preferences of local species, and knowledge of their biogeographic distribution in the region.

## 4.3 Aquatic Resources Delineation

RBC conducted formal aquatic resources delineations within approximately 5,800.98 acres, referred to as "review area" in the *Big Barstow (Barstow International Gateway Project) Aquatic Resources Delineation Report 2025* August Addendum, per USACE, RWQCB, and CDFW guidelines; see **Attachment C**. The delineations were conducted between October 2021 and August 2025 to identify areas that may be considered jurisdictional under USACE pursuant to Section 404 of the CWA; the RWQCB pursuant to Section 401 of the CWA and the Porter-Cologne Water Quality Control Act; and the CDFW pursuant to § 1602 of the CFGC. Field delineations were conducted throughout the majority of the review area based on approved access. Portions of the review area where access was prohibited were visually assessed with binoculars and/or aerial imagery at a 1:450 scale.

Prior to the on-site delineation, field maps were created using GIS. The field maps utilized color aerial imagery and USGS 7.5' quadrangle basemaps. RBC staff also reviewed the USFWS National Wetlands Inventory data (Figure 3.1-3) and USGS National Hydrography Dataset and topography (Figure 3.1-4) to

further determine the potential locations of aquatic resources within the survey area. RBC also utilized Google Earth to assess current and historic presence or absence of flows and/or ponding in the survey area (Google Earth Pro, 2025).

Areas with depressions, drainage patterns, and/or wetland vegetation within the survey area were evaluated, with focus on the presence of defined channels and/or wetland vegetation, soils, and hydrology. While in the field, potential aquatic resources were recorded using a hand-held GPS unit with a level of accuracy ranging from 4 to 30 feet. RBC staff refined the data using aerial photographs and topographic maps with one-foot contours to improve accuracy.

Lateral limits of potential non-wetland waters of the U.S. for USACE and the RWQCB were identified using field indicators of an Ordinary High Water Mark as outlined in *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (Lichvar and McColley, 2008). Additionally, staff examined potential USACE and RWQCB jurisdictional wetland areas using the routine determination methods set forth in *Part IV, Section D, Subsection 2 of the 1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), the *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (USACE 2008), and *The State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB, 2021).

The CDFW potential jurisdictional boundaries were determined based on the presence of lake or streambed and riparian habitat or wetland areas supported by (i.e., adjacent or connected to) a lake or streambed, based on the definition of streambed as outlined at 14 CCR § 1.72 and in the 1987 *Rutherford v. State of California* decision (188 Cal. App. 3d 1268). To assist in assessing CDFW-jurisdictional limits in desert areas, RBC staff utilized the methods outlined in the Mapping Episodic Stream Activity Field Guide. The Mapping Episodic Stream Activity Field Guide guidelines indicate the active watercourse extends beyond the streambed and can consist of associated features such as low-flow, active, and braided channels and banks associated with islands, and secondary channels within the bounds of a larger channel complex (Vyverberg and Brady, 2013).

A full summary of methods is presented in Attachment A, *Big Barstow Aquatic Delineation Report* (dated September 23, 2022) within **Attachment C**.

## 4.4 Special-Status Species Surveys

For the purposes of this report, species are considered to have special status if they meet one or more of the following criteria:

- Listed or considered for listing or proposed for listing under the FESA or CESA (CDFW, 2025e; USFWS, 2025b)
- USWFS Bird of Conservation Concern (BCC; CDFW, 2025e)
- BLM Sensitive (CDFW, 2025e)
- CDFW Species of Special Concern (SSC; CDFW, 2025e)
- CDFW Fully Protected Species (CDFW, 2025e)

- CDFW Watch List (WL) Species (CDFW, 2025e)
- Protected Furbearing Mammal (14 CCR § 460)
- Listed as CRPR 1 or 2 (CNPS, 2025)
- Protected under San Bernardino County Code 88.01 and the California Desert Native Plants Act (San Bernardino County Code 2007)

### *Desert Tortoise Surveys*

RBC permitted biologists conducted focused presence/absence surveys for desert tortoise within suitable habitat within BIG. Desert tortoise surveys were conducted between October 16, 2021, and October 16, 2024, within the transload warehouse center, rail yard, solar farm, off-site improvements, and the Tortilla Substation improvements (**Table 6**). Areas within the BIG footprint were surveyed at different times due to the timing of access authorizations for various parcels, as discussed below. Due to access constraints and existing obstructions to desert tortoise movement (i.e., National Trails Highway) a survey buffer was not included in the surveys except for a portion of the southwestern lead track extension that included a 100-foot survey buffer during 2025 surveys.

The surveys followed guidelines established in the *Mojave Desert Tortoise Pre-Project Survey Protocols* (USFWS Desert Tortoise Survey Protocol; USFWS 2019). Complete survey methods are presented in **Attachments J - Q**. Please note that due to timing constraints related to phased land acquisitions and site access restrictions, which affected the ability and authorization to physically conduct surveys during specific time periods, some desert tortoise surveys were conducted outside the recommended seasonal survey window for protocol surveys. During consultation with USFWS and CDFW, these deviations from the recommended seasonal timing were disclosed and discussed, and the agencies agreed that all surveys and associated collected data would be considered valid.

Although BIG had 100% survey coverage for focused presence/absence surveys, BIG was surveyed incrementally during different phases from October 2021 to October 2024; the surveys conducted from September to October 2024 covered a majority of the project site, except for the solar farm which was surveyed in May 2024. The abundance of desert tortoise was calculated using the USFWS statistical model based on the survey results from the September to October 2025 surveys. Juvenile desert tortoise, which includes tortoises with a carapace length less than 180 millimeters, if observed, are not factored into this calculation due to the lower probability of detection. The abundance was also calculated based on the assumption that all components within the entire site, except for the Tortilla Substation improvements and the southwestern lead track extension, would be considered a large project (greater than 500 acres) pursuant to the USFWS Desert Tortoise Survey Protocol (USFWS 2019). Therefore, the USFWS statistical model for large projects was utilized to calculate the total number of desert tortoise within BIG (except for Tortilla Substation, the southwestern lead track extension, and any areas surveyed that were outside of BIG) since the survey areas is greater than 500 acres and is non-linear.

The USFWS statistical model was not used for the Tortilla Substation improvements, which is located approximately three miles east of the off-site improvements; that impact area is considered a small and linear project per the USFWS Desert Tortoise Survey Protocol (USFWS, 2019) and as such, the USFWS

statistical model does not apply. The southwestern lead track extension portion of BIG was also excluded from the statistical model due to its linear nature. Abundance estimates are not calculated for small and linear projects because they are less likely to include the entire home range of desert tortoises within the project. Focused presence/absence surveys for small and linear projects are meant to assess whether or not and where desert tortoise occurs within BIG. The linear survey protocol was followed for the distribution line component of the Tortilla Substation improvements and included a 150-meter buffer; the linear survey protocol was also followed for the southwestern lead track extension and did not include a 150-meter buffer due to access restrictions and existing barriers to movement (i.e., paved roadways and existing railway). The small project protocol was followed for the substation footprint and 150-meter buffer. The fenced substation and adjacent water tank were excluded from the survey due to lack of suitable habitat.

All focused desert tortoise presence/absence surveys were led by a qualified desert tortoise biologist that has been authorized by USFWS to conduct desert tortoise surveys on numerous projects. The survey team for all focused desert tortoise presence/absence surveys also included qualified biologists that were familiar with the species and all other Mojave desert wildlife and have experience conducting focused surveys on multiple projects. Full survey methodology, surveyors, and results are presented in **Attachments J - Q**.

### *Least Bell's Vireo Surveys*

RBC conducted a habitat assessment for least Bell's vireo on March 18, 2020, and August 10, 2021, within BIG and 1,000-foot buffer (riparian bird survey area). Following the habitat assessments, RBC conducted focused presence/absence surveys for least Bell's vireo in suitable habitat within the riparian bird survey area between April 19 and July 8, 2021, April 25 and August 18, 2022, and April 10 and July 24, 2023.

RBC conducted the surveys in accordance with the USFWS *Least Bell's Vireo Survey Guidelines* (USFWS, 2001). Complete survey methods and results are presented in **Attachments R - T.**

### *Mojave Fringe-Toed Lizard Surveys*

RBC biologists documented suitable habitat for the Mojave fringe-toed lizard within the northern portion of the BIG that supports dune communities and similar sandy substrates. To assess the occupancy of the site by Mojave fringe-toed lizard, focused presence/absence surveys were conducted from June to October of 2023, which was within the active season for the species. Although there is no existing survey protocol for Mojave fringe-toed lizard, surveyors based the methods on protocol for a similar species, the *Coachella Valley Fringe-Toed Lizard (Uma inorta) Survey Protocol* (CVFTL Survey Protocol; USFWS, 2007).

The survey area included all areas mapped as active desert dunes, active desert dunes – disturbed, stabilized/partially stabilized desert dunes within BIG, plus a 100-foot buffer. Surveyors walked full-coverage belt transects spaced approximately 10 meters apart throughout the entire survey area. Mojave fringe-toed lizard foraging and dispersal activity can be observed outside of the time and temperature constraints outlined in the Coachella Valley Fringe-Toed Lizard (Uma inorta) Survey Protocol (USFWS, 2007); therefore, surveys did not strictly follow those restrictions. The focused presence/absence surveys for Mojave fringe-toed lizard were conducted by biologists familiar with Mojave desert wildlife species.

### *Mohave Ground Squirrel Surveys*

Biologist Phil Brylski, Ph.D., (CDFW memorandum of understanding Primary Investigator) conducted habitat assessments for Mohave ground squirrel on November 9, 2021, and January 3, 2022, within BIG. Based on the habitat assessments results, RBC conducted focused live-trapping surveys for Mohave ground squirrel at two grid locations within the BIG footprint with the highest habitat suitability for the species. Surveys were conducted in three sessions at each location and occurred between April 13 and July 2, 2022, in accordance with the CDFW *Mohave Ground Squirrel Survey Guidelines* (CDFW, 2010).

Dr. Brylski conducted another habitat assessment on March 7 and March 16, 2025, to assess if site conditions changed from the initial habitat assessment in 2022. Based on the habitat assessment results, RBC conducted additional focused live-trapping surveys for Mohave ground squirrel at seven grid locations within the BIG footprint in 2025. Visual and auditory surveys occurred between March 30 and April 15, 2025. The three live-trapping sessions occurred from March 31 to April 29, May 6 to May 30, and June 1 to July 6, 2025, in accordance with the revised CDFW *Mohave Ground Squirrel Survey Guidelines* (CDFW, 2023a).

Complete survey methods for the habitat assessment and focus surveys are presented in **Attachments U - W**.

### *Southwestern Willow Flycatcher Surveys*

RBC conducted a southwestern willow flycatcher habitat assessment on March 18, 2020, and August 10, 2021, within the riparian bird survey area. Following the habitat assessment, permitted biologist Linette Davenport (PER0007536) conducted focused presence/absence surveys for southwestern willow flycatcher within the riparian bird survey area between May 3 and July 15, 2021, May 17 and August 11, 2022, and May 23 and July 10, 2023.

Surveys were conducted according to *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher* (Sogge et al., 2010). Complete survey methods are presented in **Attachments Y - AA.**

### *Bat Habitat Assessment and Anabat Surveys*

Bat habitat assessments and Anabat surveys were conducted between June 30 and July 1, 2025. Structure within BIG were assessed for their potential to support bat roosting. Additionally, five Anabat detectors (Titley Scientific) were installed across areas of the BIG footprint identified as potentially suitable bat habitat. Site selection was based on features known to support bat roosting activity, such as bridges and culverts. During placement of Anabat detectors, suitable features were also visually inspected for roosting bats and sign (i.e., guano).

Each detector was securely mounted at an appropriate height near the identified habitat feature and was programmed to record from sunset to sunrise for two days. Anabat detectors are ultrasonic recording devices that detect and log the high-frequency echolocation calls produced by bats, allowing for species identification and bat activity monitoring. Bat species that were documented visually are recorded in

**Attachment B**. Although Anabat data from the survey was collected, the analysis of the Anabat data is not included in this report.

### *Swainson's Hawk Surveys*

RBC conducted focused Swainson's hawk surveys between March 20 and July 18, 2024. RBC avian biologists conducted a total of six focused surveys throughout the entire BIG footprint plus a 0.5-mile survey buffer to assess species activity and potential to nest within the BIG footprint. Three of the surveys were conducted between March 20 and April 5, 2024, during the period that Swainson's hawks are known to return to their nesting territories and begin displaying courtship and nesting behaviors. The remaining three surveys were conducted between June 10 and July 18, 2024, during the period prior to fledging when nestlings are active and visible within nests.

Focused Swainson's hawk surveys were repeated between March 20 and July 17, 2025. The six focused surveys were conducted within the BIG footprint plus a 10-mile survey buffer. Three surveys were conducted between March 20 and 4, 2025, and three surveys were conducted between June 12 and July 17, 2025.

Surveys were conducted in accordance with the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000). Complete survey methods are presented in **Attachments BB - CC**.

### *Western Burrowing Owl Surveys*

BIG is within the San Bernardino County Burrowing Owl Overlay Zone (County of San Bernardino, 2012); as such, the BIG footprint and adjacent areas were assessed for the suitability and presence of western burrowing owls. RBC conducted focused western burrowing owl surveys within accessible suitable habitat within BIG between October 16, 2021, and July 10, 2024 (**Table 6**). Focused western burrowing owl surveys were conducted within BIG and a 500-foot buffer (burrowing owl survey area) during both breeding (February 1 – August 31) and non-breeding (September 1 – January 31) seasons.

Survey methods generally followed the guidelines outlined in the CDFW Staff Report on Burrowing Owl Mitigation (CDFW, 2012). During the 2021-2022 non-breeding and breeding seasons, some portions of BIG were surveyed once rather than the recommended four survey passes due to timing constraints and a survey buffer was not included due to the lack of legal access to surrounding areas (**Table 6**). However, to support full coverage of the remaining burrowing owl survey area, four survey passes were conducted during the 2022 breeding season for approximately 495 acres; the remaining 4,600 acres were surveyed during four passes in the 2023 breeding season which included areas previously surveyed in 2021-2022 (including areas only surveyed once in the 2022 breeding season and areas surveyed during the 2021-2022 non-breeding season) as well as new project areas. The 2023 breeding season western burrowing owl surveys also included a 500-foot survey buffer of the entire BIG site; buffer areas not directly accessible were surveyed with binoculars. The 2024 breeding season western burrowing owl surveys included the solar farm and various non-contiguous parcels totaling 157 acres, as well as a 500-foot survey buffer around those areas; buffer areas not directly accessible were surveyed with binoculars. Due to the size of the area surveyed, surveys did not follow the recommended daily timing precisely; however,

presence/absence of western burrowing owls on BIG were assessed by analyzing the presence of suitable burrows and recent burrowing owl sign. Presence/absence of burrowing owl was also assessed through incidental observations of individuals and recent sign during other focused species surveys. Complete survey methodology for each western burrowing owl survey conducted are presented in **Attachments D - I**.

### *Western Yellow-Billed Cuckoo Surveys*

RBC biologists conducted a habitat assessment for western yellow-billed cuckoo on August 10, 2021, within the riparian bird survey area. Following the habitat assessment, biologist Arthur Davenport (TE-802450-9) conducted focused presence/absence surveys for western yellow-billed cuckoo within suitable habitat within the riparian bird survey area between June 29 and August 11, 2022, and June 19 and August 10, 2023.

Surveys were conducted according to *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo* (Halterman et al., 2015). Complete survey methods are presented in **Attachments DD - EE**.

### *Special-Status Plant Species Surveys and Reference Population Checks*

RBC conducted habitat assessments for special-status plants during the vegetation mapping and general biological field surveys conducted in November 2018, December 2018, March 2019, August 2019, March 2020, June 2020, August 2021, and January 2023 (**Table 6**). Special-status plant species include those that are: 1) listed or proposed for listing by federal or state agencies as threatened or endangered; 2) CRPR 1 , 2, 3, or 4 species (CNPS, 2025); 3) considered rare, endangered, or threatened by the CDFW (CDFW, 2025b) or other local conservation organizations or specialists; or 4) protected under San Bernardino County Code Chapter 88.01: Plant Protection and Management (San Bernardino County Code, 2007).

CNPS is a statewide resource conservation organization that has developed an inventory of California's sensitive plant species based on the CRPR ranking system. The CRPR system is recognized by the CDFW and essentially serves as an early warning list of potential candidate species for threatened or endangered status. The CRPR system definitions are presented in **Table 7: CRPR Definitions**.

**Table 7: CRPR Definitions**

| | | |
|---|---|---|
| CRPR | 1A | presumed extirpated in California and rare or extinct elsewhere |
| | 1B | rare, threatened, or endangered in California and elsewhere |
| | 2A | presumed extirpated in California but more common elsewhere |
| | 2B | rare, threatened, or endangered in California but more common elsewhere |
| | 3 | plants for which more information needed |
| | 4 | plants of limited distribution |
| CRPR Threat Ranks | 0.1 | Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat) |
| | 0.2 | Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) |
| | 0.3 | Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known) |

Sources: CNPS, 2025

During the habitat assessment, areas mapped as developed, disturbed habitat, or agriculture were eliminated from the special-status plant survey area (BIG and 50-foot buffer) due to lack of suitable habitat for special-status species known from the vicinity. Based on the habitat assessment, the following CRPR 1 and 2 species were identified as focal species due to the presence of suitable habitat within the special--status plant survey area as well as consultation with USFWS and CDFW: Barstow woolly sunflower (*Eriophyllum mohavense*), beaver dam breadroot (*Pediomelum castoreum*), creamy blazing star (*Mentzelia tridentata*), Emory's crucifixion-thorn (*Castela emoryi*), Mojave monkeyflower (*Diplacus mohavensis*), Parish's phacelia (*Phacelia parishii*), and spiny-hair blazingstar (*Mentzelia tricuspis*). RBC conducted special-status plant surveys within suitable habitat in the special-status plant survey area in May of 2023 and May of 2024 (**Table 4**). To account for potential changes in yearly climatic conditions which could affect special-status plant presence, special-status plant surveys were repeated across the project site in April to May of 2025 and the special-status plant survey area was revised to include BIG and a 100-foot buffer. The special-status plant surveys were conducted during the blooming period of the target species, with the exception of Emory's crucifixion thorn, which is a conspicuous shrub that would have been observed at any time of year, if present. Botanical surveys for special-status plants followed the botanical survey guidelines of CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (2018).

Prior to special-status plant surveys, RBC biologists visited reference populations and/or reviewed Calflora and CNDDB botanical records to evaluate plant phenology and seasonal conditions to determine appropriate survey dates. In spring 2023, botanical records of the focal special-status plant species were analyzed to justify survey timing and decrease the probability of a false negative survey result. In spring 2024, RBC biologists visited reference populations for the following species to confirm climatic conditions and phenology were appropriate for plant observation: beaver dam breadroot, creamy blazing star, Mojave monkeyflower, and Parish's phacelia. Reference populations were checked again in March and April of 2025 ahead of the additional special-status plant surveys.

To achieve approximately 100% coverage of the accessible special-status plant survey area, biologists walked parallel transects spaced 5-20 meters apart, adjusting spacing based on habitat structural complexity, species diversity, vegetative density, and suitability. All plant taxa observed within the special-status survey area were identified to the species, subspecies, or varietal level. Biologists identified plant species by morphological traits, including flowering and fruiting structures (if present). If field identification was not possible due to microscopic dichotomies between taxa, a sample was taken and was keyed out in the lab. The following parameters were recorded for all special-status plant observations within any portion of the total special-status plant survey area: 1) specific location details (acquired using a GPS device); 2) estimated number of individuals in the population; 3) phenology and percent of population numbers in each phenological stage (if applicable); 4) percent cover; 5) site-specific characteristics (including but not limited to microhabitat, habitat, and associated species); 6) density; and 7) digital diagnostic species photographs. Although the special-status plant survey focused on CRPR 1 and 2 species, as well as plants regulated under the San Bernardino County Code Chapter 88.01 and the California Desert Native Plants Act, locations of CRPR 3 and 4 species were recorded if documented on site during biological surveys.

Plant surveys were conducted by staff familiar with and experienced in Mojave Desert wildlife and plant species surveys. In 2023, RBC biologists conducted special-status plant surveys concurrently with the second survey pass for focused western burrowing owl surveys where suitable habitat for burrowing owls and special-status plants overlapped in the portions of the rail yard, off-site improvements, and transload warehouse center. In 2024, RBC biologists conducted special-status plant surveys concurrently with the second survey pass for focused western burrowing owl surveys where suitable habitat for burrowing owls and special-status plants overlapped in solar farm and portions of the rail yard. Also in 2024, special-status plant surveys of the Tortilla Substation (including a 50-foot buffer at each location) were conducted and did not occur concurrently with any other surveys.

Given the annual differences in climatic conditions, specifically precipitation, that may affect the germination and phenology of various floral species within BIG, special-status plant surveys were repeated across the entire site in the spring of 2025 (except for the solar farm previously surveyed in spring of 2024). During the 2025 special-status plant surveys, the team included biologists that were familiar with Mojave Desert flora. Although no other resources were the focus of the plant surveys, i.e., sensitive wildlife, any special-status wildlife or sign that was observed incidentally was also recorded during the surveys.

Western Joshua tree was observed within the BIG footprint during vegetation mapping. As such, a focused western Joshua tree census was conducted within the BIG footprint and a 50-foot buffer (i.e., special-status plant survey area) on October 17, 2024. Each western Joshua tree within the special-status plant survey area received a unique identification number, and a sub-meter GPS was used to record the location of each tree. In accordance with the Western Joshua Tree Conservation Permitting Census Instructions (CDFW, 2024b), trees were classified into the following size classes: A – less than one meter in height; B – one meter or greater but less than five meters in height; and C – five meters or greater in height. Additional, information collected included status (live/dead), maturity (branched/not branched), phenological stage (flowers/fruits/none), and proposed impacts (removal, trim, relocation, other, or none). Complete survey methods for the focused western Joshua tree census are presented in **Attachment FF**.

A plant compendium for BIG and adjacent areas is included as **Attachment B,** and includes all floral species documented on site during focused special-status plant surveys and incidentally during various other surveys conducted from 2021 to 2025.

## 4.5 Wildlife Corridors

Wildlife corridors are three-dimensional physical features that link two or more larger areas of wildlife habitat and often consist of native vegetation. A viable wildlife corridor requires an unobstructed path between habitat areas, appropriate vegetation communities to provide food and cover for both transient species and resident populations of less mobile animals, and a sufficient lack of stressors or threats within and adjacent to the corridor. Wildlife corridors can consist of large, linear stretches of connected habitat or as a sequence of stepping-stones across the landscape. Relatively small, discontinuous areas of habitat such as patches of wetlands and ornamental vegetation can facilitate wildlife movement, or corridors can be larger habitat areas with likely or known importance to local or regional fauna. Wildlife corridors enable

migration, colonization, and exchange of genetic diversity through interbreeding and are therefore critical for the movement of animals and the persistence of healthy, viable populations. Regional corridors are defined as those linking two or more large patches of habitat, and local corridors are defined as those allowing resident animals to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

RBC assessed BIG for its potential to serve as a wildlife movement corridor by considering the wildlife species potentially present, their various home ranges and migration patterns, and the site conditions supporting/precluding the movement of wildlife. In addition to the field assessment, RBC also reviewed the CDFW BIOS database and other resources to determine if BIG is located within an Essential Connectivity Area (as mapped through the CEHC Project), Terrestrial Connectivity ACE, or other CDFW-recognized wildlife corridor (CDFW, 2025b). Additionally, a 12-month site-specific movement study was conducted to evaluate wildlife movement patterns and seasonality in various habitats at the BIG site.

### *CEHC Project – Essential Connectivity Area and Potential Riparian Connections*

The CEHC Project was commissioned by the California Department of Transportation and CDFW to analyze and map a functional network of connected wildlands across the state for the purposes of guiding the conservation of natural communities in the face of human development and climate change. Essential Connectivity Areas generally connect areas of both high biological value and high conservation status across mostly natural habitats that have relatively low resistance to ecological flows, but that tend not to enjoy high levels of protection of biological resource values (Strittholt et al., 2010). The Essential Connectivity Areas represent principal connections between the Natural Landscape Blocks within which land conservation and management actions should be prioritized to maintain and enhance ecological connectivity.

Potential Riparian Connections are mapped to illustrate the contribution of streams and rivers in providing additional avenues for terrestrial and aquatic connectivity to the network of Natural Landscape Blocks and Essential Connectivity Areas.

### *Terrestrial Connectivity ACE*

The Terrestrial Connectivity ACE dataset is compiled by CDFW as an effort to gather spatial data on wildlife, vegetation and habitats from across the state, and then synthesize this information into thematic maps to help inform discussions on the conservation of biodiversity, habitat connectivity, and climate change resiliency (CDFW n.d.). The ACE maps provide a coarse level view of information for conservation planning purposes. ACE data is summarized by ACE hexagons, each totaling approximately 2.5 square miles. ACE connectivity ranks are ranked 1 – 5 based on the conservation importance of connectivity based on the best-available data:

- ACE Rank 5. Irreplaceable and Essential Corridors: this includes channelized areas as identified in The Nature Conservancy's Omniscape model, and priority species movement corridors. The Natue Conservancy's mapped channelized areas are those areas where surrounding land use and barriers are expected to funnel or concentrate animal movement. Channelized areas may

represent the last available connection(s) between two areas, making them high priority for conservation.

- ACE Rank 4. Conservation Planning Linkages: these are the habitat connectivity linkages mapped in the CEHC and fine-scale regional connectivity studies. Habitat connectivity linkages are often based on species-specific models and represent the best connections between core natural areas to maintain habitat connectivity. Linkages have more implementation flexibility than irreplaceable and essential corridors.
- ACE Rank 3. Connections with implementation flexibility: these are other areas that have been identified as having connectivity importance, but have not been identified as channelized areas, species corridors, or habitat linkages at this time.
- ACE Rank 2. Large natural habitat areas: these are large blocks of natural habitat (>2000 acres) where connectivity is generally intact. This includes natural landscape blocks from the 2010 CEHC and updated with the 2016 Statewide Intactness dataset.
- ACE Rank 1. Limited connectivity opportunity: areas where land use may limit options for providing connectivity (e.g., agriculture, urban) or no connectivity importance has been identified in models.

### *California Desert Connectivity Project - Desert Linkage Corridors*

As a product of the California Desert Connectivity Project, Desert Linkage Corridors were evaluated and mapped to produce implementable linkage designs and provide the necessary data and information to inform land management, land acquisition, restoration (e.g., habitat restoration and restoration of permeability across transportation barriers), and stewardship in connectivity zones (Strittholt et al., 2010; Penrod et al., 2012). In 2009, South Coast Wildlands brought together regional ecologists to conduct a formal evaluation of 47 linkages associated with the California deserts. The evaluation was designed to assess the biological irreplaceability and vulnerability of each linkage.

### *Missing Linkages in California's Landscape*

The *Missing Linkages: Restoring Connectivity to the California Landscape* (Missing Linkages Project) report provided a comprehensive overview of the locations of California's key wildlife corridors as well as challenges and opportunities for corridor planning (Penrod et. al., 2001). Historically, information on wildlife corridors was often not publicly accessible and limited only to individuals with local area knowledge; as a result, these areas were often overlooked in land use planning and development projects. In collaboration with wildlife experts, the project identified key, state-wide linkage areas that are crucial for maintaining or improving wildlife movement through regional landscapes. The report provided detailed descriptions of each identified key linkage area, including defining species or ecological processes that demonstrate connectivity, critical threats to connectivity, and opportunities for maintaining or improving connectivity.

### *Wildlife Movement Camera Study*

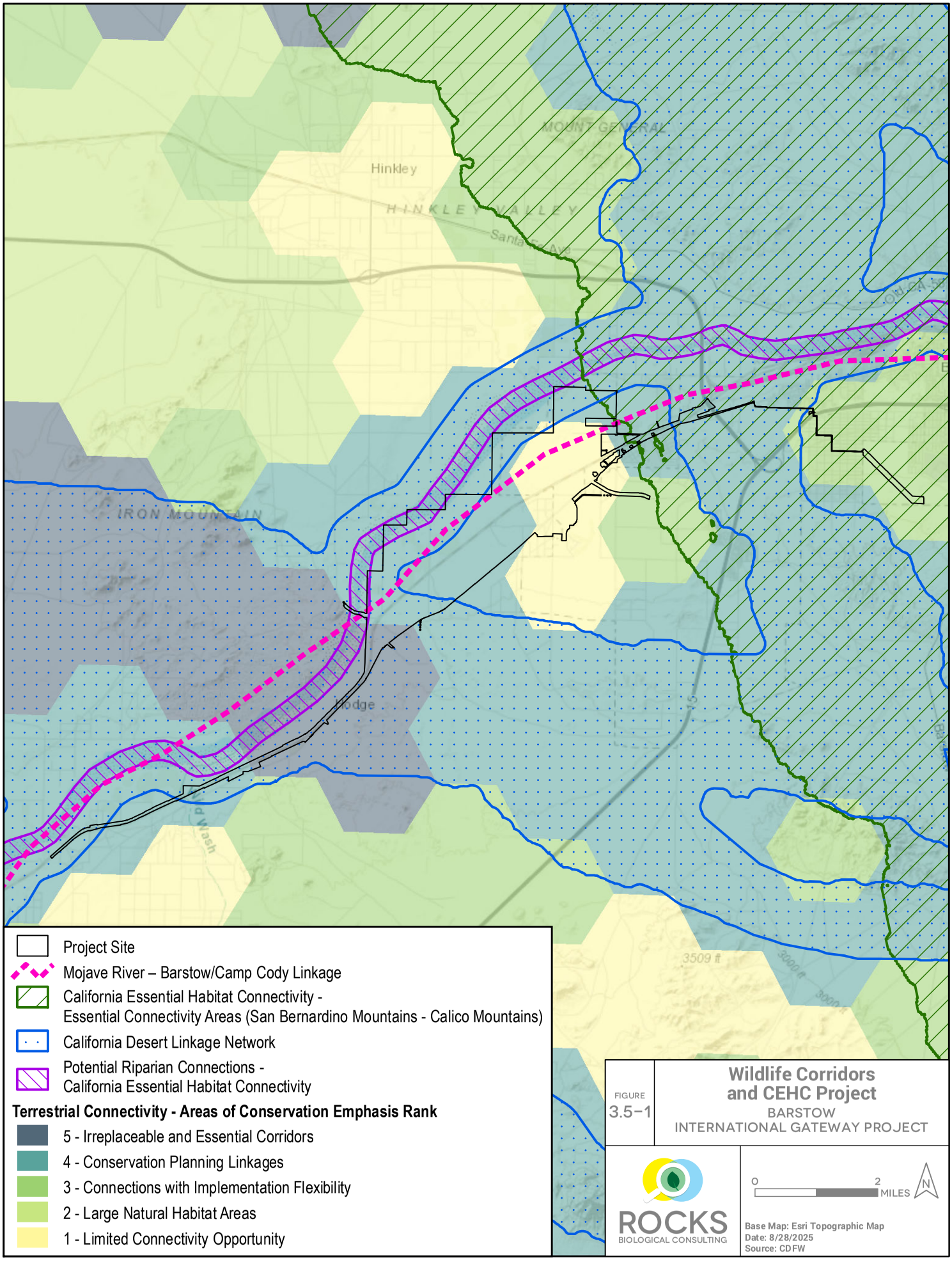
A site-specific wildlife movement camera study was conducted to assess current wildlife movement patterns within BIG and identify potentially important wildlife movement areas. The study took place over

a twelve-month period to account for and assess seasonal changes in species and usage patterns within/around BIG. Six study periods, each comprised of five consecutive nights of camera trapping, were conducted, with surveys in March 2024, June 2024, September 2024, November 2024, January 2025, and March 2025 (**Table 6**).

Using vegetation mapping, aerial photography, the CDFW BIOS, and an assessment of existing site conditions, wildlife cameras were placed in areas with a relatively high likelihood of capturing wildlife activity including along linear landscape features and existing structures linking areas of natural habitat. Sites that could capture wildlife movement under the existing railroad via culverts or openings and areas parallel to the railroad such as access roads and aquatic features were prioritized for camera trap placement. These areas also connected patches of native vegetation on either side of the railroad, contained existing natural corridors such as waterways, and connected wildlands from the southeast side of the railroad to the Mojave River. Wildlife cameras were also placed along the southern boundary of the project site along National Trails Highway to assess wildlife movement in and out of the project site at the edge of habitat, as well as along the northern portion of the project site adjacent to the Mojave River, which is also mapped in the CDFW BIOS as a movement corridor (i.e., CEHC Potential Riparian Connections, California Desert Linkage Network, and the Mojave River – Barstow/Camp Cody Linkage (Figure 3.5-1. Wildlife Corridors and CEHC Project). The study also assessed relative usage of existing railroad crossings and culverts.

During each study period, 26 to 35 cameras were stationed throughout BIG, within the following general locations: Lenwood Channel, Unnamed Stream (Milepost 10.9), existing BNSF railway main track and lead track extension under crossings or culverts, along unpaved OHV access roads and other on-site habitat areas, and Main Street crossings. The number and placement of cameras varied across the six monitoring sessions and were adjusted throughout the year to increase capture efficacy and to avoid camera theft.

During each study period, Vikeri or WOSPORTS brand infrared trail cameras were stationed throughout the site. At each camera location, wildlife cameras were oriented to best observe wildlife movement through culvert and vehicle crossing entrances/exits, towards/through natural landscapes with linear corridor features, or across project boundaries. Each camera's field of view was angled to capture the surrounding habitat or nearby structure without obstructing the movement of the species, allowing for identifiable photographs. Camera placement also avoided areas that could inadvertently trigger non-wildlife photo captures, such areas with potential for wind-blown vegetation or in areas facing oncoming vehicle traffic. Camera settings allowed two to five-photo bursts per trigger with a 10 to 30-second delay between triggers. Cameras were operational over a 24-hour period during each day until completion of each monitoring session. At the end of each study period, biologists reviewed photos from each camera to identify as much wildlife species captured as possible and document the frequency each species was captured throughout the year. Capture frequency was determined by the quantity of image captures at any given camera location which was considered in assessing the functionality of each potential wildlife movement location. Areas with higher capture frequencies for certain species were generally assumed to support more wildlife movement/activity for those species compared to other camera locations with lower capture frequencies.


Hinkley
HINKLEY VALLEY
IRON MOUNTAIN
Lodge
3509 ft
Project Site
Mojave River – Barstow/Camp Cody Linkage
California Essential Habitat Connectivity -
Essential Connectivity Areas (San Bernardino Mountains - Calico Mountains)
California Desert Linkage Network
Potential Riparian Connections -
California Essential Habitat Connectivity
Terrestrial Connectivity - Areas of Conservation Emphasis Rank
5 - Irreplaceable and Essential Corridors
4 - Conservation Planning Linkages
3 - Connections with Implementation Flexibility
2 - Large Natural Habitat Areas
1 - Limited Connectivity Opportunity
FIGURE
3.5-1
Wildlife Corridors
and CEHC Project
BARSTOW
INTERNATIONAL GATEWAY PROJECT
ROCKS
BIOLOGICAL CONSULTING
0
2
MILES
N
Base Map: Esri Topographic Map
Date: 8/28/2025
Source: CDFW

Live animals or sign (feathers, tracks, scat, etc.) observed throughout BIG were also documented during camera setup and retrieval to identify potential wildlife movement patterns not detected by infrared trail cameras. Additionally, at the beginning and end of each study period, biologists drove along paved and unpaved roadways within the project vicinity to document and identify roadkill. Roadkill observations were used to document potential areas of concern for wildlife movement and to identify how wildlife was moving throughout the site.

All wildlife species documented in the study were identified to the lowest taxonomic unit possible based on observed identifying characteristics. Most wildlife was identified to genus or species; however, some animals were only identifiable to order or family.

Complete study methods are presented in **Attachment GG**.

## 4.6 Impact Analysis

This BTR includes an analysis of direct, indirect, and cumulative impacts on biological resources, as described below.

Direct impacts are caused by the project and occur at the same time and place as the project. Any alteration, disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Direct impacts would include direct losses to native habitats, potential jurisdictional waters, wetlands, and special-status species; and diverting natural surface water flows. Direct impacts could include "take" (injury, death, harm, and/or harassment) of listed and/or special-status species. Direct impacts could also include the destruction of habitats necessary for species breeding, feeding, or sheltering. Direct impacts on plants can include crushing of adult plants, bulbs, or seeds.

Indirect impacts may occur later in time or at a place that is farther removed in distance from the project than direct impacts, but indirect impacts are still reasonably foreseeable and attributable to project-related activities. Examples include habitat fragmentation; elevated noise, dust, and lighting levels that may cause disruption and alter wildlife behavior on adjacent lands; changes in hydrology, runoff, and sedimentation; decreased water quality; soil compaction; increased human activity; and the introduction of invasive wildlife (domestic cats and dogs) and plants. As noted in Methods for Evaluating Effects, the multitude of surveys on site included buffers of various lengths to identify nearby biological resources and to aid in assessment of potential indirect impacts on protected resources, if present.

Cumulative impacts refer to incremental individual environmental effects of two or more projects when considered together. Such impacts taken individually may be minor but could be collectively significant in light of regional impacts.

## 4.7 Determining Significance under California Environmental Quality Act

State CEQA Guidelines Appendix G contains the Environmental Checklist Form, which includes questions concerning biological resources. The questions presented in the Environmental Checklist Form have been utilized as significance criteria in this section. Accordingly, BIG would have a significant effect on the biological resources if it would:

- *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;*
- *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS;*
- *Have a substantial adverse effect on state- or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;*
- *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*
- *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy, or ordinance;*
- *Conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or state habitat conservation plan.*

# 5.0 ENVIRONMENTAL SETTING

This section discusses baseline conditions within BIG as defined in Methods for Evaluating Effects and provides the results of the literature review, vegetation mapping, general biological surveys, focused surveys for special-status species, formal aquatic resources delineations, and wildlife corridor assessment within BIG.

## 5.1 Physical Setting

BIG consists of elevations ranging from 2,200 to 2,730 feet amsl. BIG is relatively flat except for aeolian dune habitat north of the rail track in the northern portion and several hillslopes south of the rail track in the central portion. BIG generally decreases in elevation moving northwest towards the Mojave River. The Mojave River and watershed, which is unique to the region, runs parallel to the north of BIG and within northern portions of the project site. BIG occurs within the following USGS 7.5' Quadrangles: Barstow, Hinkley, Barstow SE, Hodge, and Wild Crossing.

### *Historical Land Use*

Review of aerials photographs (1952 – 2016) indicates that historical land uses within BIG include the following:

- **Agricultural and Dairy**: Portions of the BIG footprint were used for agricultural and dairy purposes from at least the 1950s. Historical dairy operations within Properties 2, 3, 5 and 6 (APN: 0466-101-06, 0466-101-07, 0466-111-02, and 0466-041-23) have ongoing Corrective Action Order with regulatory oversight.
- **Service Stations and Automotive Repair**: West Main Street operated as a major byway prior to completion of Interstate 15 in 1973. Between the 1940s and 1970s, Main Street included multiple service stations.
- **Residential**: Rural residential housing and associated roads, septic systems for sanitary disposal, water wells for potable water, and other infrastructure were present primarily along Main Street from at least the 1950s. Additional low to medium density residential housing was built from the 1970s to the present.
- **Commercial Retail**: Multiple commercial uses were located within the BIG footprint and adjacent.

### *Surrounding Land Use*

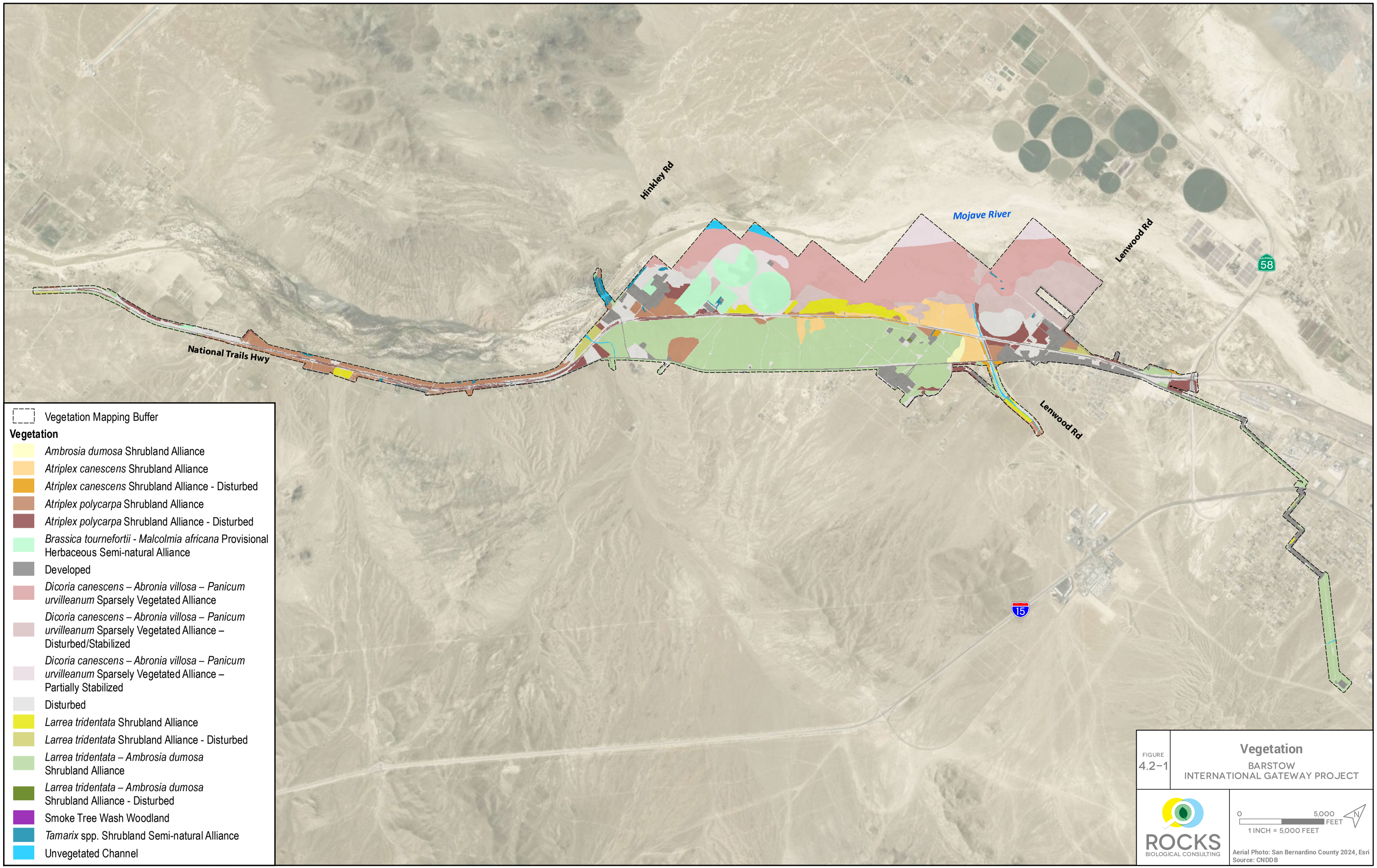
The land uses surrounding BIG are summarized as follows:

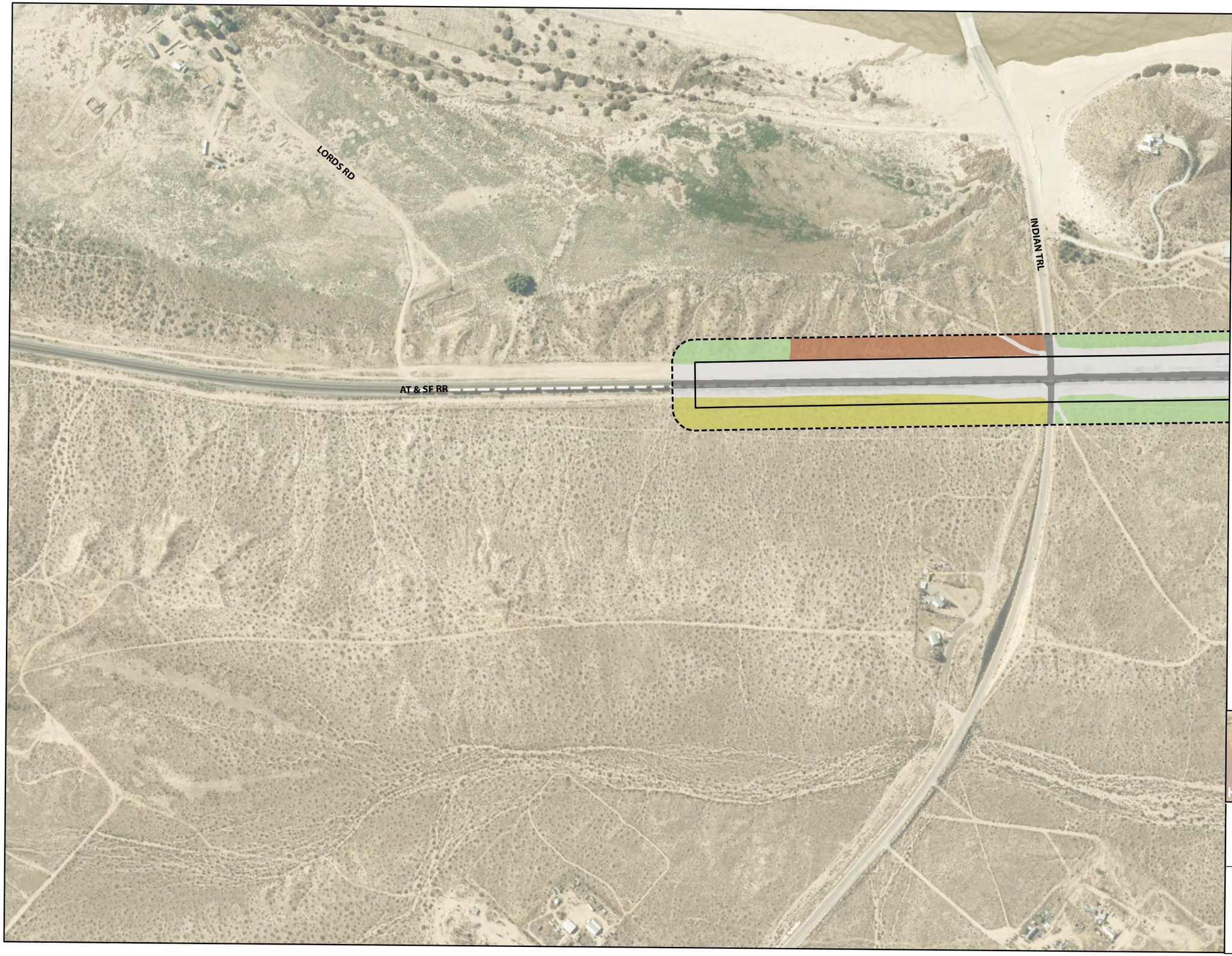
- **North:** vacant undeveloped land, the Mojave River
- **South:** primarily vacant undeveloped land, some low-density residential uses south of National Trails Highway/Main Street
- **East:** residential and commercial uses north and south of the existing tracks, including along National Trails Highway/Main Street
- **West:** vacant undeveloped land, the Mojave River

Beyond the immediately adjacent land uses are rural residential neighborhoods in the North Desert communities of Hinkley, Lenwood, Hodge, Barstow Heights, Yermo, Daggett, Newberry Springs, Kramer Junction, Red Mountain, and further unincorporated San Bernardino County. Existing access surrounding BIG is provided by Lenwood Road, Hinkley Road, and National Trails Highway/Main Street, as well as dirt roads not maintained by the County.

## 5.2 Vegetation Communities and Land Covers

BIG supports 15 vegetation communities and two land covers (Figure 4.2-1. Vegetation), which are described below. Please note that although vegetation communities were mapped up to a 100-foot buffer in the field, **Table 8: Summary of Vegetation Communities and Land Covers within BIG** quantifies the vegetation communities within the BIG project site boundary only.


Hinkley Rd
Mojave River
Lenwood Rd
National Trails Hwy
Lenwood Rd
58
15
Vegetation Mapping Buffer
Vegetation
Ambrosia dumosa Shrubland Alliance
Atriplex canescens Shrubland Alliance
Atriplex canescens Shrubland Alliance - Disturbed
Atriplex polycarpa Shrubland Alliance
Atriplex polycarpa Shrubland Alliance - Disturbed
Brassica tournefortii - Malcolmia africana Provisional Herbaceous Semi-natural Alliance
Developed
Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance
Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Disturbed/Stabilized
Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Partially Stabilized
Disturbed
Larrea tridentata Shrubland Alliance
Larrea tridentata Shrubland Alliance - Disturbed
Larrea tridentata – Ambrosia dumosa Shrubland Alliance
Larrea tridentata – Ambrosia dumosa Shrubland Alliance - Disturbed
Smoke Tree Wash Woodland
Tamarix spp. Shrubland Semi-natural Alliance
Unvegetated Channel
FIGURE
4.2-1
Vegetation
BARSTOW
INTERNATIONAL GATEWAY PROJECT
ROCKS
BIOLOGICAL CONSULTING
0
5,000
FEET
1 INCH = 5,000 FEET
N
Aerial Photo: San Bernardino County 2024, Esri
Source: CNDDB




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE 4.2–1A

**Vegetation**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

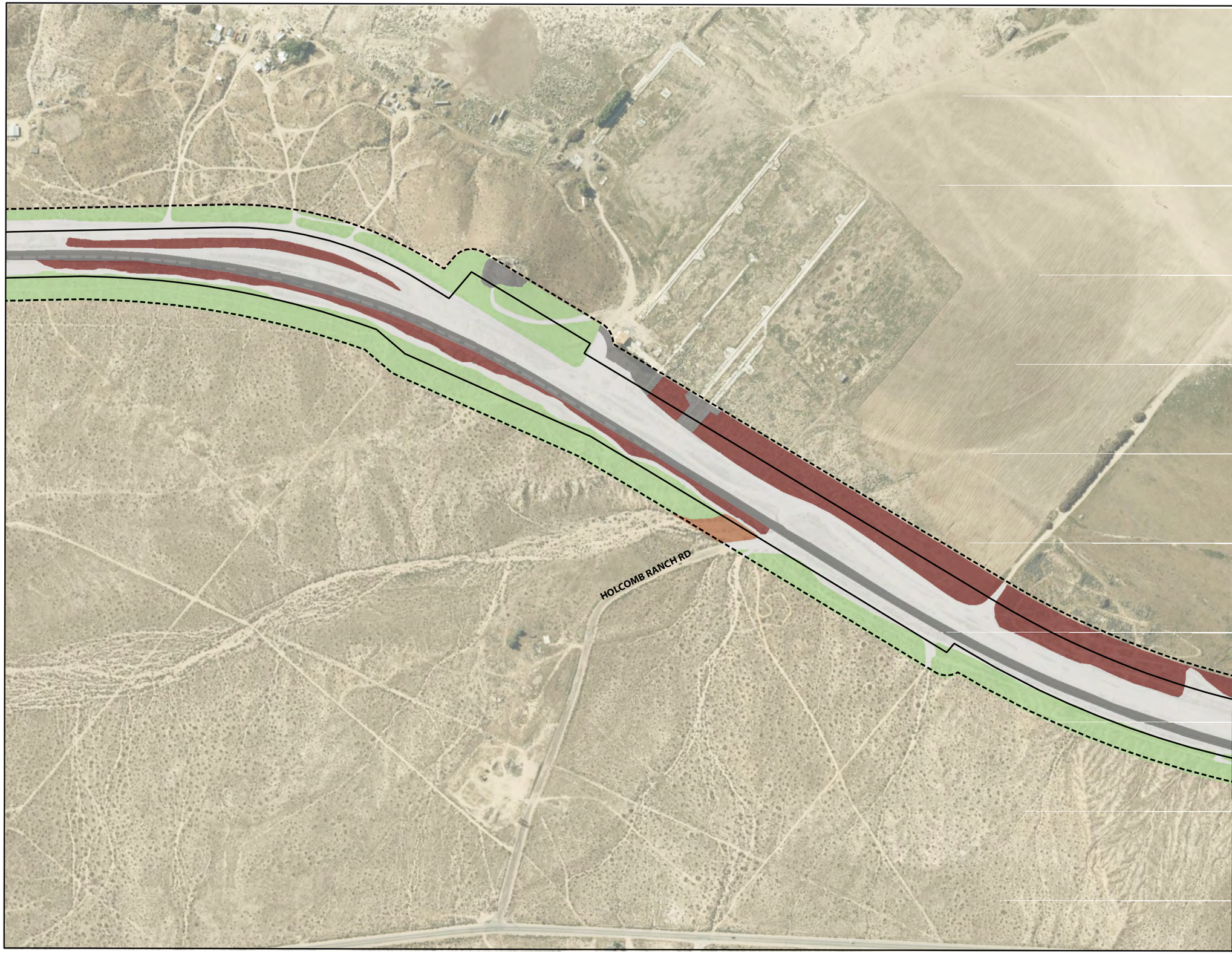
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE
4.2–1B

# Vegetation

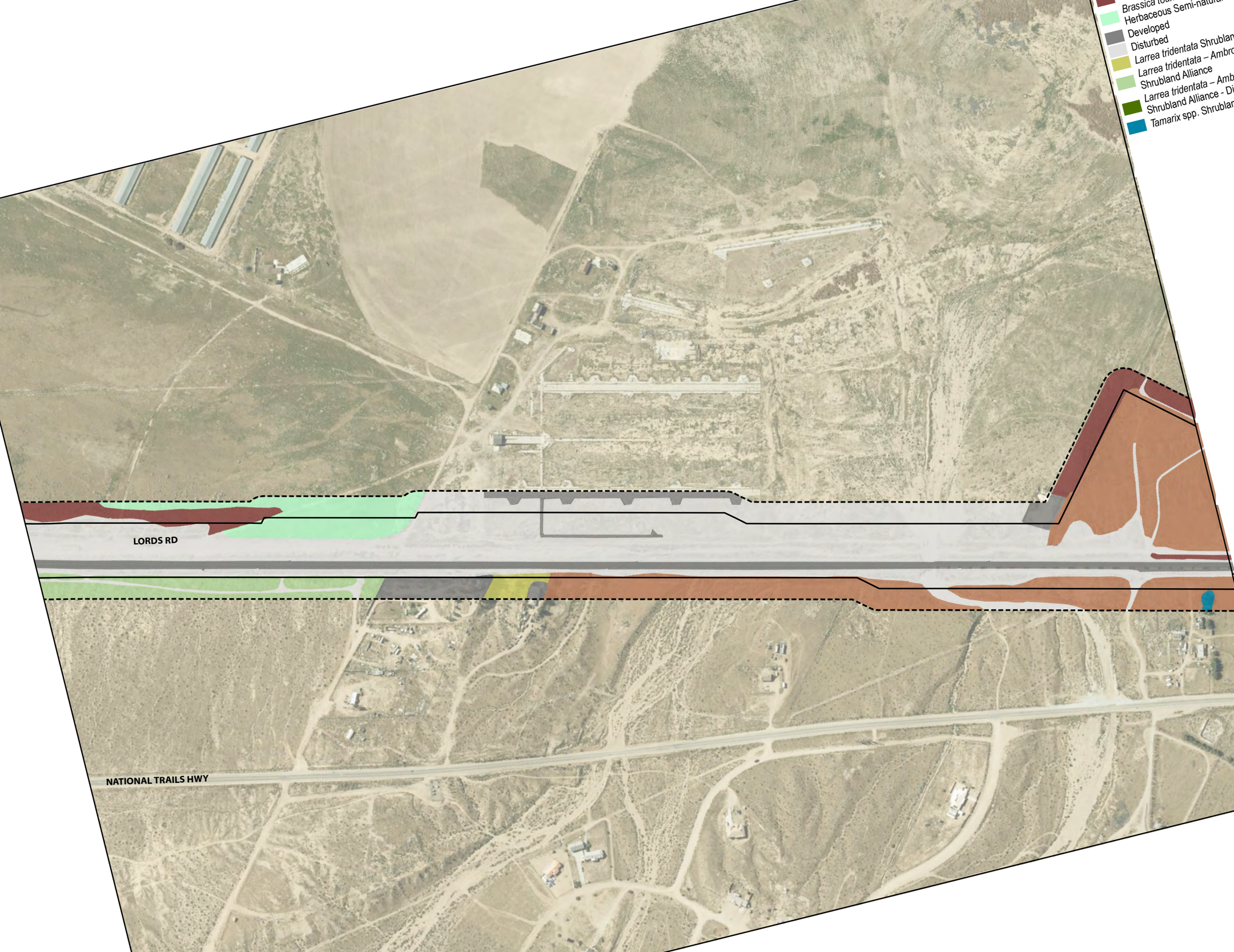
BARSTOW
INTERNATIONAL GATEWAY PROJECT

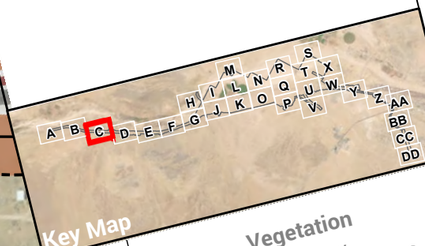
ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Key Map

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PRO...

FIGURE 4.2-1C

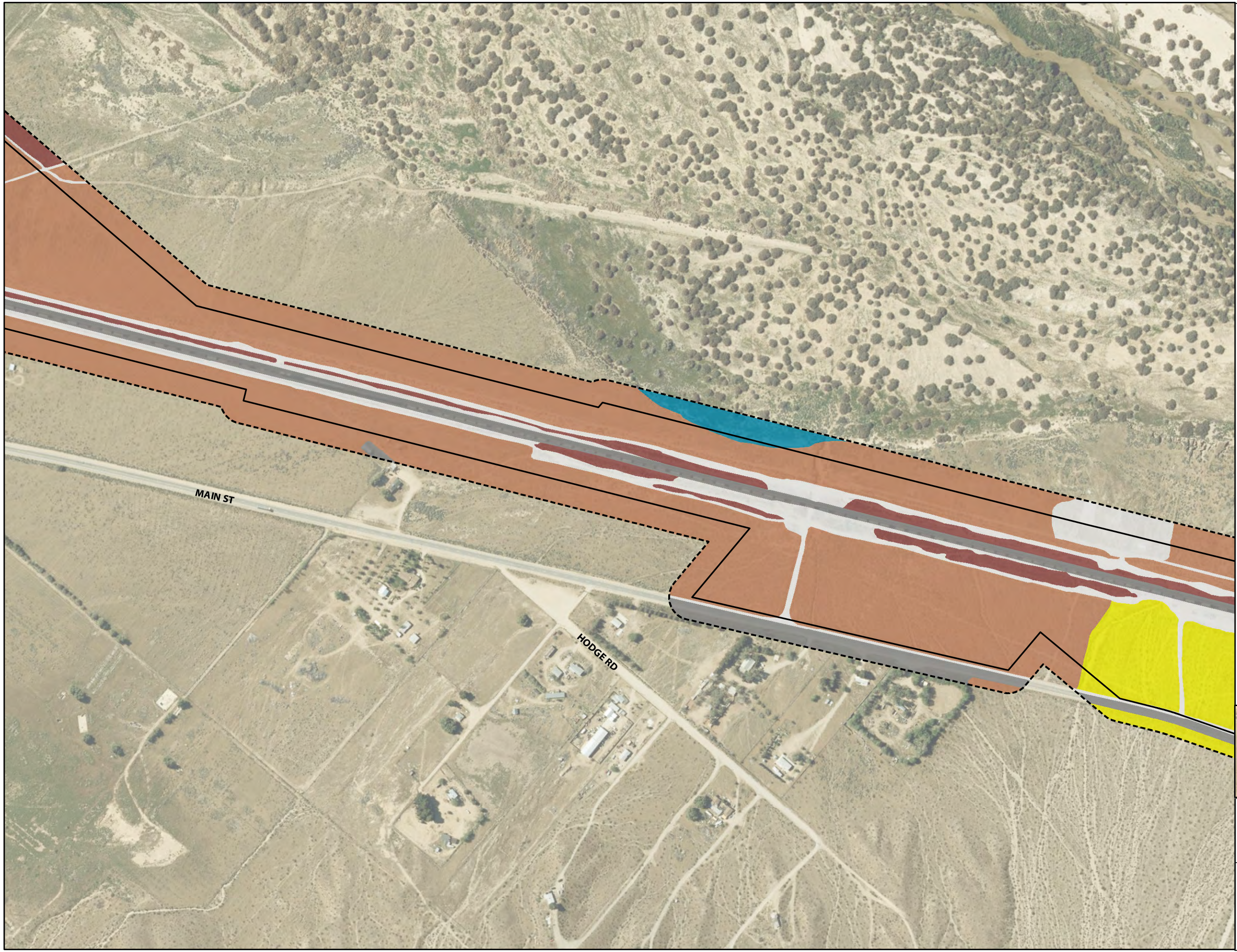
ROCKS BIOLOGICAL CONSULTING

0 400 FE

1 INCH = 400 FEET

Date: 8/28/2025

Aerial Photo: San Bernardino C...




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance




FIGURE
4.2-1D

**Vegetation**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri

MOJAVE RVR

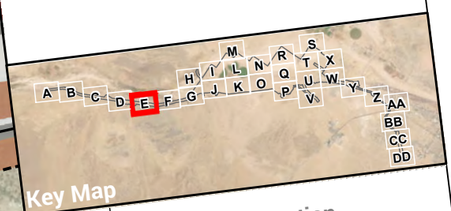
AT & S F RR

NATIONAL TRAILS HWY

Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance




Key Map

FIGURE
4.2-1E

# Vegetation

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024,

MOJAVE RVR

A T & S F RR

Vegetation Mapping Buffer
Project Site

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Tamarix* spp. Shrubland Semi-natural Alliance



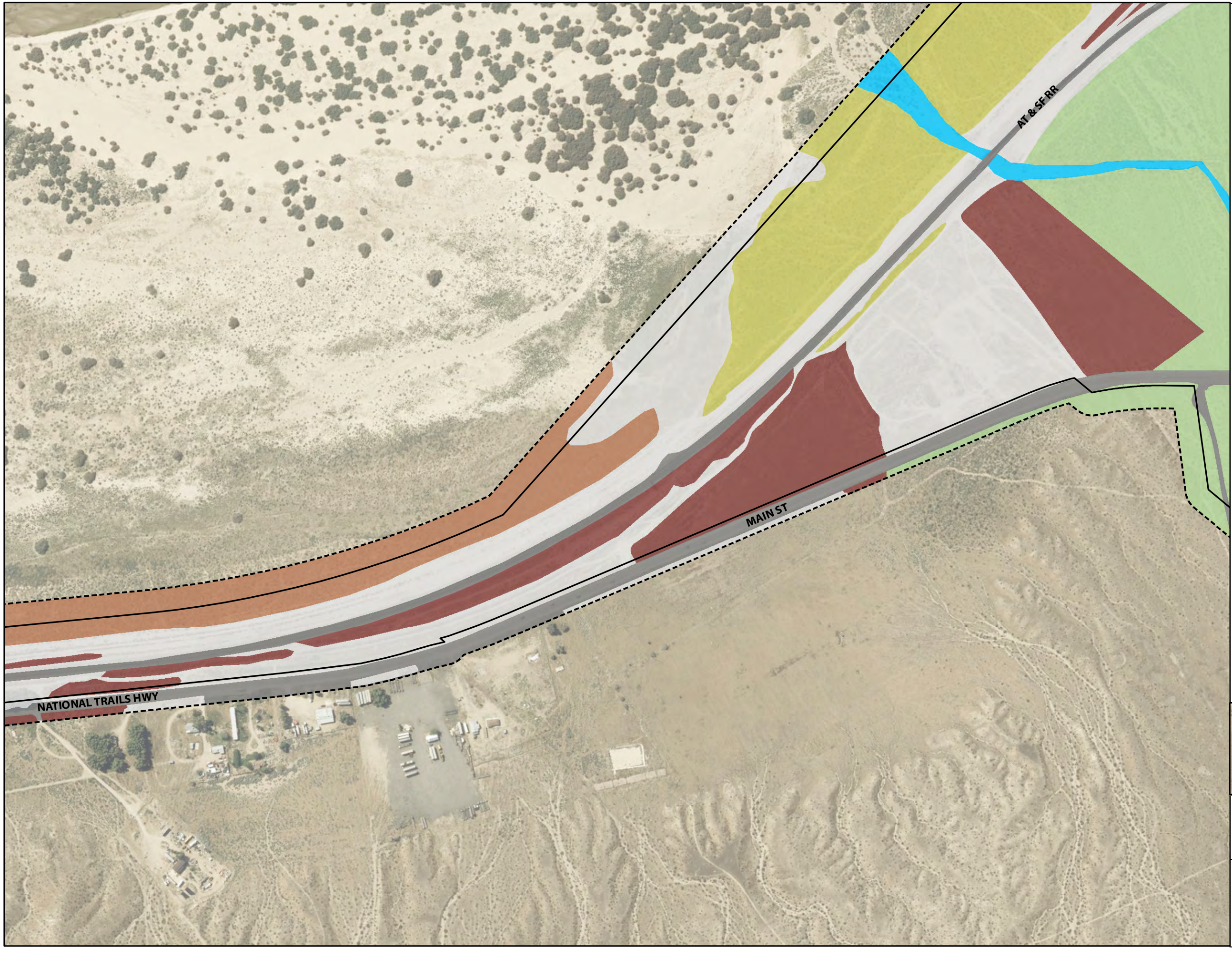

FIGURE
4.2-1F

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL

0 400 FEET
1 INCH = 400 FEET

N




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- Unvegetated Channel

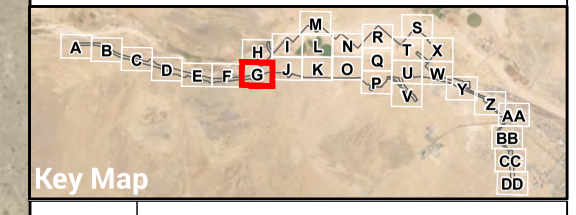



FIGURE
4.2-1G

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

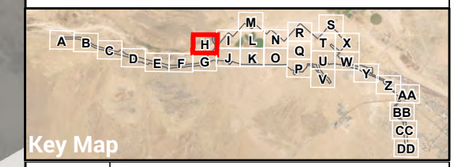



FIGURE
4.2–1H

**Vegetation**

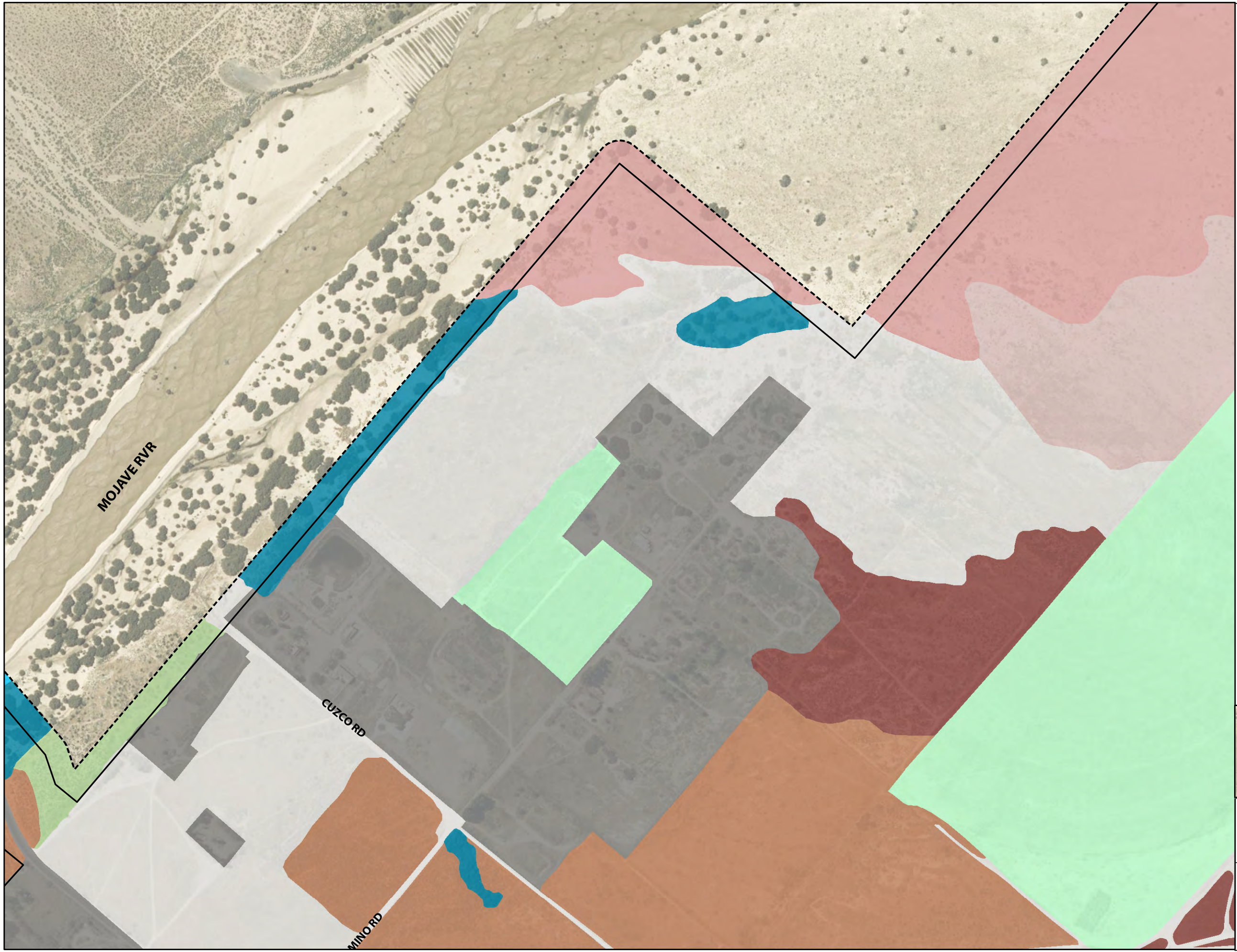
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

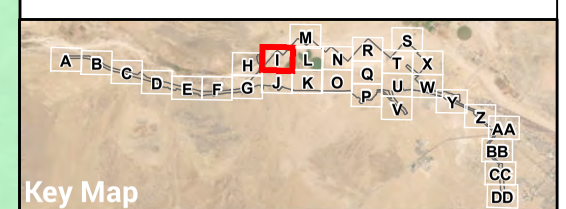



FIGURE 4.2-11

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County 2024, Esri

CAMINO RD

AT & SF RR

HINKLEY CTF

MAIN ST

Vegetation Mapping Buffer

Project Site

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance

*Atriplex polycarpa* Shrubland Alliance - Disturbed

*Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance

Developed

Disturbed

*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

Unvegetated Channel




FIGURE 4.2-1J

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County 2024, Esri

Vegetation Mapping Buffer
Project Site

**Vegetation**

*Atriplex canescens* Shrubland Alliance - Disturbed
*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
*Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
*Tamarix* spp. Shrubland Semi-natural Alliance




FIGURE
4.2–1K

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri



Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

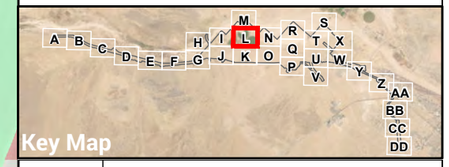


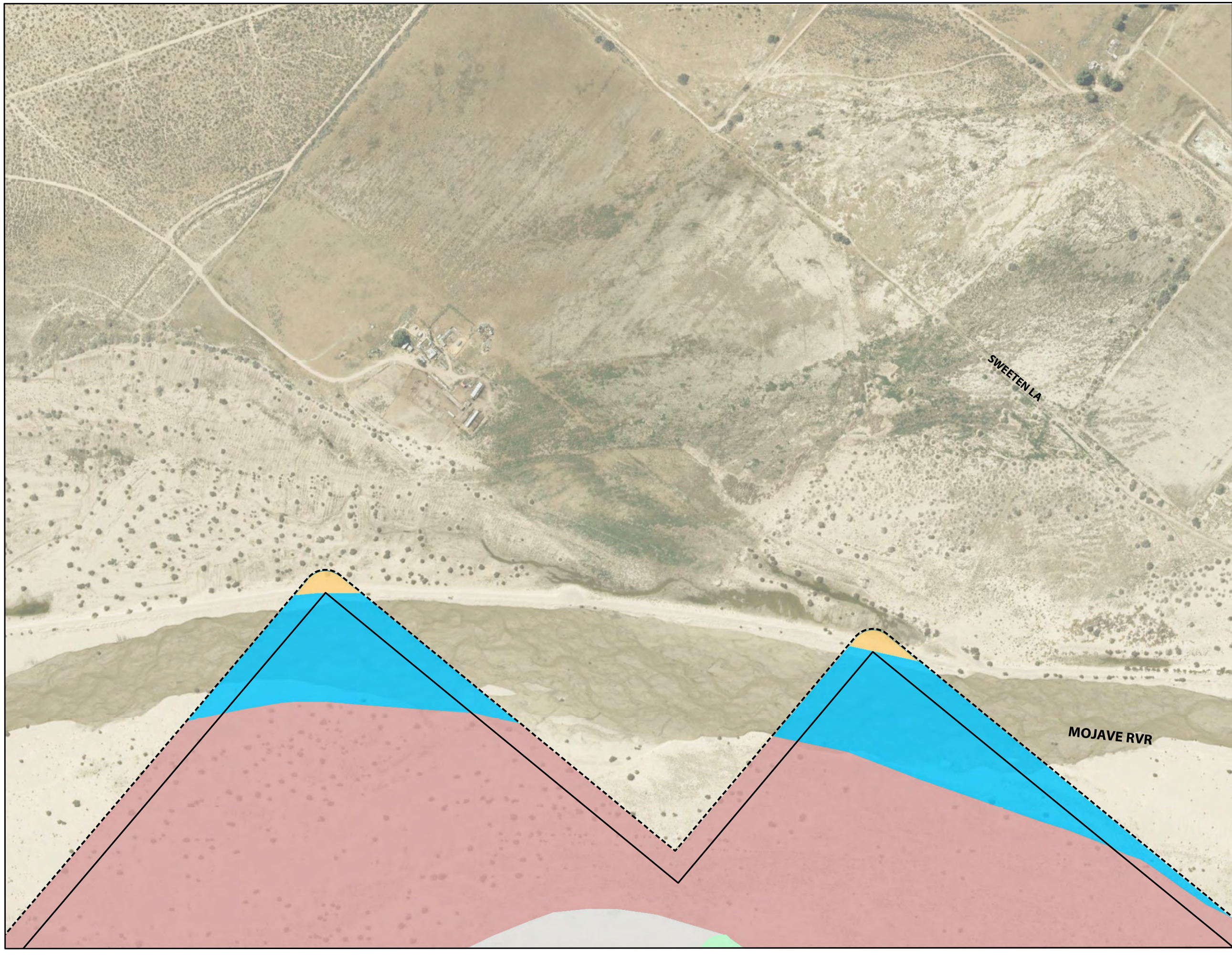

FIGURE 4.2-1L

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel




FIGURE
4.2–1M

**Vegetation**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri

Vegetation Mapping Buffer
Project Site

**Vegetation**

*Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
Disturbed
*Larrea tridentata* Shrubland Alliance



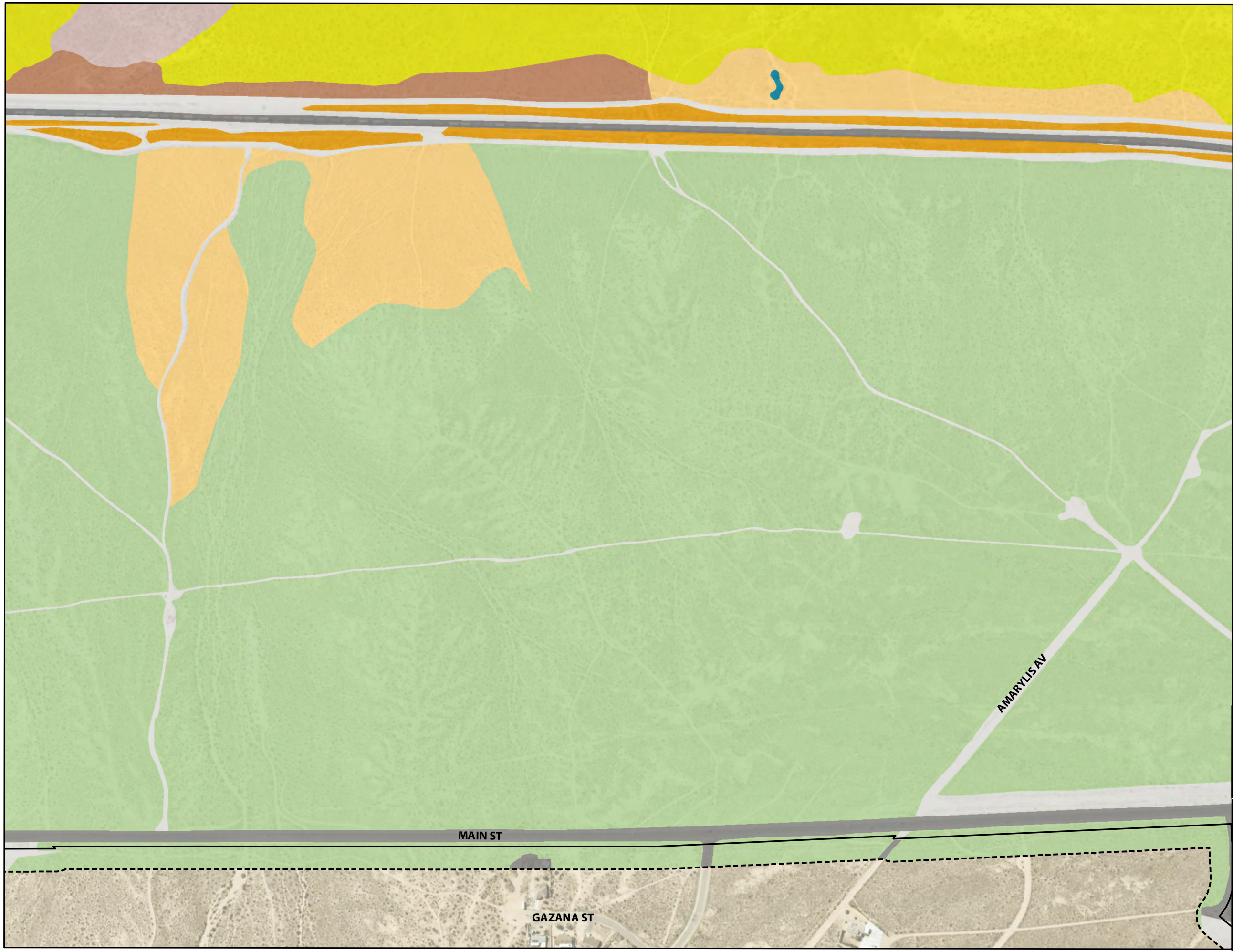

FIGURE
4.2–1N

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

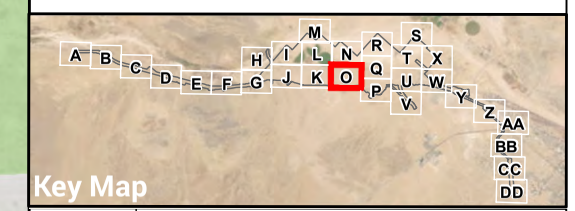


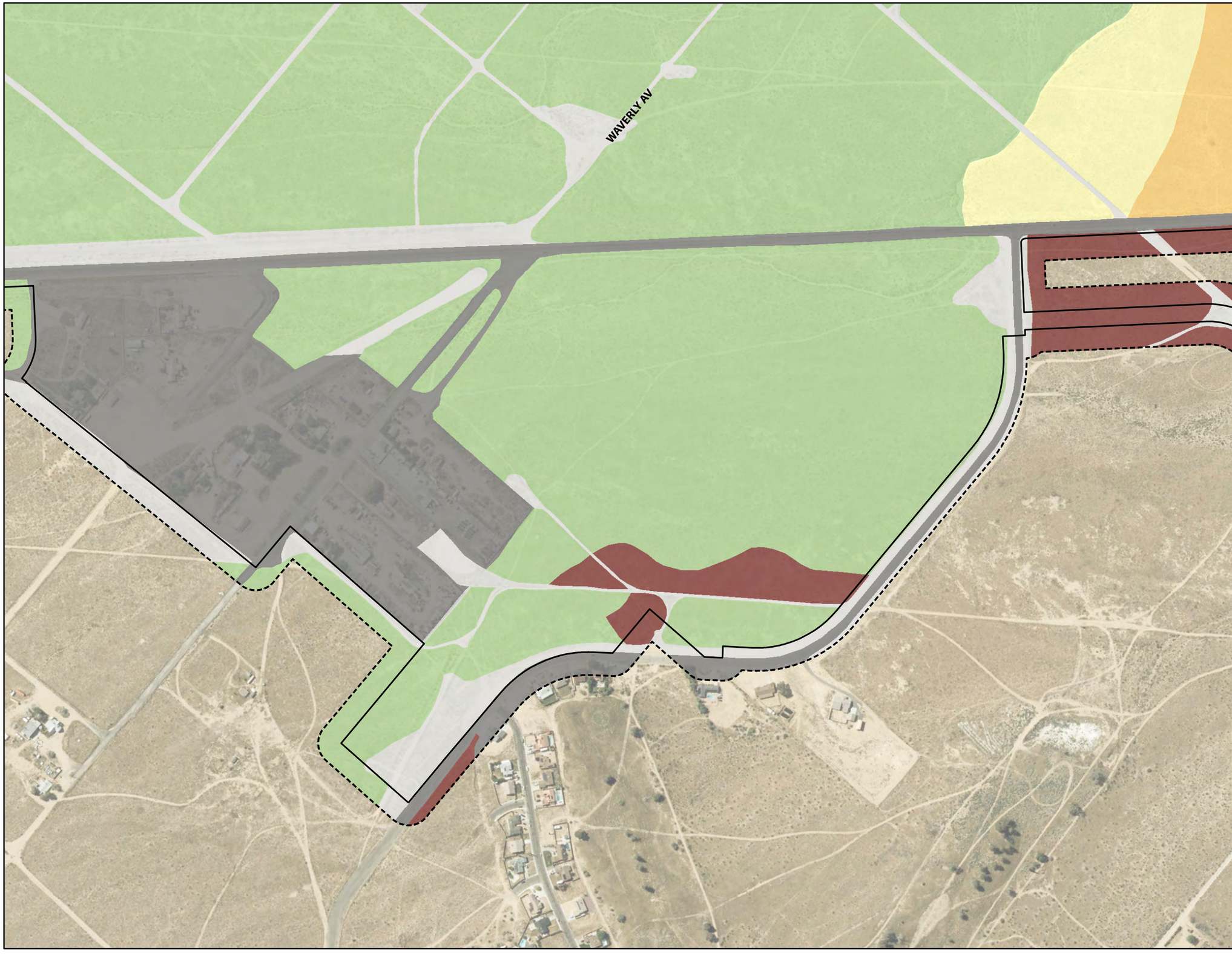

FIGURE
4.2-10

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Ambrosia dumosa* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE
4.2-1P

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Ambrosia dumosa* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance

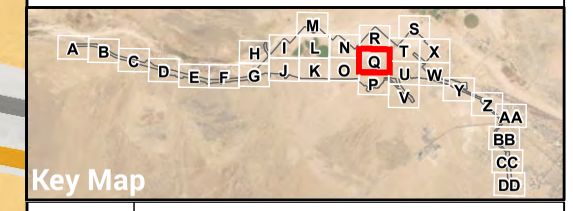


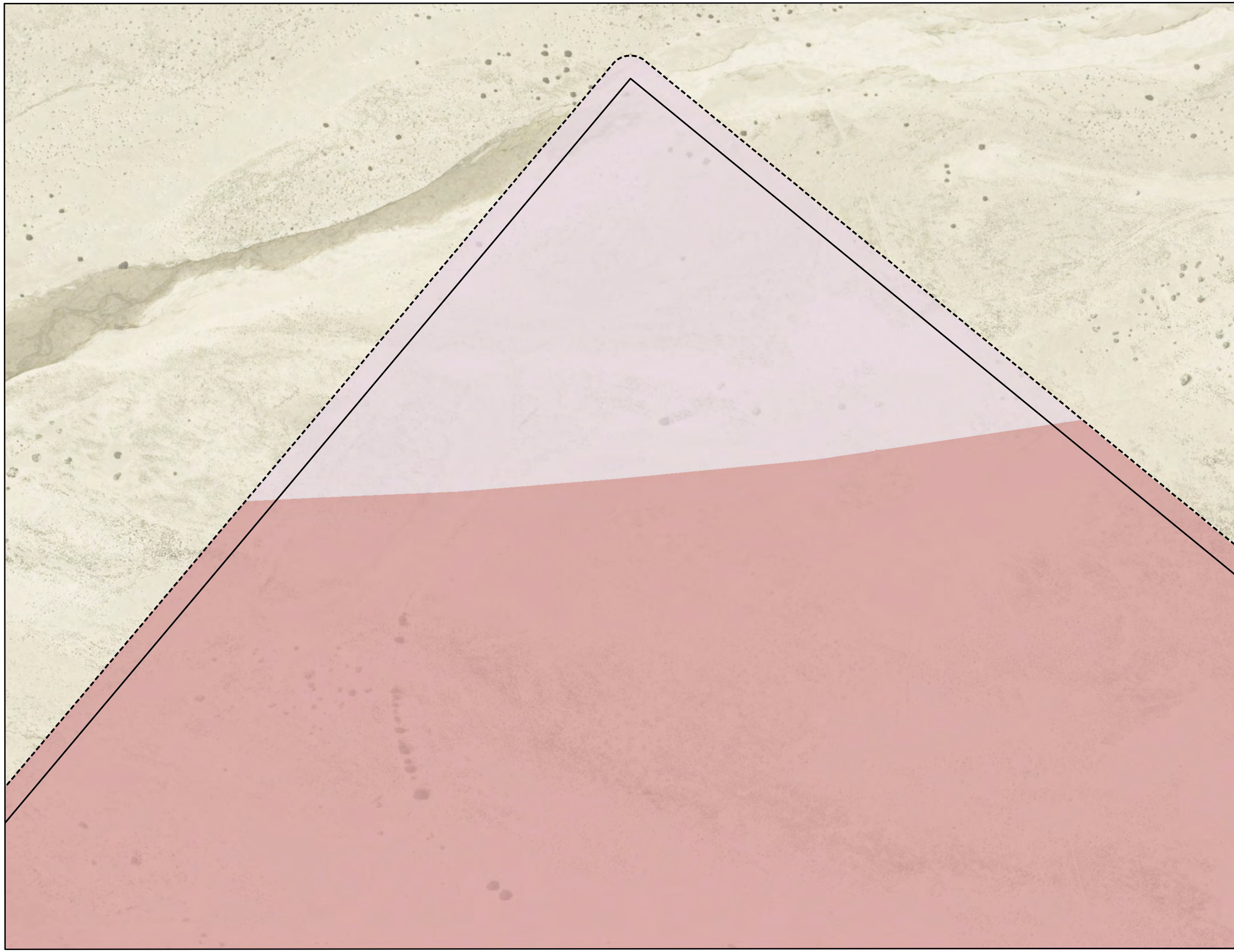

FIGURE 4.2-10

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri



Vegetation Mapping Buffer
Project Site

**Vegetation**

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized

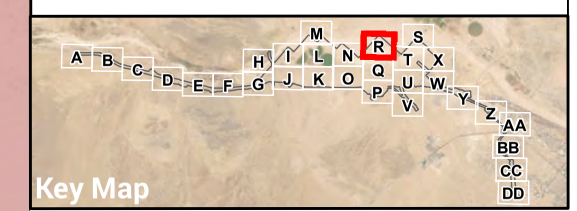


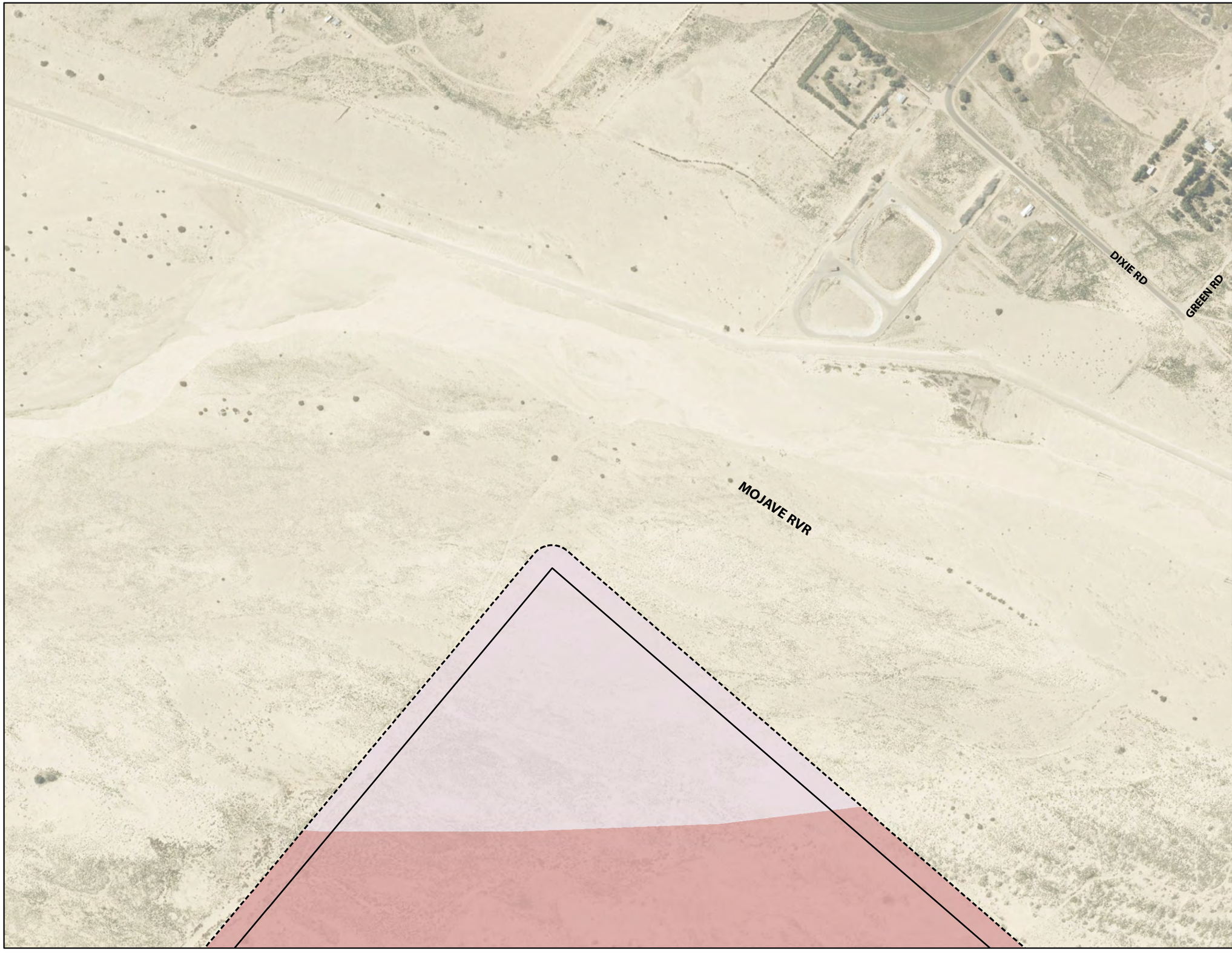

FIGURE
4.2-1R

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer

Project Site

**Vegetation**

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized




FIGURE 4.2-1S

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County 2024, Esri

Vegetation Mapping Buffer
Project Site

**Vegetation**

*Atriplex canescens* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
Disturbed
*Tamarix* spp. Shrubland Semi-natural Alliance
Unvegetated Channel

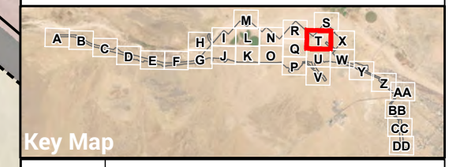


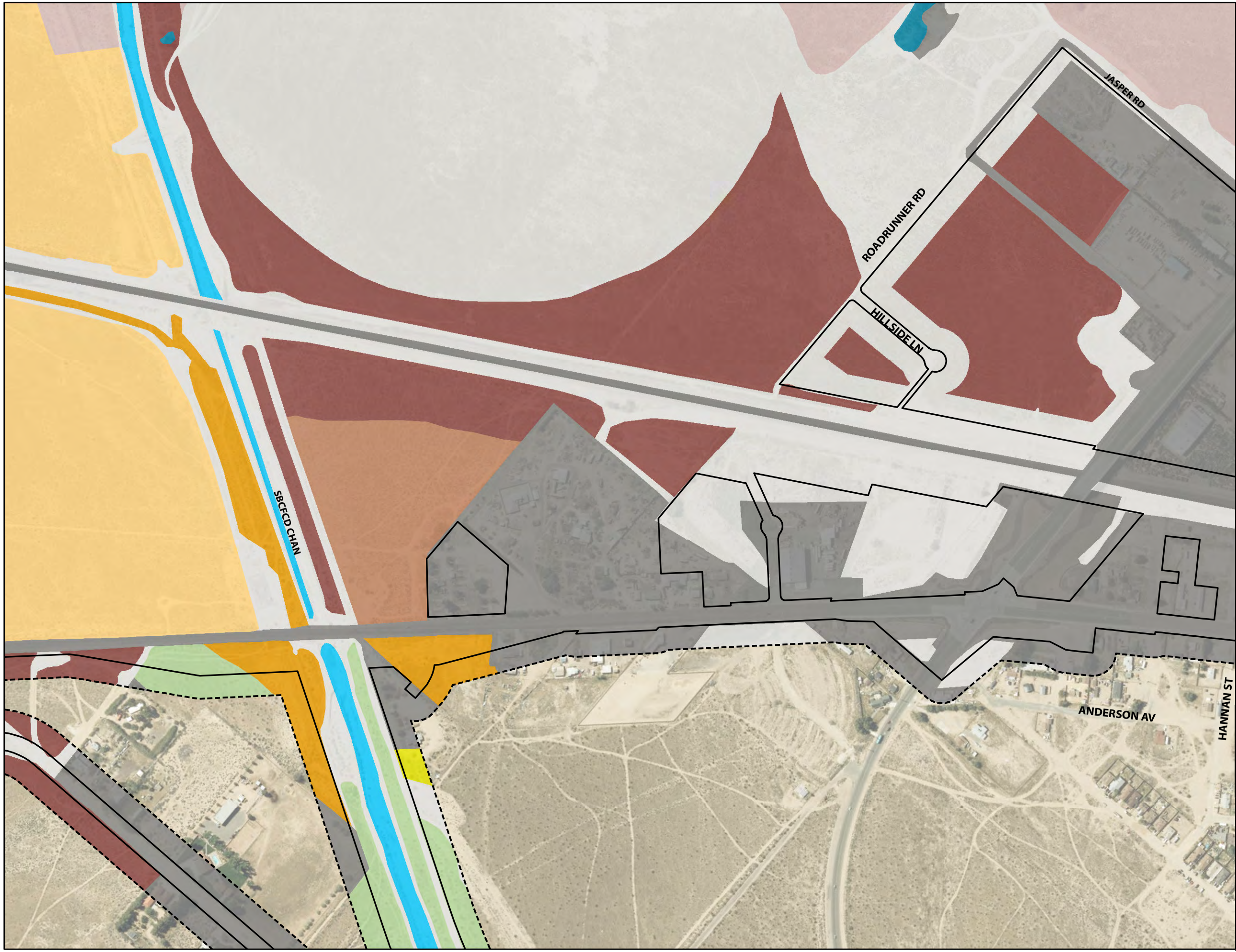

FIGURE 4.2-1T

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

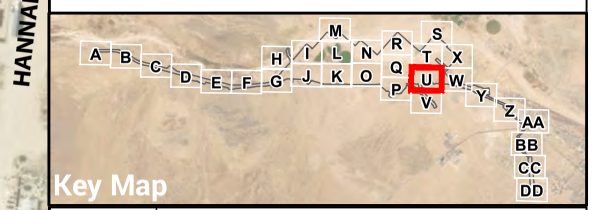



FIGURE 4.2-1U

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County 2024, Esri

Vegetation Mapping Buffer
Project Site

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
*Tamarix* spp. Shrubland Semi-natural Alliance
Unvegetated Channel

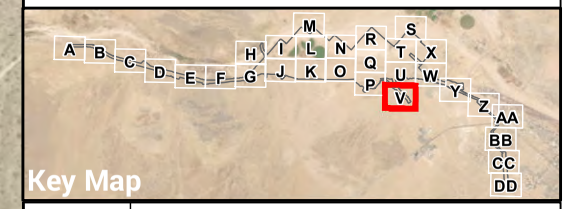


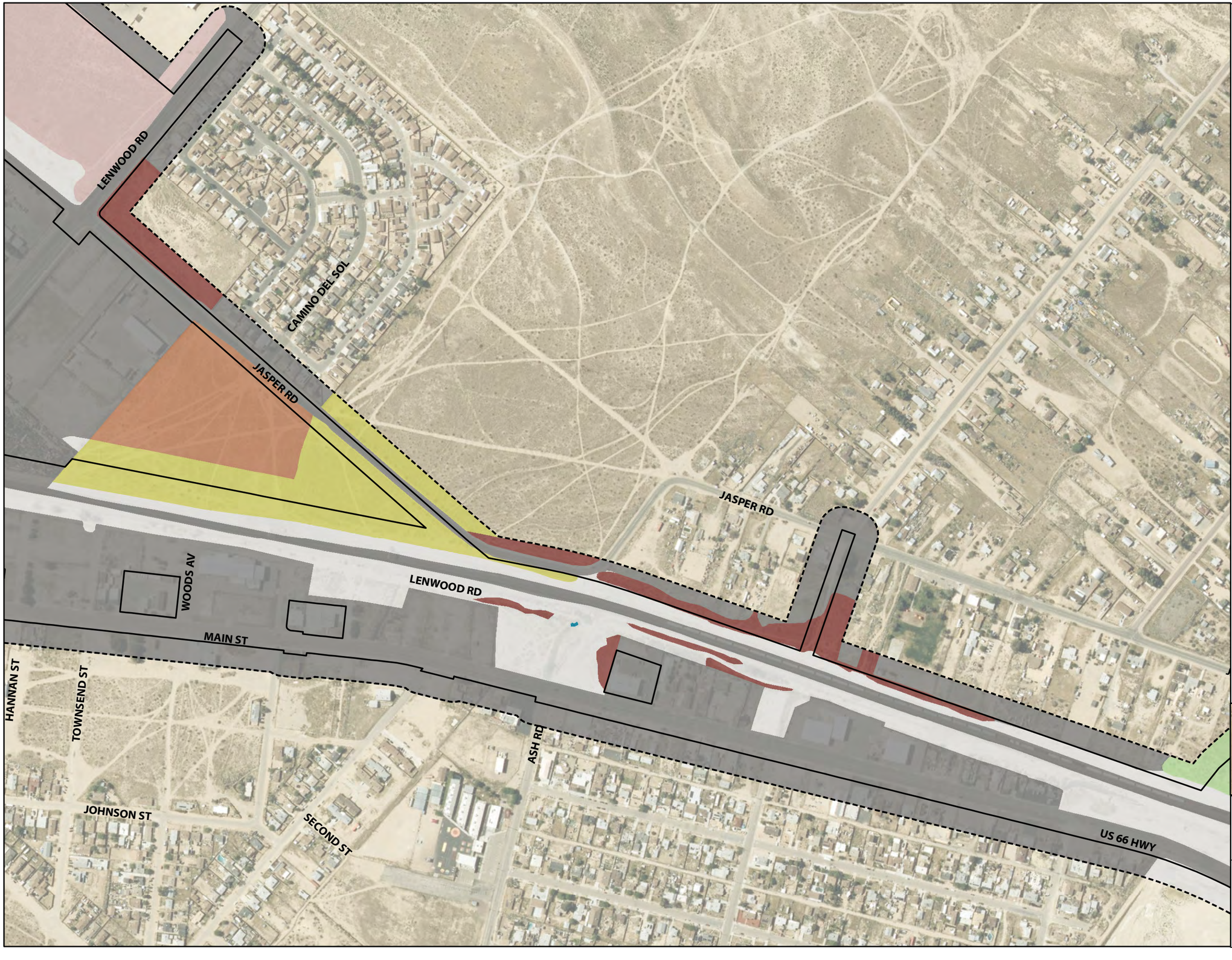

FIGURE
4.2-1V

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer

Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

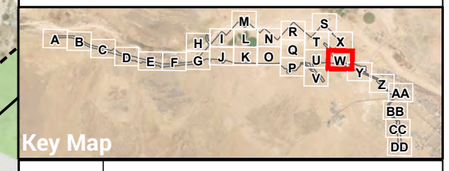



FIGURE 4.2–1W

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

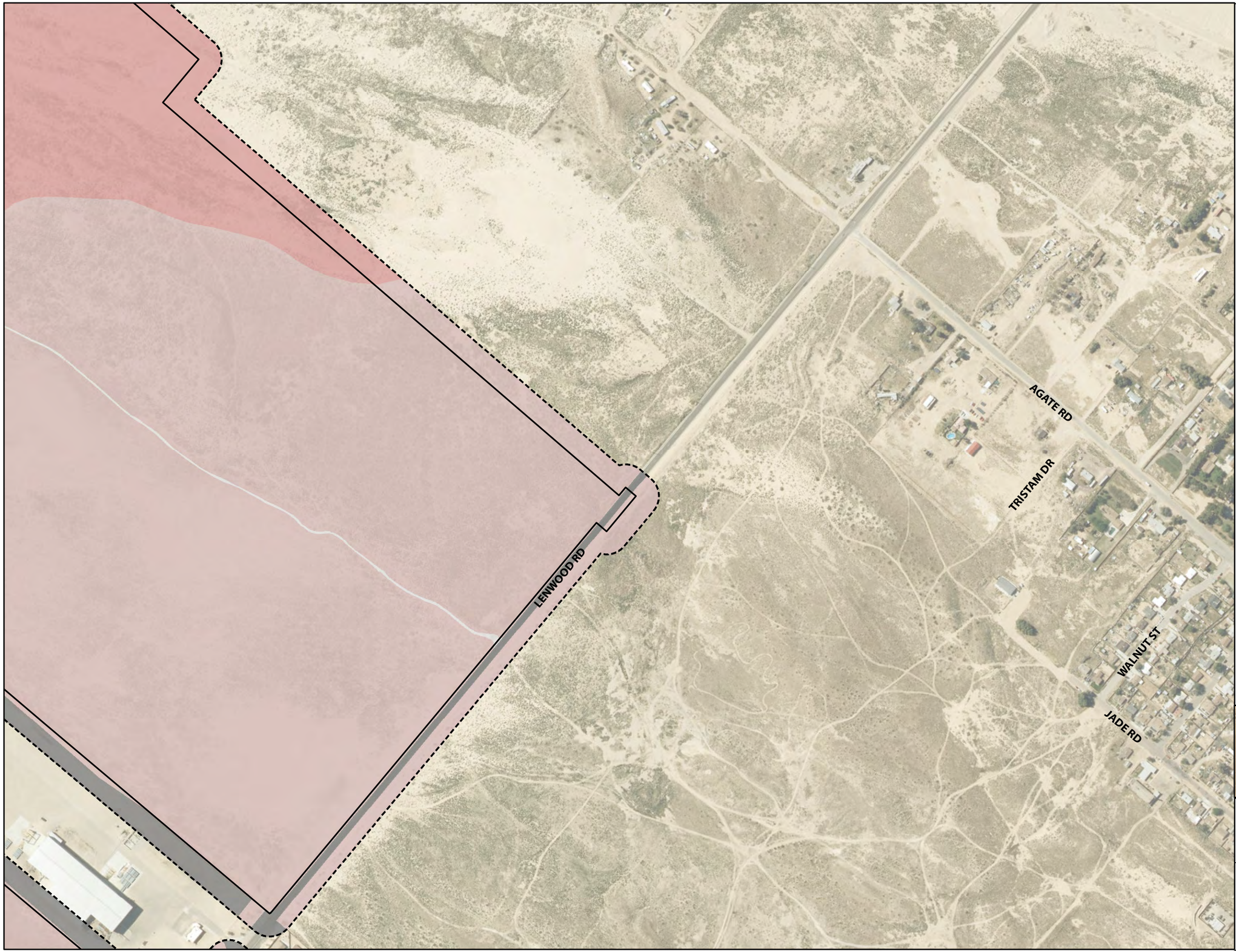
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed




FIGURE 4.2–1X

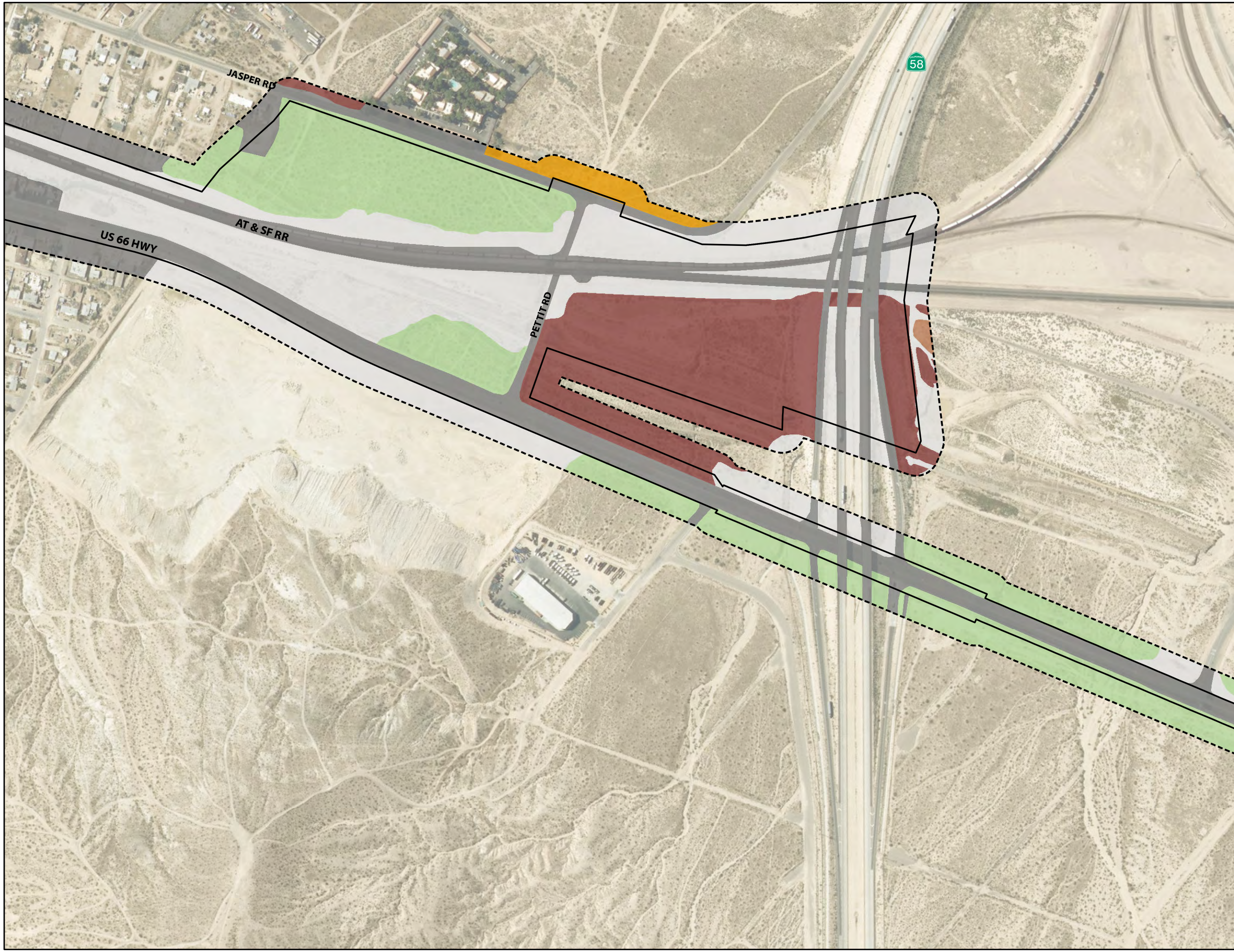
**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

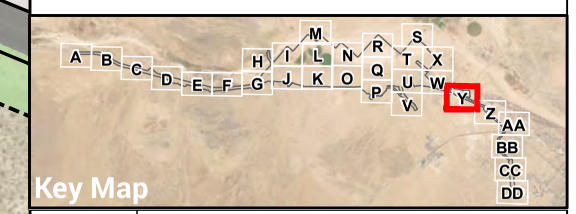



FIGURE
4.2-1Y

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri

Vegetation Mapping Buffer
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE
4.2-1Z

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri



Vegetation Mapping Buffer
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

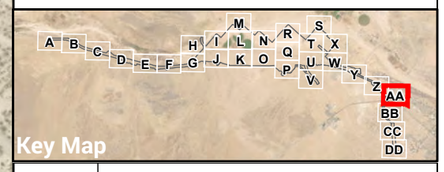



FIGURE
4.2-1AA

**Vegetation**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri

Vegetation Mapping Buffer
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

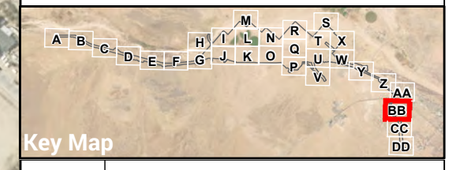



FIGURE
4.2-1BB

# Vegetation

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri




Vegetation Mapping Buffer
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance



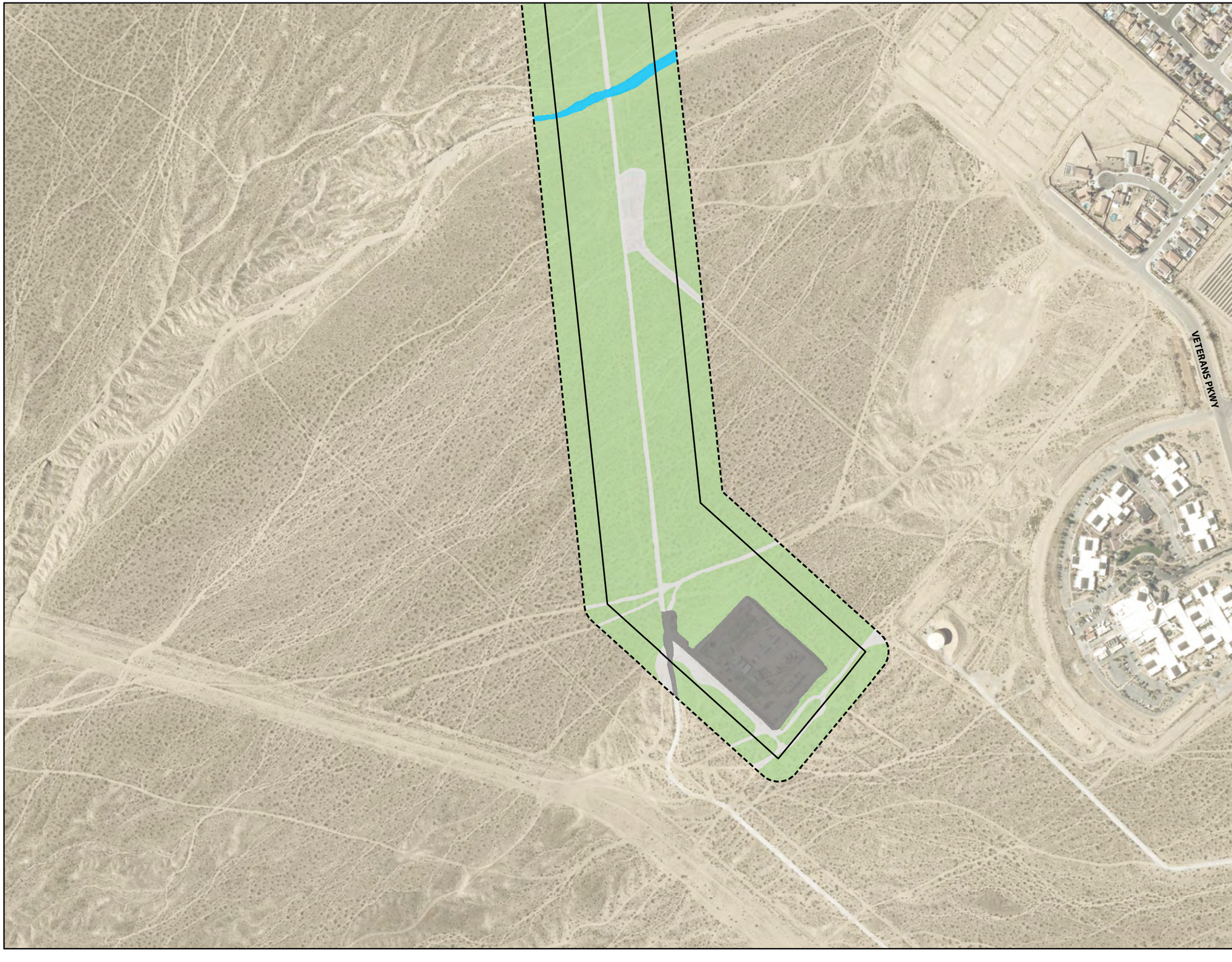

FIGURE
4.2-1CC

**Vegetation**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS

0 400 FEET
1 INCH = 400 FEET
N




Vegetation Mapping Buffer
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
Unvegetated Channel




FIGURE
4.2-1DD

**Vegetation**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County 2024, Esri

| Table 8: Summary of Vegetation Communities and Land Covers within BIG | | | | |
|---|---|---|---|---|
| **MCV2 Vegetation Community/ Land Cover** | **Holland** | **Global/State Rarity** | **CDFW Sensitive** | **Acres within the Project Site** |
| VEGETATION COMMUNITY[1] | | | | |
| *Ambrosia dumosa* Shrubland Alliance | Desert saltbush scrub | G5/S5 | No | 16.4 |
| *Atriplex canescens* Shrubland Alliance | Desert saltbush scrub | G5/S4 | No | 184.2 |
| *Atriplex canescens* Shrubland Alliance – Disturbed | Disturbed desert saltbush scrub | G5/S4 | No | 25.5 |
| *Atriplex polycarpa* Shrubland Alliance | Desert saltbush scrub | G4/S4 | No | 235.1 |
| *Atriplex polycarpa* Shrubland Alliance – Disturbed | Disturbed desert saltbush scrub | G4/S4 | No | 159.8 |
| *Brassica tournefortii – Malcolmia africana* Provisional Herbaceous Semi-natural Alliance | Non-native grassland (former agriculture) | GNR/SNR | No | 321.5 |
| Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance | Active desert dunes | G4/S3.2 | Yes | 1,016.4 |
| Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Disturbed/Stabilized | Disturbed stabilized and partially stabilized dunes | G4/S3.2 | Yes | 454.7 |
| Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Partially Stabilized | Stabilized and partially stabilized dunes | G4/S3.2 | Yes | 116.8 |
| Larrea tridentata – Ambrosia dumosa Shrubland Alliance | Creosote bush (white bursage) scrub | S5/G5 | No | 1,288.0 |
| Larrea tridentata – Ambrosia dumosa Shrubland Alliance - Disturbed | Disturbed creosote bush (white bursage) scrub | S5/G5 | No | 0.9 |
| *Larrea tridentata* Shrubland Alliance | Creosote bush scrub | S5/G5 | No | 120.9 |
| *Larrea tridentata* Shrubland Alliance – Disturbed | Disturbed creosote bush scrub | S5/G5 | No | 26.9 |
| *Tamarix* spp. Shrubland Semi-natural Alliance | Tamarisk scrub | SNA/GNA | No | 18.0 |
| Unvegetated Channel | N/A | No rank | No | 28.7 |
| **LAND COVER** | | | | |
| Developed | Developed | No rank | No | 349.6 |
| Disturbed | Disturbed | No rank | No | 636.5 |
| | | | **Total** | **5,000.0** |

Note:
Global Rarity Ranks:
G4: Worldwide >100 occurrences and/or >12,950 hectares
G5: Demonstrably secure because of its worldwide abundance
State Rarity Ranks:
S3: Statewide 21-100 occurrences and/or 2,590-12,950 hectares

| |
|---|
| S4: Statewide >100 occurrences and/or >12,950 hectares<br>S5: Demonstrably secure because of its worldwide abundance |
| Sources:<br>• CDFW, 2025f<br>• Holland, 1986<br>• Sawyer et al., 2009 |

## 5.3 Ambrosia dumosa Shrubland Alliance

*Ambrosia dumosa* shrubland (16.4 acres) occurs in one location within BIG: a small area north of Route 66 and south of the existing railroad in the central portion of the project area (Figure 4.2-1P-Q). *Ambrosia dumosa* shrubland alliance is found in the vicinity of an ephemeral wash and is directly adjacent to *Larrea tridentata – Ambrosia dumosa* shrubland alliance and *Atriplex polycarpa* shrubland alliance. This community is characterized by white bursage (*Ambrosia dumosa*) at 10-25% cover and creosote *(Larrea tridentata*) at 3% cover. It supports a moderate to dense cover of non-native Mediterranean grass (*Schismus barbatus*) in the herbaceous layer ranging from 30% to 50% absolute cover. Other shrubs are present in low cover, including allscale saltbush (*Atriplex polycarpa*) and four-wing saltbush (*Atriplex canescens*), that together make up less than 5% cover, and *Ephedra* sp. at 1%.

*Ambrosia dumosa* shrubland alliance occurs on gentle slopes on non-compacted alluvium soils that are well- to rapidly-drained silty or sandy clays or loams. On site, this vegetation community contained small to moderately sized ephemeral washes, supplied by runoff from both gradual variations in topography. The majority of this vegetation community is undeveloped; disturbances are minimal and include dirt roads and non-native grasses.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S5 and is not considered sensitive by the state.

## 5.4 Atriplex canescens Shrubland Alliance

*Atriplex canescens* shrubland alliance (184.2 acres) occurs in several locations within the project site including (1) southwest of Lenwood Channel at the northern extent of the project site (Figure 4.2-1P-Q, T-U), (2) near the center of project site, adjacent to disturbed land near the existing BNSF railroad (Figure 4.2-1O-Q) and (3) near the Mojave River (Figure 4.2-1M).

*Atriplex canescens* shrubland that occurs near Lenwood Channel at the northern extent of the project site near CA-58 is dominated by four-wing salt bush at 10% cover and Mediterranean grass at 50% cover but also contains the following species at their respective percent covers: allscale saltbush (10%), white bursage (5%), pale wolf berry (*Lycium pallidum*; 5%), green ephedra (*Ephedra viridis*, 1-5%), Mojave indigo bush (*Psorthamnus arborescens* var. *arborescens,* 1%); desert senna (*Senna covesii*, 1%) and creosote (5%).

*Atriplex canescens* shrubland that occurs in the central area of BIG, west of disturbed land near the railroad and southwest of the dunes, is characterized by four-wing saltbush at a 25% cover and Mediterranean grass at 25% cover but also contains the following species at their respective covers: allscale saltbush (10%), white bursage (1%), desert dandelion (*Malacothrix glabrata*, 1%), Fremont's pincushion (*Chaenactis fremontii*, 1%), and Russian thistle (*Salsola* spp.) at (10%).

*Atriplex canescens* shrubland that occurs west of Route 66 near the solar farm and just west of the Lenwood Channel is characterized by four-wing saltbush at 15-25% cover Mediterranean grass at 50% cover, allscale saltbush at 5-10% cover, white bursage at 5% cover, and creosote at 1% cover.

Soils that support this alliance on BIG are not compacted and consist of fine sediment with pebbles. Disturbances throughout this alliance, though minimal, include non-native plant colonization and mild off-road vehicle use. Land throughout the *Atriplex canescens* shrubland alliance is undeveloped.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S4 and is not considered sensitive by the state.

## 5.5 Atriplex canescens Shrubland Alliance – Disturbed

*Atriplex canescens* shrubland alliance – disturbed (25.5 acres) is similar to *Atriplex canescens* shrubland alliance however, it has been affected by significant disturbances. This vegetation community occurs (1) near Lenwood Channel (Figure 4.2-1U); (2) at the northeastern extent of the lead track extension, near CA-58 (Figure 4.2-1Y); and (3) along the railroad in the center of the project site (Figure 4.2-1K, O, Q).

*Atriplex canescens* shrubland alliance – disturbed is characterized by four-wing saltbush at 15-45% cover and Mediterranean grass at 25-25% cover but also contains the following species at the associated covers: allscale saltbush (1-10%), London rocket (*Sisymbrium irio*, 5%), desert dandelion (*Dicoria canescens*, 0-1%), Russian thistle (0-10%), Fremont's pincushion (0-1%), and white bursage (0-1%). This alliance contains compacted soils near the railroad and where it abuts development and non-compacted soils elsewhere. Topographically, this vegetation community ranges in elevation within approximately two feet and is generally flat in nature.

On-site *Atriplex canescens* shrubland alliance – disturbed is fragmented, adjacent to the railroad or other development (e.g., roads), and contains compacted soils throughout the majority of its geographic extent. Disturbances occur in the form of off-road vehicle use, non-native plant colonization, and proximity to the railroad. Throughout the extent of the project site, *Atriplex canescens* shrubland alliance is undeveloped.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S4 and is not considered sensitive by the state.

## 5.6 Atriplex polycarpa Shrubland Alliance

*Atriplex polycarpa* shrubland (235.1 acres) occurs in the southwestern linear region of the project site, in the center of project site, and near Lenwood Channel (Figure 4.2-1A-K, O, Q, U-W, Y). This alliance is dominated by allscale saltbush at 25-50% cover and Mediterranean grass at 10-50% cover but also contains the following species at the associated covers: four-wing saltbush (1-5%), creosote (1-10%), London rocket (0-10%), and desert dandelion (0-1%). Soils are not compacted and are suitable for fossorial species. Topographic variation in the *Atriplex polycarpa* shrubland alliance ranges from minor to moderate, with elevational changes of approximately 2-15 feet. Disturbances in this community are minimal and include dirt roads and proximity to development. Throughout the extent of the project site, *Atriplex polycarpa* shrubland alliance is undeveloped.

This vegetation community has a global rarity rank of G4 and a state rarity rank of S4 and is not considered sensitive by the state.

## 5.7 Atriplex polycarpa Shrubland Alliance – Disturbed

*Atriplex polycarpa* shrubland alliance – disturbed (159.8 acres) is similar to the *Atriplex polycarpa* shrubland alliance however, it has experienced significant anthropogenic degradation. *Atriplex polycarpa* shrubland alliance – disturbed occurs (1) linearly between disturbed land and the railroad in the center of the project site (Figure 4.2-1B-L), (2) surrounding disturbed land abutting the railroad northeast of Lenwood Channel and south of the CA-58 (Figure 4.2-1T-W, Y), and (3) in small patches the central portion of the project site and in the southern portion of the solar farm (Figure 4.2-1P).

The *Atriplex polycarpa* shrubland alliance – disturbed occurs between an area of disturbed land and the railroad in the center of BIG, and is dominated by allscale saltbush at 25% cover, four-wing saltbush at 1-15% cover, and Mediterranean grass at 10% cover, but also contains following species at the associated covers: Russian thistle (5%), creosote (0-2%), and London rocket (1%). Railroad access roads bisect and abut the railroad-adjacent *Atriplex polycarpa* shrubland alliance – disturbed, contributing to its disturbed nature.

The *Atriplex polycarpa* shrubland alliance – disturbed vegetation community surrounding disturbed land abutting the railroad just northeast of Lenwood Channel contains notably more non-native plant cover with Russian thistle at a cover of 10-25% and Mediterranean grass at a cover of 30%. Disturbances include its proximity to the railroad and fragmented nature.

Patches of *Atriplex polycarpa* shrubland alliance – disturbed in the central portion of the project site and in the southern portion of the solar farm are dominated by allscale saltbush (10% cover) but also contain the following species at the associated covers: white bursage (3%), Russian thistle (1-5%), and Mediterranean grass (10%). This area has experienced disturbance in the form of non-native colonization and trash dumping.

Within BIG, this vegetation community exhibits friable soils suitable for large denning animals, such as desert tortoise and desert kit fox. The topography of the *Atriplex polycarpa* shrubland alliance – disturbed is generally flat with compacted sandy soils with the exception of the loose sandy region near Lenwood Channel and adjacent to the dunes Throughout its entire geographic extent on the project site, the *Atriplex polycarpa* shrubland alliance – disturbed vegetation community is undeveloped.

This vegetation community has a global rarity rank of G4 and a state rarity rank of S4 and is not considered sensitive by the state.

## 5.8 Brassica tournefortii – Malcolmia africana Provisional Herbaceous Semi-natural Alliance

*Brassica tournefortii – Malcolmia africana* provisional herbaceous semi-natural alliance (321.5 acres) occurs in several areas of BIG, including centrally, north of the existing railroad and south of the Mojave River (Figure 4.2-1I-L, N), and as a patch of habitat north of Holcomb Ranch Road in the western portion of the project site (Figure 4.2-1C). *Brassica tournefortii – Malcolmia africana* provisional herbaceous

semi-natural alliance is dominated by non-native Mediterranean grass at 70% cover and London rocket at 60% cover.

Soils in the *Brassica tournefortii – Malcolmia africana* provisional herbaceous semi-natural alliance within BIG have been modified by anthropogenic land uses and are compacted by agricultural land use in the past. Topography is flat as a result of the former agricultural land use and the area remains highly disturbed.

Global and state rarity rankings do not apply to this vegetation community due to the prevalence of non-native species.

## 5.9 Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance (1,016.4 acres) occurs in the north central portion of BIG as patches of habitat, as well as in large swaths between the existing rail line and the Mojave River. It is characterized by low overall vegetation cover. Dominant plants include desert dicoria (*Dicoria canescens*) at 1% cover, Russian thistle at 1% cover, and dune evening primrose (*Oenothera deltoides*) at 1% cover. Other plant species are present with trace cover. Topographically, this vegetation community ranges in elevation with gentle to moderate slopes, present as sand dunes. *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance is considered active dunes, with the presence of windblown loose sand. This vegetation community is not heavily disturbed, although OHV tracks are present in much of the loose sand.

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance occurs as patches of habitat as well as large swaths in the north central portion of the project area north of the existing AT & SF Railroad from the west beginning north of Hinkley Road Bridge, to the east staying west of Hinkley Road (Figure 4.2-1I, L-N, Q-T, X). *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance is characterized by low vegetation cover with the presence of seasonal annuals and scattered perennials. Species present in this community include desert dicoria, Russian thistle, and dune evening primrose, each at 1% cover respectively.

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance are considered active dunes that are not stabilized and are made up of loose, windblown sand. The sand in this community is dynamic and shifts overtime resulting in dynamic fluctuations in topography that include flat sand fields and benches, as well as steeply sloped sand dunes. Disturbances are low in this community present as sparce non-native species and OHV tracks through the loose sand.

Due to the site conditions described above, *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance is considered to be of high quality. This vegetation community has a global rarity rank of G4 and a state rarity of S3 and is considered sensitive by the state.

## 5.10 Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Disturbed/Stabilized

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance - disturbed/stabilized (454.7 acres) is similar to *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance, however, it has experienced significant degradation. *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance - disturbed/stabilized occurs 1) west of an unvegetated portion of the Lenwood Channel (Figure 4.2-1T-U), 2) at the far northeast edge of the project site, east of Lenwood Channel (Figure 4.2-1T-U, W-X), and 3) throughout the central portion of the project area, generally south of *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance (Figure 4.2-1I, L, N-O, Q, T). This community is dominated by Russian thistle, at the Lenwood Channel and east of Lenwood Channel at 10-30% cover. Other species are present at low cover including four-wing saltbush (3-10%), desert dicoria (1-2%), Mediterranean grass (1-10%), dune evening primrose (*Oenothera deltoides*, 1%), red brome (*Bromus rubens*, 1%), yellow cups (*Chylismia brevipes*, 1%), fiddleneck (*Amsinckia* sp.,1%), white mallow (*Eremalche exilis*, 1%), and allscale saltbush (1%). Throughout the central portion of the project site, the community is dominated by Russian thistle at 50-75% cover, with similar representation of other species including four-wing saltbush and allscale saltbush making up 1-5% cover, Mediterranean grass (3%), red-stemmed filaree (*Erodium cicutarium*, 1-5%), desert dicoria (1-5%) white mallow (1%), desert panicgrass (*Panicum urvilleanum*, 1%), creosote (<1%), and *Ephedra* sp. (1%).

Soils in this community are made up of loose sandy soils that have been compacted or stabilized by disturbances and the presence of vegetation, especially non-native Russian thistle. The community is characterized by flat to consistent, dynamic fluctuations in topography in the form of sand flats and benches, and steep sand dunes. Disturbance in this community is primarily due to the high density of non-native species that stabilize the dunes. Additionally, human debris is present throughout the community, and soil compaction has occurred from OHV use and vicinity to other anthropogenic uses like roads and agriculture. Throughout its entire geographic extent on the project site, *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance disturbed/stabilized is undeveloped but occurs on patches of land that have been previously developed as residential and agricultural land.

Due to the site conditions described above, *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance disturbed/stabilized is of low quality. However, this vegetation community has a global rarity rank of G4 and a state rarity of S3 and is considered sensitive by the state.

## 5.11 Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Partially Stabilized

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – partially stabilized (116.8 acres) is similar to *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance, however, it has experienced partial stabilization by native herbaceous vegetation. *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – partially stabilized occurs in the central portion of the project site, 1) along the northern border adjacent to the Mojave river (Figure

4.2-1R-S) and 2) north of the former agriculture land that is now Herbaceous Semi-natural Alliance (Figure 4.2-1L, N). This community is dominated by desert panic grass at 50% cover, or desert dicoria at 10% cover. Other species are present in low cover including Russian thistle at 3%, desert calico (*Loeseliastrum matthewsii*) at 1%, Gilia species at 1%, lupine species at 1%, fan-leaved tiquilia (*Tiquilia plicata*) at 1%, dune evening primrose at 1%, and brittle spineflower (*Chorizanthe brevicornu*) at 1%.

Soils in this community is made up of non-compacted loose sands that have been partially stabilized by low to moderate cover of native herbs. The topography in this community is mostly flat, but includes gentle, consistent, dynamic fluctuations in topography that include sand flats and benches, and sand dunes. *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – partially stabilized is undisturbed and undeveloped throughout its entire geographic extent on the project site.

Due to the site conditions described above, *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – partially stabilized is considered to be of moderate quality. This vegetation community has a global rarity rank of G4 and a state rarity of S3 and is considered sensitive by the state.

## 5.12 Larrea tridentata – Ambrosia dumosa Shrubland Alliance

*Larrea tridentata – Ambrosia dumosa* shrubland alliance (1,288.0 acres) occurs 1) along the proposed lead track extensions (Figure 4.2-1A-C); 2) throughout the majority of the project site south of the existing BNSF railroad (Figure 4.2-1G, J-K, O-Q, U-W), 3) north of the Hinkley bridge (abutting tamarisks adjacent to Mojave River) and east of Jasper Road (Figure 4.2-1H-I), and 4) at the Tortilla Substation and proposed 33KV distribution route (Figure 4.2-1Y-DD).

Throughout the majority of the project site, the *Larrea tridentata – Ambrosia dumosa* shrubland alliance is characterized by creosote at 10-20% cover and white bursage at greater than 1% cover. Four-wing saltbush and allscale saltbush are also present in the shrub stratum at 5-10% cover. Throughout the majority of its expanse, this vegetation community contains a moderate to dense cover of non-native Mediterranean grass in the herbaceous layer, ranging from 30-50% cover. Spiny senna (*Senna armata*) is also present at a low cover.

The *Larrea tridentata – Ambrosia dumosa* shrubland alliance north of the Hinkley bridge (abutting tamarisks adjacent to Mojave River) and east of Jasper Road is characterized by creosote at 5-20% cover, Mediterranean grass at 25% cover, four-wing saltbush at 5% cover, and allscale saltbush at 3% cover.

The *Larrea tridentata – Ambrosia dumosa* shrubland alliance at the Tortilla Substation exhibited higher floral biodiversity than other areas within the project site. Dominant plants include creosote and Mediterranean grass, the former of which occurs at 15-25% cover and the latter of which occurs at 25% cover. The following species were also present at the following respective percent covers: white bursage (5%), checker fiddleneck (*Amsinckia tessalata*, 1%); *Cryptantha* sp. (1%); desert dandelion (1%); desert lantern (*Eremothera boothii*, 1%); *Eriogonum* sp. (1%); Sahara mustard (*Brassica tournefortii,* 1%); red-stemmed filaree (1%); Mojave indigo bush (1%), *Atriplex* sp. (1%); spiny senna (1%); Mojave yucca (*Yucca schidigera*, 1%); and silver cholla (*Cylindropuntia echinocarpa*, 1%).

The *Larrea tridentata – Ambrosia dumosa* shrubland alliance occurs on gentle to moderate alluvium slopes and is characterized by non-compacted, well drained sandy soils with pebbles and sparse patches of desert pavement. This vegetation community contained an abundance of washes, supplied by runoff from both gradual and acute variations in topography. Disturbances within this alliance are minimal and include dirt roads and non-native grasses. The majority of the *Larrea tridentata – Ambrosia dumosa* shrubland alliance is undeveloped.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S5 and is not considered sensitive by the state.

## 5.13 Larrea tridentata – Ambrosia dumosa Shrubland Alliance – Disturbed

*Larrea tridentata – Ambrosia dumosa* shrubland alliance – disturbed (0.9 acre) is similar to the *Larrea tridentata – Ambrosia dumosa* shrubland alliance, however it has experienced significant anthropogenic degradation. This vegetation community is limited in geographic distribution; it occurs in fenced yards in the center of the project site (Figure 4.2-1Q) and along the proposed lead track extensions (Figure 4.2-1C). *Larrea tridentata – Ambrosia dumosa* shrubland alliance – disturbed is characterized by creosote at 10-20% cover, Mediterranean grass at 30% cover, *Atriplex* sp. at 5-20% cover, and white bursage at 5-15% cover.

Soils in this vegetation community are generally non-compacted with pebbles on top of finer sediment. This alliance experiences minor variations in topography (i.e., within approximately two feet) due to its occurrence on or in proximity to residential or industrial development where grading has occurred. *Larrea tridentata – Ambrosia dumosa* shrubland alliance – disturbed has experienced significant disturbances in the form of fencing, trash dumping, off-road vehicle use, dirt roads, and colonization of non-natives and lacks sufficient native plant cover. This alliance occurs in fenced yards or immediately adjacent to development and is therefore used as open space associated with residences or businesses.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S5 and is not considered sensitive by the state.

## 5.14 Larrea tridentata Shrubland Alliance

*Larrea tridentata* shrubland alliance (120.9 acres) occurs within BIG: 1) along Main Street south of the existing railroads (Figure 4.2-1D-E); 2) south of agricultural land (*Brassica tournefortii - Malcolmia africana* provisional herbaceous semi-natural alliance) in the center of the project site (Figure 4.2-1K-L, N-O); 3) in patches on the west side of the railroad (Figure 4.2-1Q); 4) along Lenwood Channel (Figure 4.2-1U-V); and 5) along the proposed 33KV distribution route (Figure 4.2-1BB). Dominant species of this habitat within BIG include creosote, which is present at approximately 10-25% cover and Mediterranean grass, which is present at 50% cover. Other species are present at a lower cover, including allscale saltbush (1-10%), Russian thistle (1%), four-wing saltbush (1-10%); and *Ephedra* sp. (1-5%), amongst others. Soils are not compacted, sandy, and friable; they are comprised of pebbles on the surface of finer sediment. Topographical variation within this vegetation community is moderate with acute changes in elevation up to approximately four feet. Disturbances include dirt roads which bisect the area. Land in this vegetation community is undeveloped.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S5 and is not considered sensitive by the state.

## 5.15 Larrea tridentata Shrubland Alliance – Disturbed

*Larrea tridentata* shrubland alliance - disturbed (26.9 acres) is similar to the *Larrea tridentata* shrubland alliance, however it has experienced significant disturbance. *Larrea tridentata* shrubland alliance – disturbed occurs: 1) in the southwestern portion of project site between residential plots and north of Lenwood Road (Figure 4.2-1C); 2) at the southwestern end of the proposed lead track extensions (Figure 4.2-1A); 3) near an unvegetated channel and the Mojave River (Figure 4.2-1G-H); 4) south of Jasper Road between residential and commercial development(Figure 4.2-1W); and 5) along the proposed 33KV distribution route (Figure 4.2-1AA-BB). This vegetation community is characterized by creosote at 20% cover, Mediterranean grass at 30% cover, and allscale saltbush at 10% cover. Soils are generally not compacted and contain gravel. Topographically, *Larrea tridentata* shrubland alliance – disturbed experiences significant changes in elevation. Disturbance has occurred in the form of fencing, OHV activity, and trash dumping. Land uses include residential yards and undeveloped land.

This vegetation community has a global rarity rank of G5 and a state rarity rank of S5 and is not considered sensitive by the state.

## 5.16 Tamarix spp. Shrubland Semi-natural Alliance

*Tamarix* spp. shrubland semi-natural alliance (18.0 acres) occurs throughout BIG as continuous patches of habitat, and as rows or small strands of vegetation. *Tamarix* spp. shrubland semi-natural alliance occurs as shorter, shrublike growth form in the western portion of the project site in the floodplain of the Mojave river (Figure 4.2-1D, F, H-I) and as taller tree-like growth form near disturbed or developed land, usually planted as an ornamental or windbreak (Figure 4.2-1C, E-F, I, K-M, O, Q, T-W). *Tamarix* spp. shrubland semi-natural alliance is dominated by tamarisk species at 80% cover.

In the floodplain where this habitat occurs on BIG, soils are loose sandy soils that are not stabilized or disturbed, and the land in this area is undeveloped. Soils outside of the floodplain are compacted and disturbed by previous land uses which include residential, commercial, and agricultural. Topography in this community is generally flat, with consistent, dynamic fluctuations in topography are present as sand flats and dunes.

Global and state rarity rankings do not apply to this vegetation community due to the dominance of non-native species.

## 5.17 Unvegetated Channel

Several unvegetated channel areas (28.7 acres) occur within BIG, including: 1) in the southern portion of BIG in the form of a tributary that drains into the Mojave River (Figure 4.2-1G); 2) in the portion of the Mojave River that intersects with BIG at the Hinkley Bridge (Figure 4.2-1H-J, L-M); 3) in the Lenwood Channel (Figure 4.2-1T-V); and 4) in a drainage that intersects with BIG near Tortilla Substation (Figure 4.2-1DD). Unvegetated channel consists of dry ephemeral or intermittent washes lacking plant cover in the active floodplain. Topographically, unvegetated channel is gently sloped in the direction of

downstream flow. Soils are generally sandy with some granules throughout. Disturbances in these areas include off-road vehicle use and trash dumping.

Global and state rarity rankings do not apply to this land cover.

## 5.18 Developed Land

Developed land (349.6 acres) occurs throughout BIG and includes the rail tracks, roads, commercial buildings, residences, substations, storage yards, and paved or graded surfaces (Figure 4.2-1A-L, O-Q, T-DD). Developed land is defined as having very little to no native vegetation, though ornamental species may be present at low cover. Soils in developed land are highly disturbed, graded, or paved resulting in barren or sparsely vegetated weedy areas. Due to the developed state of the land, the topography is mostly flat, with occasional gentle slopes. Current land uses on developed land within BIG are commercial, residential, and transportation structures, including some that are abandoned or no longer in use.

Global and state rarity rankings do not apply to this land cover.

## 5.19 Disturbed Habitat

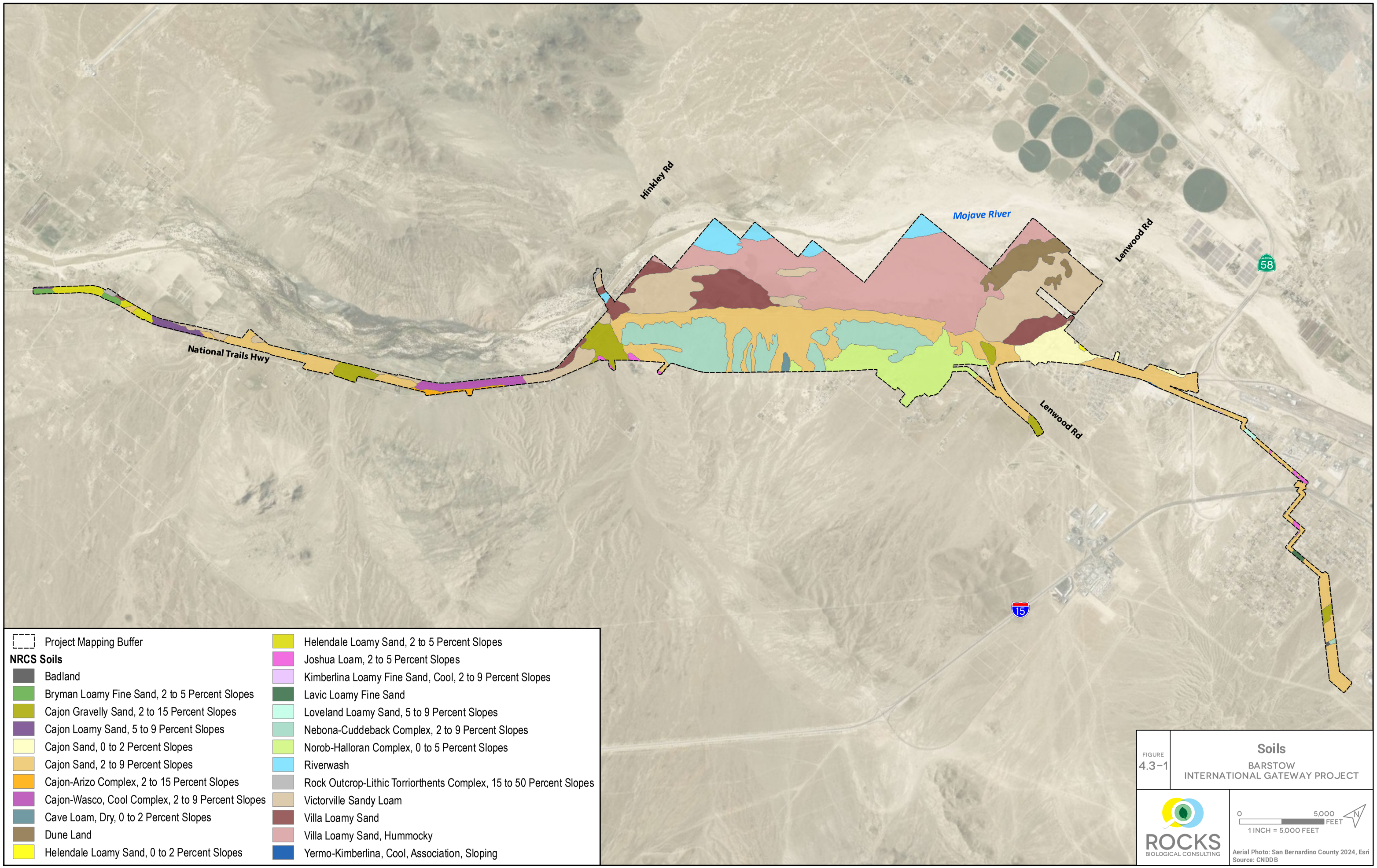
Disturbed habitat (636.5 acres) occurs throughout BIG and can be found in close proximity to nearly all other vegetation communities (Figure 4.2-1A-Q, T-DD). This community is highly variable and characterized by having no vegetation cover to being dominated by non-native Mediterranean grass at 2-75% cover or Russian thistle at 2-50% cover. Native plants within disturbed habitat on BIG are present at very low cover and include four-wing saltbush, allscale saltbush, desert dicoria, desert mallow, white mallow, and annual ambrosia, each at 1% cover or less. Other non-native species present include common barley and red-stemmed filaree each at 1% cover.

Soils in disturbed habitat are primarily highly compacted and not suitable for native plant growth; however, some areas are made up of sandy-to-gravelly soils. Soils in disturbed habitat have been impacted by previous and current land uses including agriculture, OHV use, existing and abandoned residential and commercial lots, as well as land that is adjacent to transportation structures such as easements along roadsides and existing railroad tracks. The topography in disturbed habitat is also variable, being mostly flat, but can also occur on gentle to moderate slopes throughout the site.

Global and state rarity rankings do not apply to this land cover.

## 5.20 Soils

Based on the National Resources Conservation Service (NRCS) soils data map (Figure 4.3-1. Soils), 22 soil map units and one type of bedrock outlined below in **Table 9: Soils Mapped within BIG**, occur within BIG:


Hinkley Rd
Mojave River
Lenwood Rd
National Trails Hwy
Lenwood Rd
58
15
Project Mapping Buffer
NRCS Soils
Badland
Bryman Loamy Fine Sand, 2 to 5 Percent Slopes
Cajon Gravelly Sand, 2 to 15 Percent Slopes
Cajon Loamy Sand, 5 to 9 Percent Slopes
Cajon Sand, 0 to 2 Percent Slopes
Cajon Sand, 2 to 9 Percent Slopes
Cajon-Arizo Complex, 2 to 15 Percent Slopes
Cajon-Wasco, Cool Complex, 2 to 9 Percent Slopes
Cave Loam, Dry, 0 to 2 Percent Slopes
Dune Land
Helendale Loamy Sand, 0 to 2 Percent Slopes
Helendale Loamy Sand, 2 to 5 Percent Slopes
Joshua Loam, 2 to 5 Percent Slopes
Kimberlina Loamy Fine Sand, Cool, 2 to 9 Percent Slopes
Lavic Loamy Fine Sand
Loveland Loamy Sand, 5 to 9 Percent Slopes
Nebona-Cuddeback Complex, 2 to 9 Percent Slopes
Norob-Halloran Complex, 0 to 5 Percent Slopes
Riverwash
Rock Outcrop-Lithic Torriorthents Complex, 15 to 50 Percent Slopes
Victorville Sandy Loam
Villa Loamy Sand
Villa Loamy Sand, Hummocky
Yermo-Kimberlina, Cool, Association, Sloping
FIGURE
4.3-1
Soils
BARSTOW
INTERNATIONAL GATEWAY PROJECT
ROCKS
BIOLOGICAL CONSULTING
0
5,000
FEET
1 INCH = 5,000 FEET
N
Aerial Photo: San Bernardino County 2024, Esri
Source: CNDDB

| Table 9: Soils Mapped within BIG | | | |
|---|---|---|---|
| **Soil Map Unit/Bedrock** | **Soil Series/Unit** | **Taxonomic Class** | **NRCS Hydric Status[1]** |
| Badland | N/A[3] | N/A[3] | N/A[3] |
| Bryman loamy fine sand, 2 to 5 percent slopes | Bryman | Fine-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Cajon gravelly sand, 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon loamy sand, 5 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon sand, 0 to 2 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| Cajon sand, 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon-Arizo complex[1], 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| | Arizo | Sandy-skeletal, mixed, thermic Typic Torriorthents | |
| Cajon-Wasco, cool complex[1], 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| | Wasco | Coarse-loamy, mixed, superactive, nonacid, thermic Typic Torriorthents | |
| Cave loam, dry, 0 to 2 percent slopes | Cave | Loamy, mixed, superactive, thermic, shallow Typic Petrocalcids | Yes |
| Dune land | Dune land | – | Yes |
| Helendale loamy sand, 0 to 2 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Helendale loamy sand, 2 to 5 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Joshua loam, 2 to 5 percent slopes | Joshua | Fine-loamy, mixed, superactive, thermic Argidic Argidurids | No |
| Kimberlina loamy fine sand, cool, 2 to 5 percent slopes | Kimberlina | Coarse-loamy, mixed, superactive, calcareous, thermic Typic Torriorthents | No |
| Lavic lonely fine sand | Lavic | Coarse-loamy, mixed, superactive, thermic Petronodic Haplocalcids | Yes |
| Lovelace loamy sand 5 to 9 percent slopes | Lovelace | Sandy, mixed, thermic Typic Haplocalcids | No |
| Nebona-Cuddeback complex[1], 2 to 9 percent slopes | Nebona | Loamy, mixed, superactive, thermic, shallow Typic Haplodurids | Yes |
| | Cuddeback | Fine-loamy, mixed, superactive, thermic Typic Argidurids | |
| Norob-Halloran complex[1], 0 to 5 percent slopes | Norob | Fine-loamy, mixed, superactive, thermic Typic Natrargids | Yes |
| | Halloran | Coarse-loamy, mixed, superactive, thermic Typic Natrargids | |
| Riverwash | Riverwash | – | Yes |
| Rock Outcrop-Lithic Torriorthents complex, 15 to 50 percent slopes | Rock Outcrop | – | No |
| | Torriorthents | Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Torriorthents | |
| Rosamond loam, saline-alkali | Rosamond | Fine-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |

| Table 9: Soils Mapped within BIG | | | |
|---|---|---|---|
| **Soil Map Unit/Bedrock** | **Soil Series/Unit** | **Taxonomic Class** | **NRCS Hydric Status[1]** |
| Victorville sandy loam | Victorville | Coarse-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |
| Villa loamy sand | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |
| Villa loamy sand, hummocky | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |

Source: NRCS Official Soil Series Description and Series Classification database (NRCS n.d.b); *Soil Survey of San Bernardino County, California, Mojave River Area* (USDA 1986); NRCS Soil Data Access Hydric Soils List (NRCS n.d.a).
[1] Based on the NRCS Soil Data Access Hydric Soils List (NRCS n.d.a)
[2] A complex consists of two or more soils or miscellaneous areas that either contain such small areas or are so complexly mapped that they are unable to be displayed separately (Ditzler 2015).
[3] Badland is used to describe a type of terrain/bedrock characterized by extensive erosion. Badlands are devoid of soil and vegetation and are not recognized as a soil unit by the NRCS and are therefore undescribed below (NRCS n.d.b.).

The National Technical Committee for Hydric Soils defines hydric soils; Changes in Hydric Soils Database Selection Criteria (77 FR 12234) outlines the current four hydric soil criteria. The NRCS Soil Data Access Hydric Soils List specifies 11 soil map units within the project site as hydric per Criteria 2, 3, and/or 4 NRCS, n.d.a). The soil series/units outlined above in **Table 9** are further described below per the USDA's NRCS Official Soil Series Description and Series Classification database (NRCS n.d.b) and the USDA's Soil Survey of San Bernardino County California, Mojave River Area (USDA, 1986).

Arizo – The Arizo series consists of very deep, excessively drained soils that have negligible to medium runoff. These soils formed in mixed alluvium on recent alluvial fans, inset fans, fan apron, fan skirts, stream terraces, and floodplains of intermittent streams and channels with slopes ranging from 0 to 15 percent at elevations of 750 to 4,600 feet amsl. Arizo soil is used primarily for rangeland and wildlife habitat. Native vegetation consists primarily of creosote bush and burrobush (*Hymenoclea* sp.).

Bryman – The Bryman series consists of deep, well-drained soils that have slow runoff and moderately slow permeability. These soils formed in mixed alluvium derived primarily from granitic rock and occur on terraces and older alluvial fans with slopes ranging from 0 to 15 percent at elevations of 2,800 to 3,800 feet amsl. Bryman soil is used primarily for irrigated crops, homesites, and recreation. Native vegetation consists of creosote bush, bursage (*Ambrosia* sp.), green ephedra (*Ephedra viridis*), western Joshua tree, and annual forbs and grasses.

Cajon – The Cajon series consists of very deep, somewhat excessively drained soils that have slight to low runoff and rapid permeability. These soils formed in sandy alluvium and occur on alluvial fans, fan aprons, fan skirts, inset fans, and river terraces with slopes ranging from 0 to 15 percent at elevations of 200 to 4,300 feet amsl. Cajon soil is used primarily for range, watershed, and recreation, and irrigated areas are used for growing alfalfa and other crops. Uncultivated areas consist of desert shrubs.

Cave – The Cave series consists of very shallow, well-drained soils that have medium to very high runoff and moderate or moderately rapid permeability. These soils formed in mixed alluvium and occur on fan remnants, fan piedmonts, and stream terraces with slopes ranging from 0 to 35 percent at elevations of

1,500 to 5,060 feet amsl. Cave soil is used primarily for livestock grazing, wildlife habitat, and urban development. Native vegetation consists of creosote bush, blackbrush (*Coleogyne ramosissima)*, bursage, Joshua tree, mesquite, cactus, and annual grasses and weeds.

Cuddeback – The Cuddeback series consists of moderately deep, well-drained soils that have medium to rapid runoff and moderately slow permeability above the duripan but very slow in the duripan. These soils formed in mixed alluvium on terraces and alluvial fans with slopes ranging from 2 to 9 percent at elevations of 2,200 to 3,000 feet amsl. Cuddeback soil is used mainly for wildlife habitat and recreation. Native vegetation consists of very sparse stands of creosote bush yucca species, and annual grasses and forbs.

Dune Land – The Dune Land miscellaneous areas consist of excessively drained soils with slow runoff and very rapid permeability. These soils formed from wind-deposited sand and occur on unstable hills and ridges of loose, wind-deposited sand with slopes ranging from 5 to 15 percent. Dunes are generally less than 15 feet high but can sometimes reach 25 feet high. Dune Land soil is used primarily for wildlife habitat and recreation and is essentially barren of vegetation.

Halloran – The Halloran series consists of deep, moderately well-drained soils that have slow runoff and moderately slow permeability. These soils formed in mixed alluvium dominantly from granitic sources and occur on old alluvial terraces and depressional areas with slopes ranging from 0 to 2 percent at elevations of 1,800 to 1,850 feet amsl. Halloran soil is used primarily for wildlife habitat and recreation. Native vegetation consists of creosote bush, saltbush (Atriplex sp.), and alkali-tolerant vegetation.

Helendale – The Helendale series consists of very deep, well-drained soils that have negligible to low runoff and moderately high to high saturated hydraulic conductivity. These soils formed in alluvium from granitic sources and occur on fan piedmonts, fan remnants, alluvial fans, and terraces with slopes ranging from 0 to 15 percent at elevations of 2,500 to 3,800 feet amsl. Helendale soil is used primarily for irrigated agriculture and pasture, residential development, military operations, recreation, and wildlife habitat. Native vegetation consists of creosote bush, cheesebush (*Ambrosia salsola*), Nevada jointfir (*Ephedra nevadensis*), western Joshua tree, and annual forbs and grasses.

Joshua – The Joshua series consists of moderately deep, well-drained soils that have medium to rapid runoff and moderately slow to slow permeability. These soils formed in material derived from mixed sources and occur on old terraces with a well-developed erosion pavement with slopes ranging from 2 to 15 percent at elevations of 2,600 to 3,000 feet amsl. Joshua soil is used primarily for wildlife habitat and recreation. Native vegetation consists of very sparse strands of creosote bush, white bursage, yucca species, saltbush, and annual grasses and forbs.

Kimberlina – The Kimberlina series consists of very deep, well-drained soils that have negligible to medium runoff and moderately rapid permeability. These soils formed in mixed alluvium derived dominantly from igneous and/or sedimentary rock sources and occur on alluvial fans and flood plains. with slopes ranging from 0 to 9 percent. Elevation is 125 to 2,250 feet in the San Joaquin Valley and cool phases occur at 1,800 to 4,100 feet in the Mojave Desert. Kimberlina soils are used for row crops and other agriculture. Native vegetation consists of annual grasses, forbs, and *Atriplex* spp.

Lavic – The lavic series consists of moderately deep, well-drained soils that have low to medium runoff and moderate permeability. These soils formed in mixed alluvium derived mainly from granitic sources and occur on fan piedmonts, alluvial fans, and basin rims at slopes of 0 to 9 percent at elevations of 2,400 to 3,200 feet amsl. Lavic soil is primarily used for military operations, homesites, and wildlife habitat. Small acreages are used for irrigated alfalfa, small grain crops, and pasture. Native vegetation includes creosote bush, white bursage, Joshua tree, Indian ricegrass, annual forbs and grasses.

Lovelace – The lovelace series consists of deep, well-drained soils that have slow runoff and moderate permeability. These soils formed in alluvium from mixed sources but mainly granitic rock and occur on alluvial fans with slopes ranging from 5 to 8 percent at elevations of 3,000 to 3,300 feet. Lovelace soil is used for wildlife habitat, recreation, and as rangeland following winter rains. Native vegetation includes creosote bush, Joshua tree, bursage, and shadscale as well as annual grasses and forbs. Lithic Torriorthents – Lithic Torriorthents consists of very shallow and shallow, well-drained soils that have medium to rapid runoff and rapid to very rapid permeability. These soils formed from weathering of granitic rock and occur between areas of Rock outcrop (i.e., exposed granitic rock), in small depressional areas, and on relatively stable hillslopes ranging from 15 to 50 percent at elevations of 3,000 to 4,950 feet amsl. Lithic Torriorthents soil is used primarily for wildlife habitat.

Nebona – The Nebona series consists of shallow, well-drained soils that have medium to rapid runoff and moderately rapid permeability in the upper part but very slow in the duripan. These soils formed in mixed alluvial and occur on terraces with slopes ranging from 2 to 9 percent at elevations of 2,200 to 3,000 feet amsl. Nebona soil is used mainly for wildlife habitat and recreation. Native vegetation consists of very sparse stands of creosote bush, white bursage, yucca species, some saltbush, and annual grasses and forbs.

Norob – The Norob series consists of very deep, moderately well-drained soils that have negligible to medium runoff with slow permeability. These soils formed in mixed alluvium and occur on alluvial plains and alluvial flats in the Mojave Desert with slopes ranging from 0 to 5 percent at elevations of 2,300 to 3,200 feet amsl. Norob soil is used primarily for livestock grazing, military operations, and recreation. Native vegetation consists of saltbush, creosote bush, and scattered annual grasses and forbs.

Riverwash – The Riverwash miscellaneous areas consists of excessively drained soils in the Mojave River riverbed and in beds of intermittent streams subject to flooding during prolonged storms of high intensity. These soils formed in areas of alluvium derived primarily from granitic rocks and occur on unstable sandy and gravelly alluvium that is frequently removed, resorted, and redeposited with slopes ranging from 0 to 2 percent at elevations of 1,700 to 3,100 feet amsl. Riverwash soil is used mainly for wildlife habitat and areas of Riverwash are essentially barren of vegetation. Small areas of Villa loamy sand and Victorville sandy loam soils are also included in this unit on low stream terraces along the Mojave River.

Rock Outcrop – The Rock Outcrop miscellaneous areas consist of exposed granitic bedrock on mountainsides, ridges, and rugged hills at elevations of 3,000 to 4,950 feet amsl. Rock outcrop is used primarily for wildlife habitat.

Rosamond – The Rosamond series consists of deep, well-drained soils that have medium runoff and moderate to moderately slow permeability. These soils formed in alluvium derived primarily from granitic rock and occur on slopes ranging from 0 to 2 percent at elevations from 2,200 to 2,900 feet amsl. Rosamond series is used primarily for desert range in larger areas, and irrigated areas are used for growing alfalfa and row crops. Native vegetation consists primarily of rabbitbrush, big sagebrush (*Artemisia tridentata*), saltbush, and annual and perennial grass and weeds.

Victorville – The Victorville series consists of deep, moderately well-drained soils that have medium runoff and moderately rapid permeability. These soils formed in mixed alluvium, dominantly from granitic sources and occur on low river terraces and flood plains with slopes ranging from 0 to 2 percent at elevations of 2,200 to 2,800 amsl. Victorville soil is used mainly for irrigated crops such as alfalfa, pasture, and small grains. Native vegetation consists of rabbitbrush, salt grass (*Distichlis spicata*), annual weeds and grasses, and some cottonwood (*Populus* sp.) trees.

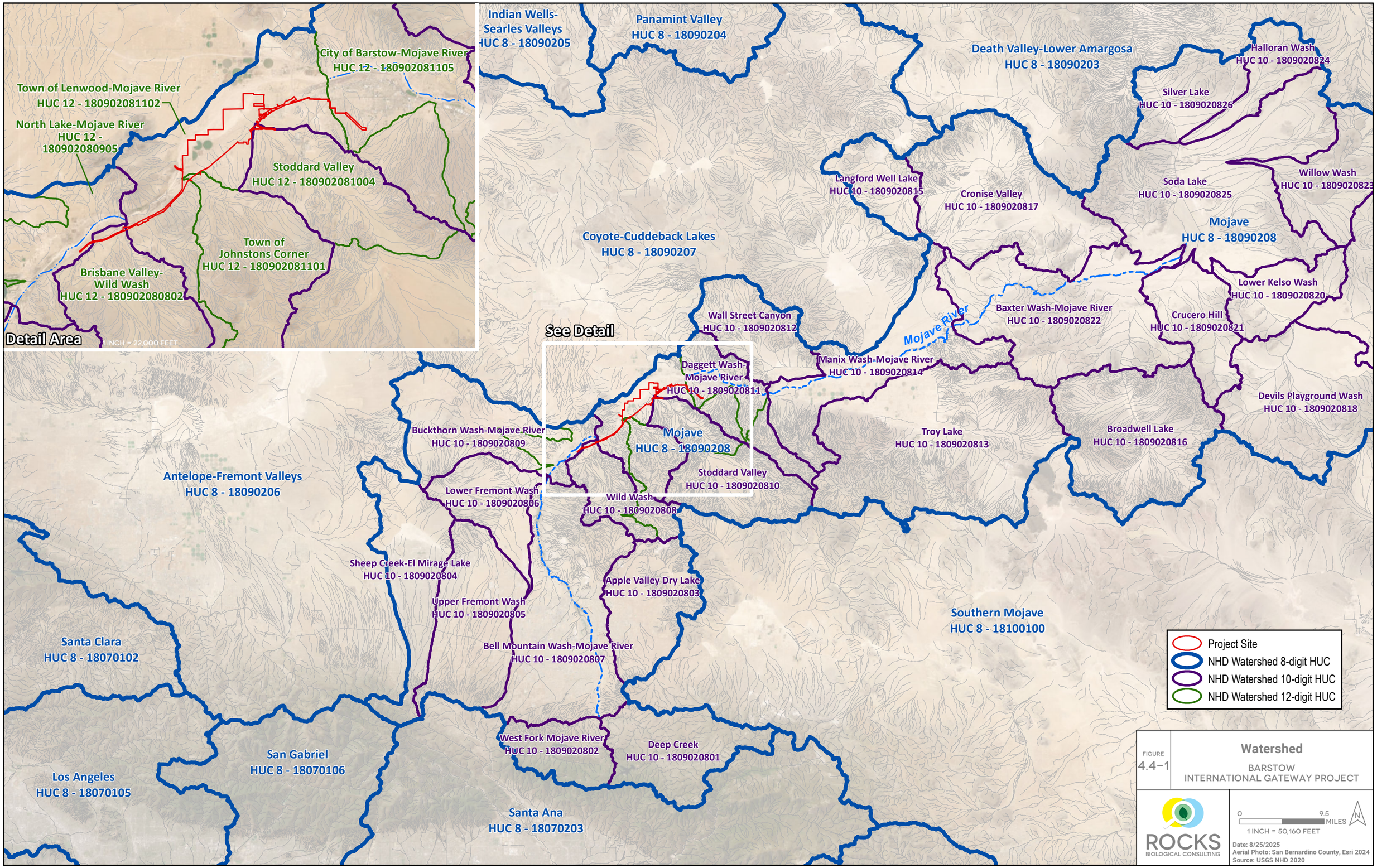
Villa – The Villa series consists of deep, moderately well-drained soils that have slow runoff and moderately rapid permeability. These soils formed in alluvium derived primarily from granitic rock and occur on river flood plains with slopes of 0 to 2 percent at elevations of 2,100 to 2,800 feet amsl. Villa soil is used mainly for irrigated crops such as alfalfa. Native vegetation consists of saltbush, mesquite, creosote bush, and annual grasses and forbs.

Wasco – The Wasco series consists of very deep, well-drained soils that have negligible or very low runoff and moderately rapid permeability. These soils formed in mixed alluvium derived mainly from igneous and/or sedimentary rock sources with slopes ranging from 0 to 5 percent at elevations of 225 to 1,000 feet amsl in the southern San Joaquin Valley and as high as 3,700 feet amsl in the Mojave Desert. Wasco soil is used primarily for growing field, forage, and row crops, and some areas are used for livestock grazing, wildlife habitat, recreation, and homesites. Native vegetation consists of Atriplex species and annual grasses and forbs.

## 5.21 Hydrology

The project site is within the Mojave Hydrologic Unit Code (HUC) 8 (18090208), Daggett Wash-Mojave River HUC 10 (1809020811), Stoddard Valley HUC 10 (1809020810), Buckthorn Wash-Mojave River HUC 10 (1809020809), Town of Lenwood-Mojave River HUC 12 (180902081102), Town of Johnstons Corner HUC 12 (180902081101), North Lake-Mojave River HUC 12 (180902080905), and Stoddard Valley HUC 12 (180902081004) (Figure 4.4-1. Watersheds). The Mojave River headwaters in the San Bernadino Mountains, continues for approximately 120 miles via surface and subsurface flows through the Mojave Desert, then drains into Soda Dry Lake (Lahontan Regional Water Quality Control Board [LRWQCB], 2002). The Mojave River typically only conveys surface flows during large storm events or in areas where geologic structures force groundwater to the surface (LRWQCB 2002).

In addition to the watersheds defined by the USGS and commonly used by the Corps, the RWQCB also defines watershed boundaries by Hydrologic Units (HUs). The project site is within the South Lahontan Hydrologic Basin, the Mojave HU, and the Middle Mojave Hydrologic Area (LRWQCB, 2021).


Detail Area
1 INCH = 22,000 FEET
See Detail
City of Barstow-Mojave River
HUC 12 - 180902081105
Town of Lenwood-Mojave River
HUC 12 - 180902081102
North Lake-Mojave River
HUC 12 -
180902080905
Stoddard Valley
HUC 12 - 180902081004
Town of
Johnstons Corner
HUC 12 - 180902081101
Brisbane Valley-
Wild Wash
HUC 12 - 180902080802
Indian Wells-
Searles Valleys
HUC 8 - 18090205
Panamint Valley
HUC 8 - 18090204
Death Valley-Lower Amargosa
HUC 8 - 18090203
Halloran Wash
HUC 10 - 1809020824
Silver Lake
HUC 10 - 1809020826
Willow Wash
HUC 10 - 1809020823
Soda Lake
HUC 10 - 1809020825
Langford Well Lake
HUC 10 - 1809020815
Cronise Valley
HUC 10 - 1809020817
Coyote-Cuddeback Lakes
HUC 8 - 18090207
Mojave
HUC 8 - 18090208
Lower Kelso Wash
HUC 10 - 1809020820
Baxter Wash-Mojave River
HUC 10 - 1809020822
Crucero Hill
HUC 10 - 1809020821
Mojave River
Wall Street Canyon
HUC 10 - 1809020812
Manix Wash-Mojave River
HUC 10 - 1809020814
Devils Playground Wash
HUC 10 - 1809020818
Daggett Wash-
Mojave River
HUC10 - 1809020811
Buckthorn Wash-Mojave River
HUC 10 - 1809020809
Mojave
HUC 8 - 18090208
Troy Lake
HUC 10 - 1809020813
Broadwell Lake
HUC 10 - 1809020816
Stoddard Valley
HUC 10 - 1809020810
Wild Wash
HUC 10 - 1809020808
Antelope-Fremont Valleys
HUC 8 - 18090206
Lower Fremont Wash
HUC 10 - 1809020806
Sheep Creek-El Mirage Lake
HUC 10 - 1809020804
Apple Valley Dry Lake
HUC 10 - 1809020803
Upper Fremont Wash
HUC 10 - 1809020805
Southern Mojave
HUC 8 - 18100100
Bell Mountain Wash-Mojave River
HUC 10 - 1809020807
Santa Clara
HUC 8 - 18070102
West Fork Mojave River
HUC 10 - 1809020802
Deep Creek
HUC 10 - 1809020801
San Gabriel
HUC 8 - 18070106
Los Angeles
HUC 8 - 18070105
Santa Ana
HUC 8 - 18070203
Project Site
NHD Watershed 8-digit HUC
NHD Watershed 10-digit HUC
NHD Watershed 12-digit HUC
FIGURE
4.4-1
Watershed
BARSTOW
INTERNATIONAL GATEWAY PROJECT
ROCKS
BIOLOGICAL CONSULTING
0
9.5
MILES
N
1 INCH = 50,160 FEET
Date: 8/25/2025
Aerial Photo: San Bernardino County, Esri 2024
Source: USGS NHD 2020

Known hydrologic sources for the observed on-site drainages, discussed further below, are direct precipitation, upstream Mojave River flows, and runoff from surrounding roads and development. Based on field observations, features within BIG south of the railroad tracks generally drain southeast to northwest, following a slight change in topography towards the railroad tracks. The USGS NHD web map indicates flows from the Mojave River continue northeast and ultimately drain into Soda Dry Lake (USGS, 2021).

## 5.22 Jurisdictional Aquatic Resources

Based on the results of the Aquatic Resources Delineation Report (**Attachment C**), the 5,800.9-acre review area of BIG (BIG project boundary and a 50 to 450-foot buffer to assess potential off-site improvements) supports 142.79 acres (259,504 linear feet) of potential non-wetland waters of the U.S./State jurisdictional by USACE and RWQCB, respectively, (as shown in Figure 4.5-1. USACE/RWQCB Jurisdictional Aquatic Resources and listed in **Table 10: Total Acreages of Delineated Aquatic Resources within BIG Aquatic Resources Delineation Report Review Area**) and approximately 58.98 acres of vegetated streambed, 594.42 acres of unvegetated streambed (716.38 acres or 259,504 linear feet of vegetated and unvegetated streambed combined), and 62.97 acres of watercourse jurisdictional by CDFW (Figure 4.5-2. CDFW Jurisdictional Aquatic Resources). Further details for each aquatic resource (Non-Wetland Water [NWW] 1 through NWW-393 and watercourses jurisdictional by CDFW), the general characteristics, latitude and longitude coordinates, and acreage and linear feet for each of the observed features within the review area are provided in **Attachment C**.

**Table 10: Total Acreages of Delineated Aquatic Resources within BIG Aquatic Resources Delineation Report Review Area**

| Agency | Aquatic Resource Type | Acres | Linear Feet |
|---|---|---|---|
| USACE | Non-Wetland Waters of the U.S. | 142.79 | 259,504 |
| | ***Total USACE Aquatic Resources*** | 142.79 | 259,504 |
| RWQCB | Non-Wetland Waters of the State | 142.79 | 259,504 |
| | ***Total RWQCB Aquatic Resources*** | 142.79 | 259,504 |
| CDFW | Unvegetated Streambed | 594.42 | 259,504 |
| | Vegetated Streambed | 58.98 | |
| | Watercourse | 62.97 | N/A[1] |
| | ***Total CDFW Aquatic Resources***[2] | 716.38 | 259,504 |

Note:
[1] Linear feet not calculated for watercourse to avoid redundant linear foot calculation where such areas overlap with streambed.
[2] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.

In addition to the non-wetland waters summarized in **Table 10**, the review area contains 16 swales (S-1 through S-16) and 23 erosional features (EF-1 through EF-23) that are not expected to be jurisdictional by USACE, RWQCB, or CDFW since they did not display an observable Ordinary High Water Mark or bed and bank, formed as a result of significant human disturbance (e.g., high-velocity sheet flow from adjacent impervious surfaces), and/or did not appear to convey flows to downstream aquatic resources via observed flow patterns, culverts, or other flow paths. Thus, S-1 through S-16 and EF-1 through EF-23 do not provide nor affect aquatic resource functions and/or downstream beneficial uses (as defined by the




Project Site

Review Area (5800.90 ac)[1]

Culvert

Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5–1A

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

11'-15'
24'-30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

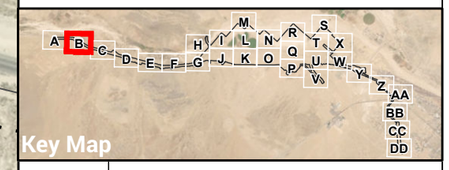



FIGURE 4.5-1B

**USACE/RWQCB Jurisdictional Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
16'-21'
24'-30'
>30'

**Other Features[3]**

Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

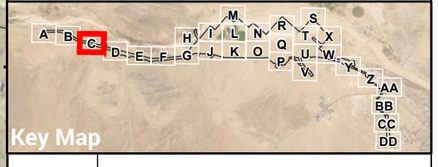



FIGURE 4.5-1C

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

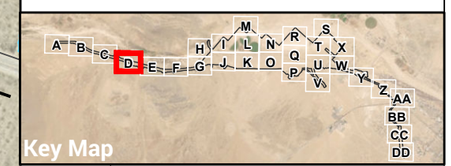



FIGURE 4.5-1D

**USACE/RWQCB Jurisdictional Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

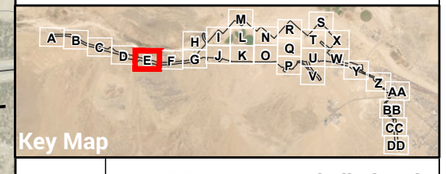



FIGURE
4.5-1E

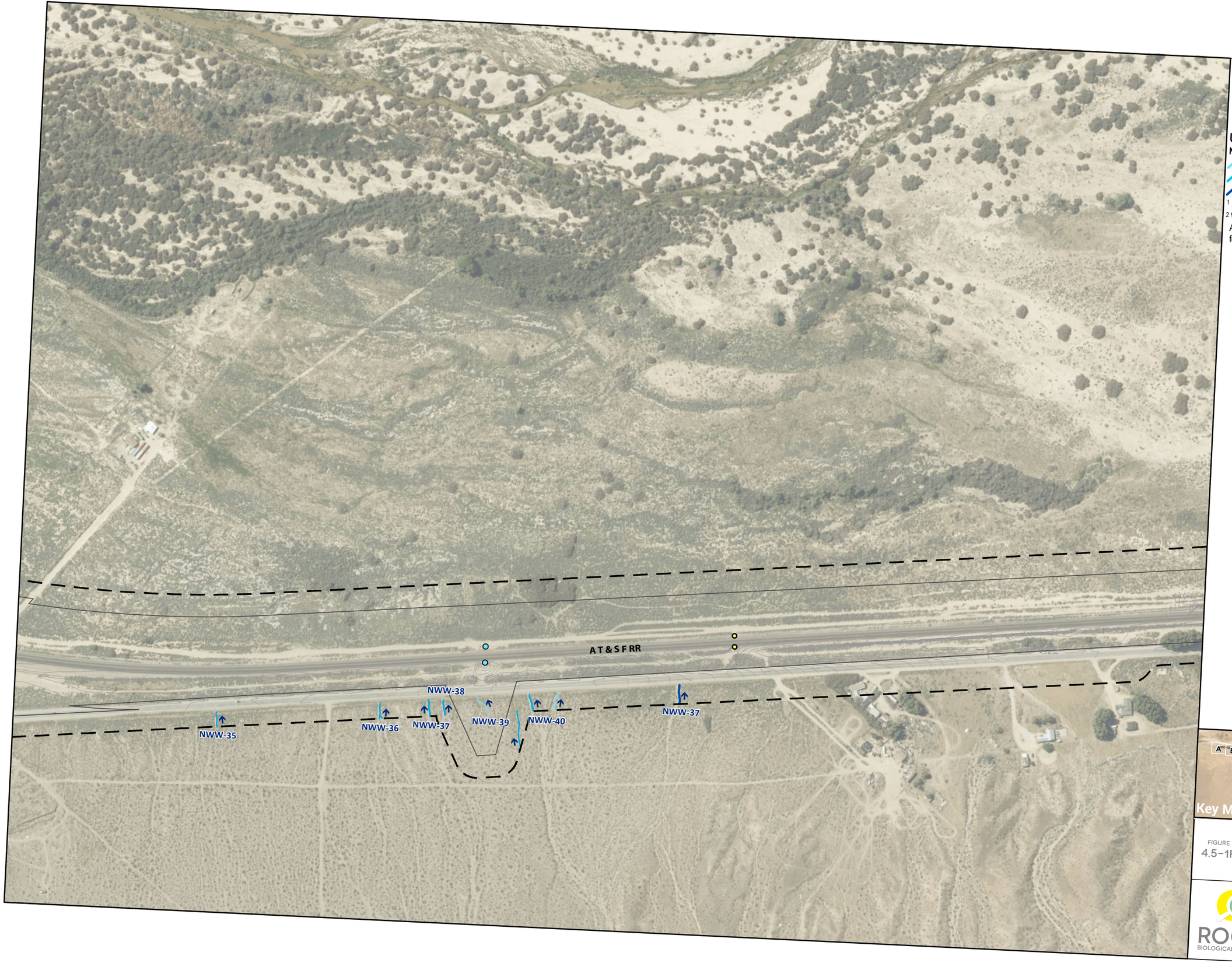
**USACE/RWQCB Jurisdictional Aquatic Resources**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Culvert

Railroad Crossing

Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

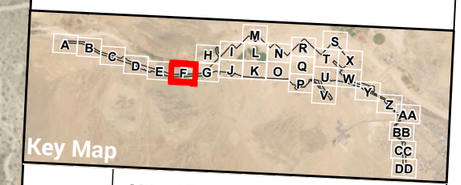



FIGURE 4.5-1F

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

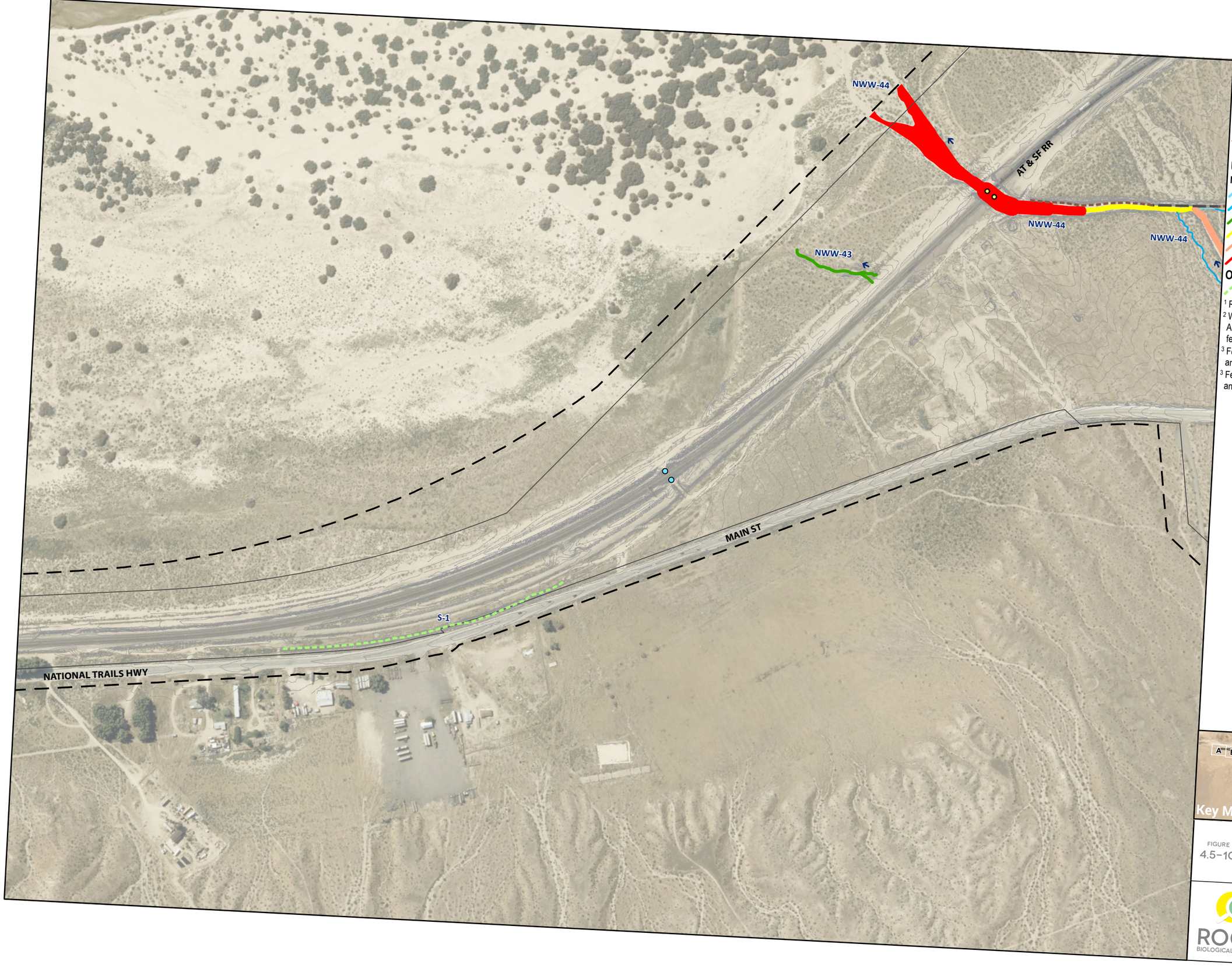
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
11'-15'
16'-21'
24'-30'
>30'

**Other Features[3]**

Swale

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5–1G

**USACE/RWQCB Jurisdictional Aquatic Resources**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5-1H

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

4'-6'

11'-15'

>30'

## Other Features[3]

Basin

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-1l

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri

AT & SF RR
HINKLEY CTF
MAIN ST
NWW-44
NWW-45
NWW-46
NWW-47
NWW-48
NWW-49
NWW-50
NWW-51
NWW-52
NWW-53
NWW-54
NWW-55
NWW-56
NWW-57
NWW-58
NWW-59
NWW-61
NWW-62
NWW-63
NWW-64
NWW-67
NWW-105
NWW-106
NWW-107
NWW-311
NWW-312
NWW-313
NWW-314
NWW-306 - NWW-310

Project Site
Review Area (5800.90 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 4.5-1J

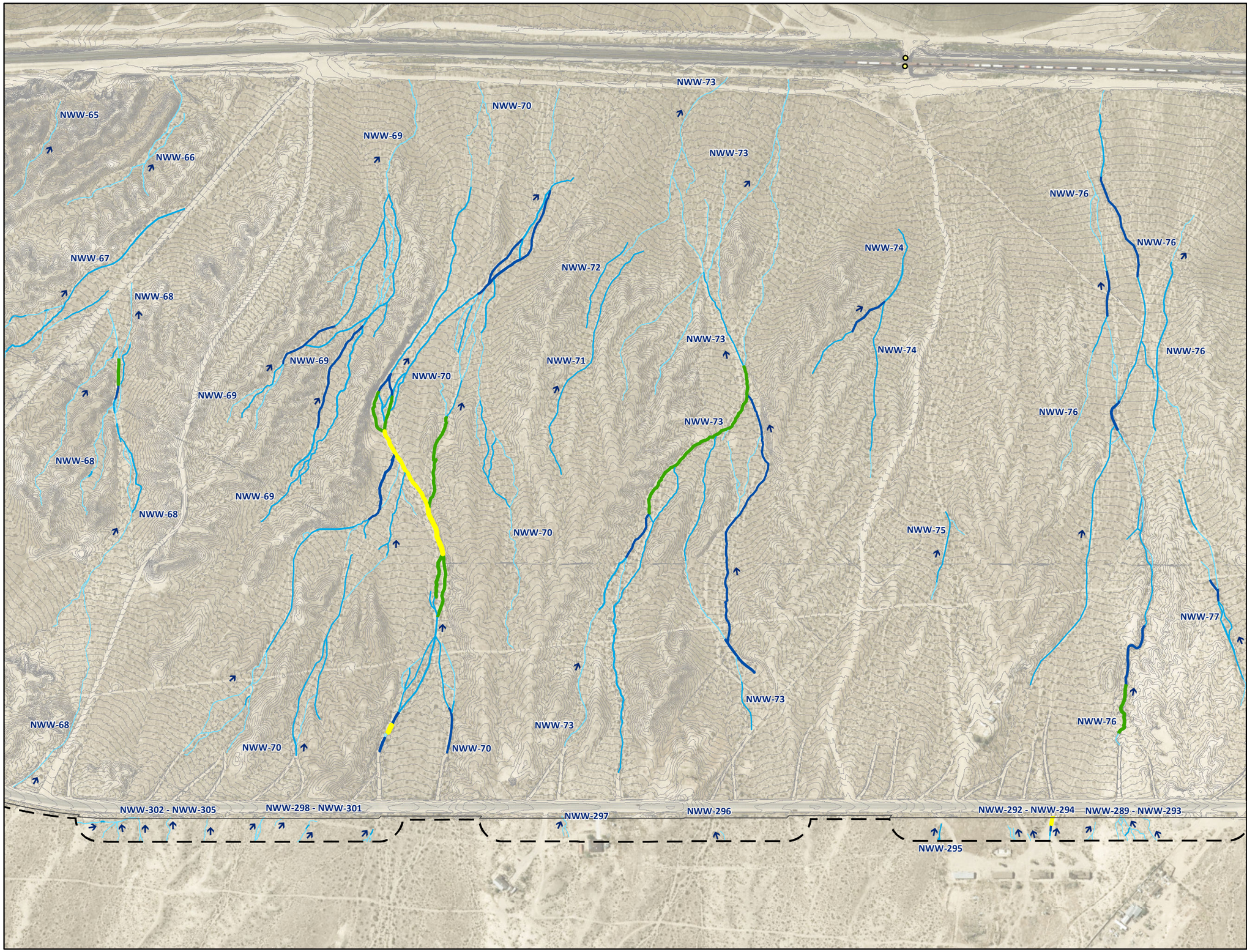
# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

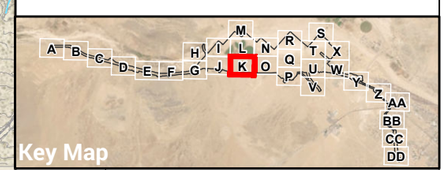


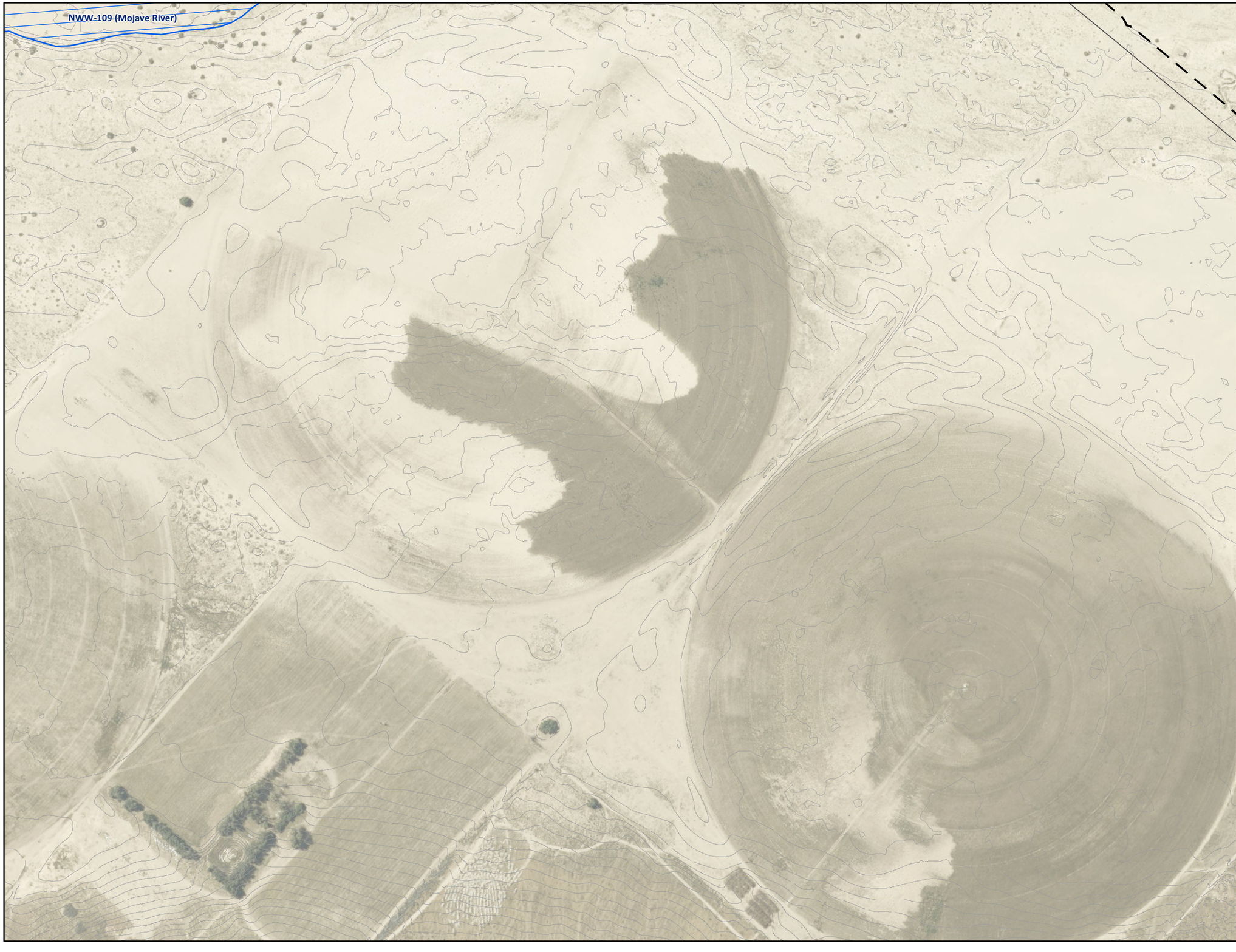

FIGURE 4.5-1K

**USACE/RWQCB Jurisdictional Aquatic Resources**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.




FIGURE 4.5-1L

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

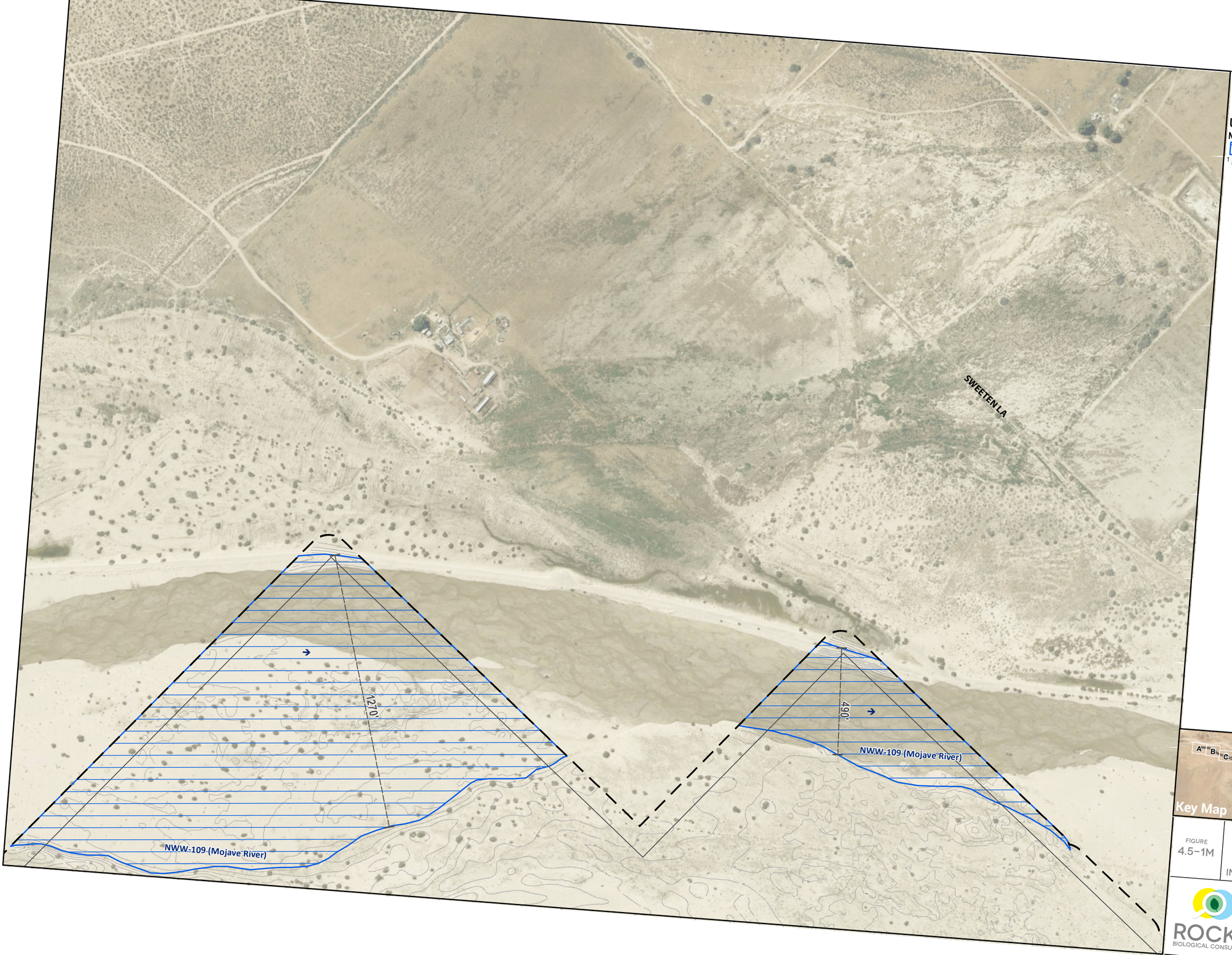
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.




FIGURE 4.5-1M

**USACE/RWQCB Jurisdictional Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT

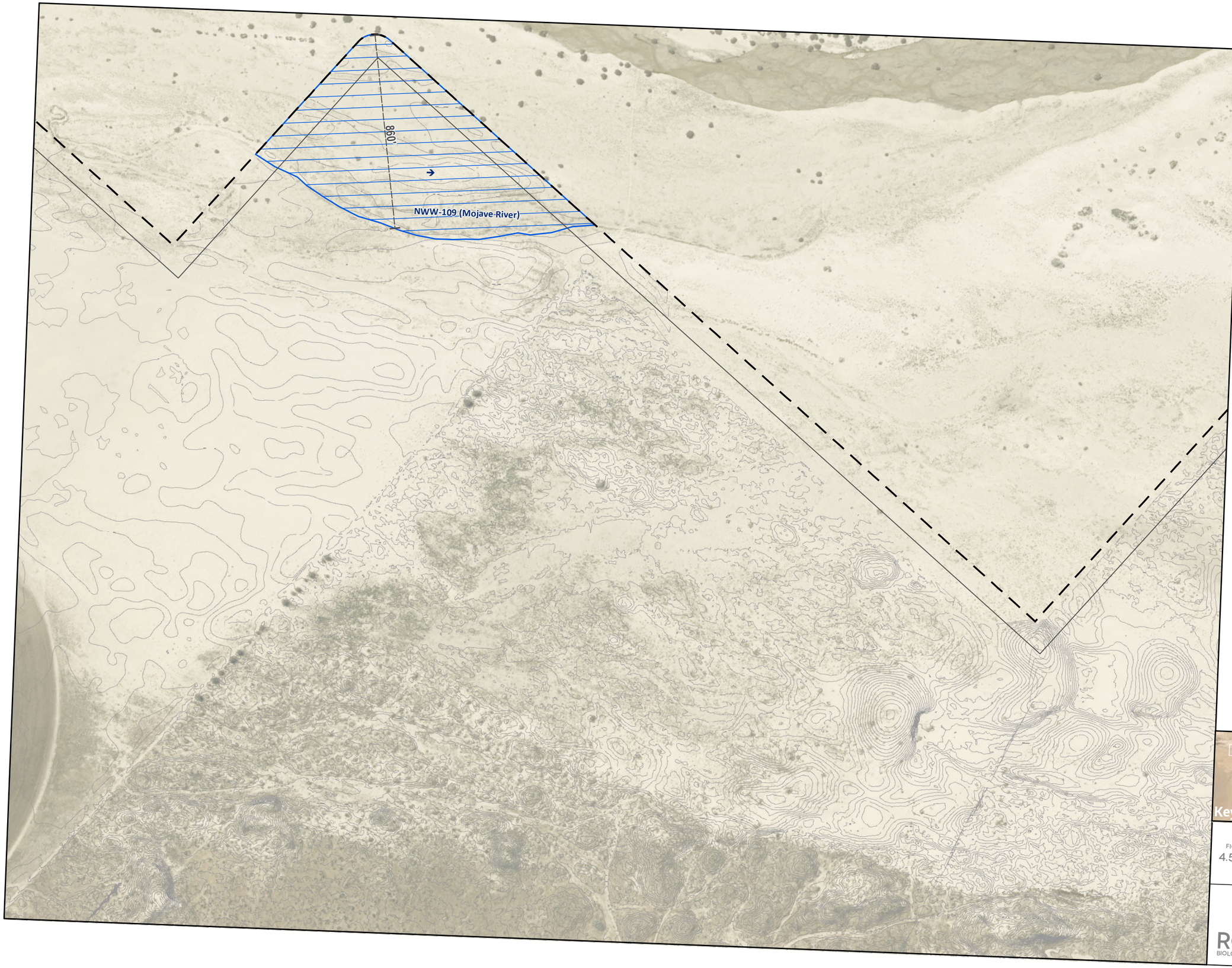
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.




FIGURE 4.5-1N

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

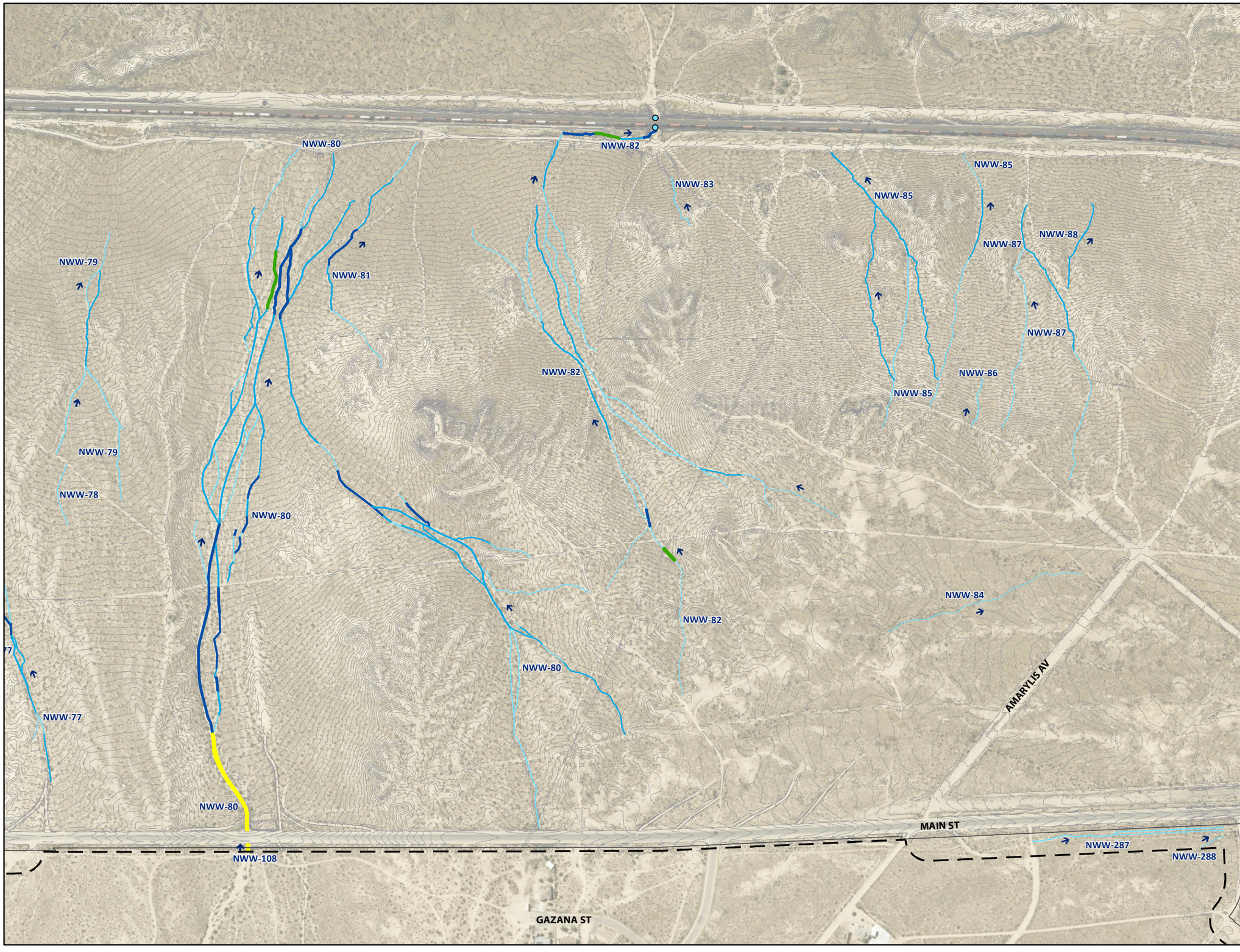
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

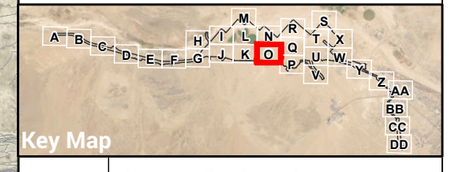



FIGURE 4.5-10

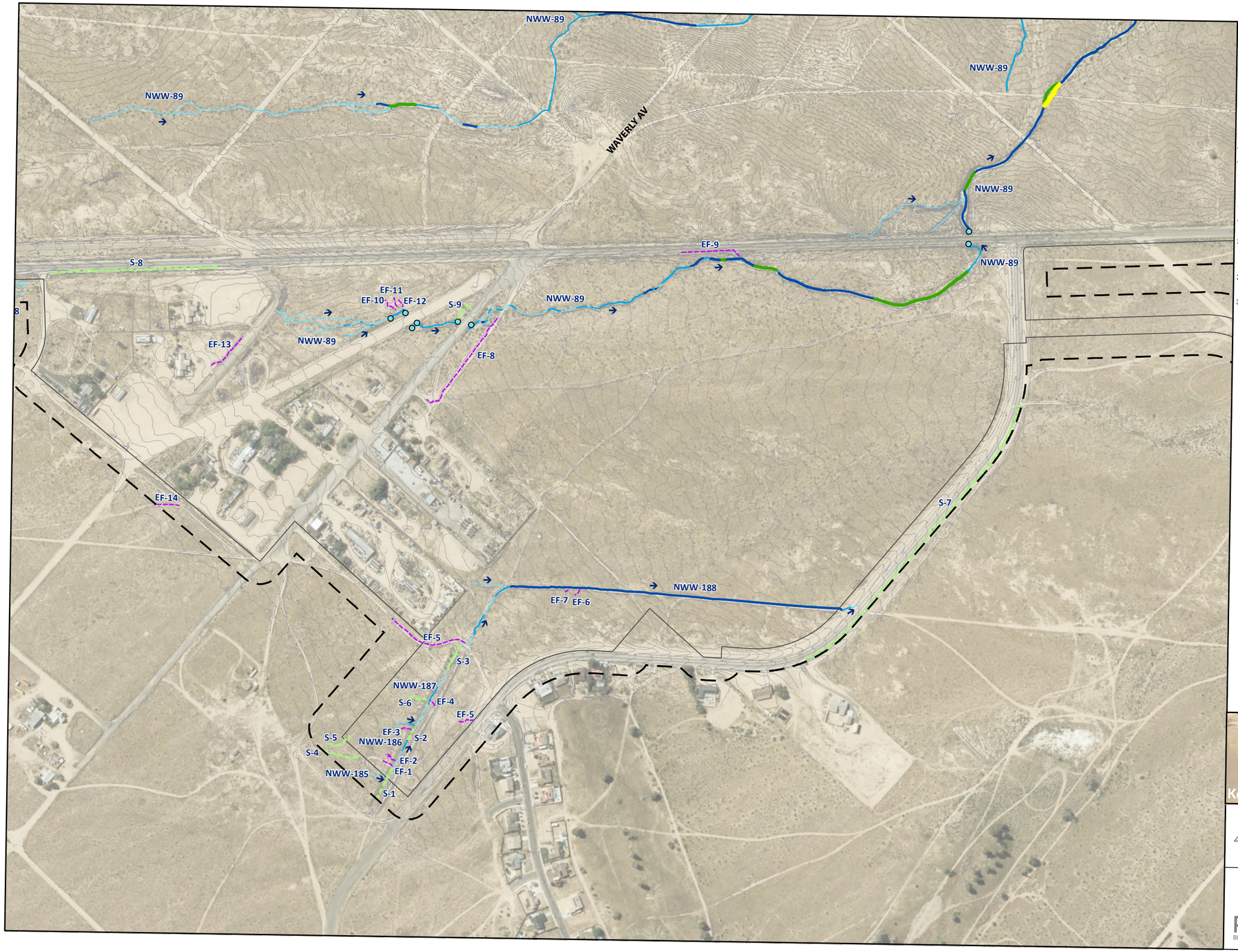
# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Other Features[3]**

Swale
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-1P

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

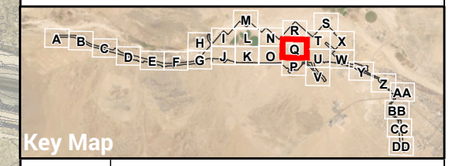



FIGURE 4.5-10

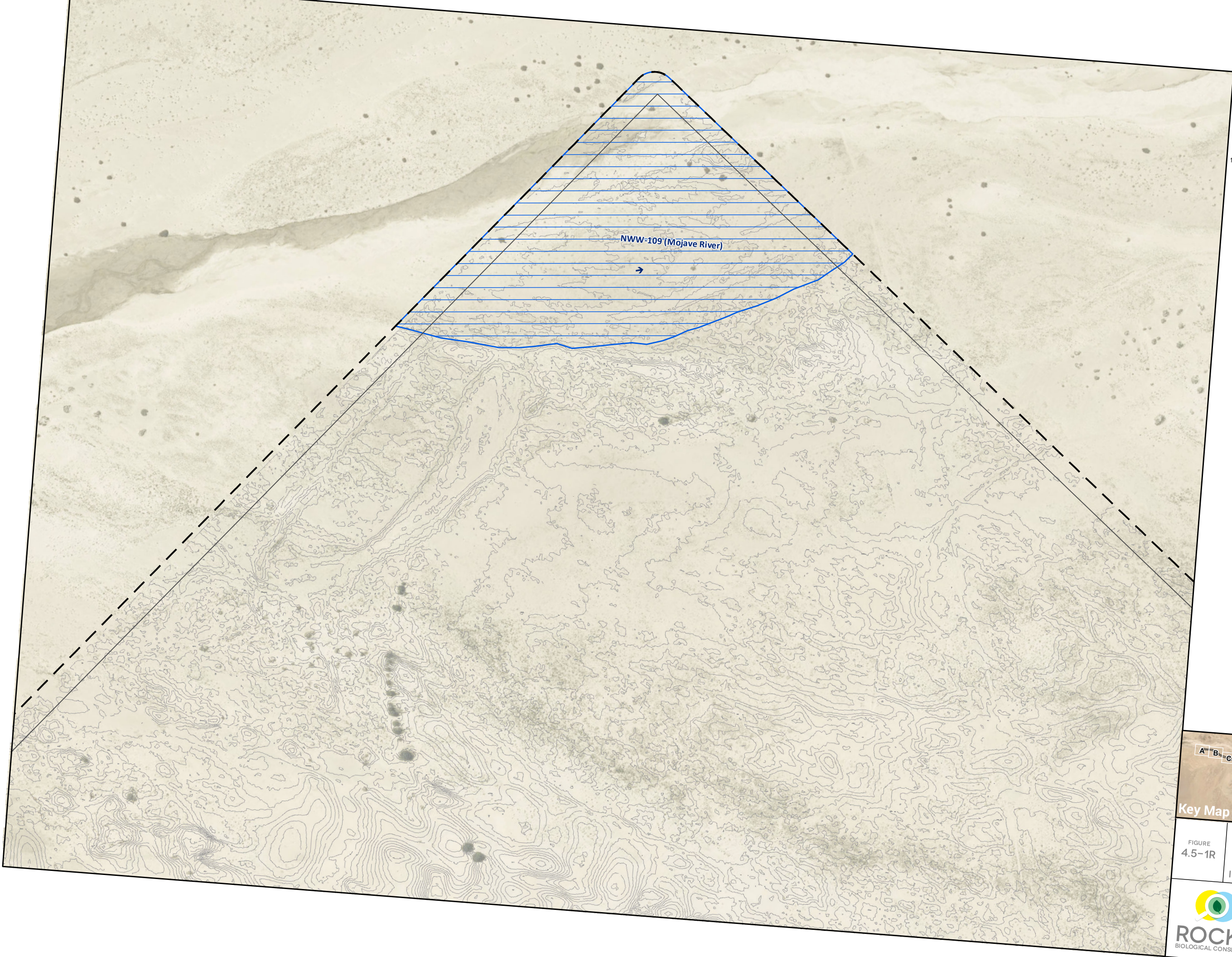
# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.

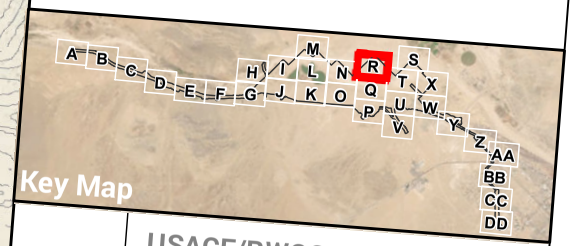



FIGURE 4.5–1R

**USACE/RWQCB Jurisdictional Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT

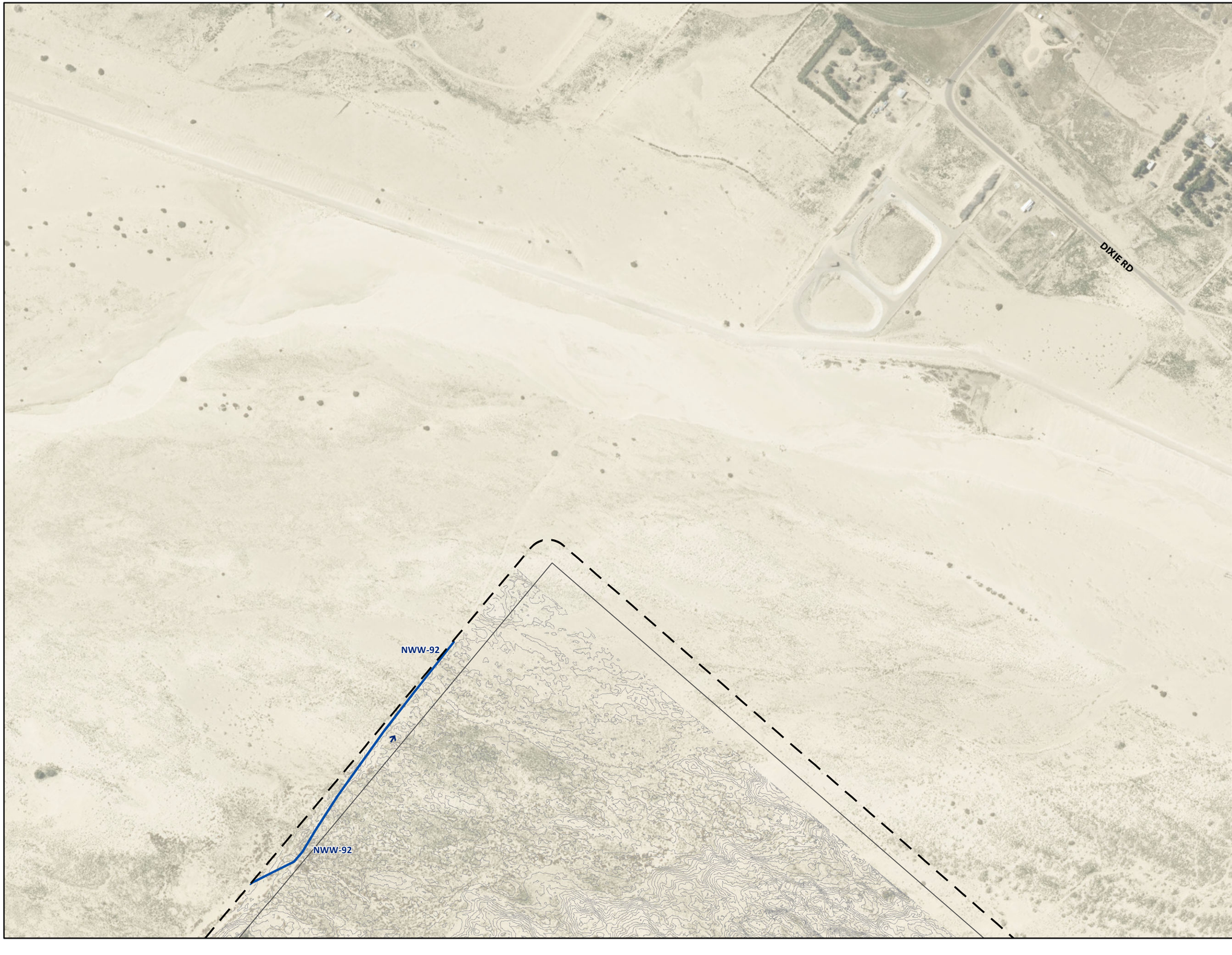
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

7'-10'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-1S

**USACE/RWQCB Jurisdictional Aquatic Resources**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

7'-10'
>30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

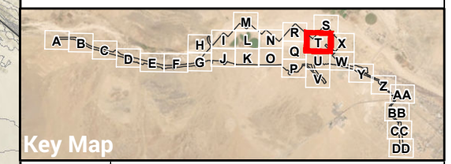


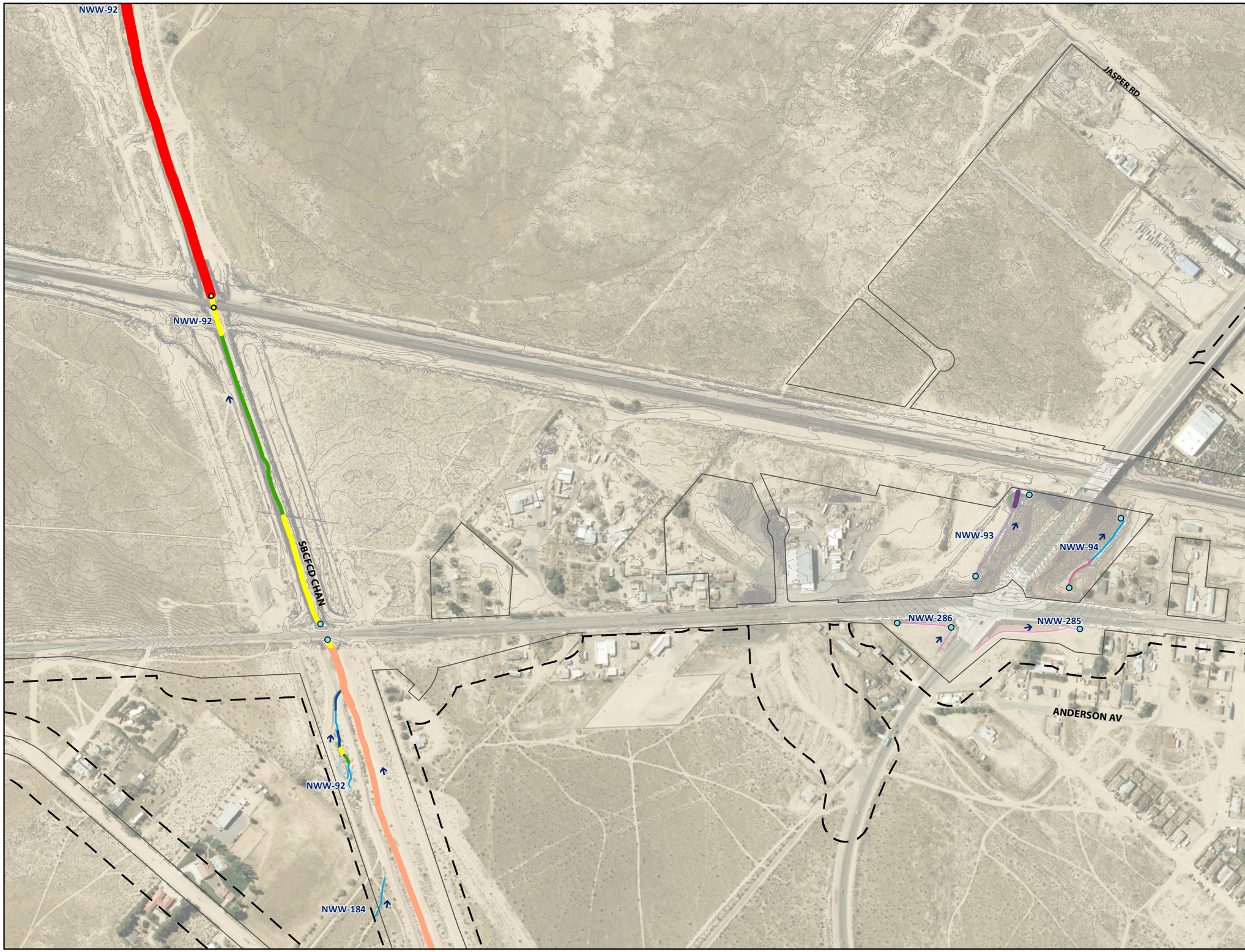

FIGURE 4.5-1T

**USACE/RWQCB Jurisdictional Aquatic Resources**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

**Non-Wetland Waters - Rip-rap (0.06 ac)[1] (widths)[2]**
3'
20'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**
1'-3'
6'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5-1U

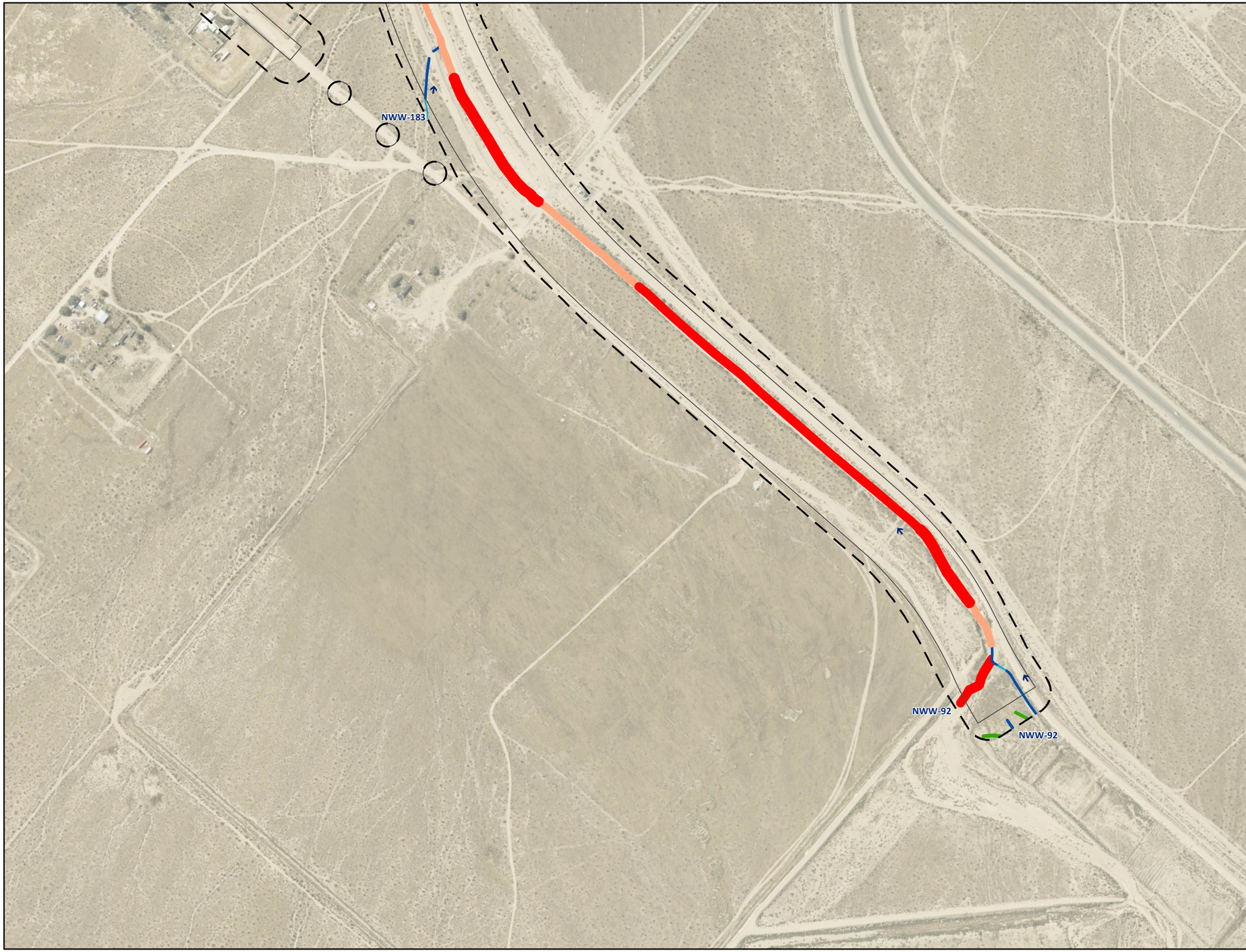
# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

4'-6'
7'-10'
11'-15'
24'-30'
>30'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-1V

**USACE/RWQCB Jurisdictional Aquatic Resources**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Culvert

Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'

4'-6'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5–1W

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

[1] Represents total acreage for survey area.




FIGURE 4.5-1X

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

1'-3'

## Other Features[3]

Basin
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-1Y

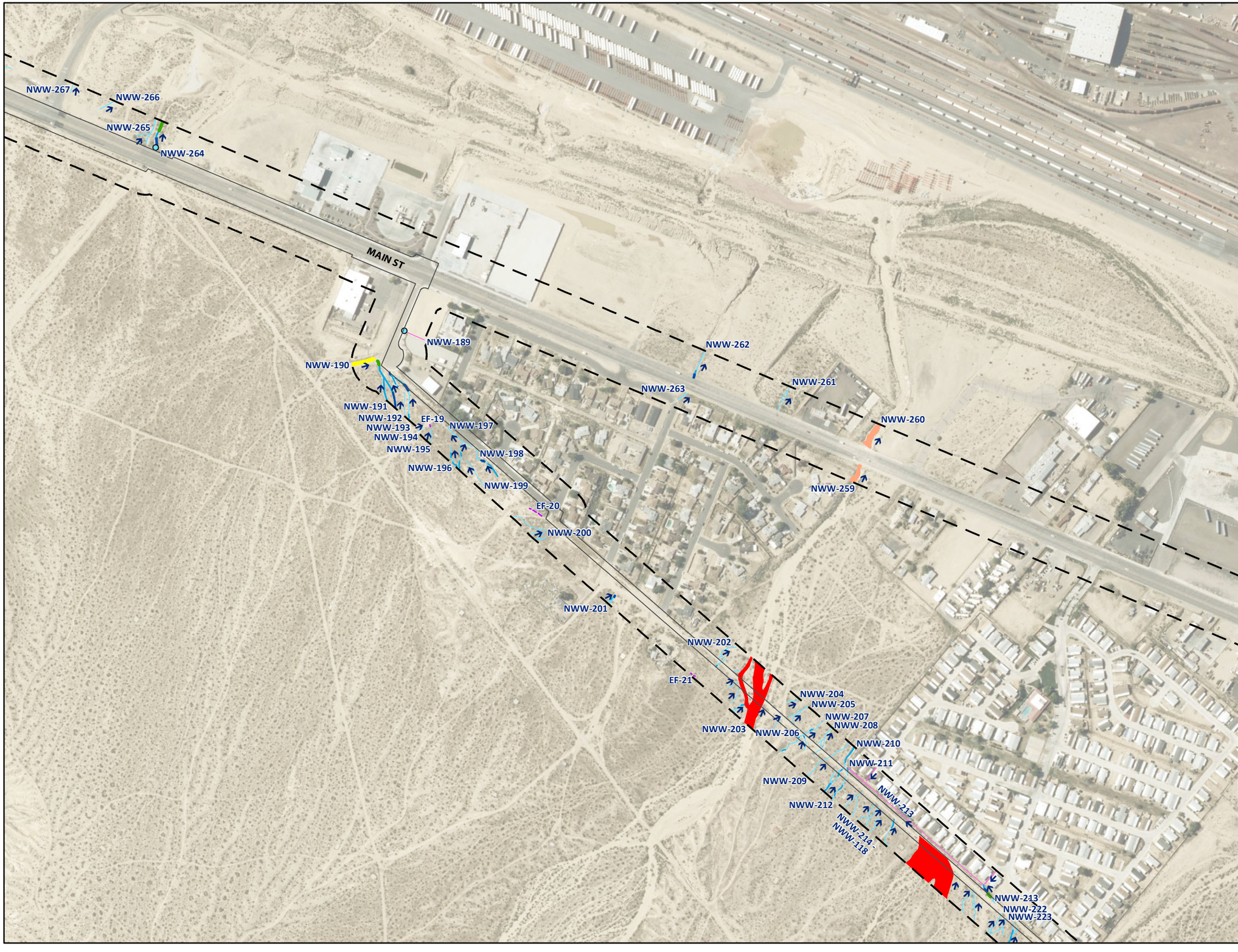
# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

1'-3'

## Other Features[3]

Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-1Z

**USACE/RWQCB Jurisdictional Aquatic Resources**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri

MAIN ST

SANTA CRUZ ST

NWW-213
NWW-222
NWW-223
NWW-224
NWW-225
NWW-227
NWW-229
NWW-228
NWW-230
NWW-231
NWW-232
NWW-233 - NWW-240
NWW-241
NWW-242
NWW-258
NWW-257
NWW-256
EF-22
B-5
NWW-255
NWW-254

15

Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

1'-3'

## Other Features[3]

Basin
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE
4.5-1AA

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5-1BB

**USACE/RWQCB Jurisdictional Aquatic Resources**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5-1CC

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

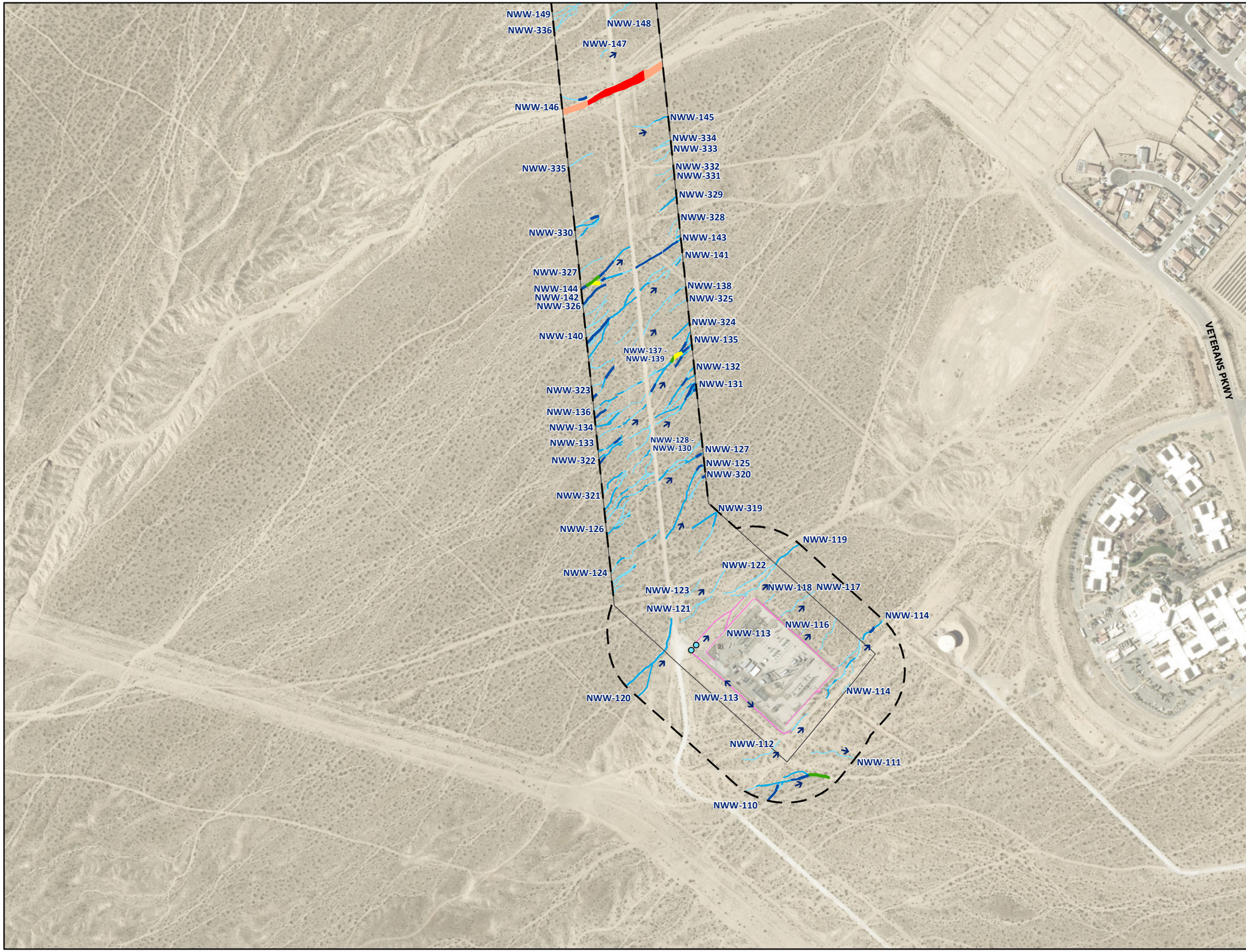
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site

Review Area (5800.90 ac)[1]

Culvert

Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'
- >30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

- 1'-3'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5-1DD

# USACE/RWQCB Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
>30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-2A

**CDFW Jurisdictional Aquatic Resources**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

16'-21'
22'-30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-2B

# CDFW Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
>30'

**Watercourse (57.03 ac)[1]**

Watercourse

**Other Features[3]**

Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

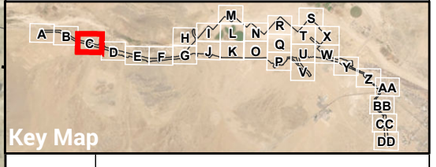



FIGURE 4.5-2C

**CDFW Jurisdictional Aquatic Resources**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

**Watercourse (57.03 ac)[1]**
Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-2D

# CDFW Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Culvert

Railroad Crossing

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

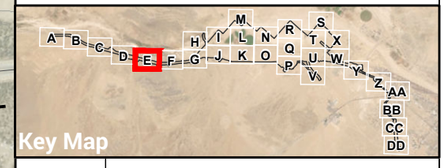



FIGURE 4.5-2E

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

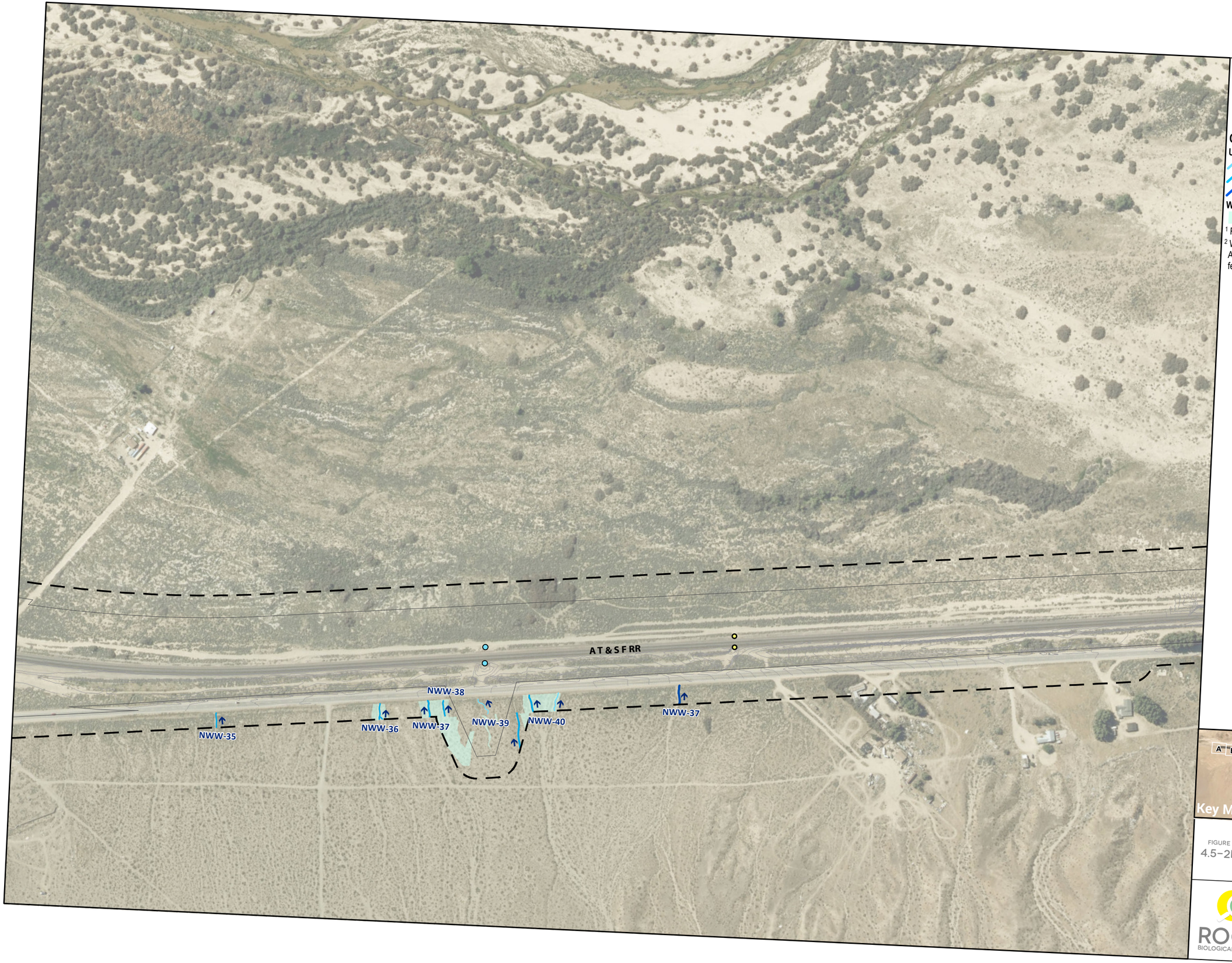
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Culvert

Railroad Crossing

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

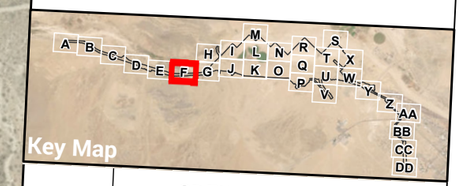



FIGURE 4.5-2F

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024

NWW-44

AT & SF RR

NWW-44

NWW-44

NWW-109 (Mojave River)

NWW-43

MAIN ST

S-1

NATIONAL TRAILS HWY

Project Site

Review Area (5800.90 ac)[1]

Culvert

Railroad Crossing

Berm - Concrete Slab

Berm - Earthen Lined

Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

16'-21'

22'-30'

>30'

**Mojave River Extent (607.04 ac)[1]**

Unvegetated Streambed

**Watercourse (57.03 ac)[1]**

Watercourse

## Other Features[3]

Swale

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.

[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-2G

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

Unvegetated Streambed

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

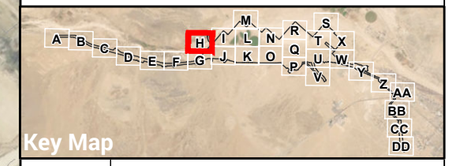



FIGURE 4.5-2H

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

## CDFW Streambed and Watercourse

**Vegetated Streambed (0.28 ac)[1] (widths)[2]**

4'-6'
11'-15'
>30'

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

## Other Features[3]

Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

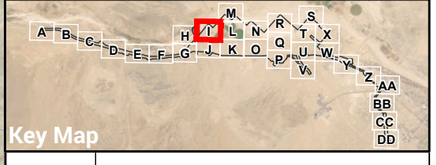



FIGURE 4.5-2I

# CDFW Jurisdictional Aquatic Resources

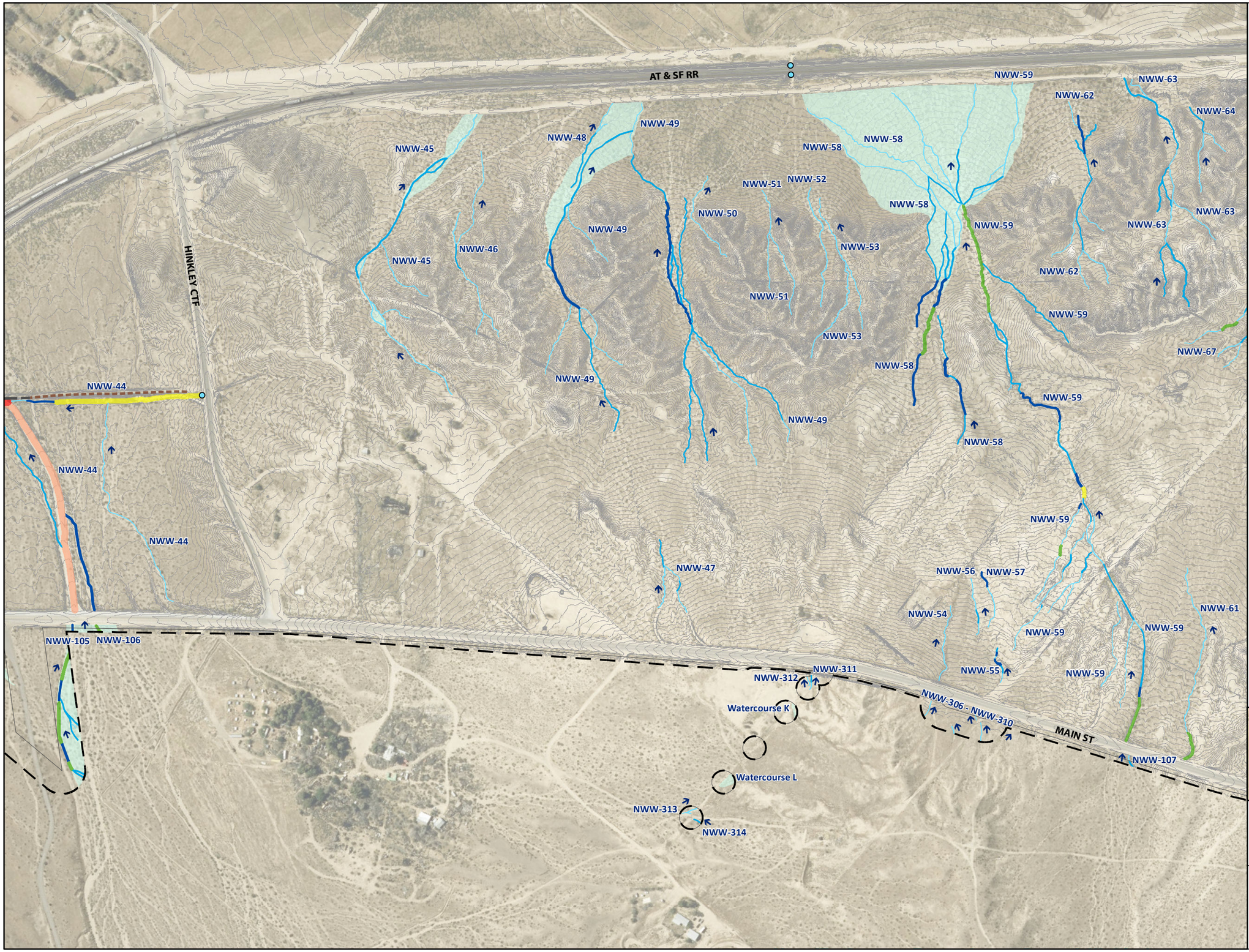
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

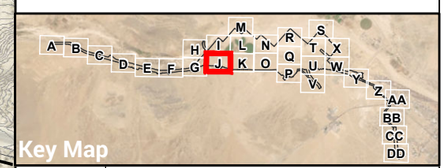



FIGURE
4.5-2J

# CDFW Jurisdictional Aquatic Resources

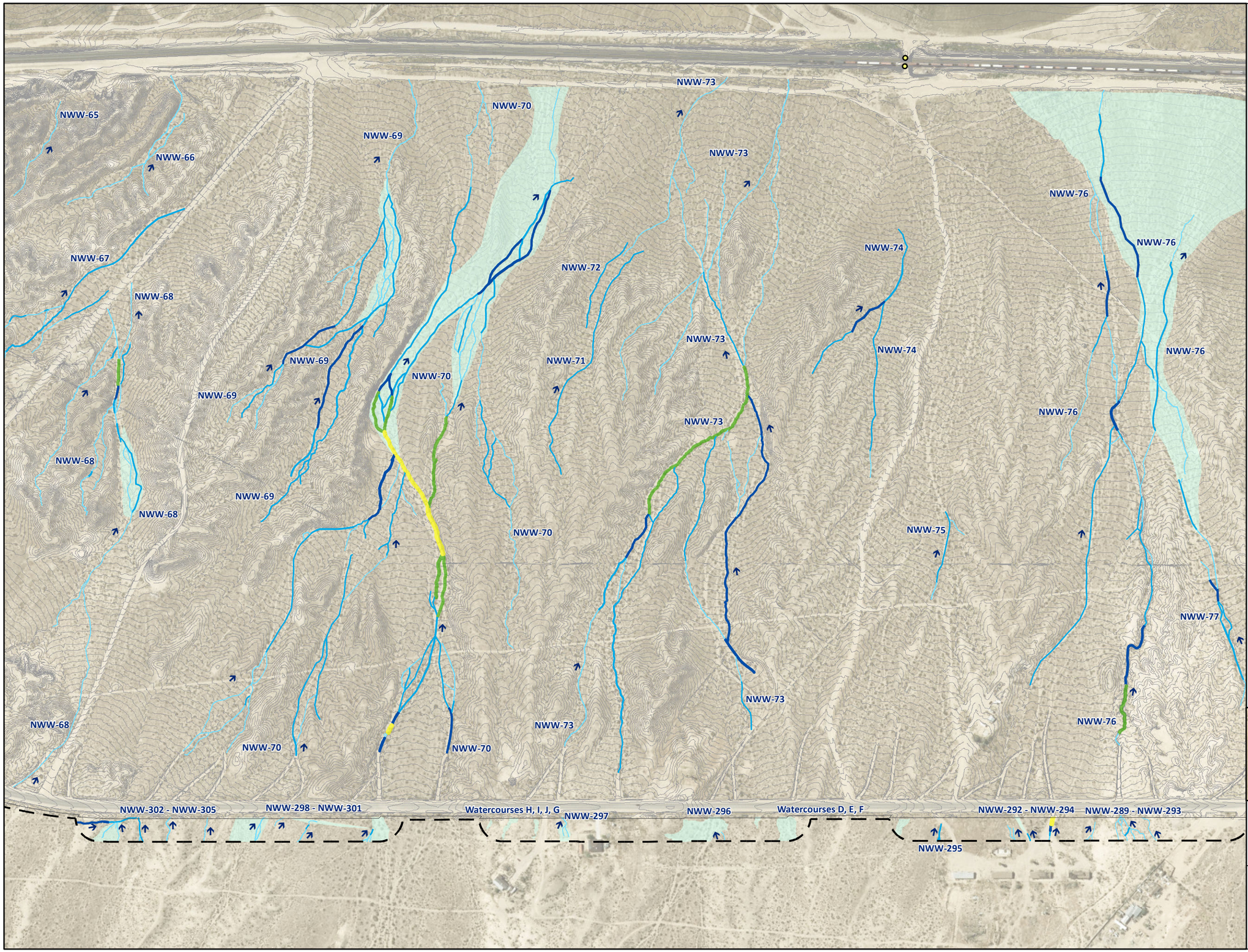
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Railroad Crossing

Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

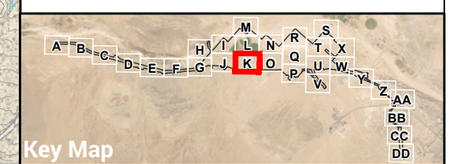



FIGURE 4.5-2K

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

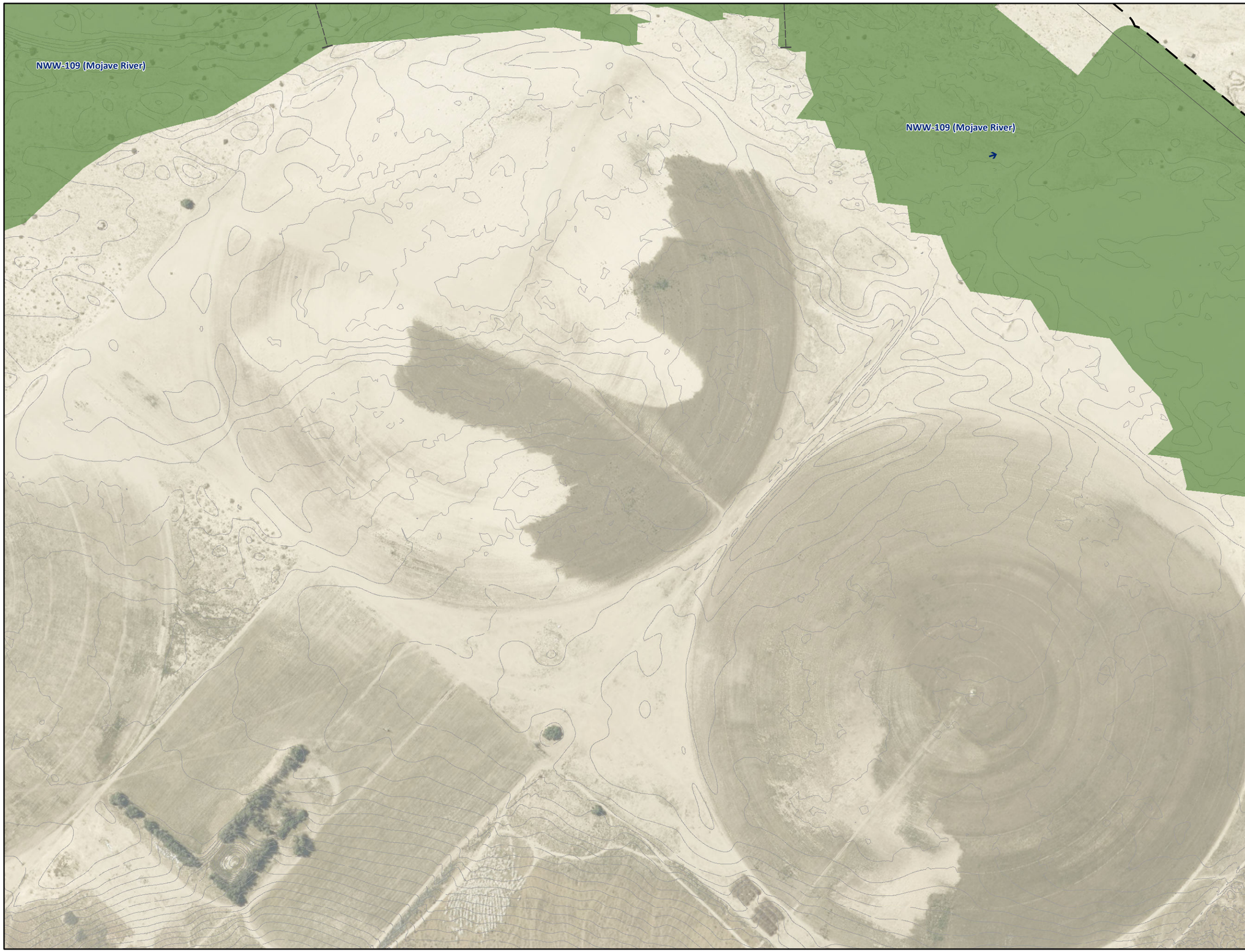
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.

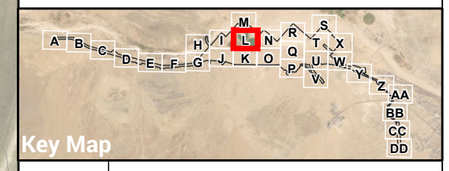



FIGURE
4.5-2L

# CDFW Jurisdictional Aquatic Resources

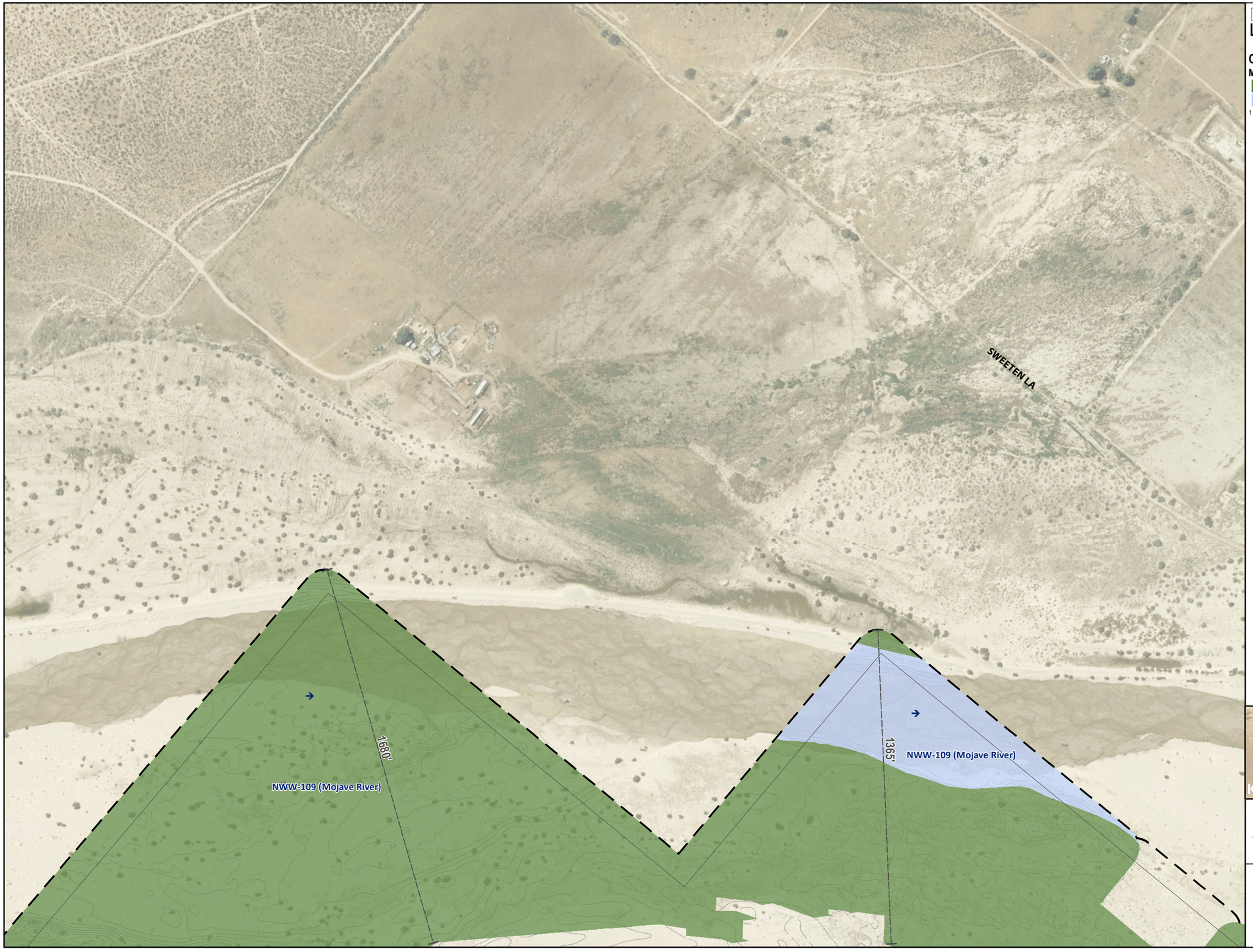
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

Unvegetated Streambed

[1] Represents total acreage for survey area.

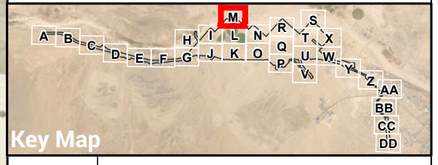



FIGURE 4.5-2M

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

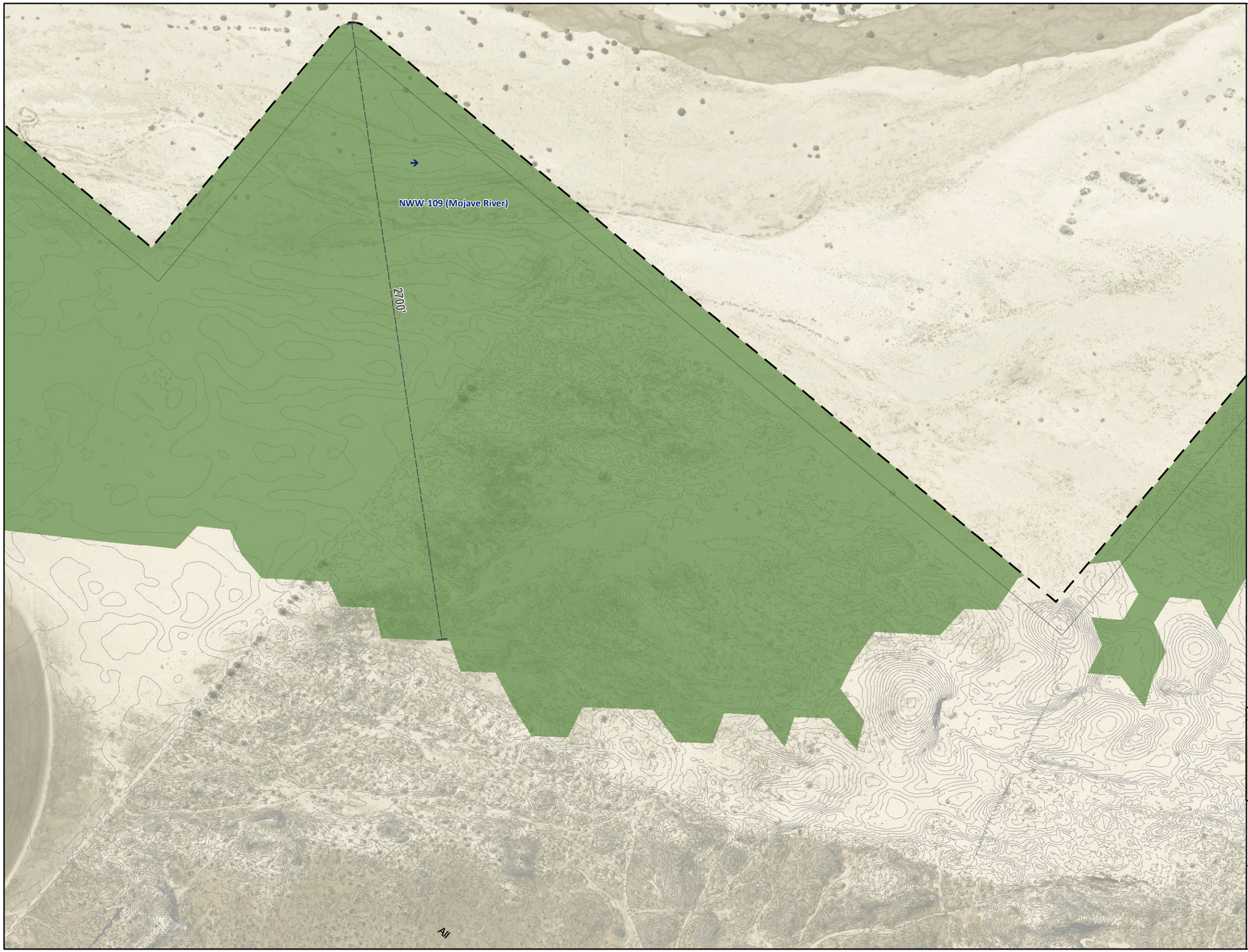
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.

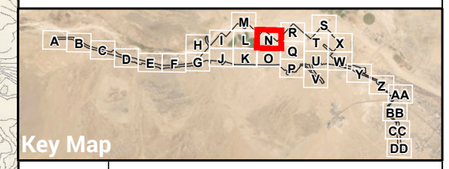



FIGURE
4.5-2N

# CDFW Jurisdictional Aquatic Resources

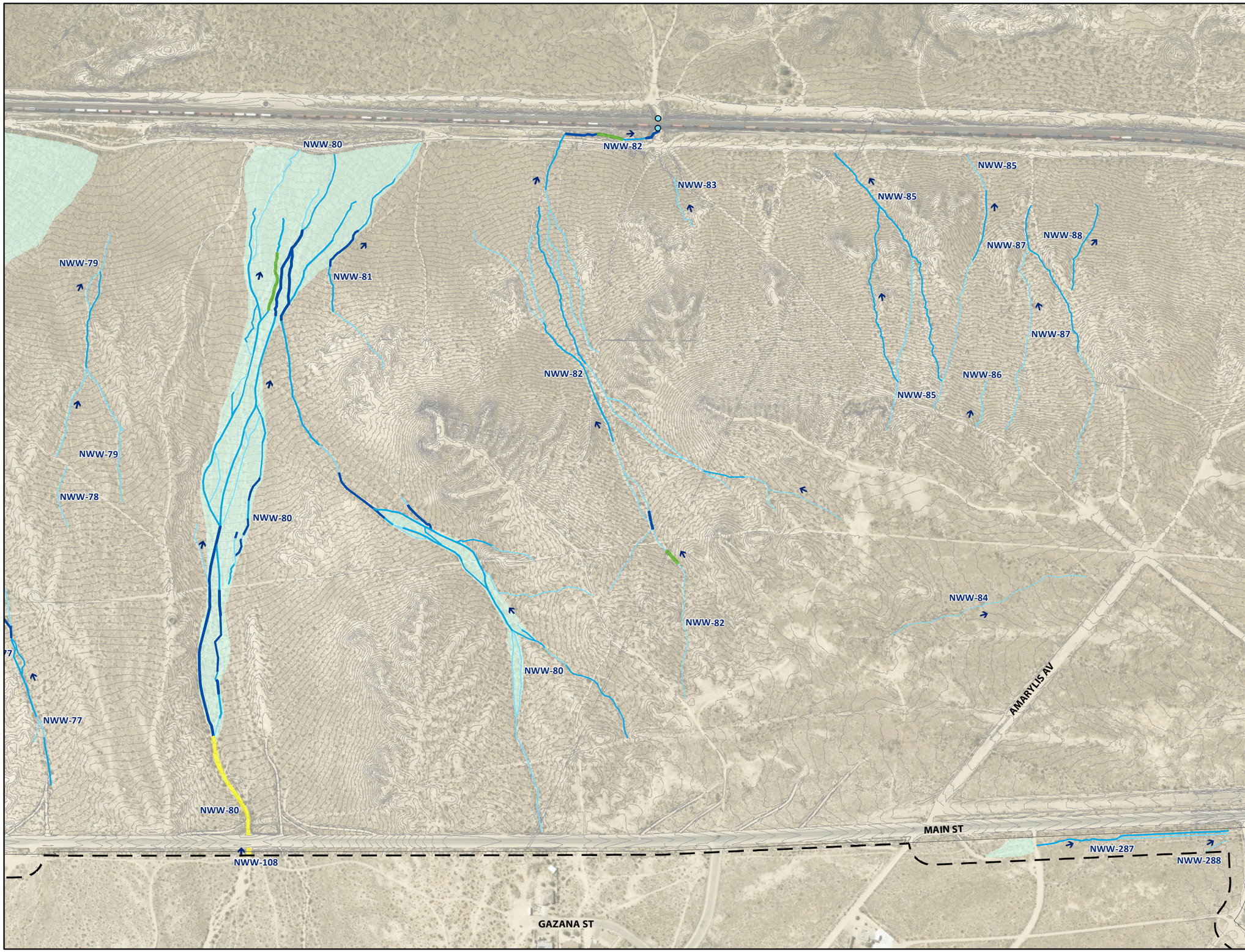
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

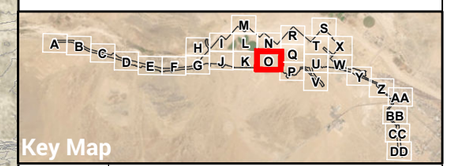



FIGURE 4.5-20

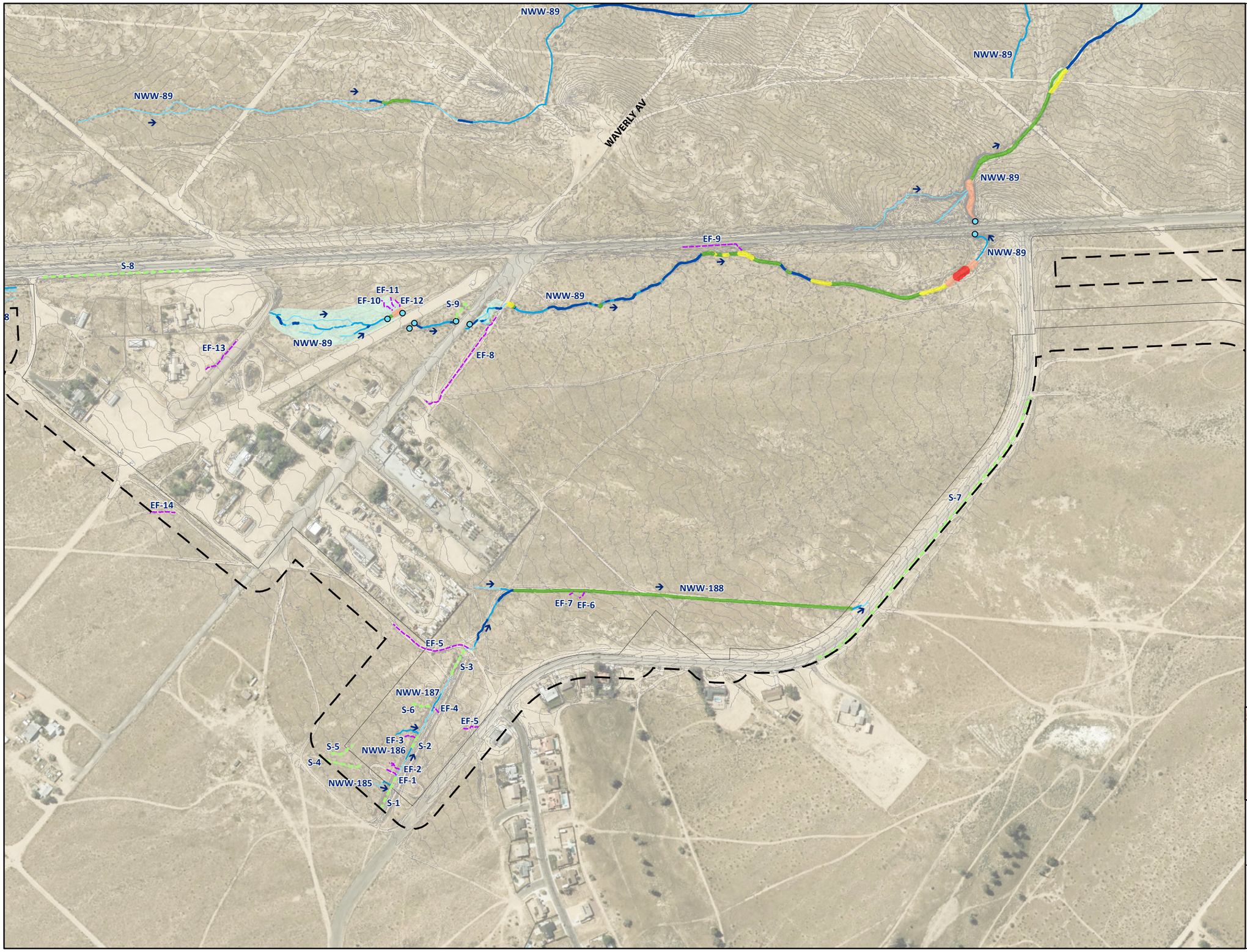
# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Watercourse (57.03 ac)[1]**

Watercourse

## Other Features[3]

Swale
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

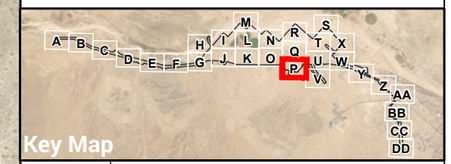



FIGURE
4.5-2P

# CDFW Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

**Watercourse (57.03 ac)[1]**
Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

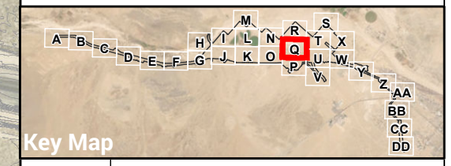



FIGURE 4.5-2Q

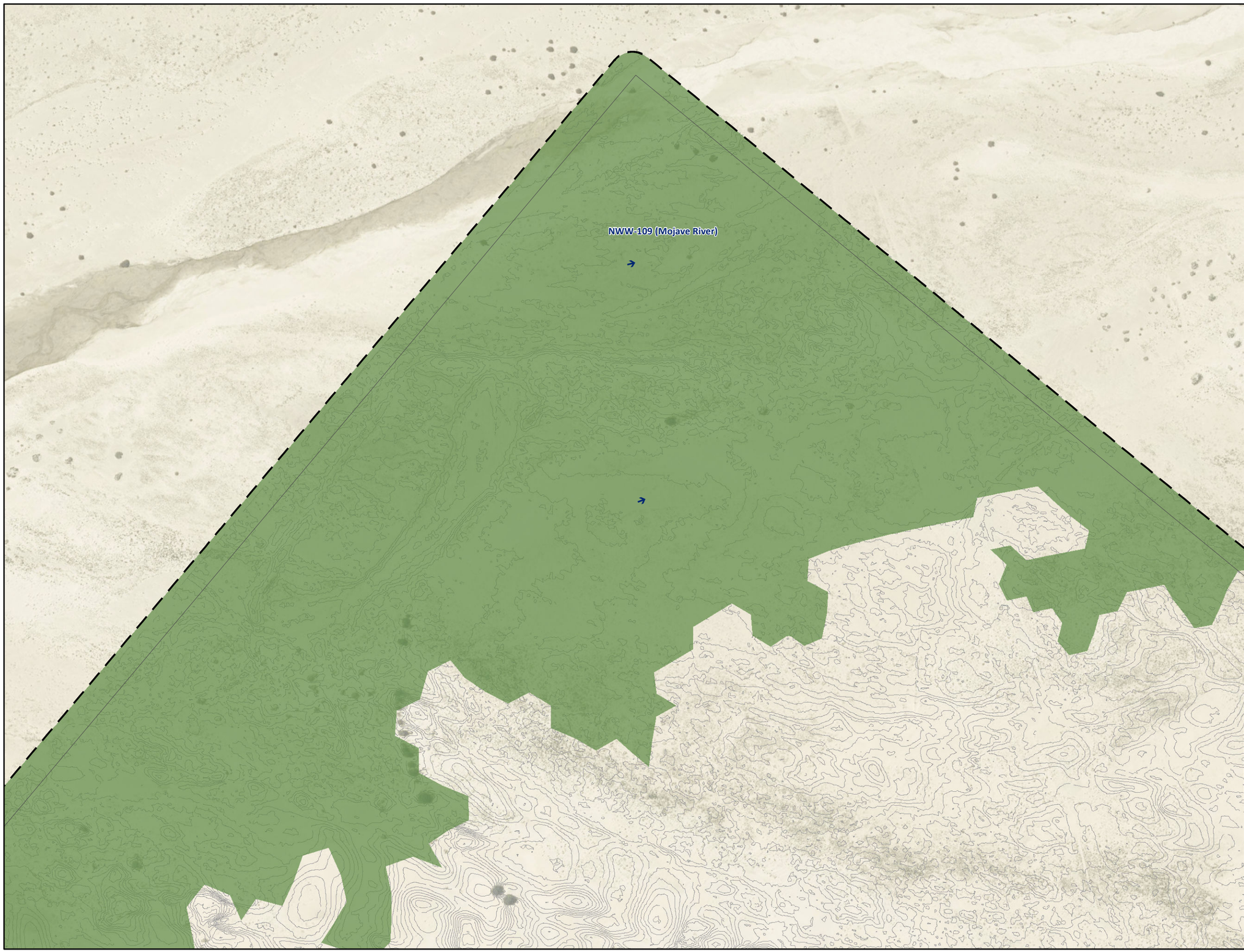
# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

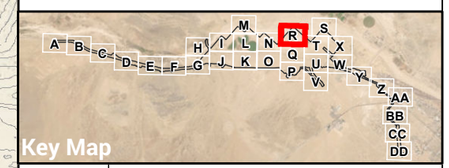


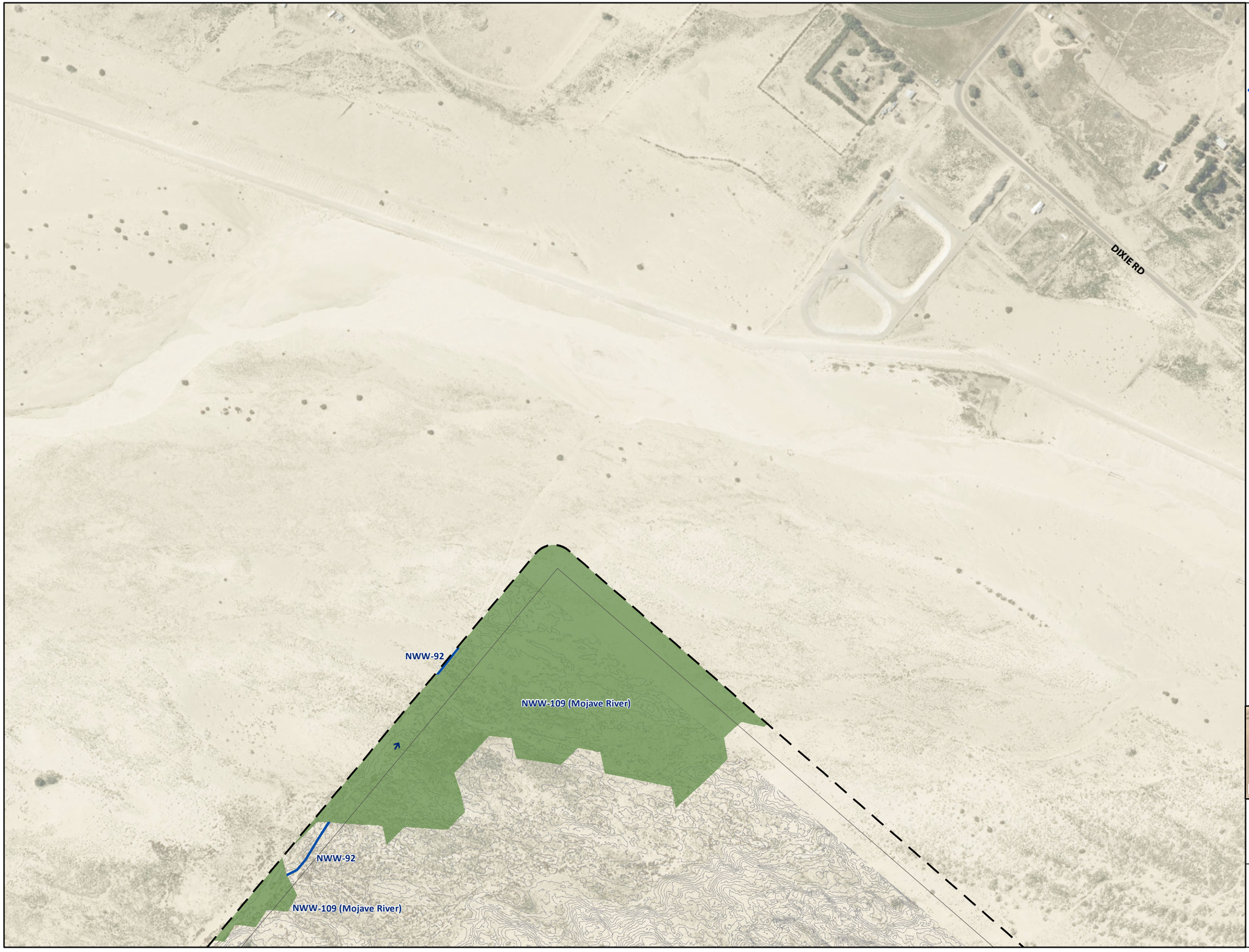

FIGURE
4.5-2R

**CDFW Jurisdictional Aquatic Resources**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

7'-10'

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

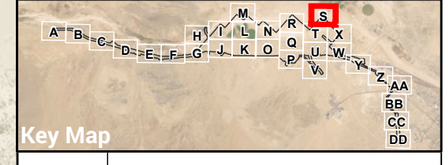



FIGURE 4.5-2S

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
7'-10'
>30'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.



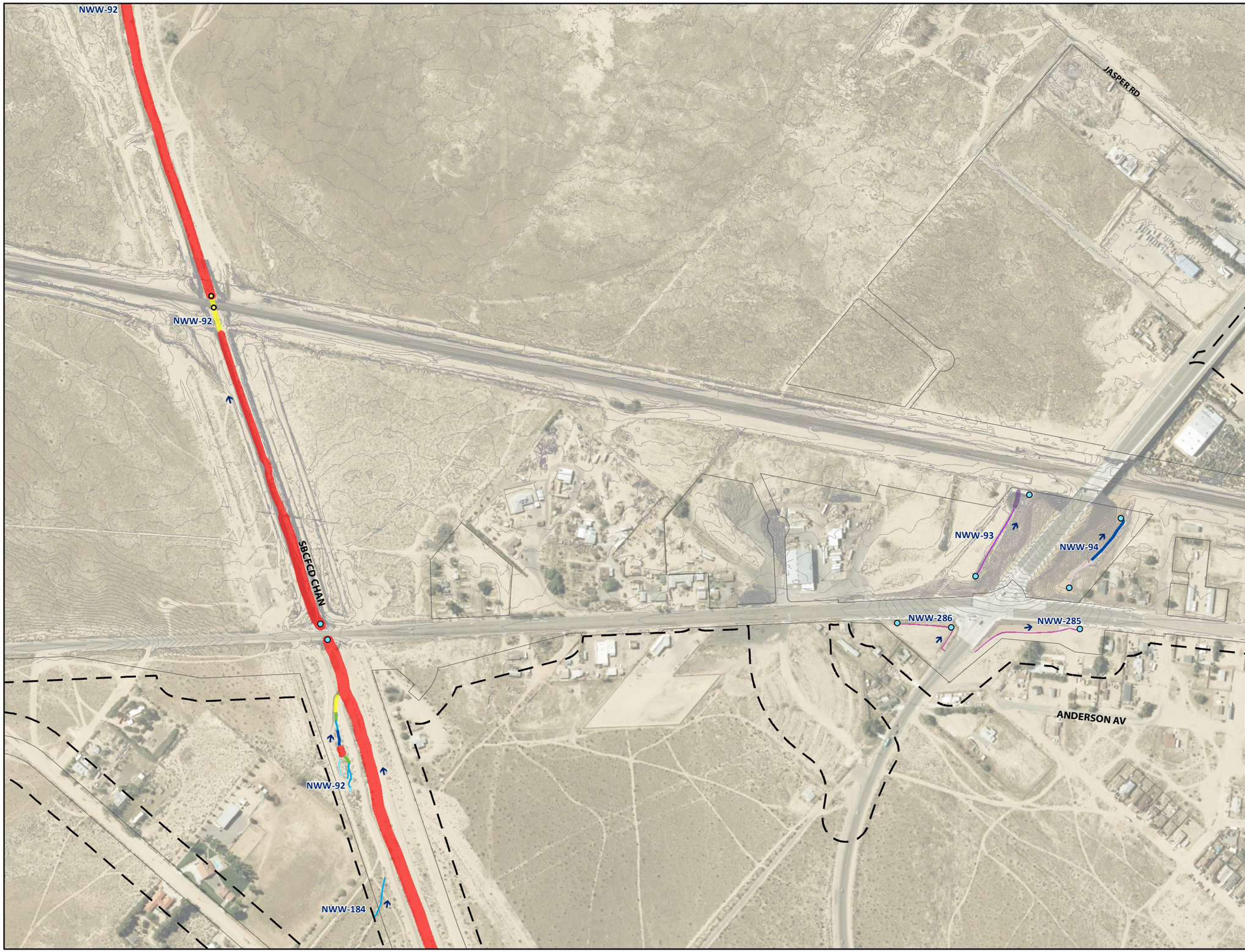

FIGURE
4.5–2T

**CDFW Jurisdictional Aquatic Resources**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
>30'

**Unvegetated Streambed - Rip-Rap (0.06 ac)[1] (widths)[2]**
3'
20'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**
10'-15'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 4.5-2U

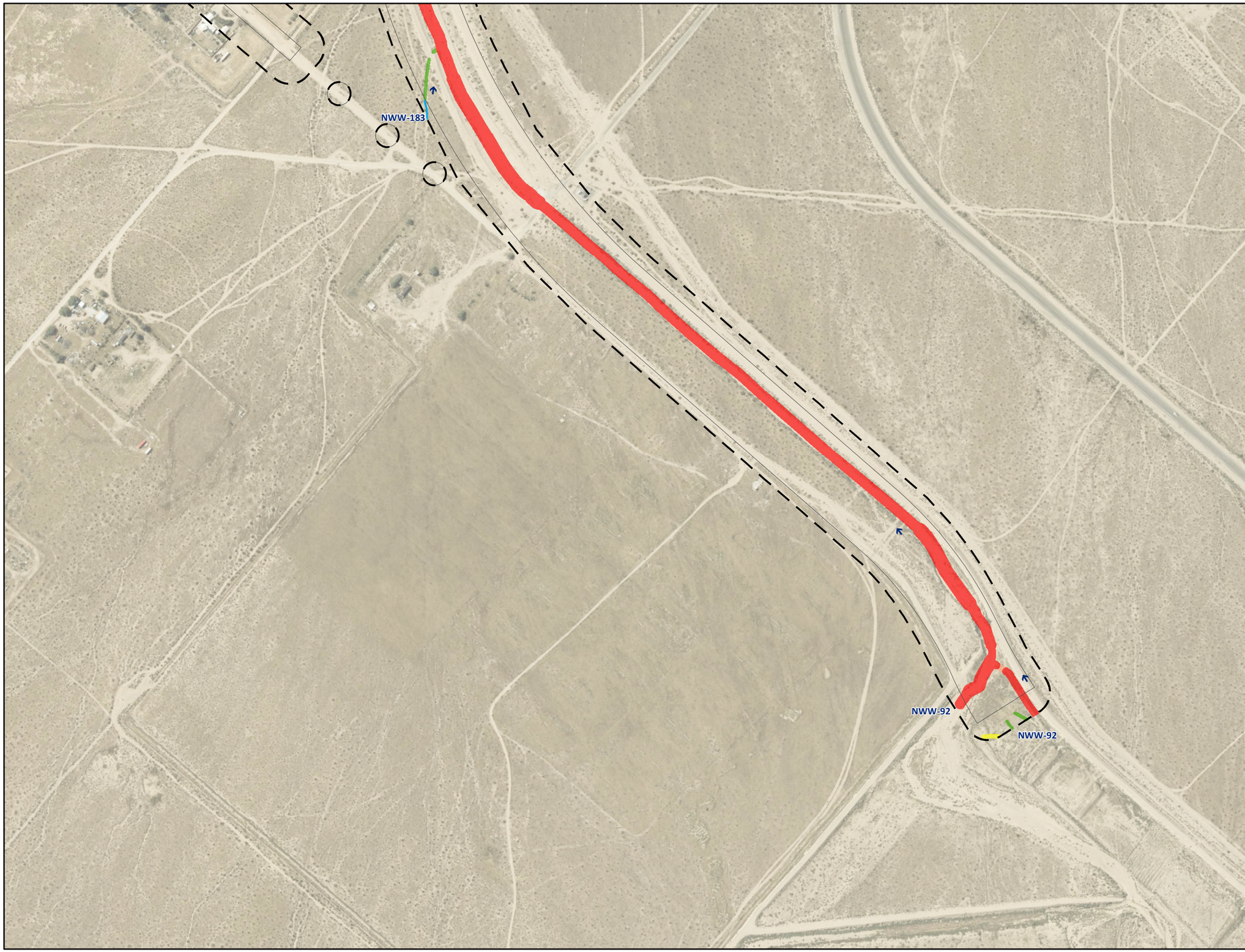
# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

4'-6'
11'-15'
16'-21'
22'-30'
>30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-2V

# CDFW Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Vegetated Streambed (0.28 ac)[1] (widths)[2]**
- 4'-6'
- 7'-10'
- 11'-15'

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
- 1'-3'
- 4'-6'
- 7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-2W

# CDFW Jurisdictional Aquatic Resources
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

[1] Represents total acreage for survey area.

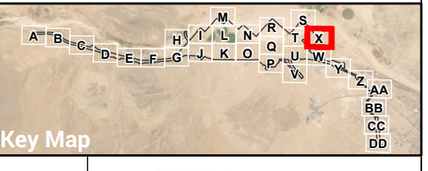



FIGURE
4.5-2X

# CDFW Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Culvert

Flow Direction

## CDFW Streambed and Watercourse

**Vegetated Streambed (0.28 ac)[1] (widths)[2]**

- 4'-6'
- 7'-10'
- 11'-15'

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 22'-30'
- >30'

**Watercourse (57.03 ac)[1]**

- Watercourse

## Other Features[3]

- Erosional Feature
- Basin

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-2Y

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

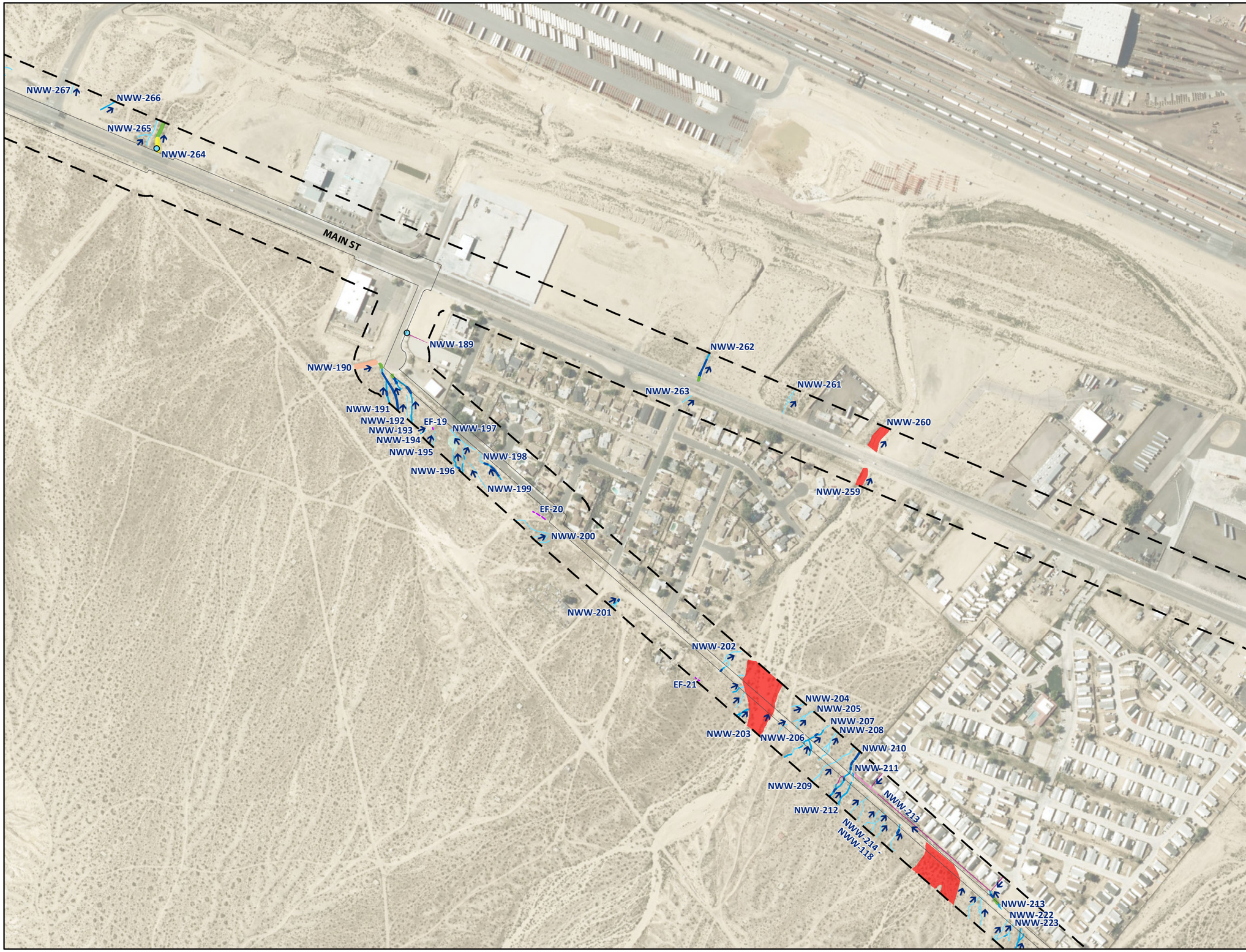
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Culvert

Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- >30'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'

**Watercourse (57.03 ac)[1]**

- Watercourse

## Other Features[3]

- Erosional Feature

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-2Z

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**

1'-3'

## Other Features[3]

Erosional Feature
Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 4.5-2AA

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.



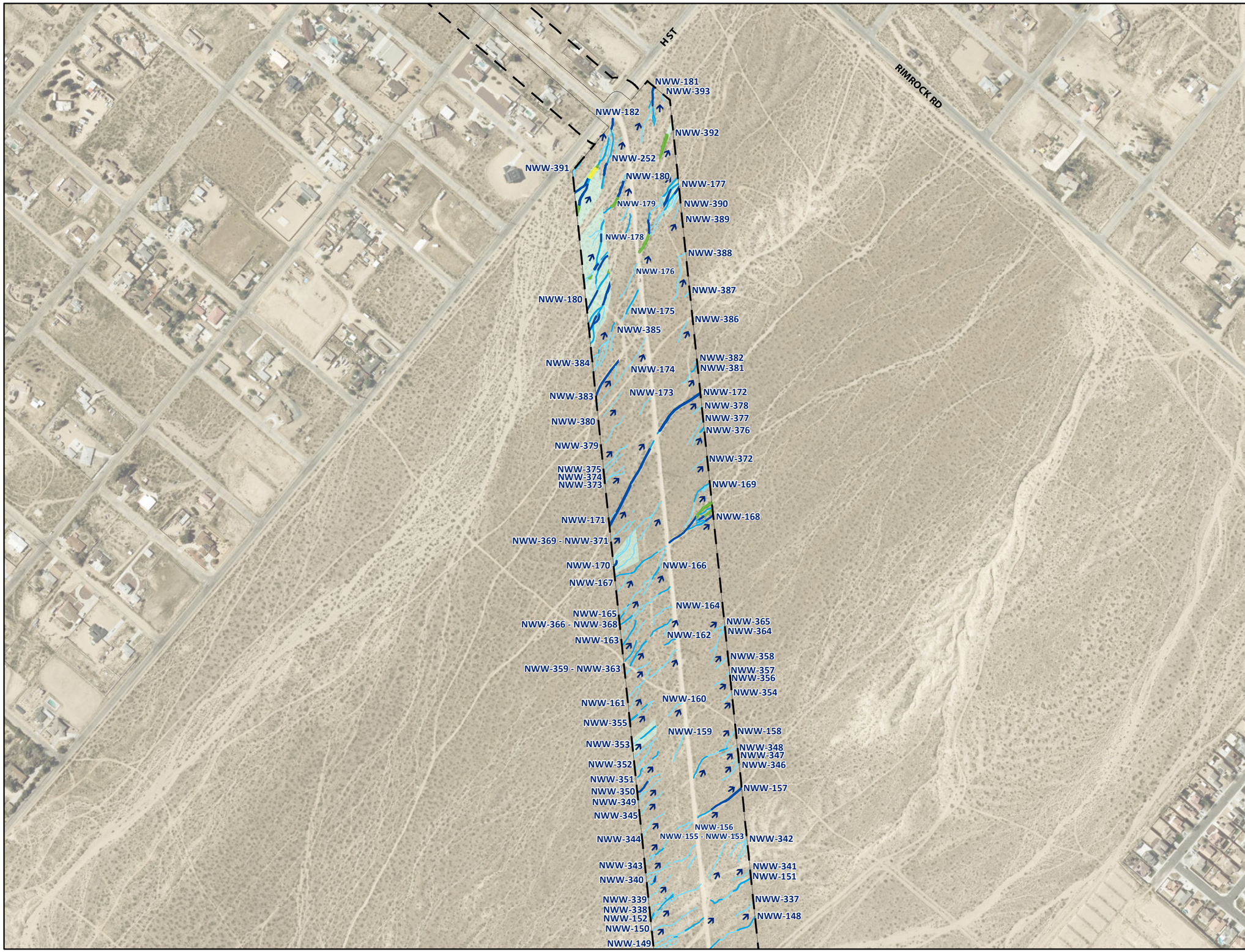

FIGURE
4.5-2BB

**CDFW Jurisdictional Aquatic Resources**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site

Review Area (5800.90 ac)[1]

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
4.5-2CC

# CDFW Jurisdictional Aquatic Resources

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

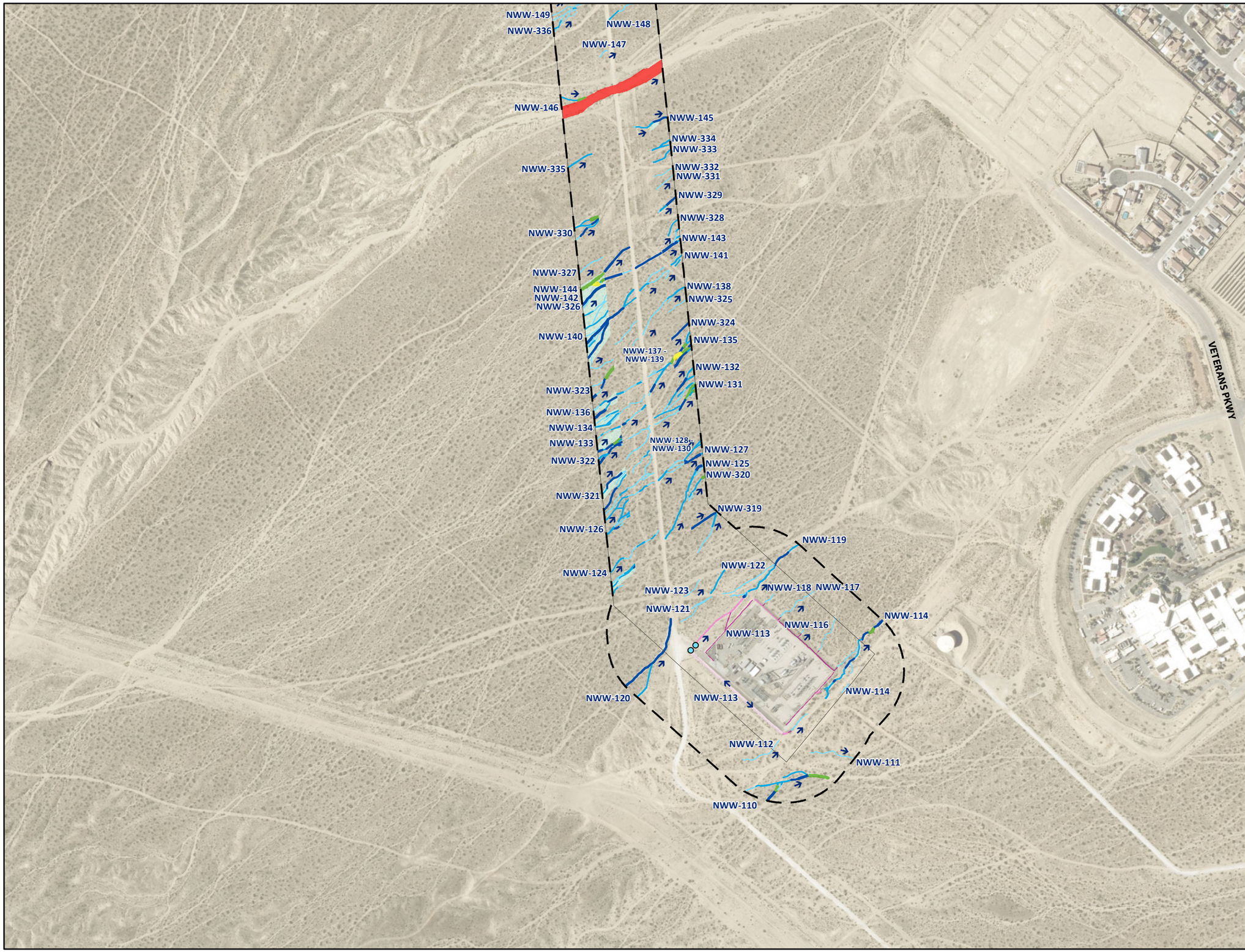
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
>30'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**
1'-3'
4'-6'
10'-15'

**Watercourse (57.03 ac)[1]**
Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

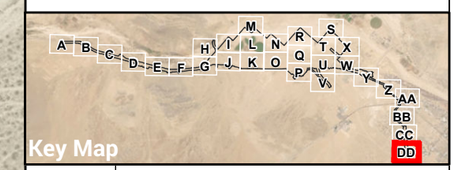



FIGURE 4.5-2DD

# CDFW Jurisdictional Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri, 2024

Lahontan RWQCB to include agricultural supply, groundwater recharge, migration of aquatic organisms, etc. [LRWQCB 2021]).

Additionally, the project site contains five manmade basins (B-1 through B-5) that are not expected to be jurisdictional by USACE, RWQCB, or CDFW since they are manmade structures wholly constructed in uplands with no downstream connectivity. Consequently, B-1 through B-5 do not provide nor affect downstream aquatic resource functions and/or beneficial uses. Additionally, B-1 through B-5 lack association with a natural feature/streambed and did not support wildlife habitat.

Lastly, the project site contains one pit (P-1) which was determined to be a manmade depression within disturbed uplands containing a large amount of solid waste.

Complete aquatic resources delineation results are presented in **Attachment C**.

## 5.23 Plants and Wildlife

BIG supports a limited diversity of vegetation communities and a high diversity of plant and wildlife species representative of the region, including the 183 plant species, 12 invertebrate species, 14 reptile species, 102 bird species, and 17 mammal species (including one aquatic mammal species) documented during various surveys of the project (**Attachment B**). Special-status plant and animal species known from the region with potential to utilize habitats present at the BIG site are discussed in the sections below.

### *Special-Status Plant Species*

The below analysis of BIG's potential to support special-status plants focuses on all project components with the exception of the 450-foot-wide 33kV corridor along Bonanza Road; although a 330-foot-wide portion of the corridor (a 30-foot-wide impact limit on the south side of Bonanza Road plus a 100-foot buffer on either side) was included in potential to occur analysis and special-status plant surveys, the remaining areas within the 450-foot-wide 33kV corridor are not included in the analysis for potential special-status plant presence below, nor the impact discussion in Section 5 of this document. Special-status plant surveys will be conducted for the remaining unsurveyed portion prior to construction during the appropriate bloom period for annuals in spring of 2026 in order to provide a comprehensive analysis of special-status plant species on BIG.

#### Database/Background Review

Based on the database/background review of sensitive plant species records for the region, 27 species were found to have been recorded within regional vicinity of the BIG site. Several of these species are not expected or have a low potential to be present on site due to a lack of suitable habitat, no occurrence in the vicinity, and/or absence of microhabitats. Special-status plants and their potential to occur within BIG are assessed in **Table 11: Special-Status Plant Species Potential to Occur within BIG** below**.** The species evaluated below in **Table 11** reflect the following queries:

- USFWS IPaC (USFWS 2025b)
- CNDDB occurrences within three miles of BIG (CDFW 2025a)

- CNPS Inventory of CRPR 1 – 4 species, within the USGS 7.5’ Quadrangles mapped within BIG and surrounding BIG including Barstow, Hinkley, Barstow SE, Hodge, Wild Crossing, Lockhart, Water Valley, Mud Hills, Lane Mountain, Nebo, Daggett, West Ord Mountain, Stoddard Well, Turtle Valley, Helendale, Victorville NW, Astley Rancho, Kramer Hills, and Twelve Gauge Lake (CNPS 2025)
- Species known to occur in the vicinity of BIG

| Table 11: Special-Status Plant Species Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| Barstow woolly sunflower (*Eriophyllum mohavense*) | CRPR 1B.2, BLM | Annual herb. Blooms March-May. Chenopod scrub, Mojavean desert scrub, and playas. Elevation 1,640-3,150 feet. | **Presumed absent**. Species documented within one mile of BIG, however this species was not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Beaver dam breadroot (*Pediomelum castoreum*) | CRPR 1B.2, BLM | Perennial herb. Blooms April-May. Mojavean desert scrub and Joshua tree woodland. Elevation 2,000-5,005 feet. | **Presumed absent**. Species documented within one mile of the BIG, however this species was not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Borrego milk vetch (Astragalus lentiginosus var. borreganus) | CRPR 4.3 | Annual herb. Blooms February-May. Mojavean desert scrub, Sonoran desert scrub. Elevation –220-3,940 feet. | **Presumed absent**. Suitable habitat present however, this species was not observed during 2023, 2024, or 2025 special-status plant surveys. |
| California alkali grass (*Puccinellia simplex*) | CRPR 1B.2, BLM | Annual herb. Blooms March-May. Chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation 5-3,050 feet. | **None**. Suitable habitat not present. |
| Chaparral sand-verbena (*Abronia villosa* var. *aurita*) | CRPR 1B.1, BLM | Annual herb. Blooms (January) March-September. Chaparral, coastal scrub, and desert dunes. Elevation 245-5,250 feet. | **Presumed absent**. Suitable habitat present but limited. Species known range largely west of BIG, although there are historical occurrences within three miles of BIG (outside of the study area). Species not documented during 2023, 2024, or 2025 special-status plant surveys. |
| Colorado Desert larkspur (*Delphinium parishii* ssp. *subglobosum*) | CRPR 4.3 | Perennial herb. Blooms in March – June. Occurs in chaparral, cismontane woodland, pinyon and juniper woodland, and Sonoran desert scrub. Elevation from 1,970 to 5,905 feet. | **None.** The database record of this species near Barstow is not accurate likely due to a geolocation error. BIG is outside the known range of this species. |
| Creamy blazing star (*Mentzelia tridentata*) | CRPR 1B.3, BLM | Annual herb. Blooms March-May. Mojavean desert scrub. Elevation 2,295-3,855 feet. | **Presumed absent**. Suitable habitat present however, this species was not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Crowned muilla (*Muilla coronata*) | CRPR 4.2 | Perennial herb. Blooms from March – May. Occurs in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland from 2,200 to 6,430 feet in elevation. | **Presumed absent**. Species documented approximately seven miles west of BIG, however this species was not observed during 2023, 2024, or 2025 special-status plant surveys. |

| | | | |
|---|---|---|---|
| Darlington's blazing star (*Mentzelia puberula*) | CRPR 2B.2 | Perennial herb. Blooms March-May. Mojavean desert scrub and Sonoran desert scrub. Elevation 295-4,200 feet. | **Presumed absent.** Suitable habitat present but species known range is approximately 12 miles southeast of BIG. Species not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Desert cymopterus (Cymopterus deserticola) | CRPR 1B.2, BLM | Perennial herb. Blooms March-May. Joshua tree woodland and Mojavean desert scrub. Elevation 2,065-4,920 feet. | **Presumed absent.** Suitable creosote bush scrub habitat present but species not documented within local area. Species not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Emory's crucifixion-thorn (*Castela emoryi*) | CRPR 2B.2 | Perennial deciduous shrub. Blooms (April) June-July (September-October). Mojavean desert scrub, playas, and Sonoran desert scrub. Elevation 295-2,380 feet. | **Presumed absent**. This species was not observed during 2023, 2024, or 2025 special-status plant surveys. Species known range is entirely east of BIG. |
| Jackass clover (Wislizenia refracta ssp. refracta) | CRPR 2B.2 | Annual herb. Blooms April-November. Desert dunes, Mojavean desert scrub, playas, and Sonoran desert scrub. Elevation 1,970-2,625 feet. | **Presumed absent**. Suitable habitat present but species not documented within local area. Additionally, species not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Joshua tree poppy (Eschscholzia androuxii) | CRPR 4.3 | Annual herb. Blooms from February – June. Occurs in Joshua tree woodland and Mojavean desert scrub in desert washes. Microhabitat requirements are flats, gravelly, rocky, sandy, slopes, and washes. Elevation is 1,920 to 5,530 feet. | **None**. Suitable microhabitat areas not present. This species is found in gravelly rocky flats and washes, which are not present. BIG may be located outside range of this species. |
| Lane Mountain milk-vetch (*Astragalus jaegerianus*) | CRPR 1B.1, FE | Perennial herb. Blooms from April – June. Occurs in Joshua tree woodland and Mojavean desert scrub in granitic, gravelly, or sandy substrates from 2,955 to 3935 feet in elevation. | **Presumed absent.** Extant populations of this species currently only known from Lane Mountain area and Fort Irwin Military Base >10 miles north of Barstow. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Mohave fish-hook cactus (*Sclerocactus polyancistrus*) | CRPR 4.2 | Shrub. Blooms from April to July. Occurs in great basin scrub, Joshua tree woodland, and Mojavean desert scrub. Soils are usually carbonate. Occurs from 2,100 to 7,610 feet in elevation. | **Present.** Approximately 14 individuals documented within BIG north of National Trails Highway, south of the BNSF mainline |
| Mojave indigo-bush (Psorothamnus arborescens var. arborescens) | CRPR 4.3 | Shrub. Blooms from April – May. Occurs in Mojavean desert scrub and riparian scrub. Elevation is 1,310 – 3,890 feet. | **Present.** Approximately 767 individuals documented within BIG primarily in areas north of National Trails Highway, south of BNSF mainline |

| | | | |
|---|---|---|---|
| Mojave menodora (Menodora spinescens var. mohavensis) | CRPR 1B.2, BLM | Perennial deciduous shrub. Blooms April-May. Mojavean desert scrub within microhabitat areas containing andesite gravel, rocky hillsides, or canyons. Elevation 2,265-6,560 feet. | **None**. Suitable microhabitat areas not present. This species is found in areas with andesite gravel, rocky hillsides, and canyons, which are not present. |
| Mojave monardella (*Monardella exilis*) | CRPR 4.2 | Annual herb. Blooms April – September. Occurs in chenopod scrub, desert dunes, Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, Mojavean desert scrub, pinyon and juniper woodland in sandy substrates. Elevation is 1,970 to 6,725 feet. | **Presumed absent**. Suitable habitat minimal. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Mojave monkeyflower (*Diplacus mohavensis*) | CRPR 1B.2, BLM | Annual herb. Blooms April-June. Mojavean desert scrub and Joshua tree woodland. Elevation 1,970-3,935 feet. | **Presumed absent**. Species documented within one mile of BIG, however this species was not observed during 2023, 2024, or 2025 special-status plant surveys. |
| Mojave spineflower (*Chorizanthe spinosa*) | CRPR 4.2 | Annual herb. Blooms from March – July. Occurs in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and playas. Prefers alkaline substrates. Elevation is 20 – 4,295 feet. | **Presumed absent**. Suitable gravelly or alkaline soils not present. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Parish's phacelia (*Phacelia parishii*) | CRPR 1B.1, BLM | Annual herb. Blooms April-May (June-July). Mojavean desert scrub and playas. Elevation 1,770-3,935 feet. | **Presumed absent**. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Slender nemacladus (*Nemacladus gracilis*) | CRPR 4.3 | Annual herb. Blooms from March – May. Occurs in cismontane woodland and valley and foothill grassland in gravelly and sandy soils. Elevation is 395 to 6,235 feet. | **None**. Species does not occur within the Mojave Desert. Previous documented occurrences likely mislabeled (Morin and Ayers 2020). Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Solitary blazing star (*Mentzelia eremophila*) | CRPR 4.2 | Annual, perennial herb. Blooms March – May. Occurs in Mojavean desert scrub. Elevation is 2,295 to 4,005 feet. | **Presumed absent**. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Spiny-hair blazing star (Mentzelia tricuspis) | CRPR 2B.1 | Annual herb. Blooms March-May. Mojavean desert scrub. Elevation 490-4,200 feet. | **Presumed absent**. Species was not observed during 2023, 2024, or 2025 special-status plant surveys. |

| | | | |
|---|---|---|---|
| Torrey's box thorn (*Lycium torreyi*) | CRPR 4.2 | Shrub. Blooms March – May. Occurs in Mojavean desert scrub, Sonoran desert scrub. Prefers rocky, sandy, streambank, and wash substrates. Elevation is -165 – 4,005 feet. | **Presumed absent**. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Utah vine milkweed (*Funastrum utahense*) | CRPR 4.2 | Perennial herb. Blooms April – June. Occurs in Mojavean and Sonoran desert scrub. Prefers gravel and sandy soils. Elevation is 330 to 4,710 feet. | **Presumed absent**. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Western Joshua tree (*Yucca brevifolia*) | SC | Perennial shrub to tree. Blooms March-June. Found on desert flats and slopes in Joshua tree woodland and other desert scrub habitats. Elevation 1,300-7,550 feet. | **Present.** The species is present on developed land likely as planted ornamental trees adjacent to Route 66, north of Lenwood Channel. Naturally occurring populations of this species are not known to occur within the vicinity of BIG . |
| White pygmy-poppy (*Canbya candida*) | CRPR 4.2 | Annual herb. Blooms from March – June. Occurs in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. Prefers granitic, gravelly, and sandy soils. Elevation is 1,970 to 4,790 feet. | **Presumed absent**. Suitable granitic/sandy microhabitat not present. Species was not observed during 2023, 2024, 2025 special-status plant surveys. |
| Note:<br>BLM: Bureau of Land Management Sensitive Species<br>CRPR: California Rare Plant Rank<br>FE: Federally Endangered<br>SC: State Candidate for listing under CESA | | | |
| Sources:<br>• Baldwin et al., 2012<br>• CNPS, 2024<br>• Morin & Ayers, 2020 | | | |

Twenty-seven non-listed special-status/CRPR plant species assessed in **Table 11** were identified as having potential to occur based on the presence of potentially suitable habitat, previously recorded USFWS and CNDDB observations within three miles of BIG, records within the CNPS nine-quad search, and identified in IPaC as having a potential to occur. These species are described in detail below and in **Table 11**. Plant species with no previously recorded USFWS and CNDDB observations within three miles of BIG, no records within the CNPS nine-quad search, and not identified in IPaC as having a potential to occur are not included in this analysis.

After an assessment of suitable habitat and site conditions, seven of the species listed as CRPR 1 or 2 were identified as having a moderate or high potential to occur on site based on occurrences in the region and the presence of potentially suitable habitats on the BIG site. These species include:

- Barstow woolly sunflower (CRPR 1B.2, BLM Sensitive),

- Beaver dam breadroot (CRPR 1B.2, BLM Sensitive),
- Creamy blazing star (CRPR 1B.3)
- Emory's crucifixion-thorn (CRPR 2B.2)
- Mojave monkeyflower (CRPR 1B.2, BLM Sensitive)
- Parish's phacelia (CRPR 1B.1, BLM Sensitive),
- Spiny-hair blazing star (CRPR 2B.1)

These seven species were targeted during focused botanical survey efforts conducted in the appropriate blooming period. Optimal detection timeframes were confirmed through reference population surveys and/or species-specific record searches as described below and in **Table 11**. Additionally, western Joshua tree, a CESA candidate species, is known to occur in the region as an ornamental tree and was included in focused survey efforts. No other federally or state-listed threatened or endangered plant species were considered to have a moderate or high potential to occur due to a lack of suitable habitats within BIG. In addition to CRPR 1 and 2 species and listed species or candidates for listing, plant species protected under San Bernardino County Code 88.01 were also included in the surveys.

### Reference Population Surveys and Botanical Record Results

Reference population surveys were conducted throughout the region within or in proximity to Barstow, Lenwood, and Hodge, California that are known to support special-status plant species with at least moderate potential to occur on BIG (**Table 12: Special-Status Plant Species 2023-2025 Reference Population Check or Botanical Record Results**). If a reference population survey was not conducted for a given plant species in 2023, 2024, or 2025, staff reviewed botanical records for the special status plant to confirm special-status plant surveys occurred during a phenological stage which allowed for positive identification of the plant, if present. The results of the reference population surveys and botanical record research are summarized in **Table 12** below.

**Table 12: Special-Status Plant Species 2023-2025 Reference Population Check or Botanical Record Results**

| Species | Reference Population Check or Botanical Record | Date | General Location | Approximate Distance from BIG | Phenology | RBC Survey Staff or Record Source |
|---|---|---|---|---|---|---|
| Barstow woolly sunflower (*Eriophyllum mohavense*) | Botanical Record | March 28, 2023 | Approximately five miles east of Kramer Junction | 18 miles northwest of project site | Foliage | Matt Berger, Calflora 2023 |
| | Botanical Record | April 10, 2024 | 1.84 miles west of US-395 on Farmington Road | 26 miles northwest of project site | Flowering | Andy Chambers, Calflora 2024 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Reference Population Check | March 19, 2025 | ½ mile southwest of Bonanza Road | ½ mile southwest of project site (i.e., Tortilla Substation) | Not found | Alec Goodman, Ryan Meszaros, & Jim Rocks |
| Beaver dam breadroot (*Pediomelum castoreum*) | Botanical Record | April 2023 | Three miles east of Hinkley Road in an unnamed wash | 10 miles north of project site | Foliage | Duncun Bell, iNaturalist 2023 |
| | Reference Population Check | May 1, 2024 | Lucerne Valley, 6.8 miles north of Highway 18 and 0.3 miles west of Barstow Road | 24 miles southeast of project site | Flowering | Alec Goodman, Hannah Swarthout, & Kelsey Woldt |
| | Reference Population Check | March 19, 2025 | Lucerne Valley, 6.8 miles north of Highway 18 and 0.3 miles west of Barstow Road | 24 miles southeast of project site | Not found | Alec Goodman, Ryan Meszaros, & Jim Rocks |
| Creamy blazing star (*Mentzelia tridentata*) | Botanical Record | May 9, 2023 | Dry wash off of Camp Rock Road | 12 miles southeast of project site | Flowering | Mike Russler, Calflora 2023 |
| | Reference Population Check | May 1, 2024 | At the western end of a dry wash which intersects Camp Rock Road | 12 miles southeast of project site | Flowering | Alec Goodman, Hannah Swarthout, & Kelsey Woldt |
| | Reference Population Check | March 19, 2025 | At the western end of a dry wash which intersects Camp Rock Road | 12 miles southeast of project site | Not found | Alec Goodman, Ryan Meszaros, & Jim Rocks |
| Emory's crucifixion-thorn | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | |
|---|---|---|---|---|---|---|
| (*Castela emoryi*)[1] | | | | | | |
| Mojave monkeyflower (*Diplacus mohavensis*) | Botanical Record | May 9, 2023 | Dry wash off of Camp Rock Road | 12 miles southeast of project site | Flowering | Mike Russler, Calflora 2023 |
| | Reference Population Check | May 1, 2024 | At the western end of a dry wash which intersects Camp Rock Road | 12 miles southeast of project site | Flowering | Alec Goodman, Hannah Swarthout, & Kelsey Woldt |
| | Reference Population Check | March 19, 2025 | At the western end of a dry wash which intersects Camp Rock Road | 12 miles southeast of project site | Not found | Alec Goodman, Ryan Meszaros, & Jim Rocks |
| Parish's phacelia (*Phacelia parishii*) | Botanical Record | May 1, 2023 | Off of Powerline Road in Manix | 25 miles northeast of project site | Flowering | Matt Berger, Calflora 2023 |
| | Reference Population Check | May 1, 2024 | Playa southeast of Coyote Dry Lake, off of Manix Trail Tank Corridor | 25 miles northeast of project site | Fruiting | Alec Goodman, Hannah Swarthout, & Kelsey Woldt |
| Spiny-hair blazing star (*Mentzelia tricuspis*)[2] | N/A | N/A | N/A | N/A | N/A | N/A |

[1] Reference population checks for Emory's crucifixion-thorn were not completed in 2023 or 2024, considering the conspicuous, perennial nature of this large shrub.
[2] Botanical records in proximity to and under same seasonal conditions as BIG are from the 1930's and have been converted to developed land.

Reference population analyses, botanical record research, and a review of precipitation and temperature data from the Barstow station (NOAA, 2025) for survey years suggests that surveys were conducted during seasonal conditions suitable for plant observation. As such, lack of observation due to adverse conditions was not anticipated.

## Special-Status Plant Species Focused Survey Results

The locations of special-status plant species, if observed, are depicted in Figure 4.6-1. Special-Status Plants Survey Results. The CESA candidate species, western Joshua tree, was documented on BIG and is discussed in further detail below. No federally or state-listed as threatened or endangered plant species were observed during general biological field surveys or focused botanical survey within BIG, and none have a moderate or high potential to occur based on the lack of suitable habitats within BIG (**Table 11**).

Seven CRPR 1 or 2 species were previously assessed to have moderate to high potential to occur but were not observed during special-status plant surveys. Two CRPR 4.3 species, Mojave fishhook cactus (*Sclerocactus polyancistrus*) and Mojave indigo bush, were documented within the proposed rail yard, and Tortilla Substation improvements during the 2023 and 2025 special-status plant surveys and are therefore also discussed below (Figure 4.6-1). No other CRPR or BLM Sensitive plant species were observed during the special-status plant surveys of BIG in 2023, 2024, or 2025 and none have a moderate or high potential to occur (**Table 11**).

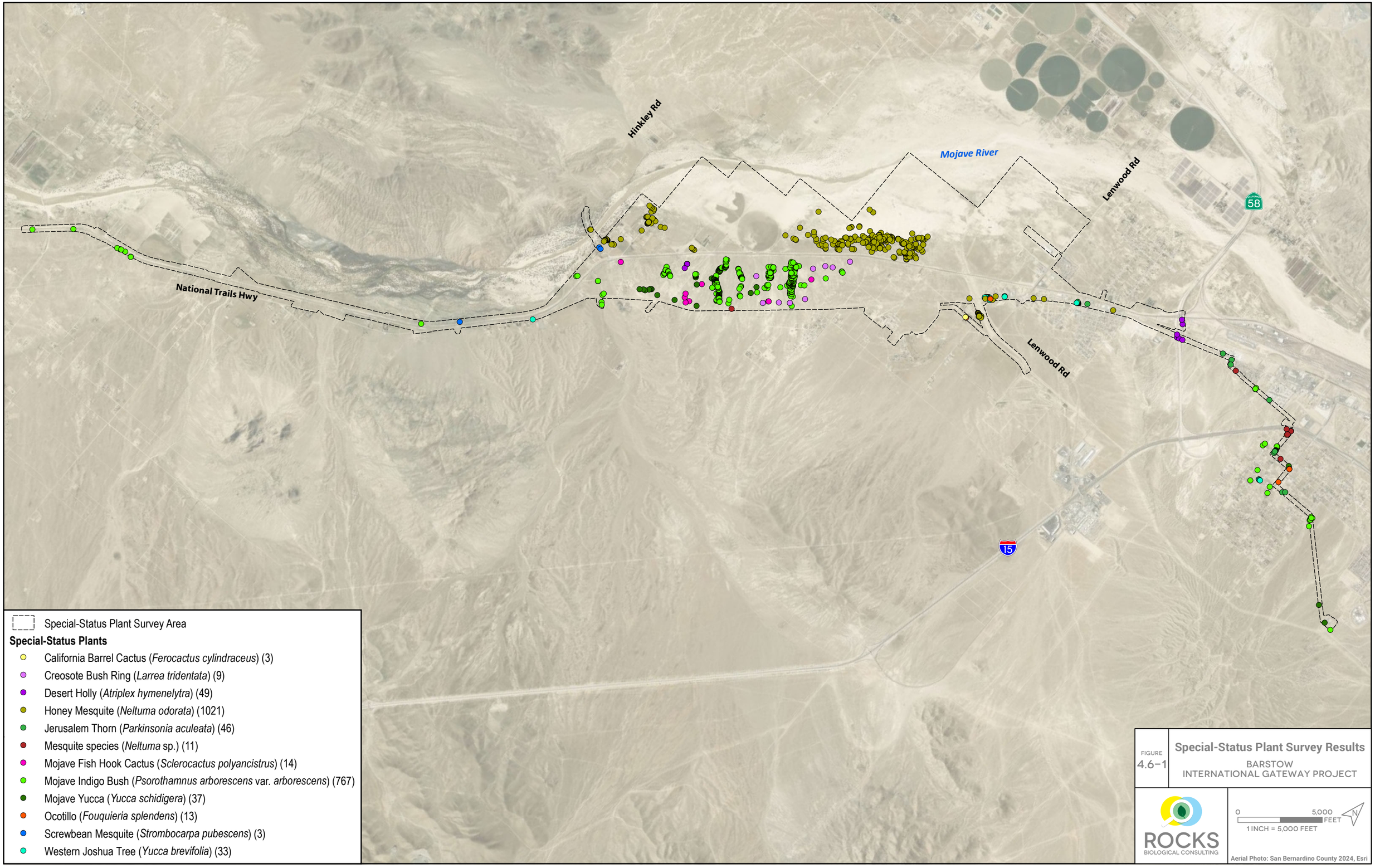
Plants regulated under the San Bernardino County Chapter 88.01 were also observed during special-status plant surveys in 2025 and are also described below.

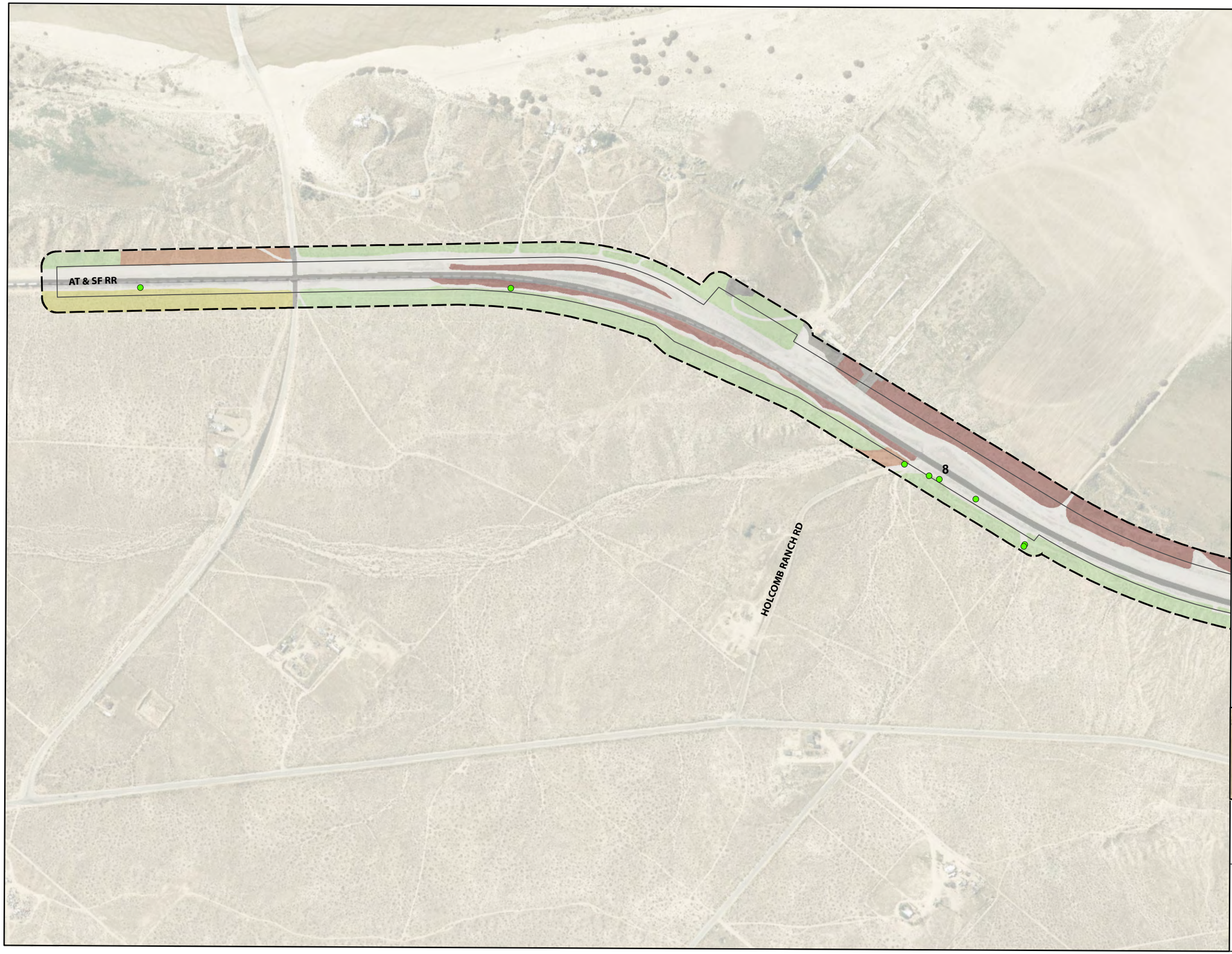
### *Western Joshua Tree*

The western Joshua tree, a CESA candidate species, is endemic to the Mojave Desert in southern Nevada, southwestern Utah, western Arizona, southeastern California, and northern Baja California Norte (USDA, n.d.). Numerous vegetation communities can support western Joshua tree including but not limited to, Joshua tree woodland, California juniper tree woodland, Mojave desert scrub, and Mojave mixed steppe habitats (USDA, n.d.). Within California, the western Joshua tree is often associated with other plant species such as juniper (*Juniperus californica*), singleleaf pinyon (*Pinus monophylla*), shrub live oak (*Quercus turbinella*), blackbrush (*Coleogyne ramosissima*), green ephedra, eastern Mojave buckwheat (*Eriogonum fasciculatum*), white burrobrush (*Hymenoclea salsola*), bladdersage (*Salazaria mexicana*), and Mojave desertrue (*Thamnosma montana*) (USDA, n.d.). The yucca moth (*Tegeticula synthetica*) is responsible for pollination, and seeds are dispersed by mammals and wind. On average, western Joshua tree's temperature threshold ranges from -13 °F (-25 °C) to 120 °F (51 °C) and annual precipitation requirements range from 3.9 to 10.6 inches (98-268 mm; USDA, n.d.).

Threats to western Joshua tree include climate change, fire, and habitat loss or degradation due to human activities (Center for Biological Diversity, 2019). Seed dispersal is greatly inhibited by climate change-induced droughts which stall recruitment and kill adult trees. Development of private lands containing large stands of western Joshua tree poses a major threat to this species (Center for Biological Diversity, 2019).

A census of western Joshua tree within BIG was conducted on October 17, 2024, pursuant to the Western Joshua Tree Conservation Permitting Census Instructions (CDFW, 2024b). A total of 33 western Joshua trees were documented within the census area, including 12 Class A, 13 Class B, and eight Class C western Joshua trees. A full account of size class composition and proposed impacts on WJTs are summarized in **Attachment FF**. The trees occur within developed land in the eastern portion of the project site. Western


Hinkley Rd
Mojave River
Lenwood Rd
National Trails Hwy
Lenwood Rd
58
15
Special-Status Plant Survey Area
Special-Status Plants
California Barrel Cactus (Ferocactus cylindraceus) (3)
Creosote Bush Ring (Larrea tridentata) (9)
Desert Holly (Atriplex hymenelytra) (49)
Honey Mesquite (Neltuma odorata) (1021)
Jerusalem Thorn (Parkinsonia aculeata) (46)
Mesquite species (Neltuma sp.) (11)
Mojave Fish Hook Cactus (Sclerocactus polyancistrus) (14)
Mojave Indigo Bush (Psorothamnus arborescens var. arborescens) (767)
Mojave Yucca (Yucca schidigera) (37)
Ocotillo (Fouquieria splendens) (13)
Screwbean Mesquite (Strombocarpa pubescens) (3)
Western Joshua Tree (Yucca brevifolia) (33)
FIGURE 4.6-1
Special-Status Plant Survey Results
BARSTOW INTERNATIONAL GATEWAY PROJECT
ROCKS BIOLOGICAL CONSULTING
0
5,000 FEET
1 INCH = 5,000 FEET
N
Aerial Photo: San Bernardino County 2024, Esri




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (15)




FIGURE 4.6–1A

**Special-Status Plant Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

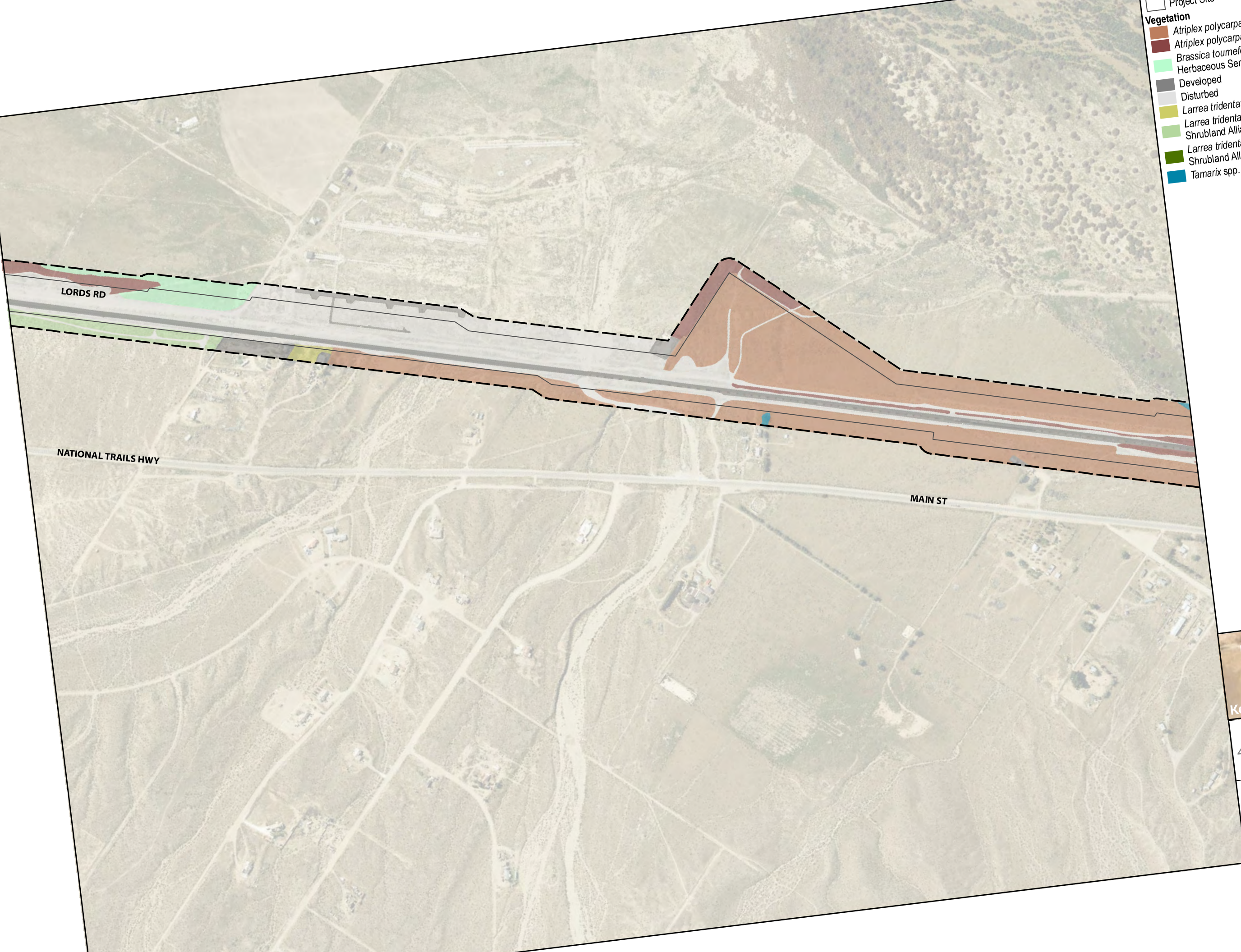
ROCKS BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

N

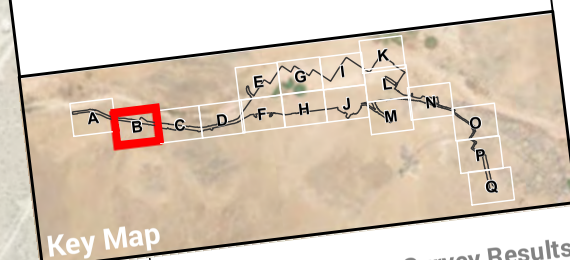
Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance




Key Map

FIGURE 4.6-1B

**Special-Status Plant Survey Results**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri 2

MOJAVE RVR

HODGE RD

NATIONAL TRAILS HWY

Special-Status Plant Survey Area
Project Site

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Tamarix* spp. Shrubland Semi-natural Alliance

**Special-Status Plants**

Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (1)

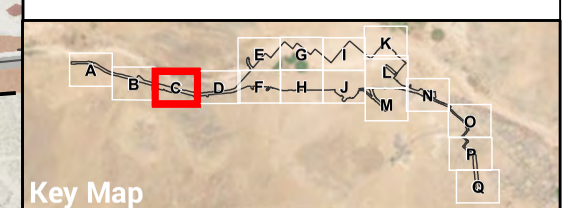


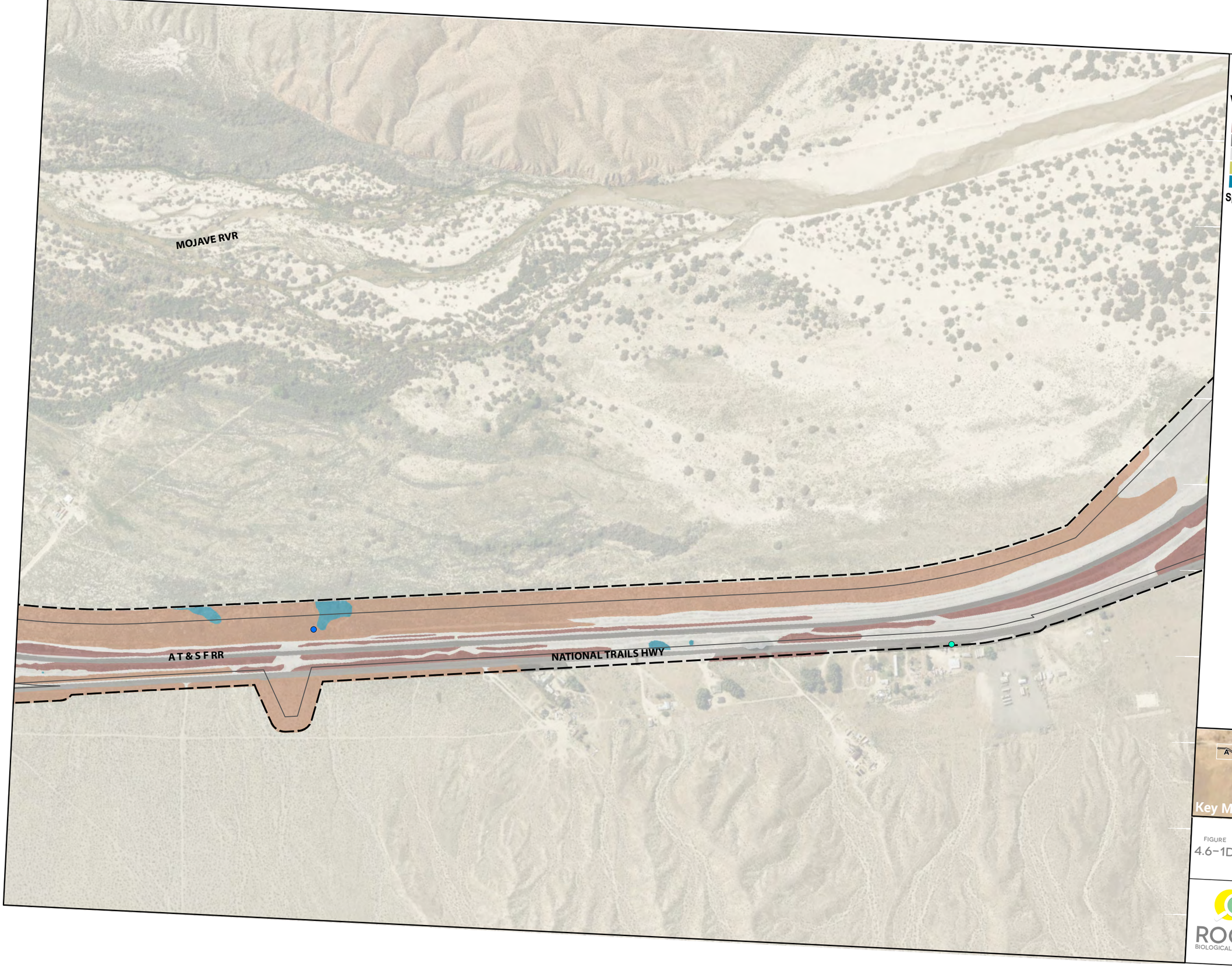

FIGURE
4.6-1C

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance

**Special-Status Plants**

- Screwbean Mesquite (*Strombocarpa pubescens*) (1)
- Western Joshua Tree (*Yucca brevifolia*) (1)




FIGURE 4.6-1D

**Special-Status Plant Survey Results**

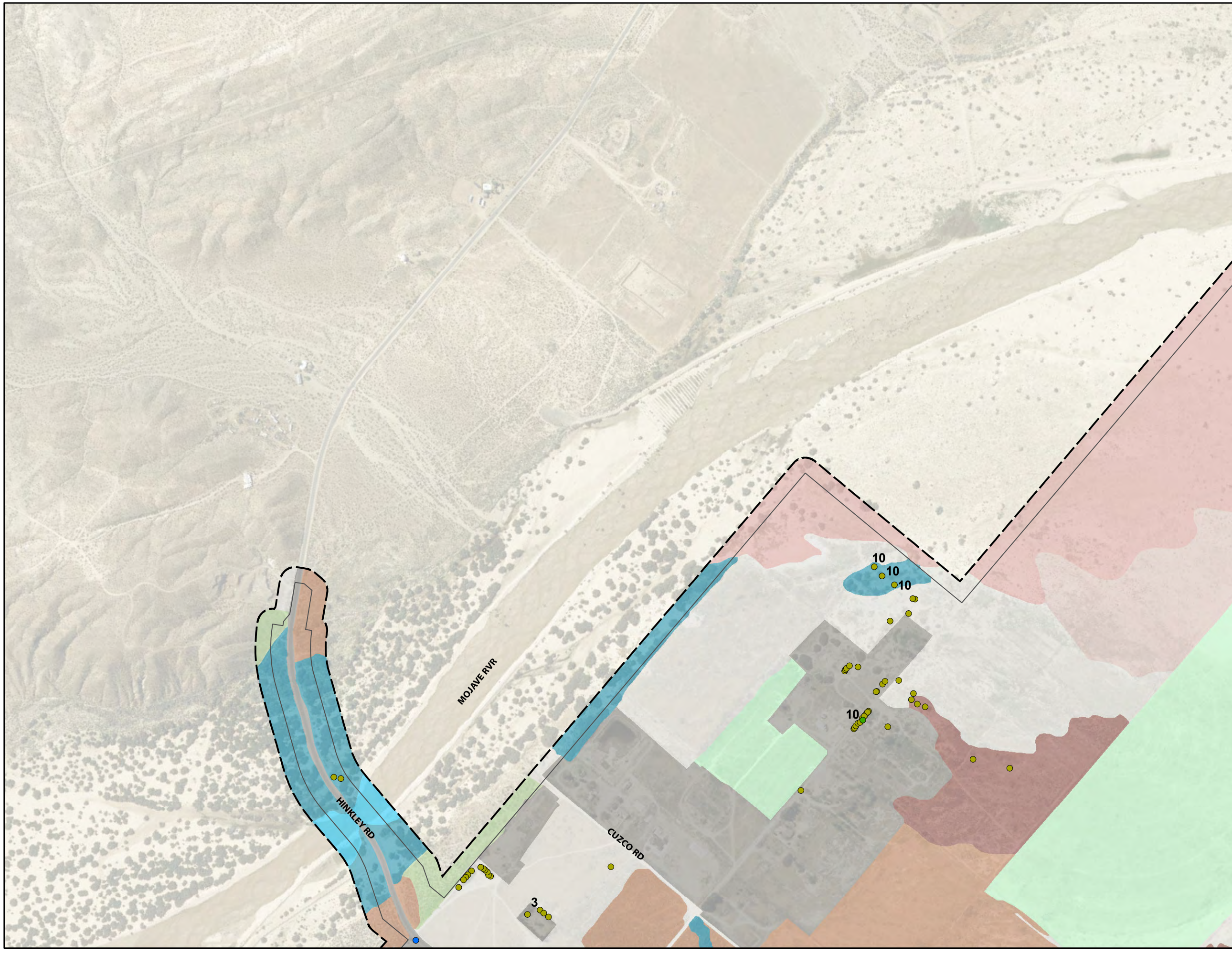
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Honey Mesquite (*Neltuma odorata*) (93)
- Jerusalem Thorn (*Parkinsonia aculeata*) (10)
- Screwbean Mesquite (*Strombocarpa pubescens*) (1)

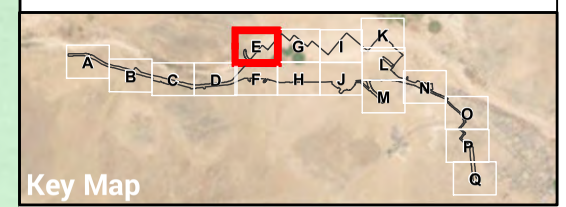



FIGURE 4.6–1E

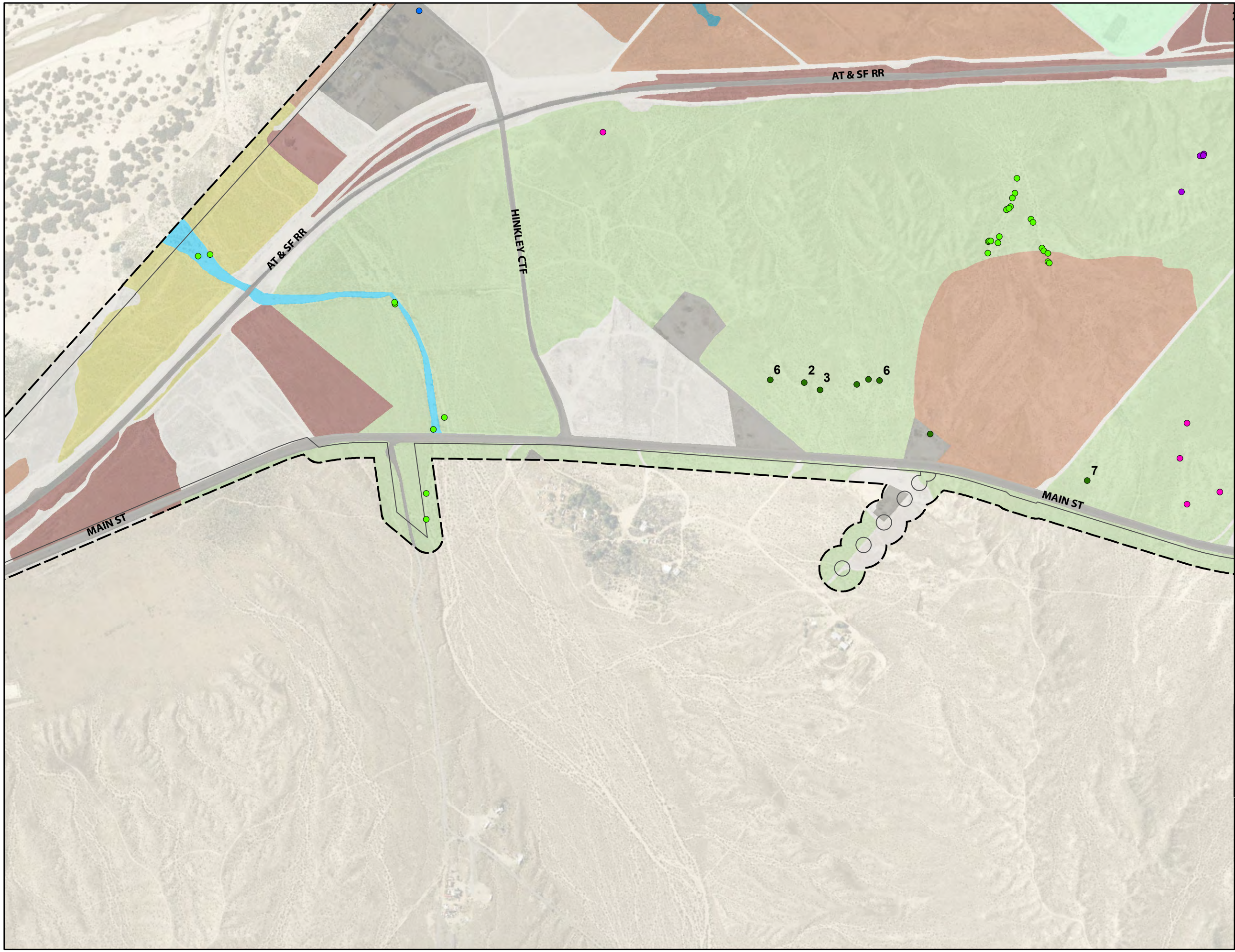
**Special-Status Plant Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Desert Holly (*Atriplex hymenelytra*) (4)
- Mojave Fish Hook Cactus (*Sclerocactus polyancistrus*) (5)
- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (28)
- Mojave Yucca (*Yucca schidigera*) (27)
- Screwbean Mesquite (*Strombocarpa pubescens*) (1)

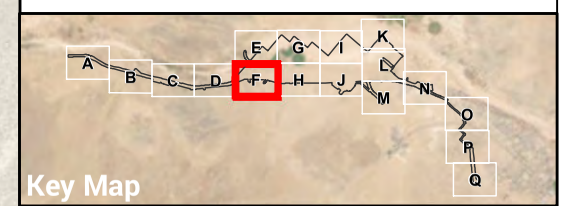



FIGURE 4.6–1F

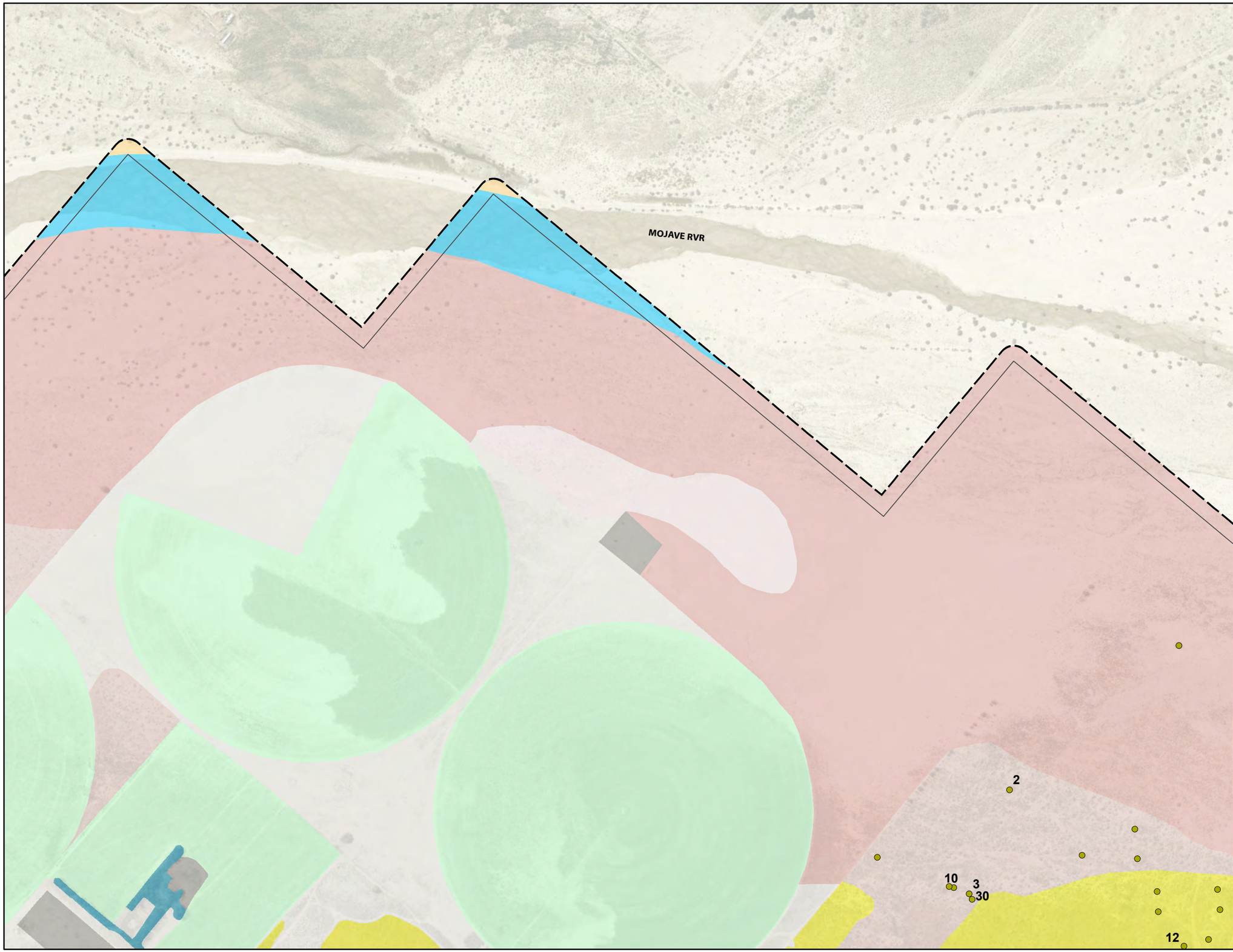
**Special-Status Plant Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Honey Mesquite (*Neltuma odorata*) (68)

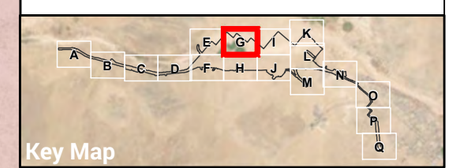



FIGURE 4.6–1G

**Special-Status Plant Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024

GAZANA ST

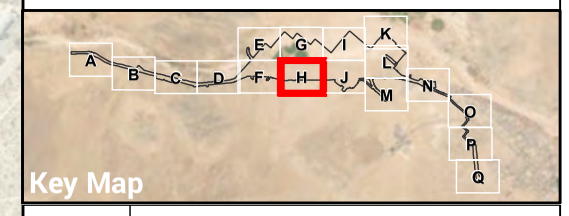
Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

**Special-Status Plants**

- Creosote Bush Ring (*Larrea tridentata*) (7)
- Honey Mesquite (*Neltuma odorata*) (52)
- Mesquite species (*Neltuma* sp.) (3)
- Mojave Fish Hook Cactus (*Sclerocactus polyancistrus*) (9)
- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (680)
- Mojave Yucca (*Yucca schidigera*) (6)



Key Map

FIGURE 4.6-1H

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024

Special-Status Plant Survey Area
Project Site

**Vegetation**

*Atriplex canescens* Shrubland Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
Disturbed
*Larrea tridentata* Shrubland Alliance
Unvegetated Channel

**Special-Status Plants**

Honey Mesquite (*Neltuma odorata*) (556)



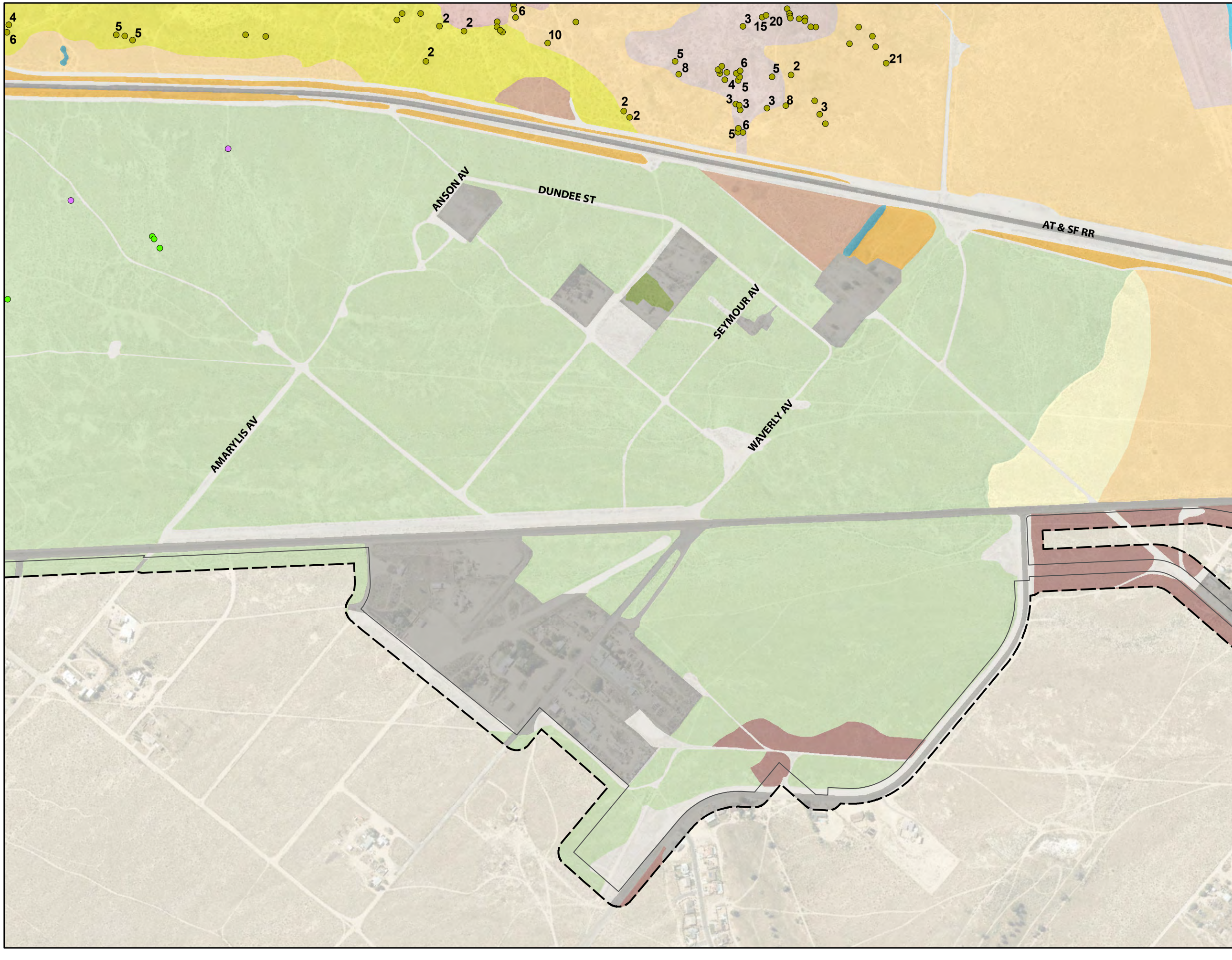

FIGURE 4.6–1I

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Ambrosia dumosa* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Creosote Bush Ring (*Larrea tridentata*) (2)
- Honey Mesquite (*Neltuma odorata*) (208)
- Mojave Indigo Bush (*Psorothamnus arborescens* var.*arborescens*) (4)




FIGURE 4.6-1J

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024

DIXIE RD

GREEN RD

MOJAVE RVR

Special-Status Plant Survey Area

Project Site

**Vegetation**

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized

Disturbed

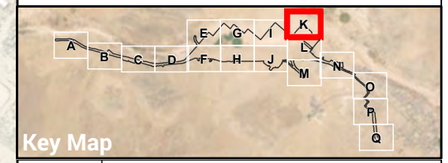



FIGURE
4.6-1K

**Special-Status Plant Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

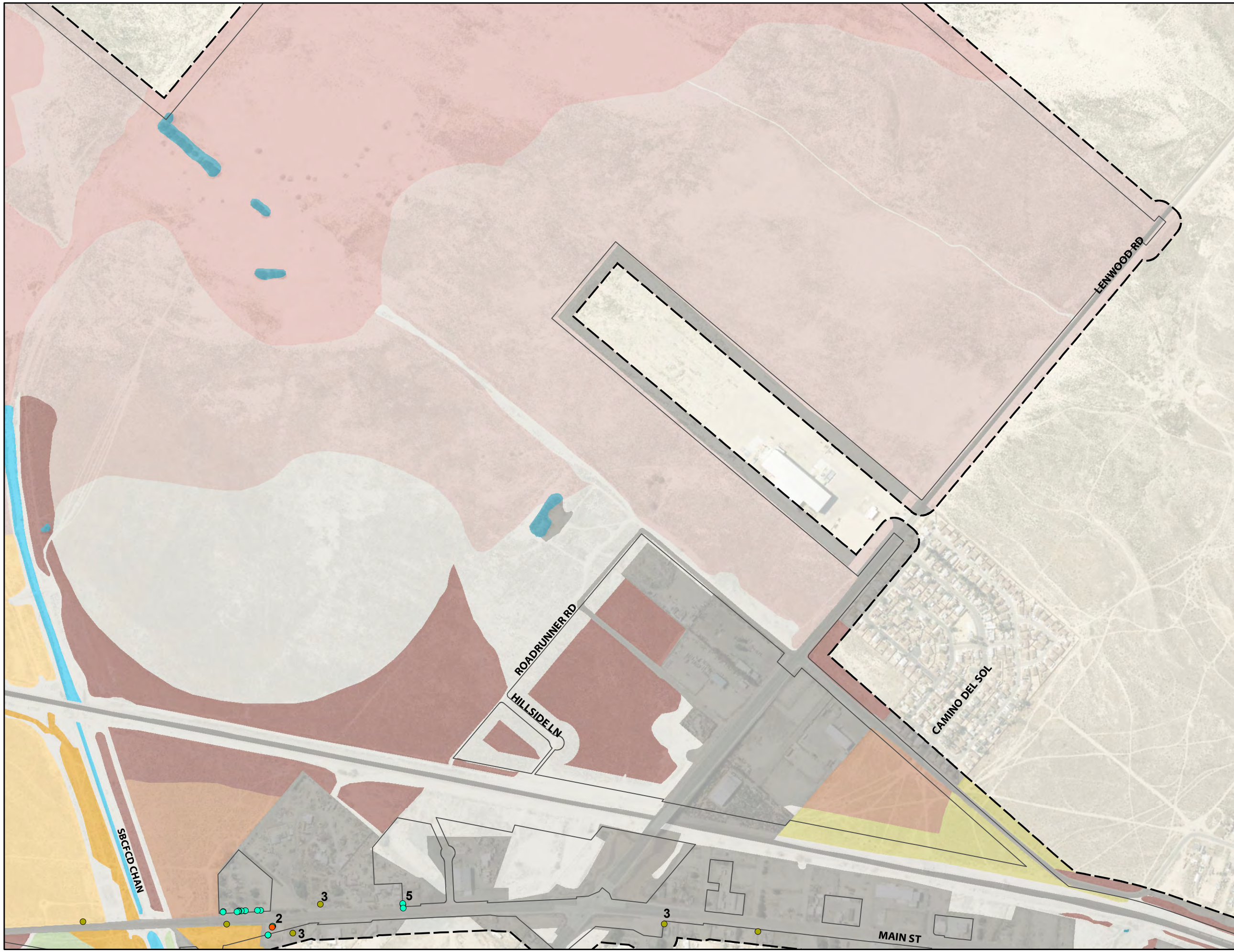
0 600 FEET

**1 INCH = 600 FEET**

N

Date: 8/27/2025

Aerial Photo: San Bernardino County, Esri 2024



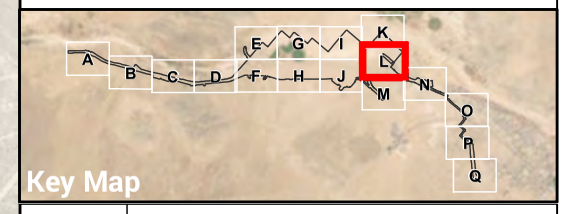

Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Honey Mesquite (*Neltuma odorata*) (12)
- Ocotillo (*Fouquieria splendens*) (2)
- Western Joshua Tree (*Yucca brevifolia*) (35)




Key Map

FIGURE 4.6–1L

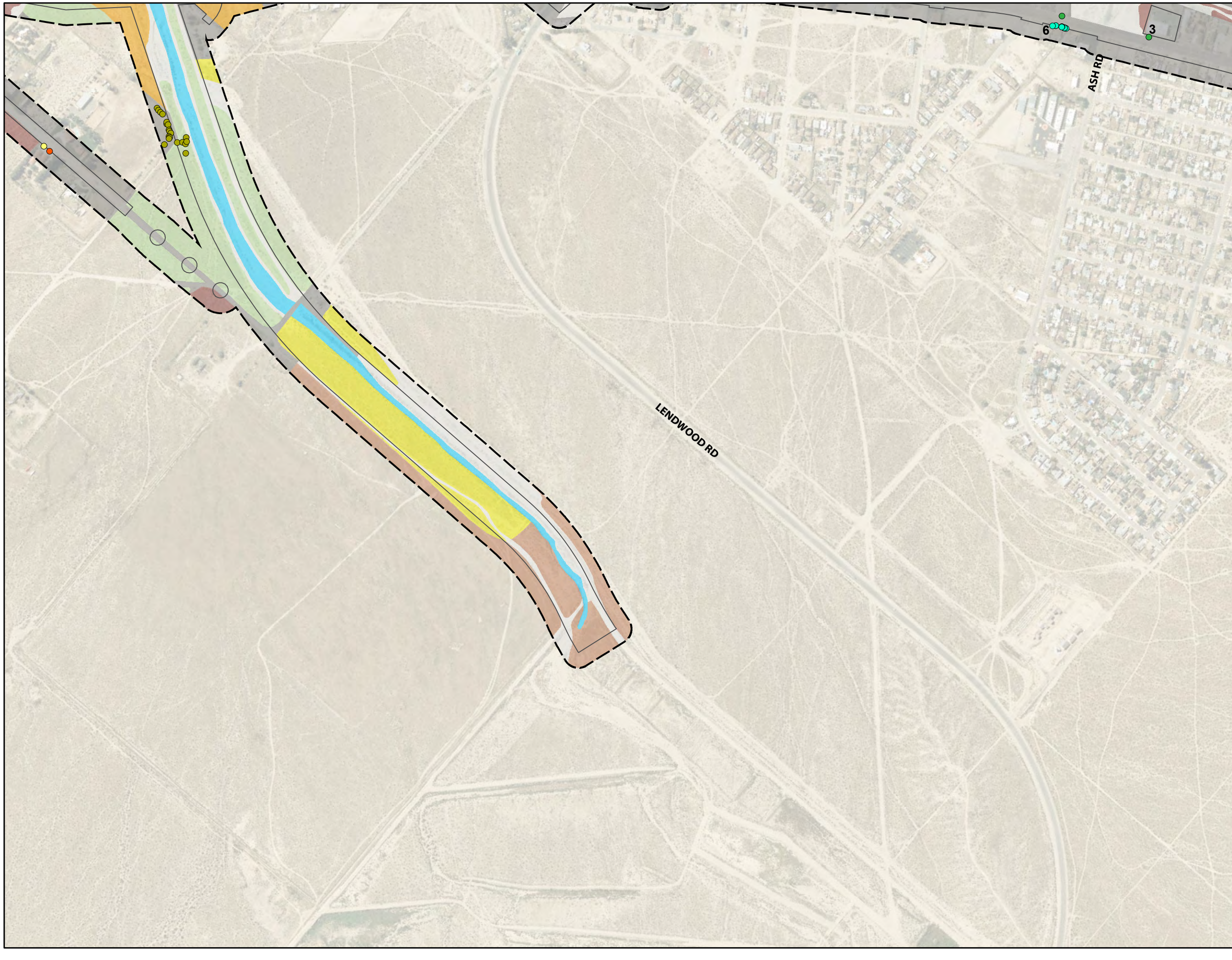
**Special-Status Plant Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- California Barrel Cactus (*Ferocactus cylindraceus*) (1)
- Honey Mesquite (*Neltuma odorata*) (31)
- Jerusalem Thorn (*Parkinsonia aculeata*) (4)
- Ocotillo (*Fouquieria splendens*) (1)
- Western Joshua Tree (*Yucca brevifolia*) (21)

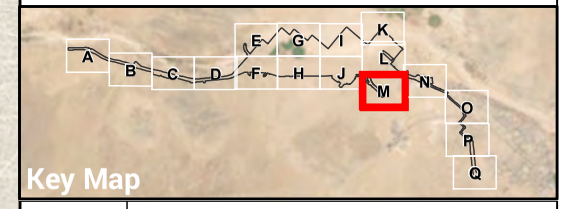



FIGURE 4.6–1M

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET
N

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024

Special-Status Plant Survey Area
Project Site

**Vegetation**

*Atriplex canescens* Shrubland Alliance - Disturbed
*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

Desert Holly (*Atriplex hymenelytra*) (45)
Honey Mesquite (*Neltuma odorata*) (1)
Jerusalem Thorn (*Parkinsonia aculeata*) (10)

AT & SF RR
PETTIT RD
58
4
15
10
10
5
10

Key Map

FIGURE 4.6-1N

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024

Special-Status Plant Survey Area
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

Jerusalem Thorn (*Parkinsonia aculeata*) (18)
Mesquite species (*Neltuma* sp.) (6)
Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (10)
Ocotillo (*Fouquieria splendens*) (3)



Key Map

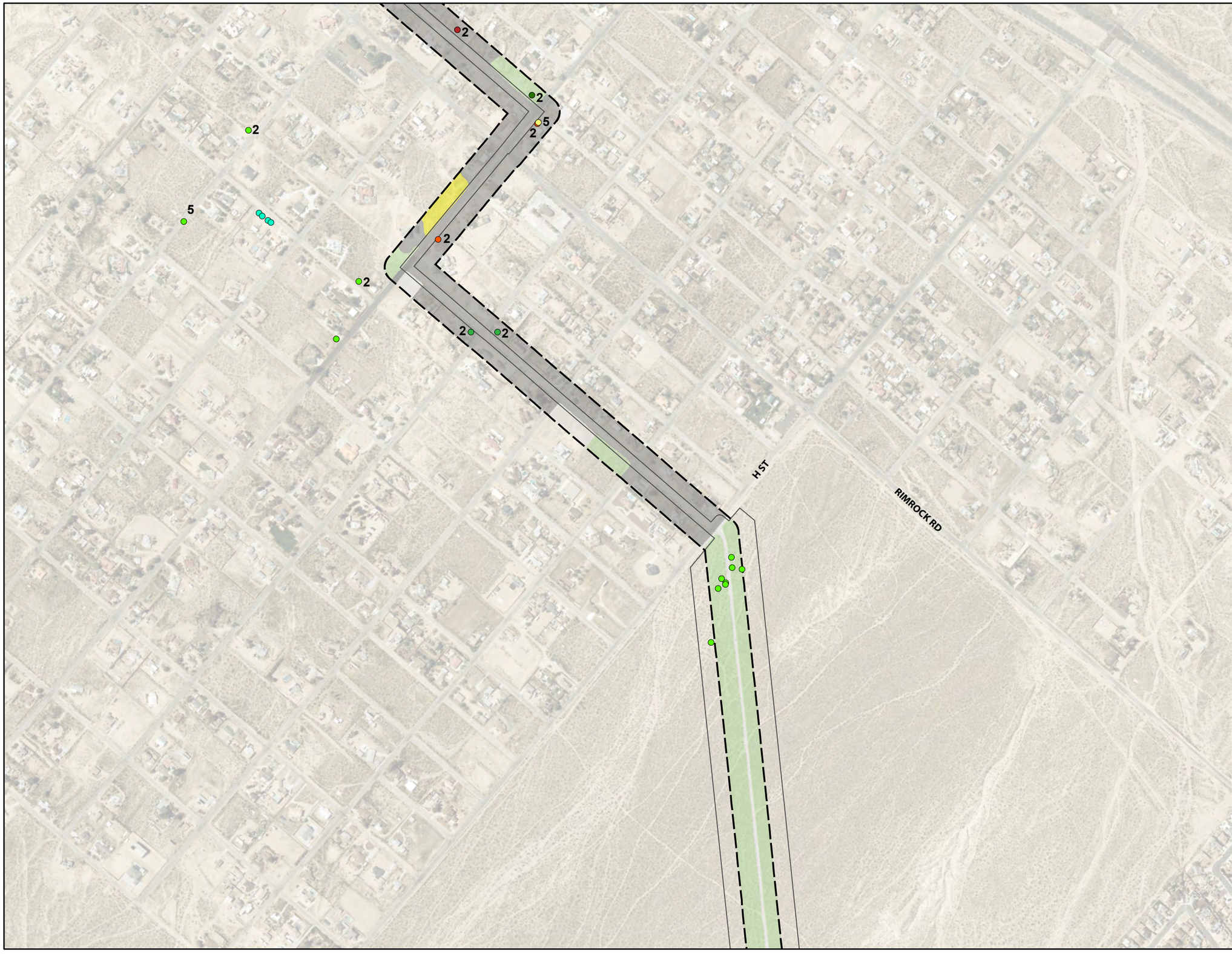
FIGURE 4.6–10

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**
- California Barrel Cactus (*Ferocactus cylindraceus*) (2)
- Jerusalem Thorn (*Parkinsonia aculeata*) (4)
- Mesquite species (*Neltuma* sp.) (2)
- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (19)
- Mojave Yucca (*Yucca schidigera*) (2)
- Ocotillo (*Fouquieria splendens*) (7)
- Western Joshua Tree (*Yucca brevifolia*) (4)



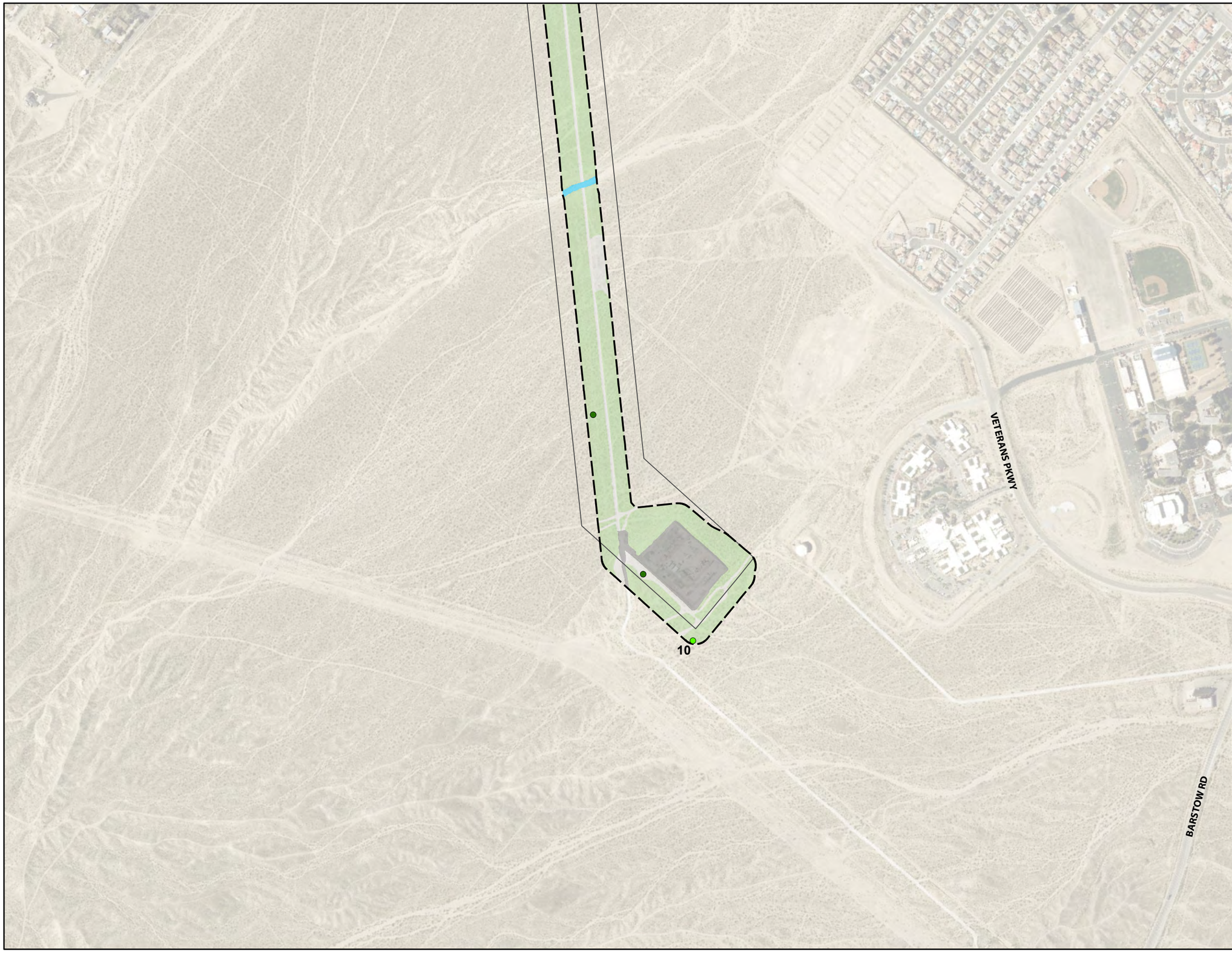

FIGURE 4.6–1P

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
Unvegetated Channel

**Special-Status Plants**

Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (10)
Mojave Yucca (*Yucca schidigera*) (2)

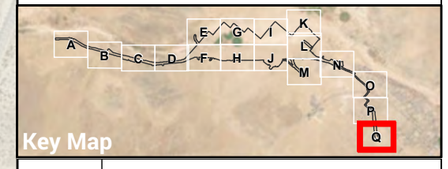



FIGURE
4.6-10

**Special-Status Plant Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/27/2025
Aerial Photo: San Bernardino County, Esri 2024

Joshua trees observed within BIG are believed to be ornamentally planted due to their proximity to developments and the lack of trees in the natural habitats on site.

### *Barstow Woolly Sunflower*

Barstow woolly sunflower is an annual herb in the sunflower family (*Asteraceae*) and has small yellow flowers that bloom from March through May (CNPS 2025). This species is endemic to California and occurs in Fresno, Kern, Los Angeles, and San Bernardino counties (Calflora, 2025). Barstow woolly sunflower occurs at elevations between 1,650 and 3,150 feet amsl. This species is found within chenopod scrub, Mojavean desert scrub, and playas (CNPS 2025).

Barstow woolly sunflower has been documented within three miles of BIG. BIG contains moderately suitable habitat for Barstow woolly sunflower. However, this species was not observed during special-status plant species conducted in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, Barstow woolly sunflower is presumed absent.

### *Beaver Dam Breadroot*

Beaver dam breadroot is a perennial herb in the pea family (*Fabaceae*) and has small pink or purple flowers that bloom from April to May (CNPS, 2025). Beaver dam breadroot is native to California and occurs within San Bernardino and Inyo Counties (Calflora, 2025). This species occurs at elevations between 2,001 and 5,003 feet amsl. Beaver dam breadroot is found in sandy washes and roads, within Mojavean desert scrub and Joshua tree woodland (CNPS, 2025).

Beaver dam breadroot has been documented within one mile of BIG. BIG contains moderately suitable habitat for beaver dam breadroot species. However, this species was not observed during special-status plant surveys in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, beaver dam breadroot is presumed absent.

### *Creamy Blazing Star*

Creamy blazing star is an annual herb in the stickleaf family with white to pale-yellow flowers that bloom from March to May (CNPS, 2025). Creamy blazing star is native to California and occurs within Kern, Inyo, San Bernardino, and San Diego counties (Calflora, 2025). This species occurs at elevations between 2,295 and 3,855 feet amsl in Mojavean desert scrubs (CNPS, 2025).

Creamy blazingstar has been documented within one mile of BIG. BIG contains moderately suitable habitat for creamy blazingstar. However, this species was not observed during special-status plant surveys in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, creamy blazingstar is presumed absent.

### *Emory's Crucifixion-Thorn*

Emory's crucifixion-thorn is a perennial deciduous shrub in the Quassia family of flowering plants (*Simaroubaceae*) with greenish-yellow flowers which generally bloom from June to July and uncommonly, in April, September, and October (CNPS, 2025). Emory's crucifixion-thorn is native to California and occurs within Inyo, San Bernardino, Riverside, and Imperial counties (Calflora, 2025). This species occurs at elevations between 295 to 2380 feet amsl in Mojavean desert scrub, playas, and Sonoran desert scrub (CNPS, 2025).

BIG contains moderately suitable habitat for Emory's crucifixion-thorn. However, this species was not observed during special-status plant surveys in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, Emory's crucifixion-thorn is presumed absent.

### *Mojave Monkeyflower*

Mojave monkeyflower is an annual herb in the lopseed family (*Phrymaceae*) and is endemic to California. This species occurs within creosote bush scrub and Joshua tree woodland. This species has small tubular pink and white flowers and blooms from April to July. This species occurs in San Bernardino County at elevations between 2,920 and 4,005 feet amsl (CNPS, 2025).

Mojave monkeyflower has been documented within one mile of BIG. BIG contains moderately suitable habitat for Mojave monkeyflower. However, this species was not observed during special-status plant surveys in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, Mojave monkeyflower is presumed absent.

### *Mojave Fishhook Cactus*

Mojave fishhook cactus is a perennial succulent in the cactus family (*Cactaceae*) with characteristic hooked central spines and rose-purple to magenta flowers that bloom from April to July. Mojave fishhook cactus is native to California and occurs in Inyo, Kern, San Bernardino, and Mono counties. This species occurs at elevations between 2,100 and 7,610 feet amsl. Mojave fishhook cactus is found in great basin scrub, Joshua tree woodland, and Mojavean desert scrub (CNPS, 2025).

Mojave fishhook cactus is a CRPR list 4.2 species meaning that it is of limited distribution or is infrequently distributed throughout regions of California. CRPR 4 plants are considered Watch List species in need of monitoring; however, evaluation for impact significance under CEQA is not required (CNPS, 2025). Mojave fishhook cactus is not imperiled in California; this species does not currently meet the requirements to be considered Rare or Endangered under CEQA nor does it qualify for listing under the CESA. Though an analysis of impact significance with respect to CEQA is not required, it is included below for due to its presence within BIG and coverage under the San Bernadino County Code as a protected native desert plant.

Fourteen individuals of Mojave fishhook cactus are sparsely distributed throughout the center of the rail yard, transload warehouse center, and solar farm (Figure 4.6-1).

### *Mojave Indigo Bush*

Mojave indigo bush is a perennial deciduous shrub in the pea family and has indigo-blue to violet-purple flowers that bloom from April to May. Mojave indigo bush is native to California and occurs within San Bernardino, Inyo, Kern, and Riverside counties. This species occurs at elevations between 1,310 and 3,890 feet amsl. Mojave indigo bush is found in Mojavean desert scrub and riparian scrub (CNPS, 2025).

Mojave indigo bush is a CRPR list 4.3 species meaning that it is of limited or infrequent distribution. This species is not considered significantly threatened in California; less than 20% of occurrences are in danger of extirpation (CNPS, 2025). Mojave indigo bush does not currently meet the parameters of a Rare or Endangered species per CEQA, nor does it qualify for listing under the CESA. As mentioned above, CRPR 4 species impact significance does not need to be evaluated under CEQA; however, it is discussed below for informational purposes due to its presence within BIG.

More than 750 Mojave indigo bushes were mapped within or near washes and drainages in the center of the rail yard northwest of Route 66, as well as southeast of the Tortilla Substation improvements (Figure 4.6-1).

### *Parish's Phacelia*

Parish's phacelia is an annual herb in the waterleaf family (*Hydrophyllaceae*) with purple flowers that generally bloom from April to May, and uncommonly in June and July (CNPS, 2025). Parish's phacelia is native to California and occurs within Inyo, San Bernardino, and Riverside counties (Calflora, 2025). This species occurs at elevations between 1,770 and 3,935 feet amsl in Mojavean desert scrub and playas (CNPS, 2025).

Parish's phacelia has been documented within three miles of BIG. BIG contains moderately suitable habitat for Parish's phacelia. However, this species was not observed during special-status plant surveys in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, Parish's phacelia is presumed absent.

### *Spiny-Hair Blazingstar*

Spiny-hair blazing star is an annual herb in the stickleaf family (*Loasaceae*) with white to pale yellow flowers that bloom from March to May (CNPS, 2025). Spiny-hair blazing star is native to California and occurs within Inyo, Kern, San Bernardino, Riverside, Imperial, and San Diego counties (Calflora, 2025). This species occurs at elevations between 490 and 4,200 feet amsl in Mojavean desert scrubs (CNPS, 2025).

Spiny-hair blazingstar has been documented within three miles of BIG. BIG contains moderately suitable habitat for spiny-hair blazingstar. However, this species was not observed during special-status plant surveys in 2023 and 2024, which included the rail yard, transload warehouse center, solar farm, off-site improvements, Tortilla Substation improvements and a portion of the 33kV alignment corridor, and 50-foot buffer. Based on negative survey results, spiny-hair blazingstar is presumed absent.

### *County of San Bernardino Desert Native Plants*

BIG supports plant species regulated under the County of San Bernardino Development Code § 88.01. Several of these species were documented within BIG during special-status plant surveys conducted in 2025 (Figure 4.6-1). Honey mesquite (*Neltuma odorata*; formerly *Prosopis glandulosa*) was mapped primarily in the central portion of BIG. The majority of the approximately 1,000 observations occur in thick stands often in sandy areas where saltbush scrub and creosote bush transition to dune habitat. Some individuals occur as ornamental plantings in developed land and disturbed habitat. Three individual screwbean mesquites (S*trombocarpa pubescens*; formerly *Prosopis pubescens*) were observed in the southern portion of BIG, and approximately 10 ornamental plantings of mesquites (*Neltuma* sp.; formerly *Prosopis* sp.) were observed. Identification to species-level was not possible due to limited access to the trees. Approximately 50 desert holly were observed within BIG with the majority of those occurring at the intersection of Main Street and State Highway 58 and the southwestern portion of BIG in developed land, disturbed habitat, and creosote bush scrub. Approximately 35 Mojave yucca (*Yucca schidigera*) occur in creosote bush scrub in the southwest portion of BIG between the existing railroad and Main Street. One individual was mapped along the south side of the Tortilla Substation, and one occurs as an ornamental planting on developed land. Approximately nine creosote bush clone rings greater than 10 ft in diameter occur in the central portion of BIG between the existing railroad and Main Street. Several other species regulated under Code § 88.01 were observed within BIG, but occur as ornamental plantings on developed land including 46 Jerusalem thorns (*Parkinsonia aculeata*), 13 ocotillos (*Fouquieria splendens*), and three California barrel cacti (*Ferocactus cylindraceus*). As previously mentioned, western Joshua tree and Mojave fishhook cactus also occur on BIG and are regulated by the County of San Bernardino Development Code 88.01. No other plant species regulated under the County Code § 88.01.050 were observed.

## *Special-Status Wildlife Species*

### Database/Background Review

Based on the database/background review of special-status wildlife species records for the region, 49 species were found to have been recorded within regional vicinity of the BIG site or are of potential regulatory agency concern based on their historic range. Several of these species are not expected or have a low potential to be present on site due to a lack of suitable habitat, no extant occurrences in the vicinity, and/or absence of specific habitat features required for critical life history stages of the species. An analysis of the potential for special-status wildlife to occur in BIG is provided in **Table 13: Special-Status Wildlife Species with Potential to Occur within BIG** below and in **Table 13.**

Special-status wildlife **s**pecies discussed in further detail in this report include those that meet one or more of the following criteria: 1) are listed under the federal and/or state endangered species acts; 2) have a moderate to high potential for occurrence; and/or 3) have been documented on BIG during recent survey efforts. Non-listed special-status wildlife species with a low potential to occur or not expected to occur are not addressed further as potentially significant project impacts are not anticipated for species that have low or no potential for occurrence.

## Summary of Results

Five federally and/or state-listed endangered or threatened species were documented within BIG. One federally and state-listed as threatened species, desert tortoise, was observed within BIG during focused surveys in October 2021, February 2022, and September to October 2024, as well as incidentally during other species' focused surveys in April 2023. The federally listed as threatened and state-listed as endangered western yellow-billed cuckoo was observed during focused surveys in June 2023. The state-listed as endangered willow flycatcher was observed during focused surveys in 2022, as well as incidentally during other species' surveys; it could not be determined if the individuals were the federally and state-listed as endangered subspecies, southwestern willow flycatcher. The state-listed as threatened Swainson's hawk and tricolored blackbird were observed incidentally during focused riparian bird surveys in June 2023 and July 2023, respectively. Swainson's hawk was also observed within and adjacent to BIG, including nesting off site, during focused surveys conducted in 2024 and 2025. No other federally or state-listed endangered or threatened wildlife species have been documented within or adjacent to BIG during focused species surveys.

Although not documented within BIG, four federally and/or state-listed endangered or threatened species have been reported within three miles of BIG, including arroyo toad (*Anaxyrus californicus*), least Bell's vireo, Mohave ground squirrel, and southwestern willow flycatcher.

Nineteen non-listed special-status wildlife species were documented within and adjacent BIG during general biological surveys and incidentally during focused species surveys from 2020 through 2025. These non-listed special status wildlife species include CDFW SSC, CDFW WL species, CDFW FP species, California FBM, BLM Sensitive species, and USFWS Bird of Conservation Concern (BCC) species. Please note that exact coordinate locations of certain special-status wildlife species may not have been recorded; their presence on site can be referenced in the standalone focused species survey reports (**Attachments D - EE**). In addition to the 19 non-listed special-status species that were documented during surveys, several other non-listed special-status wildlife species have historical records within three miles of BIG (Figure 3.1-1).

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| **FISH** | | | |
| Mohave tui chub (Siphateles bicolor mohavensis) | FE, SE | Formerly found in deep pools and slough-like areas of the Mojave River, this species now only occurs in highly modified refuge sites in San Bernardino County. | **None**. Suitable habitat not present. |
| **INVERTEBRATES** | | | |
| Monarch (Danaus plexippus) | FC (California overwintering population) | Found in open fields and meadows with milkweed in the summer. Found in a variety of habitats with nectar sources during the winter. Roost in eucalyptus, Monterey pines, and Monterey cypresses in California. | **None**. Suitable habitat not present. |
| Crotch's bumble bee (*Bombus crotchii*) | SC | Found in arid shrublands and grasslands in coastal and foothill areas of southern California. Common nectar sources include *Salvia* spp., *Lupinus* spp., *Phacelia* spp., *Asclepias* spp., *Medicago* spp., and *Chaenactis* spp. | **None**. Although BIG occurs along the eastern edge of the current known range, the arid climate and minimal nectar sources precludes BIG from supporting the species year-round. |
| **AMPHIBIANS** | | | |
| Arroyo toad (Anaxyrus californicus) | FE, SSC | Alluvial washes and slow-moving streams with shallow ponds. Find sand is required for burrowing. | **None**. Suitable breeding habitat not present. Per coordination with USFWS, this species is not expected to occur in the area. |
| **REPTILES** | | | |
| Desert tortoise (*Gopherus agassizii*) | FT, ST | Burrows in firm sandy or gravelly soils along creosote bush flats, riverbanks, washes, dunes, alluvial fans, hillsides, and canyons, often containing rocky areas. | **Present**. Species observed during focused surveys. |
| Mojave fringe-toed lizard (*Uma scoparia*) | SSC, BLM | Sparsely vegetated dunes, flats, riverbanks, and washes containing loose sands for burrowing. | **Present**. Species observed during focused surveys. |
| **BIRDS** | | | |
| American white pelican (*Pelecanus erythrorhynchos*)[2] | SSC, BCC | Nests on isolated islands in freshwater lakes or ephemeral islands in shallow wetlands. | **None**. Suitable habitat not present. |
| Bell's sparrow (Artemisiospiza belli) | WL | Found in sagebrush, alkali desert scrub, and desert scrub in low, dense stands of shrubs. Frequently associated with *Atriplex* spp. In desert habitats. | Foraging**: Present.** Incidentally observed during 2021 focused least Bell's vireo surveys. Nesting: **Moderate-to-High.** Suitable nesting habitat present. |
| Bendire's thrasher (*Toxostoma bendirei)* | SSC, BCC, BLM | Found in flat areas of desert succulent shrub in the Mojave Desert. Prefers open areas with short vegetation. Nests in cactus, thorny shrubs, and small trees. | Foraging: **Low**. Nesting: **Low**. Not known from BIG vicinity. Little to no cacti or succulents on BIG. Not observed during biological surveys. |

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| Black-tailed gnatcatcher (*Polioptila melanura*) | WL | Found in desert scrub, including washes densely lined with creosote and salt bush as well as areas studded with ocotillo, prickly pear, cholla, and mesquite. | Foraging: **Present**. Observed within tamarisk thickets along the Mojave River during 2021 and 2022 focused least Bell's vireo surveys. Nesting: **Moderate**. Suitable nesting habitat occurs within tamarisk thickets in southwestern off-site improvements. |
| Cooper's hawk (Accipiter cooperii)[1] | WL | Usually found in oak woodlands but occasionally in willow or eucalyptus woodlands as well as ornamental woodlands in suburban settings. | Foraging: **Present**. Observed within the riparian habitat south of Hinkley Road during 2022 focused western yellow-billed cuckoo surveys. Nesting: **Low-to-Moderate**. Ornamental trees suitable for nesting occur within scattered residences on site. |
| Costa's hummingbird (*Calypte costae*)[1] | BCC | Found in Sonoran and Mojave Desert scrub, coastal California chaparral and sage scrub, and deciduous forest and desert scrub in Baja California, Mexico. | Foraging: **Present**. Observed during 2022 focused surveys for yellow-billed cuckoo and least Bell's vireo near the Hinkley Road Bridge. Nesting: **Moderate**. Suitable nesting habitat present. |
| Ferruginous hawk (*Buteo regalis*)[5] | WL | Found in open grasslands, agricultural areas, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats. | Foraging: **High**. Observed during 2025 focused Swainson's hawk surveys approximately one mile north of the project site. Suitable foraging habitat present. Nesting: **None**. Species does not nest in California. |
| Golden eagle (Aquila chrysaetos)[4] | FP, WL, BLM | Found in mountainous canyonlands, deserts, agricultural fields, and semi-open habitats. | Foraging: **Present**. Observed flying over the southwestern off-site improvements during 2023 focused western burrowing owl surveys. Nesting: **None**. Suitable nesting habitat not present. |
| Lawrence's goldfinch (*Spinus lawrencei*)[1] | BCC | Found in dry, open oak woodlands, coastal scrub, pinyon pine-juniper woodlands and streamside habitats. | Foraging: **None**. Nesting: **None**. Suitable habitat not present. |
| Least Bell's vireo (*Vireo bellii pusillus*)[1] | FE, SE | Found in riparian woodland with understory of dense young willows or mulefat and willow canopy. Nests often placed along internal or external edges of riparian. | Foraging: **Not anticipated**. Species was not documented during focused surveys in 2021, 2022, or 2023. Nesting: **Not anticipated**. Marginally suitable nesting habitat present. |

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| Le Conte's thrasher (*Toxostoma lecontei*) | SSC, BCC | Found in saltbush scrub, creosote bush scrub, and other lightly vegetated desert scrub. Permanent resident within California range. | Foraging: **Present**. Observed during 2021 focused least Bell's vireo surveys.<br>Nesting: **Moderate**. Suitable nesting habitat present. |
| Loggerhead shrike (*Lanius ludovicianus*)[1] | SSC | Found within a variety of open habitats interspersed with shrubs and small trees, including disturbed habitats. | Foraging: **Present**. Observed within BIG during various focused species surveys in 2022 and 2023.<br>Nesting: **Moderate**. Suitable nesting habitat present. |
| Long-eared owl (*Asio otus*)[1] | SSC, BCC | Roost in dense vegetation and forage in open grasslands and shrublands in elevations up to 6,500 feet. | Foraging: **Present**.<br>Nesting: **Present**. Documented nesting pair in April 2025 during Swainson's hawk surveys in Lenwood Channel. |
| Lucy's warbler (*Leiothlypis luciae*)[1] | SSC | Primarily found in mesquite thickets; opportunistically found in palo verde, tamarisk, cottonwood, ironwood, and willow trees. Nests are placed in tree cavities. | Foraging: **Present**. Observed during 2022 focused southwestern willow flycatcher surveys and focused least Bell's vireo surveys.<br>Nesting: **Moderate**. |
| Merlin (Falco columbarius)[5] | WL | Found in edges of grasslands and deserts. In open country, clumps of trees or windbreaks are required for roosting. | Foraging: **Moderate**. Known from local area and foraging habitat present.<br>Nesting: **None**. |
| Mountain plover (*Charadrius montanus*)[5] | SSC, BCC, BLM | Species winters on large, (often agricultural) fields in southern California. | Overwintering: **None**. Agricultural fields on BIG have converted to non-native grassland and are no longer being maintained/plowed.<br>Nesting: **None**. |
| Northern harrier (*Circus hudsonius*)[1] | SSC | Found within a variety of open habitats including deserts, plains, agricultural fields, and estuaries. | Foraging: **Present**. Observed flying over the northeastern portion of the transload warehouse center during 2023 focused western burrowing owl surveys.<br>Nesting: **None**. Suitable nesting habitat not present. |
| Olive-sided flycatcher (*Contopus cooperi*)[1] | SSC, BCC | Found along edges or within openings of semi-open to dense forests, largely composed of conifers in Southern California. Broaden tree genera preferences during migration; desert migrants are found in various habitats containing trees. Nest primarily in conifers, occasionally in willows, oaks, alders, and eucalyptus. | Foraging: **Present**. Observed within tamarisk thickets along the Mojave River during 2022 focused southwestern willow flycatcher surveys and 2021 focused least Bell's vireo surveys.<br>Nesting: **Low**. Suitable nesting habitat not present. |
| Oregon vesper sparrow (Pooecetes gramineus affinis)[5] | SSC, BCC | Winters on open, flat areas containing low grasslands or savannahs in southern California. | Foraging: **None**.<br>Nesting: **None**. Suitable habitat not present. |

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| Osprey (Pandion haliaetus)[1] | WL | Found near aquatic habitats; species requires aquatic habitats for prey (fish). Nests in tall, dead snags or artificial platforms. | Foraging: **Present**. Observed flying over the southwestern portion of the off-site improvements during 2022 focused least Bell's vireo surveys.<br>Nesting: **Low**. Suitable nesting habitat absent. |
| Prairie falcon (*Falco mexicanus*)[1] | WL | Found in desert shrubland and grasslands. Primarily forage in grassland habitats. Nests on cliffs and mountain ledges. | Foraging: **Present**. Observed flying over the northeastern portion of the transload warehouse center during 2023 focused western burrowing owl surveys.<br>Nesting: **None**. Nesting habitat not present. |
| Sharp-shinned hawk (*Accipiter striatus*)[1] | WL | Found in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. | Foraging: **Present**. Observed flying through the northeastern portion of the rail yard during the 2020 least Bell's vireo habitat assessment.<br>Nesting: **None**. This species is not known to nest in southern California. |
| Summer tanager (*Piranga rubra*)[1] | SSC | Found in riparian habitats containing willows and cottonwoods. | Foraging: **Low**.<br>Nesting: **Low**. Limited suitable habitat present. |
| Swainson's hawk (*Buteo swainsoni*)[1] | ST, BLM | Found in open habitats for foraging including grasslands, prairies, and sometimes pastures. Nest in solitary trees or sometimes very small groves near water. | Foraging: **Low-to-Moderate**. Observed flying over the site during 2023 riparian bird surveys as well as during focused surveys in 2024-2025. Preferred foraging in active agricultural fields occurs approximately one mile north of BIG.<br>Nesting: **Low**. Pair observed nesting within one mile of BIG during 2024 focused surveys; however, potential nesting habitat on site is of lower quality than adjacent lands and Swainson's hawk nesting is rare in the project vicinity. |
| Tricolored blackbird (*Agelaius tricolor*) [2] | ST, BLM, SSC, BCC | Breeds near fresh water where emergent vegetation is present, including cattails, willow thickets, and tall herbs. Forages in grasslands and croplands. | Foraging: **Present**. A single individual was observed within the 1,000-foot buffer of the southwestern portion of the off-site improvements during 2023 riparian bird surveys.<br>Nesting: Not anticipated. |

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| Vermilion flycatcher (*Pyrocephalus rubinus*)[1] | SSC | Found in deserts, scrub, agricultural fields, parks, golf courses, and riparian woodlands, often near water. | Foraging: **Present**. An adult and juvenile were observed in an ornamental tree southwest of the former ag fields.<br>Nesting: **Moderate**. Suitable habitat present at Hinkley Road Bridge. |
| Western burrowing owl (Athene cunicularia hypugaea)[3] | SSC, BLM | Found in grasslands and open scrub from the coast to foothills. Strongly associated with California ground squirrel and other fossorial mammal burrows. | Overwintering: **Present**.<br>Nesting: **Low-to-Moderate**. Not observed or otherwise documented breeding on site in 2022 or 2023. |
| Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)[1] | FT, SE, BLM | Found primarily in riparian forests and woodlands. | Foraging: **Present**. Observed within the 1,000-foot buffer of the southwestern portion of the off-site improvements.<br>Nesting: **Low**. Only marginally suitable nesting habitat occurs within and surrounding Hinkley Road Bridge and southwestern off-site improvements, preferred willow-cottonwood riparian is absent from BIG and the surrounding areas. |
| Willow Flycatcher (*Empidonax traillii*) and Southwestern willow flycatcher (*Empidonax traillii extimus*)[1] | FE[6], SE | Breeds in dense riparian forests and woodlands with structural diversity, often with open water. Restricted to a few colonies throughout southern California. | Foraging: **Present/Low-to-Moderate**. Willow flycatcher observed during focused surveys 2022, southwestern willow flycatcher not identified.<br>Nesting: **Low-to-Moderate**. Marginally suitable habitat within and surrounding Hinkley Road Bridge and southwestern off-site improvements. |
| Yellow warbler (*Setophaga petechia*)[1] | SSC | Found within a variety of riparian habitats and occasionally disturbed habitats. | Foraging: **Present**. Observed within the riparian habitat southwest of Hinkley Road during 2022 focused least Bell's vireo surveys.<br>Nesting: **Moderate**. Suitable nesting habitat present. |
| Yellow-breasted chat (*Icteria virens*)[1] | SSC | Found within a variety of riparian habitats and occasionally disturbed and successional habitats. Nests in early stage riparian habitats with adequate shrub cover and an open canopy where dense thickets and tall perching trees are present. | Foraging: **Moderate**. Suitable riparian habitat present near Hinkley Road Bridge and southwestern off-site improvements.<br>Nesting: **Moderate**. Suitable nesting habitat present. |

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| **MAMMALS** | | | |
| American badger (*Taxidea taxus*) | SSC, FBM | Found in arid, open grasslands, fields, and pastures containing firm soil for burrowing. American badger may also be found in marshes and deserts. | **Moderate-to-High**. Suitable habitat and burrowing substrate present. |
| American beaver (*Castor canadensis*) | FBM | Found in montane riparian, valley foothill riparian, riverine, lacustrine, aspen, and fresh emergent wetland habitats. Isolated populations occur in San Bernadino County. | **Present.** One adult observed swimming upstream in the Mojave River near Hinkley Road Bridge. |
| California leaf-nosed bat (*Macrotus californicus*) | SSC, BLM | Found in desert riparian, desert wash, desert scrub, desert succulent shrub, alkali desert scrub, and palm oasis communities. Roosts can include caves, rock shelters, buildings, and bridges. | **Moderate**. Suitable roosting and foraging habitat present. |
| Desert kit fox (Vulpes macrotis arsipus) | FBM | Found in creosote scrub bush, desert scrub, and grassland communities. | **Present**. Observed on site during 2024 wildlife movement study. Suitable habitat and burrowing substrate present. |
| Mohave ground squirrel (Xerospermophilus mohavensis) | ST, BLM | Found in desert areas containing creosote bush scrub, shadscale scrub, alkali sinks, and Joshua tree woodlands. Sandy or friable soils are required to burrow. | **Presumed absent**. Species was not observed or otherwise documented during focused surveys in 2022 and 2025; BIG occurs outside of the species' current known range. |
| Mohave river vole (Microtus californicus mohavensis) | SSC | Found in moist meadows, irrigated fields and channels, and waterbody fringes near the Mojave River. | **None**. Suitable habitat not present. |
| Pallid bat (Antrozous pallidus) | SSC, BLM | Found primarily in open, dry habitats, such as grasslands and shrublands, that contain rocky areas for roosting. Roosts can include caves, crevices, and open buildings. | **Moderate**. Suitable roosting and foraging habitat present. |
| Ringtail [Ring-tailed cat] (*Bassariscus astutus*) | FP | Found in a variety of habitats including riparian, desert scrub, chaparral, pine-oak and conifer woodland where it typically utilizes rocky areas with cliffs or crevices within 0.5 miles from water. Can also use tree hollows, tree roots, burrows, or brush piles for shelter. | **Low.** Although ephemeral water and desert scrub habitat is present on site, rocky areas and suitable daytime shelters are not present. |
| Spotted bat (Euderma maculatum) | SSC, BLM | Found in arid deserts and grasslands typically near sheer cliffs. Roosts can include rock crevices, caves, and buildings. | **Low** Suitable foraging habitat present. Suitable roosts absent. |

| Table 13: Special-Status Wildlife Species with Potential to Occur within BIG | | | |
|---|---|---|---|
| **Species** | **Status** | **Habitat Description** | **Potential to Occur** |
| Townsend's big-eared bat (*Corynorhinus townsendii*) | SSC, BLM | Found in a wide variety of habitats. Roosts in caves, tunnels, buildings, and other human-made structures. Distribution is strongly correlated with suitable open roosting habitats. This species does not roost in cracks or crevices. | **Moderate**. Suitable roosting and foraging habitat present. |
| Western mastiff bat (Eumops perotis californicus) | SSC, BLM | Found in desert scrub and urban areas with extensive open space for foraging and abundant roost locations provided by crevices in rock outcrops and buildings. Roost sites must be a minimum of 9.8 feet above ground to facilitate take off. | **Low**. Suitable foraging habitat present. Suitable roosts absent. |
| Yuma myotis (Myotis yumanensis) | BLM | Found commonly throughout California but is uncommon in the Mojave and Colorado desert regions. Species roosts in buildings, mines, caves, crevices, abandoned swallow nests, and under bridges. Separate, often more open, night roosts may be used. | **Moderate.** Suitable roosting and foraging habitat present. This species was believed to have been observed during special-status bat surveys; however, identification could not be confirmed. |

Note:
BCC: USFWS Bird of Conservation Concern
FBM: California Furbearing Mammal, protected from take (14 CCR § 460 or 463)
FC: Federal candidate for listing under ESA
FE: Federally Endangered
FP: CDFW Fully Protected
FT: Federally Threatened
SC: Candidate for listing under CESA
SE: State Endangered
ST: State Threatened
BLM: Bureau of Land Management Sensitive Species
FBM: Furbearing Mammal under California Code of Regulations
SSC: CDFW Species of Special Concern
WL: CDFW Watch List
[1] CNDDB, administered by CDFW, only tracks documented nest sites and behavior indicating reproduction for this species
[2] CNDDB, administered by CDFW, only tracks detections of nesting colonies for this species
[3] CNDDB, administered by CDFW, tracks detections of burrow sites and some wintering sites for this species
[4] CNDDB, administered by CDFW, tracks detections of nest sites, behavior indicating reproduction, and wintering locations for this species
[5] CNDDB, administered by CDFW, only tracks detections of wintering locations for this species
[6] Only the subspecies of southwestern willow flycatcher is listed under the ESA

Sources:


- Brown and Amadon, 1968
- CDFW, 2025a
- CDFW, 2025b
- CDFW, 2025c
- CDFW, 2025d
- Cornell Lab of Ornithology, 2022-2025
- Grinnell, 1933
- Miller and Stebbins, 1964
- USFWS, 2021a
- USFWS, 2025b
- Zeiner et al., 1988-1990

## Threatened and Endangered Wildlife Species

### *Arroyo Toad*

#### Life History

Arroyo toad is federally listed as endangered and is a CDFW SSC. The farthest northeastern record of this species occurs within the vicinity of BIG. As such, CDFW has recommended a thorough analysis of arroyo toad occurrences in the area as well as a review of relevant scientific literature pertaining to arroyo toad migration patterns (CDFW, 2024a).

Arroyo toad historically ranges from Monterrey County south to Baja California, Mexico, from coastal Orange County and east along the desert slopes of the San Gabriel and San Bernardino mountains at elevations up to 4,600 feet (USFWS, 2009a). The Arroyo Southwestern Toad Recovery Plan (Recovery Plan; USFWS, 1999) delineated 22 watersheds within this historical range known to support populations of arroyo toad and established three recovery units (Northern, Southern, and Desert) to stabilize and expand the distinct populations that occur within this historical range (USFWS, 1999).

Arroyo toads require two habitat types to complete their life cycle; sandy, intermittent streams and rivers with extensive terrace systems and braided channels for breeding and terrestrial uplands outside the floodplain with sandy soils for foraging and overwintering (Mitrovich et al., 2011). Arroyo toads favor shallow breeding pools adjacent to slow-moving water (USFWS, 2009a). Preferred upland habitat varies and may include coastal sage scrub, chaparral, oak woodlands, sycamore cottonwood woodlands, and grassland (Griffin et al., 1999).

The movement patterns of arroyo toads have not been extensively studied though two dispersal models have been suggested: an upland-dependent model wherein adult toads move extensively from the floodplain into upland habitats in the post-breeding season, and a stream channel and terrace model which suggests that adult toads may remain in the floodplain year-round (Mitrovich et. al., 2011). Post-breeding season movement into uplands can range between 0.3-1.2 miles from the floodplain and dispersal from natal sites can be as far as 2 miles in some cases (USFWS, 1999).

#### Desktop Review

RBC evaluated the potential for arroyo toad to occur within BIG. The potential to occur was based on an extensive desktop review of arroyo toad scientific literature and database queries, knowledge of the species' natural history, and informal consultation with the USFWS. A single record of arroyo toad was listed in the CNDDB from 1949 in the Mojave River north of BIG. However, the specimen may have been washed downriver from a population further upstream during a flood (City of Barstow, 2014). Additional records of arroyo toads nearest to BIG were documented between 2017 – 2020 at four sites within the Mojave River Basin Watershed: Horsethief Creek, Little Horsethief Canyon, Mojave River West Fork, and in the vicinity of Mojave Forks Dam and Deep Creek (Hitchcock et. al., 2022). The location of these records is consistent with the populations described in the Desert Recovery Unit outlined in the Recovery Plan and occur between 45 and 80 miles upstream of BIG.

### Habitat Suitability

There is no suitable breeding habitat for arroyo toad within BIG as shallow pools that may sustain egg and larval development are lacking from the river and other watercourses on site. The aquatic features within BIG are extremely intermittent and do not sustain pools suitable for breeding. Although the Mojave River, which borders the northern boundary of the project site, may flow ephemerally following infrequent heavy rain events in the region from year to year, the flow of water in the portions of the river in the vicinity of BIG is likely too rapid to support arroyo toad breeding.

Based on the historical and current ranges of extant arroyo toad populations (Hitchcock et. al., 2022; Jennings and Hayes, 1994; USFWS, 1999; USFWS, 2009a; USFWS, 2023) and the current data on dispersal distances, the 1949 record detailed in the CNDDB is considered an outlier and not representative of the current site/regional conditions that could support the species. Based on a lack of evidence of an extant population occurring within the vicinity, region, or aquatic dispersal range, and absence of suitable breeding habitat on site or adjacent to the site, it was concluded that Arroyo toad has no potential to occur within BIG and will not be discussed further in this report.

## *Crotch's Bumblebee*

### Life History

The Crotch's bumble bee is currently a candidate for listing under the CESA based on a 2018 petition submitted by the Xerces Society for Invertebrate Conservation, Defenders of Wildlife and Center for Food Safety (CDFW, 2022). This species has historically ranged from central California to Baja California Del Norte though recent records indicate a reduction at longitudinal extremes, with most detections occurring in southern California (Thorp et al. 1983, NatureServe Explorer 2025a, Williams et al., 2014). Largely absent from mountainous regions, Crotch's bumble bee is distributed from the coast, east to the desert edge (Thorp et al. 1983, Williams et al., 2014).

Suitable habitat for this species includes a variety of open shrub and grassland vegetation communities containing ample flowers for nectaring. Due to their short tongue, Crotch's bumble bees tend to nectar on *Medicago* spp., *Lupinus* spp., *Chaenactis* spp., *Asclepias* spp., *Phacelia* spp., and *Salvia* spp., amongst a variety of other genera (Williams et al., 2014). Though Crotch's bumble bee is tolerant of fragmented and/or semi-urban environments, habitat loss, climate change, and pesticide use are considered imminent threats to populations (Williams et al., 2014; CDFW, 2022).

### Habitat Suitability

Evidence suggests a decline in the Crotch's bumble bee extent of occurrence between its current range and its historic range (The Xerces Society 2018). Although BIG is located within the species' historic range there are very few records of Crotch's bumble bee occurring in the vicinity of BIG and the surrounding region. Only four sightings have been recorded between within 20 miles of BIG. A 12-quad CNDDB search lists a 1944 record from Bell's Mountain approximately 12 miles south of BIG and a 1988 record approximately 17 miles northwest of BIG between CA State Routes 58 and 395 (CDFW, 2025b). In addition, iNaturalist lists a 2019 record approximately 17 miles southeast near Sidewinder Mountain and a 2025 sighting approximately 20 miles southwest of BIG in Victorville (iNaturalist, 2025).

The lack of observations in the region is likely due to several factors leading to the absence of suitable habitat on BIG. The average annual precipitation at BIG between 2020 and 2025 is 4.8 inches (NOAA, 2025). The low precipitation rates in the vicinity of BIG in conjunction with general site disturbance and a lack of microhabitats has contributed to a low diversity and abundance of annual plant species present on site. In addition, during the Active Colony Period (April 1 – August 31) between 2020 and 2025, the maximum daily temperatures on BIG ranged from 89-115 degrees Fahrenheit (NOAA, 2025). Based on the ideal temperatures for conducting focused surveys (65-90 degrees Fahrenheit) outlined in the *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (CDFW, 2023b), the high daily temperatures on BIG are not suitable for Crotch's bumble bee.

Based on a lack of evidence of an extant population occurring within the vicinity and region, the low diversity and abundance of available nectar sources, and the high daily temperatures during the peak Colony Active Period, Crotch's bumble bee has no potential to occur within BIG and will not be discussed further in this report.

### *Desert Tortoise*

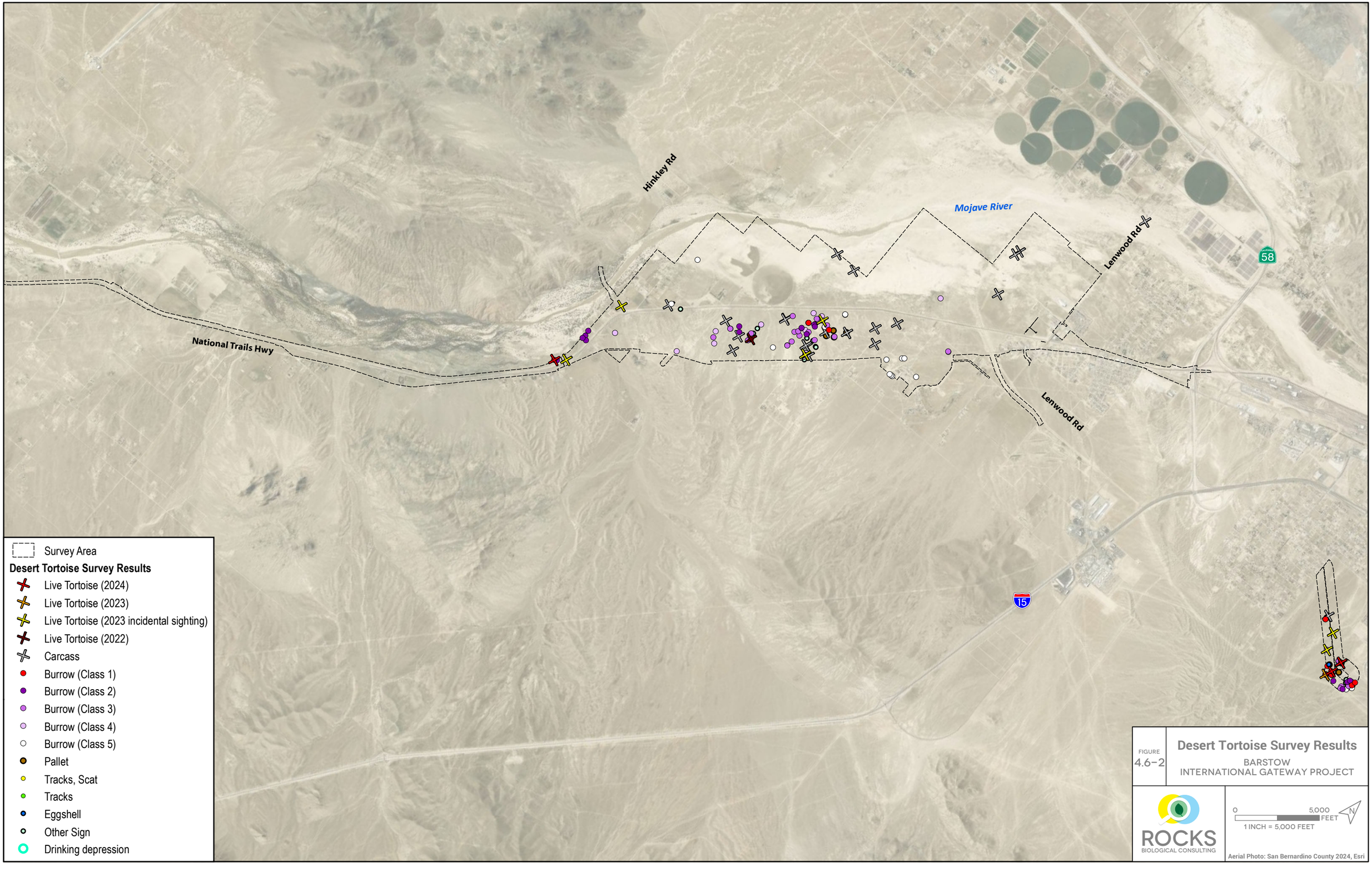
#### Life History

Desert tortoise is federally and state-listed as threatened. This species ranges across the Mojave, Sonoran, and Colorado deserts and occupies desert scrub, desert washes, and Joshua tree woodland habitats at elevations between below sea level to 7,220 feet (Zeiner et al., 1990). Desert tortoise is most active between March and June and may remain active year-round dependent on food availability and environmental conditions. This species excavates burrows in friable soils, often under shrubs and on slopes, to provide shelter and serve as a nest. Desert tortoise primarily feed on annual forbs and grasses.

This species is preyed upon by common raven (*Corvus corax*), raptors, and mammals, and is most vulnerable when young. Human presence and development can cause an increase in predator populations by providing supplementary food sources (e.g., human food waste); desert tortoises are threatened by increased predation near human development. Desert tortoise is also threatened by the destruction of, or disturbance to, desert scrub habitat and by poaching (Zeiner et al., 1990). The discussion below includes the results of the focused presence/absence surveys for desert tortoise within BIG. Unless otherwise indicated, all desert tortoise observed during surveys are considered adult desert tortoise, with a carapace length of 180 millimeters or greater.

#### Survey Findings

Focused presence/absence surveys were conducted from 2021-2024. Initial BIG surveys were conducted in October 2021 over approximately 3,200 acres within BIG and included no buffer due to access restrictions outside of the BIG footprint (**Attachment J**). Although no live tortoise was observed directly during the 2021 survey, two Class 1 burrows and one Class 2 burrow were found within two meters of each other within the northern-central portion of the rail yard (Figure 4.6-2 Desert Tortoise Survey Results)**.** Another Class 2 burrow was observed within 118 meters of the previously mentioned burrow cluster. The proximity of these burrows makes it possible that they are all utilized by the same desert tortoise. Of the two Class 1 burrows observed, the western Class 1 burrow was likely occupied at the time of the survey due to the presence of fresh tracks and scat. If the western Class 1 burrow is used a proxy


Hinkley Rd
Mojave River
Lenwood Rd
Lenwood Rd
National Trails Hwy
58
15
Survey Area
Desert Tortoise Survey Results
Live Tortoise (2024)
Live Tortoise (2023)
Live Tortoise (2023 incidental sighting)
Live Tortoise (2022)
Carcass
Burrow (Class 1)
Burrow (Class 2)
Burrow (Class 3)
Burrow (Class 4)
Burrow (Class 5)
Pallet
Tracks, Scat
Tracks
Eggshell
Other Sign
Drinking depression
FIGURE
4.6-2
Desert Tortoise Survey Results
BARSTOW
INTERNATIONAL GATEWAY PROJECT
ROCKS
BIOLOGICAL CONSULTING
0
5,000
FEET
1 INCH = 5,000 FEET
N
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Moderate-Quality DETO Habitat

Low-Quality DETO Habitat

Unsuitable DETO Habitat




Key Map

FIGURE 4.6-2A

## Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

N

Date: 8/25/2025

Aerial Photo: San Bernardino County 2020, Esri

Project Site

Desert Tortoise Survey Area

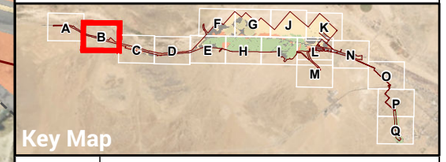
**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Moderate-Quality DETO Habitat

Low-Quality DETO Habitat

Unsuitable DETO Habitat




Key Map

FIGURE
4.6–2B

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

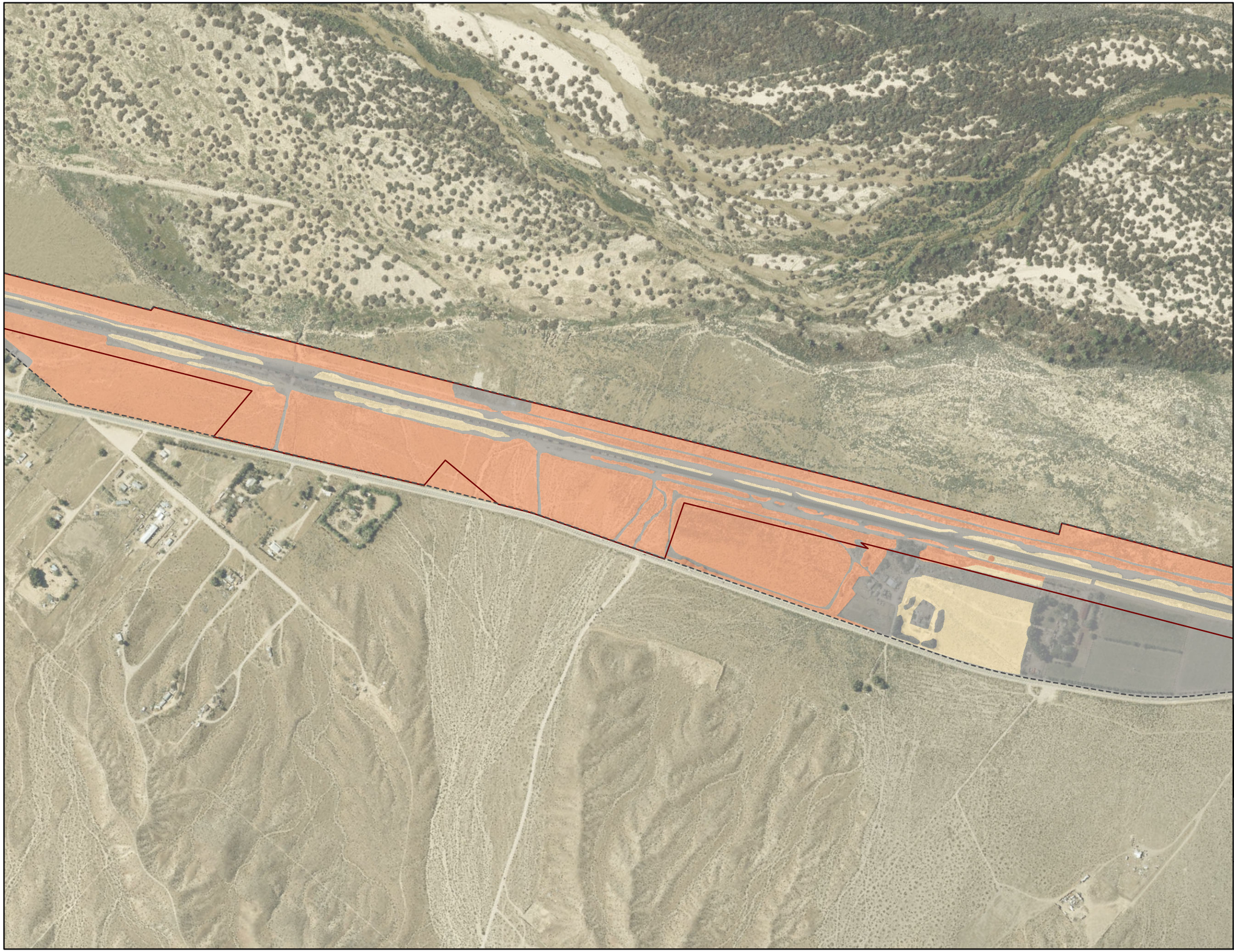
0 600 FEET

1 INCH = 600 FEET

N

Date: 8/25/2025

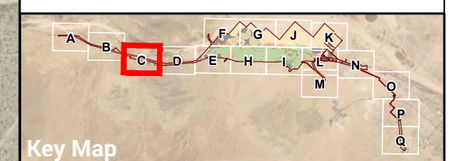
Aerial Photo: San Bernardino County 2020, Esri



Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




Key Map

FIGURE
4.6-2C

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri

Project Site

Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

Moderate-Quality DETO Habitat

Low-Quality DETO Habitat

Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2024)

Burrow (Class 1)




Key Map

FIGURE
4.6-2D

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

N

Date: 8/25/2025

Aerial Photo: San Bernardino County 2020, Esri




Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2024)
Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 1)
Burrow (Class 2)
Burrow (Class 4)
Other Sign

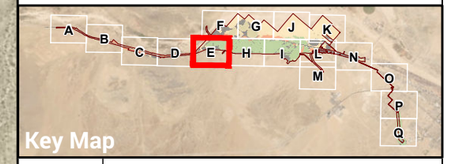



FIGURE
4.6-2E

**Desert Tortoise Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri

Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 5)

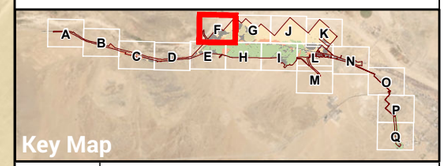



FIGURE
4.6-2F

# Desert Tortoise Survey Results

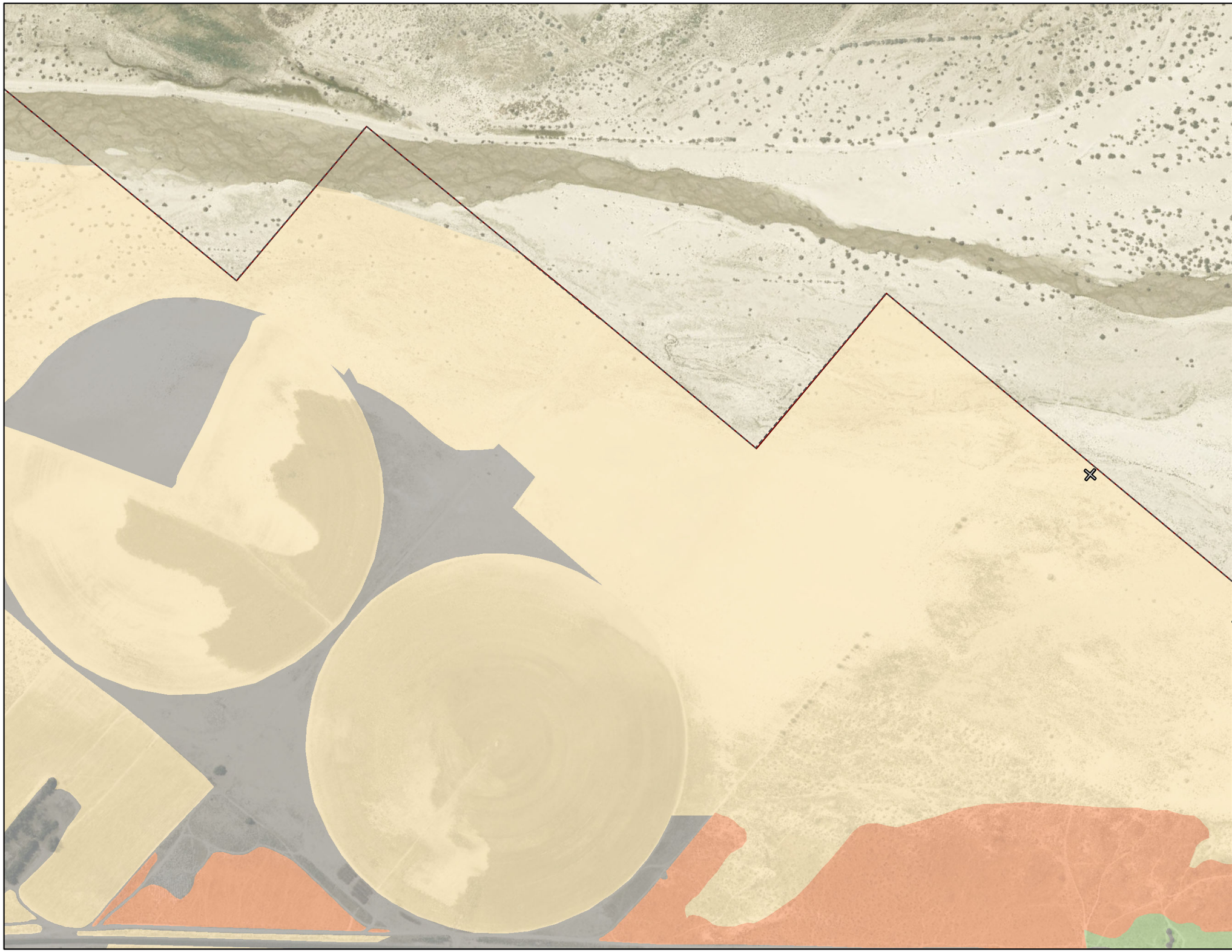
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri



Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Carcass




Key Map

FIGURE
4.6-2G

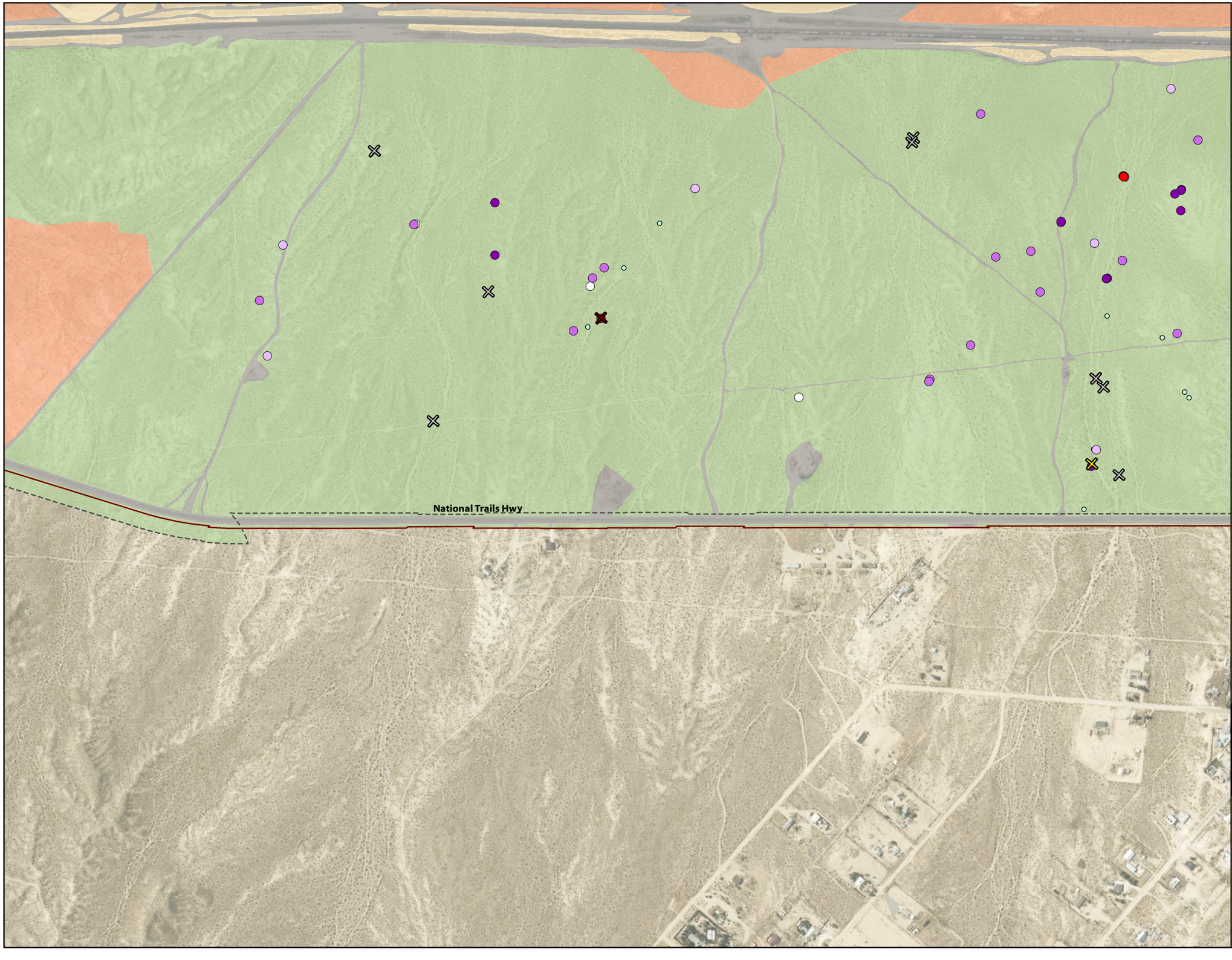
## Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri




Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2023 incidental sighting)
Live Tortoise (2022)
Carcass
Burrow (Class 1)
Burrow (Class 2)
Burrow (Class 3)
Burrow (Class 4)
Burrow (Class 5)
Other Sign

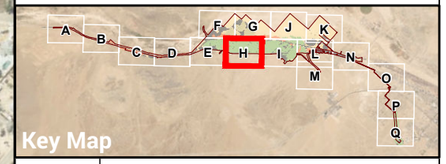



FIGURE
4.6-2H

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri



Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 1)
Burrow (Class 3)
Burrow (Class 4)
Burrow (Class 5)
Pallet




Key Map

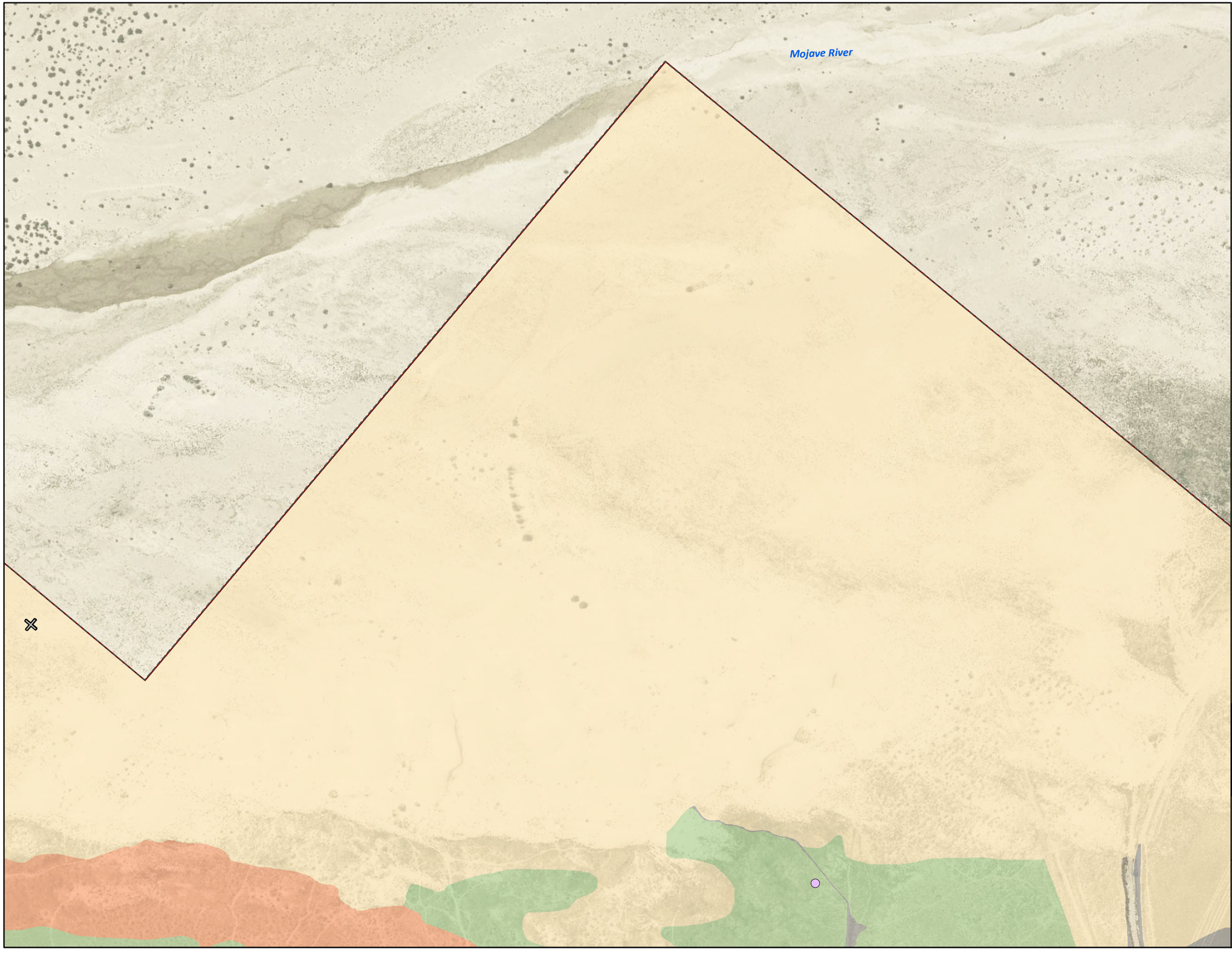
FIGURE
4.6-21

**Desert Tortoise Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri




Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Carcass
Burrow (Class 4)

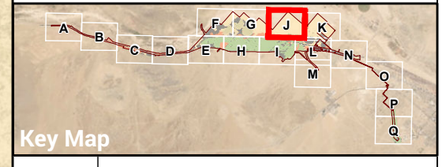



FIGURE
4.6-2J

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri

Lenwood Rd

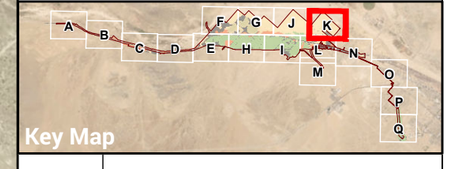
Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Carcass



Key Map

FIGURE
4.6-2K

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri

Project Site

Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Moderate-Quality DETO Habitat

Low-Quality DETO Habitat

Unsuitable DETO Habitat




FIGURE
4.6-2L

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

Date: 8/25/2025

Aerial Photo: San Bernardino County 2020, Esri



Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




Key Map

FIGURE
4.6-2M

## Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri

Project Site

Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Low-Quality DETO Habitat

Unsuitable DETO Habitat




Key Map

FIGURE
4.6-2N

**Desert Tortoise Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

N

Date: 8/25/2025

Aerial Photo: San Bernardino County 2020, Esri




Project Site

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Unsuitable DETO Habitat

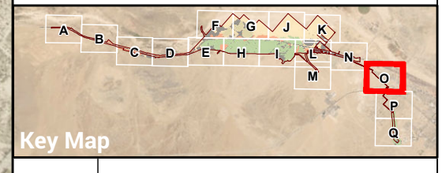



FIGURE
4.6-20

# Desert Tortoise Survey Results

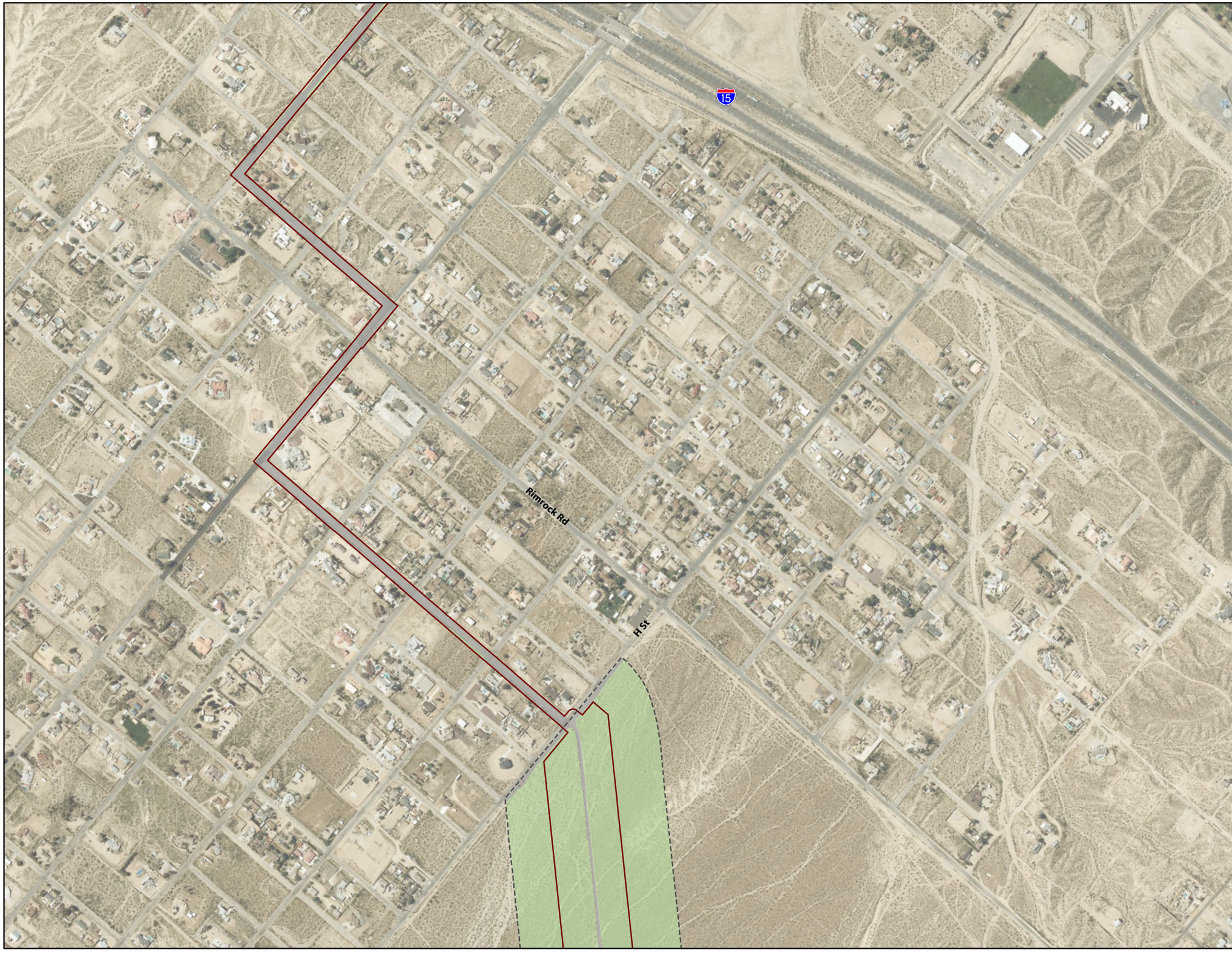
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri




Project Site

Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Moderate-Quality DETO Habitat

Low-Quality DETO Habitat

Unsuitable DETO Habitat

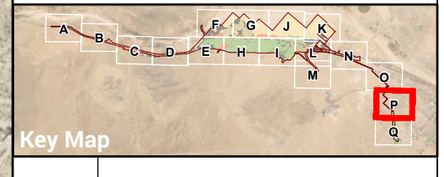



FIGURE
4.6-2P

**Desert Tortoise Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET

**1 INCH = 600 FEET**

N

Date: 8/25/2025

Aerial Photo: San Bernardino County 2020, Esri

Project Site
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2024)
Live Tortoise (2023)
Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 1)
Burrow (Class 2)
Burrow (Class 3)
Burrow (Class 4)
Burrow (Class 5)
Pallet
Eggshell
Other Sign



Key Map

FIGURE
4.6-20

# Desert Tortoise Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/25/2025
Aerial Photo: San Bernardino County 2020, Esri

for a live desert tortoise, then the USFWS statistical model estimates approximately 2.26 desert tortoise were within the 3,200-acre portion of BIG (**Attachment J**).

As authorization to access additional land within BIG was obtained, another focused presence/absence survey was conducted during February of 2022 over a 545-acre survey area that had not been previously surveyed (**Attachment K**). An adult desert tortoise and a Class 1 burrow were observed within two meters of each other in the central-southwestern portion of the rail yard boundary (Figure 4.6-2). These observations were located approximately 1,000 meters southwest of the burrow cluster observed in October of 2021. Using the USFWS statistical model, it is estimated that approximately 2.17 desert tortoise were within the 545-acre survey area (**Attachment K**).

Access was then obtained for an additional 495 acres within BIG that had not been surveyed previously. These areas consisted of disjoint parcels throughout the transload warehouse center and the rail yard. Focused presence/absence surveys over the 495-acre survey area were conducted in May 2022 and resulted in zero live tortoise and no Class 1 burrows (**Attachment L**; Figure 4.6-2). Off-site improvements were added to BIG, specifically the lead track extension, totaling approximately 246 acres. Upon gaining access for this area, focused presence/absence surveys were conducted and resulted in zero live tortoise and no desert tortoise sign in the 246-acre survey area (**Attachment M**).

Non-contiguous parcels totaling approximately 588 acres within the rail yard, transload warehouse center, and off-site improvements had not been surveyed during the 2021 and 2022 due to access constraints. Of the 588 acres, 233 acres occurred on developed land or private residences and were unsuitable for desert tortoise (**Attachment N**). Access was obtained in 2023, and focused presence/ absence surveys were conducted on the remaining 355 acres in May, September, and October of 2023. No live tortoise and no desert tortoise sign were observed within the 355-acre survey area.

Focused presence/absence surveys were conducted for the Tortilla Substation improvements plus a 500-foot buffer in October of 2023 (**Attachment O**). Although no sign or live tortoise were observed along the transmission corridor and 500-foot buffer, one live tortoise and seven Class 1 burrows were observed within the 500-foot buffer surrounding the substation (Figure 4.6-2). Due to the small size and linear nature of the Tortilla Substation improvements, the USFWS statistical model does not apply and the approximate abundance of desert tortoise within the Tortilla Substation cannot be reliably calculated.

In April and May of 2024, focused presence/absence surveys were conducted within new project areas not previously surveyed before, totaling approximately 157 acres, which included the solar farm and various non-contiguous areas. No live desert tortoise, sign, or active desert tortoise burrows were observed during the survey (**Attachment P**).

Focused presence/absence surveys were repeated for the entirety of the project site and some buffer areas (except for the areas surveyed in April and May of 2024). The survey resulted in the documentation of three adult desert tortoises outside of the project site: two tortoises were observed within the buffer of the Tortilla Substation work area, and one was observed in the buffer of the southwestern lead track extension (**Attachment Q**). No tortoises were observed within the approximately 4,500-acre proposed rail yard and transload warehouse center. However, one Class 1 burrow and several Class 2 burrows were

observed in the railyard, indicating that at least one tortoise is present in this area. One 125-millimeter midline carapace length subadult tortoise Class 2 carcass was observed approximately 50 meters from where a similar sized tortoise was observed during 2023 surveys. This is likely the same individual observed in 2023. Biologists also recorded 4 Class 1 desert tortoise burrows, 19 Class 2 desert tortoise burrows, and four Class 3 desert tortoise burrows. A total of 13 Class 4 and 5 "possible" desert tortoise burrows were also identified. Desert tortoise scat, carcasses, and tracks were also identified and recorded (**Attachment Q**).

Incidental observations of desert tortoise were also recorded during other focused species surveys in 2023 (Figure 4.6-2). An adult tortoise was observed walking northward across Hinkley Road into mowed private property during pass 1 of 2023 burrowing owl surveys. Another incidental observation included an adult tortoise observed in the southern portion of the rail yard also during pass 1 of the 2023 burrowing owl surveys; this observation is approximately 1,200 feet south from the Class 1 burrow observed during the October 2021 focused presence/absence survey. An adult tortoise was also later observed in another burrow approximately 400 feet away from the October 2021 Class 1 burrow observation on both passes 3 and 4 of the 2023 focused burrowing owl survey; these incidental observations may be the same tortoise which was assumed present within the October 2021 Class 1 burrow. A sub-adult desert tortoise was observed during pass 4 of the 2023 focused burrowing owl surveys, approximately 300 feet northwest of Route 66 in the southern portion of the rail yard. A live tortoise was also incidentally observed adjacent to the existing tracks in the western portion of the lead track extension in August of 2023. During focused burrowing owl surveys of the Tortilla Substation improvements in 2023, a tortoise was observed adjacent to the transmission corridor on pass 1; a tortoise was observed in a Class 1 burrow on pass 3 approximately 500 feet southwest of the southern portion of the transmission corridor; and one tortoise was observed approximately 250 feet southwest of the central portion of the transmission corridor and another tortoise was observed approximately 300 feet northwest of the substation fence on pass 4 (**Attachment H**).

Complete survey results are presented in **Attachments J - Q** and all survey results, including the location of all live tortoise, sign, and burrows observed during surveys are depicted in Figure 4.6-2.

### Habitat Suitability

Suitability of desert tortoise habitat was preliminarily assessed prior to desert tortoise focused surveys. Habitat suitability assessments were further refined during focused desert tortoise surveys and during 2024 vegetation mapping. Areas within BIG vary in suitability to support desert tortoise, from high to very low suitability.

All on-site desert tortoise observations, sign, and class 1-3 burrows occur within the non-disturbed subtypes of creosote bush scrub (1,288.0 acres) and desert saltbush scrub (184.2 acres). The on-site creosote bush scrub is highly suitable for desert tortoise based on the presence of friable soils, perennial shrubs for extreme temperature or predator refuge, presence of burrows, healthy vegetation, and soil conditions suitable for forage species plant growth. Forage plant species are present throughout this vegetation community, including *Cryptatha* sp., desert plantain (*Plantago ovata*), and desert dandelion. Creosote bush scrub at the Tortilla Substation supports a higher diversity of native annuals in the herbaceous layer, which desert tortoise are known to consume, including Fremont pincushion*, Phacelia*

sp., checker fiddleneck, little gilia (*Gilia minor*), and desert lantern, in addition to the taxa listed above. On-site desert saltbush scrub is highly suitable for desert tortoise based on the presence of perennial shrubs which offer predator and heat refuge, annual forage plants, and friable soils, and the absence of significant anthropogenic disturbances. A total of 1,472.3 acres of creosote bush scrub and desert saltbush scrub within BIG are considered high-quality habitat for desert tortoise. Please note that the disturbed subtypes of these vegetation communities, as described in Table 6, are not considered high-quality desert tortoise habitat.

Portions of desert saltbush scrub and creosote bush scrub communities are considered moderately suitable for desert tortoise within BIG and include 251.5 acres of desert saltbush scrub (16.4 acres of *Ambrosia dumosa* shrubland alliance and 235.1 acres) and 120.9 acres of creosote bush scrub (*Larrea tridentata* shrubland alliance). Despite the presence of dirt roads and non-native grass cover, *Ambrosia dumosa* shrubland alliance is still moderately suitable for desert tortoise due to the presence of friable soils, shrub cover to provide protection from predators and temperature extremes, and soils that support native forb growth. These portions of desert saltbush scrub and creosote bush scrub are also moderately suitable for desert tortoise due to the presence of perennial shrubs for heat and predator refuge, friable soils, and annual forage plants. A total of 372.4 acres of desert saltbush scrub and creosote bush scrub within BIG are considered moderate-quality habitat for desert tortoise; desert tortoise and sign were not observed during focused surveys in these areas.

The remaining habitat within the project site has low suitability for desert tortoise, including disturbed desert saltbush scrub, non-native grassland, active desert dunes, stabilized and partially stabilized desert dunes, disturbed and partially stabilized desert dunes, disturbed creosote bush scrub, tamarisk scrub, and unvegetated channel, for a total of 2,151.2 acres of low-quality habitat. These habitats have low potential to support desert tortoise and are considered low-quality within BIG due to the following:

- Disturbed saltbush scrub:
    - Contains compacted soils throughout the majority of its extent, is fragmented or adjacent to development, and has numerous disturbances including OHV use and non-native plant colonization.
    - Located adjacent to the railroad and is dominated by non-native plants, including Russian thistle at 10-25% cover and Mediterranean grass at 30% cover.
- Non-native grassland lacks native vegetation and has experienced heavy disturbances from previous agricultural use.
- Active desert dunes lack suitable shrub cover, friable soils, and soils that support native forbs.
- Disturbed stabilized and partially stabilized dunes lack suitable scrub cover and friable soils.
- Stabilized and partially stabilized dunes lack suitable scrub cover and friable soils.
- Disturbed creosote bush scrub:
    - Occurs on the project site in fenced in yards or immediately adjacent to development, has experienced significant disturbances, and lacks sufficient native plant cover.

- Highly disturbed, fenced, and lacks annual forage plants.

Developed land contains little to no native vegetation and graded, paved, or highly disturbed soils. Disturbed habitat has minimal vegetative cover or is dominated by non-native plants, highly compacted soils, and substantial human disturbance. Tamarisk scrub lacks friable soils, native plants and vegetation, and soils suitable for native forb growth. These three land covers and habitats are not suitable for desert tortoise.

### *Least Bell's Vireo*

#### Life History

Least Bell's vireo is federally and state-listed as endangered. Historically, this species was a common summer visitor to riparian habitat throughout much of California. This species is now found only in riparian woodlands in southern California, with the majority of breeding pairs found in San Diego, Santa Barbara, and Riverside Counties.

Although this species is less frequent in San Bernardino County, especially east of the Transverse Ranges, least Bell's vireo has been documented in desert washes in the vicinity of Barstow eight miles downstream from BIG, and in Palisades Ranch nine miles upstream (eBird, 2025). Least Bell's vireo is a migratory species and typically arrives in southern California in late March or early April and leaves for its wintering ground in September. This species is restricted to riparian woodland and is most frequent in areas that include an understory of dense young willows (*Salix* spp.) or mulefat (*Baccharis salicifolia*) with a canopy of tall willows. Least Bell's vireo typically builds nests along edges of riparian thickets (Unitt, 2004) approximately three feet above the ground.

#### Survey Findings

No least Bell's vireo were documented within BIG or suitable habitat within the 1,000-foot survey buffer during focused surveys conducted in 2021, 2022, and 2023. Complete survey results are presented in **Attachments R - T**).

#### Habitat Suitability

Marginally suitable habitat is present within BIG in the form of tamarisk thickets mapped within and around the Hinkley Road Bridge, as well as patches of tamarisk thickets within and surrounding the southwestern portion of the off-site improvements. Although black willow (*Salix gooddingii*), the preferred habitat association of least Bell's vireo, occurs within the Mojave River corridor in the vicinity of BIG, it has a limited distribution within the total cover of riparian vegetation (Figure 4.6-3. Riparian Birds Survey Results). Considering the negative results of the focused surveys conducted in 2021, 2022, and 2023, least Bell's vireo is not anticipated to migrate through BIG or nest within BIG.

### *Southwestern Willow Flycatcher*

#### Life History

All willow flycatcher (*Empidonax traillii*) subspecies occurring in California are listed as endangered under CESA. However, only the subspecies southwestern willow flycatcher is federally listed as endangered. Subspecies of willow flycatcher are very similar in appearance and can be identified by subtle differences

Project Site
Southwestern Willow Flycatcher/ Western Yellow-billed Cuckoo Survey Area
Least Bell's Vireo Survey Area
1,000-ft Buffer from Project Site

**Vegetation**
Black Willow Thickets
Fourwing Saltbush Scrub
Honey Mesquite Stand
Tamarisk Thickets
Developed

**2022 Survey Observations**
2 Individual Willow Flycatchers (5/17/22 & 5/31/22)
Individual Willow Flycatcher (5/17/22)
Individual Willow Flycatcher (5/18/22)
Individual Willow Flycatcher (LBVI Survey 5/20/22)
Individual Willow Flycatcher (LBVI Survey 5/20/22, 6/1/22 & 6/15/22)
2 Individual Willow Flycatchers (6/3/22)
Individual Willow Flycatcher (6/3/22)
2 Individual Willow Flycatchers (YBCU Survey 8/11/22)
Individual Willow Flycatcher (YBCU Survey 8/11/22)

**2023 Survey Observations**
Individual Yellow-billed Cuckoo (7/3/23)

Hinkley Rd
Mojave River
Burlington Northern Santa Fe
Jiggs Rd
Main St

Map Extent
15

FIGURE 4.6-3

# Riparian Birds Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 1,800 FEET
1 INCH = 1,700 FEET
N

Date: 8/25/2025
Aerial Photo: San Bernardino County, Esri 2024

in color and morphology (Unitt, 1987); the southwestern willow flycatcher is generally paler than other willow flycatcher subspecies (Sogge et al., 2010). Breeding location can also be used to help differentiate subspecies; if detected, any breeding willow flycatcher in BIG would be assumed to be southwestern willow flycatcher as other subspecies do not nest in this region. The breeding season of southwestern willow flycatcher extends from approximately May 15th through July 16th, with peak nesting activity typically occurring in mid-June (Unitt, 1998).

The southwestern willow flycatcher breeds throughout much of the southwestern United States in riparian woodland and forest, typically adjacent to or even over water. Surface water or saturated soil is usually present in or adjacent to southwestern willow flycatcher nesting sites. Southwestern willow flycatcher uses riparian woodland that has a canopy and an understory of shrubs or saplings. Typically, the habitat is dominated by willows though southwestern willow flycatcher has also been documented breeding within habitats composed of alder (*Alnus* spp.), ash (*Fraxinus* spp.), coast live oak (*Quercus agrifolia*), and even stands of non-native tamarisk (*Tamarix* spp.). Because southwestern willow flycatcher frequently nests adjacent to water, aquatic plants such as cattail (*Typha* spp.) and bulrush (*Schoenoplectus* spp.) are also typical of southwestern willow flycatcher habitat.

In southern California, southwestern willow flycatcher was once widespread in riparian woodland, though the subspecies declined in population precipitously in the 20th century, becoming restricted to small, scattered populations along the South Fork Kern River, the Santa Ynez River, the Santa Margarita River near Camp Pendleton, and the San Luis Rey River (Unitt, 1998). Loss and degradation of riparian habitat and brood-parasitism by the invading brown-headed cowbird (*Molothrus ater*) are attributed to the decline of southwestern willow flycatcher (Unitt, 1987).

**Survey Findings**

During the 2022 focused southwestern willow flycatcher surveys, several willow flycatchers were observed during the first two surveys passes, and incidentally until June 15 during 2022 focused least Bell's vireo surveys (**Attachment Z;** Figure 4.6-3)**.** No evidence of breeding was observed, and willow flycatchers observed from May 15 to June 24 are considered migrants unless breeding; therefore, these individuals were assumed to be migrants and not nesting southwestern willow flycatcher. Another three willow flycatchers were incidentally observed on August 11 during 2022 focused yellow-billed cuckoo surveys. It is undetermined whether these individuals were southwestern willow flycatcher that bred locally and were observed during post-breeding dispersal or if they were migrating willow flycatchers. Although no willow flycatchers were observed in 2023, the subspecies of southwestern willow flycatcher still has low-to-moderate potential to occur. Complete survey results are presented in **Attachments Y - AA**.

**Habitat Suitability**

Although willow flycatcher was observed within the 1,000-foot buffer of the southwestern portion of the off-site improvements in 2022, it has a low-to-moderate potential to migrate through marginally suitable habitat within the southwestern portion of BIG. It is also still possible for southwestern willow flycatcher to migrate through the southwestern portion of BIG; southwestern willow flycatcher has low-to-moderate potential to occur. Although there may be suitable willow and cottonwood (*Populus* spp.)-dominated

breeding habitat preferred by willow flycatcher upstream of BIG, willow flycatcher was not observed breeding during focused surveys conducted from 2021 to 2023. Marginally suitable nesting habitat is present within BIG in the form of tamarisk thickets mapped within and around the Hinkley Road Bridge, as well sparsely distributed tamarisk thickets and small pockets of black willow thicket within and surrounding the southwestern portion of the off-site improvements (Figure 4.6-3). Willow flycatcher also prefer riparian habitat with perennially flowing water for breeding as opposed to the typically ephemeral nature of the Mojave River in the vicinity of BIG. Willow flycatcher, including southwestern willow flycatcher, has low-to-moderate potential to nest on site.

### *Swainson's Hawk*

#### Life History

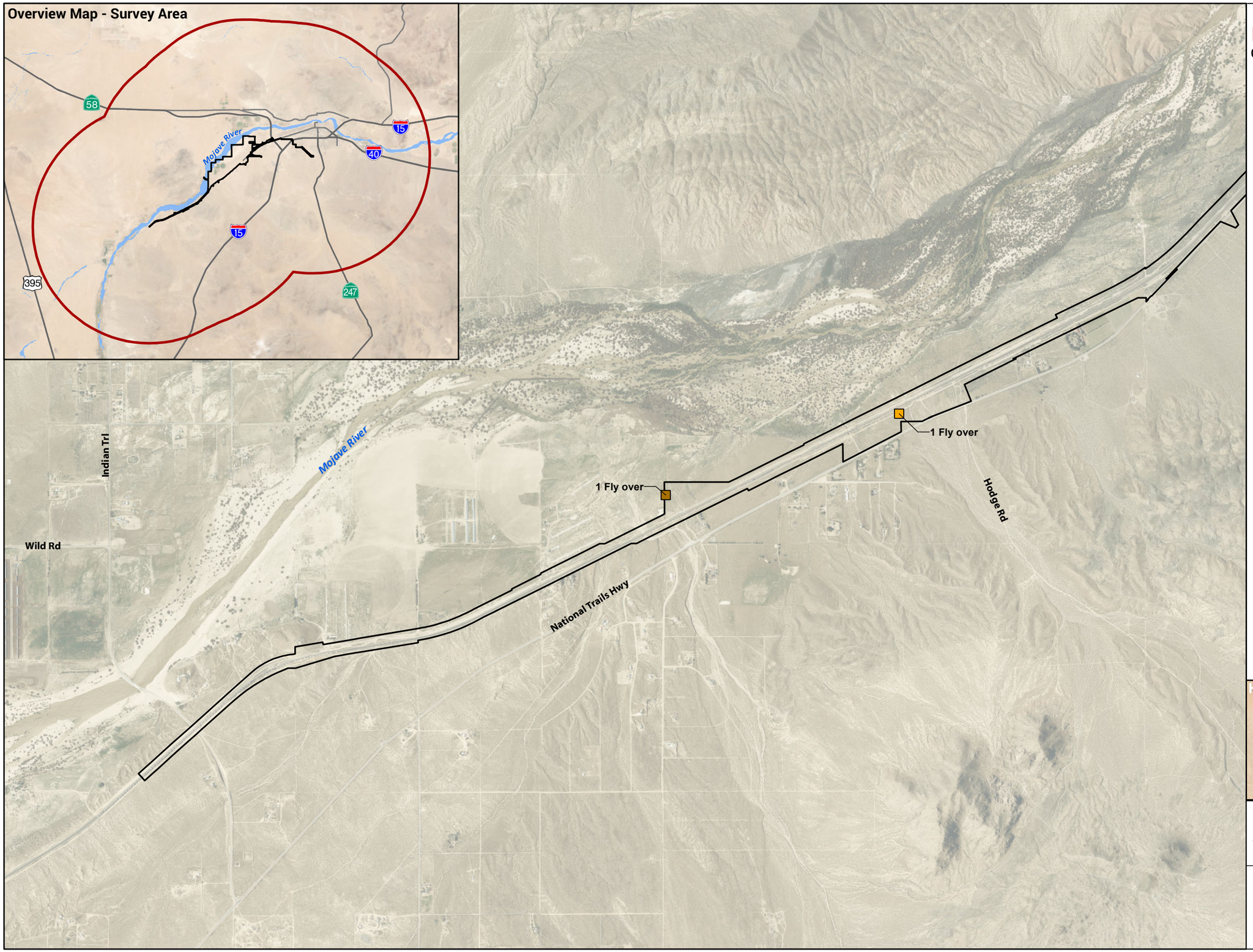
Swainson's hawk is state-listed as threatened. Historically common, populations in southern California have diminished largely due to the destruction of nesting habitat. Current breeding occurs in the Central Valley, in sparsely foliated juniper-sage flats, riparian areas, ornamental windbreaks near agricultural fields, and oak savannahs, and throughout the Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Infrequent breeding also occurs across Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley. August through September, Swainson's hawk migrates from North America, south to Argentina, returning to the northern hemisphere to nest March through August. Swainson's hawk migrates south through central and southern California in September and October, travelling towards northern California March through May (Zeiner et al., 1988-1990).

Nesting occurs in trees and shrubs or on top of utility poles in proximity to foraging sites. In urban areas across the Central Valley, Swainson's hawk prefers mature coniferous trees (England et al., 1995). In southern California, nesting is known to occur in cottonwoods and sycamores (*Platanus* sp.; Unitt, 2004). Accessibility to foraging habitat is positively correlated with nesting, particularly in urban areas (England et al., 1995). Grasslands, open desert, or agricultural fields with sparsely dispersed trees are essential for hunting prey, which include rodents, lagomorphs, ground squirrels, and arthropods. Roosting occurs in large trees, if available near foraging grounds, or within grasses (Zeiner et al., 1988-1990). Swainson's hawk is primarily threatened by loss of mature riparian breeding habitats, conversion of high-quality foraging habitat to incompatible land uses, and pesticide poisoning (Woodbridge, 1998).

#### Survey Findings

Several Swainson's hawks were incidentally observed kettling and flying over the southwestern portion of the proposed off-site improvements and the northeastern portion of the transload warehouse center in June 2023 during focused riparian bird surveys (**Attachments T, AA, and EE,** Figure 4.6-4. Swainson's Hawk Survey Results). Swainson's hawk hasn't been known to occur in the local area until recently. The species has been documented near open desert in Barstow at the community college approximately half a mile northeast of Tortilla Substation, as well as at Tees and Trees golf course approximately four miles northeast of Tortilla Substation (eBird, 2025).

During focused surveys conducted in 2024, a total of six Swainson's hawks were observed flying through the project site near Hinkley Bridge. These individuals were observed in flight only once; therefore, it is assumed they were migrating through the survey area. Swainson's hawks were not observed within the




Project Site

Swainson's Hawk Survey Area (10-mile Buffer)

**Observations**

Swainson's Hawk 5/2023

Swainson's Hawk 4/2023

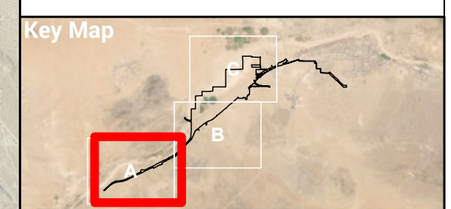



FIGURE
4.6-4A

# Swainson's Hawk Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

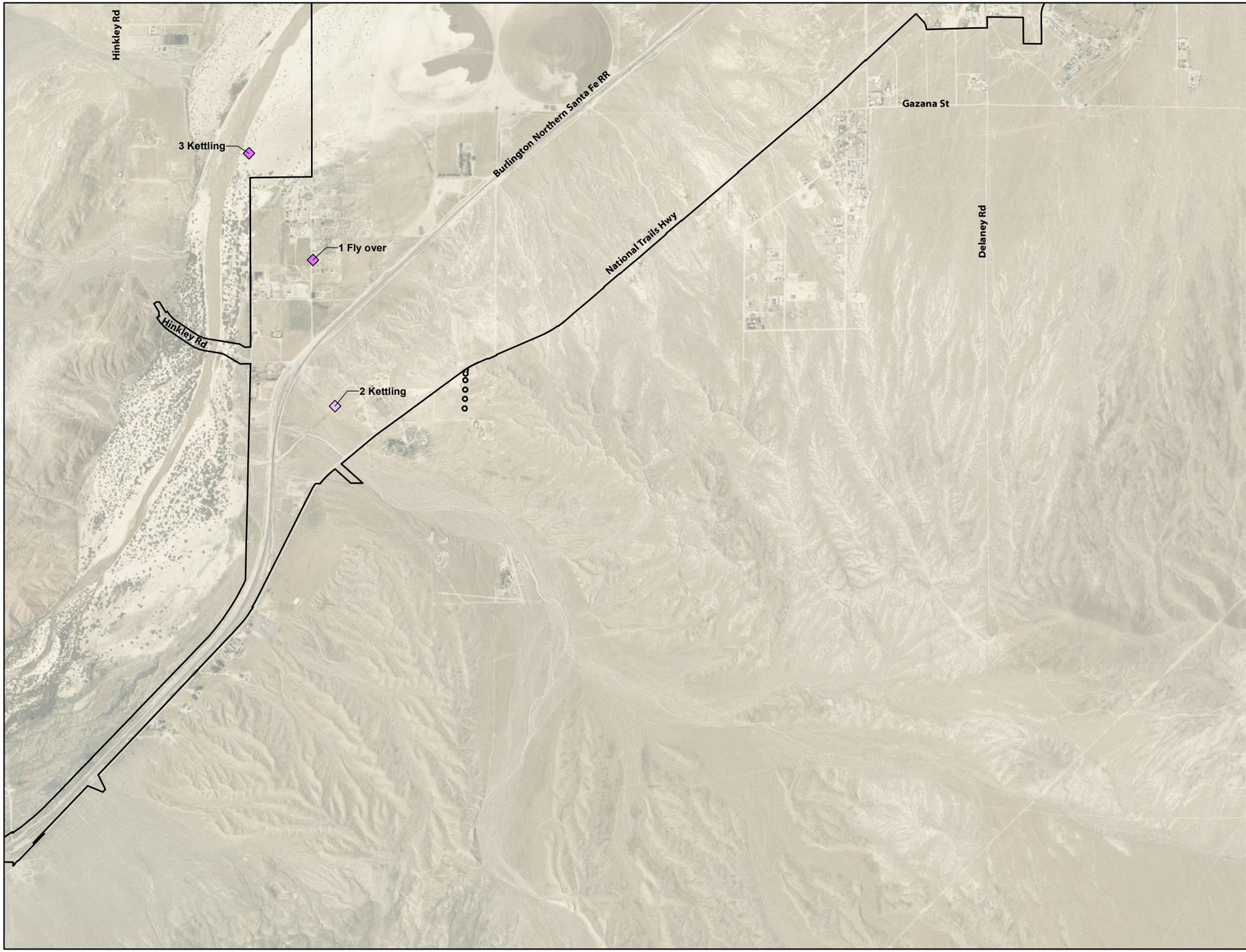
ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET

1 INCH = 2,000 FEET

N

Date: 8/25/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012




Project Site

**Observations**

- Swainson's Hawk 4/2024
- Swainson's Hawk 3/2024

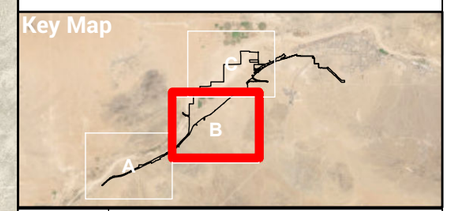



FIGURE
4.6-4B

**Swainson's Hawk Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET

**1 INCH = 2,000 FEET**

Date: 8/25/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012

Community Blvd

2 Perched

1 Perched
1 Perched
1 Perched

1 Perched
1 Perched
1 Perched
2 Perched

4 Perched, 2 Foraging
1 Perched
1 Perched, 2 Foraging
2 Perched
1 Perched
2 Incubating, 3 Nesting Chicks
1 Perched
1 Perched
1 Perched
1 Perched
1 Kettling

1 Perched
1 Perched
1 Perched

1 Perched
2 Kettling
2 Perched
1 Perched
1 Perched
1 Perched

Mojave River

Lenwood Rd

1 Perched

1 Kettling
1 Kettling

1 Kettling
1 Kettling

Oak Grove Rd

Cannae Rd

1 Fly Over

Sweeten Ln

Mojave River

Project Site

**Observations**

- Swainson's Hawk 7/2025
- Swainson's Hawk 6/2025
- Swainson's Hawk 4/2025
- Swainson's Hawk 3/2025
- Swainson's Hawk 7/2024
- Swainson's Hawk 6/2024
- Swainson's Hawk 4/2024
- Swainson's Hawk 3/2023
- Swainson's Hawk Nest

Key Map

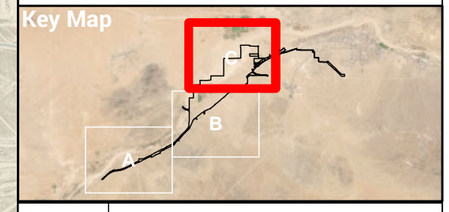



FIGURE
4.6-4C

# Swainson's Hawk Survey Results

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/25/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012

survey area during any of the other 2024 surveys. However, approximately one mile north of the BIG footprint, a Swainson's hawk pair was confirmed nesting in a mature Chinese elm (*Ulmus parvifolia*) tree adjacent to an agricultural field at the intersection of Community Boulevard and Dixie Road. (**Attachment BB**; Figure 4.6-4). Land uses surrounding this 2024 nesting site include active agricultural fields, dairy farms, and undeveloped land in all cardinal directions, including up to as far as 1.15 mile to the northwest. The pair successfully fledged two chicks from this nest site in 2024.

Recent 2025 focused surveys have documented two to 13 (and possibly up to 15) unique Swainson's hawk individuals foraging in agricultural fields north of the BIG footprint near the 2024 nesting site; the amount of Swainson's hawks observed varied throughout each individual survey and across surveys. During the second survey, March 27, 2025, approximately 13 unique individuals were recorded kettling over the agricultural fields adjacent to the nest tree. During the third survey, a maximum of five Swainson's hawks were observed on a sprinkler system off Dixie Lane, near the 2024 nest tree. Only two adult Swainson's hawks, (i.e., the breeding pair) were observed during surveys four through six. This pair of Swainson's hawks was recorded nesting approximately one mile north of the project site at the same nest tree as observed in 2024. During these final three surveys, the female Swainson's hawk consistently perched in the nest tree, foraged in the adjacent alfalfa fields, and delivered prey to the nest. The male was often recorded perching in a tree snag near Dixie Lane, fending off ravens, and also foraging in the nearby agricultural fields. RBC only observed Swainson's hawk foraging activity in the active agricultural fields adjacent to the active nest; no foraging activity was recorded on the BIG project site. Complete survey results are presented in **Attachments BB - CC.**

The three chicks from the Swainson's hawk pair were recorded and banded on Monday, June 30, 2025, by Dr. Pete Bloom; two fledglings were recorded branching in the nest tree and perched on a sprinkler system near the nesting site, respectively, on July 17, 2025. Swainson's hawk were also observed flying north over dune habitat in the northern project footprint during 2025 focused special plants surveys.

#### Habitat Suitability

The agricultural fields north of BIG provide high quality foraging habitat for Swainson's hawk, as evidenced by nearby nesting in 2024, 2025, and continued foraging activity in the area. Agricultural fields, particularly with alfalfa cultivation, provide reliable and concentrated access to prey species for Swainson's hawks (Estep, 1989). Although the BIG footprint supports suitable open foraging habitat, 2025 survey results indicate that Swainson's hawk is selectively foraging in the agriculture fields versus the natural communities within the BIG footprint. Scattered cottonwoods and other native trees within Mojave River corridor as well as mature ornamental trees throughout BIG may provide suitable nesting habitat for this species; however, suitable nesting trees are also available adjacent to the off-site high-quality agricultural foraging habitat and Swainson's hawk has never been documented nesting within the BIG footprint.

### *Tricolored Blackbird*

#### Life History

Tricolored blackbird is state-listed as threatened. Historically, tricolored blackbirds were abundantly distributed across California, breeding throughout the Sacramento and San Joaquin valleys, the foothills of the Sierra Nevadas south to Kern County, the coastal slope from Sonoma County south to the Mexican

border, and the Modoc Plateau (Shuford et al., 2008a). With increased surveillance in 2008, additional breeding populations were discovered in the western Mojave Desert and along the coast north to Humboldt County. Currently, declines in colony size is cause for concern; Central Valley breeding populations documented in 1994 decreased to less than one percent of their magnitude by 2004. Leading threats to this species include conversion of foraging and nesting habitat to development, harvesting of crops containing large colonies, and predation by black-crowned night-herons (*Nycticorax nycticorax*) and common ravens (Shuford et al., 2008a).

Tricolored blackbirds nest in large colonies near open water in emergent marsh or riparian vegetation, in proximity to abundant insect prey. Primarily suitable nesting vegetation includes cattails, tules (*Scirpus* spp.), nettles (*Urtica* sp.), thistles (*Cirsium* sp.), willows, Himalayan blackberry (*Rubus discolor*), and less commonly, tamarisk, and cottonwood (Shuford et al., 2008a). The damming and diking of wetlands in the Central Valley has led tricolored blackbirds to rely on artificial habitats for nesting and foraging; in the San Joaquin Valley, grain and silage fields are commonly used. Tricolored blackbirds breed from mid-March to early August and migrate south from within their resident range (e.g., from Sacramento to the northern San Joaquin Valley) during winter months (Shuford et al., 2008a).

**Survey Findings**

A single tricolored blackbird was observed flying over the southwestern portion of the off-site improvements during 2023 focused riparian bird surveys (Figure 4.6-3).

**Habitat Suitability**

Riparian vegetation including tamarisk with small stands of black willow within BIG and 1,000-foot buffer may provide marginally suitable nesting habitat for this species; there are no patches of cattails (*Typha* sp.) or tules within BIG or 1,000-foot buffer which are preferred for nesting. Tricolored blackbird is not anticipated to nest on site or in the immediate surrounding areas; the single individual observed incidentally during 2023 riparian bird surveys was likely passing through the area. Higher quality habitat for tricolored blackbird occurs in the form of agricultural fields approximately one mile north of BIG, the Barstow Ponds approximately five miles east of BIG, and other agricultural areas/ponds near the Barstow-Dagget Airport.

### *Western Yellow-billed Cuckoo*

**Life History**

Western yellow-billed cuckoo is federally listed as threatened and state-listed as endangered. It inhabits riparian areas exclusively, typically nesting in low to moderate elevation riparian woodlands with native broadleaf trees (Hughes, 1999). The species is generally observed in cottonwood-willow-dominated habitats, though riparian cover can vary. In California, habitat often consists of willow species and Fremont cottonwoods (*Populus fremontii*) multi-structured riparian vegetation greater than 50 acres (20 hectares), 70 percent or more canopy cover, and a minimum width of 100 meters and connectivity to nearby habitats.

Western yellow-billed cuckoo is migratory and breeds throughout the southwestern United States between late May and early September. Historically, yellow-billed cuckoo breeding grounds stretched

from southern British Columbia to northwest Mexico (Hughes, 1999). Since the 1850s, western yellow-billed cuckoo populations have declined dramatically (Roberson, 1980; Gaines and Laymon 1984; Laymon and Halterman, 1987) and breeding cuckoos have been extirpated over much of the western range, including British Columbia, Oregon, and Washington (Hughes, 1999).

#### Survey Findings

One western yellow-billed cuckoo was heard vocalizing during focused surveys on July 3, 2023, within the 1,000-foot buffer of the southwestern off-site improvements (**Attachment EE;** Figure 4.6-3). The vocalizing individual was presumed to be alone and was heard repeatedly calling, likely in response to pre-recorded western yellow-billed cuckoo broadcast vocalization played throughout the focused survey. The individual western yellow-billed cuckoo repeatedly called for approximately 20 minutes before moving towards the Mojave River. It also appeared to forage on the numerous grasshoppers in the area. When the surveying biologist returned to the same area on July 4, 2023, the individual was not heard or seen again, nor during any subsequent survey visits. Due to the single observation, this individual was not likely breeding or nesting within the 1,000-foot buffer. Complete survey results are presented in **Attachments DD - EE.**

#### Habitat Suitability

Although this species has potential to breed within the Mojave River corridor such as the riparian habitat of Palisades Ranch approximately six miles upstream of BIG, marginally suitable habitat is present within BIG in the form of tamarisk thickets mapped within and around the Hinkley Road Bridge, as well as patches of tamarisk thickets within and surrounding the southwestern portion of the off-site improvements. Willow and cottonwood-dominated habitats with perennially flowing water is the preferred habitat of this species, which is absent from BIG and the immediate surrounding areas. Although detected during a single survey within the 2023 breeding season, the individual was likely a migrant passing through the areas. Considering the lack of preferred nesting habitat, western yellow-billed cuckoo has moderate potential to migrate through BIG and low potential to nest within BIG.

### *Mohave Ground Squirrel*

#### Life History

Mohave ground squirrel is state-listed as threatened. This species occurs in the Mojave Desert in portions of Inyo, Kern, Los Angeles, and San Bernardino Counties (Laabs, 2006). The Mojave River is recognized as the southeastern range limit of Mohave ground squirrel; however, the species has occurred beyond the Mojave River, as far as Lucerne Valley (Laabs, 2006). Mohave ground squirrel inhabits desert scrub, alkali desert scrub, and Joshua tree woodland habitats (Zeiner et al., 1990).

Mohave ground squirrel predominantly feeds on the leaves and seeds of forbs and shrubs, and less frequently consumes invertebrates. This species typically feeds on annual plant species when available, and perennial shrubs are consumed at a greater rate when annuals are not present (Laabs, 2006). The Mohave ground squirrel typically hibernates for five to eleven months annually, dependent upon environmental conditions; aestivation generally commences between April and September and concludes between January and March (Laabs, 2006).

Current research suggests that the eastern range of the species has shifted westward due to development pressure and habitat conversion in the west Mojave Desert (Leitner et al., 2017). Recent trapping studies in the Barstow region have not detected Mohave ground squirrel in the immediate vicinity of BIG, including surveys conducted in Barstow and Hinkley from 2013 to 2020 (Leitner et al., 2017). Additional trapping efforts conducted southwest of Barstow from 1998 to 2007 also yielded negative results for the species. Edwards Air Force Base has the closest known core population of the species which is approximately 30 miles west of BIG while there are recent observations in Hinkley Valley and Victor Valley (Leitner, 2021).

#### Survey Findings

Although BIG is located along the southeastern edge of the historic range for Mohave ground squirrel, the species was not documented within BIG during protocol trapping surveys conducted in 2022 and 2025 (Figure 4.6-5. Mohave Ground Squirrel Habitat Assessment and Trapping Locations). Suitable creosote bush scrub habitat for Mohave ground squirrel is present within BIG. However, Mohave ground squirrel is considered absent from BIG based on recent survey results and current literature. Complete habitat assessment and survey results are presented in **Attachments U - W**.

### *Western Burrowing Owl*

#### Life History

Burrowing owl is a CDFW SSC at nesting and some wintering sites, is a USFWS BCC, is federally protected by the MBTA, and was advanced to candidacy for listing under CESA in late 2024. As such it is treated as a state-listed species with all the commensurate protections under CESA during the interim review period. The western subspecies of burrowing owl breeds from southern Canada to the western half of the United States and into Baja California and central Mexico. In California, suitable habitat for western burrowing owl is generally characterized by short, sparse vegetation with few shrubs, level to gentle topography, and well-drained soils, such as naturally occurring grassland, shrub steppe, and desert habitats (Haug et al., 1993). Western burrowing owl may also occur in agricultural areas, ruderal grassy fields, vacant lots, and pastures containing suitable vegetation structure and useable burrows with foraging habitat in proximity (Gervais et al., 2008). Western burrowing owl usually use burrows dug by California ground squirrel (*Otospermophilus beecheyi*) and round-tailed ground squirrel and dens or holes dug by other fossorial species including American badger, coyote (*Canis latrans*), and kit fox (*Vulpes macrotis*) (Ronan, 2002). Western burrowing owl also frequently use natural rock cavities, debris piles, culverts, pipes, and artificial burrows for nesting and roosting.

Western burrowing owl have declined throughout much of their range because of habitat loss due to urbanization, agricultural conversion, and destruction of ground squirrel colonies (Remsen, 1978). The incidental poisoning of burrowing owl and the destruction of their burrows during eradication programs aimed at rodent colonies have also caused their decline (Collins, 1979; Remsen, 1978). Although burrowing owl are relatively tolerant of lower levels of human activity, human-related impacts such as shooting and introduction of non-native predators have negative population impacts. Burrowing owl often nest and perch near roads where they are vulnerable to roadside shooting, fatal car strikes, and general harassment (Remsen, 1979).

Project Site

**Small Mammal Trapping Grids**

- Grid 1 (2022 & 2025)
- Grid 2 (2022 & 2025)
- Grid 3 (2025)
- Grid 4 (2025)
- Grid 5 (2025)
- Grid 6 (2025)
- Grid 7 (2025)

**Vegetation**

- Active desert dunes
- Stabilized and partially stabilized dunes
- Disturbed stabilized and partially stabilized dunes
- Creosote bush (white bursage) scrub
- Creosote bush scrub
- Disturbed creosote bush (white bursage) scrub
- Desert saltbush scrub
- Disturbed desert saltbush scrub
- Non-native grassland (former agriculture)
- Tamarisk scrub
- Disturbed
- Unvegetated Channel
- Developed

Mojave River
Lenwood Rd
Oak Grove Rd
Hinkley Rd
Burlington Northern Santa Fe
National Trails Hwy
W Main St
L St
H St
Rimrock Rd
58
15

Map Extent

FIGURE 4.6-5

**Mohave Ground Squirrel Habitat Assessment and Trapping Locations**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET
1 INCH = 4,000 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County, Esri 2024

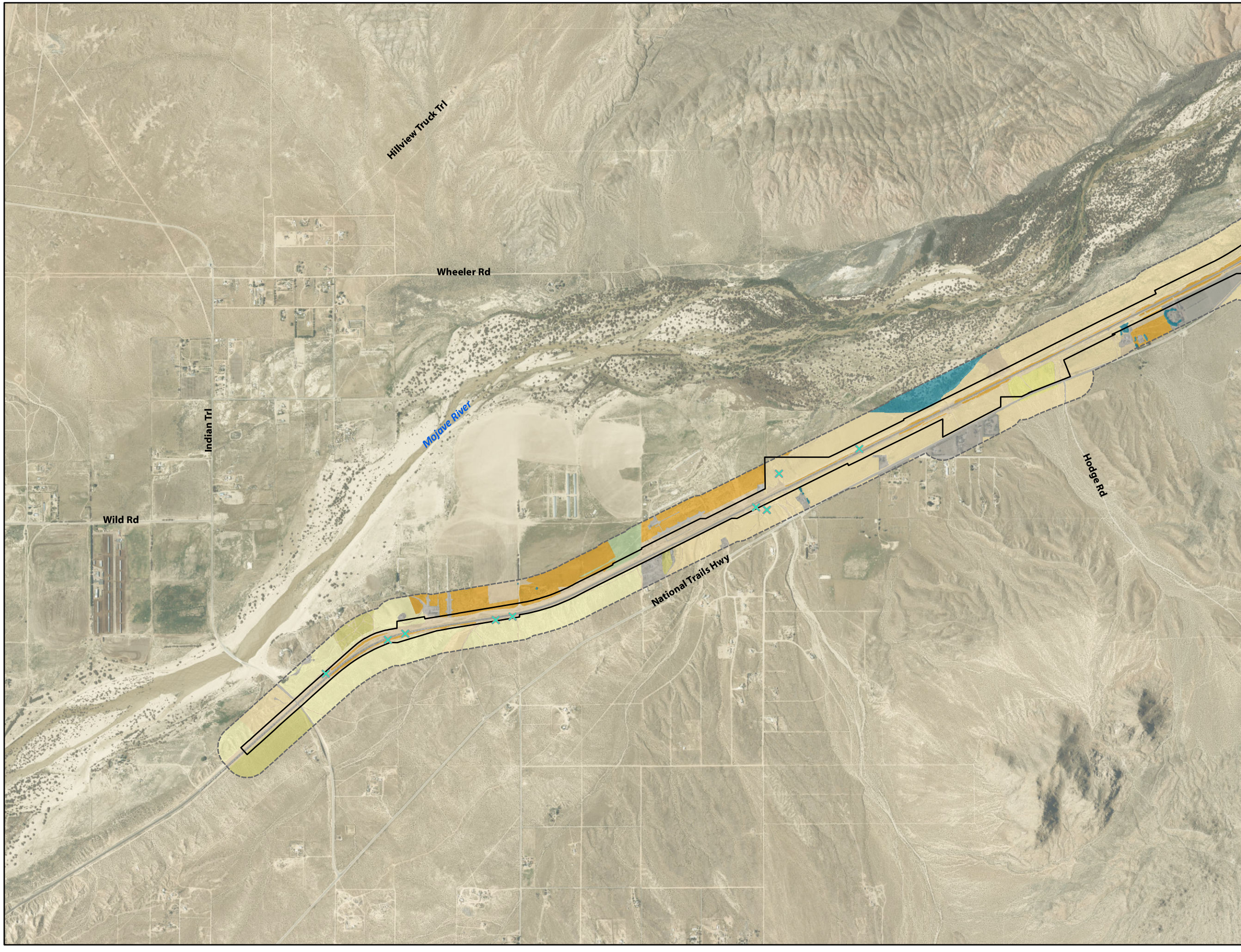
**Survey Results**

Within BIG, suitable habitat occurs throughout the project site as identified concurrently with focused desert tortoise surveys in the fall of 2021 (Table 4). Following the initial habitat assessment, RBC conducted focused breeding and non-breeding season western burrowing owl surveys within BIG. Focused presence/absence surveys were conducted during the non-breeding season between October 16, 2021, and January 12, 2022. The first pass included a survey area of approximately 3,200 acres; however, due to access constraints, passes two, three, and four were reduced to an approximately 337-acre survey area. RBC documented four western burrowing owls of unknown ages within the southern portion of the rail yard and another four western burrowing owls along the eastern and western upper banks of Lenwood Channel within the transload warehouse center during the first pass of surveys on October 16 through 21, 2021 (**Attachment D;** Figure 4.6-6. Western Burrowing Owl Survey Results). During pass three on December 28 – 29, 2021, a western burrowing owl was observed in proximity to the northern side of the existing tracks within the transload warehouse center and an active burrow with recent sign was observed approximately 72 meters northeast of the owl (**Attachment E**). No owls were observed during pass four. RBC also documented a total of 15 individual suitable burrows during passes one through four that had old burrowing owl sign (e.g., pellets, whitewash, and/or feathers); these burrows were not considered active due to lack of recent sign.

During the breeding season between April and August 2022, approximately 495 acres within the rail yard and transload warehouse center were surveyed and yielded negative results for live burrowing owl individuals, although suitable burrows and sign were documented (**Attachment F**). Twelve burrows with burrowing owl sign were recorded in the central portion of the rail yard, although active burrows with recent sign were not documented.

During the subsequent breeding season between February and July 2023, approximately 4,105 acres were surveyed which included areas not previously surveyed in 2021-2023 as well as areas that were only surveyed once during the 2021-2022 non-breeding and 2022 breeding seasons. This survey area consisted of the portions of the transload warehouse center and rail yard, Tortilla Substation improvements, and off-site improvements, plus a 500-foot buffer, were surveyed and yielded negative results for live burrowing owl individuals. Within the remaining portions of the transload warehouse center, rail yard, and off-site improvements, a total of 112 burrows were observed (including burrows observed during 2021-2022 surveys), of which 76 were determined to be suitable for western burrowing owls; burrowing owl sign, including whitewash, pellets, and feathers were present at 16 of these burrows (**Attachment G;** Figure 4.6-6). None of the observed sign was determined to be fresh and from the current breeding season. Within the Tortilla Substation improvements, no live owls were documented, and 10 suitable unoccupied burrows were recorded, although they did not contain any sign (**Attachment H;** Figure 4.6-6).

During the 2024 breeding season, focused burrowing owl surveys were also conducted for an additional approximately 157 acres, including the solar farm and non-contiguous parcels, not previously surveyed. These areas consisted of low-quality habitat within proximity to development/residences. No live owls, active owl burrows, or recent sign was observed during the surveys (**Attachment I**).




Project Site
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**

Suitable Unoccupied Burrow

**Vegetation**

- Creosote bush (white bursage) scrub
- Creosote bush scrub
- Disturbed creosote bush (white bursage) scrub
- Desert saltbush scrub
- Disturbed desert saltbush scrub
- Non-native grassland (former agriculture)
- Tamarisk scrub
- Disturbed
- Developed

Key Map

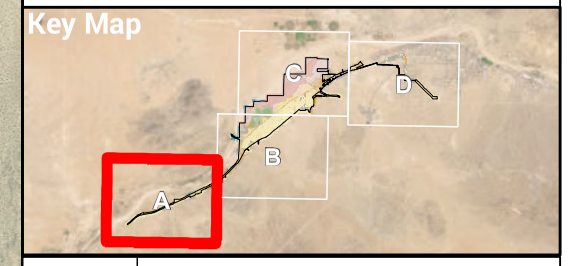



FIGURE
4.6-6A

**Western Burrowing Owl Survey Results**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County, Esri 2024
Regional Map: National Geographic, Esri 2012

Gazana St

Delaney Rd

Burlington Northern Santa Fe RR

National Trails Hwy

Hinkley Rd

Project Site

Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**

Suitable Unoccupied Burrow

**2022 Breeding Season**

Suitable Unoccupied Burrow with Sign

Suitable Unoccupied Burrow

**2021-2022 Nonbreeding Season**

Individual Live Owl (Pass 1)

Suitable Unoccupied Burrow with Sign

**2024-2025 Nonbreeding Season**

Suitable Unoccupied Burrow

**Vegetation**

Active desert dunes

Disturbed stabilized and partially stabilized dunes

Creosote bush (white bursage) scrub

Creosote bush scrub

Disturbed creosote bush (white bursage) scrub

Desert saltbush scrub

Disturbed desert saltbush scrub

Non-native grassland (former agriculture)

Tamarisk scrub

Disturbed

Unvegetated Channel

Developed

Key Map

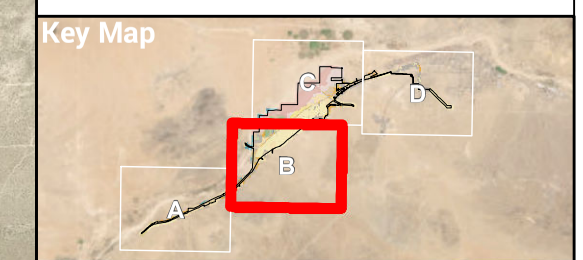



FIGURE
4.6–6B

**Western Burrowing Owl Survey Results**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET

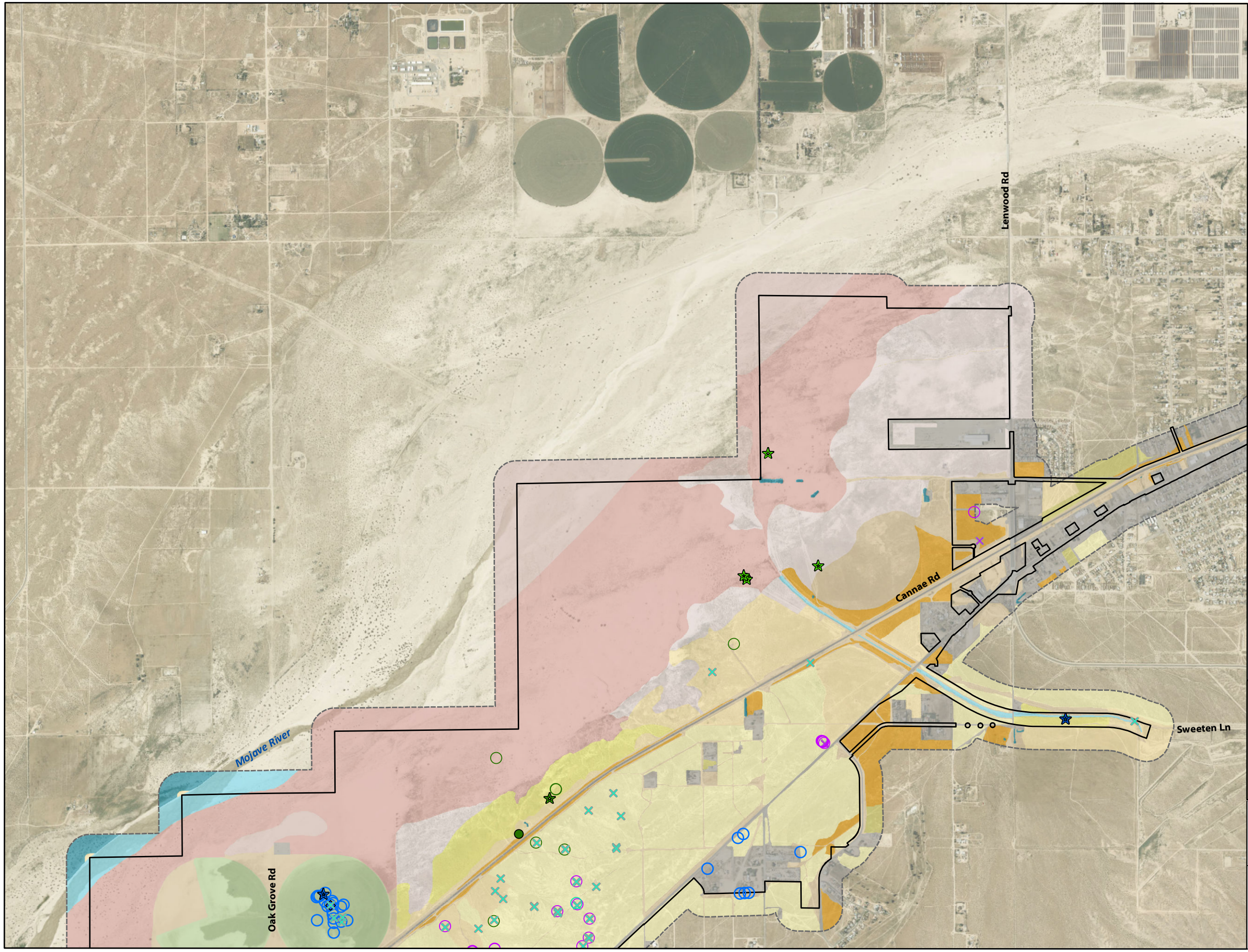
1 INCH = 2,000 FEET

N

Date: 8/25/2025

Aerial Photo: San Bernardino County, Esri 2024

Regional Map: National Geographic, Esri 2012




Project Site
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**
- Suitable Unoccupied Burrow with Sign
- Suitable Unoccupied Burrow

**2022 Breeding Season**
- Suitable Unoccupied Burrow with Sign
- Suitable Unoccupied Burrow

**2021-2022 Nonbreeding Season**
- Individual Live Owl (Pass 1)
- Individual Live Owl (Pass 3)
- Suitable Occupied Burrow
- Suitable Unoccupied Burrow with Sign

**2024-2025 Nonbreeding Season**
- Individual Live Owl (Incidental)/Occupied Burrow
- Suitable Unoccupied Burrow
- Sign

**Vegetation**
- Active desert dunes
- Stabilized and partially stabilized dunes
- Disturbed stabilized and partially stabilized dunes
- Creosote bush (white bursage) scrub
- Creosote bush scrub
- Disturbed creosote bush (white bursage) scrub
- Desert saltbush scrub
- Disturbed desert saltbush scrub
- Non-native grassland (former agriculture)
- Tamarisk scrub
- Disturbed
- Unvegetated Channel
- Developed

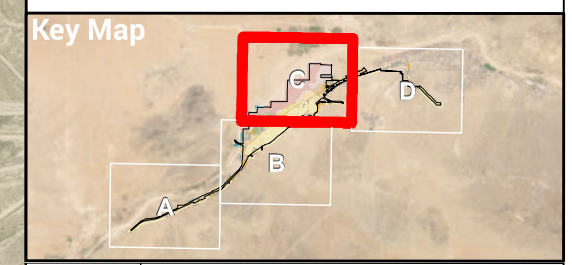



FIGURE 4.6-6C

# Western Burrowing Owl Survey Results

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET

1 INCH = 2,000 FEET

Date: 8/25/2025
Aerial Photo: San Bernardino County, Esri 2024
Regional Map: National Geographic, Esri 2012

Project Site
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**

Suitable Unoccupied Burrow

**Vegetation**

- Creosote bush (white bursage) scrub
- Creosote bush scrub
- Disturbed creosote bush (white bursage) scrub
- Desert saltbush scrub
- Disturbed desert saltbush scrub
- Disturbed
- Unvegetated Channel
- Developed

Agate Rd
Main St
Main St
L St
Barstow Rd
Rimrock Rd
H St
P St
Linda Vista Rd
58
15
247

Key Map

FIGURE
4.6-6D

**Western Burrowing Owl Survey Results**
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Burrowing owl was observed incidentally during desert tortoise focused presence/absence surveys in the fall of 2024 (**Attachment Q**). At least one individual was observed using a burrow within the southern portion of Lenwood Channel at various times from September 2024 to January 2025 (Figure 4.6-6). Burrowing owl was also seen flying over the project site on September 16, 2024. Additionally, an owl was observed using multiple burrows in the general vicinity within the agricultural fields in the southwestern portion of the transload warehouse center during various dates in October 2024. Although no focused burrowing owl presence/absence surveys are anticipated for the 2025 breeding season, burrowing owl is assumed to be present on site due to the incidental observations as recent as January 2025.

Consistent with the scattered distribution within the desert, across the entire approximately 5,000-acre site, active burrowing owl burrows were limited to the southern extent of Lenwood Channel, the former agricultural fields north of the railway, a portion of the southwest railyard, and a small area within the central transload warehouse center near the existing railway. Additional foraging activity was also observed along the northern portion of Lenwood Channel.

**Habitat Suitability**

BIG is mapped within the County of San Bernardino Burrowing Owl Overlay Zone as identified in the County of San Bernardino General Plan; as such, BIG should be evaluated for the presence of burrowing owl (County of San Bernardino, 2012). Compared to other regions in the state, burrowing owls are restricted to widely scattered populations within the Mojave Desert where desert scrub is widely but sparsely inhabited (Center for Biological Diversity et al., 2024). Within the west Mojave Desert, systematic studies found that a majority of the burrowing owl population occurs in the Lucerne, Antelope, and Apple valleys where residential and agricultural areas were more concentrated (Wilkerson and Siegel, 2011).

Although BIG is considered occupied due to presence of owls within the last three years (CDFW, 2012), as observed during the 2021-2022 non-breeding season, as well as incidentally during the 2024-2025 non-breeding season, burrowing owl activity is limited to short-term overwintering within portions of the site by a relatively few amount of transient individuals (**Attachments D, E, and Q**). Burrowing owls and active sign and burrows were not observed within BIG during the 2022, 2023, and 2024 breeding seasons which covered approximately 4,800 acres including the transload warehouse and rail yard, lead track extension, off-site improvements, solar farm, and Tortilla Substation improvements. The survey data suggests BIG does not currently support year-round resident populations or breeding activity despite the presence of suitable burrows and small mammal activity throughout the scrub-dominated portions of the site. Owls may migrate through BIG during the non-breeding season and will likely establish residency elsewhere where there is higher availability of resources to support breeding activity, such as the active agricultural lands scattered throughout the West Mojave or the developed residential areas of the Victor Valley to the south. Despite the expanse of BIG, the limited use of the site by burrowing owl is consistent with the current understanding of burrowing owl distribution in the Mojave Desert. As such, burrowing owl activity within BIG is restricted as the site‘s value for the species is limited to overwintering and there is low potential for breeding and long-term occupation.

Complete results of all focused breeding and non-breeding western burrowing owl surveys are presented **Attachments D - I**.

## Non-Listed Special-Status Wildlife Species

### *Mojave Fringe-toed Lizard*

Mojave fringe-toed lizard is a CDFW SSC. This species is found in the desert regions of Inyo, San Bernardino, Los Angeles, and Riverside Counties, at elevations from sea level to 3,000 feet amsl (Zeiner et al., 1990). Habitat for Mojave fringe-toed lizard consists of fine aeolian sand dunes and dry watercourses with low shrub cover.

Mojave fringe-toed lizard is largely insectivorous and consumes ants, beetles, spiders, and larvae. This species will also consume plant materials. Mojave fringe-toed lizard use fine sands as cover by burrowing into the sand surface. This species is diurnal and activity levels fluctuate with seasonal temperatures. Mojave fringe-toed lizard breeds in the summer and deposits eggs in the sand.

Mojave fringe-toed lizard was observed throughout dune habitat within the transload warehouse center during focused surveys conducted in 2023 (Figure 4.6-7. Mojave Fringe-Toed Lizard Survey Results). The highest concentration of Mojave fringe-toed lizards was observed in the central and northeastern portion of the transload warehouse center. Additionally, the Mojave fringe-toed lizard population within BIG represents the western most extent of the current known range of the species. This sub-population could be of added ecological value if its members have unique genetic variation that may be beneficial to the species in allowing for adaptations to changing environmental conditions.

Approximately 1,587.9 acres of dune habitat suitable for Mojave fringe-toed lizard occurs within BIG based on the site conditions described in **Table 8**:

- Active desert dunes (*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance, *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized) is considered to be of high-quality due to the relatively lower cover of non-native vegetation and the unconstrained transport of sand.
- Stabilized and partially stabilized desert dunes (*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized) is considered to be of moderate quality due to the degree of sand stabilization.
- Disturbed stabilized and partially stabilized desert dunes (*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized) is considered to be of low quality due to the higher presence of non-native vegetation and higher degree of sand stabilization.

Mojave fringe-toed lizard was also observed in the non-dune vegetation communities adjacent to BIG; however, those non-dune vegetation communities are not the primary habitat for the species and are only used for dispersal from its primary suitable dune habitats.

### *Bell's Sparrow*

Bell's sparrow is a CDFW WL species that was once considered a subspecies of sage sparrow, which was split into two species, Bell's sparrow and sagebrush sparrow (*Artemisiospiza nevadensis*), by the American Ornithological Society in 2013. It is found in desert scrub, alkali desert scrub, chaparral, and coastal sage

Mojave Fringe-toed Lizard Survey Area
Project Site

**Survey Results**

Mojave Fringe-toed Lizard (Spring 2023)
Mojave Fringe-toed Lizard (Fall 2023)
Mojave Fringe-toed Lizard (2021 Incidental Sighting)
Mojave Fringe-toed Lizard (2023 Incidental Sighting)
Mojave Fringe-toed Lizard (2024 Incidental Sighting)
Mojave Fringe-toed Lizard (2025 Incidental Sighting)

**Mojave Fringe-toed Lizard Suitable Habitat**

**Vegetation**

Active desert dunes
Stabilized and partially stabilized dunes
Disturbed stabilized and partially stabilized dunes

Mojave River
Lenwood Rd
Hinkley Rd
Burlington Northern Santa Fe
National Trails Hwy

**KEY MAP**

Map Extent

Hinkley Rd
15

FIGURE 4.6-7

# Mojave Fringe-toed Lizard Survey Results

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ROCKS BIOLOGICAL CONSULTING

0 1,800 FEET
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Date: 8/25/2025
Aerial Photo: San Bernardino County, Esri 2020

scrub across cis- and transmontane California. Bell's sparrows are frequently observed in low growing, dense shrubs, and often seek refuge in *Adenostoma* spp., sagebrush (*Artemisia* spp.), bitterbush (*Purshia* spp.), or saltbush depending on the locality. This species primarily feeds on insects, spiders, and seeds which they glean from the ground and shrubs. During the winter, Bell's sparrow occupies lower, drier elevations, generally with more open space. Primary threats include habitat loss and vegetation clearing for livestock grazing and other anthropogenic land uses (Holmes & Johnson 2005).

Bell's sparrow was incidentally observed during 2021 focused least Bell's vireo surveys (**Attachment R**), in October 2024 during desert tortoise surveys, and in March 2024 during Swainson's hawk surveys (Figure 4.6-8. Other Special-Status Species Observations). Considering its affinity to saltbush, especially during winter months, this species is potentially present throughout other areas of allscale scrub habitat within BIG. Bell's sparrow breeds in moderately dense chaparral and desert scrubs. Suitable nesting habitat is present within creosote and allscale scrub vegetation communities; therefore, Bell's sparrow has moderate to high potential to nest within BIG.

### *Black-tailed Gnatcatcher*

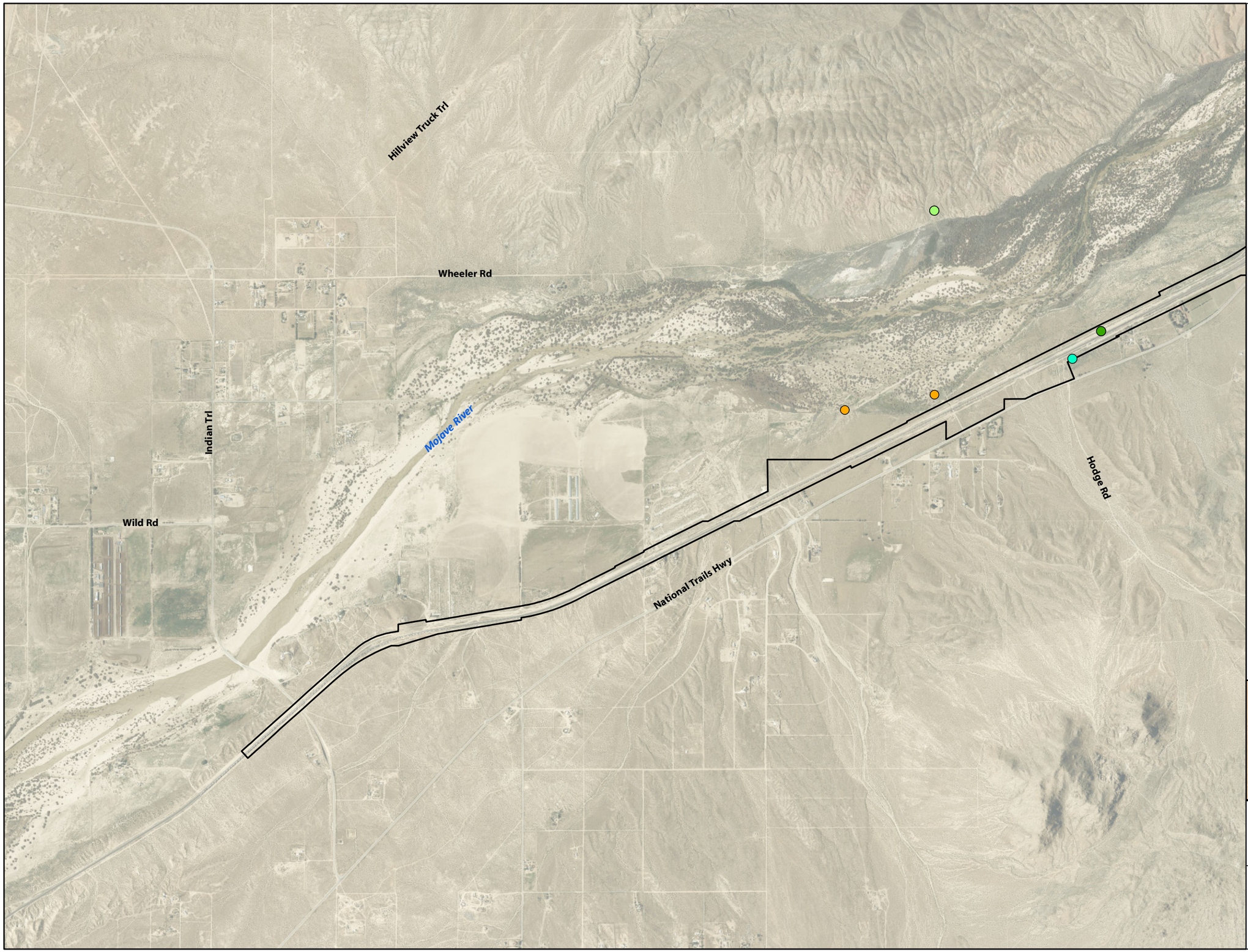
Black-tailed gnatcatcher is a CDFW WL species found in the southwestern United States and Mexico. This species inhabits semiarid and desert scrub habitats up to 7,000 feet amsl in elevation. Black-tailed gnatcatchers are well adapted to dry environments, not requiring year-round water sources, and forage almost entirely on insects among leaves and branches of desert vegetation. Nests are placed in thorny or leafy trees and scrubs with adequate shading from the sun. This species has a low tolerance for disturbance and typically does not nest in, or otherwise utilize, non-native vegetation (Farquhar and Ritchie 2022). Primary threats include loss of habitat due to development and replacement of native trees and scrubs by invasive species such as tamarisk.

This species was observed within tamarisk thickets along the Mojave River during 2021 and 2022 focused least Bell's vireo surveys (**Attachments R - S**). Several black-tailed gnatcatchers were observed within 1,000 feet southwest of Hinkley Road. Suitable black-tailed gnatcatcher nesting and foraging habitat occurs on site; therefore, this species has a moderate potential to occur within BIG.

### *Cooper's Hawk*

Cooper's hawk is a CDFW WL species. Cooper's hawk breeds throughout the United States and into Canada and Mexico. In California, Cooper's hawk nests in live oak, riparian, and other forest habitats from sea level to 9,000 feet amsl. The Cooper's hawk is tolerant of human disturbance and habitat fragmentation and nests in suburban and urban settings (Murphy et al., 1988). Cooper's hawk hunt in open woodland and habitat edges, catching avian prey in the air, on the ground, and in vegetation. The Cooper's hawk hunts a variety of small birds and may also hunt small mammals, reptiles, and amphibians. Their nest is typically a platform of sticks and twigs lined with bark (Call, 1978) and eggs are laid in February through June with the clutch size of 4 to 5 eggs (Brown and Amadon, 1968).

Declines among populations of Cooper's hawk in Southern California can be largely attributed to habitat loss, especially in riparian areas. Other threats include direct or indirect human disturbance at nest sites,




Project Site

**Other Special-Status Observations**

- Bell's Sparrow
- Golden Eagle
- Loggerhead Shrike
- Northern Harrier

Key Map

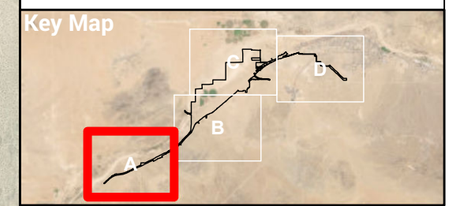



FIGURE
4.6-8A

# Other Special-Status Species Observations

BARSTOW
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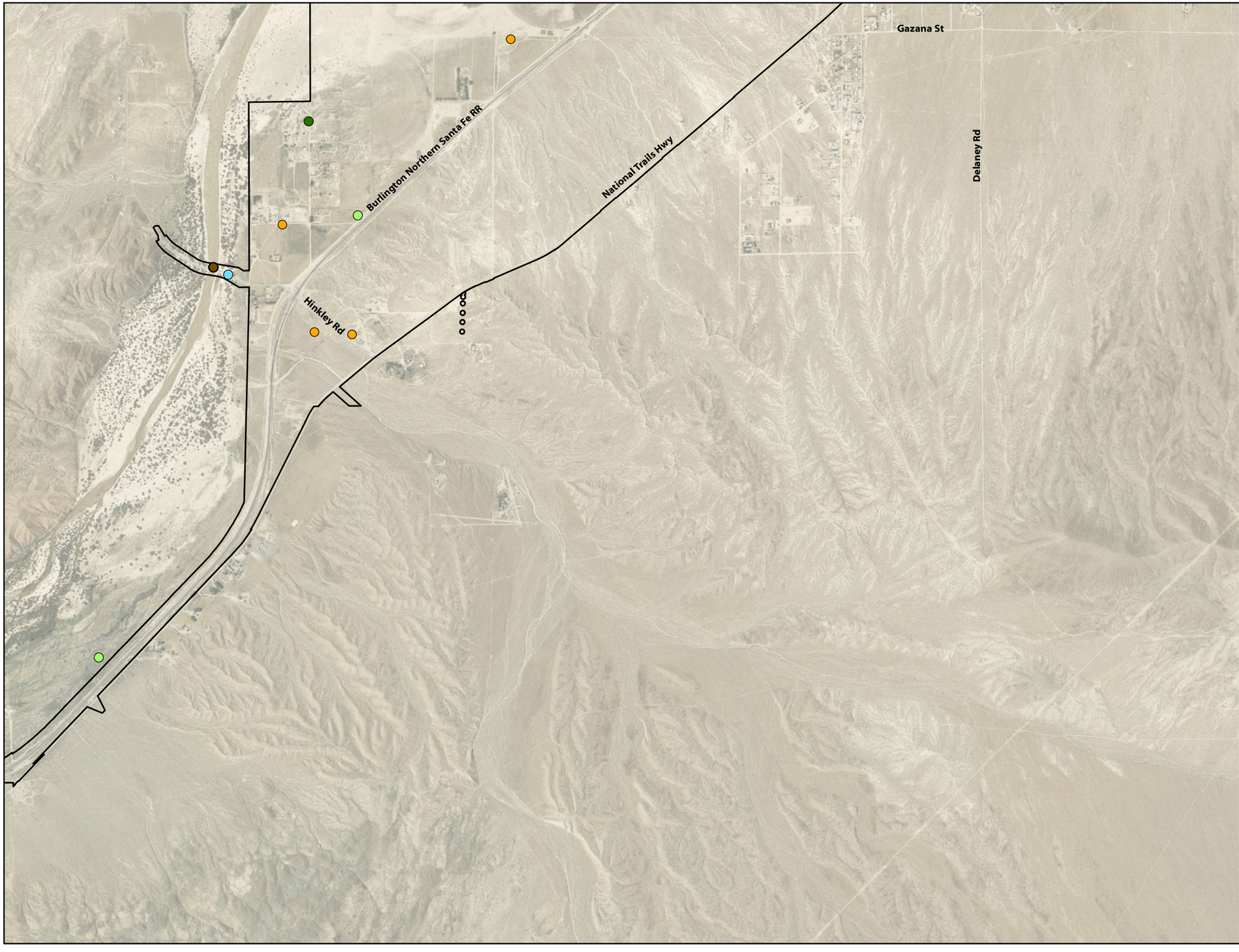
ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024
Regional Map: National Geographic, Esri 2012




Project Site

**Other Special-Status Observations**

- American Beaver
- Loggerhead Shrike
- Northern Harrier
- Olive-sided Flycatcher
- Vermillion Flycatcher

Key Map

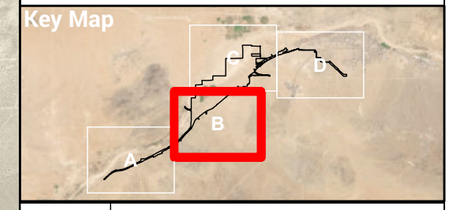



FIGURE
4.6-8B

**Other Special-Status Species Observations**
BARSTOW
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BIOLOGICAL CONSULTING

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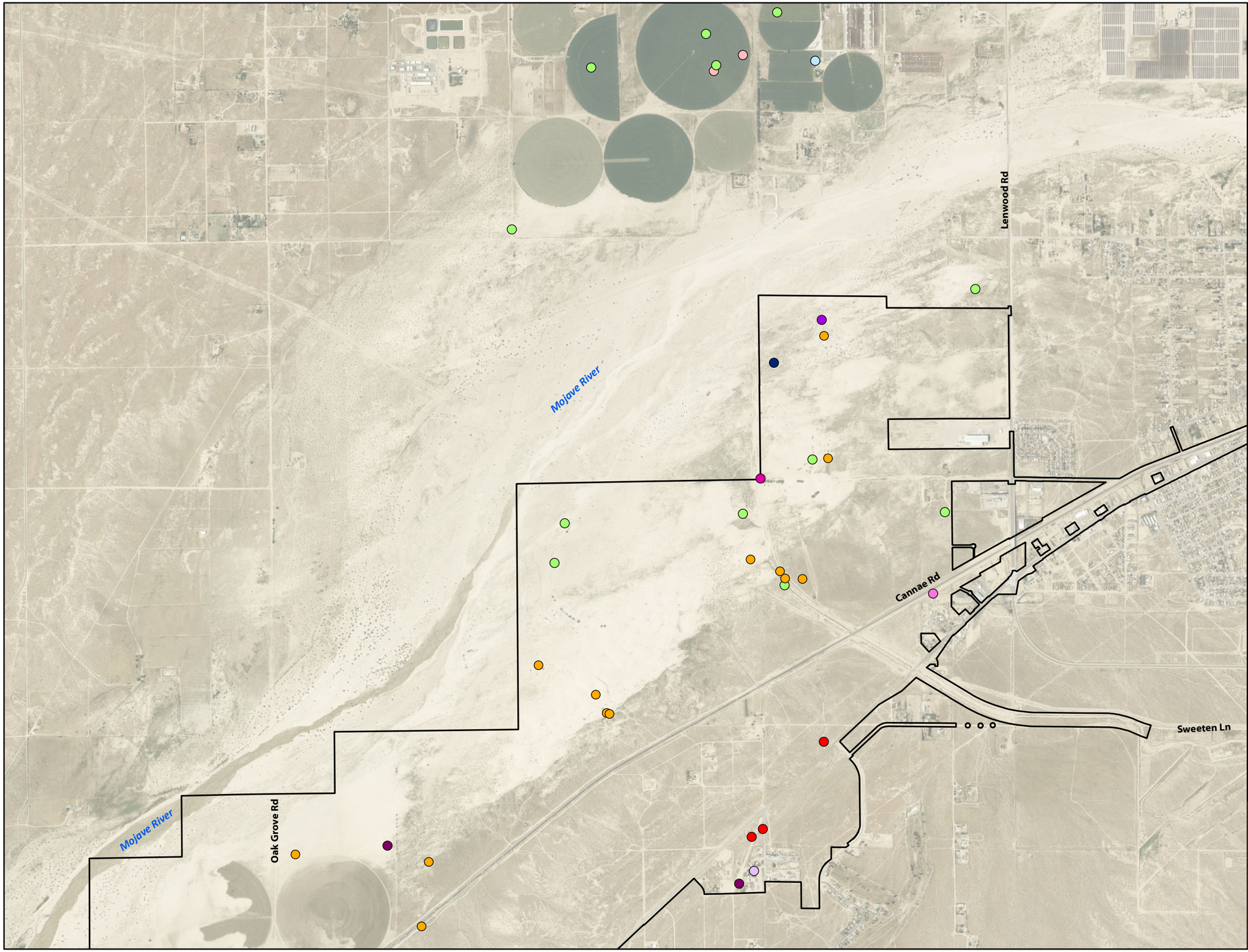


Project Site

**Other Special-Status Observations**

- Cooper's Hawk
- Costa's Hummingbird
- Desert Kit Fox
- Ferruginous Hawk
- LeConte's Thrasher
- Loggerhead Shrike
- Long-Eared Owl
- Northern Harrier
- Osprey
- Prairie Falcon
- Sharp-shinned Hawk

Key Map

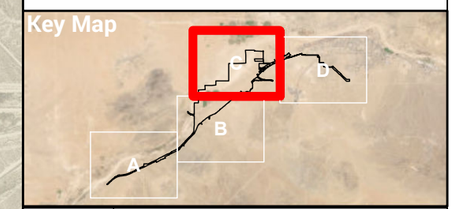


FIGURE 4.6-8C

**Other Special-Status Species Observations**

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Regional Map: National Geographic, Esri 2012

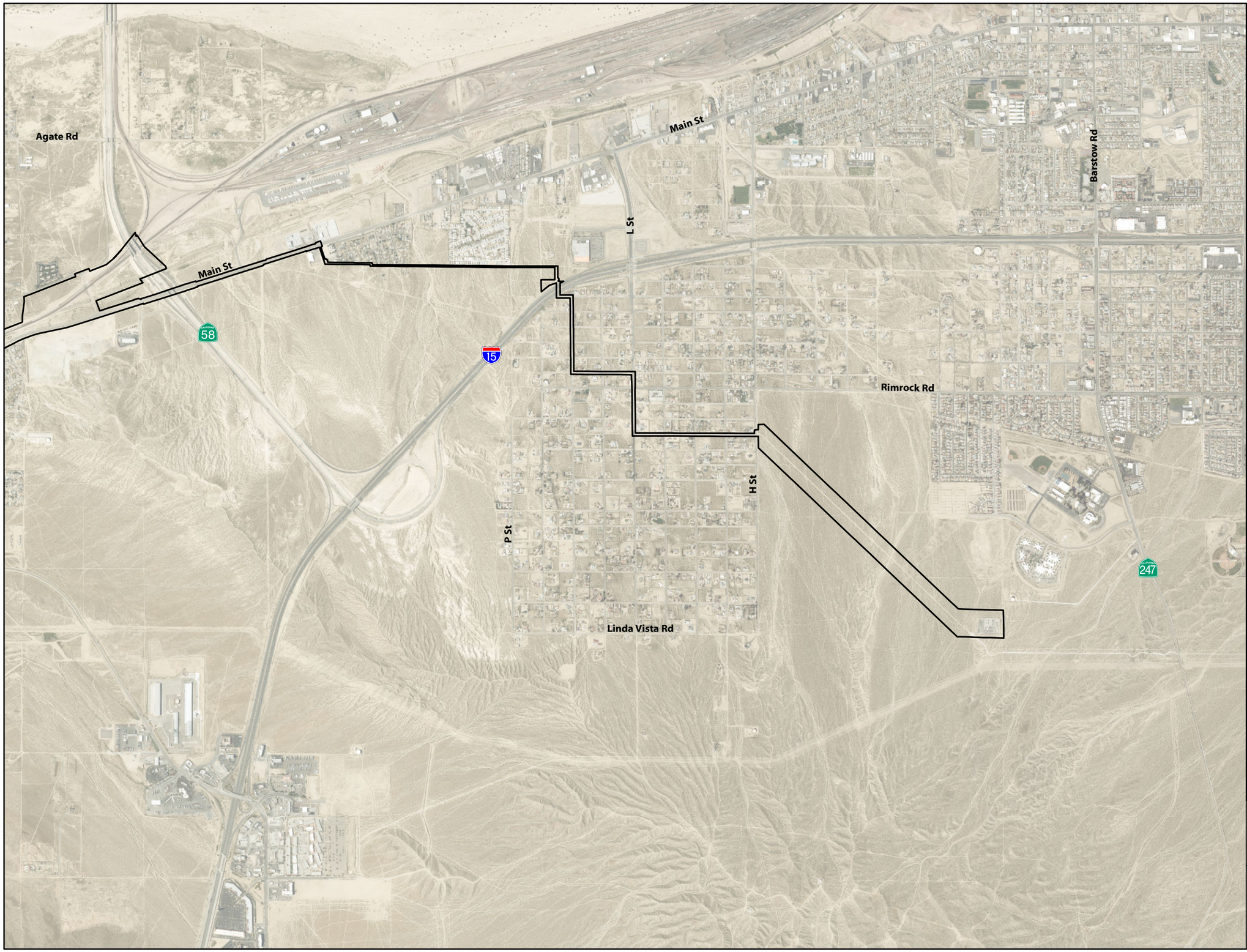


FIGURE
4.6-8D

**Other Special-Status Species Observations**
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INTERNATIONAL GATEWAY PROJECT

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BIOLOGICAL CONSULTING

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Aerial Photo: San Bernardino County, Esri 2024
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and eggshell thinning from pesticide use, although this threat is largely abated through the change in pesticide chemicals used after the 1970's (Terres, 1980).

Cooper's hawk was observed during 2022 focused western yellow-billed cuckoo surveys (**Attachment DD**). The individual was observed flying within the riparian habitat south of Hinkley Road. The species was observed again in June and September 2024 during desert tortoise surveys (Figure 4.6-8). Ornamental trees suitable for nesting occur along the northeastern portion of BIG, within the scattered residences occurring along National Trails Highway including the solar farm; Cooper's hawk has a low-to-moderate potential to nest within BIG. Additionally, Cooper's hawk may continue to forage on site.

### *Costa's Hummingbird*

Costa's hummingbird is a USFWS BCC. It is found year-round in southern California, southwestern Arizona, the Baja peninsula, and northwestern Mexico. Its breeding range extends further into the southwestern United States and northwestern Mexico, and its wintering range extends south to the western coast of central Mexico. In California, Costa's hummingbird inhabits Sonoran and Mojave desert scrub, chaparral, and sage scrub. In the Mojave they are typically found in scrub and woodland habitats near springs and streams with cottonwoods, brittlebush, and four-wing saltbush among other trees and shrubs (Baltosser and Scott, 1996). This species feeds on nectar and small flying insects. They nest about 3-7 feet above ground in shrubs, often with little vegetative cover (Baltosser and Scott, 1996). The greatest threats to Costa's hummingbird are conversion of desert scrub to developed land and livestock grazing.

Costa's hummingbird was observed during 2022 focused surveys for least Bell's vireo and yellow-billed cuckoo near the Hinkley Road Bridge (**Attachments S and DD)** and during Swainson's hawk surveys in 2025 (Figure 4.6-8). Suitable nesting and foraging habitat occur in trees and shrubs throughout BIG; therefore, Costa's hummingbird has moderate potential to nest on site.

### *Ferruginous Hawk*

Ferruginous hawk is a CDFW WL species found in open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats of California. In winter months, ferruginous hawks are often found in agricultural or grassland habitats in southwestern California. This species primarily hunts rodents, especially lagomorphs, by diving from open air or a perch, and occasionally consumes other small vertebrates such as lizards or birds. Ferruginous hawk is not known to nest in California; adult migration takes place mid-April to reach breeding grounds which span from Oregon to Canada. Development of wintering habitat has led to the decline of ferruginous hawks in southern California as this species tends to avoid anthropogenic structures and requires open, connected expanses of land (Zeiner et al., 1990).

Ferruginous hawk was not documented on site; however, this species was documented foraging in the agricultural fields approximately one mile north of the site during Swainson's hawk surveys in March and April of 2025 (Figure 4.6-8). Due to the presence of suitable habitat and the availability of prey species, ferruginous hawk has a high potential to winter within BIG. Ferruginous hawk is not expected to nest within BIG as it is not known to breed in California. The observations in March and April of 2025 were likely migrating individuals.

### *Golden Eagle*

Golden eagle is a CDFW FP and CDFW WL species and is also protected under the Bald and Golden Eagle Act. Golden eagle ranges from northern Mexico into Canada and Alaska in North America and is a year-round resident in most of California. The species generally inhabits open and semi-open habitats including prairie, sagebrush, alpine tundra, sparse woodland, and barren areas. Golden eagles are commonly observed soaring over rolling foothills, mountainous habitat, and arid flats. Prey items include mammals, birds, reptiles, and carrion, though lagomorphs and rodents are preferred. Golden eagles tend to move to lower elevations during winter and migrate to higher altitudes following reproduction. They primarily nest on rock ledges and cliffs, but will also use trees, steep hillsides, electrical transmission structures, or the ground as a nesting substrate (Cornell Lab of Ornithology, 2023). Golden eagles are known to exhibit nest fidelity and to maintain alternative nest sites (Millsap et al., 2015). Prey abundance is an important predictor of nesting territory occupancy (i.e., the use of one nest over another) (Millsap et al., 2015).

Threats to this species include electrocution from powerlines, ingestion of poison from its prey, toxic water ingestion, habitat degradation, loss of prey from development, and collisions with structures and vehicles. Additionally, human activity during early nesting stages can cause abandonment of eggs.

A pair of golden eagles was observed flying over the southwestern off-site improvements during 2023 focused western burrowing owl surveys (Figure 4.6-8). BIG supports open, arid shrub habitat suitable for golden eagle foraging within allscale scrub and creosote bush scrub vegetation communities. Lagomorphic prey species (e.g., black-tailed jack rabbit [*Lepus californicus*] and Audubon cottontail [*Sylvilagus audubonii*]) were observed frequently during general and focused biological surveys. Suitable nesting habitat for golden eagle does not occur within BIG as cliffsides and mountainous terrain are absent. The closest known nesting sites for golden eagle are located along the Granite Mountains approximately five miles south of the project including multiple nest sites that may be used by a single pair (San Bernardino County Regional Conversation Investment Strategy, 2021).

### *LeConte's Thrasher*

LeConte's thrasher is designated a CDFW SSC and a USFWS BCC, and is primarily found in open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats with well-drained soils characteristic of alluvial fans. Though predominately insectivorous, LeConte's thrasher occasionally consumes seeds and small vertebrates. LeConte's thrasher hunts on the ground by prodding leaf litter or soils to flush prey. Nesting occurs in desert washes within dense cactus or spiny shrub cover approximately three feet above ground with sufficient shade (Sheppard, 1996).

Habitat loss and degradation threaten LeConte's thrasher populations. Suitable habitat is often manipulated by off-road vehicle use or is converted to agriculture, grazed pasture, or developed land (Shuford et al., 2008b). Wildfires which periodically destroy salt bush scrub habitats and soil seed stores further threaten LeConte's thrasher populations.

LeConte's thrasher was observed throughout project surveys from 2021 – 2025 (Figure 4.6-8). Additionally, LeConte's thrasher is known to occur in the vicinity and is a resident of deserts in southern California. Suitable nesting habitat for LeConte's thrasher is present on BIG in the form of desert scrub

containing suitable spiny shrubs such as saltbush (*Atriplex* sp.) and mesquite; therefore, this species has a moderate potential to nest within BIG.

### *Loggerhead Shrike*

Loggerhead shrike is a CDFW SSC. This species is a (non-migratory) year-round resident in southern California. Loggerhead shrike prefers open habitats, typically with short vegetation and scattered shrubs. This species consumes a diet mainly consisting of insects and also feeds on reptiles, birds, and small mammals. Loggerhead shrike uses a feeding technique where the bird impales prey on spines or thorns of shrubs. Thus, loggerhead shrike suitable habitat requires vegetation with spines or thorns (Yosef, 1996).

Leading causes of decline for this species include urban development and ingestion of pesticide-laden prey. Loggerhead shrike numbers are still fairly large across North America; however, the species has dramatically declined over the past century (Yosef, 1996).

Several loggerhead shrikes were observed within BIG during various focused species surveys in 2022 – 2025 (Figure 4.6-8). Loggerhead shrike is known to occur in the area and is a common resident in parts of southern California. Suitable loggerhead shrike nesting habitat occurs on BIG in the form of desert scrub containing suitable spiny shrubs; therefore, this species has a moderate potential to nest within BIG.

### *Long-eared Owl*

Long-eared owl is a CDFW SSC that occurs year-round in California, although seasonal status varies regionally (Haas, 2004). Key habitat components for long-eared owl include dense cover for nesting and roosting, suitable nest platforms, and open foraging areas. Generally, the species nests in conifer, oak, riparian, pinyon-juniper, and desert woodlands that are either open or are adjacent to grasslands, meadows, or shrublands (Marks et al., 1994). In the Mojave Desert region, long-eared owls are known to nest in tall riparian trees, such as Fremont cottonwood (*Populus fremontii ssp. fremontii*) and athel tamarisk (*Tamarix aphylla*), in ornamental yards, natural desert woodlands, and densely vegetated desert washes (Garret and Dunn, 1981; Rosenberg et al., 1991).

Primary threats to this species include the loss and degradation of habitat and nest predation by ravens and other corvids. Population impacts from the direct effects of ingestion and exposure to pesticides and the indirect effects of reduced prey numbers from rodenticide use are unknown in California.

Long-eared owl was observed using a stick nest within a tamarisk stand in the northern terminus of Lenwood Channel during Swainson's hawk surveys in April 2025 (Figure 4.6-8). Therefore, this species is considered present for foraging and nesting.

### *Lucy's Warbler*

Lucy's warbler is a CDFW SSC primarily found in mesquite thickets and other riparian woodlands. This species arrives in California during summer months for breeding. Though mesquite is preferred, Lucy's warbler occasionally nests in blue palo verde (*Parkinsonia florida*), willow, cottonwood, tamarisk, and ironwood (*Olneya tesota*). Nesting occurs in tree cavities and breeding has been documented within mesquite thickets associated with the Mojave River. This species' diet is almost exclusively comprised of insects.

Loss and degradation of mesquite and other desert riparian habitats is the largest threat to Lucy's warbler. Diversion of water for urban and agricultural uses and the resulting lower water table is considered a primary contributor to the degradation of these habitats. Invasive plant species, human recreational activities, and grazing also threaten Lucy's warbler.

Lucy's warblers were incidentally observed; during 2022 focused least Bell's vireo surveys and focused southwestern willow flycatcher surveys (**Attachments S and Z**). Suitable Lucy's warbler nesting and foraging habitat exists within BIG and surrounding areas (transload warehouse center and southwestern portion of the off-site improvements) support tamarisk thickets. Therefore, potential for Lucy's warbler to nest within BIG is moderate.

### *Merlin*

Merlin is a CDFW WL species and uncommon winter migrant in the low elevations of California (i.e., less than 3,900 feet). Merlin prefers coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, edges, deserts, and herbaceous stage habitats. This species relies on a diet primarily comprised of small birds and occasionally preys on insects and small mammals. Shorelines act as particularly important hunting grounds during winter months.

Merlin experienced stark population declines from pesticide use prior to environmental legislation in 1972. Since the ban of harsh pesticides, populations have increased slowly, though sightings in southern California are still considered rare (Zeiner et al., 1990).

Merlin was not observed within BIG. However, BIG supports grasslands and open desert scrub suitable for merlin foraging and is within the known elevational range of this species. This species is also known to occur in the area (eBird, 2025). Due to the presence of suitable habitat, the merlin has a moderate potential to occur within BIG. Please note that this species is not known to nest in California.

### *Northern Harrier*

Northern harrier is a CDFW SSC and USFWS BCC. It breeds from sea level to 5,700 feet amsl in California's central valley. Typical habitats include meadows, grasslands, open rangelands, desert sinks, and fresh and saltwater emergent wetlands. They are found in flat, open areas with tall dense grasses, shrubs, and edges used for nesting, cover, and foraging. Their nests are placed on the ground, usually at a marsh edge (Brown and Amadon, 1968). While they usually nest in emergent wetlands or along rivers or lakes, they can nest in grasslands, grainfields, and sagebrush flats several miles from water; however, their home range usually includes fresh water (Zeiner et al., 1990).

Populations of northern harrier, including breeding populations in southern California, have been in decline since the mid-1900s (Grinnell and Miller, 1944; Remsen, 1978). Major threats include destruction of wetland habitat, native grassland, and moist meadows, and burning and plowing of nesting areas during the breeding season.

Northern harrier was observed flying over the northeastern portion of the transload warehouse center during 2023 focused western burrowing owl surveys, as well as flying over the site and agricultural fields one mile north of BIG during various spring and fall surveys in 2024 and 2025 (Figure 4.6-8) and suitable

foraging habitat is present throughout BIG. However, suitable nesting habitat for northern harrier does not occur and this species is not anticipated to nest within BIG due to the lack of suitable emergent herbaceous wetland vegetation for nesting.

### *Olive-sided Flycatcher*

Olive-sided flycatcher is a CDFW SSC found along edges or within opening of semi-open to dense forest south from the Oregon to the Mexican border. Within its range, this species is associated with coniferous trees with open canopies. In California, olive-sided flycatchers primarily nest in pines and occasionally in willows, oaks, alders, and eucalyptus (*Eucalyptus* spp.). This species is considered a specialist as it primarily feeds on hymenopterous prey (i.e., wasps and bees). Olive-sided flycatchers require perches for hunting or calling and prefer to navigate open spaces within the upper third of the canopy.

Olive-sided flycatcher was observed during 2022 focused southwestern willow flycatcher surveys and during 2021 focused least Bell's vireo surveys, although these individuals were likely migrants and were not observed nesting (**Attachments R and Z**; Figure 4.6-8). Olive-sided flycatcher may pass through BIG and adjacent areas during the breeding season; however, suitable coniferous forest nesting habitat preferred by this species does not occur within or around the site and therefore this species has low potential to nest within BIG.

### *Osprey*

Osprey is a CDFW WL species. Osprey exclusively nest near large bodies of water where fish, their primary prey, are available. Nests are made of sticks and placed on snags, dead-topped trees, cliffs, and manmade structures. Open-branched trees or other perches are required near the nest for perching and landing, and nests are generally within 400 meters of fish-producing water (Zeiner et al., 1988-1990). During the early 1900s, osprey populations were negatively affected by habitat loss, hunting, and competition with fishermen. Osprey populations declined further in the mid-1900s due to the widespread use of the pesticide DDT, which caused eggshell thinning and thus failed nesting attempts.

Osprey was observed flying over the southwestern portion of the off-site improvements during 2022 focused least Bell's vireo surveys (**Attachment S**) as well as during spring 2025 special-status plant surveys (Figure 4.6-8). This species may also forage in the open areas surrounding the Mojave River. The section of the Mojave River that abuts BIG is intermittently inundated dependent on precipitation rates; it cannot continuously provide the quantity of fish needed to support nesting osprey. Large trees and structures near bodies of water suitable for nesting are absent from the project site and immediate surrounding areas; therefore, this species has a low potential to nest within BIG.

### *Prairie Falcon*

Prairie falcon is a CDFW WL species. It ranges from southeastern desert northwest through the Central Valley. Typical habitats include annual grasslands, savannahs, agricultural fields, and desert scrub. They primarily nest in natural crevices or ledges on steep bluffs and cliffs up to 11,000 feet (Cornell Lab of Ornithology, 2022).

Prairie falcon was observed flying over the northeastern portion of the transload warehouse center during 2023 focused western burrowing owl surveys and was also observed flying over the site and perching on transmission lines at Tortilla Substation in the fall of 2024 during desert tortoise surveys (Figure 4.6-8). Suitable foraging habitat is present throughout BIG. However, suitable nesting habitat for prairie falcon is not present due to the absence of bluffs or cliff habitat and this species is not anticipated to nest within BIG.

### *Sharp-Shinned Hawk*

Sharp-shinned hawk is a CDFW WL species. This species breeds in ponderosa pine (*Pinus ponderosa*), black oak (*Quercus velutina*), riparian deciduous, mixed conifer, and Jeffrey pine (*Pinus jeffreyi*) habitats in California. Sharp-shinned hawks prefer riparian habitats but are not restricted to these areas. North facing slopes with perches are critical habitat requirements for this species (Zeiner et al., 1988-1990). Nests are generally located near water in a dense, even-aged, single-layered forest canopy (Zeiner et al., 1988-1990). They are considered the least common breeding accipiter in California.

Sharp-shinned hawk was observed flying through the northeastern portion of the rail yard, approximately 1,700 feet northeast of Lenwood Channel during the 2020 least Bell's vireo habitat assessment (Figure 4.6-8). Suitable foraging habitat is present throughout BIG; however, this species does not breed in southern California and is not anticipated to nest within BIG.

### *Vermillion Flycatcher*

Vermillion flycatcher is a CDFW SSC ranging from the southwestern United States, south to central Argentina (Wolf and Jones, 2000). The species is an uncommon year-round resident along the Colorado River, with scarce breeding populations found throughout central southern California in isolated patches where riparian thickets meet open, mesic habitats. Nesting birds primarily inhabit cottonwood, willow, mesquite, and other vegetation in desert riparian habitat adjacent to irrigated fields, ditches, ponds, and sloughs (Grinnell and Miller, 1944). Monogamous pairs often raise two broods, frequently feeds above water, sallying for flying insects, especially bees (Bent, 1942). One adult and one juvenile vermillion flycatcher were observed foraging in ornamental pine trees within the scattered residential area southwest of the former agricultural fields during Swainson's hawk surveys in June of 2024 (Figure 4.6-8). There is moderate potential for this species to nest on site due to the presence of marginally suitable tamarisk in the vicinity of Hinkley Road Bridge and the southwestern lead track extension.

### *Yellow Warbler*

Yellow warbler is a CDFW SSC. In southern California, yellow warbler nests in open-canopy lowland and foothill riparian woodlands dominated by cottonwoods, alders, or willows up to 8,000 feet amsl. The species is typically found in California from April to October where it holds a small territory for nesting and foraging. The yellow warbler forages for insects and spiders in the upper canopy of deciduous trees and shrubs. It builds a cup nest 2-16 feet off the ground in in alders, cottonwoods, and willows and usually lays 4-5 eggs (Garrett and Dunn, 1981). Yellow warblers are threatened by habitat destruction and fragmentation, especially of riparian habitats, and brood-parasitism by brown-headed cowbirds.

Yellow warbler was observed within the riparian habitat southwest of Hinkley Road during 2022 focused least Bell's vireo surveys (**Attachment S**). Suitable foraging habitat in the form of tamarisk thickets within the southwestern portion of the off-site improvements and Hinkley Road Bridge is present. This species has a moderate potential to nest within BIG.

### *Yellow-breasted Chat*

Yellow-breasted chat is a CDFW SSC found widely across the U.S and Central America (Cornell Lab of Ornithology, 2025). This species inhabits riparian habitats in the foothills, deserts, and low elevation mountains of California, and can also be found in some disturbed and successional habitats (Zeiner et al., 1990). Yellow-breasted chat is an omnivore, gleaning insects and spiders from foliage and foraging on berries and other fruit (Zeiner et al., 1990). Nesting is generally restricted to areas along streams, creeks, sloughs, and rivers (Shuford and Gardali, 2008c). Females build cup nests in usually low, dense vegetation and lays three to six eggs (Eckerle and Thompson, 2001). Yellow-breasted chats are migratory summer residents in California; they arrive on their breeding grounds in late March and depart in late September (Shuford and Gardali, 2008c). Threats to this species include destruction of riparian woodlands, parasitism by brown-headed cowbirds, and vegetation removal associated with flood control measures in connection to urban development and agriculture (Shuford and Gardali, 2008c).

Yellow-breasted chat was not documented within BIG during biological surveys; however, suitable foraging habitat in the form of tamarisk thickets within the southwestern portion of the off-site improvements and Hinkley Road Bridge is present. This species has a moderate potential to nest within BIG.

### *American Badger*

American badger is a CDFW SSC found throughout most of California. American badgers are carnivorous; they feed primarily on mammals such as ground squirrels (*Sciuridae*) and pocket gophers (*Geomyidae*), but will also eat reptiles, insects, earthworms, eggs, birds, and carrion (Zeiner et al., 1990). They inhabit a variety of dry habitats with friable soils suitable for digging burrows, which are essential for survival. They typically reuse old burrows, but some may dig a new den each night (Messick and Hornocker, 1981).

Badgers are considered ecosystem engineers, meaning they modify their environment in a way that provides or maintains microhabitats for other species that would otherwise cease to exist. American badger dens are utilized by a wide variety of species including special-status species such as desert tortoise and western burrowing owl. The intensive digging and resulting biopedturbation performed by this species can lead to an increase in soil nutrient cycling, fungal growth, cryptobiotic crust formation, and fertile land for vascular plants (Eldridge, 2004). American badgers are born underground and rely on natal burrows for protection during development, making them especially vulnerable to land clearing construction activities (Messick & Hornocker, 1981). Badgers may be found within environments altered by human activities; however, this species has been heavily impacted by trapping and poisoning (Zeiner et al., 1990).

American badger presence was assessed for BIG, and individuals, burrows, or their sign were not documented during field surveys including the wildlife movement study. However, suitable habitat and

friable soils and desert scrub occur throughout BIG as evidenced by the numerous burrows scattered throughout the railyard and around the Tortilla Substation (Figures 4.6-2 and 4.6-6). Burrows surveyed during 2023 burrowing owl breeding season surveys, which were assessed for current or potential use by burrowing/denning wildlife species, also have the potential to be used/modified by American badger (**Attachment G**). Due to the presence of suitable burrows, burrowing substrate, and co-occurring burrowing species such as desert tortoise, western burrowing owl, and desert kit fox, American badger has a moderate to high potential to occur within BIG.

### *American Beaver*

American beaver is protected as a CFGC furbearing mammal within portions of San Bernardino County further than 10 miles from the California-Arizona border. Historically, this species was widely abundant throughout North America; however, populations were significantly reduced due to the fur trade and habitat removal. American beavers are important ecological engineers and recruit a wide array of plant and animal species to areas where they have created ponds and meadows with their dams (Zeiner et. al., 1988-1990).

American beaver typically occurs in montane riparian, valley foothill riparian, riverine, lacustrine, aspen, and fresh emergent wetland habitats; however, isolated populations are known to occur in San Bernadino County within areas of the Mojave River containing permanent water (Zeiner et. al., 1988-1990). The species is dependent on water for cover from predators where they often construct their lodges for refuge and young rearing; however, they have also been known to dwell in burrows in muddy banks. American beavers are non-migratory and are known to establish home ranges of up to 36 acres in the San Bernardino Mountains, which usually consists of one adult pair and offspring (Light, 1969).

One American beaver was incidentally observed swimming upstream in the Mojave River near Hinkley Road Bridge during 2024 focused nesting Swainson's hawk surveys (Figure 4.6-8). No other American beaver sign, including tracks, cut vegetation, lodges, or dams, were observed during surveys. The solitary American beaver observed in 2024 likely traveled from an upstream area of the river that flows perennially. The species is not anticipated to construct burrows or otherwise dwell immediately adjacent to BIG since the section of the Mojave River in the vicinity of BIG does not contain permanent water throughout the year. American beaver may be present in the vicinity of BIG for a relatively short duration, specifically only when the Mojave River has enough flowing water to support the species.

### *Desert Kit Fox*

Desert kit fox is protected as a CFGC fur-bearing mammal. The desert kit fox is found in the Mojave and Colorado deserts in California in open scrub habitats such as creosote scrub and saltbush scrub. It digs burrow complexes for shelter and relies on areas that support abundant rodent population for prey (Kadaba et al., 2013). The biggest threat to desert kit fox is habitat loss, which has been increasing recently due to large scale renewable energy projects in the desert. In addition, anthropogenic climate change, urbanization, and degradation of habitat by off-road vehicle use, grazing, agriculture, and military uses pose threats to this species.

Desert kit fox was detected via wildlife cameras on site during the wildlife movement study; this species was captured on cameras installed along National Trails Highway, the vehicle crossings along the existing railway, and along Lenwood Channel (**Attachment GG**). A wildlife camera also recorded kit fox using a burrow within the southern portion of Lenwood Channel. This species was also observed during 2024 burrowing owl and desert tortoise surveys near National Trails Highway (Figure 4.6-8). Suitable burrows and burrow complexes occur throughout the desert scrub portions of BIG, generally south of the railway and in the vicinity of Tortilla Substation in the areas that contain friable soils (**Attachment G**).

### *California Leaf-nosed Bat*

California leaf-nosed bat is a CDFW SSC and BLM-designated sensitive species. This species is found in a variety of desert riparian, wash, and scrub habitat areas in Southern California. California leaf-nosed bat populations have substantially declined within portions of their Southern California range most likely due to human encroachment of occupied habitat areas and disturbance of roost sites (Zeiner et al., 1988-1990).

California leaf-nosed bats are colonial roosters and will select roosts that provide protection against high daytime temperatures, including mines, caves, and occasionally buildings and bridges. Maternity roosts are formed during the late spring and early summer months with young typically born (one per female) between May and June. Young are typically weaned one month after birth. California leaf-nosed bats are primarily insectivorous and forage low over open ground for a wide variety of insect species.

California leaf-nosed bat was not observed on site during the initial bat habitat assessment and visual survey, although Anabat data was collected at select locations in BIG, review of the data and the identification of bat species are not included in this analysis (Attachment X). This species has moderate potential to occur on BIG to the presence of a potentially suitable roosting site, i.e., the Hinkley Road Bridge. The bridge is structurally capable of hosting roosting bats as it contains dark crevices and features suitable for pedal grasping. Additionally, the Hinkley Road Bridge occurs near shrub and seasonally mesic, riparian habitat adequate for foraging.

### *Pallid Bat*

Pallid bat is a CDFW SSC and BLM-designated sensitive species. This species is a yearlong resident in California and occupies a wide variety of habitats, including grasslands, shrublands, woodlands, and mixed conifer forests. Occupied habitat areas are typically associated with the presence of rocky areas that are suitable for roosting. Pallid bats are highly sensitive to disturbances on roost sites and, as result, are becoming increasingly restricted within their known range due to human encroachment within occupied habitat areas (Zeiner et al., 1988-1990).

Pallid bats are colonial roosters and will select roosts that provide protection against high temperatures during daytime hours, including caves, mines, rock crevices, and occasionally buildings or underneath bridges (NatureServe Explorer, 2023). Maternity roosts are formed in early April with young born (one to three per female) between April and July. Young are typically weaned between July and August. Pallid bats are insectivorous and forage over open ground for a wide variety of insect prey species.

Pallid bat was not observed within BIG during the initial bat habitat assessment and visual survey, although Anabat data was collected at select locations in BIG, review of the data and the identification of bat species are not included in this analysis (Attachment X). This species has moderate potential to occur within BIG due to the presence of a potentially suitable roosting site, the Hinkley Road Bridge (as discussed above), and suitable shrub foraging habitat.

### *Ringtail [Ring-tailed Cat]*

Ringtail, also known as ring-tailed cat (*Bassariscus astutus*), is a CDFW fully protected species. This species is distributed throughout western North America in a variety of habitats including desert scrub, chaparral, pine-oak and conifer woodland, and bare rock/scree. Typically, this species is found near rocky areas with cliffs or crevices for daytime shelter, usually within 0.5 miles of water. For dens, they will utilize rock shelters, tree hollows and roots, other animal burrows, mineshafts, and abandoned buildings. Ringtails are omnivorous but prefer a carnivorous diet made up of mostly small mammals, birds, arthropods, and reptiles. These secretive animals are nocturnal, and little is known about their mating habits, although they are thought to live alone most of the year and home ranges of the same sex typically do not overlap.

BIG is located within the known range of ringtail, however, this species was not directly observed within BIG and was not detected during the wildlife movement study; cameras were placed along Hinkley Bridge and along the lead track extension adjacent to the Mojave River corridor and did not capture ringtail. Individuals and sign (scat) have been recorded in other areas of the Mojave Desert such as the Mountains north of Barstow (Tietz, 2021) and Beacon Station further east of BIG (Tauber, 2018). Suitable den habitat for the species, e.g., rocky habitat and dens, is present along the cliffs of Iron Mountain north of the Mojave River adjacent to the southwestern lead track extension, but is not present on BIG. As such, this species has a low potential to occur within BIG.

### *Townsend's Big-Eared Bat*

Townsend's big-eared bat is a CDFW SSC. This species is distributed throughout California in all regions except alpine and subalpine habitats and is generally observed in areas with sufficient moisture. Historically abundant in California, Townsend's big-eared bat is now considered rare, likely due to the disturbance of roosting sites. Townsend's big-eared bat is a generally non-migratory species with high site fidelity; individuals remain within 20 miles of their roosts, even during periods of hibernation.

Roost site availability and small brood size (one offspring per litter) are limiting factors in terms of Townsend's big-eared bat population growth and maintenance. This species relies on anthropogenic structures such as abandoned buildings, mines, caves, bridges, and tunnels for roosting and hibernating. During reproduction, Townsend's big-eared bat forms maternal colonies composed of females and young; males remain in proximity to maternal roosts (Fellers and Pierson, 2002). Mating season occurs from November to February, with ovulation occurring in the spring. Lepidopteran prey, particularly small moths, compose the majority of this species' diet; beetles and other insects are occasionally consumed. Foraging occurs near vegetation on habitat edges or within foliage.

Townsend's big-eared bat was not observed within BIG during the initial bat habitat assessment and visual survey, although Anabat data was collected at select locations in BIG, review of the data and the

identification of bat species are not included in this analysis (**Attachment X**). This species has moderate potential to occur within BIG due to the presence of a suitable roosting site, the Hinkley Road Bridge, which occurs adjacent to seasonally mesic, suitable foraging habitat.

### *Yuma Myotis*

Yuma myotis is a BLM-designated sensitive species. This species is a year-round resident in California and is widespread throughout western North America. Yuma myotis is found in a wide variety of upland and lowland habitats, including riparian, desert scrub, moist woodlands, and forests, usually near open water (NatureServe Explorer, 2025b). Species distribution is primarily tied to bodies of water, which are used as foraging sites and sources of drinking water. This species is often observed drinking water due to its poor urine concentration capabilities.

Warm-season roosts include caves, cliff crevices, bridges, buildings, tunnels, abandoned cliff swallow nests, and cavities and nooks in large live trees (redwood, Douglas-fir, oak, maple) near water (Ammerman et al. 2012; Vaughan 1980; Evelyn et al. 2004). Winter roosts are sometimes similar but are generally unknown. Although no major threats have been identified, the species is subject to ongoing slow reduction of available roost sites, roost disturbance by humans, and degradation of foraging habitat (NatureServe Explorer, 2025b).

Large nursery colonies may form in buildings, caves, mine tunnels, and under bridges (Dalquest 1947, Betts 1997, Ammerman et al. 2012). Females form maternity colonies in April, and their single young are born late May-July; colonies disperse by the end of September (NatureServe Explorer, 2025b). Yuma myotis may be found feeding and roosting with other bat species, such as Mexican free-tailed bat (*Tadarida brasiliensis*) and pallid bats.

One unconfirmed Yuma myotis individual was observed within BIG during the initial bat habitat assessment and visual survey. The bat was found in between an expansion joint inside a culvert under the railway. Yuma myotis and the little brown bat (*Myotis lucifugus*) can be difficult to distinguish in the field; as such, the identification of the individual is undetermined (Nagorsen and Brigham 1993, Verts and Carraway 1998, Attachment X). Additionally, review of and the identification of bat species from the Anabat data collected during the bat habitat assessment and visual survey are not included in this analysis. Due to the unconfirmed identification of this observation, and the presence of suitable culverts and span bridges for roosting and desert scrub foraging habitat within BIG, Yuma myotis has a moderate potential to forage and roost within the project. The full results of the bat habitat assessment and visual survey are provided in Attachment X.

### *Nesting Birds*

Native bird nests are protected by CFGC Section 3505 and the MBTA. The nesting season generally occurs from February through September but can vary based on species and annual climatic conditions. BIG contains suitable nesting habitat for a variety of native avian species common to desert scrub communities. Avian species with a potential to nest within/around BIG have been documented throughout all project surveys (**Attachment B**). Throughout BIG and the surrounding areas, nesting has

the potential to occur in shrubs/trees, burrows, and manmade structures such as buildings and utility poles within a variety of habitat.

## *Critical Habitat*

The FESA defines critical habitat as a specific geographic area, or areas, that contains features essential for the survival and recovery of endangered and threatened species. USFWS designates critical habitat for endangered and threatened species and may include sites for breeding and rearing, movement or migration, feeding, roosting, cover, and shelter. Critical habitat may also include areas that are not currently occupied by the species, but that will be needed for its recovery. Special management of critical habitat, including measures for water quality and quantity, host animals and plants, food availability, pollinators, sunlight, and specific soil types is required to support the long-term survival and recovery of the identified species.

Although USFWS-designated critical habitat for desert tortoise occurs within 3 miles of BIG, no USFWS-designated critical habitat is present within BIG (USFWS, 2025a); see Figure 3.1-2.

## *Wildlife Corridors*

### Existing Conditions and Database Analysis

Based on the desktop analysis, including review of the CDFW BIOS viewer data, BIG overlaps with five potential wildlife movement corridors: Terrestrial Connectivity Area of Conservation Emphasis (ACE), California Desert Linkage Network, CEHC Potential Riparian Connection, CEHC Essential Connectivity Area, and the Mojave River – Barstow/Camp Cody Linkage identified in the *Missing Linkages* project (Figure 3.5-1; CDFW, 2025g; CEHC, 2003, 2017a; SCCW, 2014; Penrod et. al., 2001).

ACE: BIG overlaps with four ranks of mapped ACEs. A portion of the southwestern lead track extension is ranked as an *Irreplaceable and Essential Corridor* (Rank 5). Rank 5 ACEs are of conservation concern considering the level of biodiversity that they support relative to the surrounding area and may represent the last available connection between two natural areas considering the surrounding land use and existing barriers in the region. The Rank 5 ACE, which overlaps the southwestern portion of BIG south of Hinkley Road, is relatively undisturbed and contiguous with a CEHC-recognized natural landscape block that extends into the landscape beyond the western and northwestern areas of BIG (Figure 3.5-1; CDFW, 2025g; CEHC, 2017b). The majority of BIG is mapped as a Rank 4 ACE which is a *Conservation Planning Linkage* but is also mapped as a Rank 1 ACE over the northeastern sections of the transload warehouse and rail yard. Rank 4 ACEs are still considered high quality habitat but have not yet been identified as scarce as areas containing Rank 5 ACEs. Rank 1 ACEs are described as a *Limited Connectivity Opportunity* due to existing anthropogenic land use (CDFW, 2025g). Rank 3 ACEs are identified as having connectivity important but not as species corridors or linkages. The Tortilla Substation improvements along with the southernmost terminus of Lenwood Channel are located within a Rank 3 ACE, which is considered to be an area with connections with implementation flexibility.

CEHC: The CEHC California Desert Linkage Network overlaps the northern portion of BIG along the Mojave River, the solar farm, and the off-site improvements (Figure 3.5-1; CEHC, 2014). California Desert Linkage Network areas are determined based on size, habitat quality, nexus to adjacent ecoregions, seasonal

wildlife movement, climate change resilience, aquatic resources, and potential ecological benefits of the proposed linkage. The Mojave River, which is unique to the region, provides a well-defined, open path of travel for wildlife species, allowing access to larger plots of natural habitat; additionally, its floodplain is considered a Potential Riparian Connection by the CEHC (2003).

CEHC Essential Connectivity Areas of varying classes overlap with the northeastern portion of the transload warehouse center, rail yard, off-site improvements, and Tortilla Substation improvements (CEHC, 2017a). However, based on the field assessment, wildlife movement in this portion of BIG is highly constrained by existing residential, commercial, and transit development. This developed area does not provide suitable conditions for regional wildlife movement, and it is likely that this portion of the CEHC Corridor is not mapped accurately. The CEHC map was created at a statewide scale and serves as a tool to be refined at the local and regional level. The CDFW provides a disclaimer that the data provided in the CEHC project varies in currentness, accuracy, scale, completeness, and extent of coverage. Based on field verification of the CEHC Essential Connectivity Area mapping, this corridor is likely much more functional outside of BIG to the east where there is considerably less development.

Missing Linkages: The *Missing Linkages* project identifies an approximately 79-mile Mojave River – Barstow/Camp Cody linkage that extends from Summit Terrace to Manix that is important for riparian birds, including western yellow-billed cuckoo and willow flycatcher, as well as sand transport to the Kelso Dunes. BIG overlaps with some riparian areas associated with the Mojave River, in particular the Hinkley Road Bridge expansion, and also overlaps with dune habitat adjacent to the Mojave River, which could serve as a source of sand to the Kelso Dunes. As a result, BIG partially overlaps with the Mojave River – Barstow/Camp Cody linkage.

Local Corridor Observations: BIG is also used by local wildlife populations of wildlife as a local corridor for movement, foraging, cover, and breeding within the extent of the BIG footprint and the immediate surrounding areas, as well as a corridor for movement between the larger blocks of habitat and regional connectivity areas beyond BIG as described above. As documented during the general and focused species surveys conducted from 2021-2025, BIG provides suitable habitat that supports a variety of wildlife species inhabiting the site. However, existing barriers to movement limit the ability for many species to move through BIG to surrounding areas of natural habitat. The southern boundary of BIG is marked by approximately 14 miles of National Trails Highway until the 33kV alignment moves eastward and continues along additional paved two-lane roads (**Attachment GG**). The speed limit along National Trails Highway is high as 55 miles per hour. Additionally, approximately 13 miles of existing railway runs through the middle of BIG, which is built on raised ballast and fill and bridge structures. Due to these landscape-level obstructions, the natural habitat on BIG is fragmented from larger blocks of natural habitat to the southeast and northwest. The presence of vehicles and the potential for collisions along National Trails Highway and the existing railway may also prevent wildlife moving into and throughout BIG to forage, disperse, and/or seek cover.

However, select areas of BIG may facilitate wildlife movement through the project site. Lenwood Channel occurs in the northeastern portion of BIG and conveys flows to the Mojave River during heavy rain events. The channel is an earthen bottom feature and its incised topography provides cover from its elevated surroundings. The channel ranges from approximately 15 feet to 60 feet wide (exact widths provided in

Attachment C) and runs northwest-southeast through the railyard and transload warehouse center, allowing wildlife to move between the south of the BIG through the channel, to the Mojave River and vice versa. Additionally, a span bridge was built over the Lenwood Channel to support railway operations, leaving the corridor generally unobstructed for wildlife movement underneath. Wildlife may also utilize the various culverts and crossings along the existing railway as local corridors to access the Mojave River, which allows them to safety cross below the rail without entering the right-of-way. Culvert sizes range from approximately two feet to five feet while crossings are generally considered at grade and are large enough to accommodate most passenger vehicles. Although culverts and crossings are located along the existing railway, wildlife movement across/under the railway is still constrained as the openings are located at select locations primarily intended to convey water during heavy rain events. To access culverts and crossings, wildlife are funneled along the railway where adequate cover may be lacking. Certain wildlife may still successfully cross over National Trails Highway and the existing railway; however, those species may be limited to medium sized animals (e.g., coyote, bobcat [*Lynx rufus*], desert kit fox) and are still subject to potential vehicle strikes.

The northern portion of BIG (proposed transload warehouse center) occurs along the Mojave River, which flows during average/above average precipitation years and is also mapped as a wildlife corridor/linkage (CEHC, 2017a). Even as an ephemeral feature, wildlife may still use the linear corridor to travel between large expanses of natural habitat along the river year round, including between other core desert habitat regions (San Bernardino County Regional Conservation Investment Strategy, 2021). Several sensitive species, such as yellow-billed cuckoo, willow flycatcher, and American beaver have been documented within the Mojave River corridor during various project surveys.

Although open spaces south of the railway are linked to the Mojave River and viable habitat blocks to the north and beyond via travel through culverts, crossings, and Lenwood Channel, the existing manmade obstructions to movement prevent the lands within BIG from being a high-value wildlife corridor. These obstructions result in BIG's fragmentation from other expanses of desert habitat and edge effects where wildlife may be more negatively impacted by human disturbance (e.g., vehicle collisions, removal of habitat). Despite BIG's limited functionality as a wildlife corridor, it occurs adjacent to the Mojave River, which is a critical corridor and habitat linkage in the region (San Bernardino County Regional Conservation Investment Strategy, 2024).

### Wildlife Movement Camera Study

To further assess wildlife movement on BIG, the wildlife movement camera study was conducted over six study periods throughout the year in March, June, September, and November of 2024, as well as January and March of 2025 (**Table 6**). Between 26 and 35 infrared trail cameras (depending on availability and identification of additional camera locations) were deployed for each study period in potential linear corridors within BIG, along habitat edges, and at structures/openings that connected two areas of natural habitat that are otherwise separated from each other by physical barriers. These areas included Lenwood Channel, railway vehicle crossings and culverts, various access/dirt roads, and along the Mojave River and the barrier of National Trails Highway. Wildlife movement is anticipated to be concentrated in these areas, especially for larger species (medium-sized mammals and reptiles such as coyote and desert tortoise) with the ability to travel large distances and that have the potential to move through BIG to reach other areas

beyond the site. The camera locations were placed along National Trails Highway/Main Street, at various crossings and culverts along the railway, along Lenwood Channel, along the Mojave River corridor, and at Hinkley Road Bridge (Figure 4.7-1. Wildlife Movement Study). A variety of medium-sized mammals, small reptiles, rodents and lagomorphs (hares and rabbits), and bird species were detected by use of wildlife cameras within BIG during the wildlife movement study. Other notable detections included desert tortoise (*Gopherus agassizii*) and western toad (*Anaxyrus boreas*).

Medium-sized mammals such as coyote (*Canis latrans*) and desert kit fox (*Vulpes macrotis arsipus*) were captured throughout all six study periods. Small mammals such as kangaroo rat (*Dipodomys* sp.) and white-tailed antelope squirrel (*Ammospermophilus leucurus*), and lagomorphs such as desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*), were also observed year-round throughout the site. These species are common desert residents and can be observed all year within their range. Bird species detected included several resident species such as mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), California thrasher (*Toxostoma redivivum*), California quail (*Callipepla californica*), and western meadowlark (*Sturnella neglecta).* Small reptiles observed include common desert species such as northern desert spiny lizard (*Sceloporus magister uniformis*), zebra-tailed lizard (*Callisaurus draconoides*) and desert iguana (*Dipsosaurus dorsalis*). Please note that most of the species detected via camera during the study were also documented during various other project surveys. Except for the detection of migratory bird species such as white-crowned sparrow (*Zonotrichia leucophrys*), lark sparrow (*Chondestes grammacus*), and American pipit (*Anthus rubescens*), the species detected during the wildlife movement camera study were relatively common residents and did not include any migratory species or species with regional post-natal dispersion potential. A full list of all the wildlife species detected during the wildlife movement camera study is included in **Attachment GG**.

Following the completion of the wildlife movement camera study, species frequency maps were generated for all camera locations throughout all six study periods. The maps display the number of images captured of certain species with larger home ranges that may extend beyond BIG; these species included coyote, desert kit fox, desert tortoise, bobcat (*Felis rufus*), and burrowing owl. Throughout the study, wildlife cameras placed throughout Lenwood Channel detected coyote traveling through the channel from the railway and northward. Coyotes were also documented at vehicle crossings and underneath span bridges along the railway, including crossings along the southwest lead track extension (**Attachment GG**). Although desert kit fox had a lower capture frequency, they were also observed on wildlife cameras throughout Lenwood Channel, though more detections occurred in the channel south of the main track. Desert kit fox was also observed at vehicle crossings and under span bridges along the railway. Bobcat was detected during Periods 2 and 4, moving off site towards the Mojave River near MP 10.9 and entering a span bridge at MP 12.3. Although desert tortoise was observed on only one day (3/21/24) during only one study period (Period 1) at MP 11.3, the camera photos showed an adult tortoise approaching the culvert from the north several times and turning away; the burst frequency of the camera capture and relatively slower speed of the species resulted in a higher quantity of capture frequency and it was determined that the desert tortoise individual did not cross the culvert at MP 11.3 (**Attachment GG**). This desert tortoise was captured on camera approximately 1,200 feet northeast of a burrow supporting a live desert tortoise during fall 2024 desert tortoise surveys (**Attachment Q**). A single burrowing owl was also observed during the study on one day (3/17/25) during Period 6 along the dune

Project Site
Period 1 Camera Location

**Existing Barriers**
National Trails Highway
Existing BNSF Railway
Vehicle Crossing
Culvert

**Movement Corridors**
Mojave River (Potential Riparian Connections – CEHC Project)
Lenwood Channel[1]

[1] Representative depiction of Lenwood Channel wildlife movement corridor, not mapped to USACE aquatic resources mapping standards

DETAIL VIEW

DETAIL VIEW

Oak Grove Rd
National Trails Hwy
Gazana St
Lenwood Rd
58
15

# Wildlife Movement Study - Period 1: March 17-22, 2024

FIGURE 4.7-1A

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET
1 INCH = 4,000 FEET

Aerial Photo: San Bernardino County 2024, Esri

Project Site

Period 2 Camera Location

**Existing Barriers**

National Trails Highway

Existing BNSF Railway

Vehicle Crossing

Culvert

**Movement Corridors**

Mojave River (Potential Riparian Connections – CEHC Project)

Lenwood Channel[1]

[1] Representative depiction of Lenwood Channel wildlife movement corridor, not mapped to USACE aquatic resources mapping standards

Lenwood Rd

Oak Grove Rd

Gazana St

58

15

# Wildlife Movement Study - Period 2: June 24-30, 2024

FIGURE 4.7-1B

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET

1 INCH = 4,000 FEET

N

Aerial Photo: San Bernardino County 2020, Esri

Project Site

Period 3 Camera Location

**Existing Barriers**

National Trails Highway

Existing BNSF Railway

Vehicle Crossing

Culvert

**Movement Corridors**

Mojave River (Potential Riparian Connections – CEHC Project)

Lenwood Channel[1]

[1] Representative depiction of Lenwood Channel wildlife movement corridor, not mapped to USACE aquatic resources mapping standards

Oak Grove Rd

Lenwood Rd

Gazana St

58

15

# Wildlife Movement Study - Period 3: September 8-13, 2024

FIGURE 4.7-1C

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET

1 INCH = 4,000 FEET

N

Aerial Photo: San Bernardino County 2024, Esri

Project Site
Period 4 Camera Location

**Existing Barriers**
National Trails Highway
Existing BNSF Railway
Vehicle Crossing
Culvert

**Movement Corridors**
Mojave River (Potential Riparian Connections – CEHC Project)
Lenwood Channel[1]

[1] Representative depiction of Lenwood Channel wildlife movement corridor, not mapped to USACE aquatic resources mapping standards

Oak Grove Rd
Lenwood Rd
Gazana St
58
15

# Wildlife Movement Study - Period 4: November 21-26, 2024

FIGURE 4.7-1D

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET
1 INCH = 4,000 FEET

Aerial Photo: San Bernardino County 2024, Esri

Project Site
Period 5 Camera Location

**Existing Barriers**
National Trails Highway
Existing BNSF Railway
Vehicle Crossing
Culvert

**Movement Corridors**
Mojave River (Potential Riparian Connections – CEHC Project)
Lenwood Channel[1]

[1] Representative depiction of Lenwood Channel wildlife movement corridor, not mapped to USACE aquatic resources mapping standards

Oak Grove Rd
Lenwood Rd
Gazana St
58
15

# Wildlife Movement Study - Period 5: January 10-14, 2025

FIGURE 4.7-1E

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET
1 INCH = 4,000 FEET

Aerial Photo: San Bernardino County 2020, Esri

Project Site
Period 6 Camera Location

**Existing Barriers**
National Trails Highway
Existing BNSF Railway
Vehicle Crossing
Culvert

**Movement Corridors**
Mojave River (Potential Riparian Connections – CEHC Project)
Lenwood Channel[1]

[1] Representative depiction of Lenwood Channel wildlife movement corridor, not mapped to USACE aquatic resources mapping standards

Oak Grove Rd
Lenwood Rd
Gazana St
58
15

# Wildlife Movement Study - Period 6: March 13-18, 2025

FIGURE 4.7-1F

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 4,000 FEET
1 INCH = 4,000 FEET

Aerial Photo: San Bernardino County 2024, Esri

area adjacent the Mojave River but was not captured on camera during any other study periods (**Attachment GG**).

Although the Mojave River is mapped as an important habitat linkage and wildlife corridor (Figure 3.5-1), no medium-sized mammals such as coyote, desert kit box, or bobcat were observed on wildlife cameras stationed at Hinkley Road Bridge. Smaller wildlife including birds, desert cottontail, white-tailed antelope squirrel, and western toad were documented during most study periods. The camera at the Hinkley Road Bridge was placed immediately past the north side of the bridge within the riverbed where there was almost no vegetative cover. The majority of species caught on camera at the Hinkley Road Bridge were primarily observed during the day and were likely using the bridge as a shade structure. The lack of vegetation cover immediately surrounding the camera station at the Hinkley Road Bridge may have precluded wildlife species from crossing directly under the bridge or from resting long enough to be captured by the wildlife camera if they did pass under the bridge. Additionally, with only one camera aimed at the entire span of the Hinkley Road Bridge, species that moved quickly on the opposite side of the river from the camera may have been less likely to be detected, especially at night when species like desert kit fox and coyote are more active. The upper banks along the Mojave River at Hinkley Road Bridge contain mature shrubs and trees which may be more suitable for travel along the Mojave River corridor, as opposed to the lower elevation of the riverbed that is void of vegetation.

Coyote and desert kit fox were also detected on cameras located along National Trails Highway (**Attachment GG**). National Trails Highway represents an obstruction to wildlife movement, and fragments natural habitats occurring on either side of the paved roadway. The presence of medium-sized mammals captured at cameras along the highway as well as roadkill observations of the same species supports that species with relatively larger home ranges are still crossing or attempting to cross National Trails Highway into BIG and/or crossing along the highway on the edge of habitat in search for food or cover.

The wildlife movement camera study not only confirmed the presence of certain resident desert wildlife species on site, as well as some migrating bird species, but also confirmed the use of crossing structures such as Lenwood Channel and various culverts and crossings along the railway that may be used by medium-sized animals. A full description of the wildlife movement camera study, including the results, is included in **Attachment GG.**

# 6.0 IMPACT ANALYSIS

Pursuant to CEQA, project impacts must be identified and then analyzed in consideration of the Environmental Checklist Form (form) included as Appendix G to the State CEQA Guidelines. The form lists the various environmental factors that must be considered for a project under CEQA and the potential impacts that must be evaluated for each environmental factor to determine if a project would have potentially significant impacts under CEQA.

The following section provides a discussion of the potential direct and indirect impacts on biological resources that may result from BIG construction and operations and maintenance and an analysis of whether such impacts would have a potentially significant effect on the environment, specifically whether BIG would result in "a substantial, or potentially substantial, adverse change in the environment" (Public Resources Code § 21068).

***Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

### Special-Status Plant Species

The below analysis reflects potential impacts on special-status plant species within all project components of BIG with the exception of the 450-foot-wide corridor for the 33kV alignment along Bonanza Road. It is anticipated that the final alignment and its associated 30-foot-wide impact area along Bonanza Road will be located within the 450-foot-wide study area, pending final design. Special-status plant surveys will be conducted prior to construction in spring of 2026 during the appropriate bloom period for annuals and will cover the remaining 450-foot-wide corridor not previously assessed/surveyed for special-status plant species presence. Any special-status plant species observed within the final 33kV alignment along Bonanza Road will be documented with the City prior to mobilization activities, and adequate mitigation consistent with the measures to avoid and minimize impacts on special-status plant species outlined in this document will be applied accordingly. These measures include: weed control (MM BIG BIO-6), work limit delineation (MM BIG BIO-7), staging and stockpiles (MM BIG BIO-33), worker awareness training (MM BIG BIO-1), biological resource monitoring (MM BIG BIO-2), desert native plant salvage plan (MM BIG BIO-37), compensatory mitigation for sensitive natural communities (MM BIO-28), and water quality best management practices (MM BIG BIO-30).

#### *Construction – Direct and Indirect Impacts*

No federally or state-listed as endangered or threatened plant species were documented within BIG during special-status plant surveys conducted in 2023, 2024, or 2025 and none have moderate to high potential to occur based on the lack of suitable habitat within BIG, with the exception of western Joshua tree (CESA candidate) ornamental plantings as discussed below. As such, no impacts on federally or state-listed endangered or threatened plant species are anticipated with BIG implementation.

No non-listed CRPR 1 or 2 plant species were documented within BIG; however, seven species (Barstow woolly sunflower, beaver dam breadroot, creamy blazing star, Emory's crucifixion-thorn, Mojave

monkeyflower, Parish's phacelia, and spiny-hair blazingstar) were initially determined to have moderate to high potential to occur based on the presence of suitable habitat within BIG and documented occurrences within 3 miles of BIG (CNPS, 2025); see Figure 3.1-1. However, none of the seven species with moderate to high potential to occur were documented during 2023, 2024, or 2025 focused special-status plant surveys conducted during the appropriate blooming periods. Therefore, there will be no project impacts to CRPR 1 or 2 plant species.

Two non-listed CRPR 4.3 species; Mojave fishhook cactus and Mojave indigo bush, were documented within BIG during 2023, 2024, and 2025 focused special-status plant surveys (Figure 5.1-1. Special-Status Plant Impacts). Both species are still relatively common within their range, and both occur adjacent BIG. BIG will result in the removal of approximately 14 individuals of Mojave fishhook cactus and 700 individuals of Mojave indigo bush. However, plants ranked as CRPR 4.3, such as Mojave fishhook cactus and Mojave indigo bush, are considered to have a limited distribution but are not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known).Therefore, removal of individuals of these species within the BIG footprint would not have a substantial effect on the viability of either species. There are little to no known threats across these species' range that would prevent the persistence of these species outside of BIG. Additionally, Mojave fishhook cactus is regulated under the County Code 88.01 as discussed below.

While western Joshua tree, a candidate for listing under CESA, is present within the BIG footprint, individuals of the species would not be impacted by project implementation. Of the 33 western Joshua trees documented in the census area during the project census on October 17, 2024, 17 trees are within the project boundary and 16 trees are within 10 feet of the project impacts boundary . However, no trees would be directly impacted by removal or indirectly impacted by construction disturbing their root system. Further, western Joshua trees on BIG occur as ornamental plantings associated with residential housing and are not naturally occurring; The trees within BIG are isolated and are not likely contributing to the species reproduction and transfer of genetic material in the known range. Impacts would be less than significant..

Plant species that are regulated by the County of San Bernardino Code § 88.01, including creosote rings, *Prosopis* sp., Mojave yucca, desert holly, and the previously mentioned western Joshua tree and Mojave fishhook cactus were observed on-site during 2025 special-status plant surveys. Individuals of some species will be impacted during construction. However, conformance with County of San Bernardino Code § 88.01 requires that project impacts associated with removal of the plants be considered as part of the entitlement/ environmental review process. Salvage of regulated plant species would minimize impacts if avoidance is not feasible. Therefore, with the implementation of MM BIG BIO-37, impacts on special-status plants would still be less than significant. Please note that the County Code 88.01 includes additional plants regulated under the California Desert Native Plants Act, as such, compliance with the County Code 88.01 will satisfy compliance with the act.

Due to the absence of federally and state-listed, as well as CRPR 1 and 2, plant species from the project site and conformance with the County of San Bernardino § 88.01 which also regulates plants covered under the California Desert Native Plants Act (MM BIG BIO-37), BIG implementation would result in less than significant direct impacts on special-status plant species.

AT & SF RR

HOLCOMB RANCH RD

8

9

Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (15)



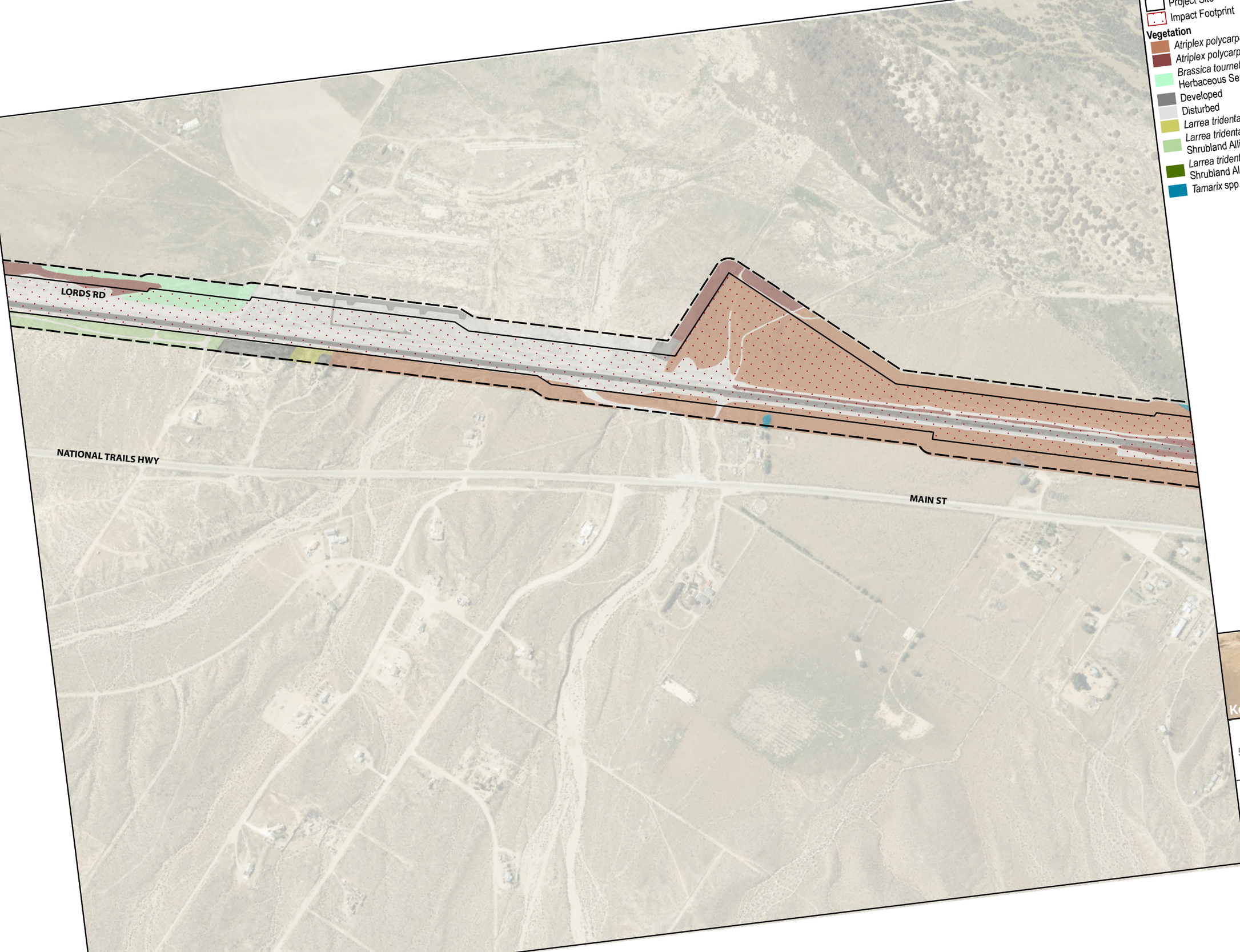

FIGURE
5.1-1A

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024




Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance




Key Map

FIGURE 5.1-1B

**Special-Status Plant Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

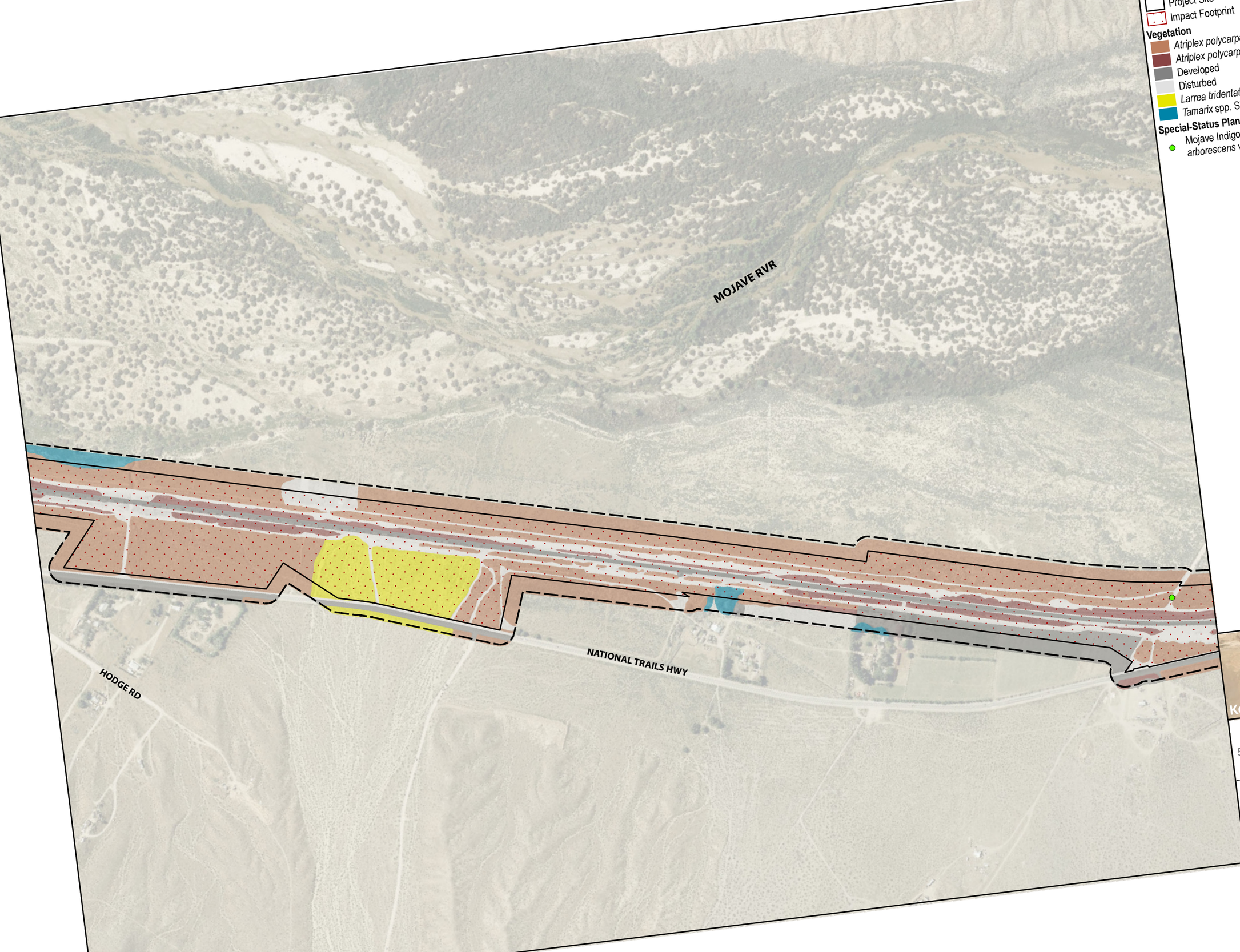
ROCKS BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri 2



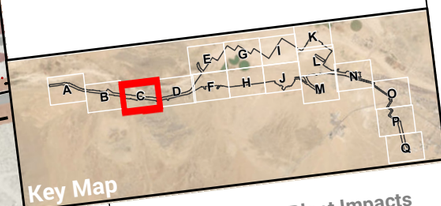

Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

**Special-Status Plants**

- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (1)




Key Map

FIGURE 5.1-1C

**Special-Status Plant Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

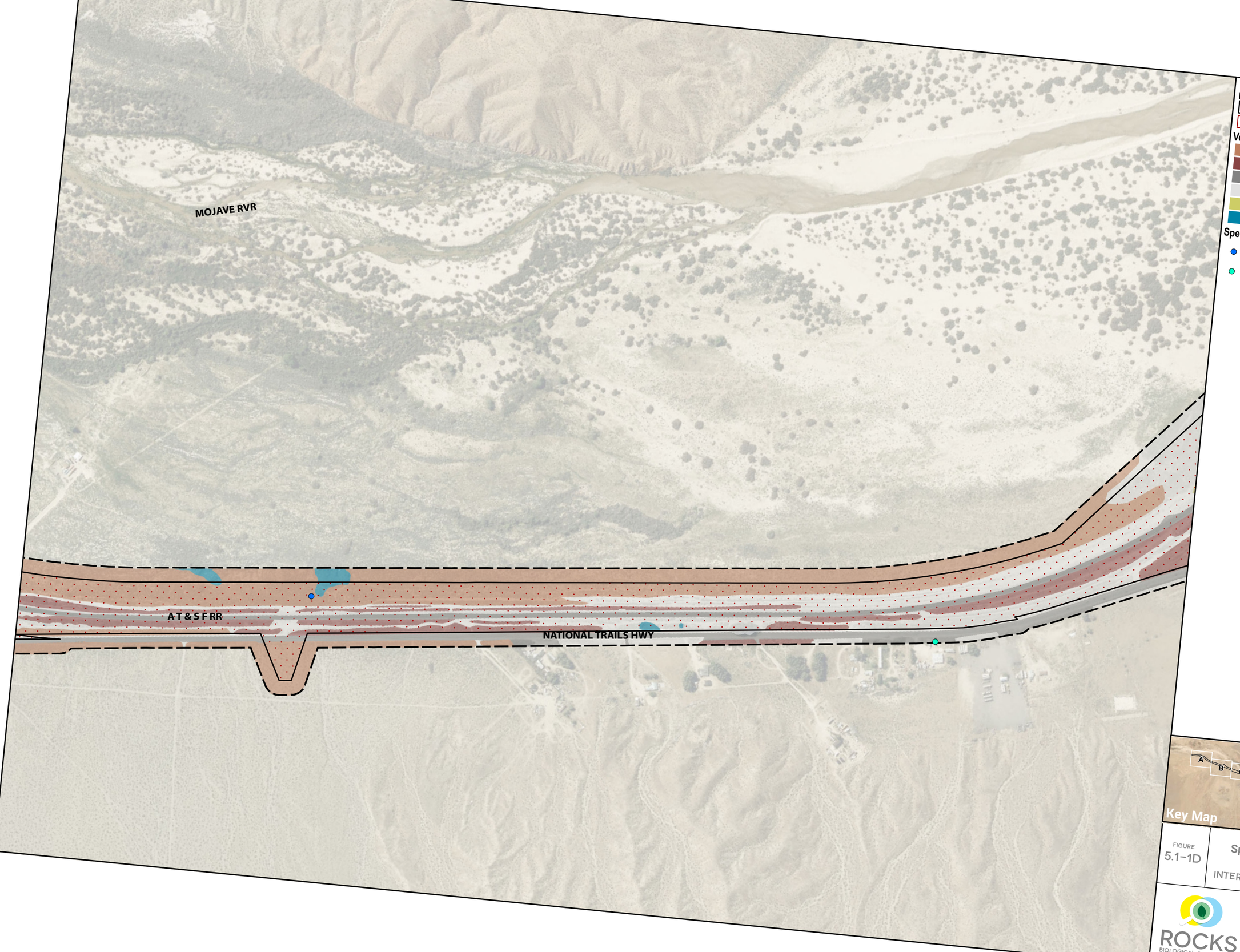
ROCKS BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri 2




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Tamarix* spp. Shrubland Semi-natural Alliance

**Special-Status Plants**

Screwbean Mesquite (*Strombocarpa pubescens*) (1)
Western Joshua Tree (*Yucca brevifolia*) (1)

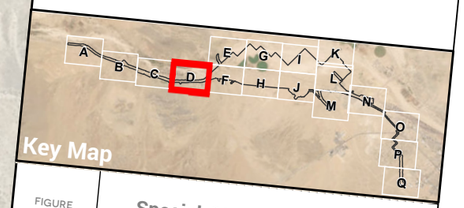


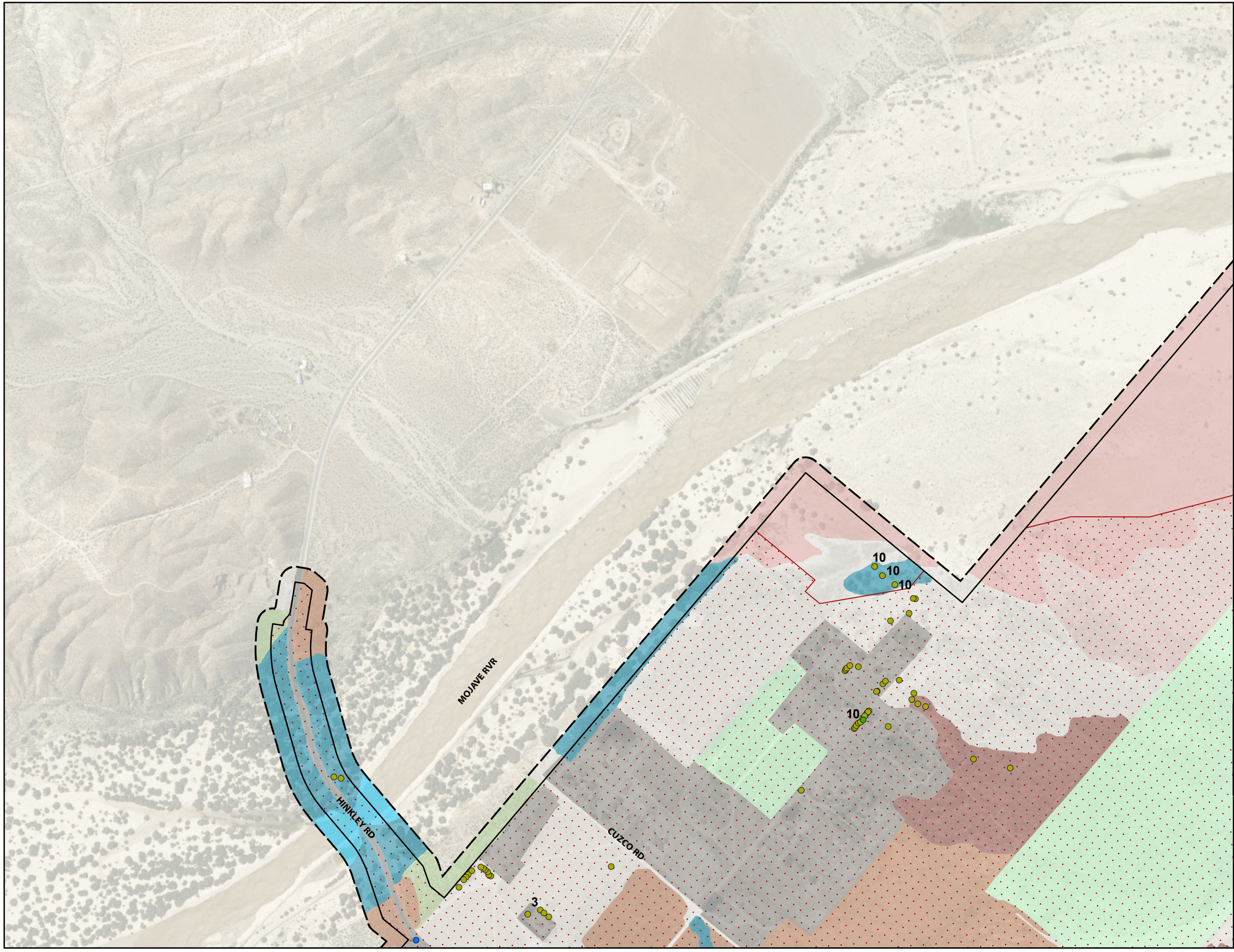

FIGURE 5.1-1D

**Special-Status Plant Impacts**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL

0 600 FEET
1 INCH = 600 FEET
N




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Honey Mesquite (*Neltuma odorata*) (93)
- Jerusalem Thorn (*Parkinsonia aculeata*) (10)
- Screwbean Mesquite (*Strombocarpa pubescens*) (1)

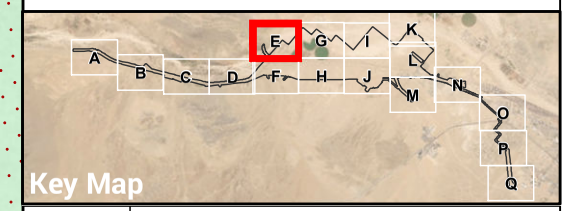



FIGURE 5.1–1E

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024

AT & SF RR

HINKLEY CTF

AT & SF RR

MAIN ST

MAIN ST.

6 2 3 6

7

Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Desert Holly (*Atriplex hymenelytra*) (4)
- Mojave Fish Hook Cactus (*Sclerocactus polyancistrus*) (5)
- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (28)
- Mojave Yucca (*Yucca schidigera*) (27)
- Screwbean Mesquite (*Strombocarpa pubescens*) (1)




FIGURE
5.1–1F

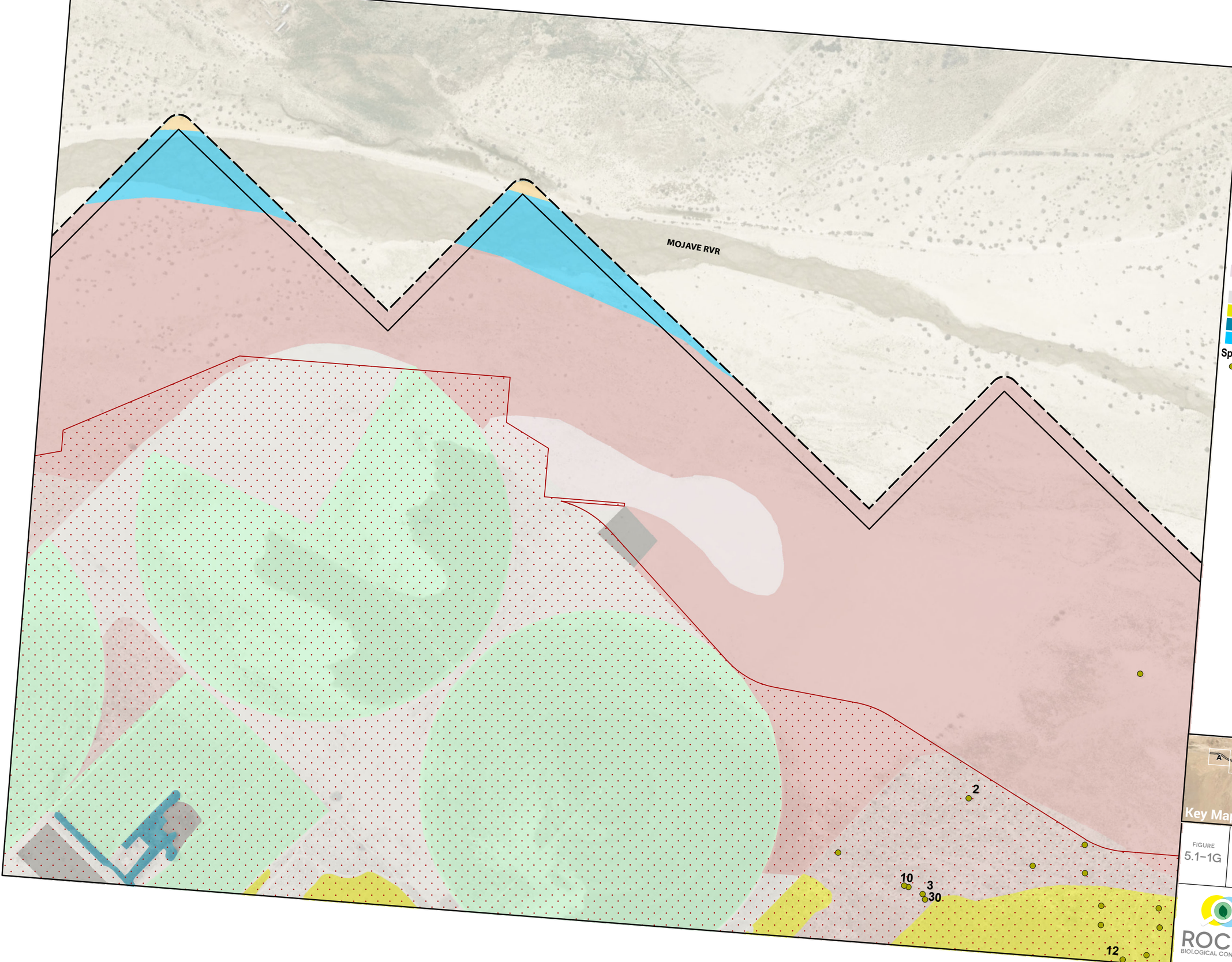
**Special-Status Plant Impacts**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Honey Mesquite (*Neltuma odorata*) (68)

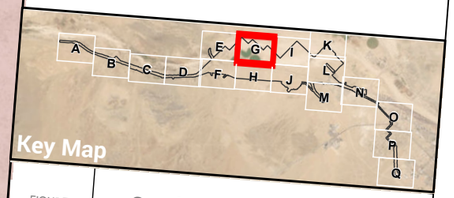



FIGURE 5.1–1G

**Special-Status Plant Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET

1 INCH = 600 FEET

N

GAZANA ST

Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

**Special-Status Plants**

- Creosote Bush Ring (*Larrea tridentata*) (7)
- Honey Mesquite (*Neltuma odorata*) (52)
- Mesquite species (*Neltuma* sp.) (3)
- Mojave Fish Hook Cactus (*Sclerocactus polyancistrus*) (9)
- Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (680)
- Mojave Yucca (*Yucca schidigera*) (6)

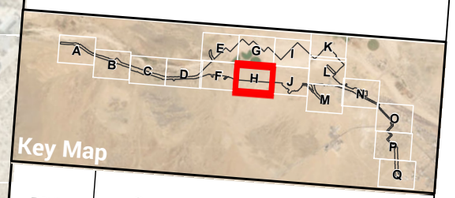



FIGURE 5.1–1H

**Special-Status Plant Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/20/2020

Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

*Atriplex canescens* Shrubland Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
Disturbed
*Larrea tridentata* Shrubland Alliance
Unvegetated Channel

**Special-Status Plants**

Honey Mesquite (*Neltuma odorata*) (556)

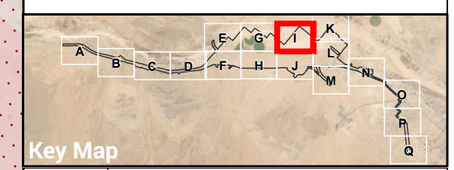


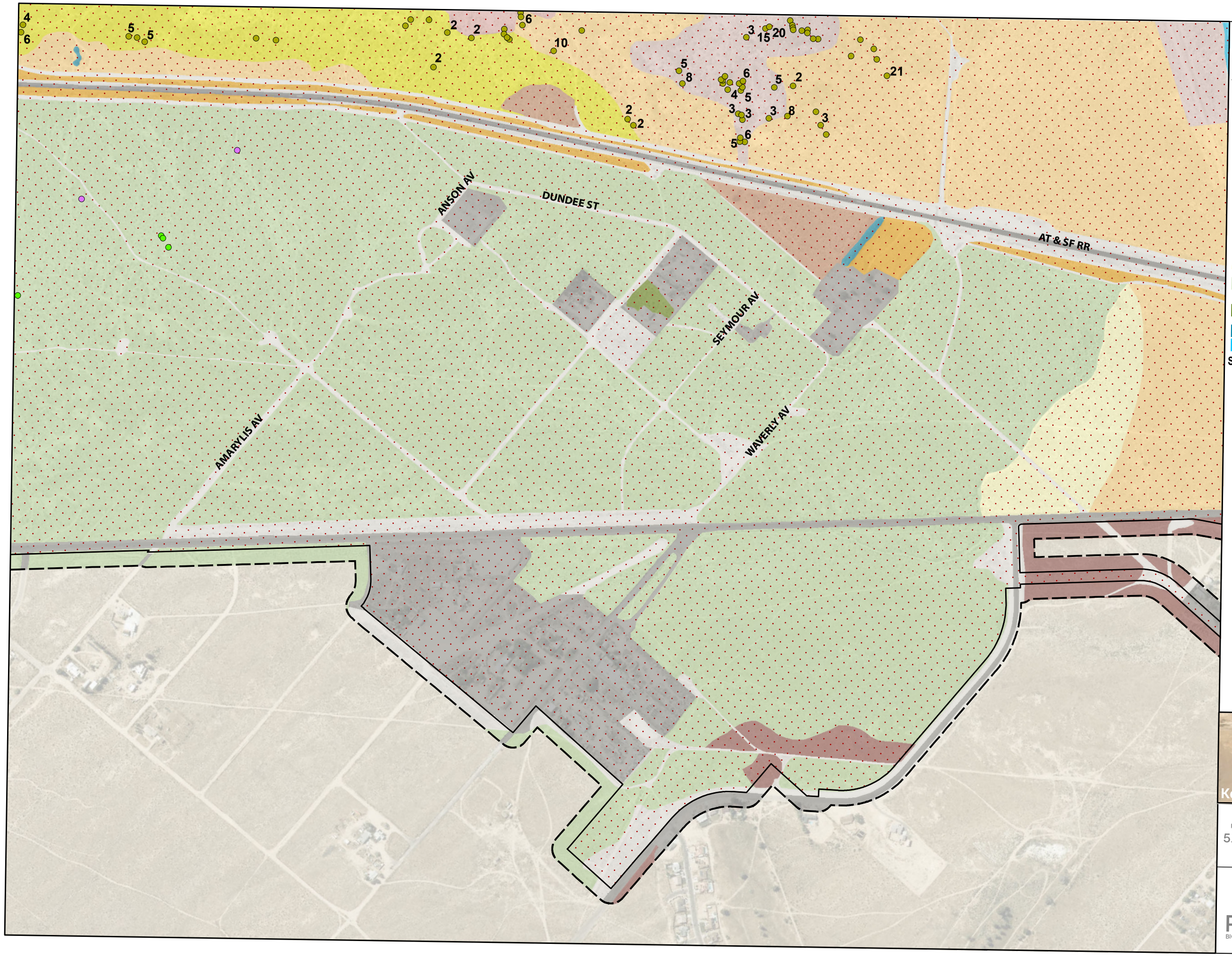

FIGURE 5.1–1I

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Ambrosia dumosa* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Creosote Bush Ring (*Larrea tridentata*) (2)
- Honey Mesquite (*Neltuma odorata*) (208)
- Mojave Indigo Bush (*Psorothamnus arborescens* var.*arborescens*) (4)

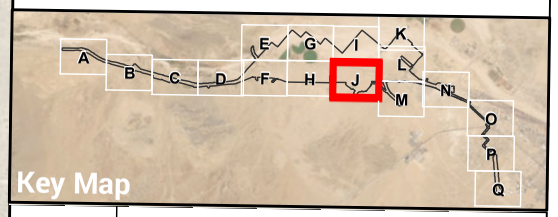



FIGURE 5.1–1J

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024

DIXIE RD

GREEN RD

MOJAVE RVR

Special-Status Plant Survey Area

Project Site

Impact Footprint

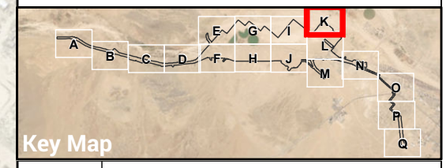
**Vegetation**

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized

Disturbed




Key Map

FIGURE
5.1–1K

**Special-Status Plant Impacts**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

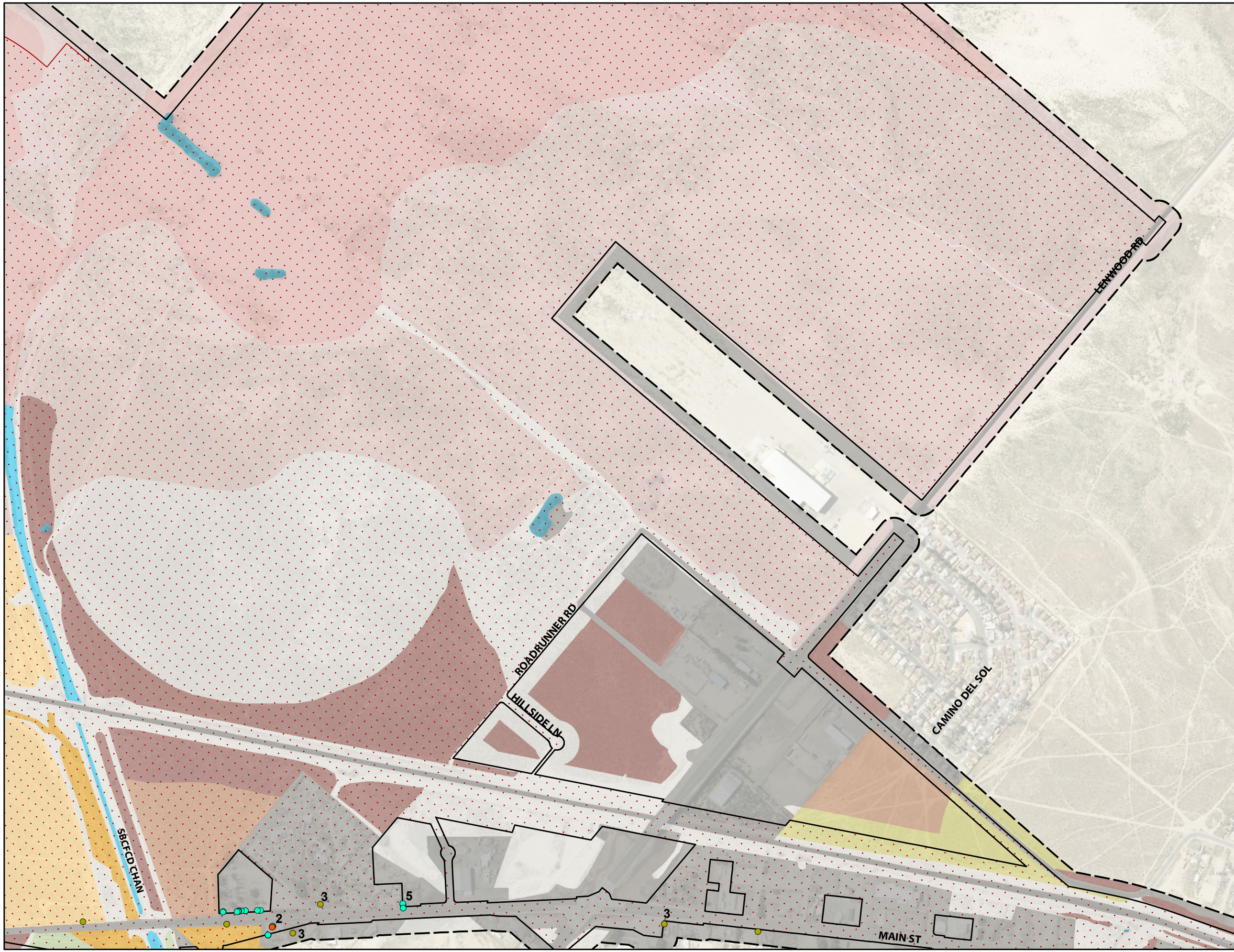
0 600 FEET

**1 INCH = 600 FEET**

N

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- Honey Mesquite (*Neltuma odorata*) (12)
- Ocotillo (*Fouquieria splendens*) (2)
- Western Joshua Tree (*Yucca brevifolia*) (35)

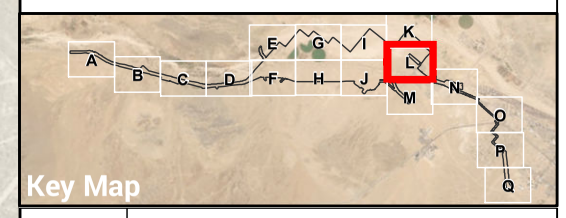



FIGURE 5.1–1L

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024

LENDWOOD RD

ASH RD

6

3

Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

**Special-Status Plants**

- California Barrel Cactus (*Ferocactus cylindraceus*) (1)
- Honey Mesquite (*Neltuma odorata*) (31)
- Jerusalem Thorn (*Parkinsonia aculeata*) (4)
- Ocotillo (*Fouquieria splendens*) (1)
- Western Joshua Tree (*Yucca brevifolia*) (21)

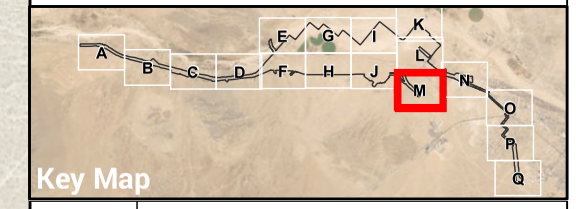



FIGURE
5.1–1M

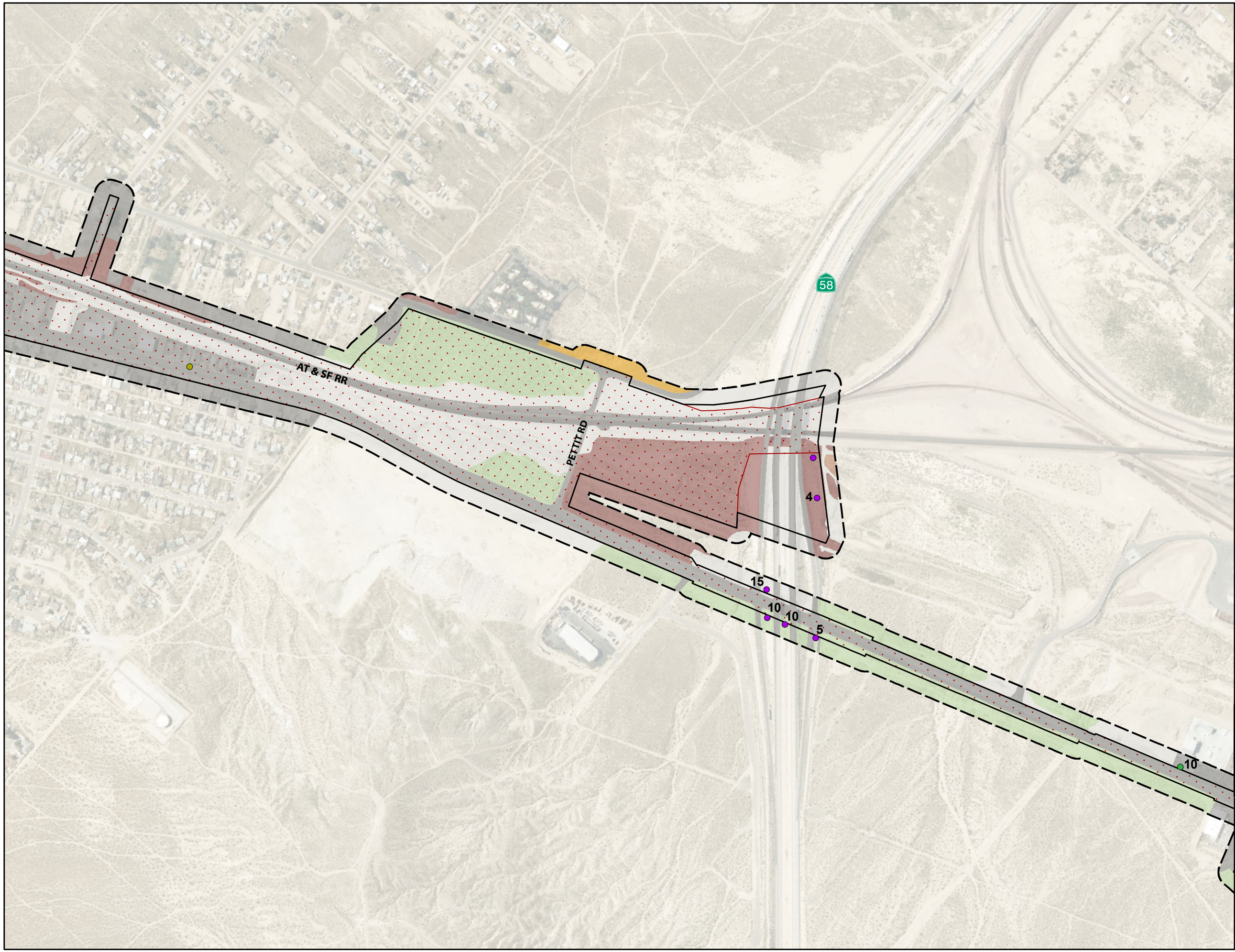
**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

*Atriplex canescens* Shrubland Alliance - Disturbed
*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

Desert Holly (*Atriplex hymenelytra*) (45)
Honey Mesquite (*Neltuma odorata*) (1)
Jerusalem Thorn (*Parkinsonia aculeata*) (10)

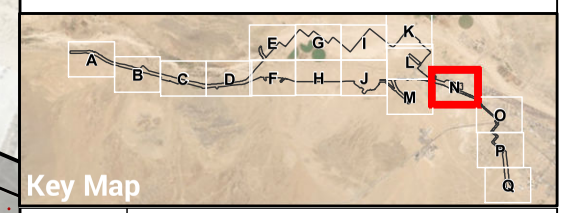



FIGURE
5.1–1N

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

Jerusalem Thorn (*Parkinsonia aculeata*) (18)
Mesquite species (*Neltuma* sp.) (6)
Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (10)
Ocotillo (*Fouquieria splendens*) (3)

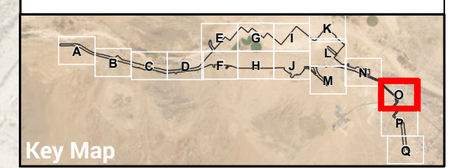


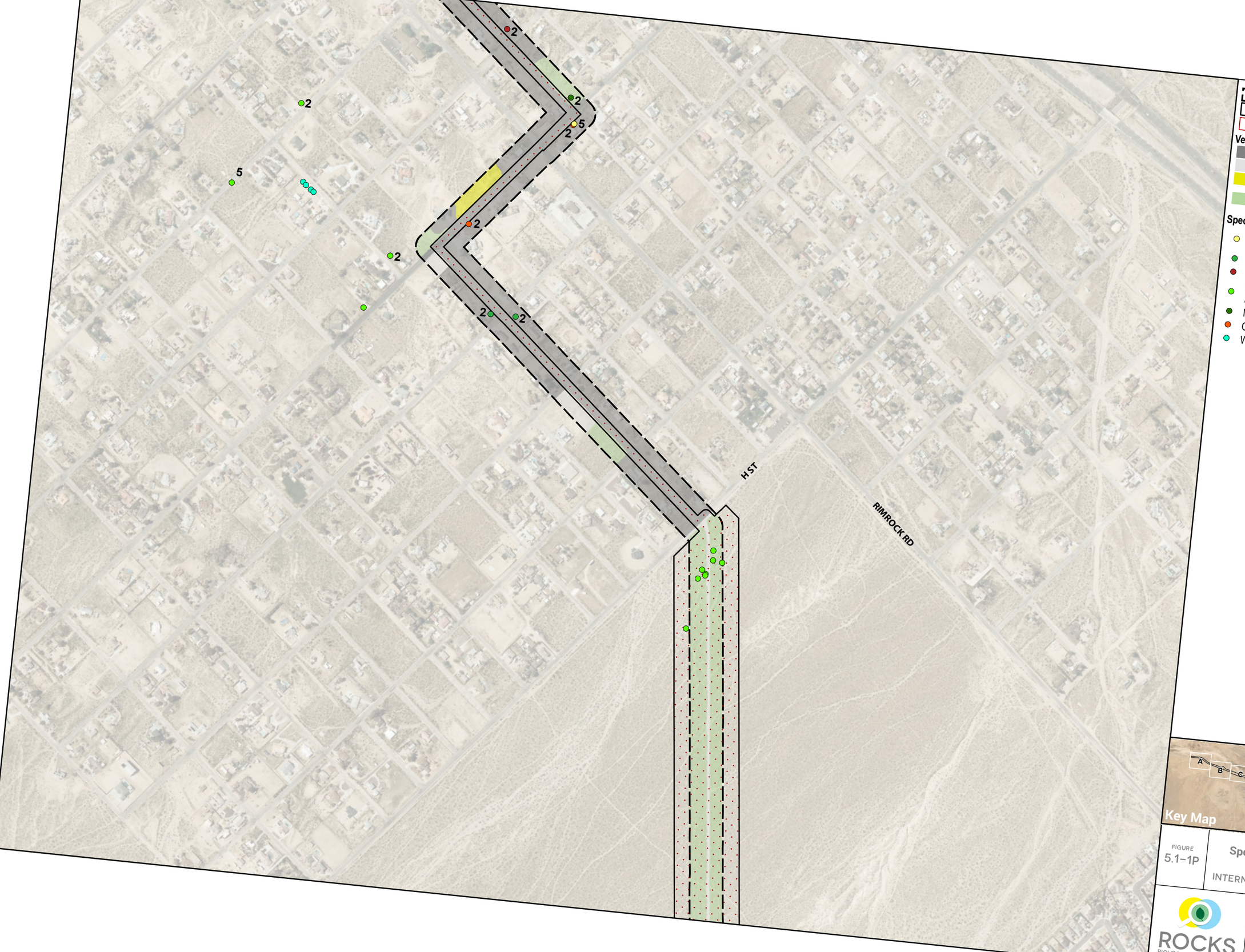

FIGURE
5.1–10

**Special-Status Plant Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024




Special-Status Plant Survey Area
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

**Special-Status Plants**

California Barrel Cactus (*Ferocactus cylindraceus*) (2)
Jerusalem Thorn (*Parkinsonia aculeata*) (4)
Mesquite species (*Neltuma* sp.) (2)
Mojave Indigo Bush (*Psorothamnus arborescens* var. *arborescens*) (19)
Mojave Yucca (*Yucca schidigera*) (2)
Ocotillo (*Fouquieria splendens*) (7)
Western Joshua Tree (*Yucca brevifolia*) (4)




FIGURE 5.1-1P

**Special-Status Plant Impacts**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS

0 600 FEET
1 INCH = 600 FEET

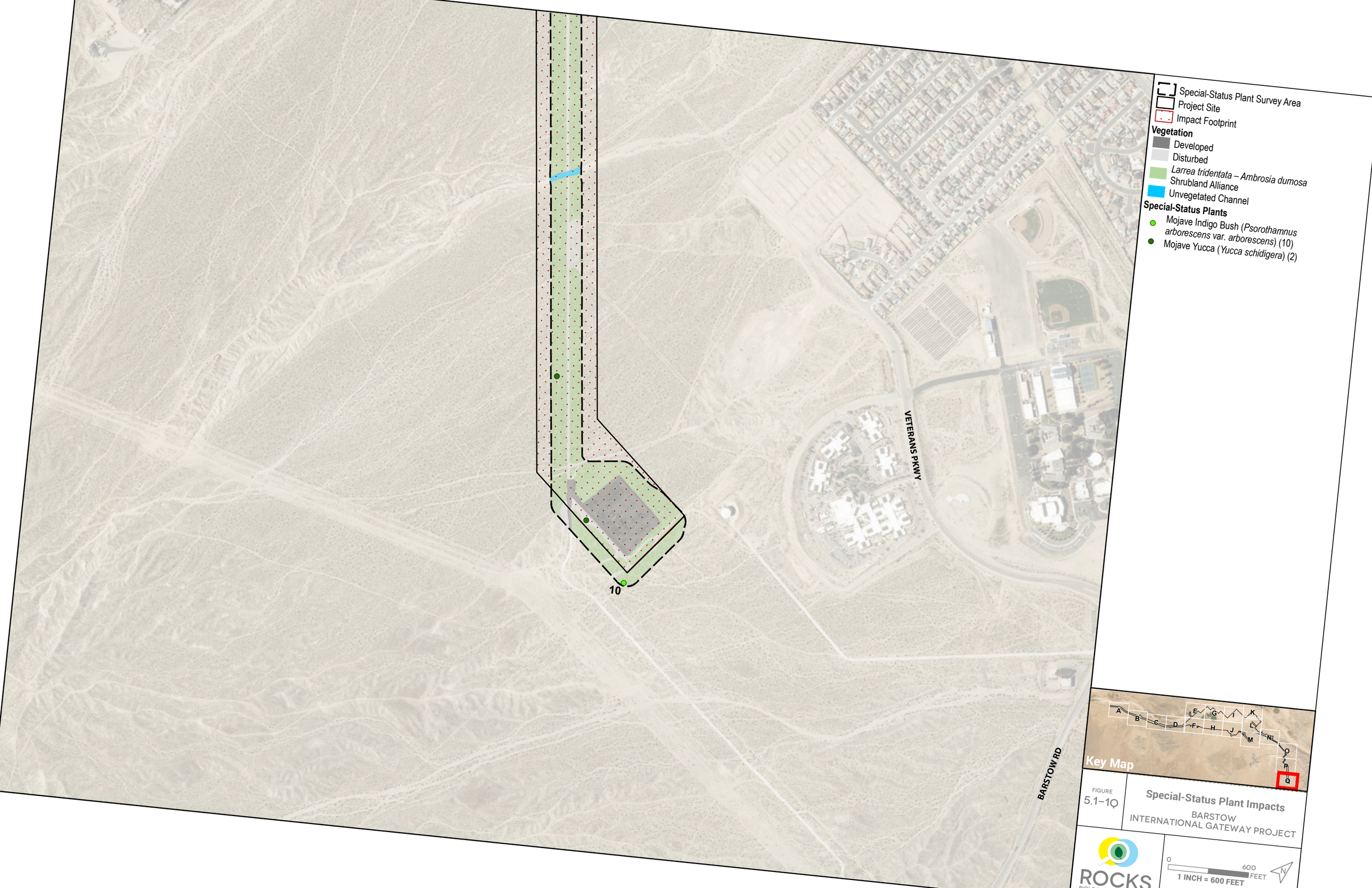



FIGURE 5.1–10

Special-Status Plant Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS

0 600 FEET

1 INCH = 600 FEET

The construction of BIG has the potential to result in indirect impacts on special-status plant species adjacent to the project site. If left unmitigated, construction impacts such as runoff, erosion, and fugitive dust have the potential to alter natural site conditions which may adversely impact special-status plant populations. Water quality BMPs will be implemented during construction to minimize erosion, runoff, and stormwater contaminants (MM BIO-30). Construction may also lead to the introduction of non-native species which can outcompete and displace native plant species. However, MM BIG BIO-6 requires that BIG implement an Adaptive Weed Control Plan to help prevent the spread of invasive plants within and around the project site. Therefore, with implementation of MM BIG BIO-6, indirect impacts on special-status plants during construction of BIG would be less than significant.

#### *Operations & Maintenance – Direct and Indirect Impacts*

No additional direct impacts on special-status plant species will result from the operation and maintenance of BIG. Although not considered sensitive for the purposes of this analysis, CRPR 3 and 4 plant species and plants regulated under the County Code 88.01 occurring within the impact footprint would have already been removed/salvaged during the construction phase of BIG.

Operation and maintenance of BIG is also not expected to result in long-term indirect impacts as an Adaptive Weed Control Plan would be implemented as part of project operations (MM BIG BIO-6). Therefore, indirect impacts on special-status plant species as a result of BIG operations and maintenance would be less than significant.

### Threatened and Endangered Wildlife Species

Five federally and/or state-listed wildlife species; desert tortoise, Swainson's hawk, western burrowing owl (state candidate for listing), willow flycatcher, and yellow-billed cuckoo, were documented within or adjacent to BIG during surveys conducted from 2021 to 2025 (**Table 6**) (**Threatened and Endangered Wildlife Species**). Additionally, the state-listed tricolored blackbird was incidentally observed during various focused riparian bird surveys in 2023. Focused surveys were also conducted in 2022, 2023, and 2025 for three additional federally and/or state-listed wildlife species: least Bell's vireo, Mohave ground squirrel, and southwestern willow flycatcher. Least Bell's vireo and Mohave ground squirrel were not documented within BIG or associated survey buffers; and although willow flycatcher was observed, subspecies could not be determined.

#### *Desert Tortoise*

Suitable desert tortoise habitat occurs within BIG, including areas of high, moderate, and low suitability. Based on focused survey results from the fall 2024 surveys and analysis using the USFWS statistical model, it is estimated that approximately 1.7 adult desert tortoises occur within BIG.

#### Construction – Direct and Indirect Impacts

Direct impacts on desert tortoise could occur during BIG construction activities such as vegetation removal, grading, excavation, vehicle traffic, material and equipment storage, resulting in harassment, injury, and/or death of individual tortoises. Specifically, vegetation removal and mass grading within suitable habitat such as the railyard and trenching for the 33kV alignment has the potential to remove active burrows and/or harass any desert tortoise individuals in the vicinity of direct impact areas or active

construction areas. Harassment of desert tortoise may cause tortoises to void, or empty, their bladder when stressed, leading to dehydration and possibly death. Machinery, such as cranes, skid steers, excavators, or even pick-up trucks have the potential to strike desert tortoise resulting in injury or mortality. These impacts on desert tortoise would be considered significant.

Implementation of BIG may result in direct impacts through destruction, loss, or degradation of suitable habitat during construction. Desert tortoise individuals and sign were documented within desert saltbush scrub and creosote bush (white bursage) scrub habitats (*Larrea tridentata – Ambrosia dumosa* shrubland alliance and *Atriplex canescens* shrubland alliance) within BIG during focused surveys which are considered high-quality habitat; impacts on these habitat types totals up to 1,472.2 acres (Figure 5.1-2. Desert Tortoise Impacts). Although desert tortoise, sign, or burrows were not observed during focused surveys within the areas mapped as desert saltbush scrub and creosote bush scrub (*Ambrosia dumosa* shrubland alliance, *Atriplex polycarpa* shrubland alliance, and *Larrea tridentata* shrubland alliance), these areas are also moderate-quality habitat for desert tortoise based on availability of resources and site conditions; impacts on these vegetation types totals up to 372.4 acres. The remaining vegetation communities including disturbed desert saltbush scrub, non-native grassland, active desert dunes, disturbed stabilized and partially stabilized dunes, stabilized and partially stabilized dines, disturbed creosote bush scrub, and desert creosote bush scrub (white bursage) scrub are considered low-quality habitat for desert tortoise due to the lack of native plants and shrubs, friable soils, and other required resources; impacts on these habitat types and land covers totals up to 1,556.5 acres. Developed and disturbed land covers, as well as tamarisk scrub within the impact footprint, totaling up to 989.3 acres, are considered not suitable for desert tortoise. Both low quality habitat and unsuitable land covers are considered to be unoccupied by desert tortoise; the incidental desert tortoise observed in March 2023 during burrowing owl surveys was spotted in developed habitat (mowed private property) walking towards Hinkley Road Bridge, however, the area where it was observed does not represent high-quality habitat for the species due to the lack of natural vegetation and food resources, and frequency of anthropogenic disturbances such as potential interactions with humans and pets.

Direct impacts would be avoided or minimized during BIG construction with implementation of MMs including the following:

- Construction limits would be clearly demarcated to prevent potential direct impacts on desert tortoise habitat occurring adjacent to the project site (MM BIG BIO-7).
- Tortoise-proof exclusion fencing would be installed where individuals are known to occur, recent sign has been observed, or construction activities have the potential to result in take (MM BIG BIO-13). The exclusion fence shall be maintained through the end of the construction of BIG.
- Immediately following the installation of exclusion fencing and prior to ground-disturbing activities or vegetation removal, pre-construction desert tortoise clearance surveys (MM BIG BIO-13), with the goal of locating all desert tortoise within the impact area, would be conducted by agency-approved biological monitors in accordance with USFWS clearance survey methods.




Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




FIGURE
5.1-2A

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

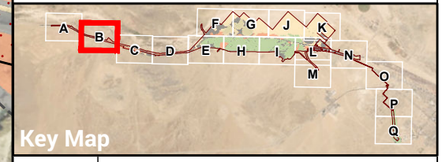
N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




Key Map

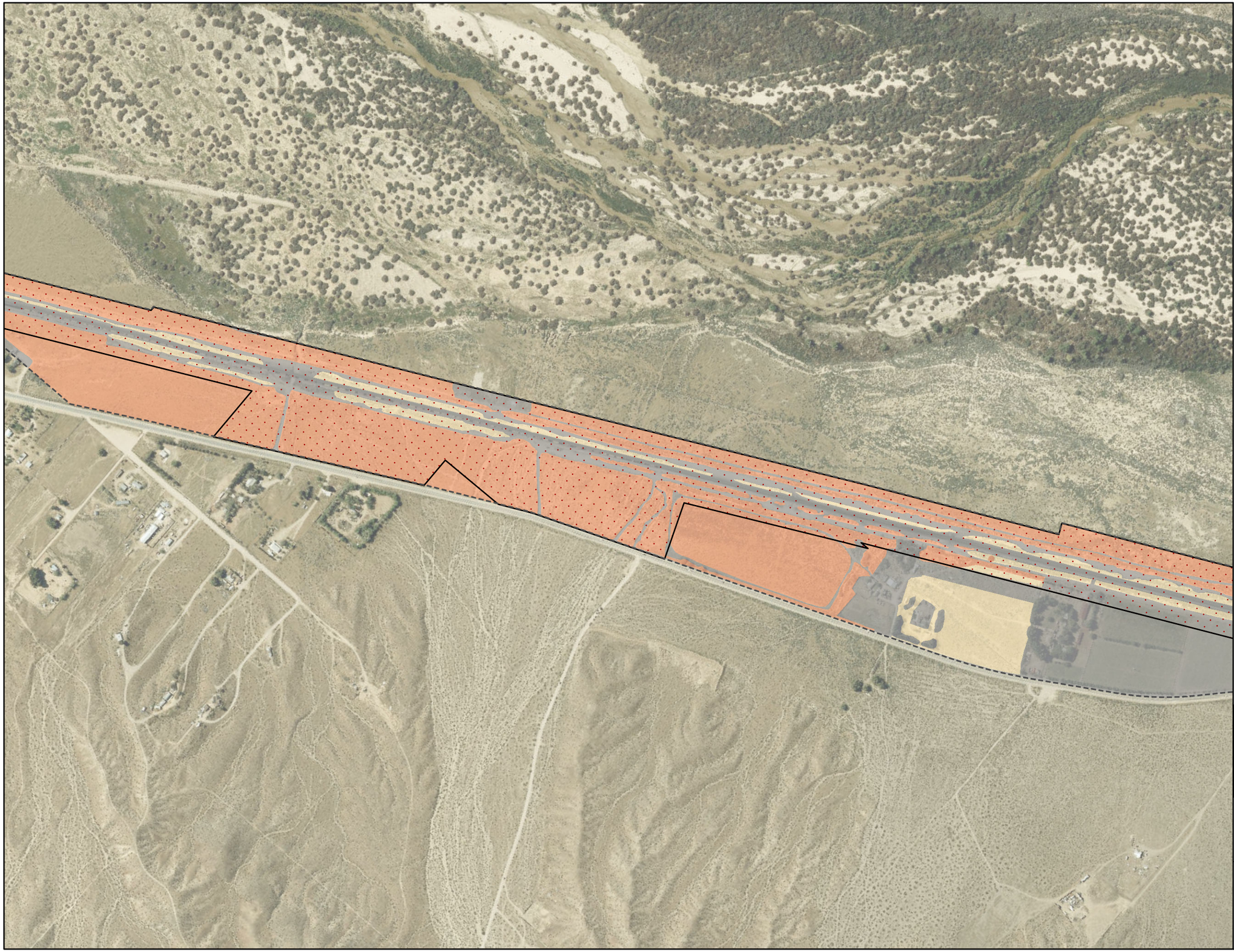
FIGURE
5.1–2B

**Desert Tortoise Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

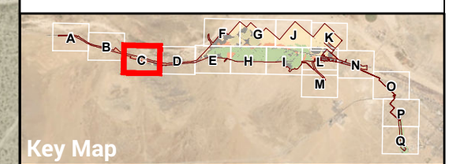
Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri



Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




Key Map

FIGURE
5.1–2C

**Desert Tortoise Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2024)
Burrow (Class 1)




Key Map

FIGURE
5.1–2D

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2024)
Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 1)
Burrow (Class 2)
Burrow (Class 4)
Other Sign

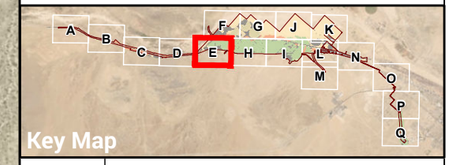



FIGURE
5.1-2E

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 5)

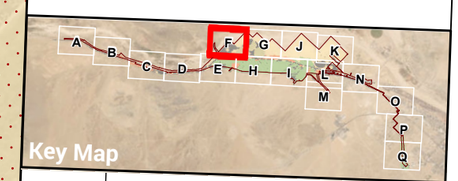



FIGURE
5.1-2F

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Carcass

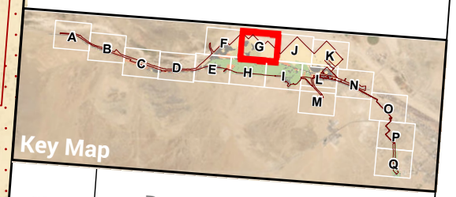



FIGURE
5.1-2G

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025




Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2023 incidental sighting)
Live Tortoise (2022)
Carcass
Burrow (Class 1)
Burrow (Class 2)
Burrow (Class 3)
Burrow (Class 4)
Burrow (Class 5)
Other Sign




Key Map

FIGURE
5.1–2H

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Live Tortoise (2023 incidental sighting)
Carcass
Burrow (Class 1)
Burrow (Class 3)
Burrow (Class 4)
Burrow (Class 5)
Pallet

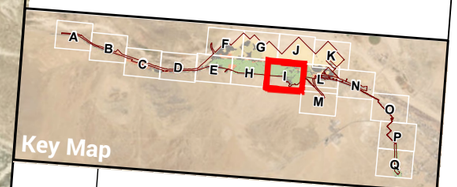



FIGURE
5.1-21

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/30/2023

Mojave River

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Carcass
Burrow (Class 4)

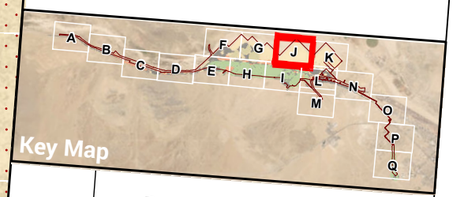



FIGURE 5.1-2J

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/20/2020

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

Low-Quality DETO Habitat
Unsuitable DETO Habitat

**Desert Tortoise Survey Results**

Carcass

Lenwood Rd

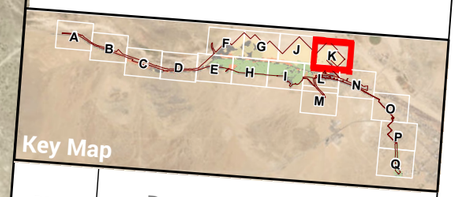



FIGURE
5.1-2K

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

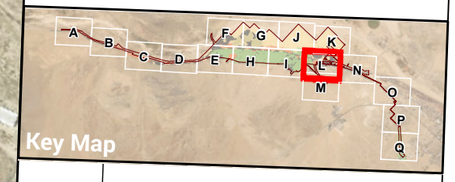
N

Date: 8/29/2025

Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat



Key Map

FIGURE
5.1-2L

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

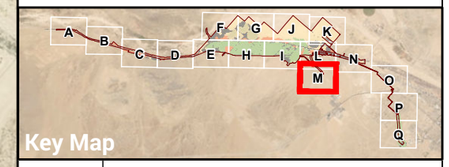
Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri



Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




Key Map

FIGURE
5.1–2M

**Desert Tortoise Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

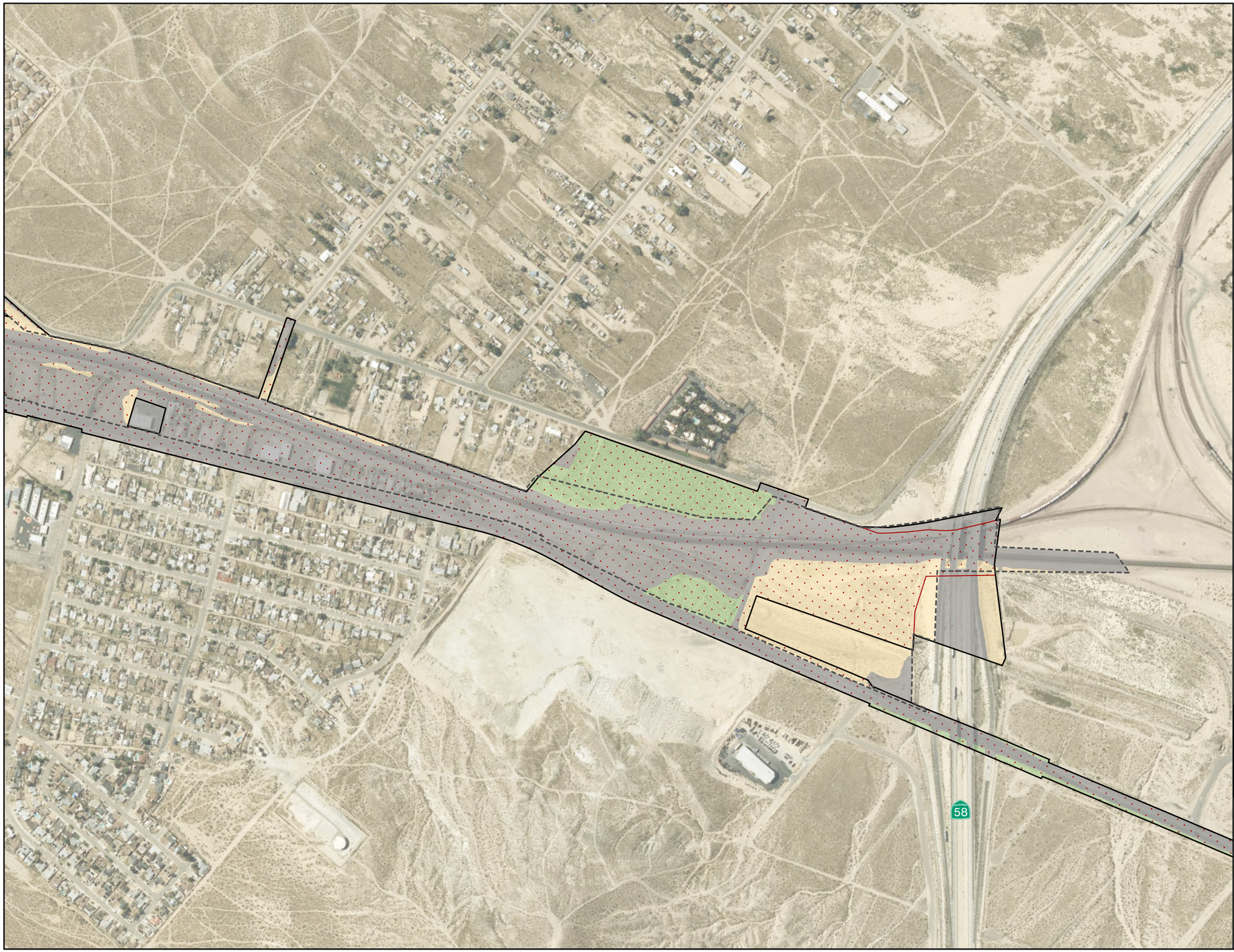



FIGURE
5.1-2N

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site

Impact Footprint

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat

Unsuitable DETO Habitat

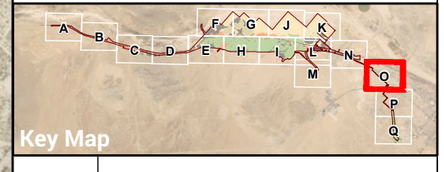



FIGURE
5.1-20

# Desert Tortoise Impacts

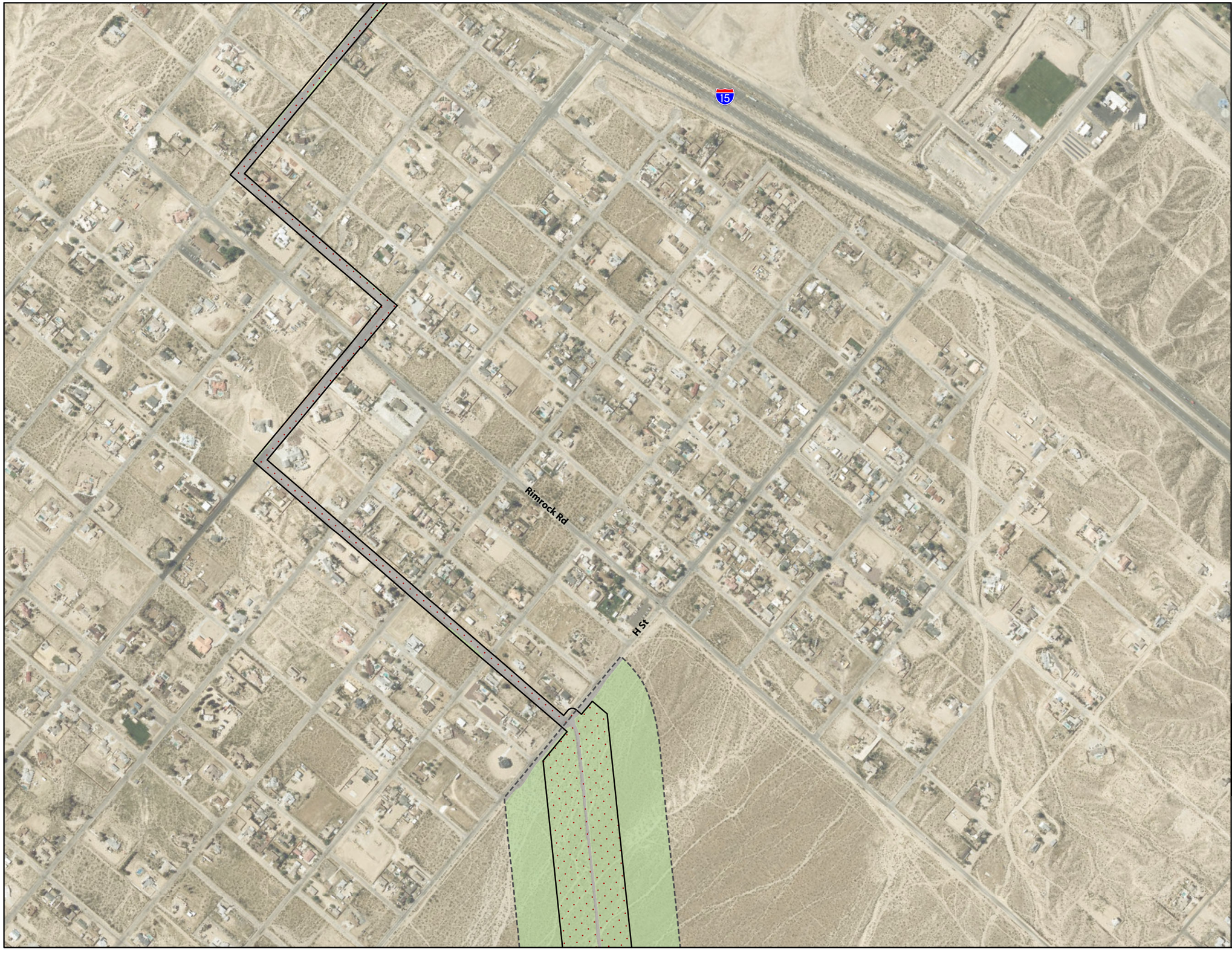
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Desert Tortoise Survey Area

**Desert Tortoise Habitat Quality**

High-Quality DETO Habitat
Moderate-Quality DETO Habitat
Low-Quality DETO Habitat
Unsuitable DETO Habitat




FIGURE
5.1–2P

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

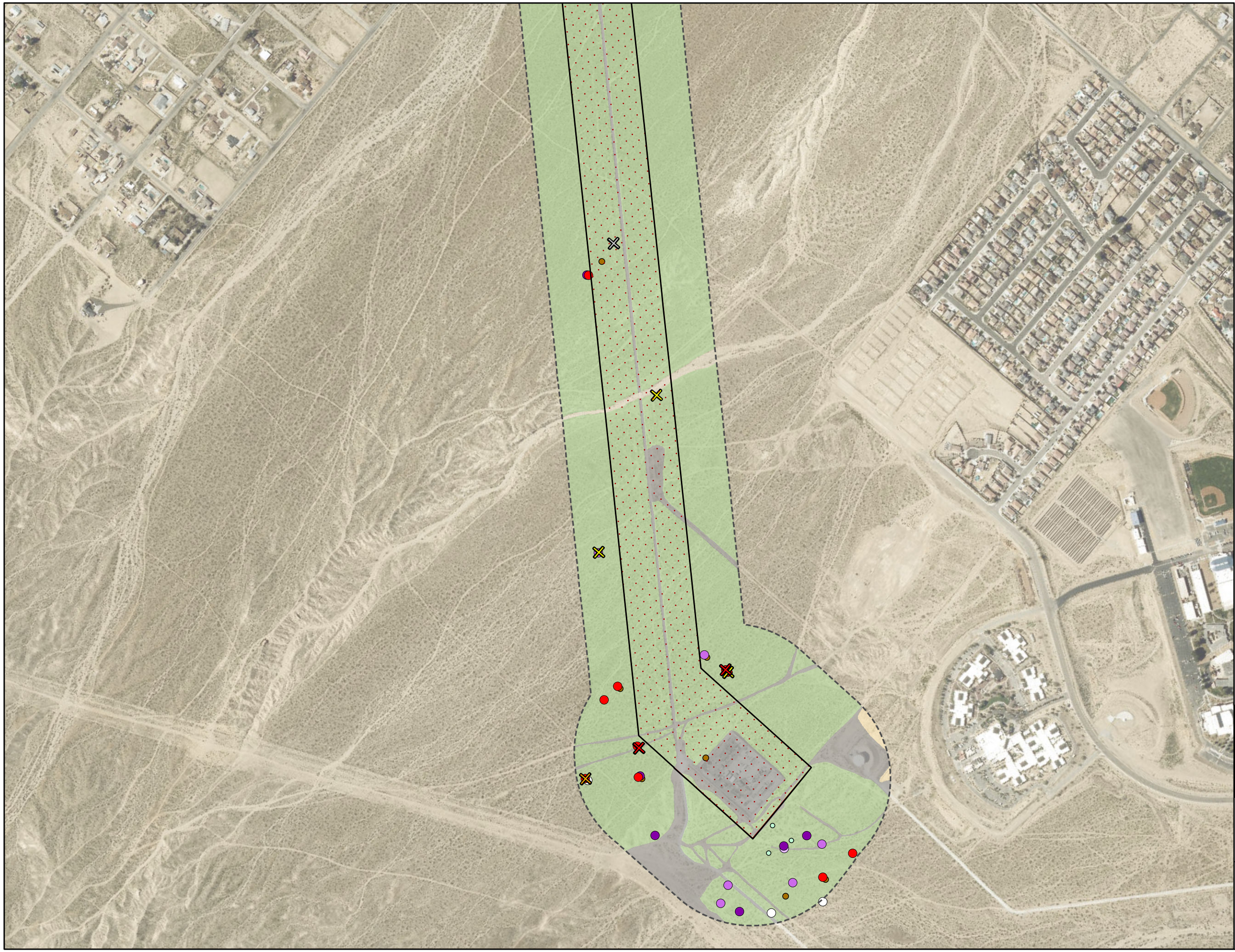



FIGURE
5.1-20

# Desert Tortoise Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 600 FEET
1 INCH = 600 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

- If desert tortoises or nests are discovered during clearance surveys, additional species-specific MMs would be implemented which could include the implementation of a Desert Tortoise Translocation Plan (MM BIG BIO-14).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers desert tortoise identification, threats, and required MMs (MM BIG BIO-1).
- Biological monitors would be retained to oversee and assist in the implementation of BIG MMs (MM BIG BIO-2) and would have the authority to halt work if desert tortoise is discovered on site or if BIG is not in compliance with MMs (MM BIG BIO-3).
- Vehicles and equipment would be restricted to established roads, construction areas, and other permissible areas. Any vehicles that must drive off established routes in suitable desert tortoise habitat would be accompanied by a biological monitor and/or the vehicle route shall be surveyed and cleared by a biological monitor (MM BIG BIO-4).
- Speed limits shall be set and enforced, and wildlife on the roadways would be avoided to the greatest extent possible (MM BIG BIO-4).
- Nighttime construction will adhere to a Nighttime Construction and Lighting Plan per MM BIG BIO-8 that includes reduced speed limits and work within previously disturbed areas as wells as lighting restrictions.
- The ground under a vehicle or construction equipment would be inspected for desert tortoise any time the vehicle or construction equipment is parked for more than 10 minutes within or adjacent to desert tortoise habitat (MM BIG BIO-4).
- Structures that provide potential shelter for desert tortoise would be inspected before the material is moved, buried, or capped. Best management practices would be used to minimize the risk of desert tortoise entrapment in holes and trenches excavated during construction (MM BIG BIO-9).
- Pet dogs, which could harass, injure, or kill desert tortoise, would not be permitted on site (MM BIG BIO-12).
- To offset direct impacts on suitable and/or occupied desert tortoise habitat BNSF would provide compensatory mitigation (MM BIG BIO-16) through the purchase of USFWS/CDFW-approved mitigation bank credits, on-site or off-site permittee-responsible mitigation, or a combination of these. Desert tortoise compensatory mitigation would preserve suitable habitat within the known range of desert tortoise in perpetuity (MM BIG BIO-16).

Direct impacts on desert tortoise resulting from the construction of BIG are potentially significant. However, direct impacts on desert tortoise would be avoided and/or minimized with the successful implementation of these species-specific MMs. With successful implementation of the species-specific mitigation measures, desert tortoise would be prevented from entering active construction areas and construction personnel shall be required to conform to construction best practices related to desert tortoise. Additionally, compensatory mitigation habitat of equal or greater value than habitat to be removed would provide habitat deemed essential for the survival of the species, protected in perpetuity.

Therefore, direct impacts on desert tortoise resulting from BIG construction would be less than significant impact.

Indirect impacts on desert tortoise adjacent to BIG may occur during construction because of increased noise, vibration, lighting, and dust generated by construction equipment. However, the following measures will be implemented during construction to address potential indirect impacts on desert tortoise:

- Noise attenuation best practices shall be implemented during construction, such as the use of temporary noise barriers to reduce noise levels at or below 80 dBA Leq as described in GPU NOI-1 (EIR Appendix 5.12).
- A fugitive dust control plan shall be implemented and includes measures such as watering exposed surfaces and unpaved roads at least three times a day, suspending dust-generating activities when average wind speed exceeds 25 miles per hour, and watering or presoaking all land clearing, grubbing, scraping, excavation, and demolition activities as described in MM BIG AQ-1 (EIR Appendix 5.3).
- A Storm Water Pollution Prevention plan shall be implemented during construction to avoid impacts on desert tortoise adjacent to BIG related to erosion, runoff, and stormwater contaminants (MM BIG BIO-30)
- The introduction of weeds to areas adjacent to BIG has the potential to convert suitable habitat for desert tortoise to disturbed habitat types unsuitable for desert tortoise. To avoid and minimize the spread of non-native and invasive plant species from BIG to adjacent undeveloped lands BIG shall implement an Adaptive Weed Control Plan (MM BIG BIO-6).
- Nighttime construction lighting will be directed away from adjacent habitats (MM BIG BIO-8).

Existing barriers to wildlife movement within and around BIG may preclude desert tortoise from occurring in the vicinity post translocation. The Mojave River adjacent to the northern boundary likely prevents any movement into the site from the north, both in its dry state and while flowing. Existing vehicle noise disturbances from the railway and National trails highway may also deter desert tortoise from approaching BIG, making the species unlikely to move in the vicinity (post translocation). Additionally, areas identified as conservation areas for desert tortoise, where core populations have been identified and/or development is restricted or limited as regulated by regional planning conservation efforts, do not occur within or in the areas immediately surrounding BIG which would be potentially indirectly impacted. The closest mapped conservation/management area is the Superior-Cronese Area of Critical Environmental Concern (ACEC) which is under the jurisdiction of BLM, and is located north of the Mojave River/southwestern lead track extension (BLM, 2016); it is not anticipated that this area would experience indirect impacts from BIG and that desert tortoise would not move into BIG from this management area due to existing obstructions such as the Mojave River and Iron Mountain.

Additional indirect impacts on nearby desert tortoise could occur during BIG construction if common raven are attracted to the BIG vicinity. Common raven, a predator of desert tortoise, are often associated with human presence in the Mojave Desert because they utilize naturally occurring or created water sources, supplement their diet with human trash, and construct nests on human-made structures. Indirect

impacts on desert tortoise resulting from an increase in raven presence are potentially significant due to increased predation on desert tortoise, especially juveniles and hatchlings.

To minimize indirect impacts on desert tortoise:

- Construction personnel shall attend WEAP training regarding best practices to avoid attracting common raven (MM BIG BIO-1 and MM BIG BIO-15).
- Proper storage and removal of trash will be required (MM BIG BIO-10).
- Biological monitors would conduct surveys for common raven throughout the duration of construction activities to track potential population increases and predation on desert tortoise (MM BIG BIO-15).
- A Raven Management Plan will be prepared (MM BIG BIO-15) that will manage and reduce potential raven subsidies at the site (i.e. construction water and holding ponds).

With the implementation of BIG MMs, indirect impacts on desert tortoise during BIG construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

All desert tortoise individuals will be removed from BIG during pre-construction translocation efforts (MM BIG BIO-14). Additionally, suitable habitat for desert tortoise will be permanently removed from BIG during construction. Permanent chain link fencing with desert tortoise exclusion specifications will be installed around most of the project facilities, which will prevent desert tortoise from entering areas where they may be directly impacted by operational activities (MM BIG BIO-34). Fencing shall be inspected regularly; any gaps and failures in the fencing will be repaired as needed. Direct impacts resulting from operation and maintenance of BIG are not anticipated.

Indirect impacts on desert tortoise could occur during BIG operations and maintenance, however, due to increased human presence in the vicinity of occupied habitat. Increased human presence could result in increased raven populations and therefore, increased predation of desert tortoise hatchlings and juveniles in nearby habitat, if present. Increased human presence may also lead to increased disturbance to nearby habitat areas, which may result in the introduction of invasive plant species in the vicinity of BIG. These invasive plant species could displace native plants that are a food source for desert tortoise and alter the soil composition, making it potentially less suitable for burrow excavation and occupation.

To following measures have been incorporated into BIG to avoid and minimize indirect impacts on desert tortoise:

- BNSF shall participate in the interagency Raven Monitoring and Management Program to address indirect impacts to the species related to the potential increase in the raven population. The Applicant's participation in the program shall be subject to compensation through the payment of a onetime fee not to exceed $150 and no less than $105 per disturbed acre, as established by the Desert Managers Group (MM BIG BIO-15).
- An Adaptive Weed Control Plan will be implemented to minimize the potential for invasive plants to spread from BIG to adjacent habitat (MM BIG BIO-6).

- Prior to start of operations then quarterly, exclusion fencing affixed to the perimeter fencing that is adjacent to natural habitats shall be inspected; BNSF shall carry out repair of the fencing, as needed (MM BIG BIO-34).
- MM BIG BIO-36 limits nighttime lighting during operations to the developed project site, limiting light trespass into adjacent habitats.

With the successful implementation of MMs, indirect impacts on desert tortoise during the operational phase of BIG would be less than significant.

### *Least Bell's Vireo*

Least Bell's vireo was not documented during protocol surveys conducted for BIG and a 1,000-foot survey buffer. This species is not anticipated to forage or nest within BIG based on the negative results of focused surveys and low-quality nesting habitat.

#### Construction – Direct and Indirect Impacts

Direct and indirect impacts on least Bell's vireo are not anticipated during the construction of BIG as the species is not known to occur on BIG or immediately adjacent areas.

#### Operations & Maintenance – Direct and Indirect Impacts

Direct and indirect impacts on least Bell's vireo are not anticipated during the operation of BIG as the species is not known to occur on BIG or immediately adjacent areas.

### *Southwestern Willow Flycatcher*

Willow flycatchers were observed within the 1,000-foot survey buffer during riparian bird surveys conducted for BIG. Late-season willow flycatcher observations could not definitely be ruled out as southwestern willow flycatcher, which are typically differentiated based on nesting behaviors. As such, southwestern willow flycatcher is considered to have low-to-moderate potential to forage and nest in riparian habitat within the BIG footprint near Hinkley Road Bridge and adjacent the southwestern portion of the BIG footprint within suitable habitat along the Mojave River (Figure 5.1-3. Riparian Birds Impacts).

#### Construction – Direct and Indirect Impacts

BIG construction activities could result in direct impacts on nesting southwestern willow flycatcher, if present. Vegetation clearing and grading associated with the construction of the southwestern lead track extension and improvements to the Hinkley Road Bridge will result in the removal of marginal tamarisk scrub habitat. The removal of this habitat could result in harassment, injury, damage or destruction of an active nest, and/or death of adults, eggs, and/or young if present during construction.

To avoid or minimize such impacts, BNSF would implement the MMs including the following:

- Vegetation trimming and removal and other construction activities within suitable southwestern willow flycatcher nesting habitat would occur outside of their typical breeding season (May 1 – August 31) to the maximum extent feasible (MM BIG BIO-17).

Impact Footprint

Southwestern Willow Flycatcher/
Western Yellow-billed Cuckoo Survey Area

Least Bell's Vireo Survey Area

1,000-ft Buffer from Project Site

**Vegetation**

- Black Willow Thickets
- Fourwing Saltbush Scrub
- Honey Mesquite Stand
- *Tamarisk* Thickets
- Developed

**2022 Survey Observations**

- 2 Individual Willow Flycatchers (5/17/22 & 5/31/22)
- Individual Willow Flycatcher (5/17/22)
- Individual Willow Flycatcher (5/18/22)
- Individual Willow Flycatcher (LBVI Survey 5/20/22)
- Individual Willow Flycatcher (LBVI Survey 5/20/22, 6/1/22 & 6/15/22)
- 2 Individual Willow Flycatchers (6/3/22)
- Individual Willow Flycatcher (6/3/22)
- 2 Individual Willow Flycatchers (YBCU Survey 8/11/22)
- Individual Willow Flycatcher (YBCU Survey 8/11/22)

**2023 Survey Observations**

- Individual Yellow-billed Cuckoo (7/3/23)

Hinkley Rd

Mojave River

Jiggs Rd

Burlington Northern Santa Fe

Main St

Map Extent

15

FIGURE 5.1-3

**Riparian Birds Impacts**

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS

0 1,800 FEET

1 INCH = 1,700 FEET

N

- If avoidance of nesting season is not feasible, then pre-construction surveys for southwestern willow flycatcher would be conducted prior to construction within suitable nesting habitat (MM BIG BIO-17).
- If nesting southwestern willow flycatcher are documented within direct impact areas, then all work within 500 feet would be prohibited until additional measures and/or authorizations are issued in consultation with USFWS and CDFW, which could include restricting construction activities to only occur outside of the typical breeding season (MM BIG BIO-17).

Although willow flycatcher was observed within the survey area during focused surveys, the removal of marginally suitable habitat will result in approximately 16 acres of tamarisk scrub, which is spread throughout the southwestern portion of the project (Figure 5.1-3). Most of the suitable habitat within the survey area will be avoided by direct impacts during construction and approximately 500 acres of Mojave River floodplain placed in a conservation easement. No other direct impacts on potential habitat suitable for southwestern willow flycatcher are anticipated. With successful implementation of MM BIG BIO-18, direct impacts on nesting southwestern willow flycatcher during BIG construction would be less than significant.

BIG construction activities could result in indirect impacts on nesting southwestern willow flycatcher if present within marginally suitable tamarisk scrub habitat within a 500-foot buffer of the direct impact footprint. Similar to the direct impact footprint, the tamarisk scrub surrounding the project occurs in patches along the Mojave River in the vicinity of the lead track extension and the Hinkley Bridge (Figure 5.1-3). Excessive noise levels that may be generated during construction activities could elevate stress levels of southwestern willow flycatcher if nesting adjacent to BIG. Excessive noise could impair normal vocal communication between territorial males, the mated pair, and parents and their young. Interference in parent/young communication could lead to reduced parental care, increased risk of nest abandonment, and decreased perception of alarm calls that signal the presence of predators.

To avoid or minimize such impacts, BNSF would implement the MMs including the following:

- If nesting southwestern willow flycatcher are documented during pre-construction surveys within 500 feet of proposed construction activities, no work shall occur within 500 feet of the nest and noise monitoring would be implemented (MM BIG BIO-17).
- Construction activities that cause the noise limits to be exceeded would be adjusted or noise attenuation measures implemented to reduce noise to below the agency-approved threshold. If such adjustments are not feasible, work would be postponed until after the breeding season or after the southwestern willow flycatcher fledglings are no longer dependent on the affected breeding territory, as confirmed by a qualified biologist (MM BIG BIO-17).

These measures would avoid or minimize indirect impacts on southwestern willow flycatcher by ensuring that if the species is confirmed nesting within 500 feet of construction activities during the breeding season construction noise levels do not exceed those recommended by the agencies. With successful implementation of MM BIG BIO-17, indirect impacts on nesting southwestern willow flycatcher during BIG construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on willow flycatcher (including southwestern willow flycatcher) could occur during BIG operations and maintenance through injury and/or death if willow flycatchers strike vehicles (including trains) or BIG structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Willow flycatcher generally moves along vegetated riparian corridors and would not likely travel through BIG or near BIG components, except for the Hinkley Road Bridge; therefore, the area where willow flycatcher may encounter vehicles or structures is limited. As such, these potential direct impacts on southwestern willow flycatcher resulting from BIG operations and maintenance would be less than significant.

Indirect impacts on southwestern willow flycatcher could occur during BIG operations and maintenance due to elevated noise levels generated by trains, large vehicles and equipment, and other on-site activities. Prolonged, excessive noise could cause interference with normal breeding and foraging activities, resulting in a decline in the local population, if present. Operational noise levels may exceed pre-construction levels with increased human, vehicle, and equipment activities resulting from BIG operations. However, they are not expected to significantly affect any willow flycatcher migrating through the Mojave River corridor. Therefore, indirect impacts on southwestern willow flycatcher resulting from BIG operations and maintenance are not anticipated.

### *Swainson's Hawk*

During focused surveys conducted for the project in 2024 and 2025, a Swainson's hawk pair was confirmed nesting near the intersection of Community Blvd and Dixie Rd approximately 1 mile north of the BIG footprint (Figure 5.1-4. Swainson's Hawk Impacts). Additionally, Swainson's hawks were incidentally observed flying over BIG and foraging within the general vicinity during riparian bird surveys as well as focused burrowing owl breeding season surveys conducted in 2023. Swainson's hawk was also observed flying over the site and perching on structures in the vicinity of BIG during focused surveys in 2025. Suitable nesting habitat is present within and adjacent to BIG, primarily within riparian habitat along the Mojave River.

**Construction – Direct and Indirect Impacts**

Direct impacts on Swainson's hawk by removal of suitable foraging habitat may occur with project implementation; however, Swainson's hawk forages in a wide variety of open habitats which are abundant around BIG. A regional foraging habitat analysis was conducted using site specific vegetation mapping and CDFW VegCAMP mapping data within a 10-mile radius of BIG (Analysis Area). It was determined that following vegetation communities/land cover types were found in the Analysis Area: inactive agricultural fields, active agricultural fields, desert scrub and dunes, riparian, barren, urban, and developed/disturbed (**Attachment CC**). Developed/disturbed, urban, and barren areas within the Analysis Area are considered unsuitable for Swainson's hawk foraging. The other vegetation communities and land cover types present (inactive agricultural fields, active agricultural fields, desert scrub, and riparian), provide potential foraging opportunities for Swainson's hawk. Based on the vegetation data and aerial photography review, 77% of BIG habitat impacts are suitable Swainson's hawk foraging habitat (up to 3,402 acres) and 23% of BIG habitat impacts are unsuitable for foraging (up to 989 acres) (Figure 5.1-5. Swainson's Hawk Foraging

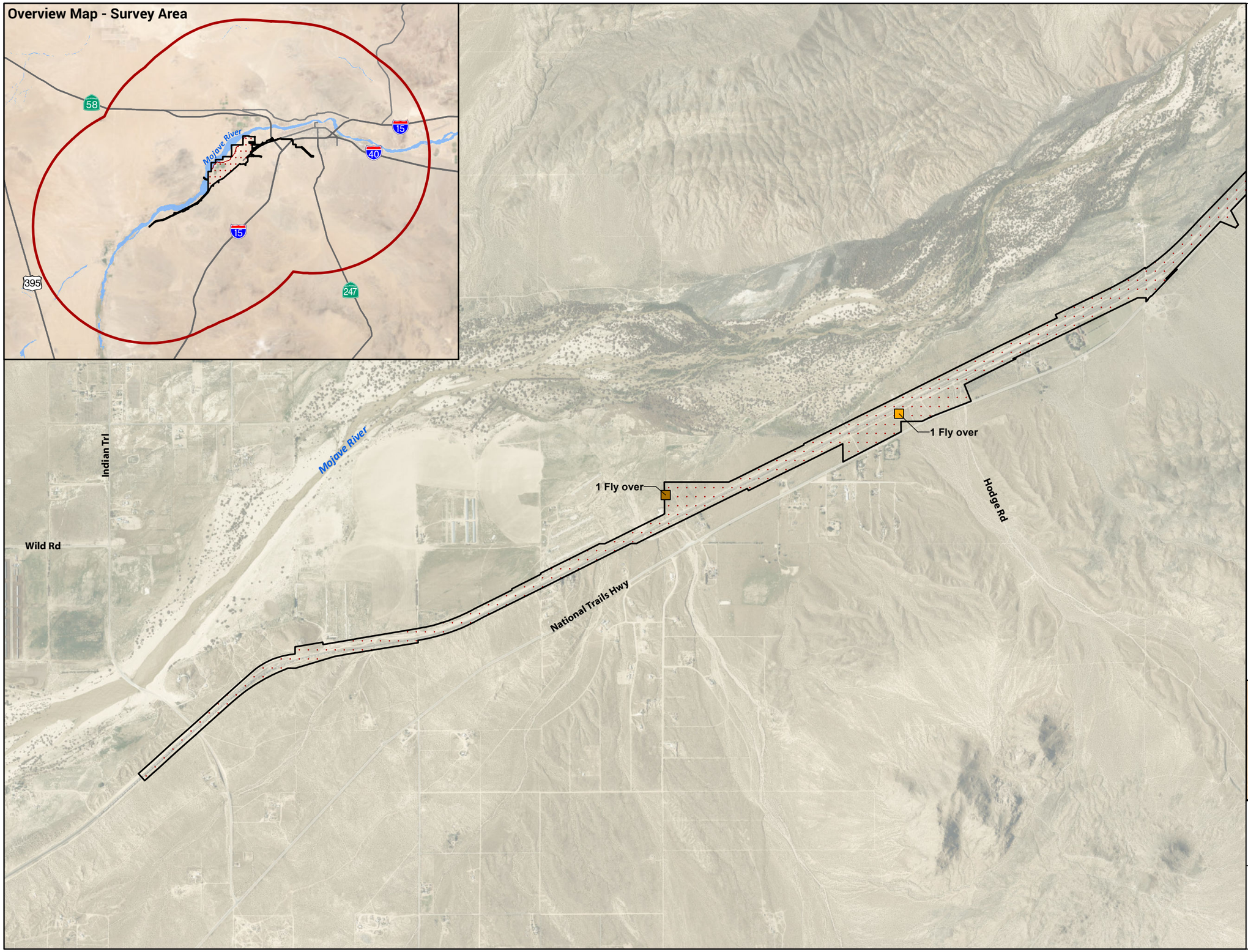



FIGURE
5.1-4A

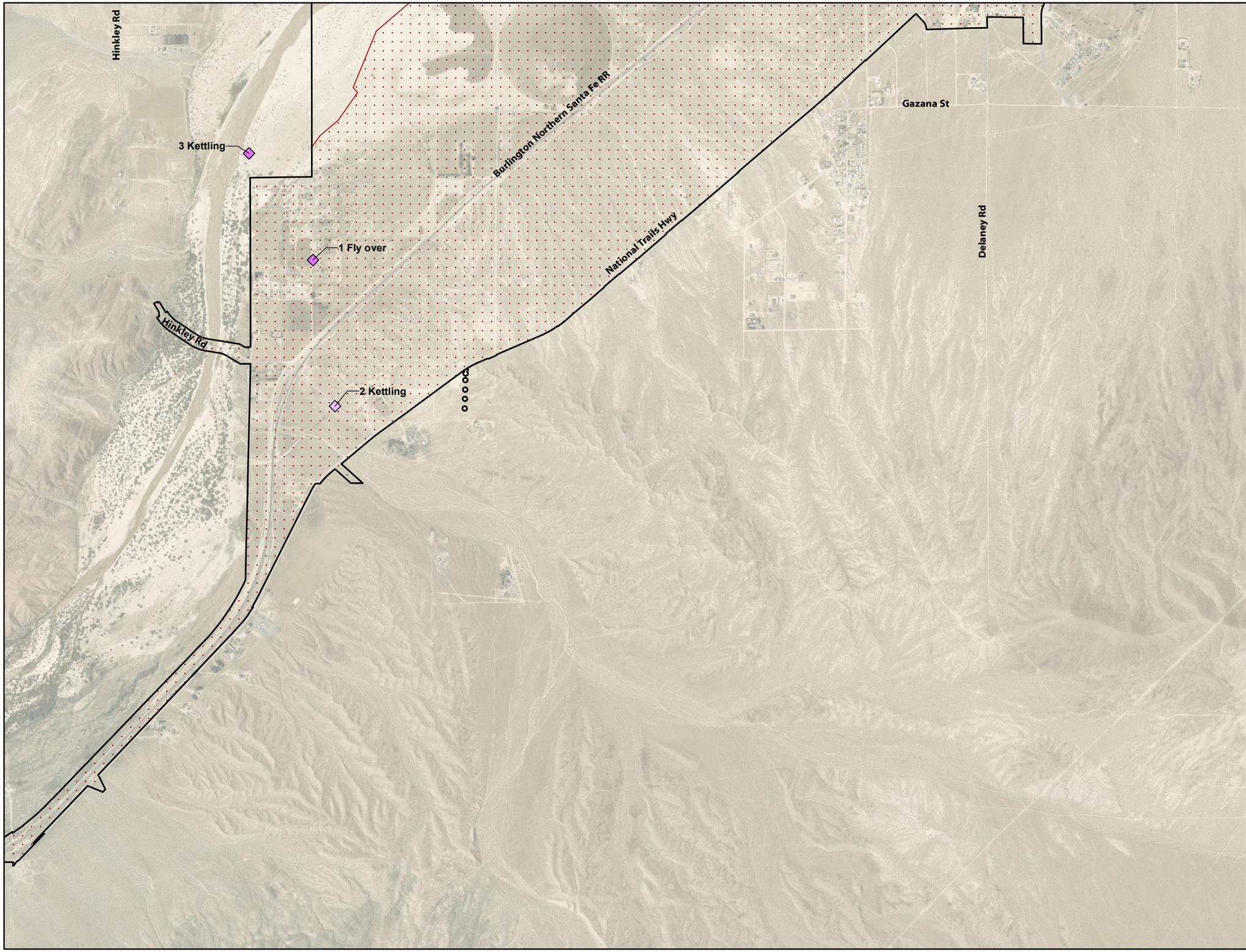
# Swainson's Hawk Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/26/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012




Project Site
Impact Footprint
Swainson's Hawk Survey Area (10-mile Buffer)

**Observations**

Swainson's Hawk 4/2024
Swainson's Hawk 3/2024

Key Map

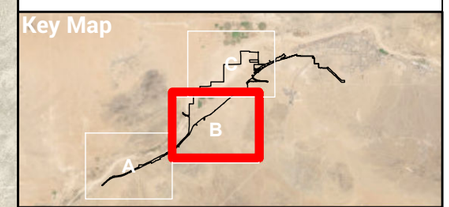



FIGURE
5.1-4B

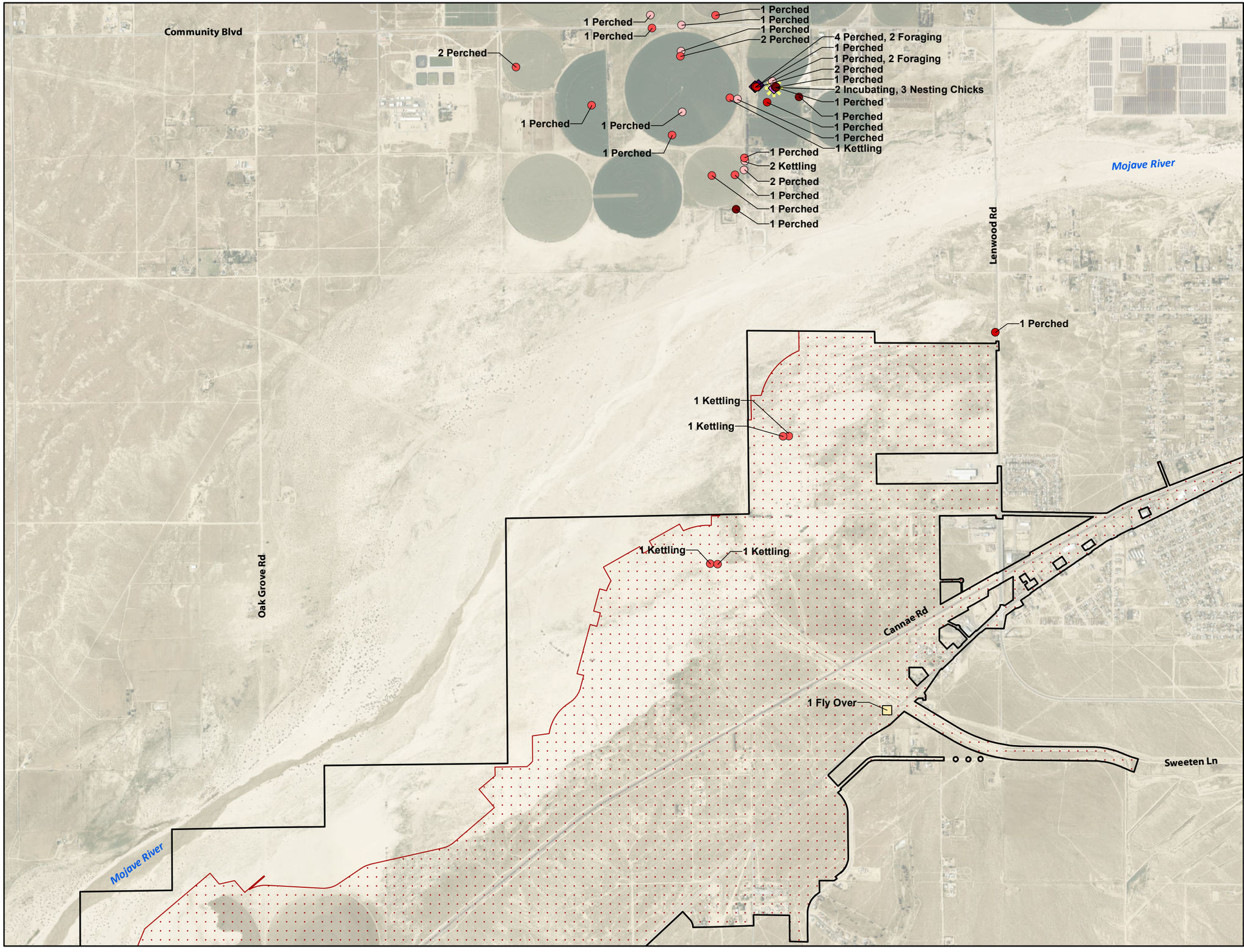
# Swainson's Hawk Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/26/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012




Project Site
Impact Footprint
Swainson's Hawk Survey Area (10-mile Buffer)

**Observations**

- Swainson's Hawk 7/2025
- Swainson's Hawk 6/2025
- Swainson's Hawk 4/2025
- Swainson's Hawk 3/2025
- Swainson's Hawk 7/2024
- Swainson's Hawk 6/2024
- Swainson's Hawk 4/2024
- Swainson's Hawk 3/2023
- Swainson's Hawk Nest

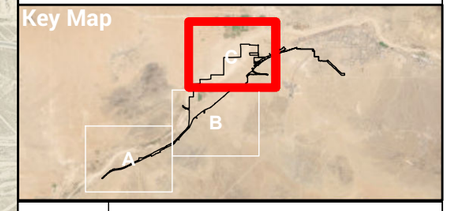



FIGURE 5.1-4C

# Swainson's Hawk Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/26/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012

Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

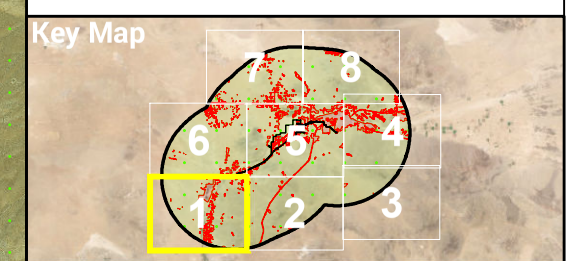



FIGURE
5.1–5A

# Swainson's Hawk Foraging Habitat

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

N

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012

Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

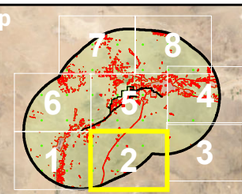



FIGURE
5.1–5B

# Swainson's Hawk Foraging Habitat

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012

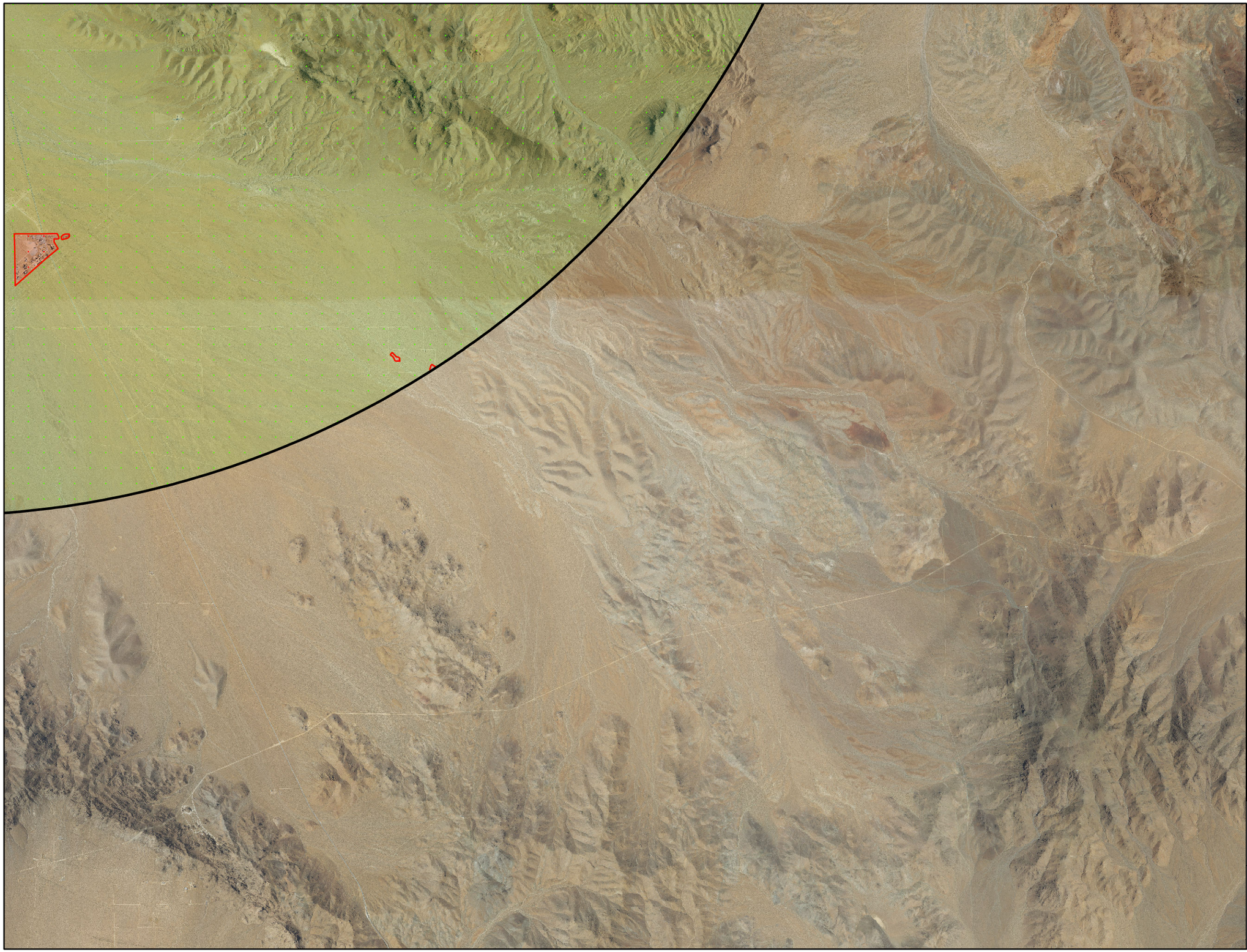



FIGURE
5.1–5C

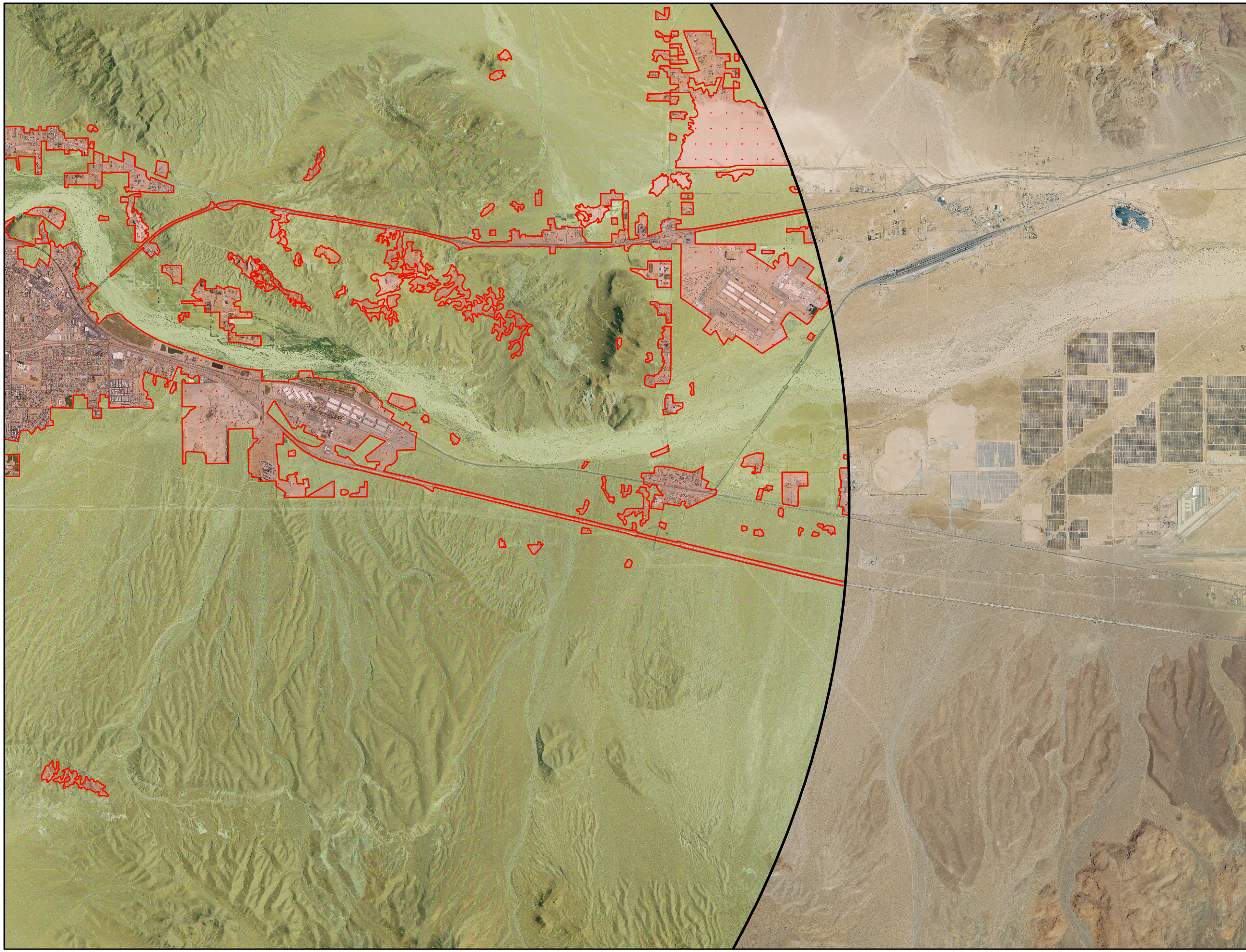
# Swainson's Hawk Foraging Habitat

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012



Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

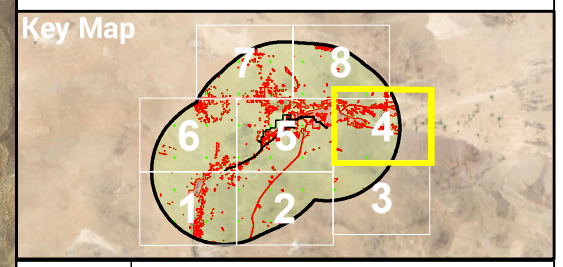



FIGURE
5.1–5D

# Swainson's Hawk Foraging Habitat

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

N

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012

Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

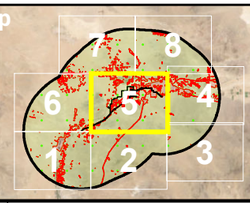



FIGURE
5.1–5E

# Swainson's Hawk Foraging Habitat

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

N

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012

Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

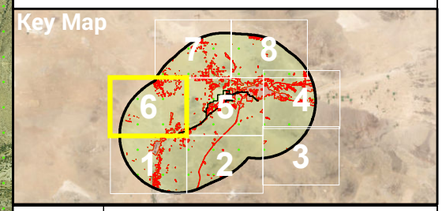



FIGURE
5.1–5F

# Swainson's Hawk Foraging Habitat

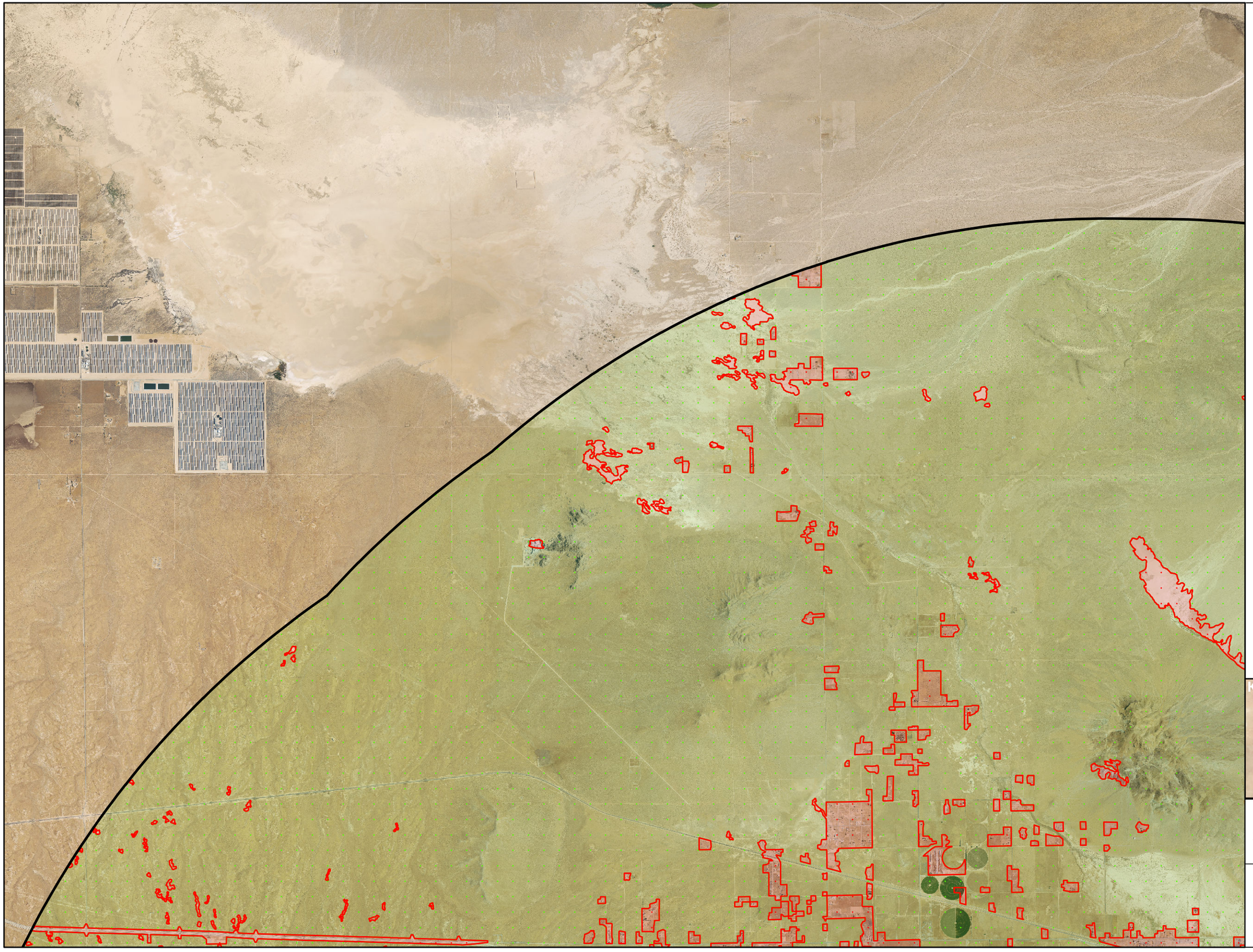
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

N

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012



Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

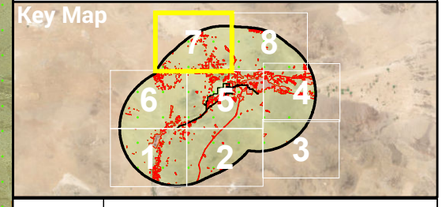



FIGURE 5.1–5G

# Swainson's Hawk Foraging Habitat

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 1 MILE

1 INCH = 1 mile

N

Date: 8/29/2025

Aerial Photo: NAIP 2024

Regional Map: National Geographic, Esri 2012

Survey Area 10-mile Buffer

Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat - within Project Survey Area

Unsuitable Swainson Hawk Foraging Habitat

Suitable Swainson Hawk Habitat - Foraging within Project Survey Area

Suitable Swainson Hawk Foraging Habitat

Key Map

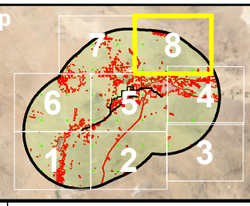



FIGURE
5.1–5H

# Swainson's Hawk Foraging Habitat

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 1 MILE
1 INCH = 1 mile

N

Date: 8/29/2025
Aerial Photo: NAIP 2024
Regional Map: National Geographic, Esri 2012

Habitat). The Analysis Area contains 94% suitable foraging habitat (401,933 acres) and 6% of these lands are unsuitable for foraging (24,924 acres) (Figure 5.1-5). Accordingly, the BIG project will only remove 0.01% of the total amount of suitable foraging habitat within the Analysis Area (project site plus 10-mile buffer). As such, removal of suitable foraging habitat by the project would not result in significant impacts to foraging habitat in the region for Swainson's hawk.

Proximity of suitable foraging habitat to potential nest trees is an important factor for Swainson's hawk nest site selection. Nest sites are generally adjacent to or within easy flying distance to alfalfa or other habitats or agricultural crops which provide an abundant and available prey source (CDFW, 1994). The only active agricultural fields within the Analysis Area are adjacent to and in the immediate vicinity of the active nest site one a mile away from BIG. No active agricultural fields are present within BIG. Former agricultural areas on BIG have been left fallow, overgrown with invasive mustards (e.g., *Brassica nigra*) and tumbleweeds (*Salsola* spp.), and based on historic aerial photo review have not been cultivated or irrigated since 2015. Although Swainson's hawks have been observed flying over BIG, they have not been observed foraging on site during the two years of focused survey efforts. However, RBC biologists have made numerous observations in 2024 and 2025 of the nesting pair foraging within the active agricultural fields immediately adjacent to the nest site one mile to the north (Figure 5.1-4). Dr. Pete Bloom, renowned raptor biologist with nearly 100 publications including Swainson's hawk studies, banded the Swainson's hawk chicks at the nest tree in both 2024 and 2025. Although the nesting pair's exact movement patterns have not been monitored via affixed transmitters, in personal communications with the project team, he has stated the Swainson's hawk pair is likely to focus foraging efforts near the nest since there are such high quality, active agricultural lands/foraging grounds (alfalfa fields) surrounding the nest tree compared to the lower quality foraging grounds (desert scrub, dunes, idle agricultural fields) on the BIG project site across the Mojave River (Dr. Pete Bloom, pers. comm. 2025). The presence of the alfalfa fields with an adjacent tree suitable for nest building likely determined this nest site selection, as largely disturbed desert scrub habitat such as what is present on BIG, does not provide the prolific prey base needed to support a nesting pair and their chicks in this desert setting. The preference of foraging within the active agricultural fields is further confirmed by the presence of vole (*Microtus* spp.) and gopher (*Thomomys bottae*) carcasses observed in the nest during banding efforts; these prey species have a higher density around active agriculture. Due to the increased availability of resources, the nesting pair would be less likely to move farther from the alfalfa fields to forage onto BIG. Studies have also shown that as prey availability may determine home range size, Swainson's hawk that nest in areas surrounded by high prey availability and low vegetative cover (such as alfalfa crops) have smaller home ranges, making them likely to stay closer and forage near the nest compared to Swainson's hawk breeding in areas with lower prey availability (Babcock, 1995). The irrigated alfalfa fields will not be directly impacted by the BIG project, therefore, the construction of BIG is not likely to disturb potential nesting activities or foraging success of the breeding pair should they continue to utilize the same nest annually (Figure 5.1-5).

No other active Swainson's hawk nests have been documented within the 10-mile radius of the study area and other recorded observations of Swainson's hawk nests in the larger region are primarily associated with agricultural areas of the Antelope Valley over 20 miles to the west. Furthermore, the BIG site is located beyond the non-disturbance buffer zone (½ mile) typically required by CDFW for construction impact avoidance (Swainson's Hawk Technical Advisory Committee, 2000) and is not expected to be

disturbed by project construction activities. Given that foraging activities associated with the Swainson's hawk nest one mile away are focused on the agricultural lands immediately adjacent and results of the regional foraging habitat analysis, the loss of habitat on BIG as potential foraging habitat for this pair will not have a significant impact on the success of the nest site.

However, although there is a low likelihood of Swainson's hawk nesting on site or immediately adjacent, BIG construction could also result in direct impacts on nesting Swainson's hawk through harassment, injury, and/or death of adults, eggs, and/or young, as well as nest abandonment, if construction activities remove or physically disturb active nest trees.

Direct impacts on nesting Swainson's hawk would be avoided or minimized through implementation of MMs, including the following:

- Focused Swainson's hawk nest surveys would be conducted prior to the start of construction activities following the survey protocols outlined in the CDFW's *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (MM BIG BIO-20; Swainson's Hawk Technical Advisory Committee, 2000).
- If active Swainson's hawk nests are documented within BIG or in the immediate vicinity, an appropriate avoidance buffer would be established around each nest in consultation with CDFW to avoid direct physical impacts on the nest tree (MM BIG BIO-20).
- Nest avoidance buffers would be enforced by biological monitors who would be retained to oversee and assist in the implementation of BIG MMs (MM BIG BIO-20).
- Monitors would have the authority to halt work if buffers are not maintained (MM BIG BIO-3).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required MMs for special-status wildlife, including Swainson's hawk (MM BIG BIO-1).

With successful implementation of these mitigation measures, direct impacts on Swainson's hawk resulting from the construction of BIG would be less than significant.

BIG construction could also indirectly impact nesting Swainson's hawk if present in the areas surrounding BIG due to elevated construction noise levels. Excessive noise levels generated during construction activities could elevate stress levels of nesting Swainson's hawk and impair normal vocal communication between the mated pair and their young. Interference in parent/young communication could lead to reduced parental care, increased risk of nest abandonment, and decreased perception of alarm calls that signal the presence of predators. To avoid and minimize indirect impacts on Swainson's hawk during construction:

- Nest avoidance buffers shall be established around active nests (as determined by focused surveys conducted for a minimum ½-mile radius of BIG) in coordination with CDFW and a biological monitor shall be present to document any noncompliance associated with the avoidance buffer (MM BIG BIO-20).

With successful implementation of MMs, indirect impacts on nesting Swainson's hawk during construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Potentially significant direct impacts on Swainson's hawk could occur during BIG operations and maintenance if hawks strike vehicles (including trains) or BIG structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Swainson's hawk could be vulnerable to vehicle strikes if they are attracted to roadways by presence of dead or injured prey species resulting from increased vehicular traffic within/around BIG. In addition, Swainson's hawk may attempt to use BIG structures as perches during BIG operations and maintenance which could result in structure strikes as well as Swainson's hawk death or injury. MMs have been incorporated to minimize or avoid vehicle and/or structure strikes and to reduce the risk of wildlife mortality during operations and maintenance. BIG would also incorporate avian-safe MMs that would avoid or minimize Swainson's hawk strikes with BIG structures and potential electrocution (MM BIG BIO-35). With the successful implementation of and MMs, direct impacts on Swainson's hawk during BIG operations and maintenance would be less than significant.

Operation and maintenance of BIG may also result in indirect impacts on Swainson's hawk, including adverse effects of nighttime lighting and noise. Lighting shall be directed on BIG and away from adjacent natural areas and areas containing suitable habitat, such as the Mojave River, during the operation of BIG (MM BIG BIO-36). Additionally, noise levels are not expected to exceed existing levels at areas where Swainson's hawk are expected to nest in the vicinity of BIG. Therefore, indirect impacts on Swainson's hawk from operation and maintenance are not anticipated.

### *Tricolored Blackbird*

One tricolored blackbird was documented within the vicinity of BIG during biological surveys. The individual was likely passing through the area and did not appear to be nesting; this species is not anticipated to nest within or immediately adjacent to BIG due to lack of preferred nesting habitat with cattails and tules.

**Construction – Direct and Indirect Impacts**

Although approximately 16 acres of tamarisk scrub will be directly impacted as a result of BIG construction (**Table 12**), the removal of this habitat is considered minor and does not substantially affect the amount of suitable foraging habitat available for tricolored blackbird foraging within the Mojave River corridor that will be placed under conservation easement by the project. Direct impacts on tricolored blackbird could also occur during BIG construction through injury and/or death during vegetation removal. However, because tricolored blackbird is not anticipated to nest within BIG, tricolored blackbird will likely flush from active work areas during construction. As such, these potential direct impacts would be less than significant.

The closest suitable nesting habitat for tricolored blackbird occurs approximately one mile north of BIG. Due to the lack of suitable nesting habitat in the areas immediately surrounding BIG, indirect impacts on tricolored blackbird during construction, such as noise and nighttime lighting, are not anticipated.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on tricolored blackbird could occur during BIG operations and maintenance through injury and/or death if individuals strike vehicles (including trains) or BIG structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Suitable foraging habitat would not be present immediately adjacent to BIG during operations and maintenance; therefore, tricolored blackbird is unlikely to encounter BIG components or enter roadways near the site except potentially along Hinkley Road Bridge where there is already existing vehicular traffic. Furthermore, suitable foraging habitat relative to BIG is located along the Mojave River corridor, which is in the northern vicinity of BIG; tricolored blackbird is not likely to travel outside of the riparian corridor into BIG to forage, making vehicle and equipment collisions unlikely. As such, direct impacts would be less than significant.

Indirect impacts on tricolored blackbird during operations and maintenance, such as noise and nighttime lighting, are not anticipated.

### *Western Yellow-billed Cuckoo*

Western yellow-billed cuckoo was observed within the 1,000-foot survey buffer during riparian bird surveys conducted for BIG and, as a result, this species has low potential to nest in riparian habitat within the BIG footprint near Hinkley Road Bridge and adjacent the BIG footprint within suitable habitat along the Mojave River (Figure 5.1-3).

**Construction – Direct and Indirect Impacts**

BIG construction activities could result in direct impacts on nesting western yellow-billed cuckoo. Vegetation clearing and grading associated with the construction of the southwestern lead track extension and improvements to the Hinkley Road Bridge will result in the removal of marginal tamarisk scrub habitat. The removal of this habitat could result in harassment, injury, damage or destruction of an active nest, and/or death of adults, eggs, and/or young during construction.

To avoid or minimize such impacts, BNSF would implement MMs, including the following:

- Vegetation trimming and removal and other construction activities within suitable western yellow-billed cuckoo nesting habitat would occur outside of their typical breeding season (May 1 – August 31) to maximum extent feasible (MM BIG BIO-17).
- If avoidance of nesting season is not feasible, then pre-construction surveys for western yellow-billed cuckoo would be conducted prior to construction within suitable nesting habitat (MM BIG BIO-17).
- If nesting western yellow-billed cuckoo are documented within direct impact areas, then all work within 500 feet would be prohibited until additional measures and/or authorizations are issued in consultation with USFWS and CDFW, which could include restricting construction activities to only occur outside of the typical breeding season (MM BIG BIO-17).

Although western yellow-billed cuckoo was observed within the survey area during focused surveys, the removal of marginally suitable habitat will result in approximately 16 acres of tamarisk scrub, which is spread throughout the southwestern portion of the project (Figure 5.1-3) and a conservation easement

will be placed over approximately 500 acres of the Mojave River floodplain. Most of the suitable habitat within the survey area will be avoided by direct impacts during construction. No other direct impacts on potential habitat suitable for western yellow-billed cuckoo are anticipated. With successful implementation of MM BIG BIO-17, direct impacts on nesting western yellow-billed cuckoo during BIG construction would be less than significant.

BIG construction activities could result in indirect impacts on nesting western yellow-billed cuckoo if present within marginally suitable tamarisk scrub habitat within a 500-foot buffer of the direct impact footprint. Similar to the direct impact footprint, the tamarisk scrub surrounding the project occurs in patches along the Mojave River in the vicinity of the lead track extension and the Hinkley Bridge (Figure 5.1-3) Excessive noise levels that may be generated during construction activities could elevate stress levels of nesting western yellow-billed cuckoo and impair normal vocal communication between territorial males, a mated pair, and parents and their young. Interference in parent/young communication could lead to reduced parental care, increased risk of nest abandonment, and decreased perception of alarm calls that signal the presence of predators.

To avoid or minimize such impacts, BNSF would implement MMs, including the following:

- If nesting western yellow-billed cuckoo are documented during pre-construction surveys within 500 feet of proposed construction activities, no work shall occur within 500 feet of the nest territory and noise monitoring would be implemented (MM BIG BIO-17).
- Construction activities that cause the noise limits to be exceeded would be adjusted or noise attenuation measures implemented to reduce noise to below the agency-approved threshold. If such adjustments are not feasible, work would be postponed until after the breeding season or after the western yellow-billed cuckoo fledglings are no longer dependent on the affected breeding territory, as confirmed by a qualified biologist (MM BIG BIO-17).

These measures would help avoid or minimize indirect impacts on western yellow-billed cuckoo by ensuring that if the species is confirmed nesting within 500 feet of construction activities during the breeding season construction noise levels do not exceed those recommended by the agencies. With successful implementation of MM BIG BIO-17, indirect impacts on nesting western yellow-billed cuckoo during BIG construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on western yellow-billed cuckoo could occur during BIG construction and operations and maintenance through injury and/or death if western yellow-billed cuckoo strike vehicles (including trains) or BIG structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Western yellow-billed cuckoo generally moves along vegetated riparian corridors and would not likely travel through BIG or near project components, except for the Hinkley Road Bridge; therefore, the area where western yellow-billed cuckoo may encounter vehicles or structures is limited. In addition, western yellow-billed cuckoo may be present in the area for a limited time each year due to their migratory behavior. As such, these potential direct impacts would be less than significant.

Indirect impacts on western yellow billed cuckoo could occur during BIG operations and maintenance due to elevated noise levels generated by trains, large vehicles and equipment, and other on-site activities. Prolonged, excessive noise could cause interference with normal breeding activities. Operational noise levels may exceed pre-construction levels with increased human, vehicle, and equipment activities resulting from BIG operations. However, they are expected to significantly affect any willow flycatcher migrating through the Mojave River corridor. Indirect impacts resulting from BIG operations are not anticipated.

### *Mohave Ground Squirrel*

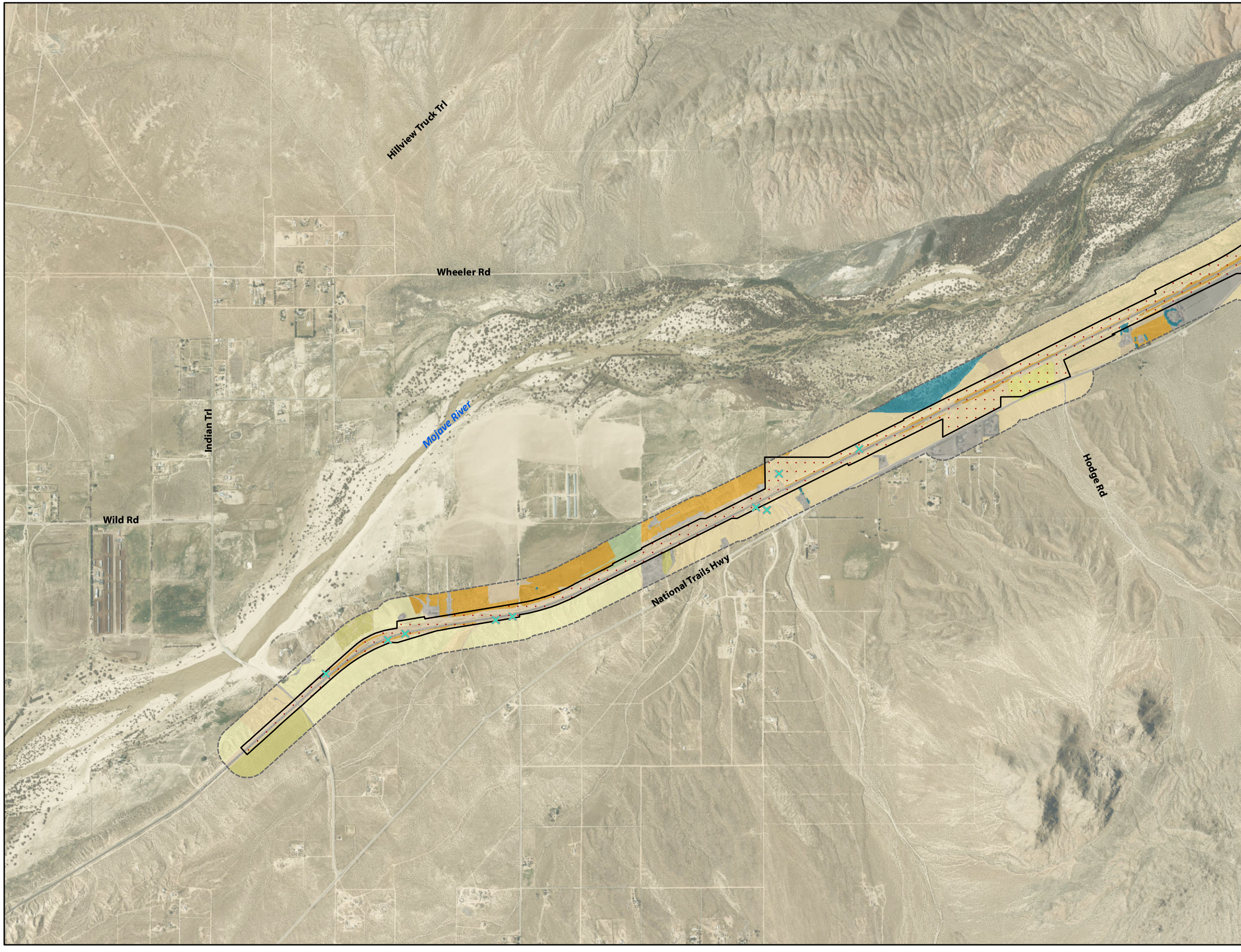
Focused live-trapping surveys for Mohave ground squirrel conducted from April to July 2022 and from April to July 2025 were negative. Additionally, recent scientific literature and regional trapping efforts provide evidence that the historical range of Mohave ground squirrel has shifted and decreased, and that BIG is outside of the current range of the species. The closest known core population of Mohave ground squirrel is approximately 30 miles to the west, and regional trapping efforts and historical data reveal that the closest known confirmed occurrences of Mohave ground squirrel do not occur within BIG or the immediate surrounding areas (Leitner, 2021). As such, impacts on Mohave ground squirrel are not anticipated.

### *Western Burrowing Owl*

Western burrowing owl individuals, their sign, and suitable burrows were documented within allscale scrub, creosote bush scrub, and dune habitat in portions of the rail yard and transload warehouse center during focused presence/absence surveys in the non-breeding season of 2021-2022 (Figure 5.1-6. Western Burrowing Owl Impacts). Although no owls were observed during the focused breeding season surveys in 2022, 2023, and 2024, suitable burrows and sign were observed within the transload warehouse center and rail yard, solar farm, Tortilla Substation improvements, off-site improvements, and adjacent land (i.e., survey buffer). However, none of the sign was recent, indicating that western burrowing owl was likely not present on BIG during those breeding season surveys. Western burrowing owl was incidentally documented on site during protocol desert tortoise presence/absence surveys in September and October 2024 in the agricultural fields within the transload warehouse center as well as within the southern portion of Lenwood Channel. Due to these observations, it is assumed that western burrowing owl is present on site.

#### Construction – Direct and Indirect Impacts

Direct impacts on western burrowing owl may occur from vegetation clearing and grading, resulting in harassment, injury, and/or death could occur if individuals are present during BIG construction. Specifically, vegetation removal and mass grading within suitable habitat such as the railyard and transload warehouse center where burrowing owl has been observed has the potential to remove active burrows and/or harass any burrowing owl individuals in the vicinity of direct impact areas or active construction areas. Machinery, such as cranes, skid steers, excavators, or even pick-up trucks have the potential to strike burrowing owl resulting in injury or mortality. Burrowing owl may also be attracted to material and soil stock piles during construction creating a potential risk to individuals in proximity to work activities. These impacts on burrowing owl would be considered significant. Although breeding burrowing




Project Site
Impact Footprint
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**

Suitable Unoccupied Burrow

**Vegetation**

Creosote bush (white bursage) scrub
Creosote bush scrub
Disturbed creosote bush (white bursage) scrub
Desert saltbush scrub
Disturbed desert saltbush scrub
Non-native grassland (former agriculture)
Tamarisk scrub
Disturbed
Developed

Key Map

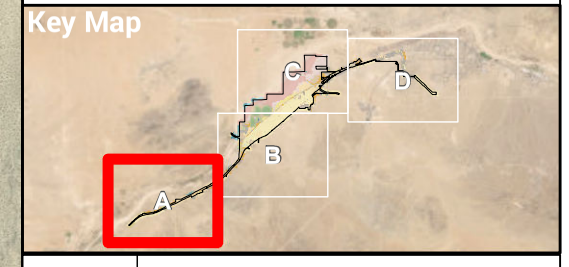



FIGURE
5.1–6A

**Western Burrowing Owl Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024
Regional Map: National Geographic, Esri 2012

Gazana St

Delaney Rd

Burlington Northern Santa Fe RR

National Trails Hwy

Hinkley Rd

Project Site
Impact Footprint
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**
Suitable Unoccupied Burrow

**2022 Breeding Season**
Suitable Unoccupied Burrow with Sign
Suitable Unoccupied Burrow

**2021-2022 Nonbreeding Season**
Individual Live Owl (Pass 1)
Suitable Unoccupied Burrow with Sign

**2024-2025 Nonbreeding Season**
Suitable Unoccupied Burrow

**Vegetation**
Active desert dunes
Disturbed stabilized and partially stabilized dunes
Creosote bush (white bursage) scrub
Creosote bush scrub
Disturbed creosote bush (white bursage) scrub
Desert saltbush scrub
Disturbed desert saltbush scrub
Non-native grassland (former agriculture)
Tamarisk scrub
Disturbed
Unvegetated Channel
Developed

Key Map

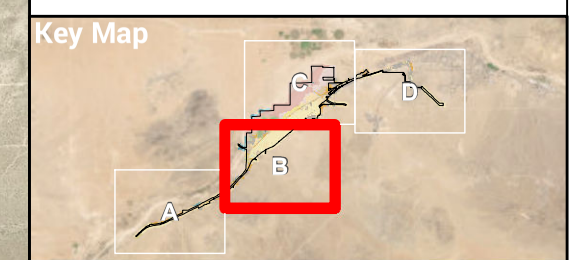



FIGURE
5.1–6B

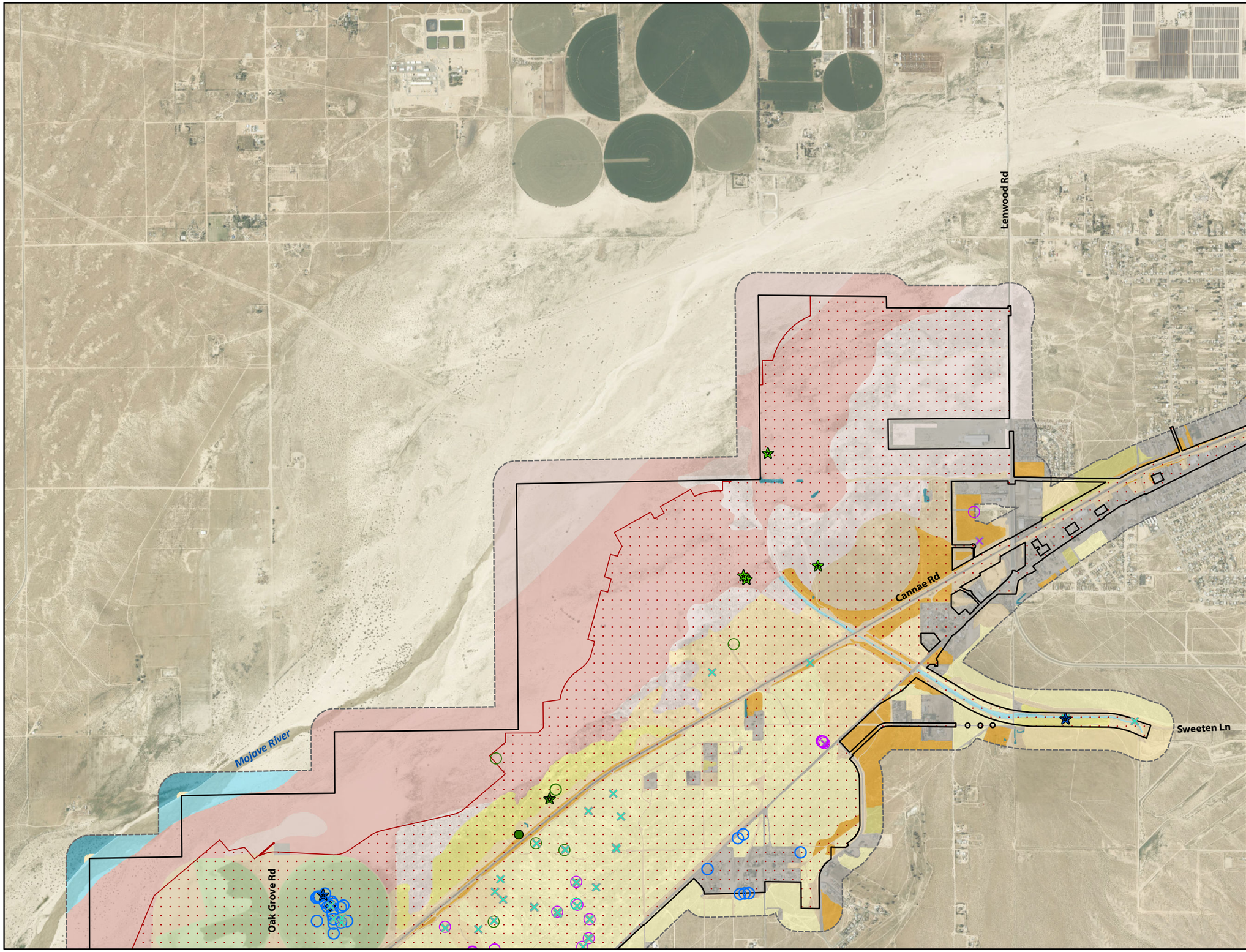
**Western Burrowing Owl Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024
Regional Map: National Geographic, Esri 2012




Project Site
Impact Footprint
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**
- Suitable Unoccupied Burrow with Sign
- Suitable Unoccupied Burrow

**2022 Breeding Season**
- Suitable Unoccupied Burrow with Sign
- Suitable Unoccupied Burrow

**2021-2022 Nonbreeding Season**
- Individual Live Owl (Pass 1)
- Individual Live Owl (Pass 3)
- Suitable Occupied Burrow
- Suitable Unoccupied Burrow with Sign

**2024-2025 Nonbreeding Season**
- Individual Live Owl (Incidental)/Occupied Burrow
- Suitable Unoccupied Burrow
- Sign

**Vegetation**
- Active desert dunes
- Stabilized and partially stabilized dunes
- Disturbed stabilized and partially stabilized dunes
- Creosote bush (white bursage) scrub
- Creosote bush scrub
- Disturbed creosote bush (white bursage) scrub
- Desert saltbush scrub
- Disturbed desert saltbush scrub
- Non-native grassland (former agriculture)
- Tamarisk scrub
- Disturbed
- Unvegetated Channel
- Developed

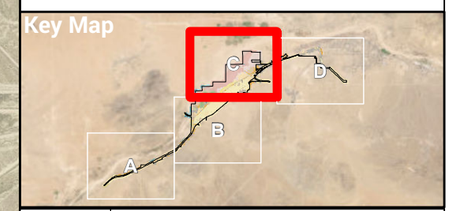



FIGURE 5.1-6C

# Western Burrowing Owl Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET

1 INCH = 2,000 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri 2024

Regional Map: National Geographic, Esri 2012

Project Site
Impact Footprint
Western Burrowing Owl Survey Area

**Western Burrowing Owl Survey Results**

**2023 Breeding Season**

Suitable Unoccupied Burrow

**Vegetation**

Creosote bush (white bursage) scrub
Creosote bush scrub
Disturbed creosote bush (white bursage) scrub
Desert saltbush scrub
Disturbed desert saltbush scrub
Disturbed
Unvegetated Channel
Developed

Agate Rd
Main St
Main St
L St
Barstow Rd
Rimrock Rd
H St
P St
Linda Vista Rd
58
15
247

Key Map

A
B
C
D

FIGURE
5.1-6D

Western Burrowing Owl Impacts
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri 2024
Regional Map: National Geographic, Esri 2012

owls have not been documented on BIG there is still low potential for breeding in the future due to the presence of over 3,000 acres of suitable habitat; thus, harassment, injury, death, and/or destruction of eggs and chicks could occur if construction activities, such as grading, directly impact occupied burrows.

To avoid such impacts on western burrowing owl burrows during BIG construction, BNSF would implement MMs, including the following:

- Pre-construction burrowing owl surveys would be conducted in accordance with CDFW's *Staff Report on Burrowing Owl Mitigation* to determine if any occupied burrowing owl burrows are present within or adjacent to construction areas prior to and during ground disturbance (MM BIG BIO-21).
- If occupied burrowing owl burrows are documented prior to or during construction, no-work exclusion buffers would be established and maintained around each burrow until burrowing owl fledglings, if present, are no longer dependent on the burrow and disperse from the area or until adult burrowing owls are no longer occupying the burrow (MM BIG BIO-21).
- Biological monitors would be retained to monitor occupied burrows and confirm nearby construction activities do not result in adverse effects on natural burrowing owl behaviors and nesting success (MM BIG BIO-21).
- If burrowing owl(s) do not naturally disperse from the active burrow, a relocation plan would be developed and implemented in coordination with CDFW (MM BIG BIO-21).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required project MMs for special-status wildlife (MM BIG BIO-1).
- Biological monitors would have the authority to halt work if the project is not in compliance with such measures (MM BIG BIO-3).
- Construction limits clearly demarcated to prevent unanticipated project impacts (MM BIG BIO-7).
- Vehicles and equipment restricted to established roads, construction areas, and other permissible areas (MM BIG BIO-4).
- Speed limits set and enforced, and wildlife on the roadways avoided to the greatest extent possible (MM BIG BIO-4).
- Best management practices implemented to minimize risk of wildlife entrapment in holes and trenches excavated during construction (MM BIG BIO-9).
- Efforts will be made to discourage sensitive wildlife inhabitation of spoils, stockpiles, and materials (i.e. covering with secured tarps, spreading out materials, etc.). Uncovered/unmanaged spoils and stockpiles would be inspected before being disturbed (MM BIG BIO-33).
- Pets, which could harass, injure, or kill wildlife, prohibited on site (MM BIG BIO-12).

With the successful implementation of these MMs, some direct impacts on western burrowing owl within BIG would be avoided and/or minimized.

However, project implementation could also result in destruction or degradation of suitable habitat. Burrowing owls have only been documented within BIG during the non-breeding season (2021-2022 and 2024-2025). The removal of approximately 3,300 acres of suitable habitat would result in the loss of potential overwintering habitat for western burrowing owl; this includes all desert saltbush scrub, non-native grassland, dunes, creosote bush scrub, and the associated disturbed subtypes (and excludes developed, disturbed habitat, and tamarisk scrub). In these areas, suitable burrows and small mammal activity have been documented during multiple previous surveys (**Attachments D - Q**).

BIG is currently not a high-value resource for breeding activity and long-term residency, which is supported by the lack of observed breeding activity during the previous breeding seasons (2022-2024) as discussed above. As burrowing owl populations in the Mojave Desert are scattered but concentrated in regions with agricultural land use and/or in proximity to suburban development, they are likely to breed outside of BIG. However, suitable burrows and the presence of prey occur throughout BIG, although burrowing owls have only used certain portions of the site for overwintering as recent as January 2025 and may continue to do so in the future; therefore, the removal of suitable habitat would be potentially significant. To offset impacts related to the removal of suitable habitat, BNSF shall prepare a Compensatory Mitigation Plan (CMP) in consultation with CDFW that describes the compensatory mitigation that shall be provided at a minimum 1:1 ratio to offset permanent and temporary impacts on burrowing owl habitat (MM BIG BIO-22). Compensatory mitigation may include mitigation bank credit purchase (i.e., purchase of available credits for the burrowing owl from a CDFW-approved mitigation bank), on-site or off-site permittee-responsible mitigation, or a combination of these. Credits purchased or lands acquired for burrowing owl compensatory mitigation would be used to preserve high-quality, suitable habitat in perpetuity. Therefore, with implementation of project MMs, direct impacts on western burrowing owl resulting from the construction of BIG would be less than significant.

Indirect impacts on western burrowing owl in proximity to BIG, if present, could also occur during construction due to elevated noise, vibration, and dust levels generated by equipment. However, the following measures will be implemented during construction to address potential indirect impacts on burrowing owl during construction:

- Noise attenuation best practices shall be implemented during construction, such as the use of temporary noise barriers to reduce noise levels at or below 80 dBA Leq as described in GPU NOI-1 (EIR Appendix 5.12).
- A fugitive dust control plan shall be implemented and includes measures such as watering exposed surfaces and unpaved roads at least three times a day, suspending dust-generating activities when average wind speed exceeds 25 miles per hour, and watering or presoaking all land clearing, grubbing, scraping, excavation, and demolition activities as described in MM BIG AQ-1 (EIR Appendix 5.3).
- A Storm Water Pollution Prevention plan shall be implemented during construction to avoid impacts on western burrowing owl adjacent to BIG related to erosion, runoff, and stormwater contaminants (MM BIG BIO-30)

- The introduction of weeds to areas adjacent to BIG has the potential to convert suitable habitat for burrowing owl to disturbed habitat types unsuitable for burrowing owl. To avoid and minimize the spread of non-native and invasive plant species from BIG to adjacent undeveloped lands BIG shall implement an Adaptive Weed Control Plan (MM BIG BIO-6).

Pre-construction burrowing owl surveys shall include a 500-foot buffer around active work areas. If burrowing owls or active burrows are observed during pre-construction surveys, avoidance buffers shall be established, maintained, and monitored (MM BIG BIO-21).As such, these indirect impacts during BIG construction are anticipated to be less than significant.

BIG construction would result in indirect impacts on western burrowing owl, including fragmentation of western burrowing owl habitat which can lead to isolated populations of the species and restricted gene flow within the species total population. However, BIG does not support breeding burrowing owl as evidenced by the lack of breeding activity during focused breeding season surveys from 2022 to 2024. Burrowing owls are likely breeding outside of BIG in areas with higher availability of resources required for breeding, such as in/near areas of high agricultural activity and suburban development. Therefore, the removal of overwintering burrowing owl habitat would not substantially affect gene flow or isolate existing known populations which breed outside of BIG. Additionally, compensatory mitigation requirements which would include purchase of burrowing owl credits at a mitigation bank, conservation of suitable burrowing owl habitat off-site would offset, and/or payment to an existing in-lieu fee program would offset indirect impacts related to the loss of burrowing owl habitat by conserving suitable habitat off site but within the range of the species.

Lastly, indirect impacts on western burrowing owl during BIG construction could occur if construction is required at night and uses lighting that interferes with normal burrowing owl behavior or potentially attracts predators to occupied burrows, should owls be present during construction. Such impacts could reduce burrowing owls' hunting success and increase predation on the species. To avoid indirect impacts resulting from nighttime construction and lighting:

- If nighttime work is necessary, the implementation of a Nighttime Construction and Lighting Plan will be required, which includes measures to prevent indirect lighting impacts on species such as burrowing owl (MM BIG BIO-8).

With the proper implementation of MM BIG BIO-8, indirect impacts on western burrowing owl during BIG construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

The operations and maintenance of BIG may also result in direct impacts on burrowing owl. Burrowing owls are most often killed by vehicles when they flush from the shoulder of the road or are hunting low to the ground as they cross a road. BIG would increase vehicular traffic including in areas adjacent to suitable habitat which may result in increased vehicle strikes and mortality. Suitable habitat for burrowing owl within BIG would be removed during construction, making them unlikely to occur onsite and collide with vehicles (including trains). Although suitable habitat for this species would remain adjacent to BIG in some locations where they may be increased vehicular traffic, these species are unlikely to be attracted

to the large developed BIG footprint because it would lack suitable resources; hence the number of burrowing owls potentially encountering vehicles to cross into BIG would be low.

Potentially significant direct impacts on western burrowing owl could occur during BIG operations and maintenance through injury and/or death if owls strike project structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Additionally, burrowing owl may inhabit other manmade structures such as culverts, open manholes, rubble piles, tubing, and other burrow-like structures. BIG would incorporate avian-safe MMs that would avoid or minimize avian (including raptors) strikes with project structures (MM BIG BIO-35). This includes designing project structures to prevent electrocution of raptors, including burrowing owl, or otherwise occupation of other manmade structures. Direct impacts on western burrowing during operations and maintenance would be less than significant.

Operation and maintenance of BIG may also result in adverse effects of nighttime lighting as well as noise on western burrowing owl, if present in areas adjacent to BIG. Lighting shall be directed on BIG and away from adjacent natural areas containing suitable habitat during the operation of BIG and as prescribed in BIG Specific Plan (MM BIG BIO-36). Operational noise levels may exceed pre-construction levels with increased human, vehicle, and equipment activities resulting from BIG operations. However, they are not expected to significant affect any burrowing owl potentially overwintering in the areas surrounding BIG. Therefore, indirect impacts on western burrowing owl from operation and maintenance of BIG, if present, are not anticipated.

### Non-Listed Special-Status Wildlife Species

A total of 25 non-listed special-status wildlife species were either documented during BIG biological surveys or were determined to have a moderate to high potential to occur within BIG.

#### *Mojave Fringe-toed Lizard*

Mojave fringe-toed lizard was documented within the northern and northeastern portions of BIG in dune habitat and contiguous desert scrub habitat during focused surveys (Figure 5.1-7. Mojave Fringe-Toed Lizard Impacts). As discussed in Section 4.4, the sub-population of Mojave fringe-toed lizard occurring at BIG represents a peripheral population at the western edge of the current known range of the species. Approximately 1,588 acres of suitable dune habitat of varying qualities occur within BIG.

#### Construction – Direct and Indirect Impacts

BIG construction activities could result in direct impacts on Mojave fringe-toed lizard. Vegetation clearing, grading, and other construction activities could result in harassment, injury, and/or death of Mojave fringe-toed lizard. BIG construction activities could also result in direct impacts on Mojave fringe-toed lizard through destruction, loss, or degradation of the species' primary dune habitat. Dune vegetation communities and habitat is designated as sensitive by CDFW. Approximately up to 1,009 acres of suitable dune habitat (up to 552 acres of high-quality active desert dunes, 7 acres of moderate-quality stabilized and partially stabilized dunes, and 451 acres of low-quality disturbed stabilized and partially stabilized dunes) will be directly impacted by BIG. However up to 579 acres of dune habitat (up to 465 acres of high-quality active desert dunes, 110 acres of moderate-quality stabilized and partially stabilized dunes, and 4 acres of low-quality disturbed stabilized and partially stabilized dunes) within BIG occur outside of the

Mojave Fringe-toed Lizard Survey Area
Project Site
Impact Footprint

**Survey Results**

Mojave Fringe-toed Lizard (Spring 2023)
Mojave Fringe-toed Lizard (Fall 2023)
Mojave Fringe-toed Lizard (2021 Incidental Sighting)
Mojave Fringe-toed Lizard (2023 Incidental Sighting)
Mojave Fringe-toed Lizard (2024 Incidental Sighting)
Mojave Fringe-toed Lizard (2025 Incidental Sighting)

**Mojave Fringe-toed Lizard Suitable Habitat**

**Vegetation**

Active desert dunes
Stabilized and partially stabilized dunes
Disturbed stabilized and partially stabilized dunes

Mojave River
Lenwood Rd
Hinkley Rd
Burlington Northern Santa Fe
National Trails Hwy

**KEY MAP**

Map Extent

Hinkley Rd

15

FIGURE 5.1-7

# Mojave Fringe-toed Lizard Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 1,800 FEET

1 INCH = 1,800 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri 2020

grading limits, will not be removed during construction, and is connected to large blocks of suitable habitat beyond BIG (Figure 5.1-7).

To mitigate direct impacts, BNSF would implement MMs, including the following:

- All construction activities within suitable habitat would occur during the species typical active season (March 1 – September 30) to the maximum extent feasible. Since Mojave fringe-toed lizards remain buried in the sand during inactive periods, disturbing suitable habitat during the active period would increase the likelihood that individuals could disperse away from construction activities more readily and reduce potential injury or death (MM BIG BIO-23).
- A biological monitor would be present during the disturbance and removal of suitable Mojave fringe-toed lizard dune habitat and if encountered, would be relocated to suitable habitat outside of the construction impact area and out of harm's way (MM BIG BIO-23).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required BIG MMs for special-status wildlife (MM BIG BIO-1).
- Biological monitors would be retained to oversee and assist in the implementation of BIG MMs (MM BIG BIO-2) and would have the authority to halt work if BIG is not in compliance with such measures (MM BIG BIO-3).
- Construction limits would be clearly demarcated to prevent unanticipated impacts (MM BIG BIO-7).
- Vehicles and equipment would be restricted to established roads, construction areas, and other permissible areas (MM BIG BIO-4).
- Speed limits would be set and enforced, and wildlife on the roadways avoided to the greatest extent possible (MM BIG BIO-4).
- Best management practices would be implemented to minimize risk of wildlife entrapment in holes and trenches excavated during construction (MM BIG BIO-9).
- Pets, which could harass, injure, or kill wildlife, would be prohibited on BIG (MM BIG BIO-12).
- To offset direct impacts on suitable and/or occupied Mojave fringe-toed lizard habitat BNSF would provide compensatory mitigation (MM BIG BIO-24) through on-site or off-site permittee-responsible mitigation, or a combination of these. Mitigation would include conservation and management in perpetuity of suitable Mojave fringe-toed lizard habitat of equal or greater value than habitat within the impact areas. Lands containing suitable habitat for conservation can include on-site unimpacted dune habitat, off-site lands containing suitable Mojave fringe-toed habitat, or a combination of both.

These measures would help avoid or minimize direct impacts on Mojave fringe-toed lizard by conducting pre-construction clearance surveys and relocation to protect this species from injury and death. Providing worker environmental training for construction personnel and biological monitors to oversee construction activities in suitable/occupied Mojave fringe-toed lizard habitat will help further avoid and minimize impacts on Mojave fringe-toed lizard. Additionally, the conservation of suitable Mojave fringe-toed lizard habitat on-site and/or off-site, with adequate compensatory mitigation acreage requirements determined

in coordination with CDFW, would offset the removal of suitable habitat as the result of BIG construction. With successful implementation of the MMs described above and below, direct impacts on Mojave fringe-toed lizard during BIG construction would be less than significant.

BIG construction would also indirectly impact Mojave fringe-toed lizard through the removal of its primary dune habitat and potentially fragmenting suitable habitat within the species' range. Fragmentation of habitat could result in reduced movement and gene flow within the local population. BIG would be constructed at the southern extent of active desert dunes in the vicinity of BIG and suitable habitat for Mojave fringe-toed lizard is not present south of the dunes, which is generally bordered by the existing railway. Approximately 500 acres of active desert dunes occurring along the northern extent of BIG adjacent to the Mojave River will not be directly impacted during construction and will allow for continued movement into connected large blocks of suitable habitat located north, northeast, and southwest of BIG. Therefore, genetic exchange across the species' range would continue even with the removal of approximately 1,000 acres of suitable dune habitat resulting from the construction of BIG.

Construction of BIG may also result in indirect impacts on Mojave fringe-toed lizard. The sub-population of Mojave fringe-toed lizard in the vicinity of BIG could be of added ecological value if its members have unique genetic variation that may be beneficial to the species in allowing for adaptations to changing environmental conditions. Mortality of this peripheral population could result in decrease in genetic variation across the species, making them less adaptable to changing environmental conditions, including but limited to, affects resulting from climate change. A decrease in transfer of genetic variation will likely negatively affect the long-term viability of the species. However, as over 500 acres of suitable dune habitat will be avoided during the construction of BIG, the subpopulation of Mojave fringe-toed lizard in the vicinity of BIG may still persist. The unimpacted dune area will continue to support this species and is connected to suitable Mojave fringe-toed lizard habitat beyond BIG to the north, northeast, and southwest.

Additional indirect impacts on Mojave fringe-toed lizard during BIG construction could also occur due to elevated noise, vibration, and dust levels generated by construction equipment. Construction activities adjacent to occupied dune habitat could disrupt normal Mojave fringe-toed lizard behavior by flushing individuals and subjecting them to an increased risk of predation, thus contributing to population decline in the vicinity of BIG. However, these indirect impacts are limited to individuals occurring directly adjacent to project construction only; Mojave fringe-toed lizard occurring farther from active construction would not experience these indirect impacts. For example, assuming the average territory size of a male Mojave fringe-toed lizard is 0.25 acre (Kaufman, 1982), indirect impacts may be limited to lizard with territories that are within approximately 60 feet of the grading limits. Mojave fringe-toed lizards with territories occurring farther than 60 feet of the grading limits are not likely to be subjected to indirect impacts; thus, allowing for continued survival of the species adjacent to BIG. Therefore, indirect impacts on Mojave fringe-toed lizard resulting from construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Operation and maintenance of BIG has the potential to result in direct impacts on Mojave fringe-toed lizard. Although suitable dune habitat will be removed from BIG after construction, Mojave fringe-toed

lizard individuals may still occur at the edge of the project site, adjacent to the unimpacted dune habitat. Furthermore, permanent fencing is not proposed along the northern extent of BIG facilities. Although suitable habitat will be removed within BIG, Mojave fringe-toed lizard may infrequently cross into project components adjacent natural dune habitat and individuals may experience vehicle strikes or increased potential for predation due to lack of cover structures. However, these incidental occurrences would affect only a limited number of individuals and not substantially affect the stability of the species population as they would be expected to remain primarily in the intact preserved habitat.

BIG operations and maintenance will also result in increased human presence in the vicinity of occupied habitat that may contribute to indirect impacts. Increased human presence could result in increased raven populations and, therefore, increased predation of Mojave fringe-toed lizard and juveniles in nearby habitat, if present. Increased human presence may also lead to increased disturbance to nearby habitat areas, which may result in the introduction of invasive plant species in the vicinity of BIG. These invasive plant species could displace native plants that are a food source and provide cover for Mojave fringe-toed lizard.

To following measures have been incorporated into BIG to avoid and minimize indirect impacts on Mojave fringe-toed lizard:

- A Raven Management Plan will be prepared (MM BIG BIO-15) that will manage and reduce potential raven subsidies at the site.
- BNSF shall participate in the interagency Raven Monitoring and Management Program to address indirect impacts to the species related to the potential increase in the raven population. The Applicant's participation in the program shall be subject to compensation through the payment of a onetime fee not to exceed $150 and no less than $105 per disturbed acre, as established by the Desert Managers Group (MM BIG BIO-15).
- An Adaptive Weed Control Plan will be implemented to minimize the potential for invasive plants to spread from BIG to adjacent habitat during the operation of BIG (MM BIG BIO-6).

Therefore, direct and indirect impacts resulting from the operation and maintenance of BIG would be less than significant.

### *Special-Status Raptors*

Cooper's hawk, golden eagle, long-eared owl, merlin, northern harrier, osprey, prairie falcon, and sharp-shinned hawk (collectively referred to as special-status raptors in this section) were either observed within the vicinity of BIG during surveys or were identified as having potential to occur within the vicinity, and suitable foraging habitat is present within and adjacent to BIG.

#### Construction – Direct and Indirect Impacts

BIG construction could result in direct impacts on special-status raptors through removal of foraging habitat; however, large areas of suitable foraging habitat for these raptors are present adjacent to BIG and throughout the region. As such, removal of suitable foraging habitat would be less than significant.

Golden Eagle

Although a pair of golden eagles were observed flying over the southwestern lead track extension area in 2023, this species is not expected to nest on BIG. Suitable rocky outcrops and cliffs do not occur within BIG or in the immediate surrounding areas. The closest known nest sites for golden eagle occur in the Granite Mountains approximately five miles south of Barstow. Direct impacts on golden eagle nesting are not anticipated.

Raptors with No Nesting Potential – Ferruginous Hawk, Merlin, Northern Harrier, Sharp-shinned Hawk, Prairie Falcon, and Osprey

Non-listed special status raptors ferruginous hawk, merlin, and sharp-shinned hawk do not nest in southern California; of these raptors, only sharp-shinned hawk was observed on BIG. Although observed on BIG, suitable nesting habitat for northern harrier, osprey, and prairie falcon do not occur on the project site or immediate surrounding areas. As such, direct impacts on nests of these species are not anticipated.

Raptors with Nesting Potential – Cooper's Hawk and Long-eared Owl

Cooper's hawk and long-eared owl were observed on BIG. Potentially suitable nesting habitat for Cooper's hawk is present in riparian habitat within BIG near Hinkley Road Bridge and adjacent the BIG footprint within suitable habitat along the Mojave River and within ornamental trees located on the scattered residences along National Trails Highway. Additionally, long-eared owl was observed nesting in a stand of tamarisk at the northern portion of Lenwood Channel. BIG construction could result in direct impacts on nesting Cooper's hawk and long-eared owl through harassment, injury, and/or death of adults, eggs, and/or young if construction activities remove or physically disturb active nest trees. Such impacts are potentially significant because they could result in direct destruction of the active nest or abandonment of the nest by adult Cooper's hawk.

Direct impacts on active Cooper's hawk and long-eared owl nests during BIG construction would be avoided or minimized through implementation of measures, including those listed below:

- Pre-construction nesting bird surveys would be conducted to confirm no active Cooper's hawk or long-eared owl nests are present within direct impact areas during ground disturbance (MM BIG BIO-18).
- If active nests are observed, no-work exclusion buffers would be established and maintained around each nest until fledglings, if present, are no longer dependent on the nest and disperse from the area (MM BIG BIO-18).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required project MMs for special-status wildlife (MM BIG BIO-1).
- Biological monitors would be retained to oversee and assist in the implementation of BIG MMs (MM BIG BIO-2) and would have the authority to halt work if BIG is not in compliance with such measures (MM BIG BIO-3).

With successful implementation of MMs, direct impacts on nesting special-status raptors during construction would be less than significant.

Indirect impacts on special-status raptors foraging during project construction could occur due to elevated noise, vibration, and dust levels generated by construction equipment. However, if present within or near active work areas, special-status raptors would likely disperse from the area, thus unlikely to affect raptor foraging behavior and long-term viability.

However, elevated construction noise levels and lighting resulting from BIG construction could indirectly impact nesting Cooper's hawk and long-eared owl adjacent to BIG. Excessive noise levels and nighttime lighting generated during construction activities could elevate stress levels of nesting Cooper's hawk and long-eared owl and impair normal vocal communication between the mated pair and their young. Interference in parent/young communication could lead to reduced parental care, increased risk of nest abandonment, and decreased perception of alarm calls that signal the presence of predators.

Indirect impacts on active Cooper's hawk and long-eared owl nests during BIG construction would be avoided or minimized through implementation of measures outlined below:

- Pre-construction nesting bird surveys would be conducted to confirm no active Cooper's hawk or long-eared owl nests are present adjacent to direct impact areas during ground disturbance (MM BIG BIO-18). If active nests are observed, no-work exclusion buffers would be established and maintained around each nest until fledglings, if present, are no longer dependent on the nest and disperse from the area (MM BIG BIO-18). The no-work zone would be of sufficient size and distance to reduce the level of noise reaching the nest.
- Biological monitors would be retained to oversee and assist in the implementation of BIG MMs (MM BIG BIO-2) and would have the authority to halt work if BIG is not in compliance with such measures (MM BIG BIO-3).
- Nighttime construction lighting will be directed away from adjacent habitats (MM BIG BIO-8).

With successful implementation of MMs, indirect impacts on nesting special-status raptors during construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on special-status raptors could occur during project operations and maintenance if birds strike vehicles (including trains) or BIG structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Raptors are vulnerable to vehicle strikes because they can be attracted to roadways by the presence of dead or injured wildlife resulting from increased vehicular traffic within/around BIG. In addition, special-status raptors may attempt to use project structures as perches during BIG operations and maintenance which could result in collisions. BIG MMs will be implemented to minimize or avoid vehicle and/or structure strikes and to reduce the risk of special-status raptor mortality during operations and maintenance. However, BIG would incorporate avian-safe MMs that would avoid or minimize special-status raptor strikes with project structures and potential electrocution (MM BIG BIO-35). With the successful implementation of MMs, direct impacts on raptors during project operation and maintenance would be less than significant.

Operation and maintenance of BIG may also result in indirect impacts for special-status raptors, including adverse effects of nighttime lighting as well as noise. Lighting shall be directed on BIG and away from

adjacent natural areas and sensitive habitat areas, such as the Mojave River, during the operation of BIG (MM BIG BIO-36). Operational noise levels may exceed ambient levels with increased human, vehicle, and machinery activities. However, noise barriers would be installed along the solar farm and along the intermodal facility to mitigate noise impacts during the operation of the facilities (BIG NOI-2, EIR Appendix 5.12) and a Conservation Easement placed over several hundred acres of the Mojave River Floodplain will provide a substantial buffer from project operations for the riparian area where special-status raptors may nest and forage.

With successful implementation of MMs, indirect impacts on nesting special-status raptors during operations and maintenance would be less than significant.

### *Special-Status Riparian Birds – Lucy's Warbler, Olive-sided Flycatcher, Vermillion Flycatcher, Yellow Warbler, and Yellow-breasted Chat*

Lucy's warbler, olive-sided flycatcher, and yellow warbler were observed within the 1,000-foot survey buffer during riparian bird surveys conducted for the project. Vermillion flycatcher was also observed near the residences in the vicinity of Hinkley Road. Yellow-breasted chat has a moderate potential to occur within BIG. These five species are collectively referred to as special-status riparian birds in this section. As a result, these species have potential to forage in riparian habitat within the BIG footprint near Hinkley Road Bridge and adjacent the BIG footprint within suitable habitat along the Mojave River. Suitable nesting habitat for olive-sided flycatcher is not present on BIG or immediately adjacent lands; however, Lucy's warbler, vermillion flycatcher, yellow warbler, and yellow-breasted chat have a moderate potential to nest within or adjacent to the riparian habitat near Hinkley Road Bridge.

#### Construction – Direct and Indirect Impacts

Lucy's warbler, olive-sided flycatcher, vermillion flycatcher, yellow warbler, and yellow-breasted chat were observed during surveys conducted for the project and yellow-breasted chat has a moderate potential to occur (collectively referred to as special-status riparian birds in this section). As a result, these species have potential to forage in riparian habitat within the BIG footprint near Hinkley Road Bridge and adjacent the BIG footprint within suitable habitat along the Mojave River.

Suitable nesting habitat for olive-sided flycatcher is not present on BIG or immediately adjacent lands; however, Lucy's warbler, vermillion flycatcher, yellow warbler, and yellow-breasted chat have a moderate potential to nest within or adjacent to the riparian habitat near Hinkley Road Bridge.

BIG construction could result in direct impacts on special-status riparian birds through removal of foraging habitat; however, only approximately 16 acres of suitable tamarisk scrub (*Tamarix* spp. Shrubland Semi-natural Alliance) foraging habitat would be removed and graded which is minimal in relation to the available foraging habitat in the region along the Mojave River. Additionally, the project will provide an approximate 500-acre Mojave River Floodplain Conservation Easement, substantially offsetting these impacts. As such, removal of suitable foraging habitat would be less than significant.

BIG construction activities could result in direct impacts on nesting Lucy's warbler, vermillion flycatcher, yellow warbler, and yellow-breasted chat. Vegetation clearing within an active Lucy's warbler, vermillion

flycatcher, yellow warbler, or yellow-breasted chat breeding territory could result in harassment, injury, damage or destruction of an active nest, and/or death of adults, eggs, and/or young during construction.

To avoid or minimize such impacts on Lucy's warbler, vermillion flycatcher, yellow warbler, and yellow-breasted chat, BNSF would implement MMs, including the following:

- Vegetation trimming and removal and other construction activities within suitable Lucy's warbler, vermillion flycatcher, yellow warbler, and yellow-breasted chat nesting habitat would occur outside of the avian breeding season (typically February through August) to the greatest extent feasible (MM BIG BIO-18).
- Regardless of the time of year, pre-construction surveys for nesting birds would be conducted prior to construction within suitable nesting habitat (MM BIG BIO-18).
- If nesting Lucy's warbler, vermillion flycatcher, yellow warbler, or yellow-breasted chat are documented, no-work exclusion buffers would be established and maintained around each nest until fledglings, if present, are no longer dependent on the nest and disperse from the area (MM BIG BIO-18).

With successful implementation of MM BIG BIO-18, direct impacts on nesting special-status riparian birds during BIG construction would be less than significant.

Indirect impacts on foraging special-status riparian birds adjacent to during BIG construction could occur due to elevated noise, vibration, and dust levels generated by construction equipment. Specifically, a portion of the southwestern lead track extension will be constructed adjacent to tamarisk scrub habitat, which is the habitat where the species were observed previously. However, foraging special-status riparian birds adjacent to active construction areas may flush to suitable habitats that continues further upstream or downstream the river corridor, thus unlikely to affect special-status riparian bird foraging behavior and long-term viability.

BIG construction activities could also result in indirect impacts on nesting Lucy's warbler, vermillion flycatcher, yellow warbler, and yellow-breasted chat from excessive construction noise and nighttime lighting. If active nests are detected during pre-construction nesting surveys, exclusion buffers would be established and maintained around each nest (MM BIG BIO-18). Exclusion buffers that adequately minimize noise impacts at active nests would be established and avian behavior would be monitored to confirm that construction activities do not alter normal reproductive behavior. Additionally, nighttime construction lighting will be directed away from adjacent habitats per MM BIG BIO-8. As such, these indirect impacts on special-status riparian birds during BIG construction are anticipated to be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on special-status riparian birds could occur during BIG construction and operations and maintenance through injury and/or death if riparian birds strike vehicles (including trains) or BIG structures, such as buildings, windows, solar panels, towers, wires, and electrified components. Lucy's warbler, olive-sided flycatcher, vermillion flycatcher, yellow warbler, and yellow-breasted chat generally move along riparian corridors and would not likely travel through BIG or near BIG components as the

riparian corridor is avoided by the project, except for the Hinkley Road Bridge; therefore, the area where special-status riparian birds may encounter vehicles or structures is limited. In addition, these species are present in the area for a limited time each year due to their migratory behavior. As such, these impacts would be less than significant.

Operation and maintenance of BIG may also result in indirect impacts for special-status riparian birds, including adverse effects of nighttime lighting as well as noise. Lighting shall be directed on BIG and away from adjacent natural areas and sensitive habitat containing suitable nesting habitat during the operation of BIG (MM BIG BIO-36). Noise levels may exceed ambient levels in the immediately adjacent riparian corridor during operations from increased human activity; however, a Conservation Easement will be placed over the Mojave River Floodplain protecting approximately 500 acres of habitat for riparian birds (MM BIG BIO-1). The Conservation Easement will provide a substantial buffer from project operations and where special-status riparian birds are expected to occur. Therefore, indirect impacts on special-status riparian birds from operation and maintenance of BIG are not anticipated.

### *Special-Status Upland Birds – Bell's Sparrow, Black-tailed Gnatcatcher, Costa's Hummingbird, LeConte's Thrasher, and Loggerhead Shrike*

Bell's sparrow, black-tailed gnatcatcher, Costa's hummingbird, LeConte's thrasher, and loggerhead shrike (collectively referred to as special-status upland birds in this section) were either observed within BIG during biological surveys or are known to occur within the vicinity. As a result, these species have potential to forage on site or in nearby areas. Additionally, suitable nesting habitat for these special-status upland birds occur within or adjacent to BIG.

#### Construction – Direct and Indirect Impacts

BIG construction would result in direct impacts on special-status upland birds through loss of potential foraging habitat within BIG, such as allscale scrub and creosote bush scrub areas; however, large areas of suitable foraging habitat for these species are present adjacent to BIG and are abundant throughout the region. Mapped conservation and management areas in the region of BIG include the Superior-Cronese ACEC, Ord-Ordman ACEC, and the Fremont-Kramer ACEC under the jurisdiction of BLM (BLM, 2016). The landscape-level management areas contain suitable nesting and foraging habitat for these special-status upland bird species and have restrictions for development on public lands that allow for long-term habitat preservation.

BIG construction activities could result in direct impacts on nesting special-status upland birds. Vegetation clearing within an active breeding territory could result in harassment, injury, damage or destruction of an active nest, and/or death of adults, eggs, and/or young during construction.

To avoid or minimize such impacts on special-status upland birds, BNSF would implement MMs, including the following:

- Vegetation trimming and removal and other construction activities within suitable nesting habitat for special-status upland birds would occur outside of the avian breeding season (typically February through August) to the greatest extent feasible (MM BIG BIO-18).

- Regardless of the time of year, pre-construction surveys for nesting birds would be conducted prior to construction within suitable nesting habitat (MM BIG BIO-18).
- If nesting special-status upland birds are documented, no-work exclusion buffers would be established and maintained around each nest until fledglings, if present, are no longer dependent on the nest and disperse from the area (MM BIG BIO-18).

With successful implementation of MM BIG BIO-18, direct impacts on nesting special-status upland birds during project construction would be less than significant.

Indirect impacts on foraging upland birds adjacent to BIG during project construction could occur due to elevated noise, vibration, and dust levels generated by construction equipment. These disturbances are temporary in duration, thus unlikely to affect upland bird foraging behavior and long-term viability. BIG construction activities could also result in indirect impacts on nesting special-status upland birds from excessive construction noise and nighttime lighting. If active nests are present, exclusion buffers would be established and maintained around each nest (MM BIG BIO-18). Exclusion buffers that adequately minimize noise impacts at active nests would be established and avian behavior would be monitored to confirm that construction activities do not alter normal reproductive behavior. Additionally, nighttime construction lighting will be directed away from adjacent habitats per MM BIG BIO-8. As such, these indirect impacts on special-status upland birds during BIG construction are anticipated to be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Potential direct impacts on special-status upland birds could occur during BIG operations and maintenance if birds strike vehicles (including trains). Although suitable habitat for these species would remain adjacent to BIG in some locations, these species are unlikely to be attracted to the large developed BIG footprint because it would lack suitable resources; hence the number of special-status upland birds potentially encountering vehicles would be low. As such, these direct impacts on upland birds during BIG operations and maintenance would be less than significant.

Operation and maintenance of BIG may also result in indirect impacts for special-status upland birds, including adverse effects of nighttime lighting as well as noise. Lighting shall be directed on BIG and away from adjacent natural areas containing suitable nesting habitat during the operation of BIG (MM BIG BIO-36). Additionally, birds are not likely to nest in areas of frequent indirect disturbance. Any birds that establish nests in areas of frequent disturbance are likely tolerant of such disturbances. Therefore, indirect impacts on special-status upland birds from operation and maintenance of BIG would be less than significant.

### *Nesting Birds*

The BIG footprint has potential to support avian nests, which are protected under the MBTA and/or CFGC § 3503, which provide that it is unlawful to “take, possess, or needlessly destroy” avian nests or eggs. Note that avoidance and minimization measures for impacts on listed and other special-status bird species previous discussed will adequately mitigate for potential impacts on general nesting birds protected under the MBTA and/or CFGC § 3503.

**Construction – Direct and Indirect Impacts**

Project implementation could result in potentially significant direct impacts on avian nests from vegetation clearing and grading, resulting in potential death, injury, or harassment of nesting birds, their eggs, and/or their young, if present, during construction, including ground disturbing activities, vegetation clearing, and building removal. These impacts are potentially significant because direct impacts on nesting birds could lead to a decline in population of locally nesting species, but can be avoided, minimized, and/or mitigated through implementation of the measures outlined in **Section 7.0**:

- Removal of suitable nesting habitat would occur outside of the breeding season (generally February 1 to September 15; MM BIG BIO-18), when feasible.
- Prior to construction initiation, a biologist would survey the area(s) subject to removal (MM BIG BIO-18). If active nests are found, construction activity would be avoided in a buffer area around the nest until nestlings have fledged and the nest is determined to be inactive (MM BIG BIO-18).

Additional nest protection requirements that would be implemented as part of the project are described below. With the implementation of MMs, direct impacts due to death, injury, or harassment of nesting birds, their eggs, and/or their young would be less than significant.

Elevated noise levels during construction could result in indirect impacts on nesting birds within the project vicinity. Increased noise near avian nests can elevate stress levels and impair normal vocal communication between territorial males, the mated pair, and parents and their young, which could lead to increased physical encounters between territorial males, reduce parental care of young. Impacts from elevated noise could also include an increase in nest abandonment, and a decrease in the perception of alarm calls signaling the presence of predators. Project noise modeling showed noise level increases as a result of the project (see Appendix 5.12 BIG-1); however, these increases were modest and generally within the range of ambient noise levels (i.e., less than 70-72 dBA) in areas where birds are anticipated to nest adjacent to BIG. During all project construction, certain equipment use shall be restricted to hours least likely to disrupt wildlife (e.g., more limited at night or early morning) and sounds generated from construction would remain close to ambient levels to the greatest extent practicable during these times (MM BIG BIO-19 and MM BIG BIO-8). Additionally, noise attenuation best practices will be implemented during construction, such as the use of temporary noise barriers to reduce noise levels at or below 80 dBA $L_{eq}$ as described in GPU NOI-1 (EIR Appendix 5.12).

As such, potential indirect impacts are anticipated to be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Potential direct impacts on nesting birds could occur within BIG during operations and maintenance if active nests are disrupted or destroyed, resulting in nest failure. However, although some bird species are tolerant of frequent human-related disturbances and may even establish nests in manmade structures, general avian activity within BIG is likely to be low during operation and maintenance. The number of potentially impacted nests is not likely to affect the survival of those species. Additionally, nests may be destroyed if established on electrified components of BIG. However, BIG would also incorporate avian-safe MMs that would avoid or minimize bird strikes with project structures and potential electrocution

(MM BIG BIO-35). Direct impacts on nesting birds resulting from BIG operations would be less than significant.

Operation and maintenance of BIG may also result in indirect impacts on nesting birds adjacent to BIG, including adverse effects of nighttime lighting as well as noise. However, birds are not likely to nest in areas of frequent indirect disturbance. Any birds that establish nests in areas of frequent disturbance are likely tolerant of such disturbances. Additionally, MM BIG BIO-36 limits nighttime lighting during operations to the developed project site, limiting light trespass into adjacent habitats. Therefore, indirect impacts on nesting birds resulting from BIG operation and maintenance would be less than significant.

### *American Beaver*

One American beaver was incidentally observed swimming upstream in the Mojave River near Hinkley Road Bridge during 2024 focused nesting Swainson's hawk surveys. However, this species may only be present for a limited time within the section of the Mojave River immediately adjacent to BIG, since the river does not contain permanent water throughout the year which is required for the species to be present.

#### Construction – Direct and Indirect Impacts

Direct impacts on American beaver could occur during BIG construction through possible harassment, injury, and/or death if individuals are present in areas subject to ground disturbance or vegetation clearing during construction, specifically, during the widening of the Hinkley Road Bridge. No other areas with the potential to support flowing water suitable for American beaver dispersal will be directly impacted during the construction of BIG. Furthermore, the species would only be potentially impacted should flowing water be present in the portion of the Mojave River adjacent to BIG during construction.

To avoid or minimize direct impacts during construction, BNSF would implement MMs, including the following:

- Construction activities shall be restricted to the dry season to the greatest extent feasible (MM BIG BIO-25).
- Should construction occur outside of the dry season, BMs shall conduct pre-construction sweeps for American Beaver. If American beaver is observed, construction cannot be initiated until the species is no longer present (MM BIG BIO-25).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required MMs for special-status wildlife (MM BIG BIO-1).
- Biological monitors would have the authority to halt work if BIG is not in compliance with such measures (MM BIG BIO-3).
- Construction limits clearly demarcated to prevent unanticipated BIG impacts (MM BIG BIO-7).

With the successful implementation of the BIG-specific MMs, potential direct impacts on American beaver resulting from construction would be less than significant.

Indirect impacts on nearby American beaver may occur during BIG construction because of increased noise, vibration, and dust generated by construction equipment. These disturbances are temporary and relatively short in duration, thus unlikely to affect American beaver behavior. Additionally, pre-construction sweeps will be conducted within 250 feet of active construction areas; if American beaver is present, construction would be paused until the species is no longer in the vicinity (MM BIG BIO-25). Therefore, indirect impacts on American beaver resulting from BIG construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on American beaver could occur if they are harmed or killed through vehicle or structure collisions during operation of BIG. However, American beaver is not anticipated to occur where equipment or vehicle collisions are likely to happen, as this species is restricted to riparian corridors with flowing water. The operation of BIG does not include any active components or facilities within the Mojave River. Direct impacts on American beaver resulting from BIG operations are not anticipated.

Operation and maintenance of BIG may also result in indirect impacts for American beaver, including adverse effects of nighttime lighting as well as noise. Lighting shall be directed on BIG and away from adjacent natural areas and sensitive habitat areas, such as the Mojave River, during the operation of BIG (MM BIG BIO-1). Operational noise levels may exceed ambient levels with increased human, vehicle, and machinery activities. However, they are not expected to significantly affect American beaver that may occur adjacent to BIG at a level that harms local populations. Therefore, indirect impacts on American beaver from operation and maintenance of BIG are not anticipated.

### *American Badger and Desert Kit Fox*

Suitable desert scrub habitat (e.g., creosote bush scrub and desert saltbush scrub) and friable soils for American badger and desert kit fox are present within BIG, which are a species of special concern and a protected fur bearing species, respectively. Additionally, these species are known to occur in the region. Desert kit fox is considered present on site and American badger has a moderate-to-high potential to occur. American badgers and desert kit fox are nocturnal and generally stay in underground dens during the day.

**Construction – Direct and Indirect Impacts**

BIG implementation could result in direct impacts on American badger and desert kit fox, if present, through destruction or degradation of suitable habitat; approximately 2,300 acres of suitable habitat for these species will be directly impacted as a result of BIG. American badger has a wide range that spans the Great Plains and Western United States, and desert kit fox occurs throughout the Mojave and Colorado deserts, as well as southern Nevada, western Arizona, and parts of Utah and Mexico. Both species have low threat ranks and are relatively common throughout their ranges. Ample suitable habitat for these species exists in the project vicinity and elsewhere in the Mojave Desert. Given these species wide ranges and relatively low rarity, loss of suitable habitat within BIG would not substantially affect these species. Although removal of habitat and excavation of burrows may result in displacement of individuals, American badger and desert kit fox generally utilize multiple dens at any given time and regularly dig new dens; therefore, these species would likely have high re-establishment success and high

survival rates following displacement. Compensatory mitigation requirements for species with similar habitat, such as desert tortoise and burrowing owl, will also function to preserve large expanses of habitat suitable for American badger and desert kit fox in perpetuity (MM BIG BIO-16 and MM BIG BIO-22).

Direct impacts on American badger and desert kit fox could also occur during BIG construction through possible harassment, injury, and/or death on individuals present or potentially present within dens in impact areas during construction activities, such as grading and excavation/trenching. It is possible that American badger and desert kit fox would not flush to adjacent lands containing similar suitable habitat during construction, especially if individuals are sleeping and/or young are present in dens within the grading footprint. Kit fox also may be attracted to material and soil stock piles during construction creating a potential risk to individuals in proximity to work activities. Additionally, nighttime project vehicle traffic and construction activities increase the risk of potential vehicle strikes as these species are nocturnal. Harassment, injury, and/or mortality of American badger and desert kit fox during construction would be potentially significant.

To avoid or minimize direct impacts during construction, BNSF would implement MMs, including the following:

- Prior to the start of ground- or vegetation-disturbing activities, a DB shall submit an American badger and desert kit fox plan which details the methods to clear BIG of the species; the plan will be implemented following approval by CDFW (MM BIG BIO-26).
- Pre-construction den surveys will be conducted and suitable American badger and desert kit fox burrows would be inspected during (MM BIG BIO-26).
- If any burrows are determined to be active natal American badger or desert kit fox dens (i.e., currently occupied by young), then an appropriate no-work exclusion buffer around each den would be implemented until it is determined by a qualified biologist that young are no longer dependent on the den (MM BIG BIO-26).
- Biological monitors would be retained to monitor natal dens to confirm nearby construction activities do not adversely affect natural American badger or desert kit fox behaviors (MM BIG BIO-26).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required MMs for special-status wildlife (MM BIG BIO-1).
- Biological monitors would have the authority to halt work if BIG is not in compliance with such measures (MM BIG BIO-3).
- Construction limits clearly demarcated to prevent unanticipated BIG impacts (MM BIG BIO-7).
- Vehicles and equipment restricted to established roads, construction areas, and other permissible areas (MM BIG BIO-4).
- Speed limits set and enforced, and wildlife on the roadways avoided to the greatest extent possible (MM BIG BIO-4).

- Best management practices implemented to minimize the risk of wildlife entrapment in holes and trenches excavated during construction (MM BIG BIO-5).
- Efforts will be made to discourage sensitive wildlife inhabitation of spoils, stockpiles, and materials (i.e. covering with secured tarps, spreading out materials, etc.). Uncovered/unmanaged spoils and stockpiles would be inspected before being disturbed (MM BIG BIO-33).
- Pets, which could harass, injure, or kill wildlife, prohibited on site (MM BIG BIO-12).
- Nighttime construction will adhere to a Nighttime Construction and Lighting Plan per MM BIG BIO-8 that includes reduced speed limits and work within previously disturbed areas as well as lighting restrictions.

With the successful implementation of the BIG-specific MMs, potential direct impacts on American badger and desert kit fox resulting from construction would be avoided and/or minimized. In addition, through compensatory mitigation for federally and state-listed species, BIG would conserve high-quality American badger and desert kit fox habitat in perpetuity. With mitigation incorporated, direct impacts on American badger and desert kit fox resulting from BIG construction would be less than significant.

Indirect impacts on American badger and desert kit fox in areas adjacent to BIG and/or individuals and populations using movement corridors within BIG may occur during construction because of increased noise, vibration, lighting, and dust generated by construction equipment. The areas surrounding BIG, particularly the undeveloped areas south of the railyard and southwestern lead track extension and surrounding the Tortilla Substation contain suitable desert scrub habitat with friable soils similar to the existing condition of BIG. However, the following measures will be implemented during construction to address potential indirect impacts on American badger and desert kit fox occurring adjacent to BIG:

- Noise attenuation best practices shall be implemented during construction, such as the use of temporary noise barriers to reduce noise levels at or below 80 dBA $L_{eq}$ as described in GPU NOI-1 (EIR Appendix 5.12).
- A fugitive dust control plan shall be implemented and includes measures such as watering exposed surfaces and unpaved roads at least three times a day, suspending dust-generating activities when average wind speed exceeds 25 miles per hour, and watering or presoaking all land clearing, grubbing, scraping, excavation, and demolition activities as described in MM BIG AQ-1 (EIR Appendix 5.3).
- A Storm Water Pollution Prevention plan shall be implemented during construction to avoid impacts on desert tortoise adjacent to BIG related to erosion, runoff, and stormwater contaminants (MM BIG BIO-30).
- Lighting will be shielded and directed to avoid illuminating adjacent wildlife habitat (MM BIG BIO-8).

Desert kit fox was observed utilizing wildlife corridors within BIG such as Lenwood Channel, which may provide dispersal routes through BIG to surrounding areas of suitable natural habitat, throughout the year-long wildlife movement camera study (**Attachment GG**). American badger also has a potential to use wildlife corridors through BIG, such as Lenwood Channel, if present. Construction of BIG includes

improvements to existing wildlife crossing structures, including vehicle crossings along the railway as well as the widening of Lenwood Channel. Although desert kit fox and American badger may avoid using these movement corridors during construction, those impacts would be considered temporary, as desert kit fox and American would be able to return to and utilize the post-construction vehicle crossings and widened Lenwood channel for dispersal to travel between areas of natural habitat surrounding BIG.

Indirect impacts on American badger and desert kit fox could also occur if BIG construction is required at night and uses lighting that interferes with normal American badger and desert kit fox behavior. Such impacts are potentially significant because they could affect their ability to successfully forage and makes them easier targets for predators. Indirect impacts on American badger and desert kit fox could also occur through introduction of canine distemper, which can cause mortality. Canine distemper could be spread to resident American badger and desert kit fox, if present on site, by domestic dogs or coyotes. Coyotes are often associated with human presence because they supplement their diet with trash and roadkill.

- To avoid impacts on wildlife from nighttime construction and lighting, construction would occur in accordance with a Nighttime Construction and Lighting Plan (MM BIG BIO-8). Nighttime work would be restricted to certain areas and lighting would be shielded and directed away from adjacent habitat areas (MM BIG BIO-8).
- To avoid impacts related to potential introduction of canine distemper, pets would not be allowed on BIG (MM BIG BIO-12) and measures would be implemented to reduce the risk of attracting coyotes to BIG, including proper storage of trash (MM BIG BIO-10) and proper removal of dead wildlife (MM BIG BIO-11).

With the implementation of MMs, indirect impacts on American badger and desert kit fox resulting from construction of BIG would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

Direct impacts on American badger and desert kit fox could occur if they are harmed or killed through vehicle or structure collisions during operation of BIG. However, as most of the suitable habitat for American badger and desert kit fox will be removed during construction and BIG will become unsuitable for the two species. American badger and desert kit fox activity on BIG is expected to decrease following construction. Additionally, permanent fencing will be installed with specifications to prevent/minimize wildlife from entering BIG (MM BIG BIO-34). Therefore, no potential additional direct impacts on American badger and desert kit fox are anticipated to occur during operation and maintenance of BIG.

BIG operations and maintenance would result in fragmentation of American badger and desert kit fox habitat, potentially indirectly impacting the species by restricting gene flow. However, the project includes a wildlife crossing at MP 12.5 (MM BIG BIO-32), as well as improvements to Hinkley Road Bridge and Lenwood Channel, which will maintain their function as wildlife corridors, and allow for continued movement of species and genetic exchange to other patches of undeveloped habitat in the vicinity of BIG. Operation and maintenance of BIG may also result in indirect impacts on American badger and desert kit fox, including adverse effects of nighttime lighting as well as noise. Lighting shall be directed on BIG and away from adjacent natural areas containing suitable habitat during the operation of BIG (MM BIG BIO-36). Operational noise levels may exceed ambient levels with increased human, vehicle, and machinery

activities. However, they are not expected to significantly affect American badger and desert kit fox that may occur adjacent to BIG at a level that harms local populations. Additionally, noise barriers would be installed along the solar farm and along the intermodal facility to mitigate noise impacts during the operation of the facilities (BIG NOI-2, EIR Appendix 5.12). Therefore, no additional indirect impacts on American badger and desert kit fox are anticipated during BIG operations.

### *Special-Status Bats – California Leaf-nosed Bat, Pallid Bat, Townsend's Big-eared Bat, and Yuma Myotis*

California leaf-nosed bat, pallid bat, Townsend's big-eared bat, and Yuma myotis (collectively referred to as special-status bats in this section) were not documented or confirmed during biological surveys conducted for BIG; however, these bats have the potential to roost in project structures such as Hinkley Road Bridge, expansion joints in various undercrossings along the existing railway, components of Tortilla Substation, and various rock and broken concrete piles throughout the project site. The open desert scrub, dune, and riparian habitats adjacent to these potential roosting areas are suitable for foraging.

#### Construction – Direct and Indirect Impacts

Direct impacts on special-status bats could occur during BIG construction through harassment, injury, and/or death if construction activities impact occupied roost structures on site. Specifically, any improvements to the existing culverts and undercrossings, Tortilla Substation, and Hinkley Road Bridge, as well as the removal of suitable rock piles, have the potential to directly impact special-status bats if roosting within those structures. Such impacts may result in the direct reduction in local populations, especially if maternity roosts are impacted. Impacts on foraging habitat near these roost structures are relatively temporary and would be limited to when active construction is occurring; these areas may still be suitable for foraging during the night should construction be limited to daytime hours.

To avoid or minimize such impacts, BNSF would implement MMs, including the following:

- Pre-construction bat surveys would be conducted within impact areas suitable for roosting (MM BIG BIO-27).
- If roosting bats are present and exclusion strategies are required, then exclusion efforts would be implemented between September 1 and October 15 to the maximum extent feasible (MM BIG BIO-27). No exclusion would be permitted during the typical bat maternity season (April through August). Exclusion techniques would be consistent with recommendations provided in *California Department of Transportation Bat Mitigation: A Guide to Developing Feasible and Effective Solutions* (H. T. Harvey & Associates 2019) (MM BIG BIO-27).
- All construction personnel working on BIG would be required to attend a worker environmental awareness training that covers required MMs for special-status wildlife (MM BIG BIO-1).
- Biological monitors would be retained to oversee and assist in the implementation of MMs (MM BIG BIO-2) and would have the authority to halt work if BIG is not in compliance with such measures (MM BIG BIO-3).

With successful implementation of MMs, direct impacts on special-status bats during construction would be less than significant.

Indirect impacts on bats during BIG construction could occur when construction occurs at night and uses lighting that could interfere with normal bat behavior or potentially attract predators to roost areas. Such impacts are potentially significant because they could alter normal bat roosting and emergence behaviors. To avoid impacts on wildlife from nighttime construction and lighting, construction would occur in accordance with a Nighttime Construction and Lighting Plan (MM BIG BIO-8). Nighttime work would be restricted to already disturbed areas and lighting would be shielded and directed away from suitable or occupied bat roosting areas and structures (MM BIG BIO-8). As focused pre-construction surveys will be conducted and additional avoidance measures implemented if special-status bats are present per MM BIG BIO-27, noise impacts from construction are not likely to result in adverse effects on bats. Indirect impacts on special-status bats during construction would be less than significant.

**Operations & Maintenance – Direct and Indirect Impacts**

During operation of BIG, bats may still roost on project structures such as Hinkley Bridge, various expansion joints for span bridges and vehicle undercrossings, and buildings proposed within the transload warehouse center. These areas would have the potential to support nearby foraging, especially if located adjacent to open areas and natural habitat, such as the proximity of Hinkley Bridge to the Mojave River corridor. With the implementation of MM BIG BIO-27, bat-friendly roost designs would be incorporated into project plans as feasible. As such, direct impacts on bats, including special-status bats, during operation of BIG would be less than significant.

Indirect impacts associated with lighting and noise are not anticipated within areas adjacent to BIG that may support suitable roosts during BIG operations. To address potential indirect impacts on bats during operation of BIG:

- The duration of nighttime lighting at operational facilities shall be minimized by using methods other than lighting (e.g., remote monitoring systems. Nighttime lighting shall also have shields or cowls to direct light downward to contain the light to the boundaries of the project footprint (MM BIG BIO-36).
- Noise barriers would be installed along the solar farm and along the intermodal facility to mitigate noise impacts during the operation of the facilities (BIG NOI-2, EIR Appendix 5.12)

Indirect impacts on bats, including special-status bats, during operation of BIG would be less than significant.

***Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?***

## Vegetation Community and Land Cover Impacts

Nine vegetation communities and three land cover types, as identified in **Table 14: BIG Vegetation Community/Land Cover Impacts** below, are present within the BIG footprint including three CDFW sensitive vegetation communities; high-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance, moderate-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum*

sparsely vegetated alliance – partially stabilized, and low-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – disturbed/stabilized (Figure 5.2-1. Vegetation Impacts). These natural communities have a state sensitivity ranking of S3.

### *Construction – Direct and Indirect Impacts*

Direct impacts on such habitats would occur with project implementation through destruction or crushing and clearing of vegetation with heavy equipment during project construction and subsequent conversion to developed land.

BNSF construction would result in 1,009.1 acres of permanent impacts on CDFW sensitive vegetation communities (high-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance, moderate-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – partially stabilized, and low-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – disturbed/stabilized) as shown in Figure 5.2-1. To adequately mitigate for permanent impacts on these sensitive vegetation communities, BNSF would provide compensatory mitigation through land acquisition and preservation (MM BIG BIO-28). Conserved land would be high quality, relatively undisturbed, habitat maintained and preserved in perpetuity. With implementation of compensatory mitigation, sensitive vegetation community impacts resulting from the project would be less than significant.

LORDS RD

AT & SF RR

INDIAN TRL

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance



Key Map

FIGURE 5.2–1A

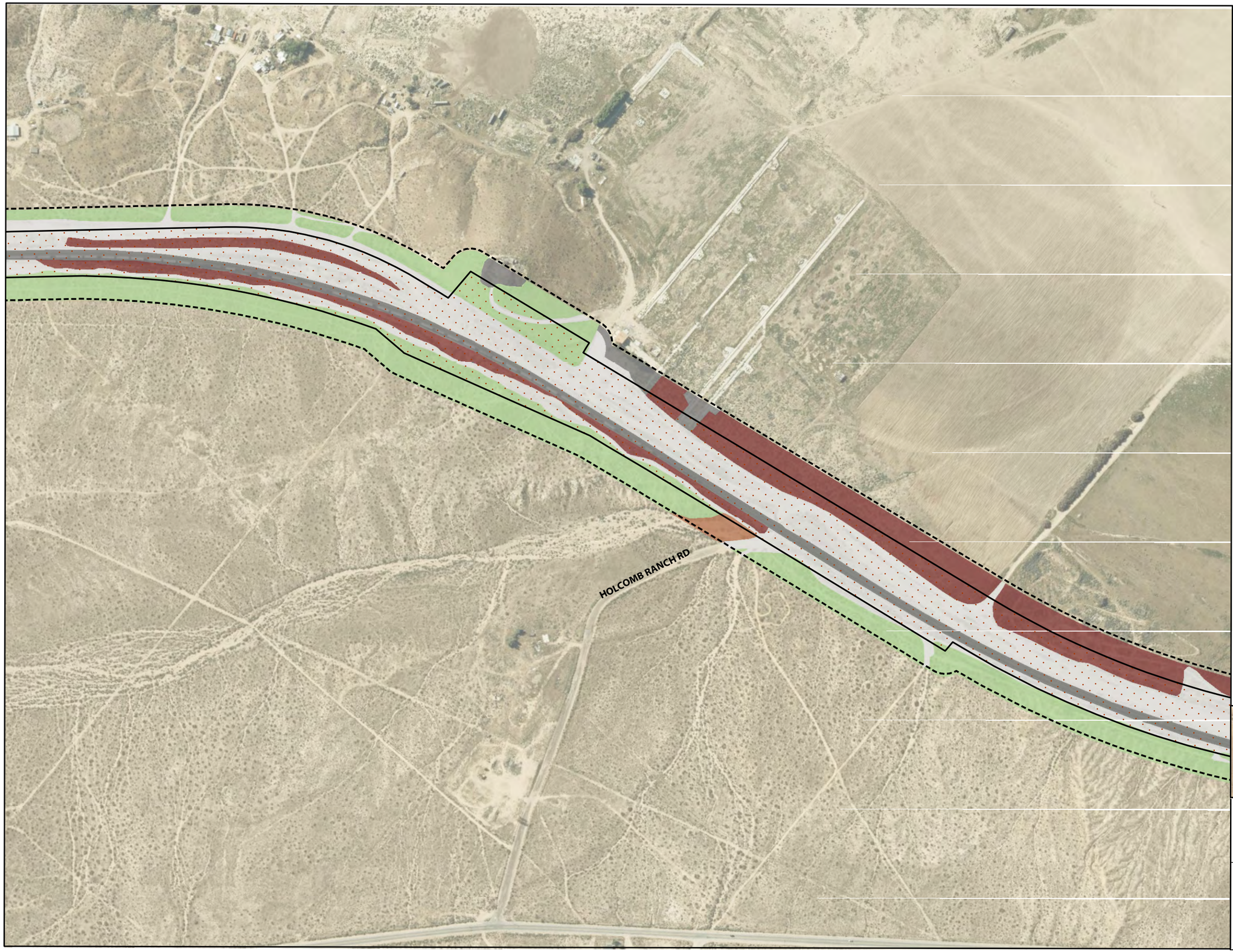
**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE
5.2-1B

## Vegetation Impacts

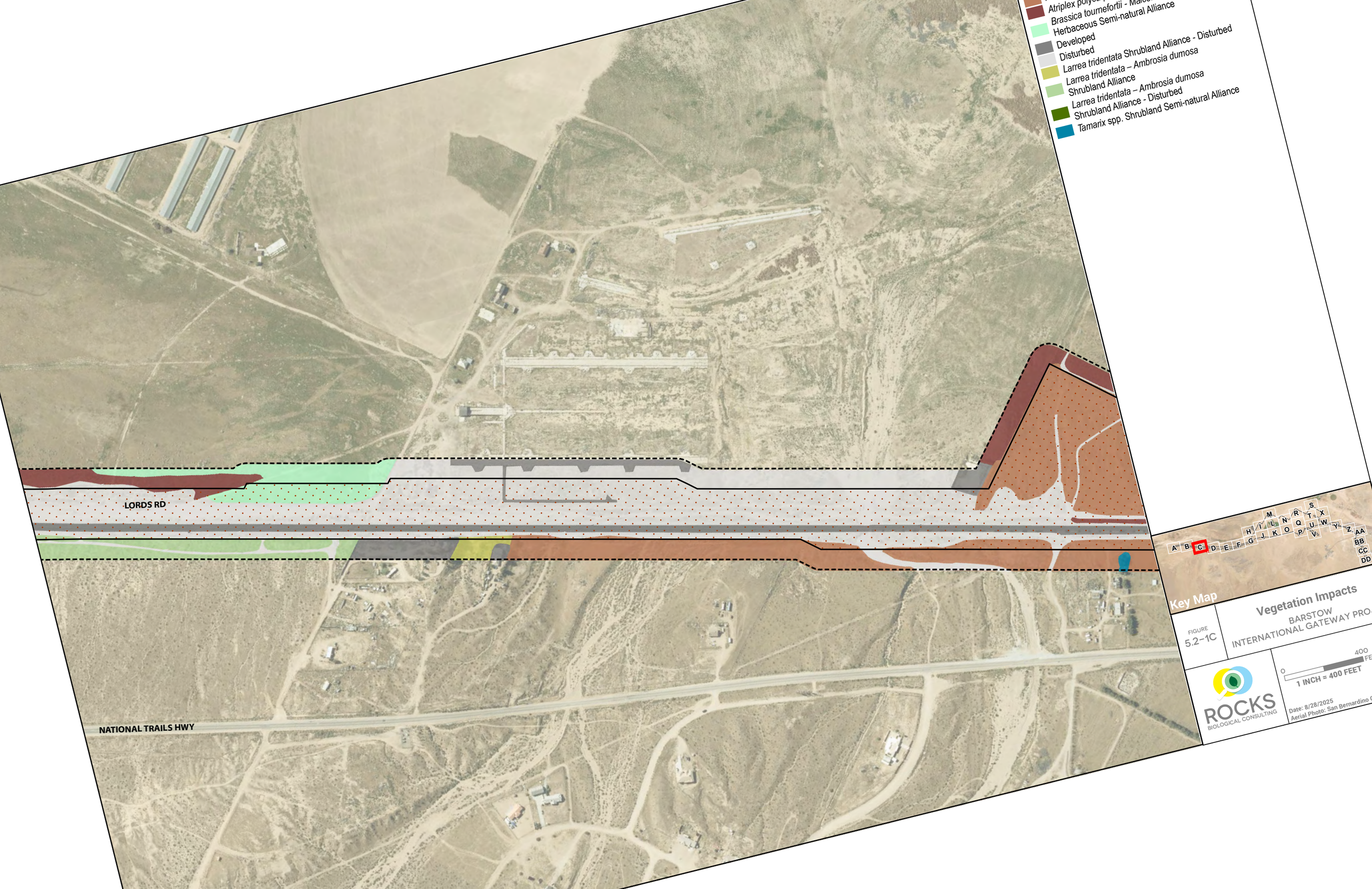
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024


Atriplex polycarpa - Malosma laurina
Brassica tournefortii - Malosma laurina
Herbaceous Semi-natural Alliance
Developed
Disturbed
Larrea tridentata Shrubland Alliance - Disturbed
Larrea tridentata – Ambrosia dumosa Shrubland Alliance
Larrea tridentata – Ambrosia dumosa Shrubland Alliance - Disturbed
Tamarix spp. Shrubland Semi-natural Alliance
LORDS RD
NATIONAL TRAILS HWY
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
AA
BB
CC
DD
Key Map
Vegetation Impacts
BARSTOW
INTERNATIONAL GATEWAY PRO
FIGURE
5.2-1C
ROCKS
BIOLOGICAL CONSULTING
0
400
1 INCH = 400 FEET
Date: 8/28/2025
Aerial Photo: San Bernardino C

Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

MAIN ST

HODGE RD

Key Map

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD

FIGURE 5.2-1D

## Vegetation Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2

MOJAVE RVR

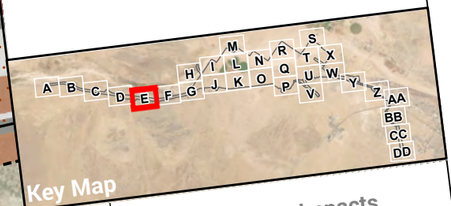
AT & S F RR

NATIONAL TRAILS HWY

Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance




Key Map

FIGURE 5.2–1E

## Vegetation Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/28/2025

Aerial Photo: San Bernardino County, Esri, 2

MOJAVE RVR

A T & S F RR

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Tamarix* spp. Shrubland Semi-natural Alliance

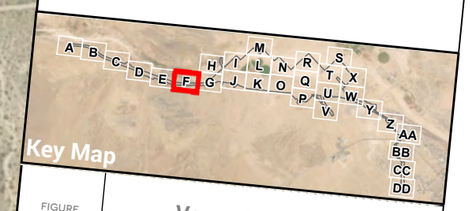
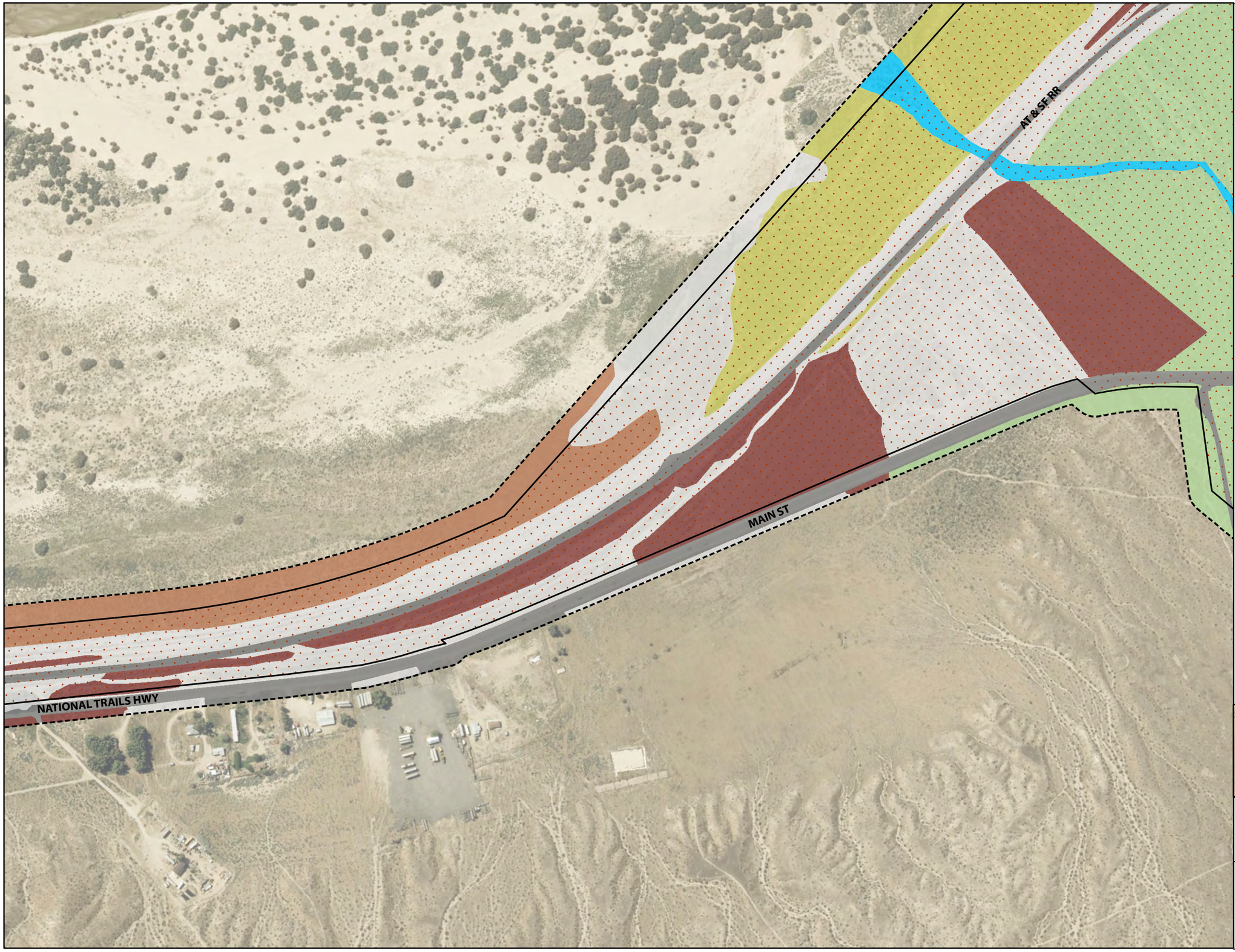



FIGURE
5.2-1F

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL

0 400 FEET
1 INCH = 400 FEET
N




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- Unvegetated Channel




FIGURE
5.2–1G

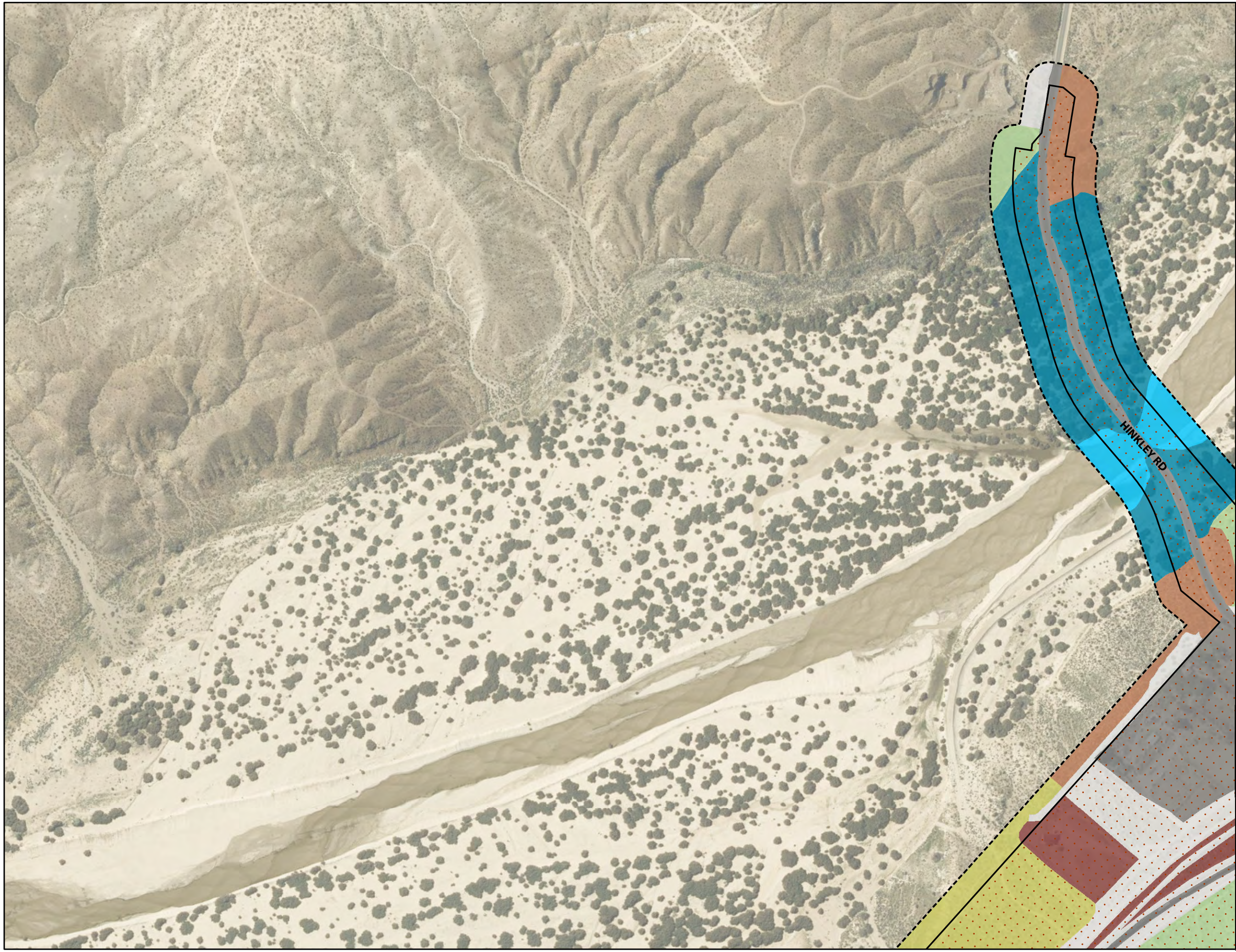
**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

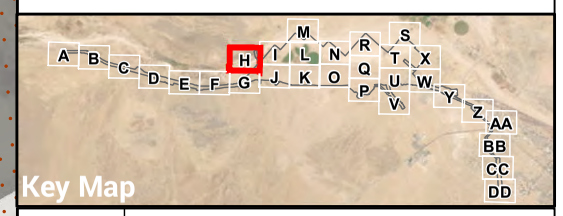



FIGURE
5.2-1H

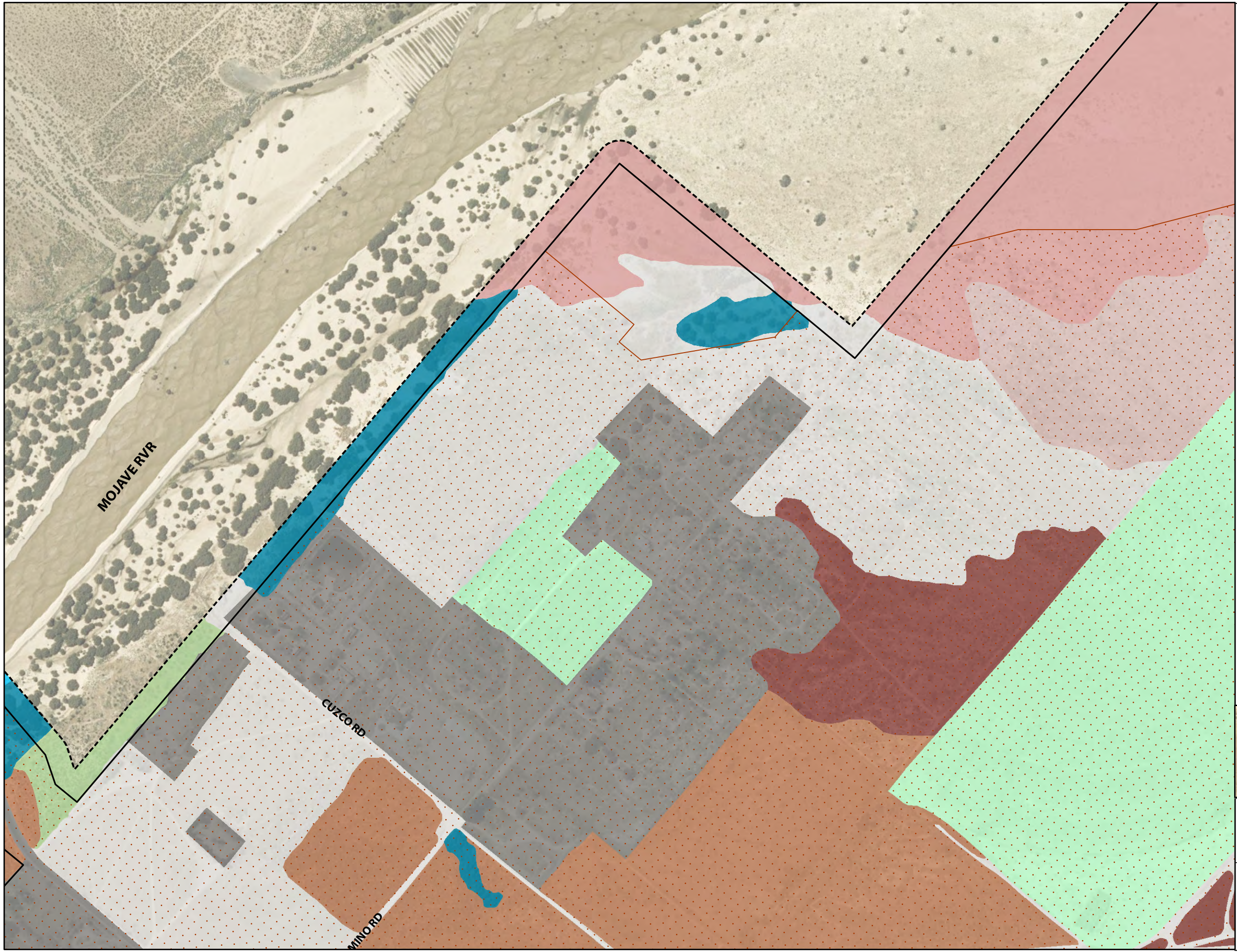
**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

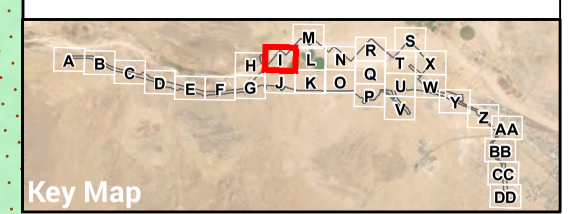



FIGURE 5.2-11

**Vegetation Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

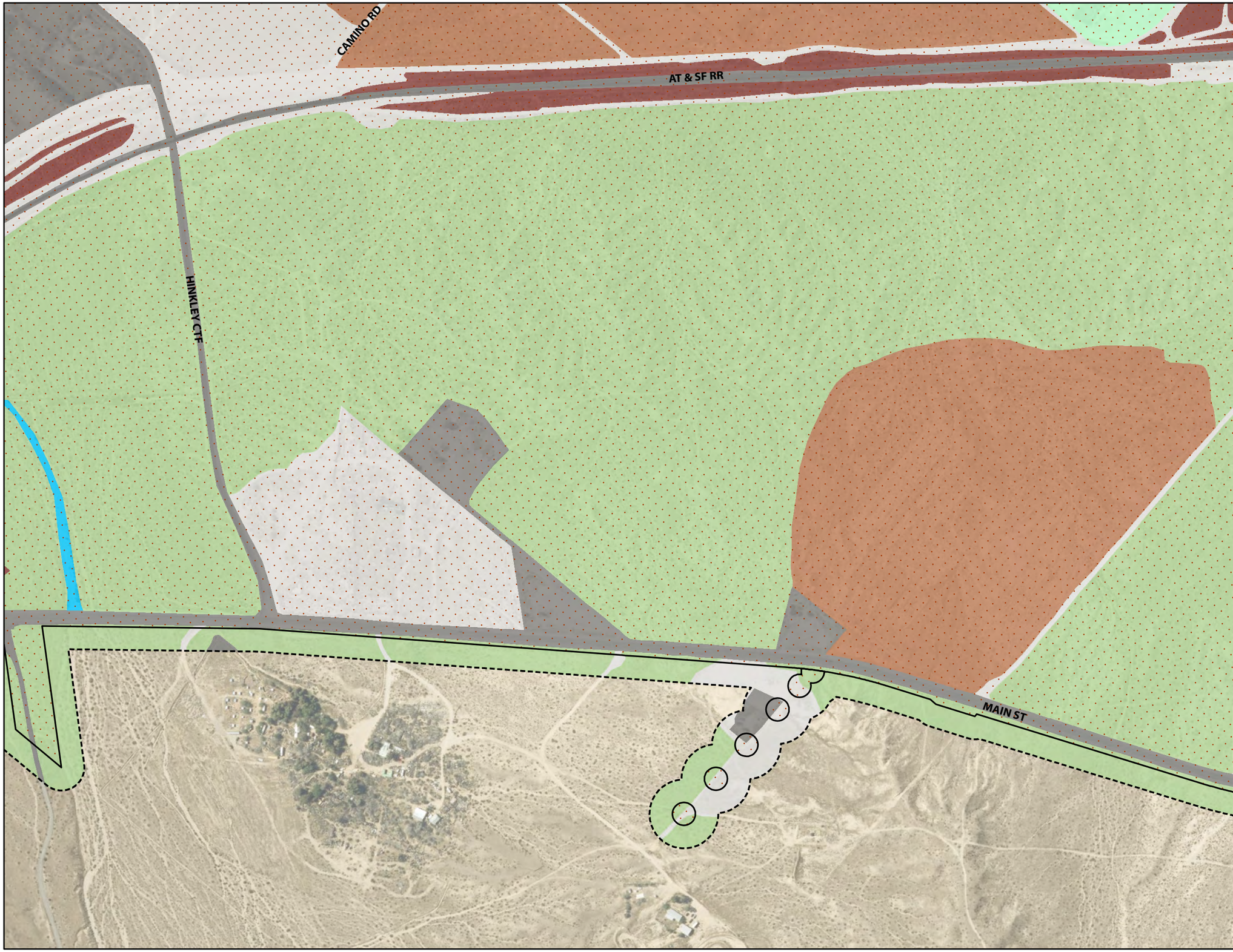
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- Unvegetated Channel




FIGURE 5.2-1J

## Vegetation Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/28/2025

Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- Developed
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

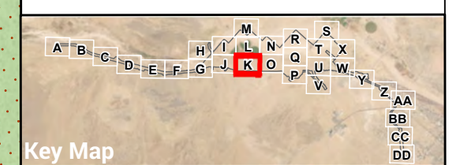



FIGURE 5.2–1K

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024



Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance - Disturbed
*Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
Developed
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
Disturbed
*Larrea tridentata* Shrubland Alliance
*Tamarix* spp. Shrubland Semi-natural Alliance
Unvegetated Channel

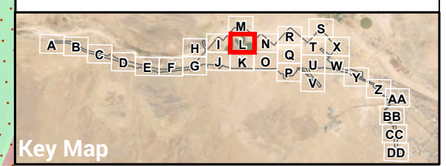


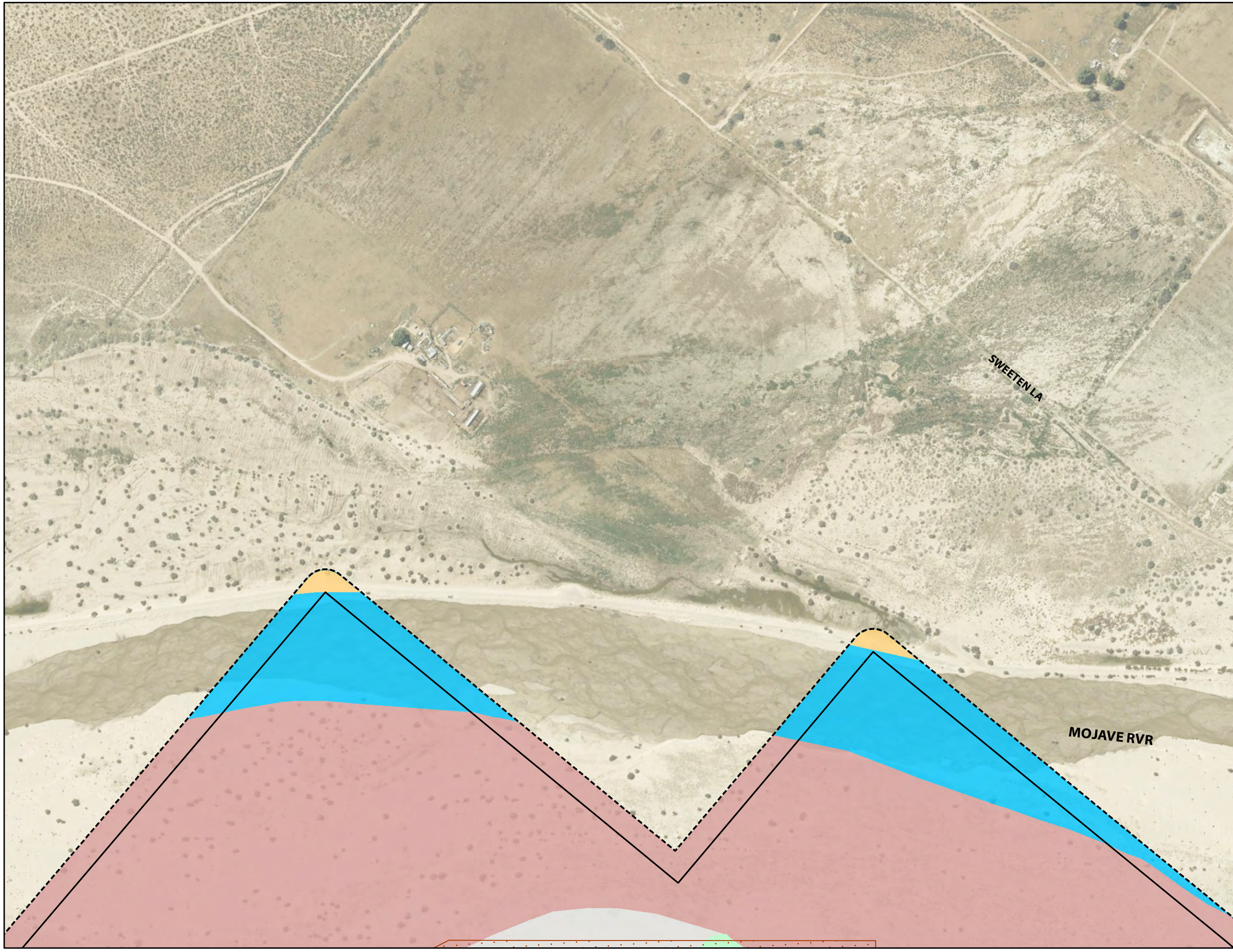

FIGURE
5.2-1L

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance
- Unvegetated Channel

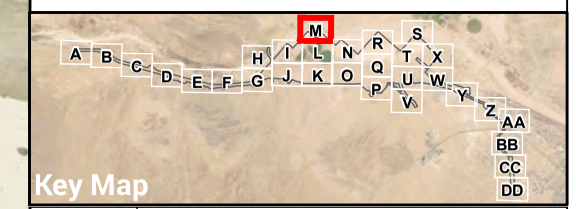



FIGURE
5.2-1M

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Brassica tournefortii - Malcolmia africana* Provisional Herbaceous Semi-natural Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized
Disturbed
*Larrea tridentata* Shrubland Alliance




FIGURE 5.2–1N

**Vegetation Impacts**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

AMARYLIS AV

MAIN ST

GAZANA ST

Key Map

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD

FIGURE 5.2-10

## Vegetation Impacts

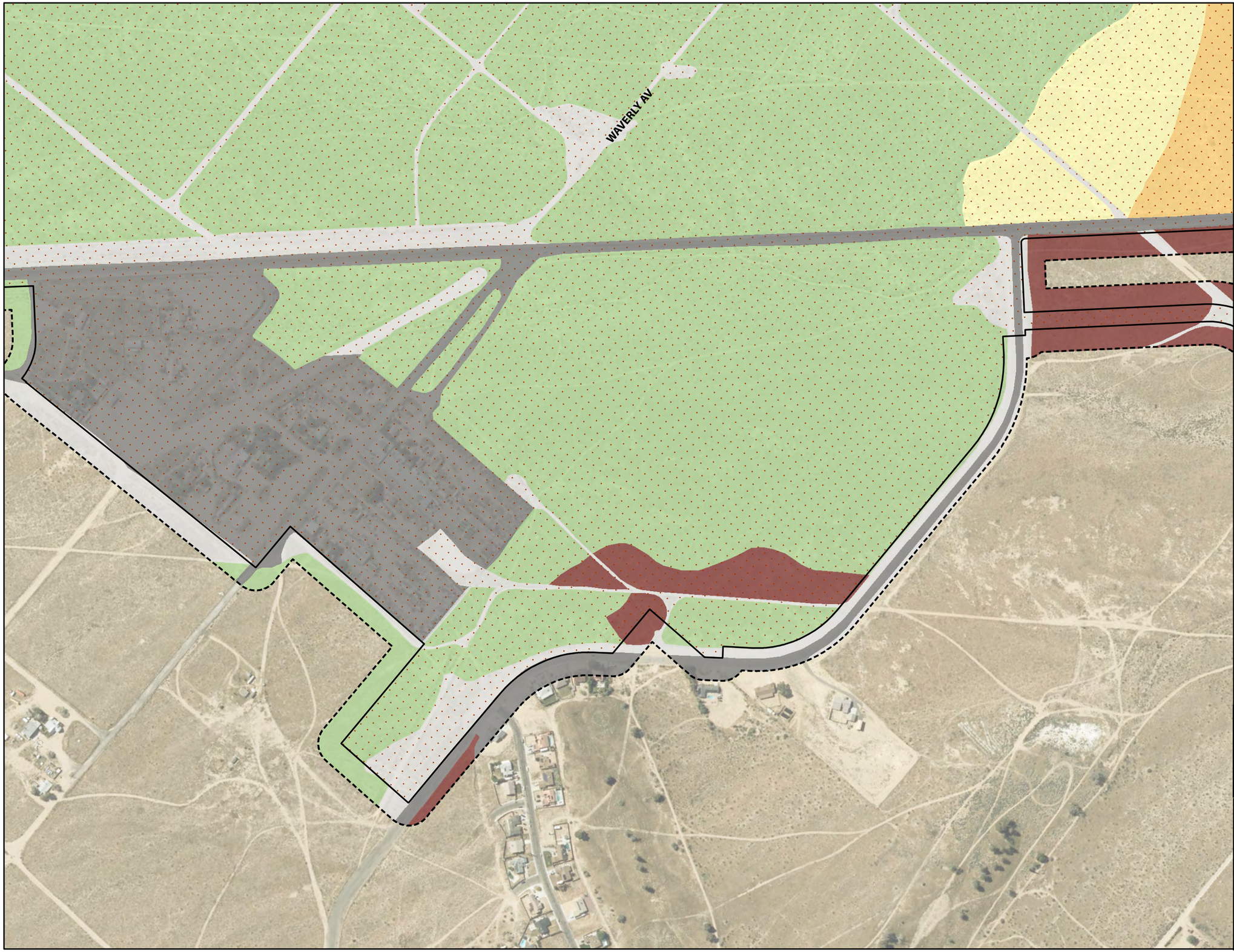
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Ambrosia dumosa* Shrubland Alliance
*Atriplex canescens* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

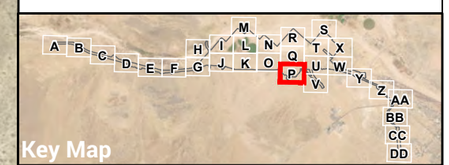



FIGURE
5.2–1P

# Vegetation Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Ambrosia dumosa* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance
- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance - Disturbed
- *Tamarix* spp. Shrubland Semi-natural Alliance

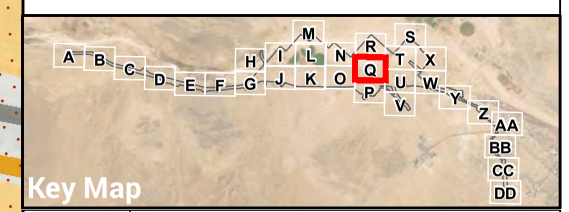



FIGURE 5.2-19

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized

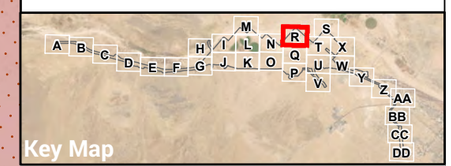



FIGURE
5.2–1R

**Vegetation Impacts**

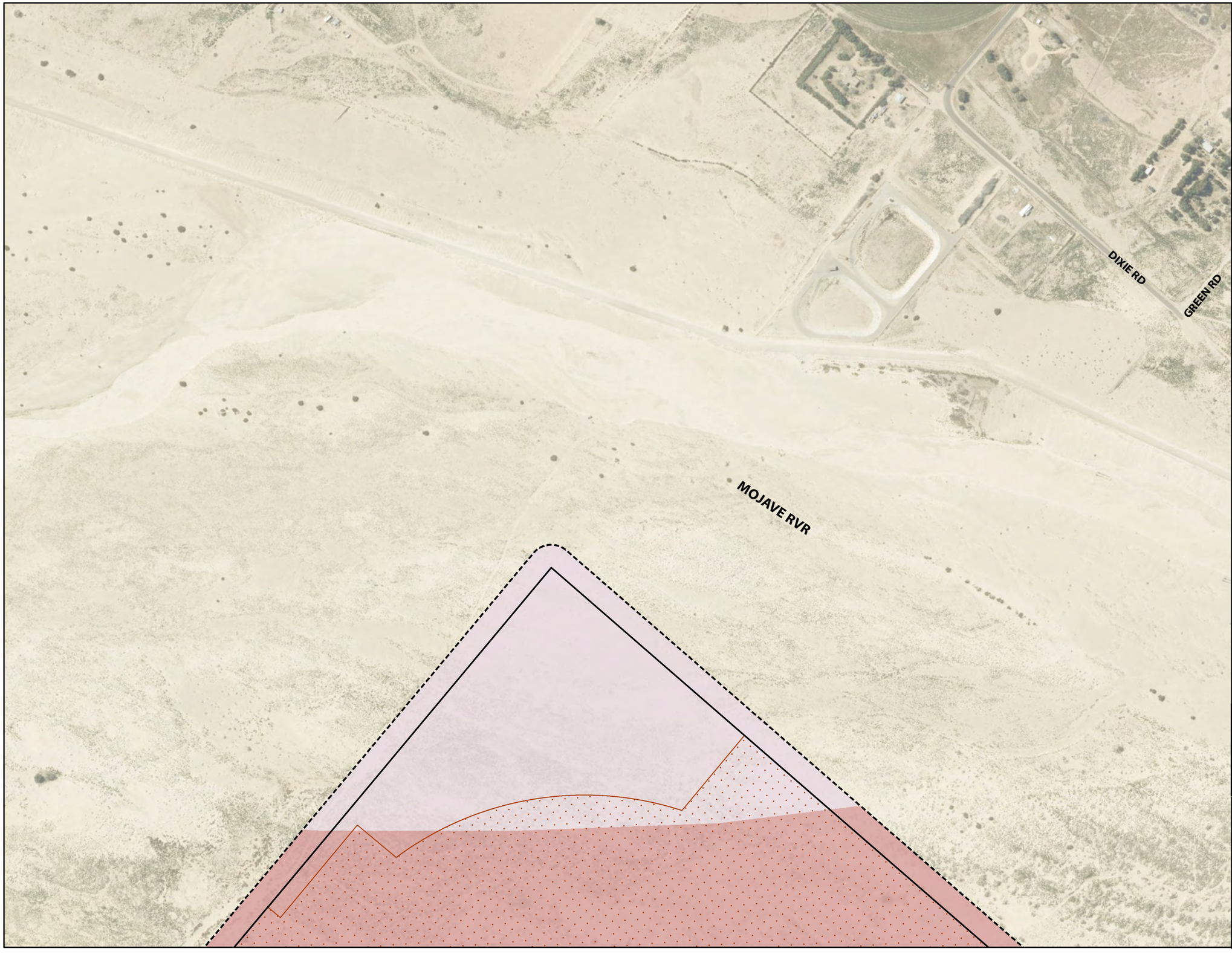
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance

*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Partially Stabilized




FIGURE 5.2-1S

## Vegetation Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Atriplex canescens* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
Disturbed
*Tamarix* spp. Shrubland Semi-natural Alliance
Unvegetated Channel



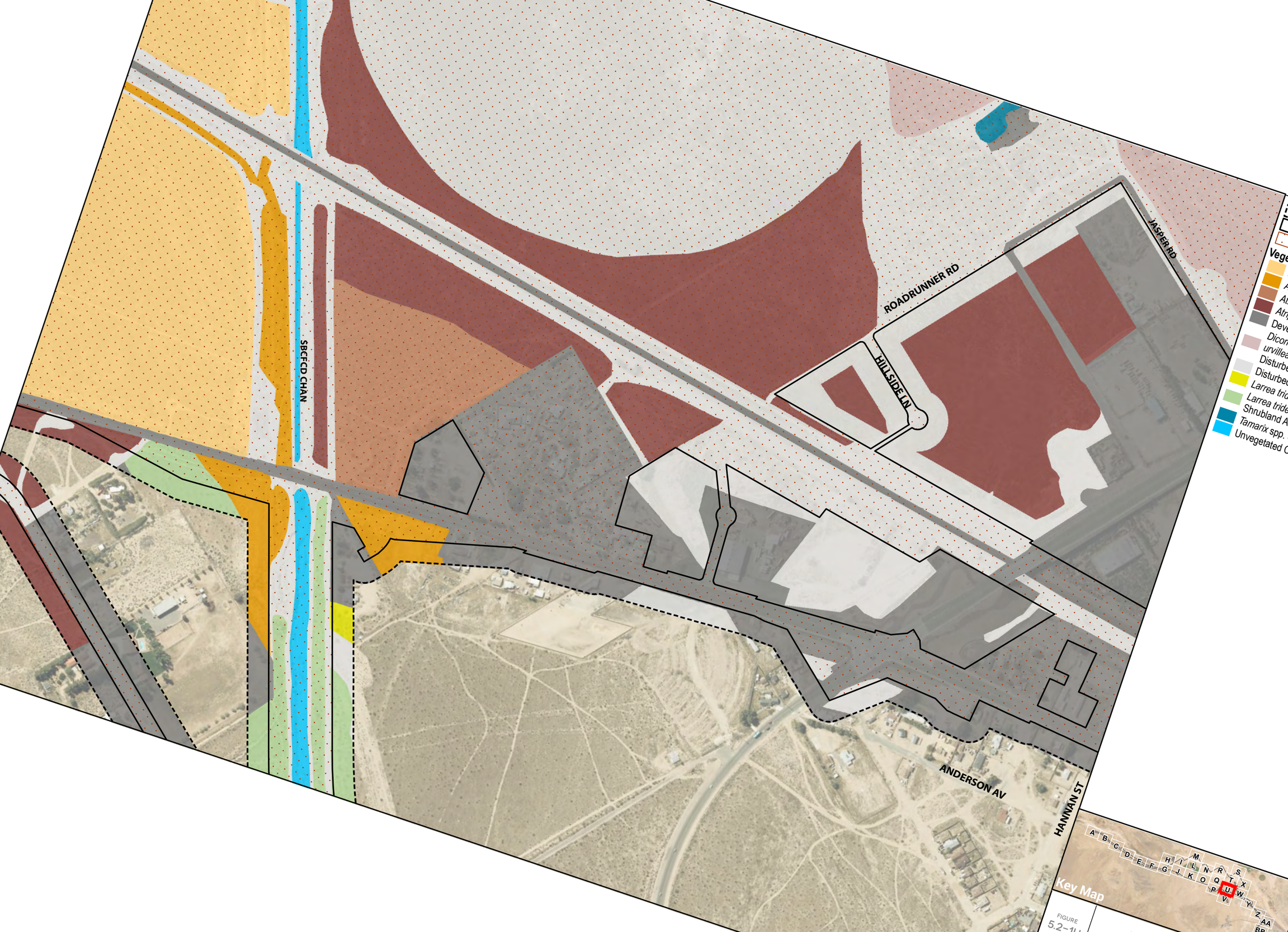

FIGURE
5.2–1T

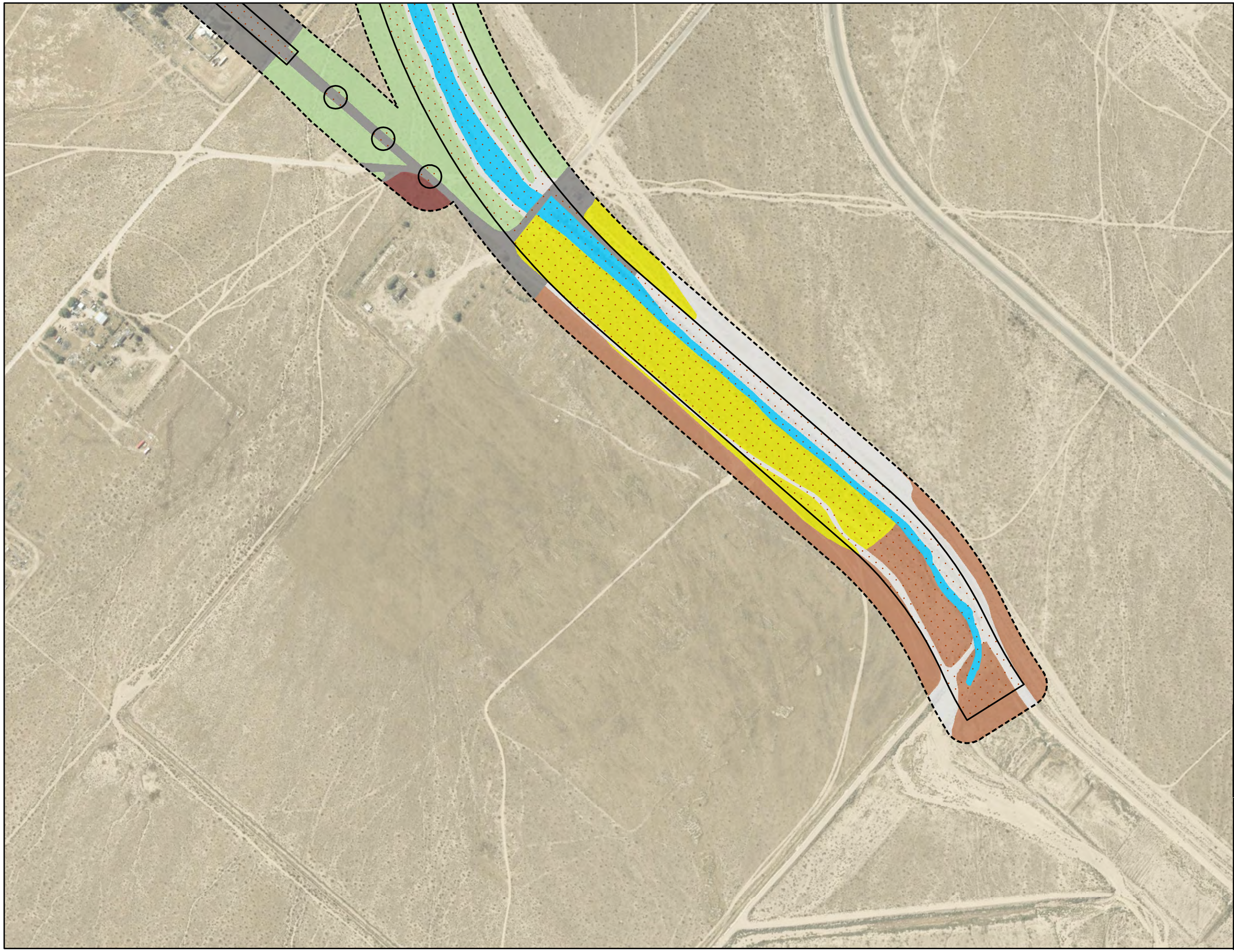
**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

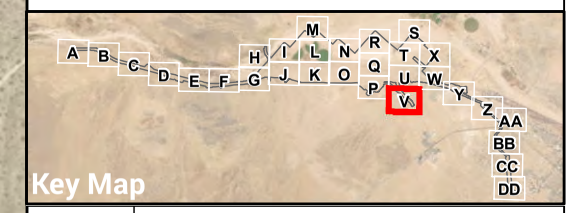

ROADRUNNER RD
JASPER RD
HILLSIDE LN
SBCFCD CHAN
ANDERSON AV
HANNAN ST
Vegetation Mapping Buffer
Project Site
Impact Footprint
Vegetation
Atriplex canescens Shrubland Alliance
Atriplex canescens Shrubland Alliance - Dis
Atriplex polycarpa Shrubland Alliance
Atriplex polycarpa Shrubland Alliance - Distur
Developed
Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance –
Disturbed/Stabilized
Disturbed
Larrea tridentata Shrubland Alliance
Larrea tridentata – Ambrosia dumosa Shrubland Alliance
Tamarix spp. Shrubland Semi-natural Alliance
Unvegetated Channel
Key Map



Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

*Atriplex polycarpa* Shrubland Alliance
*Atriplex polycarpa* Shrubland Alliance - Disturbed
Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
*Tamarix* spp. Shrubland Semi-natural Alliance
Unvegetated Channel




Key Map

FIGURE
5.2–1V

## Vegetation Impacts

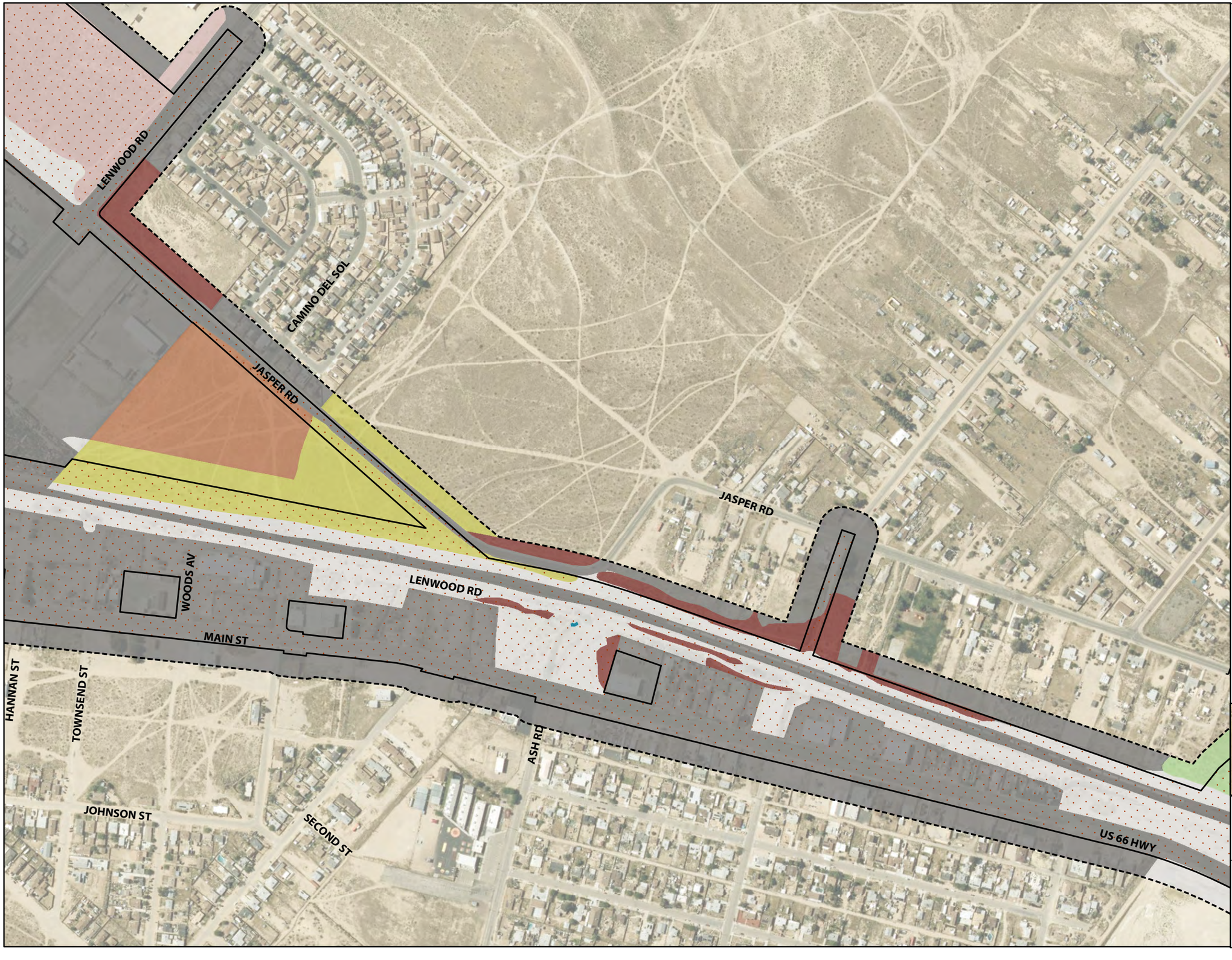
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
- Disturbed
- *Larrea tridentata* Shrubland Alliance - Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
- *Tamarix* spp. Shrubland Semi-natural Alliance

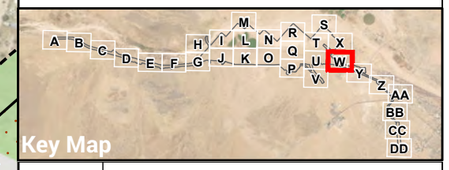



FIGURE 5.2–1W

**Vegetation Impacts**

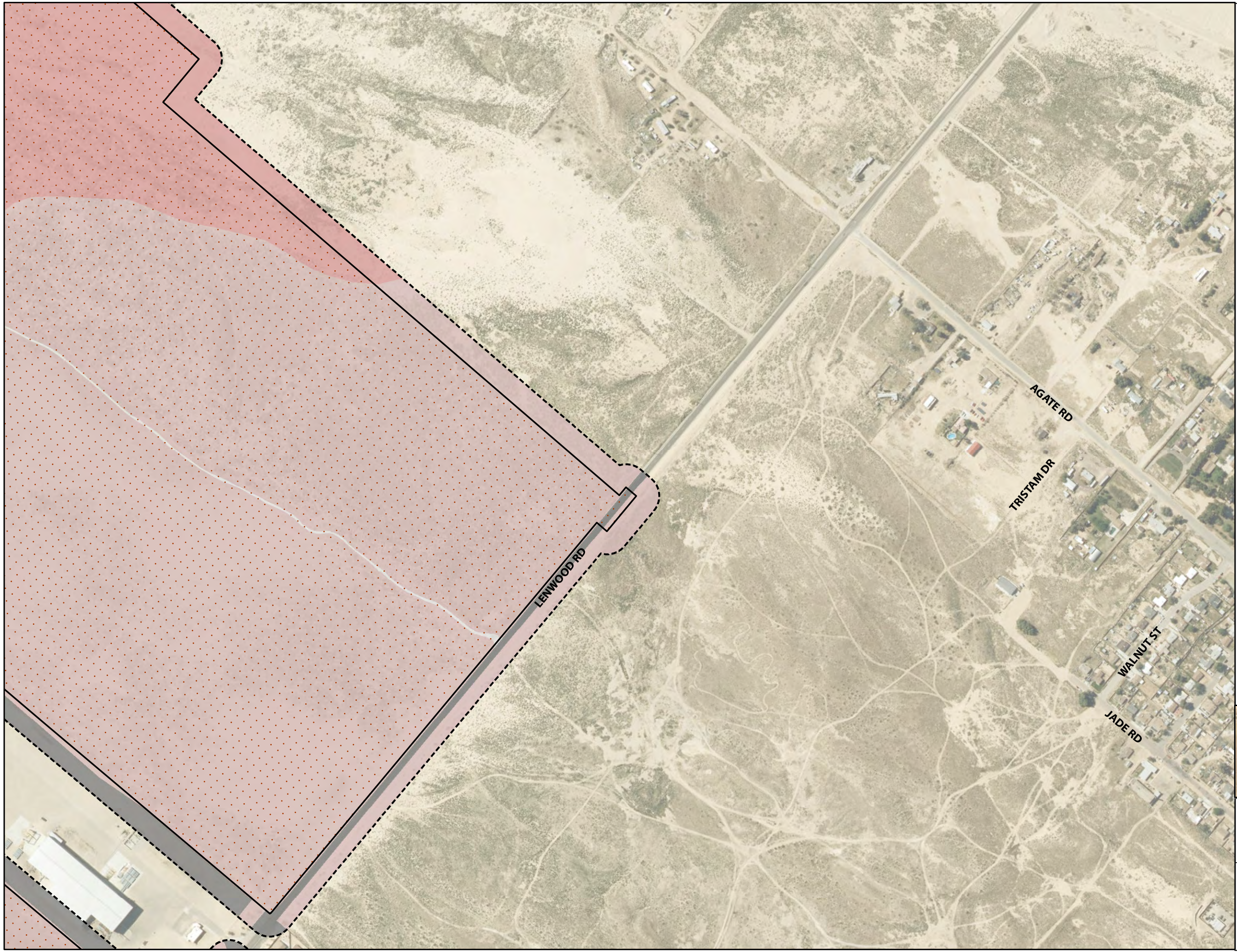
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

Developed
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance
*Dicoria canescens – Abronia villosa – Panicum urvilleanum* Sparsely Vegetated Alliance – Disturbed/Stabilized
Disturbed



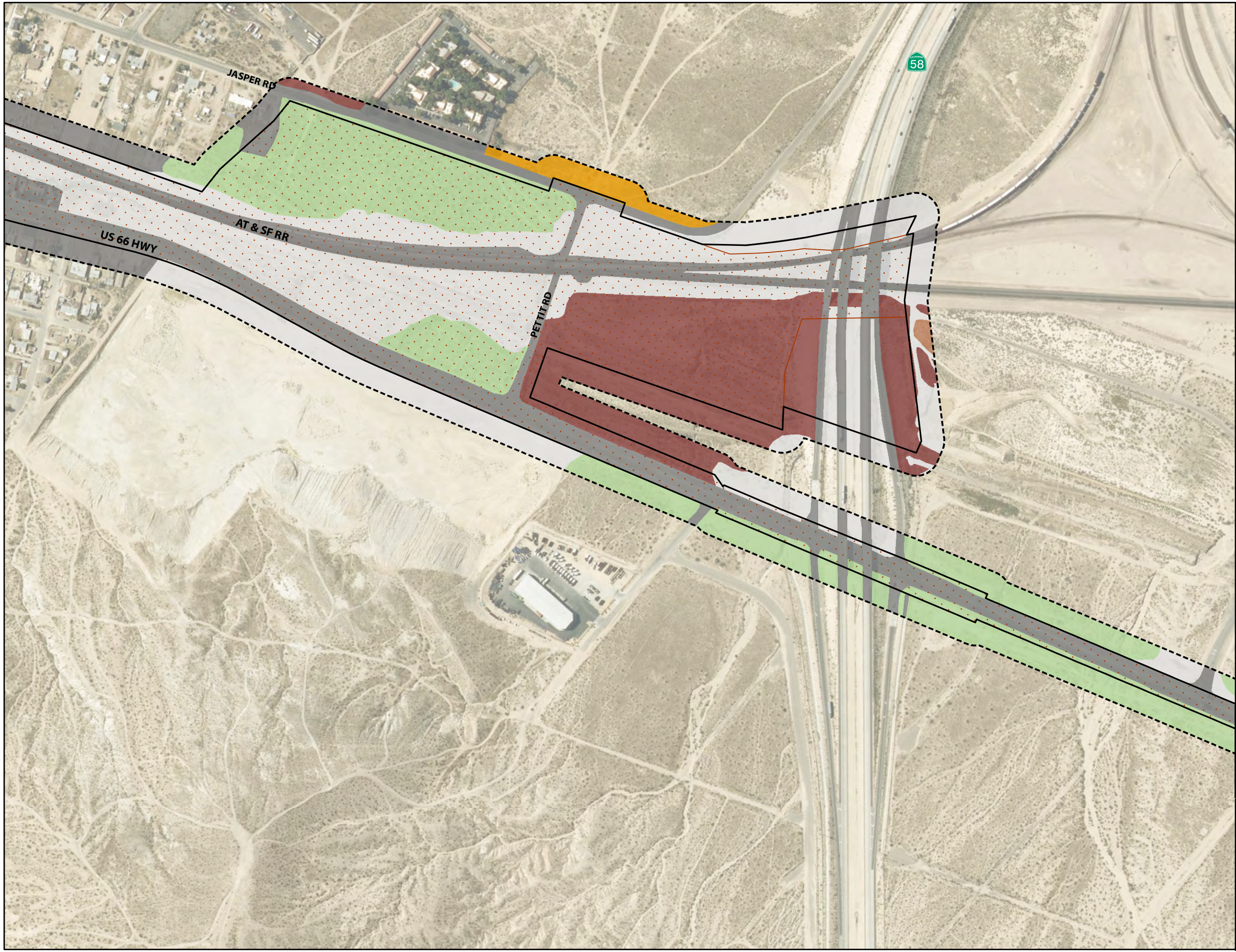

FIGURE 5.2-1X

**Vegetation Impacts**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

- *Atriplex canescens* Shrubland Alliance - Disturbed
- *Atriplex polycarpa* Shrubland Alliance
- *Atriplex polycarpa* Shrubland Alliance - Disturbed
- Developed
- Disturbed
- *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE
5.2–1Y

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

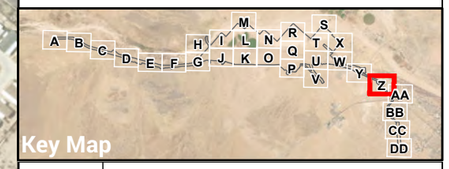
0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance



Key Map

FIGURE
5.2-1Z

# Vegetation Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance




FIGURE
5.2-1AA

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata* Shrubland Alliance
*Larrea tridentata* Shrubland Alliance - Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

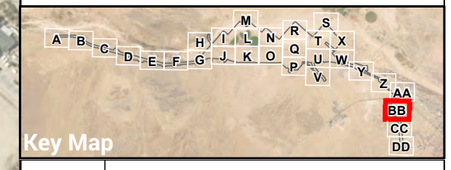



FIGURE
5.2-1BB

# Vegetation Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance

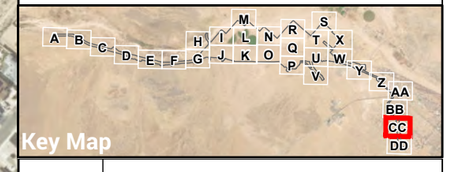



FIGURE
5.2-1CC

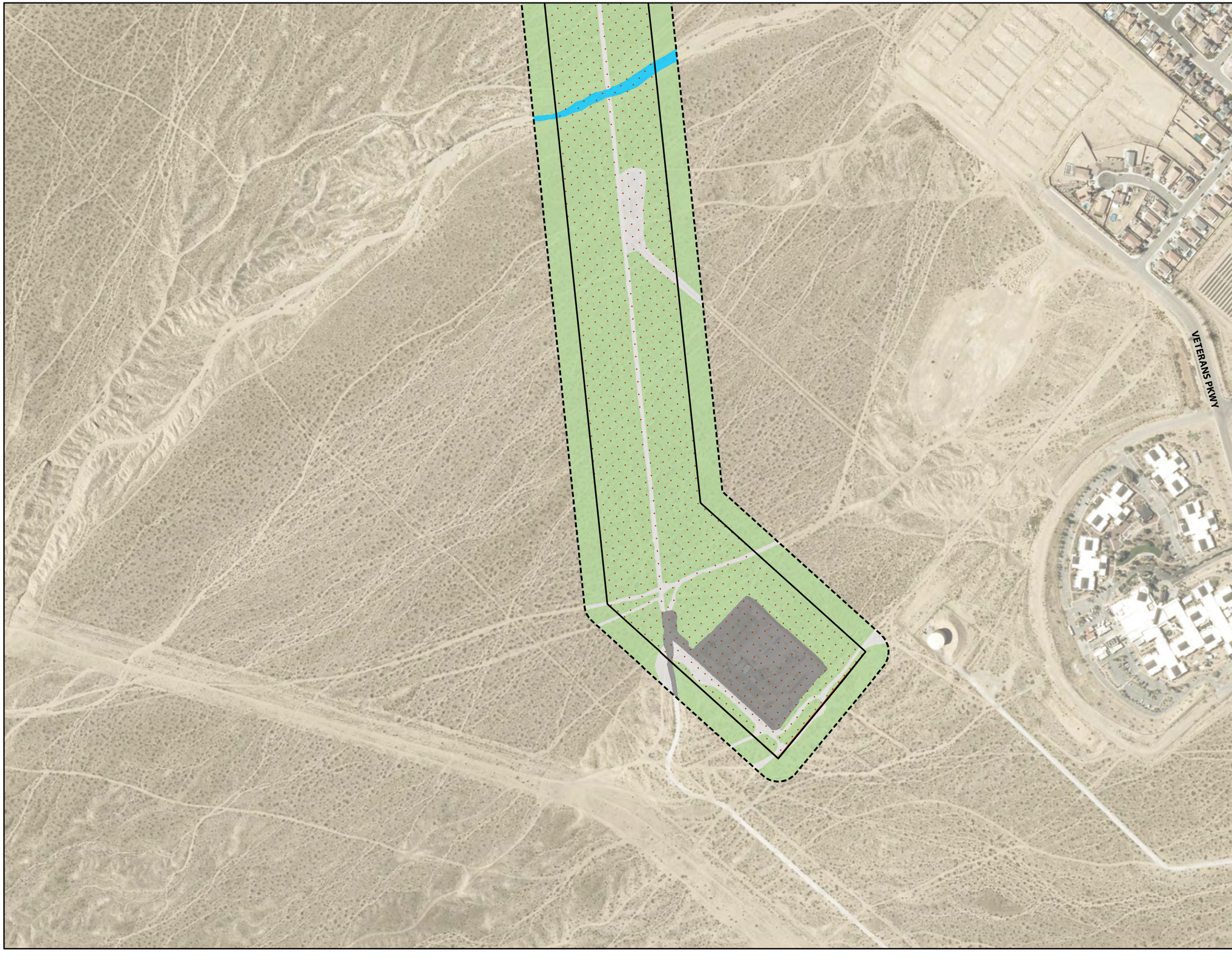
**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024




Vegetation Mapping Buffer
Project Site
Impact Footprint

**Vegetation**

Developed
Disturbed
*Larrea tridentata – Ambrosia dumosa* Shrubland Alliance
Unvegetated Channel




FIGURE
5.2-1DD

**Vegetation Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/28/2025
Aerial Photo: San Bernardino County, Esri, 2024

| Table 14: BIG Vegetation Community/Land Cover Impacts | | | | |
|---|---|---|---|---|
| **Vegetation Community/Land Cover** | **Holland** | **Global/State Rarity** | **CDFW Sensitive** | **Maximum Acres of Permanent Impacts** |
| **VEGETATION COMMUNITY[1]** | | | | |
| *Ambrosia dumosa* Shrubland Alliance | Desert saltbush scrub | G5/S5 | No | 16.4 |
| *Atriplex canescens* Shrubland Alliance | Desert saltbush scrub | G5/S4 | No | 184.2 |
| *Atriplex canescens* Shrubland Alliance – Disturbed | Disturbed desert saltbush scrub | G5/S4 | No | 25.5 |
| *Atriplex polycarpa* Shrubland Alliance | Desert saltbush scrub | G4/S4 | No | 235.1 |
| *Atriplex polycarpa* Shrubland Alliance – Disturbed | Disturbed desert saltbush scrub | G4/S4 | No | 157.1 |
| *Brassica tournefortii – Malcolmia africana* Provisional Herbaceous Semi-natural Alliance | Non-native grassland (former agriculture) | GNR/SNR | No | 321.4 |
| Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance | Active desert dunes | G4/S3.2 | Yes | 551.5 |
| Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Disturbed/Stabilized | Disturbed stabilized and partially stabilized dunes | G4/S3.2 | Yes | 450.6 |
| Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance – Partially Stabilized | Stabilized and partially stabilized dunes | G4/S3.2 | Yes | 7.1 |
| Larrea tridentata – Ambrosia dumosa Shrubland Alliance | Creosote bush (white bursage) scrub | S5/G5 | No | 1,228.0 |
| Larrea tridentata – Ambrosia dumosa Shrubland Alliance - Disturbed | Disturbed creosote bush (white bursage) scrub | S5/G5 | No | 0.9 |
| *Larrea tridentata* Shrubland Alliance | Creosote bush scrub | S5/G5 | No | 120.9 |
| *Larrea tridentata* Shrubland Alliance – Disturbed | Disturbed creosote bush scrub | S5/G5 | No | 26.9 |
| *Tamarix* spp. Shrubland Semi-natural Alliance | Tamarisk scrub | SNA/GNA | No | 16.1 |
| Unvegetated Channel | N/A | No rank | No | 15.6 |
| **LAND COVER** | | | | |
| Developed | Developed | No rank | No | 346.1 |
| Disturbed | Disturbed | No rank | No | 627.0 |
| | | **Total** | | **4,390.4** |

Note:
Global Rarity Ranks:
G4: Worldwide >100 occurrences and/or >12,950 hectares
G5: Demonstrably secure because of its worldwide abundance
State Rarity Ranks:
S3: Statewide 21-100 occurrences and/or 2,590-12,950 hectares
S4: Statewide >100 occurrences and/or >12,950 hectares
S5: Demonstrably secure because of its worldwide abundance

Sources:
- CDFW, 2025f
- Holland, 1986
- Sawyer et al., 2009

The remaining native and naturalized habitats totaling up to approximately 2,086.8 acres would also be permanently impacted during the construction of BIG (**Table 14**). These habitats support a variety of native plant and wildlife species, and as such, the loss of these habitats is considered potentially significant. However, as these native habitat support species that require compensatory mitigation for unavoidable direct impacts, those mitigation requirements may be used to fulfill direct impacts on native habitats. Specifically, impacts of up to approximately 2,086.8 acres of direct impacts on native habitats may be offset by the compensatory mitigation requirements of species such as desert tortoise (MM BIG BIO-16), burrowing owl (MM BIG BIO-22), or Mojave fringe-toed lizard and/or active desert dunes (MM BIG BIO-24 and MM BIG BIO-28). The preservation of the habitats supporting these sensitive biological resources (i.e., desert tortoise, burrowing owl, and dune vegetation communities/Mojave fringe-toed lizard habitat) would also serve to support the preservation of native habitat supporting other sensitive and common desert species with the potential to be impacted by the construction of BIG. Therefore, impacts on native and naturalized vegetation communities would be less than significant.

The construction of BIG may also result in indirect impacts on native vegetation communities adjacent to the site. BIG construction may lead to increased disturbance to nearby habitat areas, which may result in the introduction of invasive plant species in the vicinity of BIG. These invasive plant species could displace native plants and alter the composition of natural areas adjacent to active construction areas and decrease their quality of habitat. However, BIG shall implement an Adaptive Weed Control Plan to avoid and minimize the spread of non-native and invasive plant species from BIG to adjacent undeveloped lands (MM BIG BIO-6).

### *Operations & Maintenance – Direct and Indirect Impacts*

As much of the native habitat will be removed from the site during construction, no additional direct impacts are anticipated on sensitive or native/naturalized vegetation communities during BIG operations.

Indirect impacts on adjacent sensitive and/or native vegetation communities, such as the dune habitat occurring north-northwest of the BIG footprint, may occur due to edge effects including increased human disturbance, presence of trash, increased presence of non-native plant species, etc. However, MMs will adequately minimize and avoid such impacts. Therefore, indirect impacts to vegetation communities due to the operation of BIG would be less than significant.

***Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?***

### Jurisdictional Aquatic Resources Impacts

#### *Construction – Direct and Indirect Impacts*

Implementation of BIG would result in potentially significant direct permanent impacts on up to approximately 31.57 acres (216,252 linear feet) of non-wetland waters of the U.S./State jurisdictional by USACE and RWQCB as well as up to 7.97 acres of vegetated streambed, 38.71 acres of unvegetated streambed, and 57.86 acres of watercourse (104.54 acres; 216,252 linear feet in total) jurisdictional by CDFW (**Table 15: Potential Aquatic Resource Impacts**; Figure 5.3-1. USACE/RWQCB Jurisdictional Aquatic Resources Impacts; Figure 5.3-2. CDFW Jurisdictional Aquatic Resources Impacts). See **Attachment C** for the general characteristics, latitude and longitude coordinates, and acreage and linear feet of permanent impacts on aquatic resources features delineated within the BIG project site.

Potential impacts to jurisdictional aquatic resources, both within and downstream of BIG, include alteration of existing drainage patterns from grading and installation of impervious surfaces, and increased peak stormwater flow velocities within shorter durations. On-site detention basins and related stormwater infrastructure, and best management practices (BMPs) required by the Stormwater Pollution Prevention Plan would be constructed and/or implemented simultaneously with construction of the increased impervious surface footprint. Impacts to downstream water quality would be less than significant with proper implementation of MM BIG BIO-30, MM BIG BIO-10, and MM BIG BIO-31 (described below), specifically inhibiting polluted runoff, sedimentation, and accumulation of anthropogenic waste from entering jurisdictional aquatic resources. Direct and indirect impacts to drainage patterns and water quality of jurisdictional aquatic resources upstream of BIG would not occur during construction.

BNSF would be responsible for acquiring the necessary authorizations required by USACE, RWQCB, and CDFW and associated compensatory mitigation requirements to offset impacts on aquatic resources (MM BIG BIO-29). Compensatory mitigation to offset impacts on jurisdictional aquatic resources would be implemented through the purchase of mitigation bank credit purchase (e.g., purchase of enhancement and/or preservation credits at an agency-approved mitigation bank), on- and off-site permittee responsible mitigation, or a combination of these options depending on availability (MM BIG BIO-29). Final mitigation ratios and credits would be determined in consultation with USACE, RWQCB, and CDFW. Therefore, after compliance with USACE, RWQCB, and/or CDFW regulatory requirements, including the associated compensatory mitigation, BIG would result in a less than significant impact on jurisdictional aquatic resources.




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
5.3–1A

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

11'-15'
24'-30'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

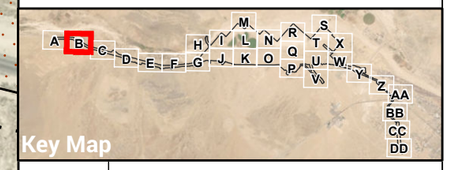



FIGURE 5.3-1B

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

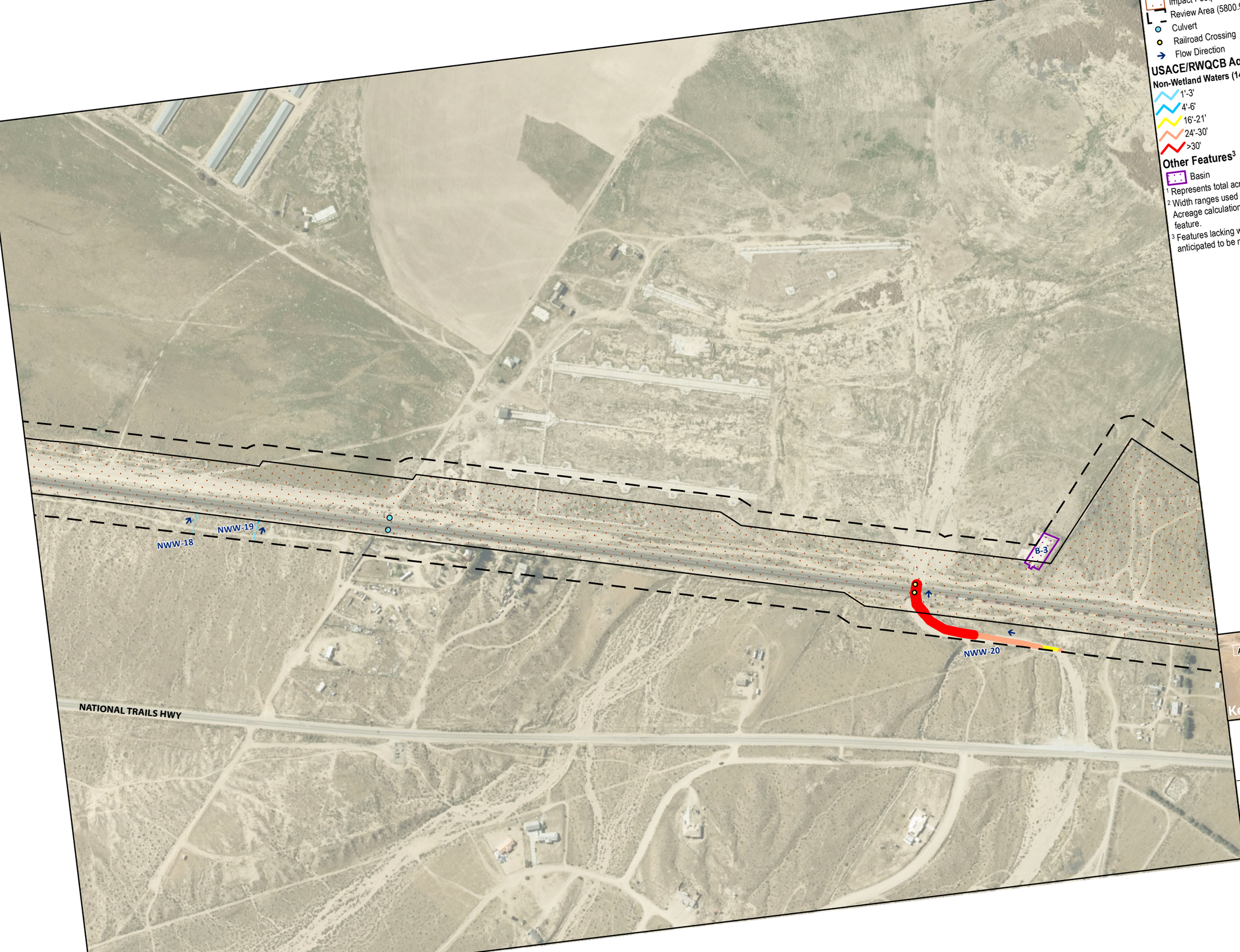
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County 2024, Esri




Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
16'-21'
24'-30'
>30'

**Other Features[3]**

Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




Key Map

FIGURE 5.3-1C

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County 2024, F

Impact Footprint

Review Area (5800.90 ac)[1]

Railroad Crossing

Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

NWW-21

NWW-22

NWW-23

NWW-24

NWW-25

NWW-26

NWW-27

NWW-29

NWW-30

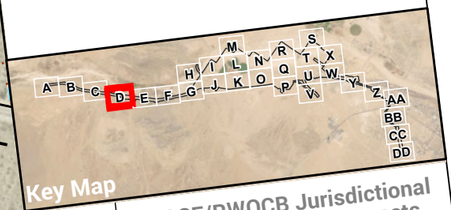
NWW-103

NWW-104

NWW-28

MAIN ST

HODGE RD




Key Map

FIGURE 5.3-1D

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County 2024,

Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

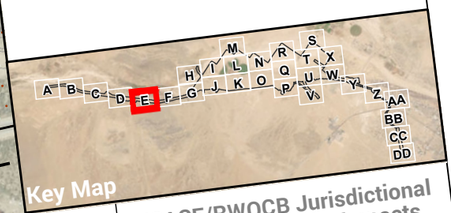
**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

AT&SF RR
NWW-31
NWW-33
NWW-32
NWW-34
NATIONAL TRAILS HWY



Key Map

FIGURE 5.3-1E

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

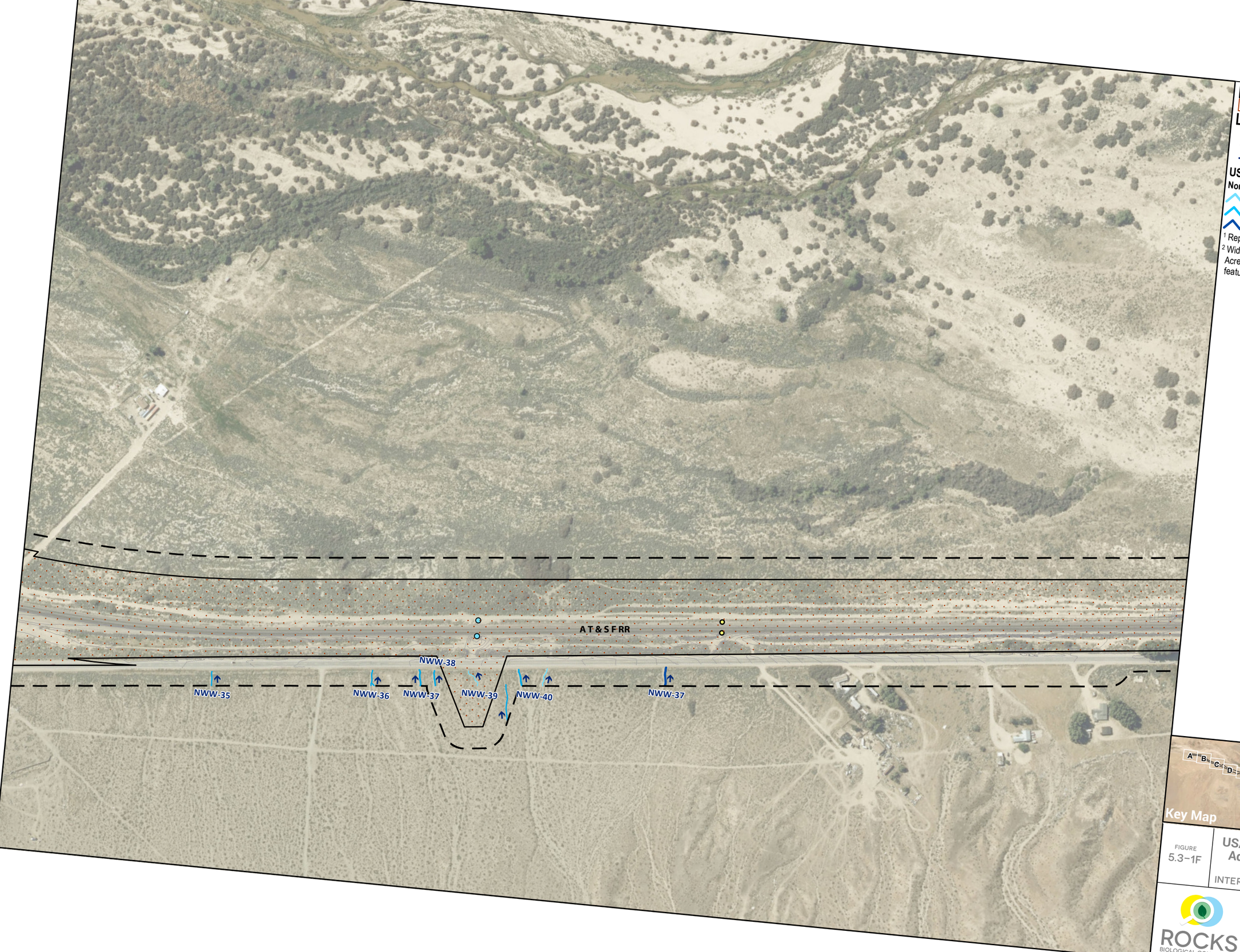
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024,




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.



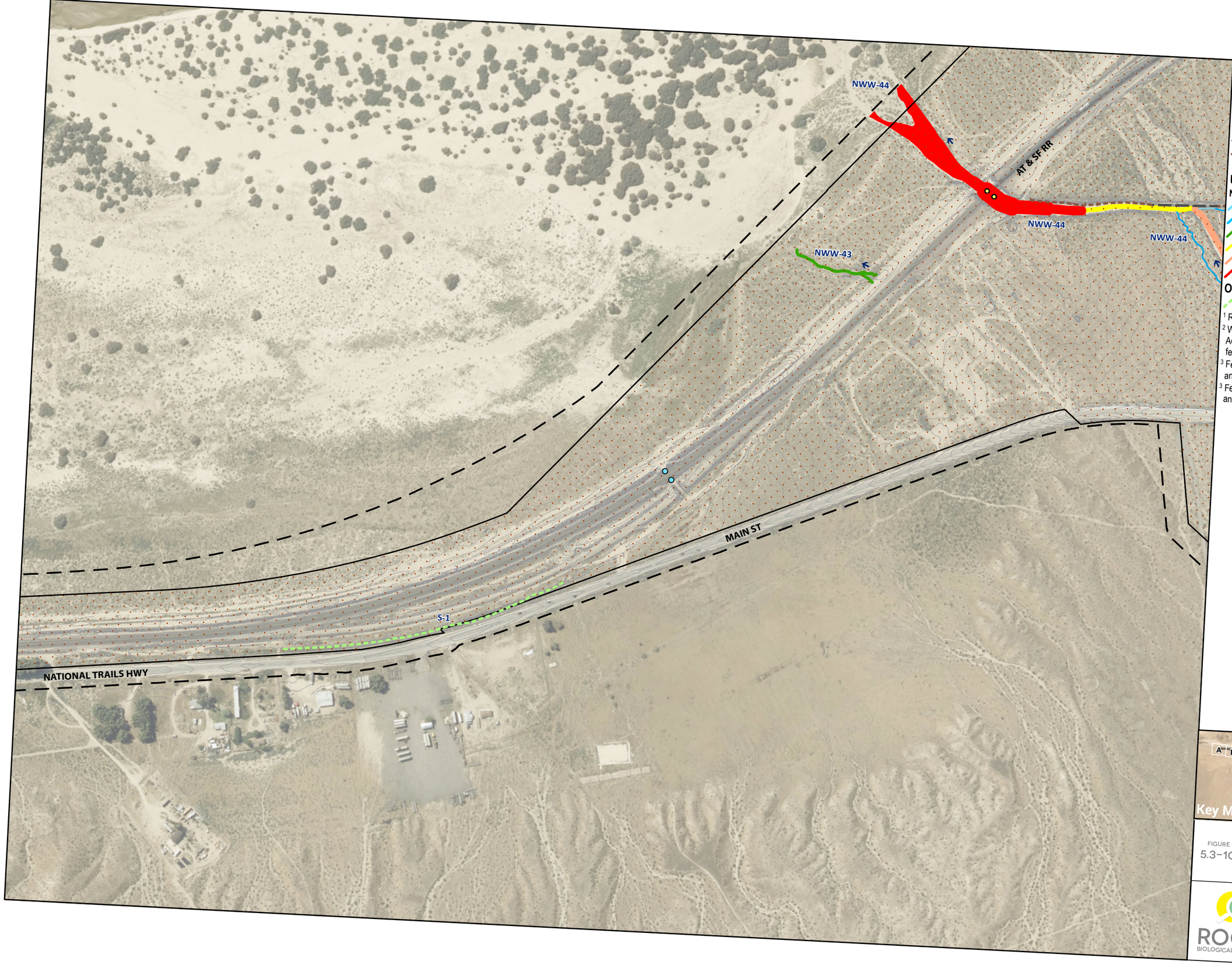

FIGURE 5.3-1F

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL

0 400 FEET
1 INCH = 400 FEET
N




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
11'-15'
16'-21'
24'-30'
>30'

**Other Features[3]**

Swale

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 5.3–1G

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

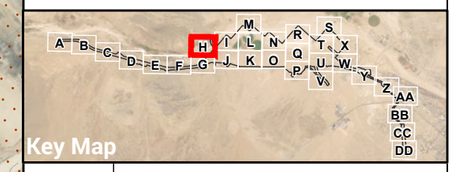



FIGURE 5.3-1H

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

4'-6'
11'-15'
>30'

## Other Features[3]

Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

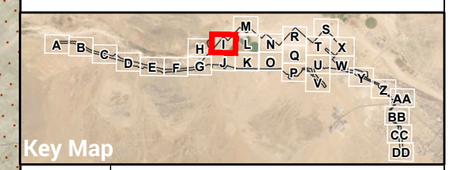



FIGURE 5.3-1l

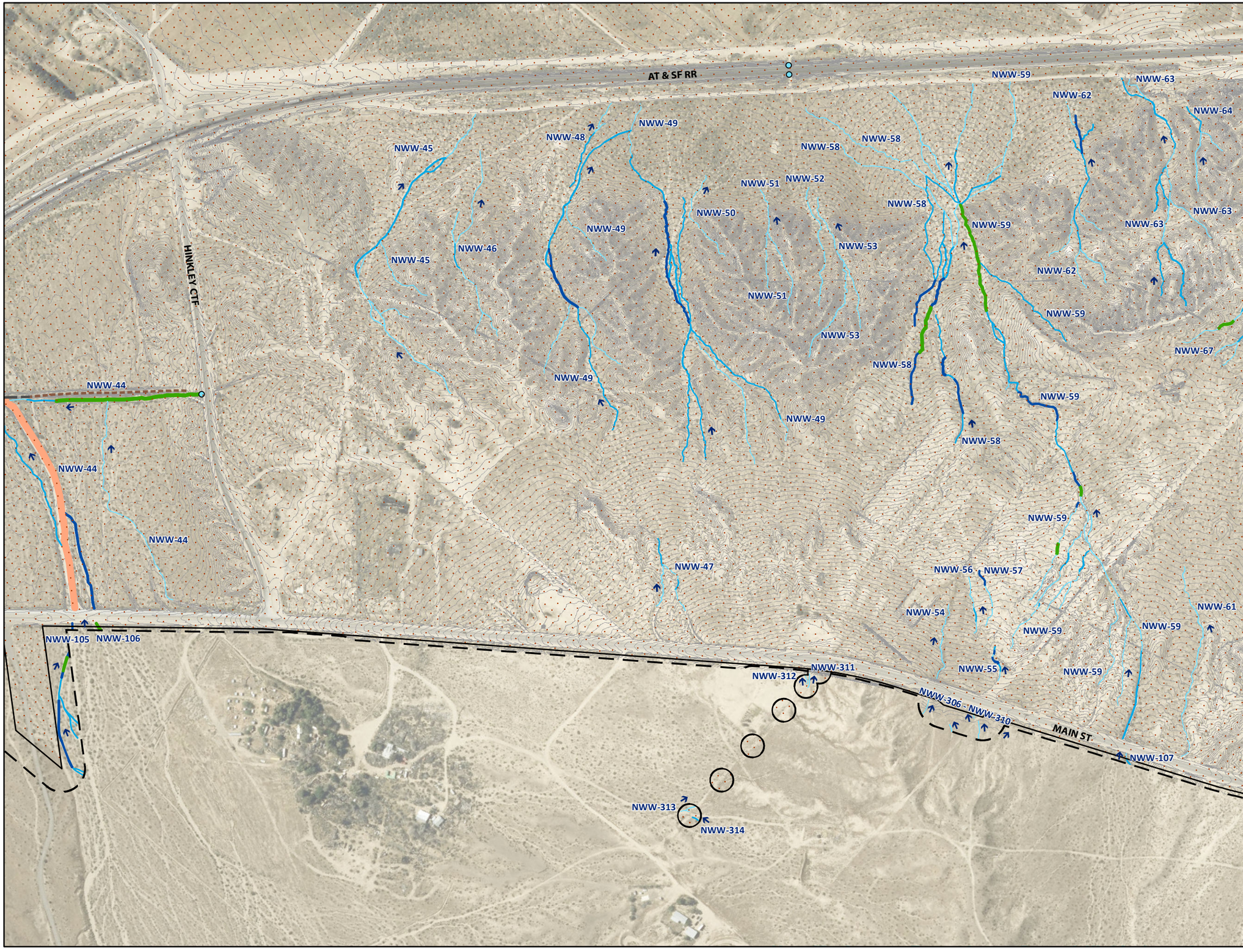
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

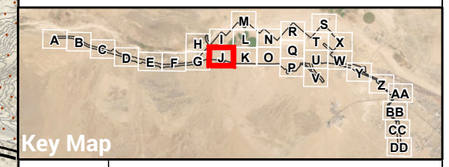



FIGURE 5.3-1J

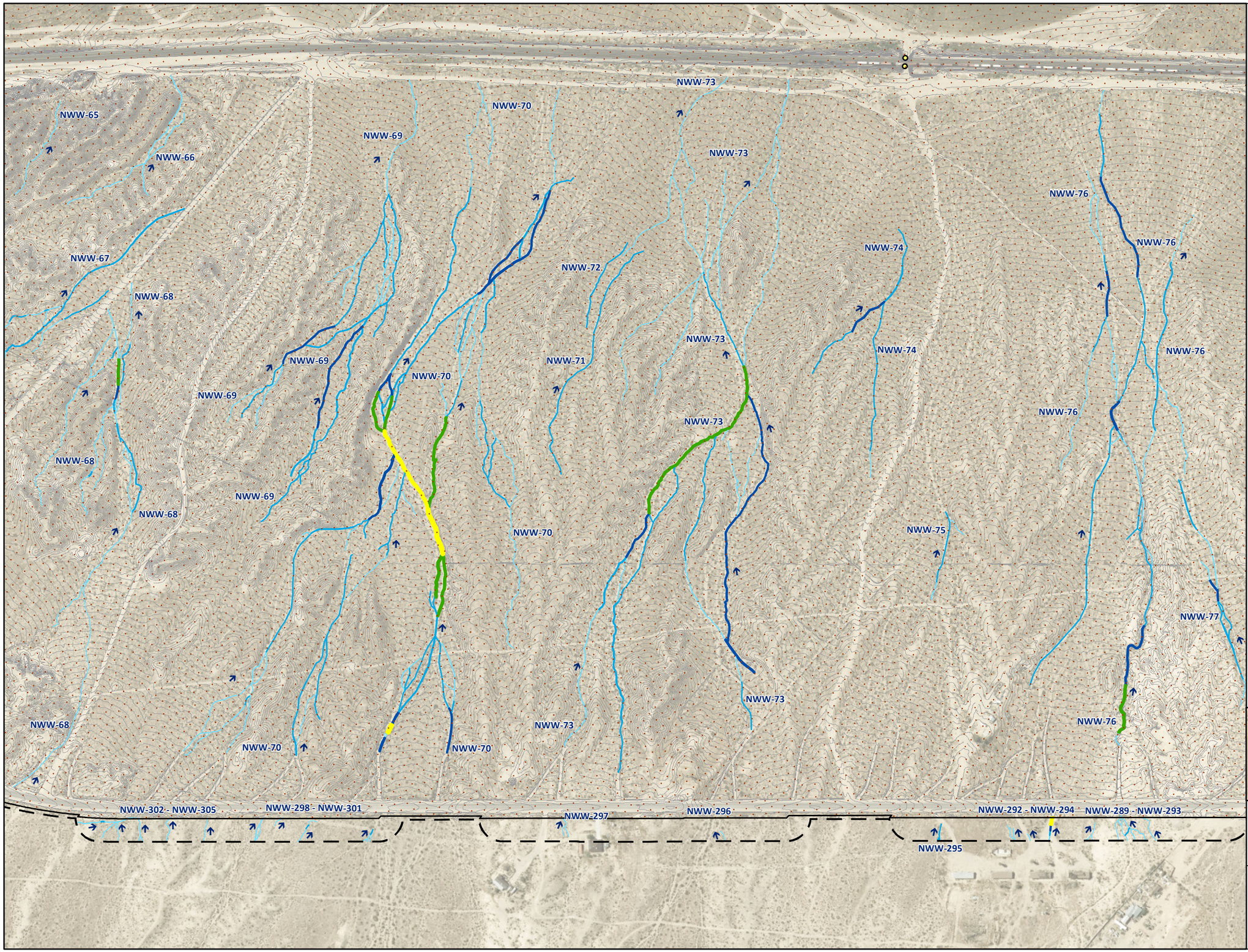
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

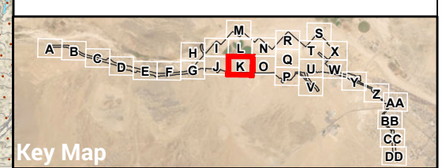



FIGURE 5.3-1K

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

NWW-109 (Mojave River)

Project Site
Impact Footprint
Review Area (5800.90 ac)[1]

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.

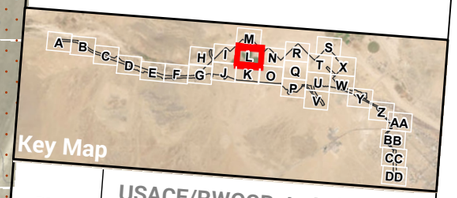



FIGURE
5.3-1L

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**

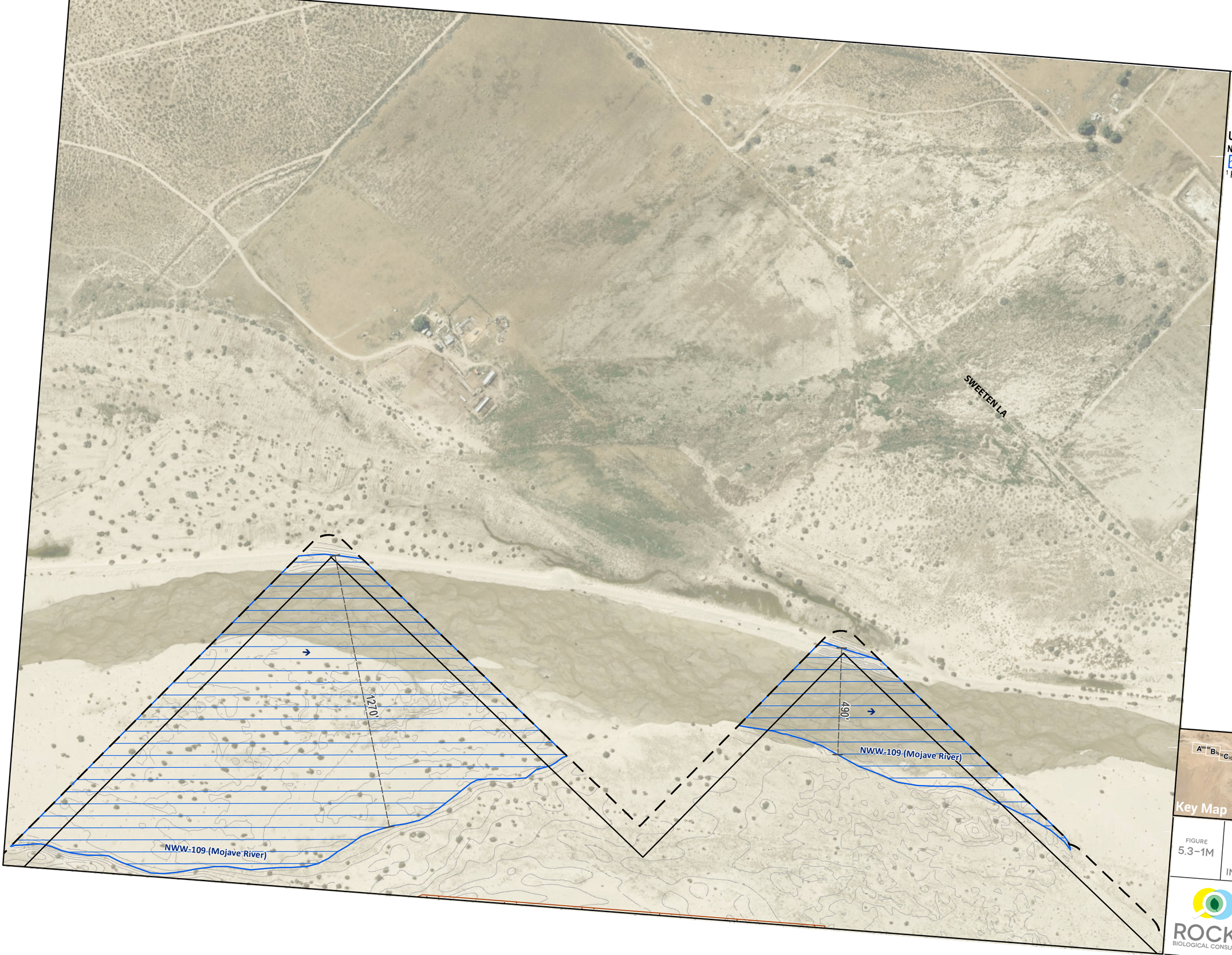
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**
Mojave River Extent

[1] Represents total acreage for survey area.

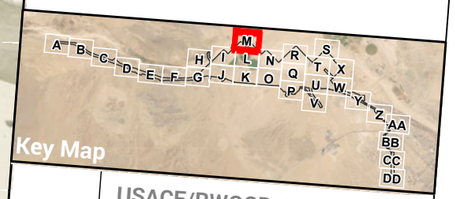



FIGURE 5.3-1M

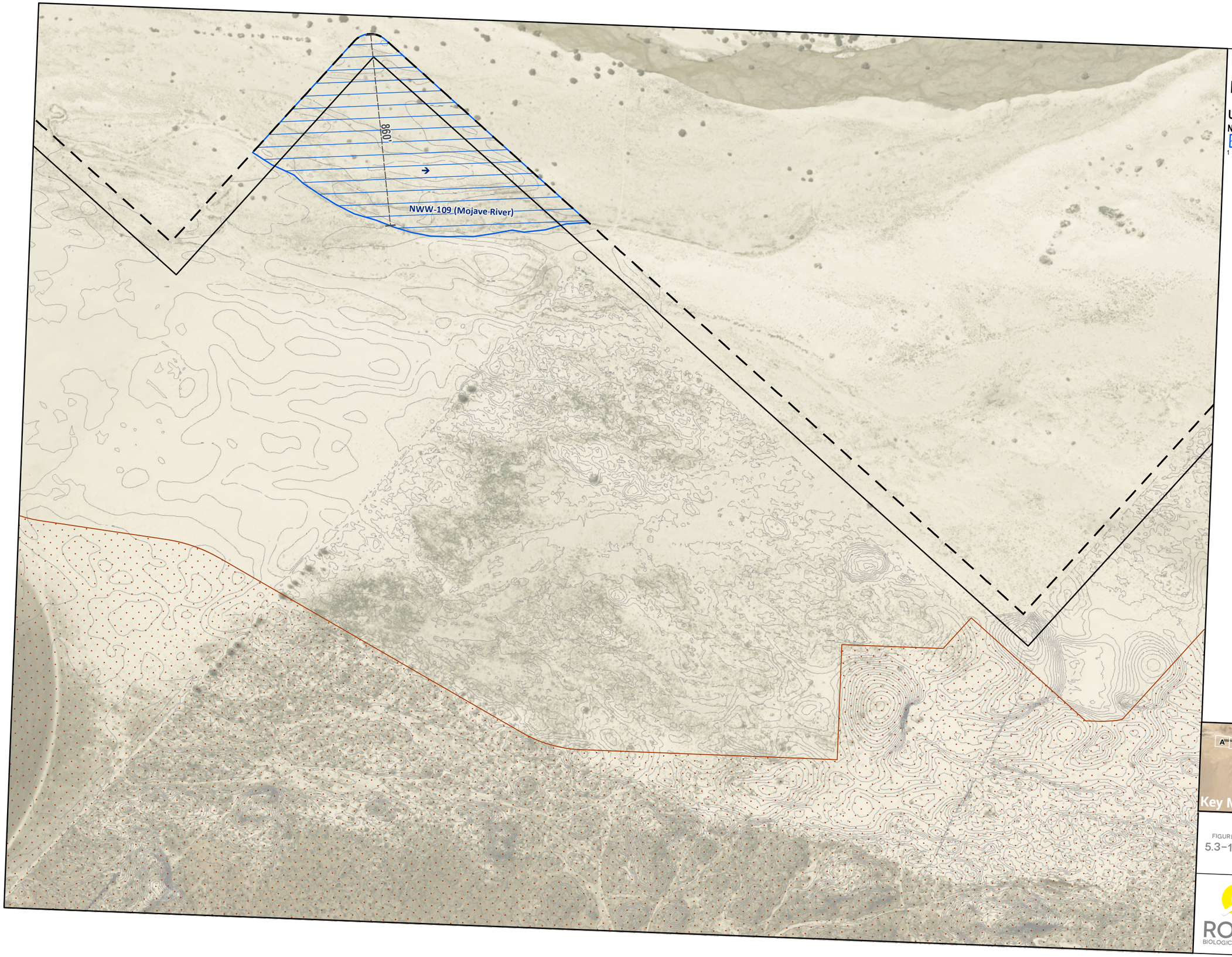
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**

Mojave River Extent

[1] Represents total acreage for survey area.




FIGURE 5.3-1N

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County 2024, Esri

NWW-80
NWW-82
NWW-83
NWW-85
NWW-85
NWW-87
NWW-88
NWW-79
NWW-81
NWW-87
NWW-82
NWW-86
NWW-85
NWW-79
NWW-78
NWW-80
NWW-84
NWW-82
NWW-80
AMARYLLIS AV
NWW-77
NWW-80
MAIN ST
NWW-287
NWW-288
NWW-108
GAZANA ST

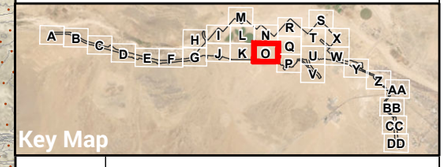
Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.



Key Map

FIGURE 5.3-10

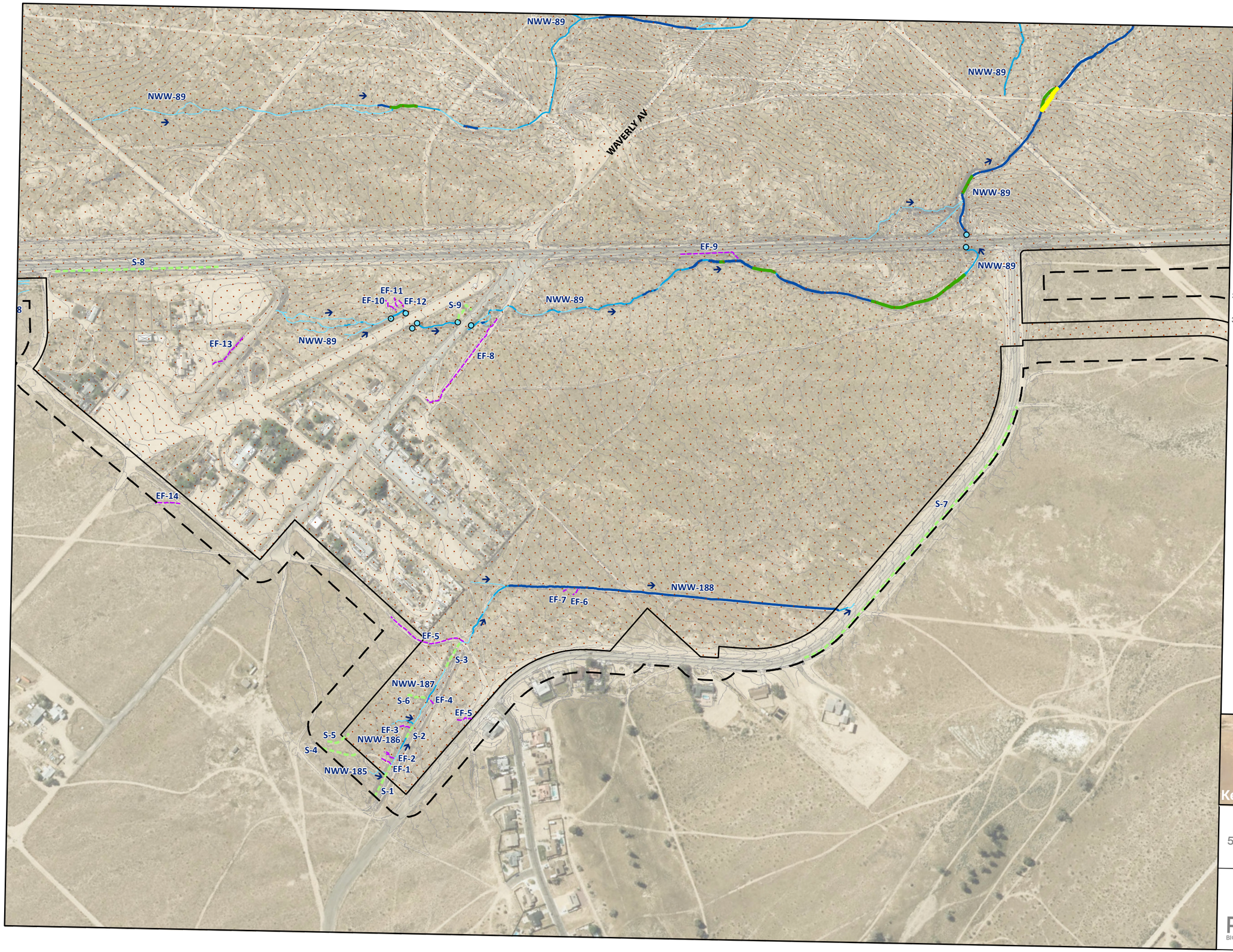
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Other Features[3]**

Swale
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 5.3-1P

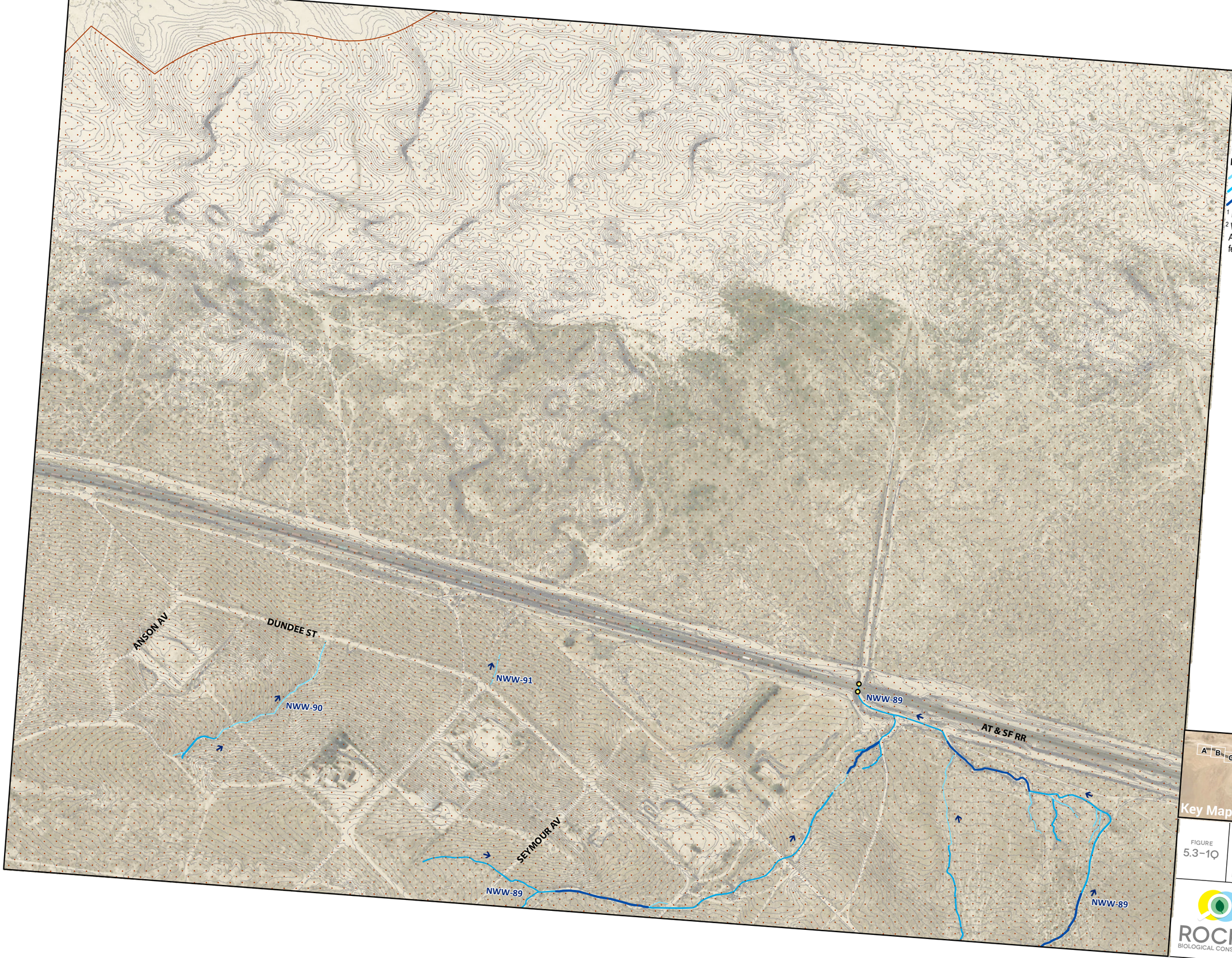
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

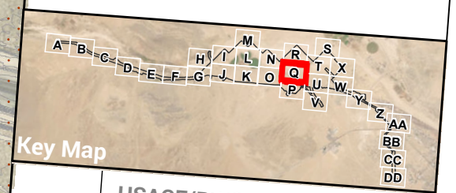



FIGURE 5.3-1Q

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

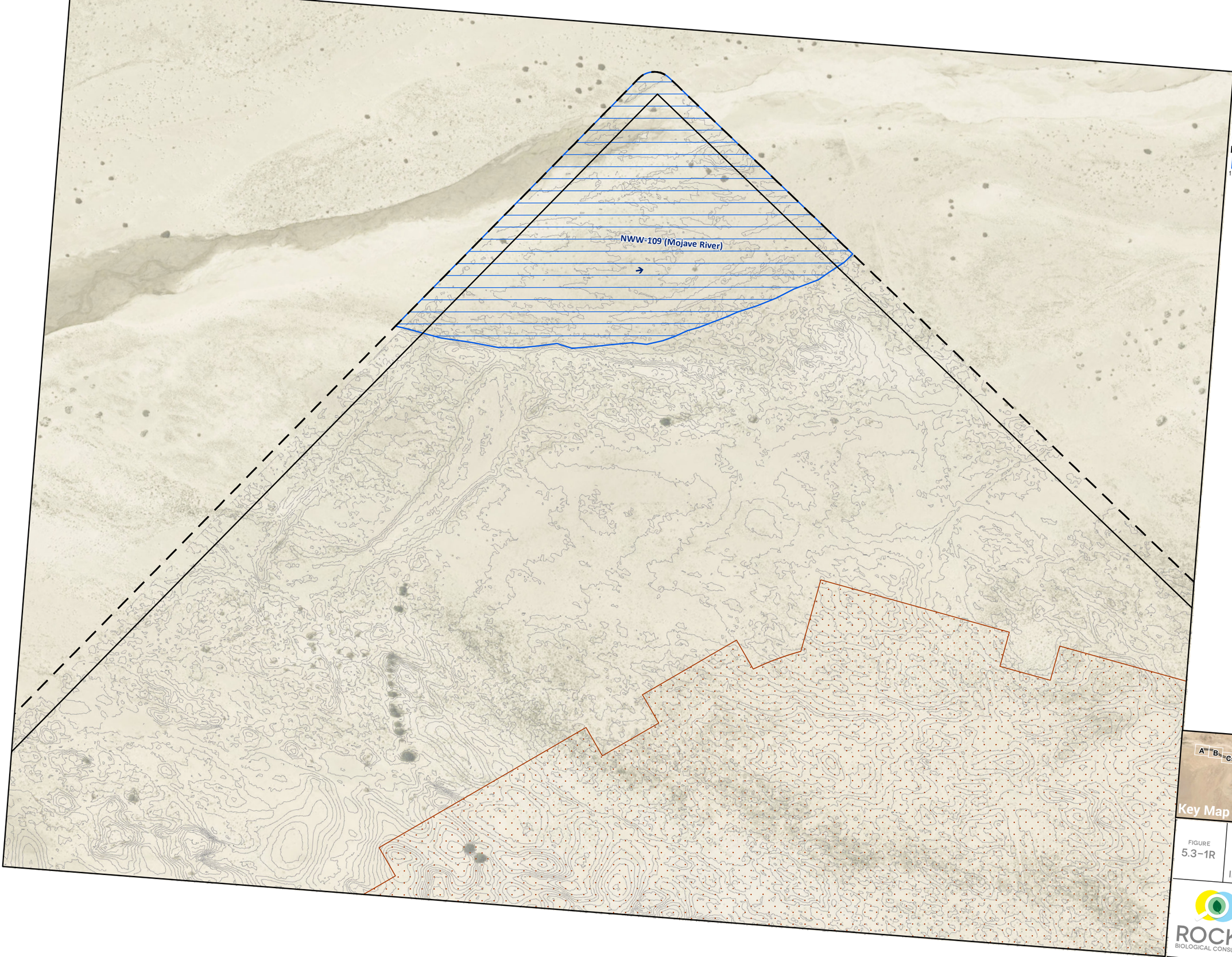
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1]**
Mojave River Extent

[1] Represents total acreage for survey area.




FIGURE 5.3–1R

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

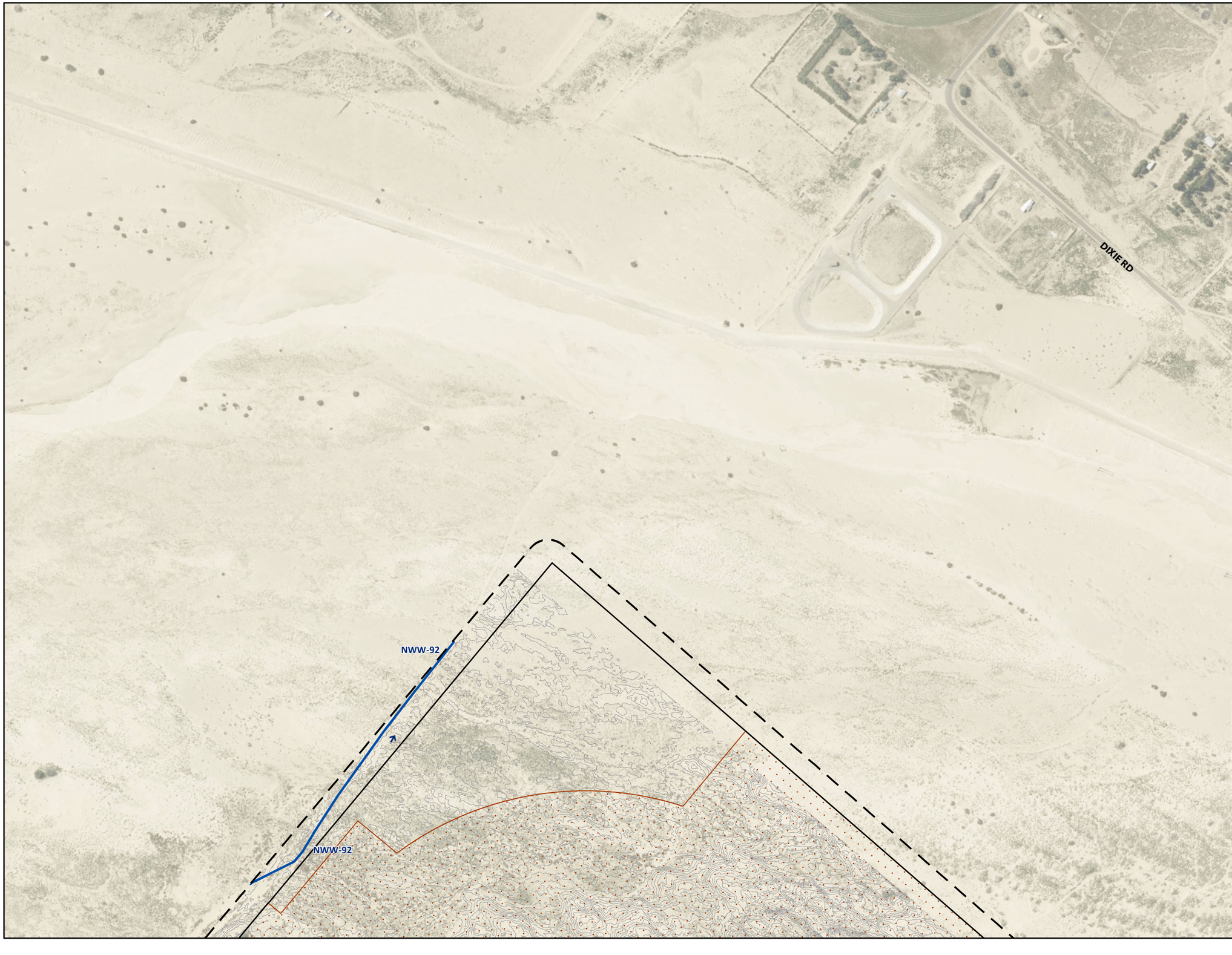
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

7'-10'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
5.3-1S

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

7'-10'
>30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 5.3-1T

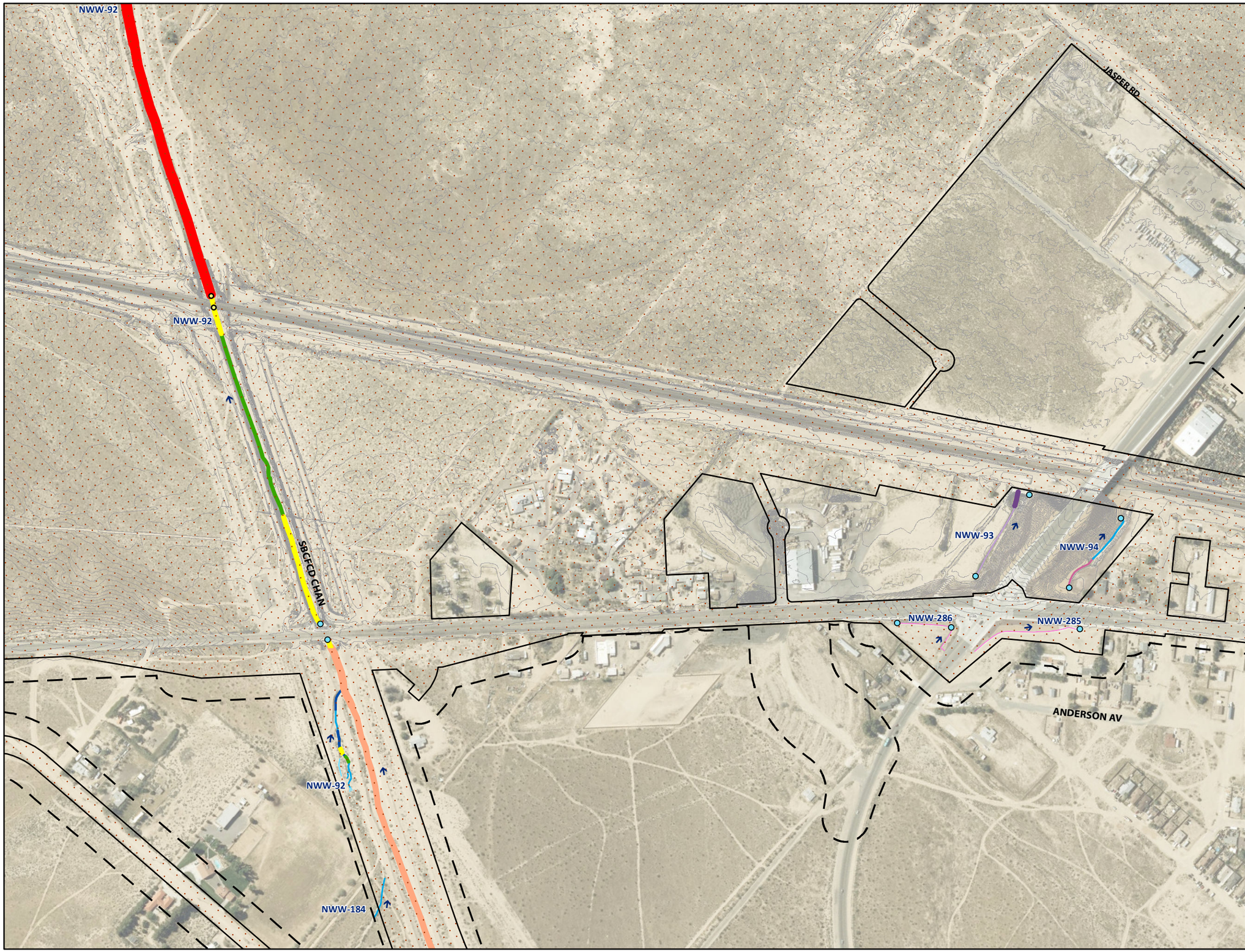
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

**Non-Wetland Waters - Rip-rap (0.06 ac)[1] (widths)[2]**
3'
20'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**
1'-3'
6'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

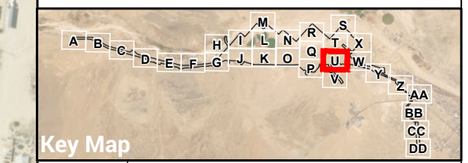



FIGURE 5.3-1U

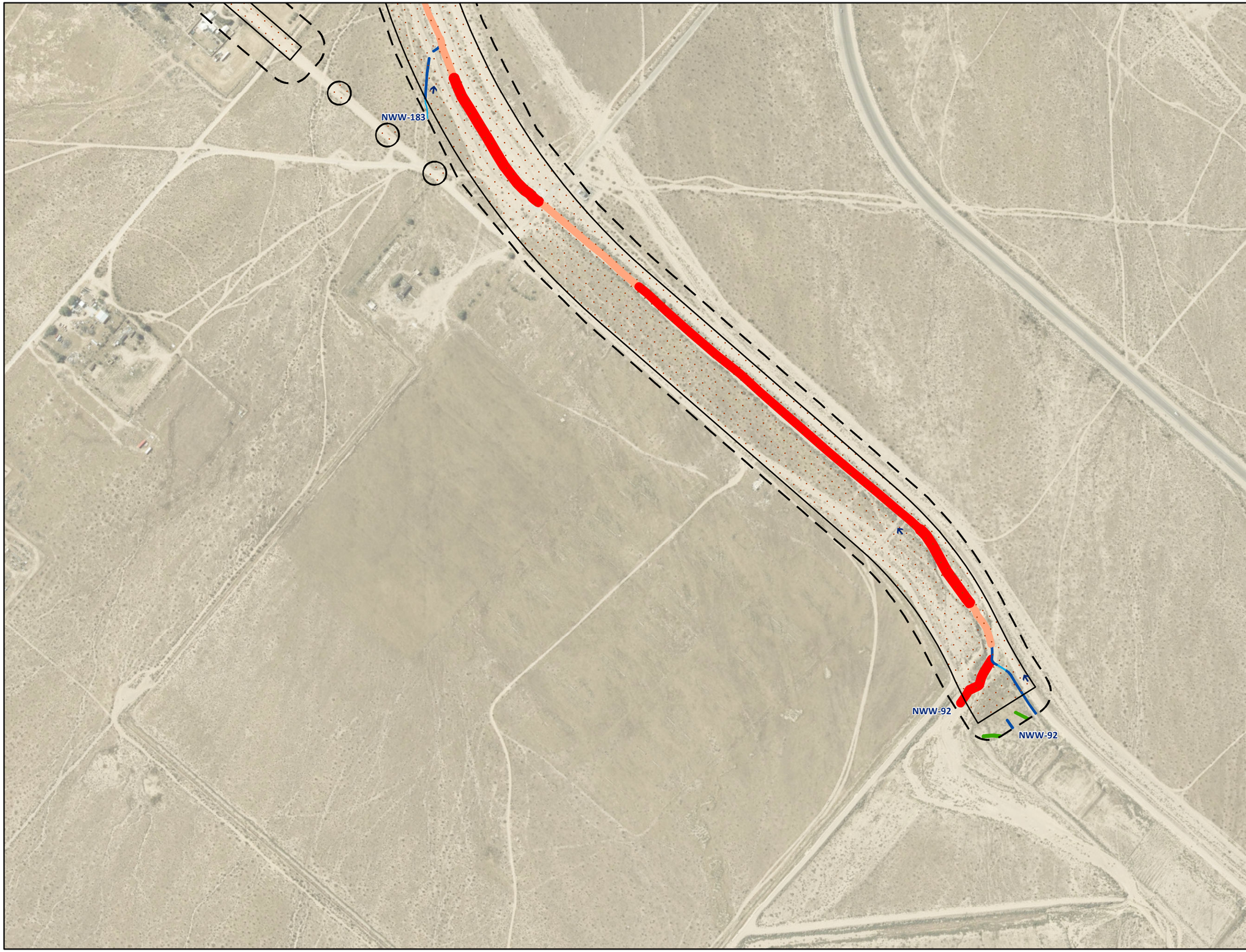
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

4'-6'
7'-10'
11'-15'
24'-30'
>30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.



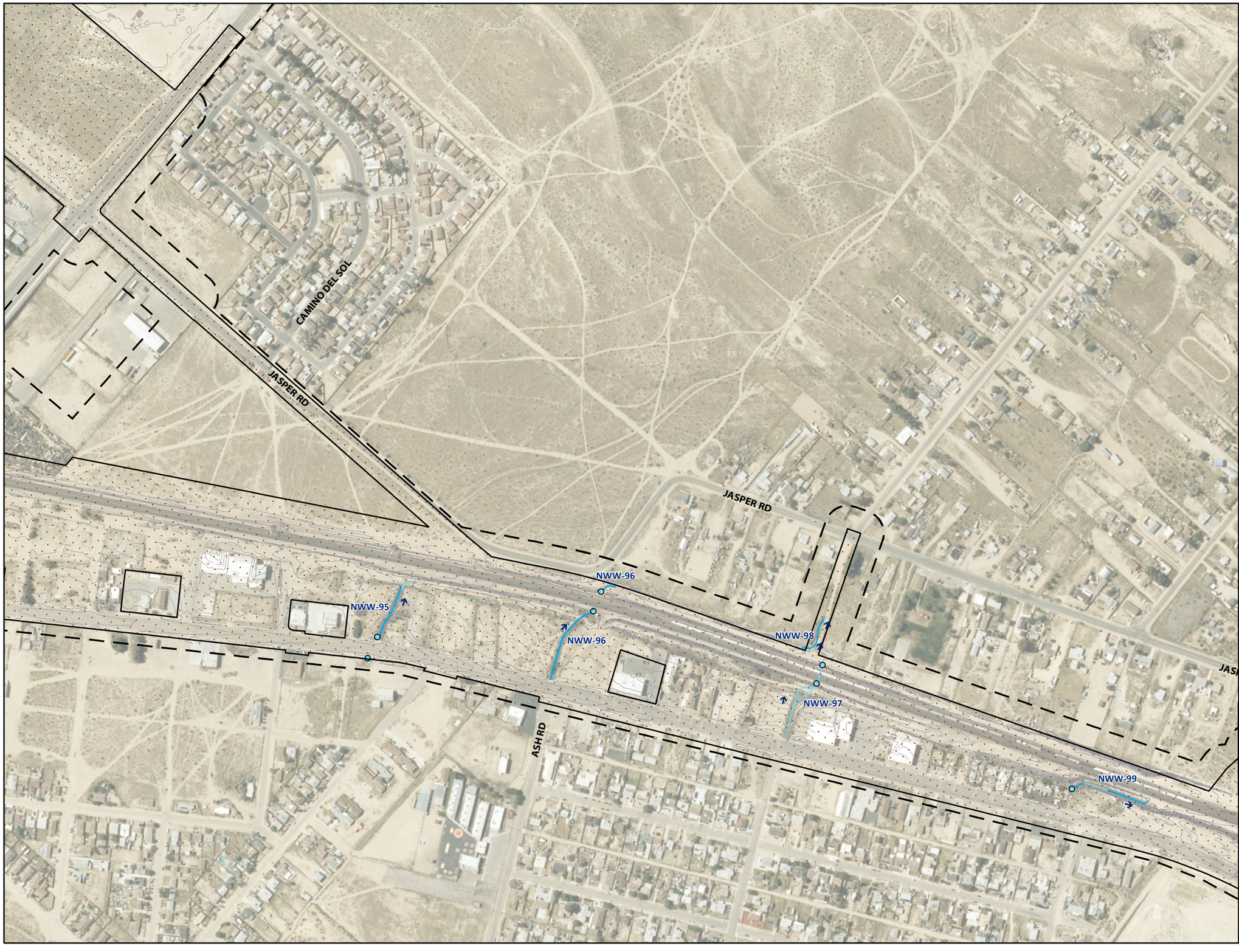

FIGURE
5.3-1V

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 5.3–1W

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025

Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]

[1] Represents total acreage for survey area.




FIGURE
5.3-1X

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri

Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'
- >30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

- 1'-3'

**Other Features[3]**

- Basin
- Erosional Feature

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

JASPER RD

PETTIT RD

MAIN ST

58

NWW-284

NWW-283

NWW-99

NWW-100

NWW-101

NWW-102

B-4

NWW-281

NWW-279

NWW-275 - NWW-278

NWW-274 - NWW-269

EF-16 - EF-18

NWW-280

NWW-267

NWW-268

Key Map

A B C D E F G H I J K L M N O P Q R S T U V W X Y YL Z AA BB CC DD

FIGURE 5.3-1Y

USACE/RWQCB Jurisdictiona
Aquatic Resources Impacts

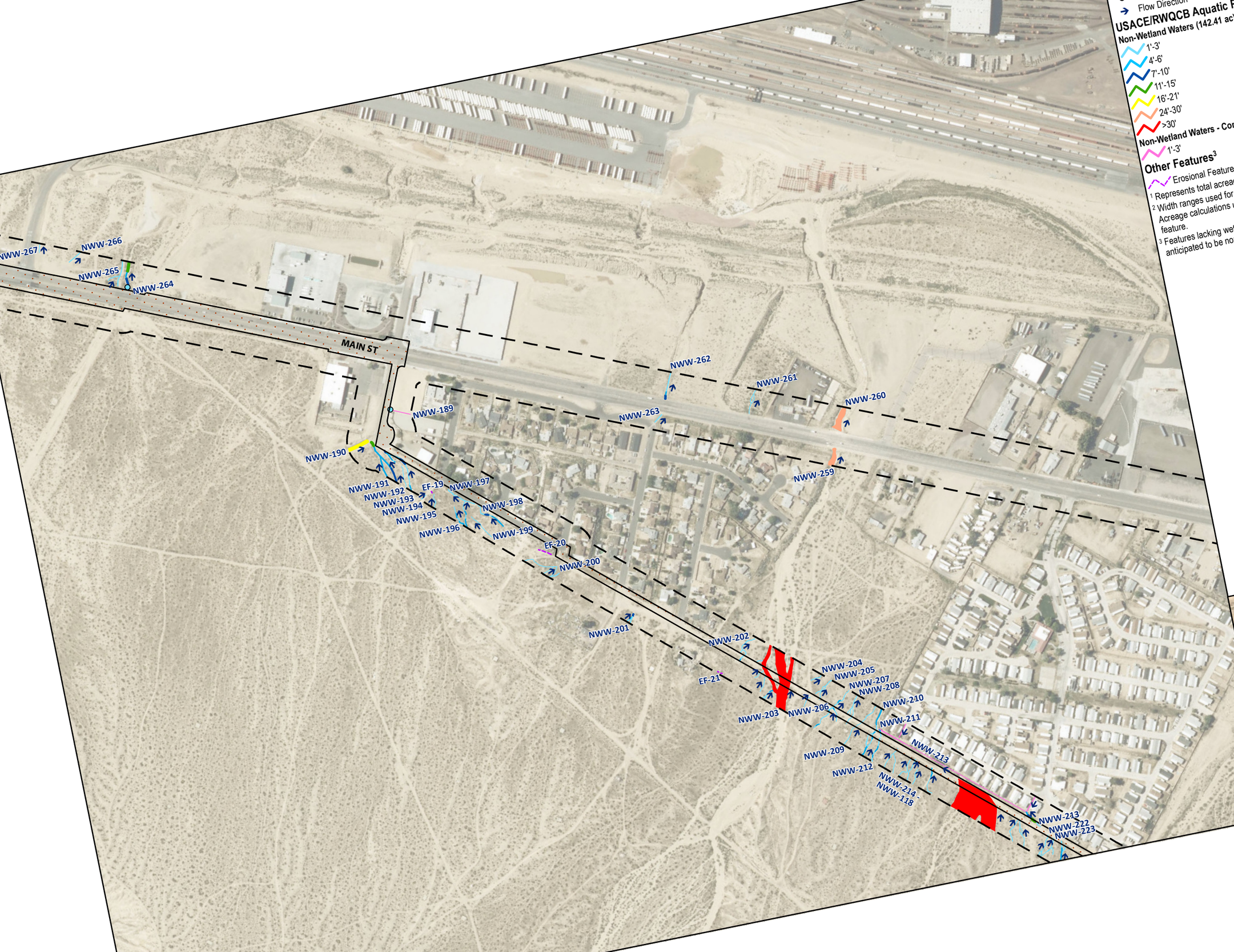
BARSTOW
INTERNATIONAL GATEWAY PROJE

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino Count




Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'
- >30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

- 1'-3'

**Other Features[3]**

- Erosional Feature

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




Key Map

FIGURE 5.3-1Z

USACE/RWQCB Jurisdictiona
Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJE

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino Count

MAIN ST

SANTA CRUZ ST

NWW-213
NWW-222
NWW-223
NWW-224
NWW-225
NWW-227
NWW-229
NWW-228
NWW-230
NWW-231
NWW-232
NWW-233 - NWW-240
NWW-241
NWW-242
NWW-258
NWW-257
NWW-256
EF-22
B-5
NWW-255
NWW-254

15

Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**USACE/RWQCB Aquatic Resources**

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

1'-3'

**Other Features[3]**

Basin
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE
5.3-1AA

**USACE/RWQCB Jurisdictional Aquatic Resources Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 5.3-1BB

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

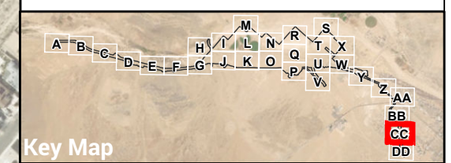



FIGURE 5.3-1CC

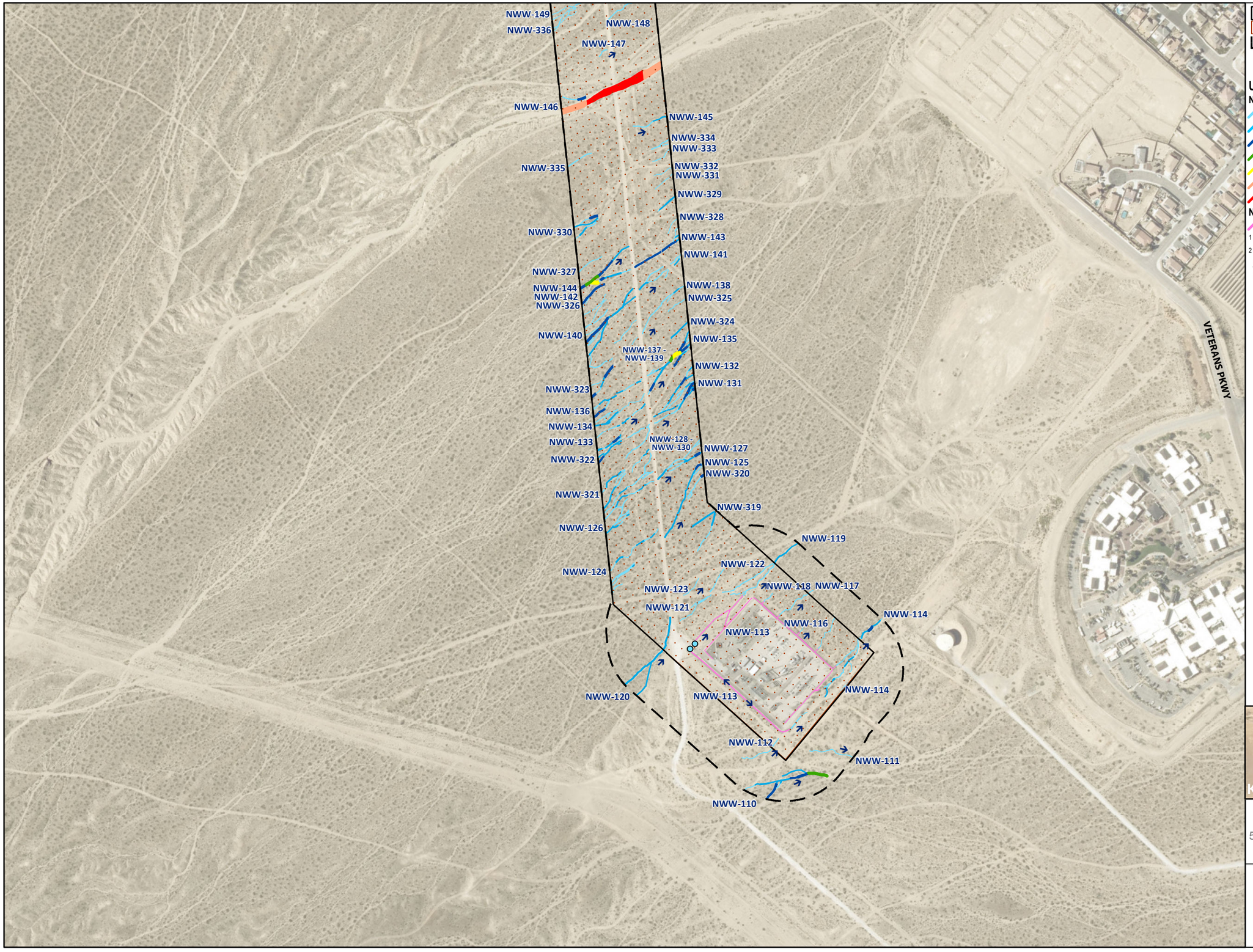
# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## USACE/RWQCB Aquatic Resources

**Non-Wetland Waters (142.41 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'
- >30'

**Non-Wetland Waters - Concrete (0.32 ac)[1] (widths)[2]**

- 1'-3'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

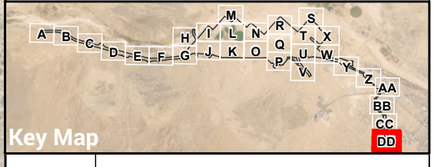



FIGURE 5.3-1DD

# USACE/RWQCB Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County 2024, Esri




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
>30'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
5.3-2A

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

16'-21'
22'-30'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
5.3-2B

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024

Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
>30'

**Watercourse (57.03 ac)[1]**
Watercourse

**Other Features[3]**
Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

NWW-18
NWW-19
B-3
Watercourse A
NWW-20
NATIONAL TRAILS HWY

Key Map

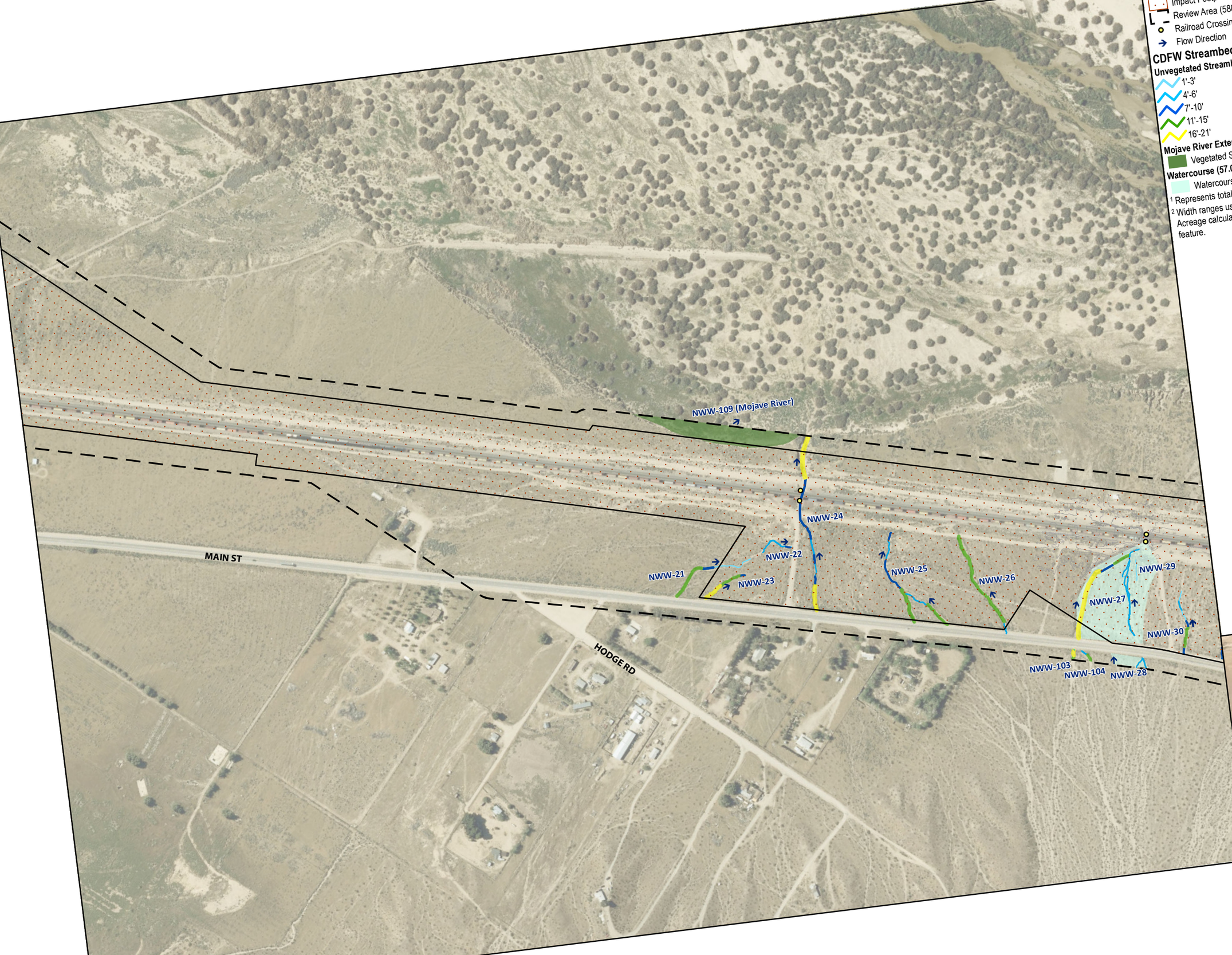
FIGURE 5.3-2C

# CDFW Jurisdictional Aquatic Resources Impacts
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2




Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'

**Mojave River Extent (607.04 ac)[1]**
- Vegetated Streambed

**Watercourse (57.03 ac)[1]**
- Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




Key Map

FIGURE 5.3-2D

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

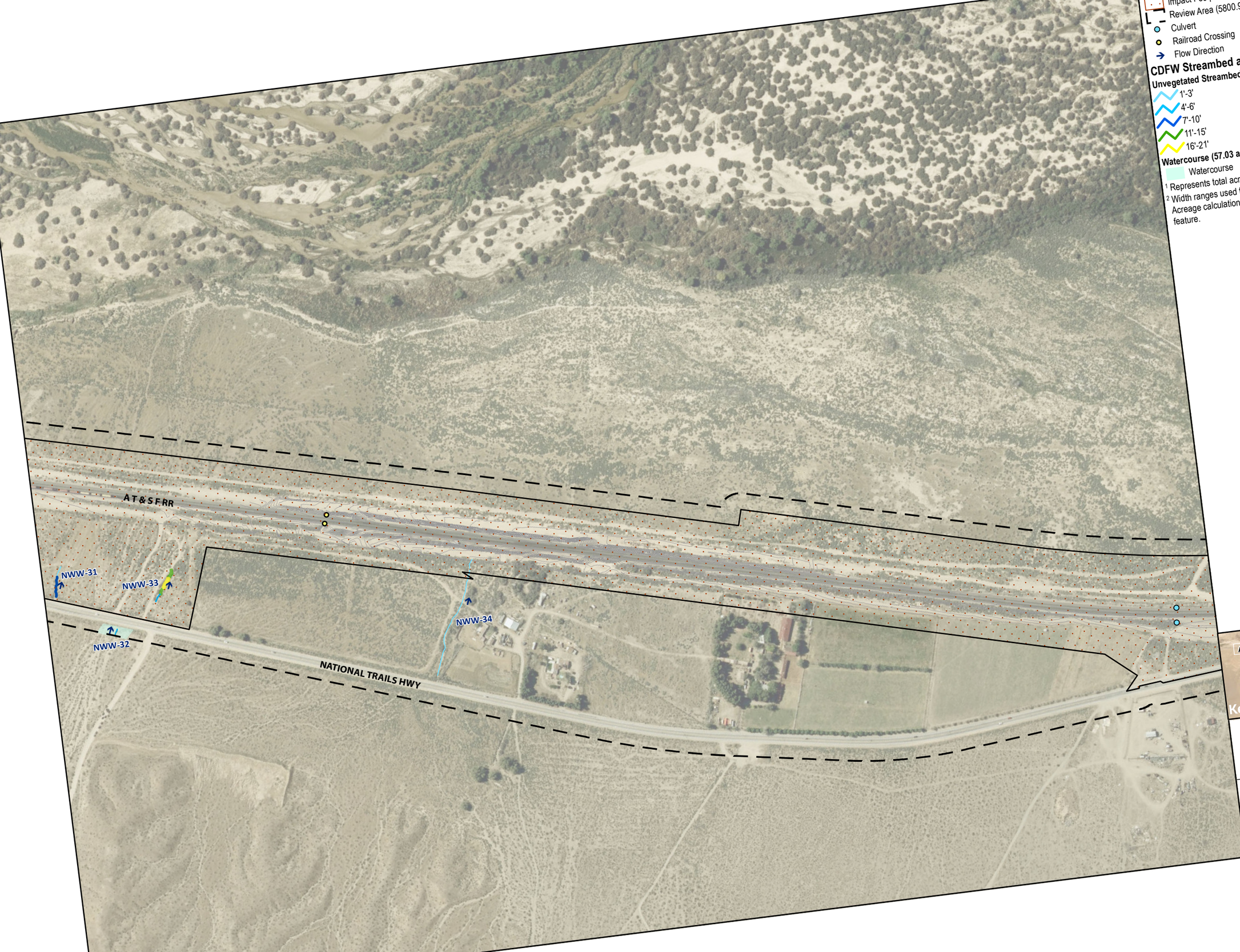
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2




Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




Key Map

FIGURE 5.3-2E

# CDFW Jurisdictional Aquatic Resources Impacts

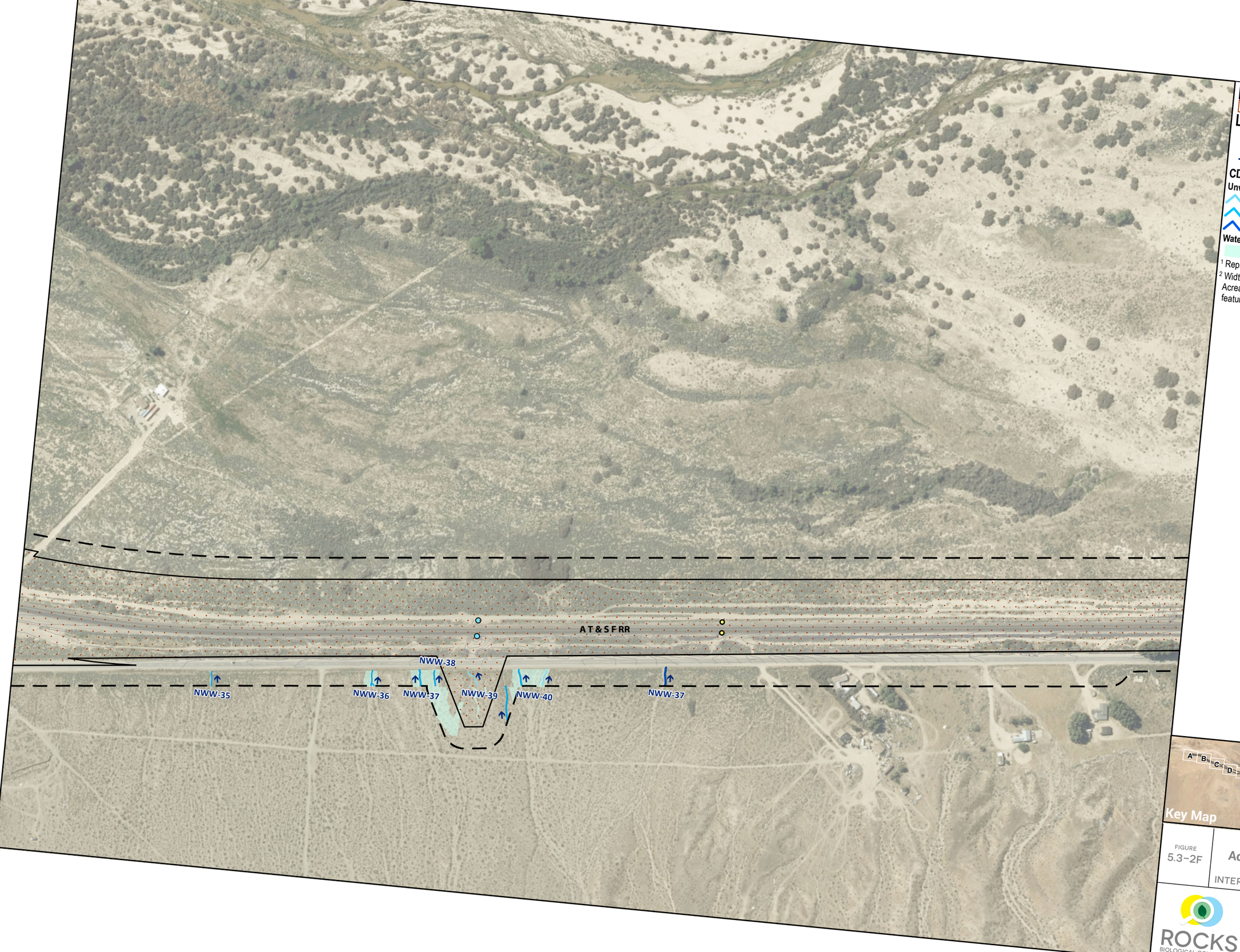
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

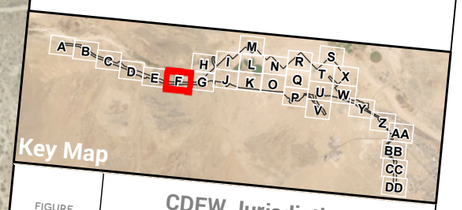
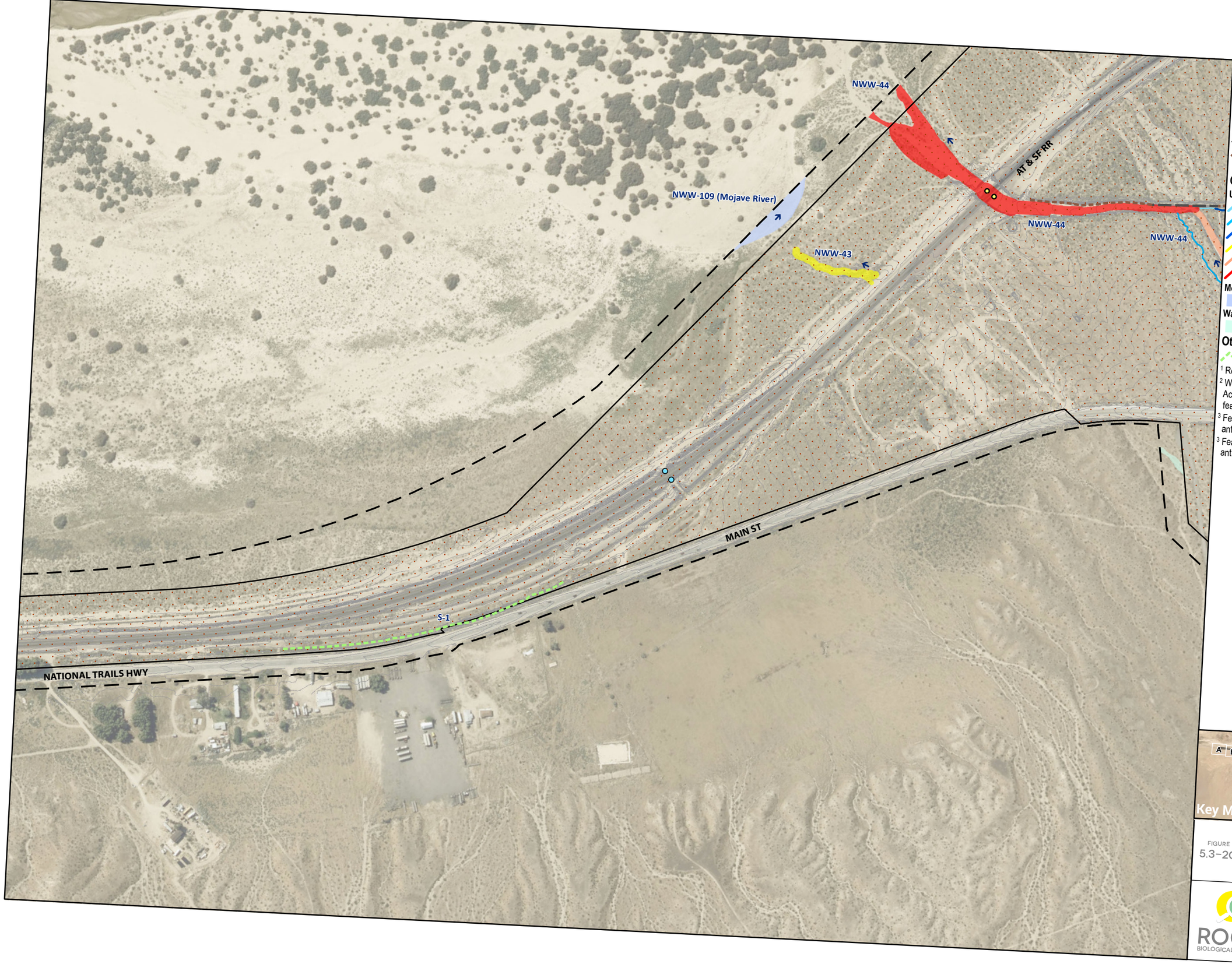



FIGURE
5.3-2F

**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL

0 400 FEET
1 INCH = 400 FEET
N




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
16'-21'
22'-30'
>30'

**Mojave River Extent (607.04 ac)[1]**

Unvegetated Streambed

**Watercourse (57.03 ac)[1]**

Watercourse

**Other Features[3]**

Swale

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

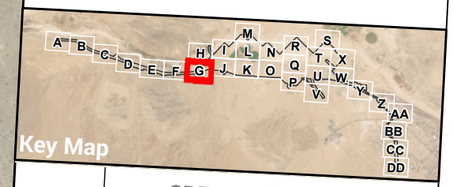



FIGURE 5.3-2G

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed
Unvegetated Streambed

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

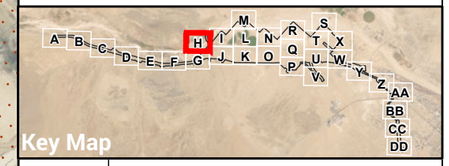



FIGURE 5.3-2H

**CDFW Jurisdictional Aquatic Resources Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Vegetated Streambed (0.28 ac)[1] (widths)[2]**

4'-6'
11'-15'
>30'

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

**Other Features[3]**

Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.

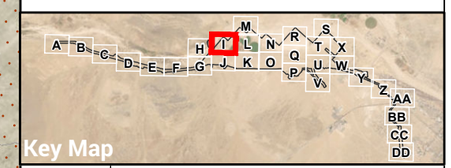



FIGURE 5.3-2l

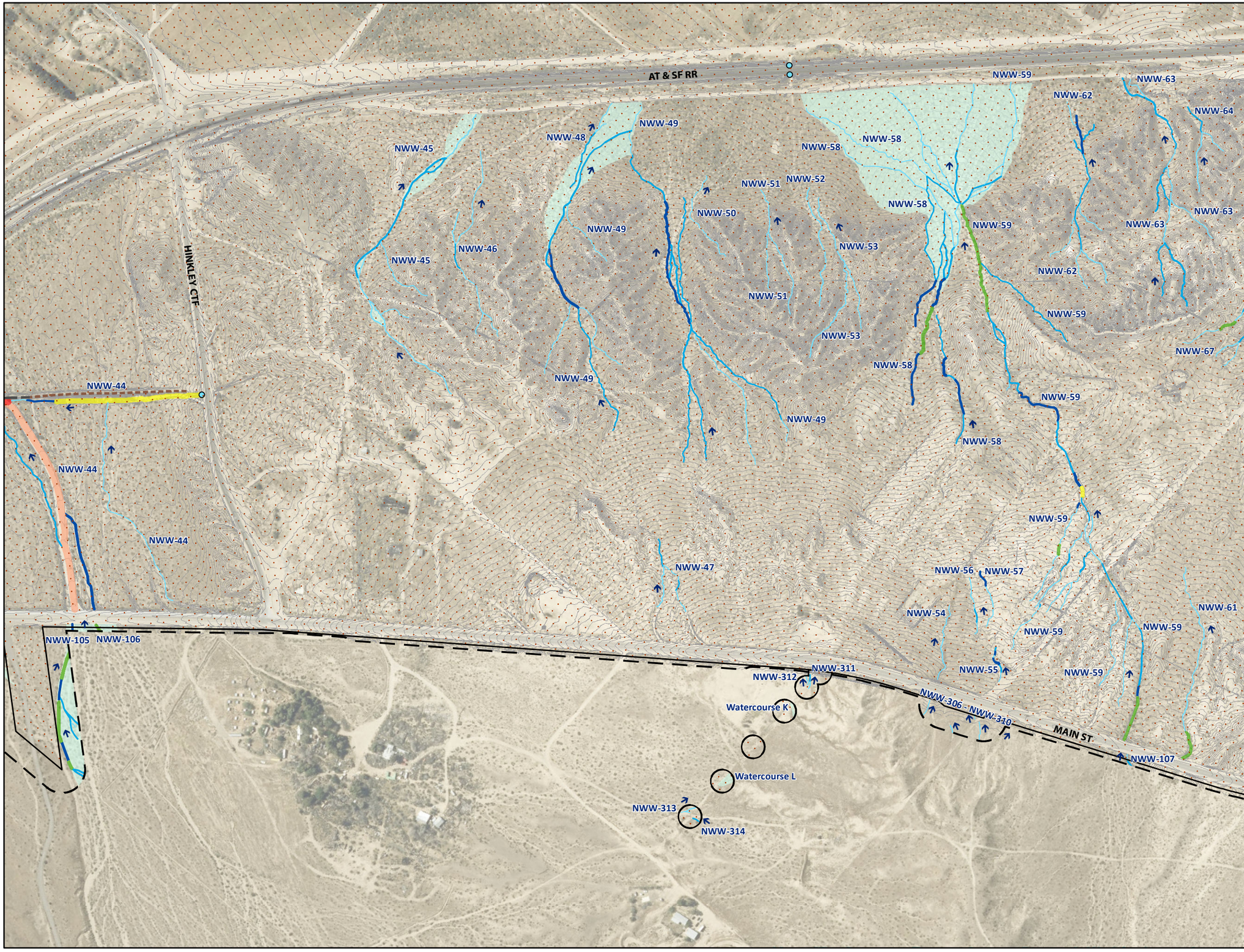
# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

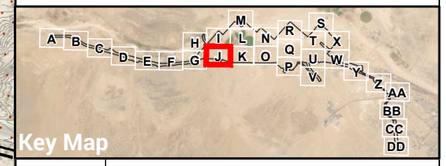



FIGURE 5.3-2J

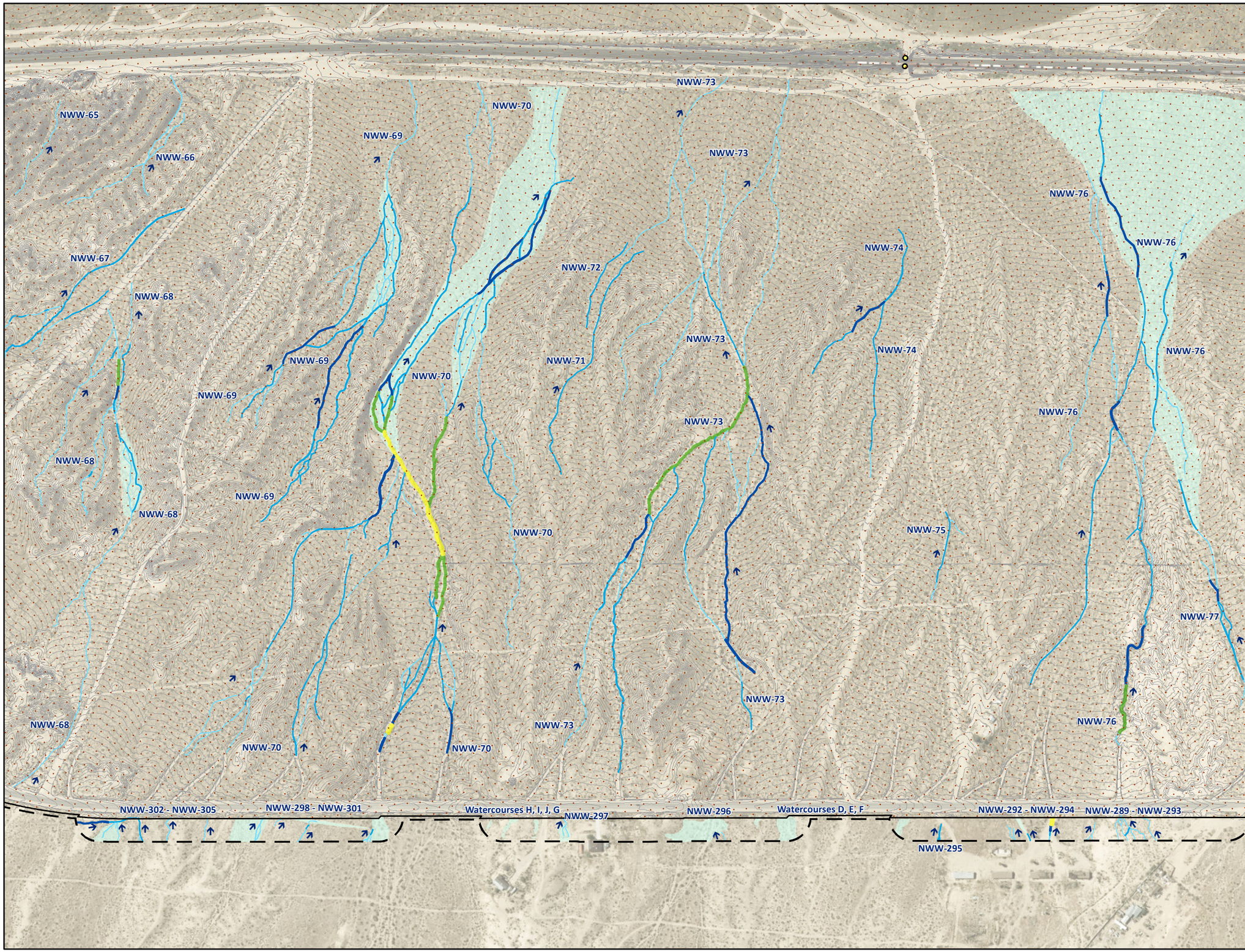
# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

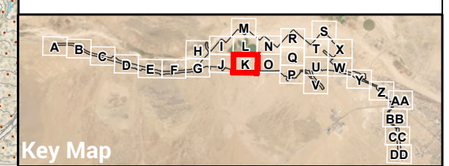



FIGURE 5.3–2K

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024

NWW-109 (Mojave River)

NWW-109 (Mojave River)

Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.




Key Map

FIGURE
5.3-2L

**CDFW Jurisdictional Aquatic Resources Impacts**

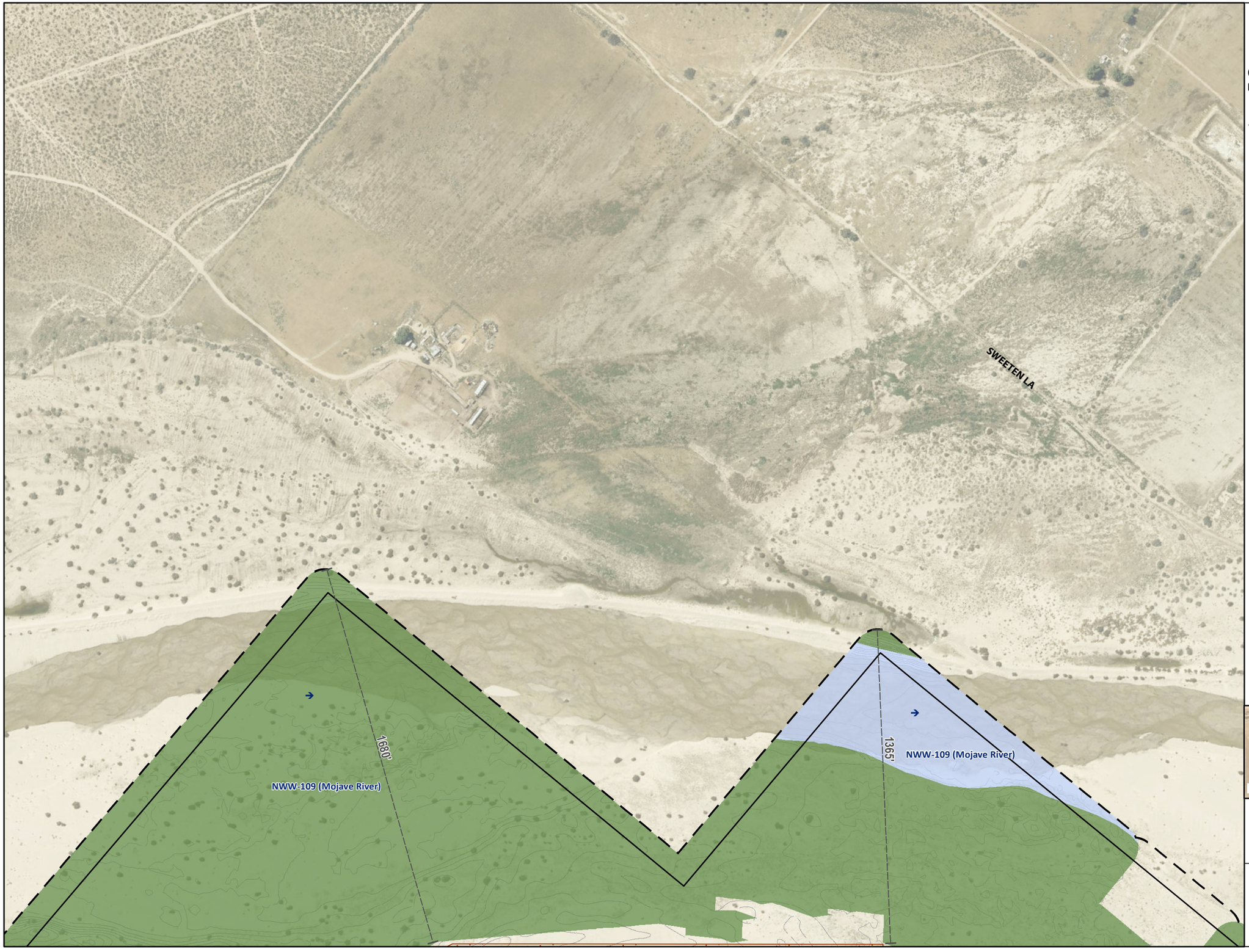
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed
Unvegetated Streambed

[1] Represents total acreage for survey area.

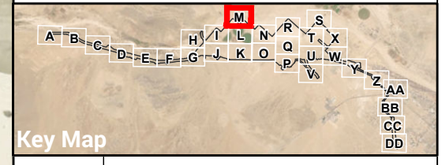



FIGURE 5.3-2M

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

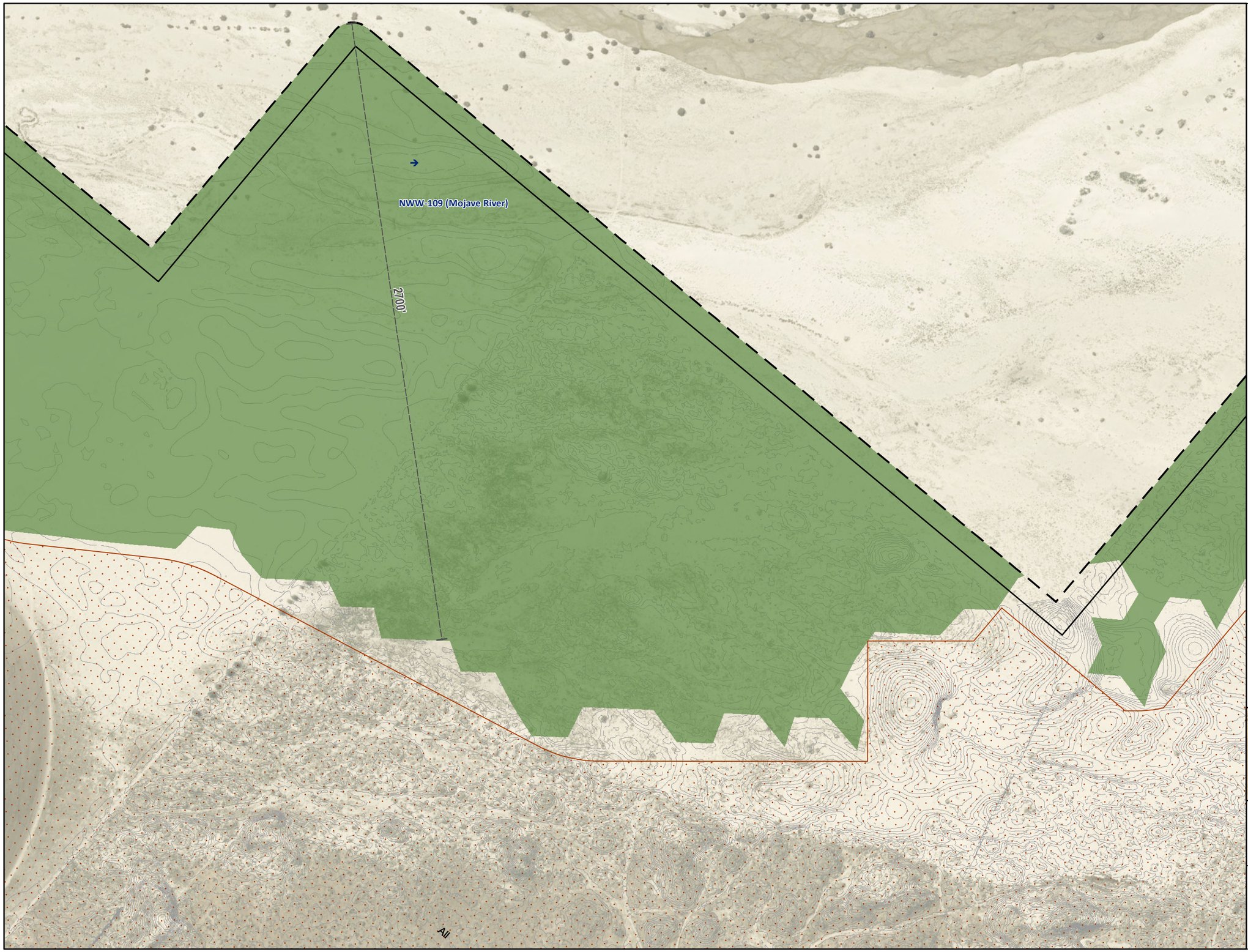
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.

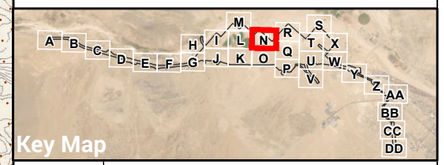



FIGURE
5.3-2N

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024

NWW-80
NWW-82
NWW-83
NWW-85
NWW-85
NWW-87
NWW-88
NWW-79
NWW-81
NWW-82
NWW-87
NWW-86
NWW-85
NWW-79
NWW-78
NWW-80
NWW-84
NWW-82
NWW-80
AMARYLLIS AV
NWW-77
NWW-80
MAIN ST
NWW-287
NWW-288
NWW-108
GAZANA ST

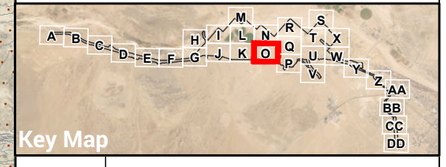
Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (57.03 ac)[1]**
Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.



Key Map

FIGURE 5.3-20

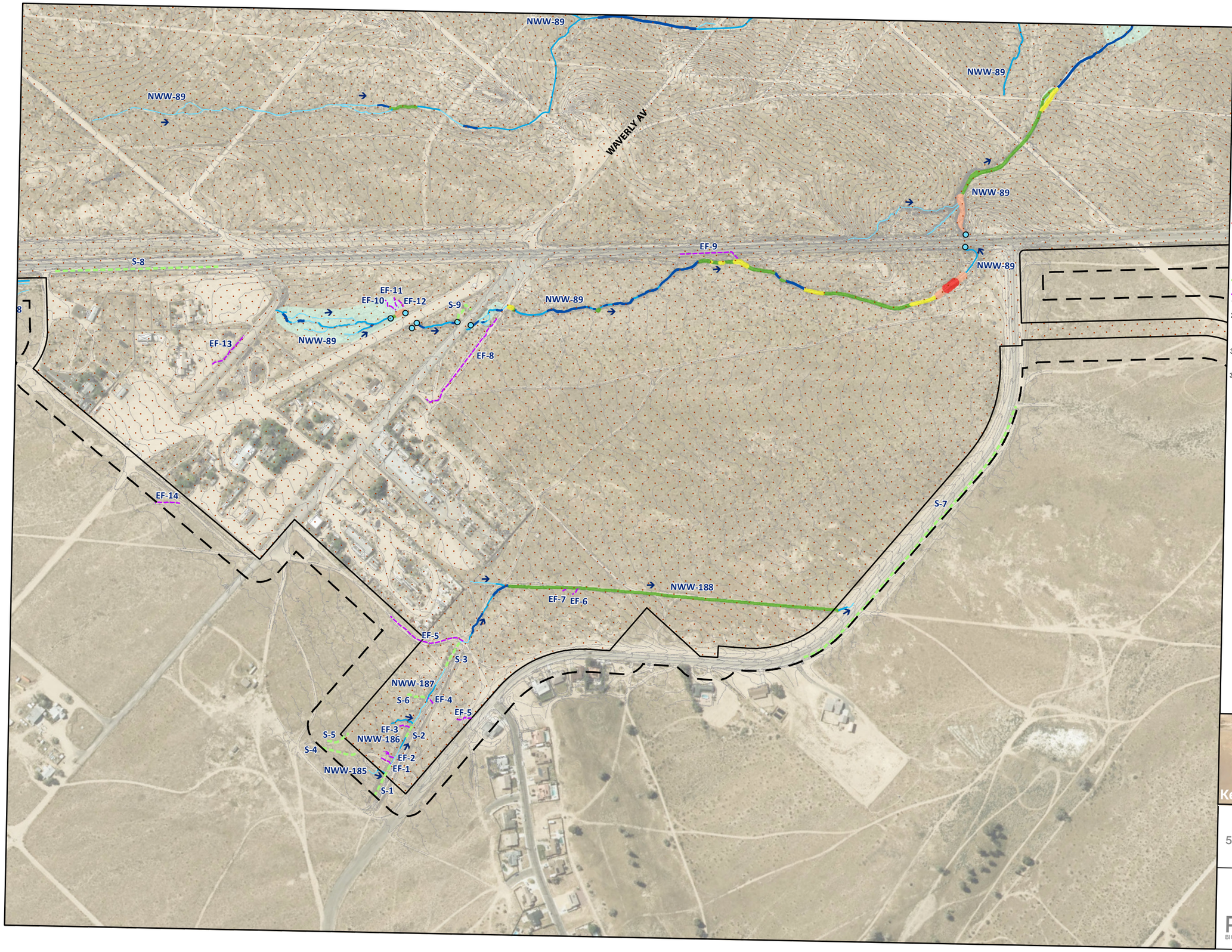
# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Watercourse (57.03 ac)[1]**

Watercourse

**Other Features[3]**

Swale
Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 5.3-2P

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024

Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

**Watercourse (57.03 ac)[1]**
Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

ANSON AV
DUNDEE ST
NWW-90
NWW-91
NWW-89
AT & SF RR
SEYMOUR AV
NWW-89
NWW-89

Key Map
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD

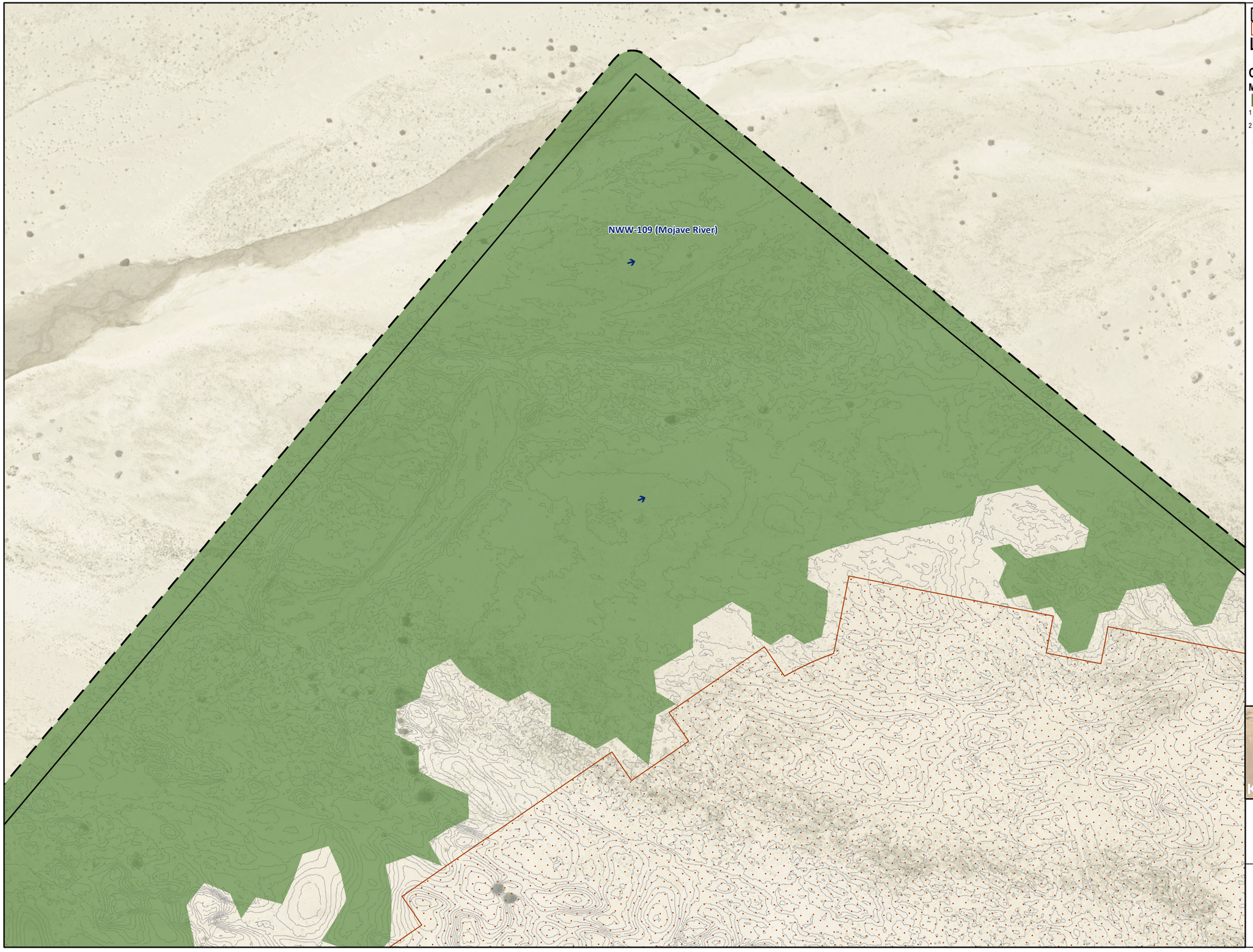
FIGURE 5.3-2Q

**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Mojave River Extent (607.04 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

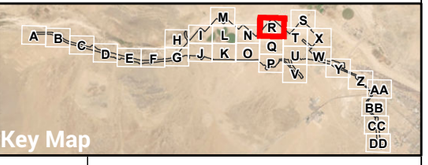



FIGURE 5.3-2R

**CDFW Jurisdictional Aquatic Resources Impacts**

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

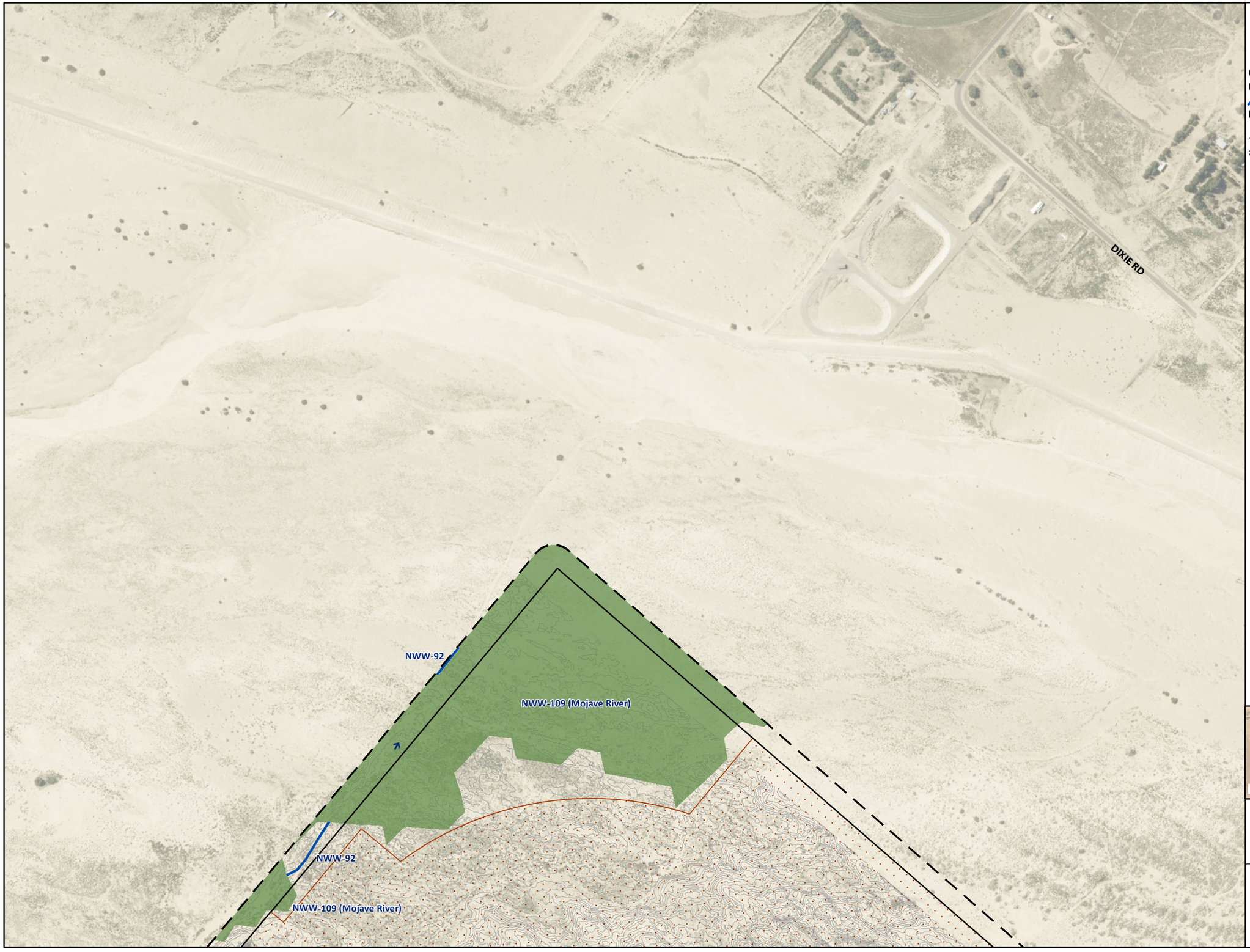
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
7'-10'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

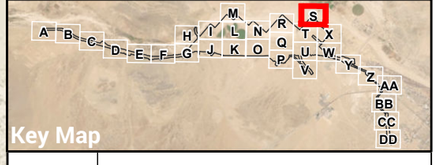


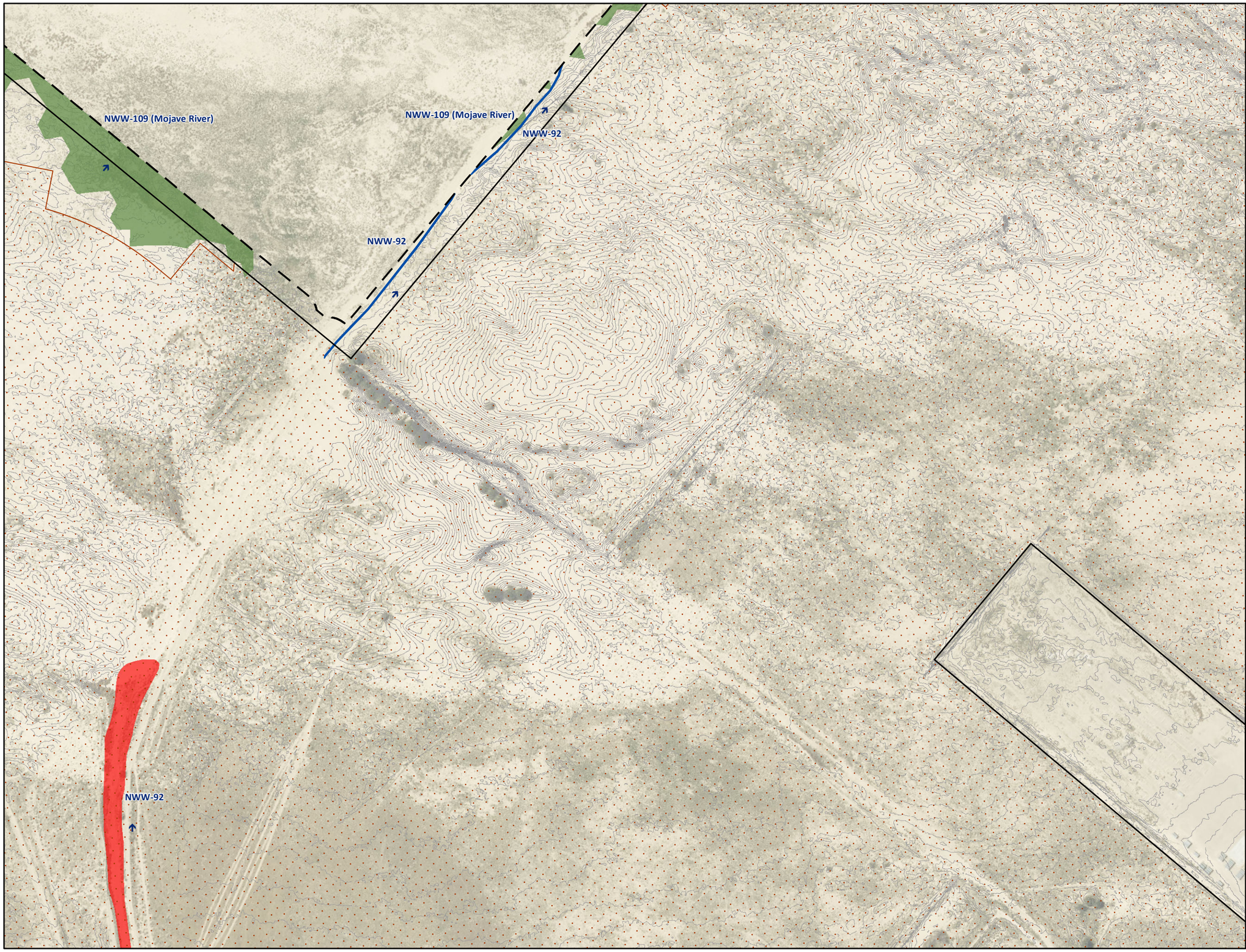

FIGURE 5.3-2S

**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
7'-10'
>30'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 5.3–2T

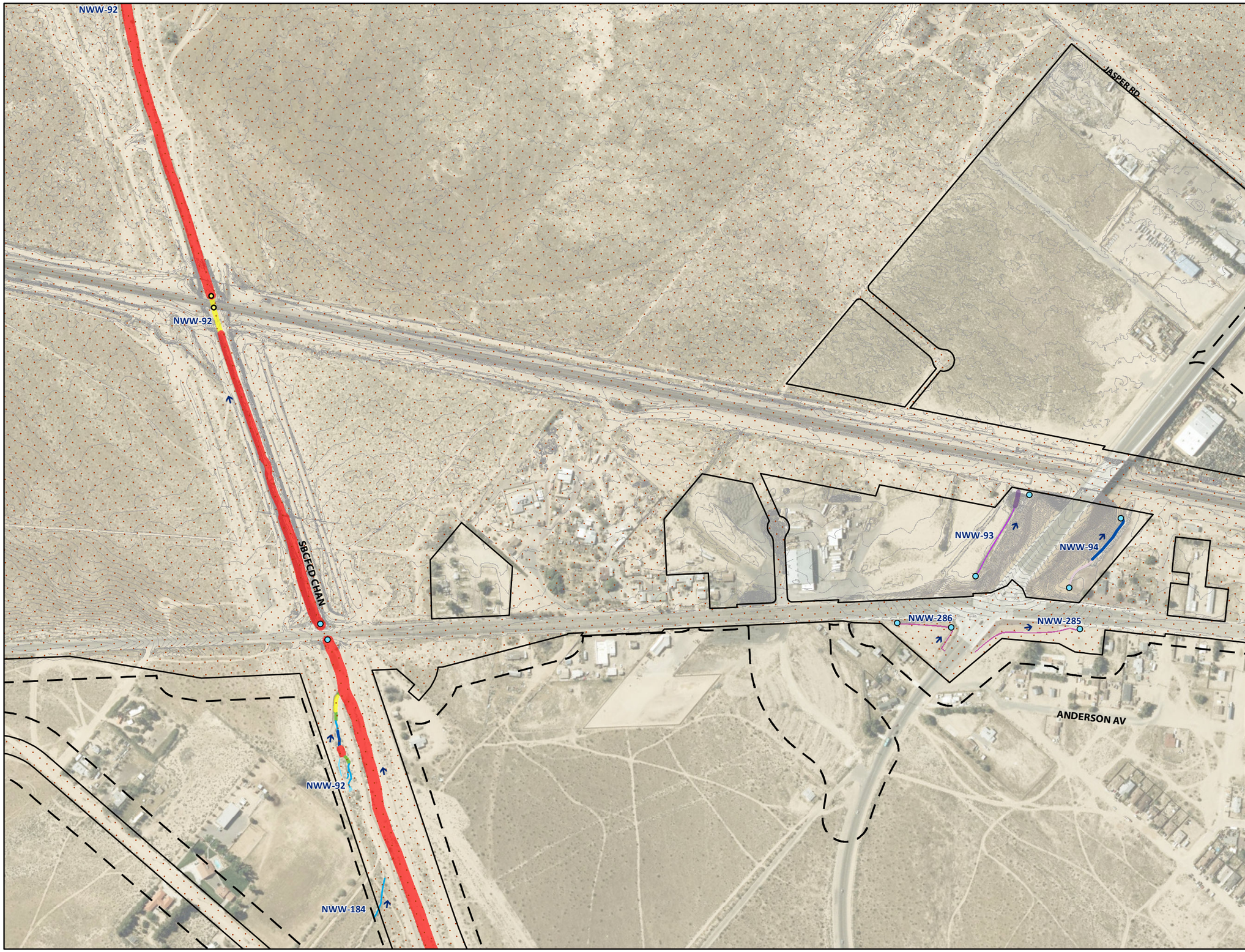
# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
>30'

**Unvegetated Streambed - Rip-Rap (0.06 ac)[1] (widths)[2]**
3'
20'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**
10'-15'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 5.3-2U

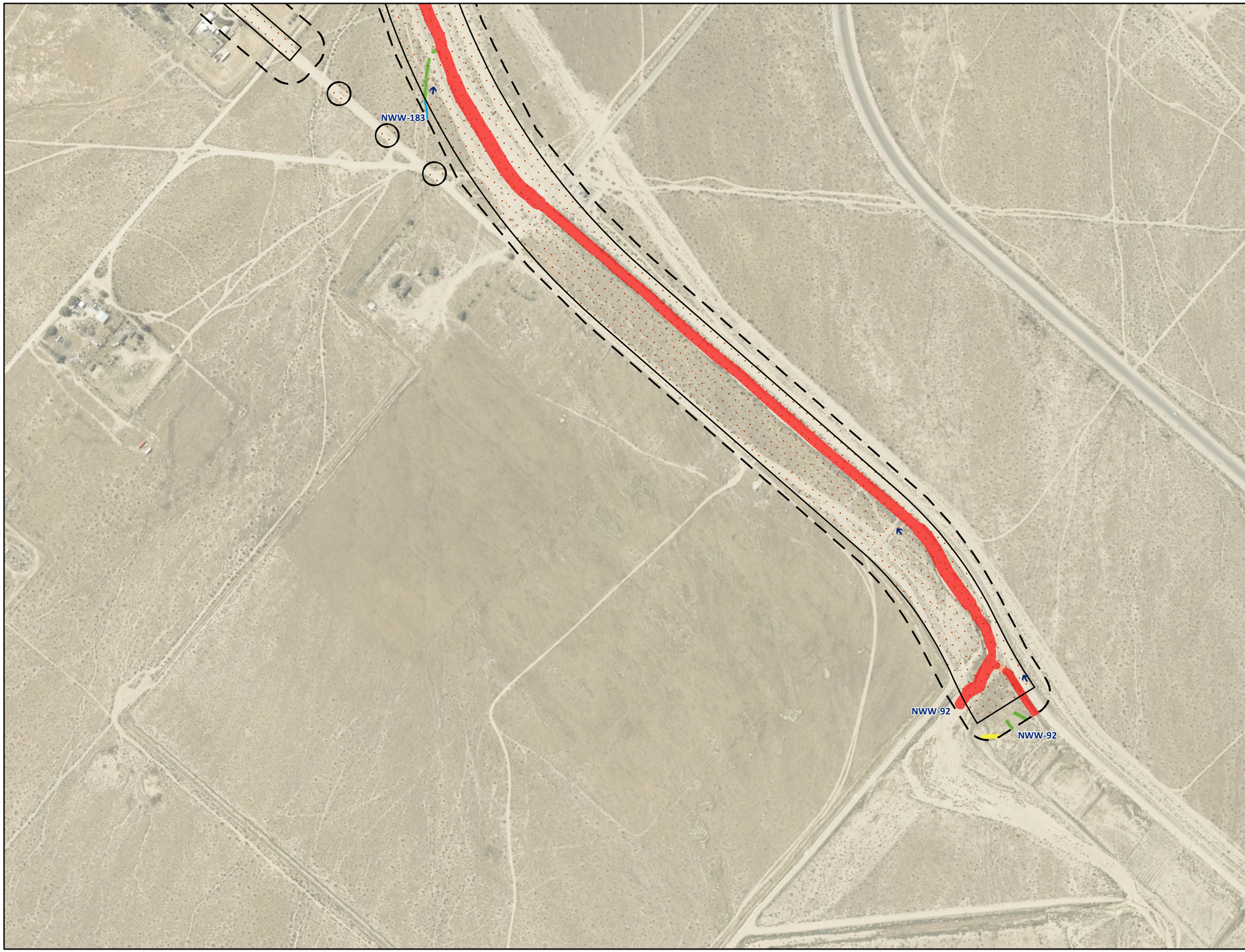
# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

4'-6'
11'-15'
16'-21'
22'-30'
>30'

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
5.3-2V

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Vegetated Streambed (0.28 ac)[1] (widths)[2]**
- 4'-6'
- 7'-10'
- 11'-15'

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
- 1'-3'
- 4'-6'
- 7'-10'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

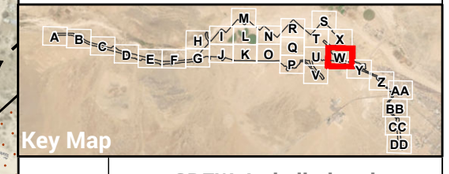



FIGURE 5.3–2W

**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW INTERNATIONAL GATEWAY PROJECT

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]

[1] Represents total acreage for survey area.

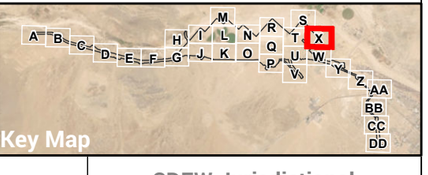



FIGURE
5.3-2X

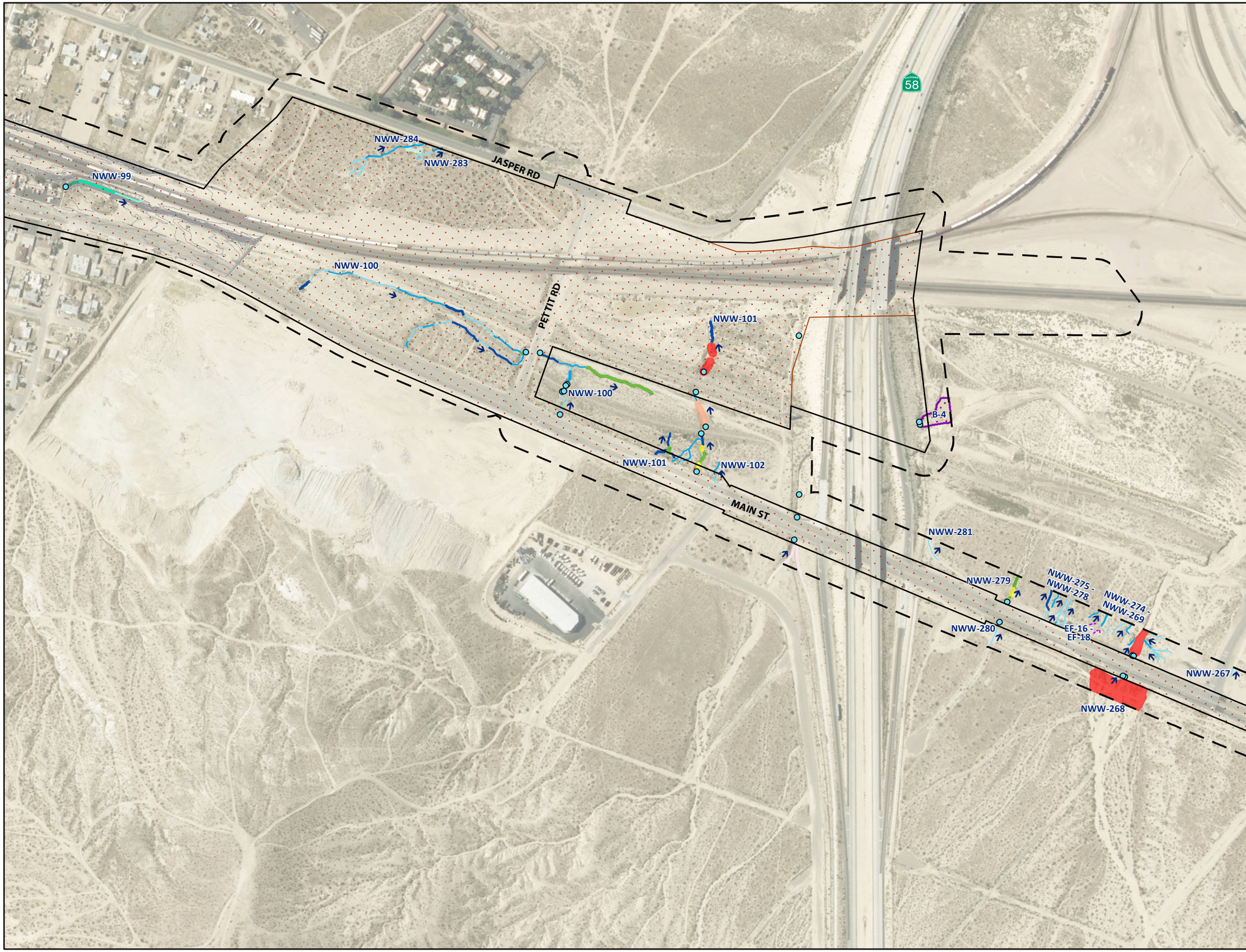
**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## CDFW Streambed and Watercourse

**Vegetated Streambed (0.28 ac)[1] (widths)[2]**
- 4'-6'
- 7'-10'
- 11'-15'

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 22'-30'
- >30'

**Watercourse (57.03 ac)[1]**
- Watercourse

## Other Features[3]
- Erosional Feature
- Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE 5.3-2Y

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

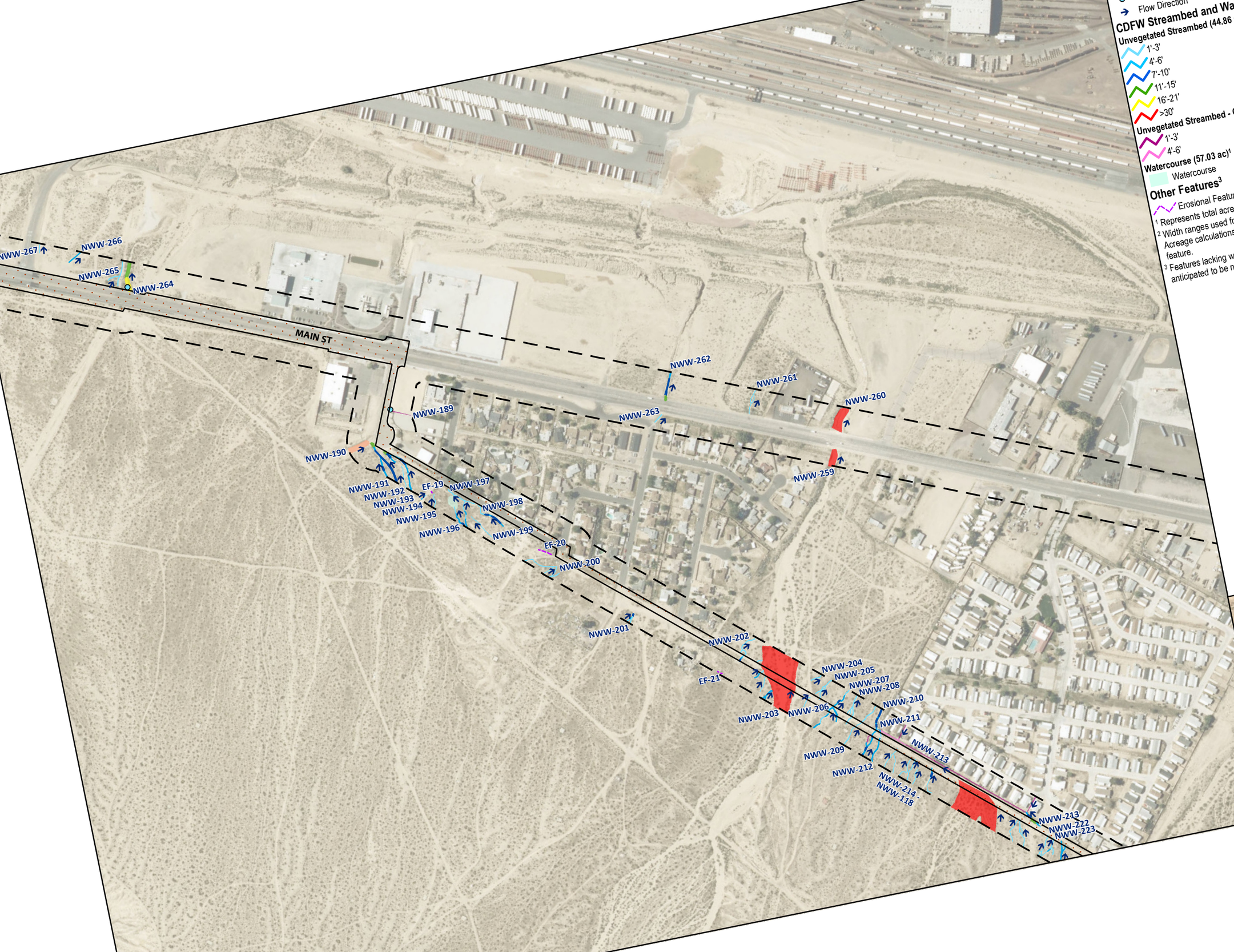
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri, 2024




Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- >30'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**

- 1'-3'
- 4'-6'

**Watercourse (57.03 ac)[1]**

- Watercourse

**Other Features[3]**

- Erosional Feature

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




Key Map

FIGURE 5.3-2Z

CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJE

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino Count

MAIN ST

SANTA CRUZ ST

NWW-213
NWW-222
NWW-223
NWW-224
NWW-225
NWW-227
NWW-229
NWW-228
NWW-230
NWW-231
NWW-232
NWW-233 - NWW-240
NWW-241
NWW-242
NWW-258
NWW-257
NWW-256
EF-22
B-5
NWW-255
NWW-254

15

Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**
1'-3'

**Other Features[3]**
Erosional Feature
Basin

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking wetland indicators or OHWM, and thus anticipated to be non-jurisdictional.




FIGURE
5.3-2AA

**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

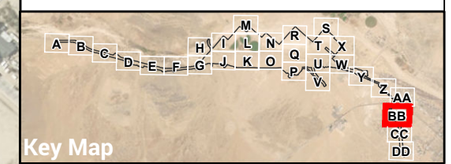


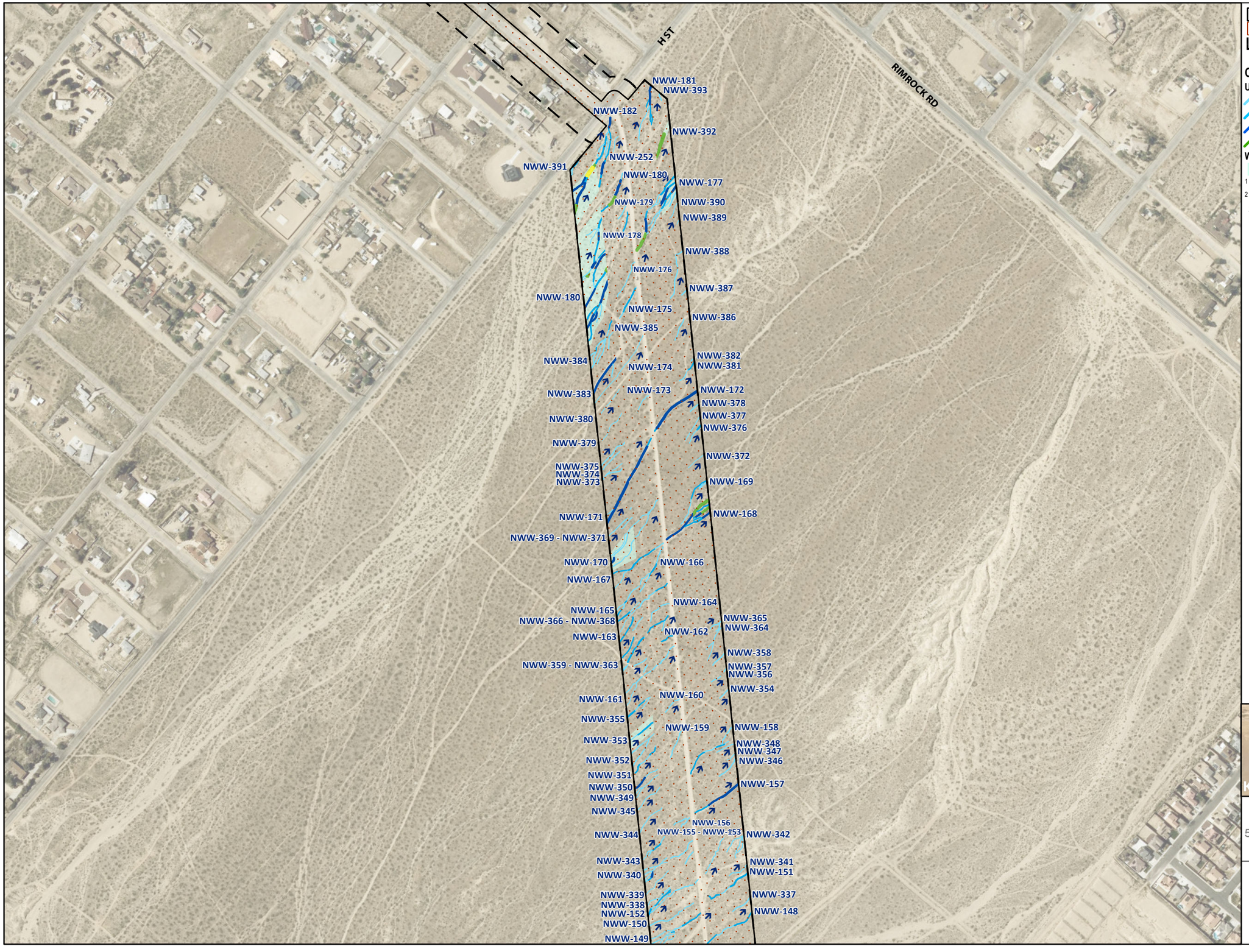

FIGURE
5.3-2BB

**CDFW Jurisdictional Aquatic Resources Impacts**
BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET
N

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**

1'-3'
4'-6'
7'-10'
11'-15'

**Watercourse (57.03 ac)[1]**

Watercourse

[1] Represents total acreage for survey area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

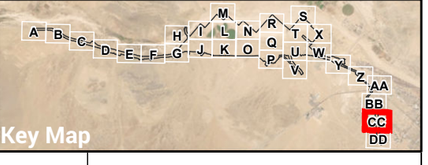



FIGURE 5.3-2CC

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW INTERNATIONAL GATEWAY PROJECT

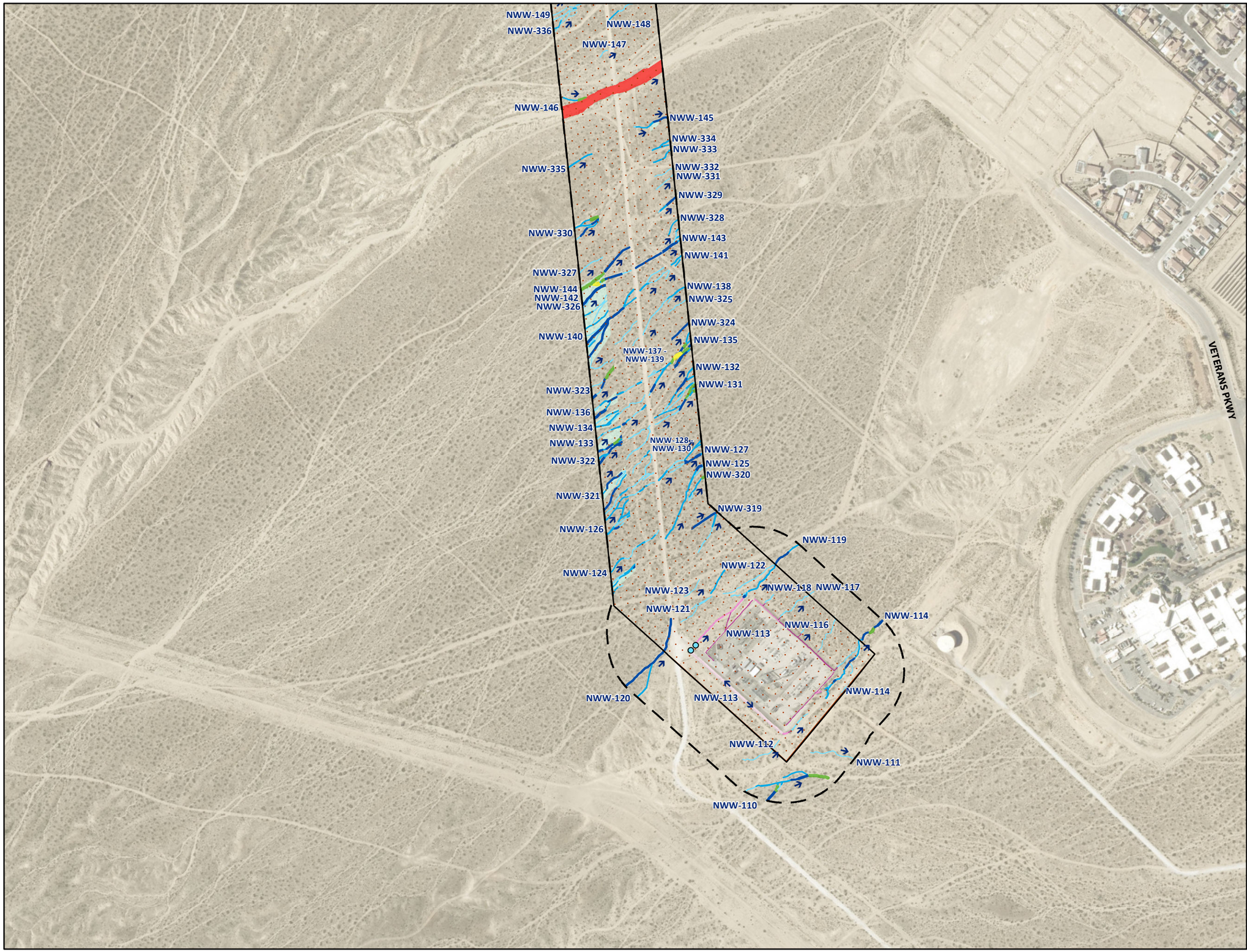
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/29/2025

Aerial Photo: San Bernardino County, Esri, 2024




Project Site
Impact Footprint
Review Area (5800.90 ac)[1]
Culvert
Flow Direction

## CDFW Streambed and Watercourse

**Unvegetated Streambed (44.86 ac)[1] (widths)[2]**
1'-3'
4'-6'
7'-10'
11'-15'
>30'

**Unvegetated Streambed - Concrete (1.18 ac)[1] (widths)[2]**
1'-3'
4'-6'
10'-15'

**Watercourse (57.03 ac)[1]**
Watercourse

[1] Represents total acreage for survey area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE
5.3-2DD

# CDFW Jurisdictional Aquatic Resources Impacts

BARSTOW
INTERNATIONAL GATEWAY PROJECT

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/29/2025
Aerial Photo: San Bernardino County, Esri, 2024

| Table 15: Potential Aquatic Resource Impacts | | | |
|---|---|---|---|
| **Agency** | **Aquatic Resource Type** | **Maximum Acres** | **Linear Feet** |
| USACE | Non-Wetland Waters of the U.S. | 31.57 | 219,252 |
| | Total USACE Aquatic Resources Impacts[1] | **31.57** | **219,252** |
| RWQCB | Non-Wetland Waters of the U.S./State | 31.57 | 219,252 |
| | Total RWQCB Aquatic Resources Impacts[1] | **31.57** | **219,252** |
| CDFW | Vegetated Streambed | 7.97 | 219,252 |
| | Unvegetated Streambed | 38.71 | |
| | Watercourse | 57.86 | N/A[2] |
| | Total CDFW Aquatic Resources Impacts[1] | **104.54** | **219,252** |

[1] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.
[2] Linear feet not calculated for watercourse to avoid redundant linear foot calculation where such areas overlap with streambed.

The build-out of BIG includes improvements to Hinkley Road Bridge and Lenwood Channel. The existing Hinkley Road Bridge will be widened such that the channel width beneath the bridge would be widened. Additionally, Lenwood channel will also be widened by approximately 60 to 100 feet for a length of approximately 1.1 miles to improve flooding compared to existing conditions. It is anticipated that these project components will result in the creation of waters jurisdictional by USACE, RWQCB, and CDFW. The exact acreage of the and extent of the additional waters resulting from the construction of BIG will be determined in review of the final design of BIG.

### *Operations & Maintenance – Direct and Indirect Impacts*

The increased amount of impervious surface area proposed would increase the flow rate of stormwater runoff and runoff from operations (e.g., washdown, maintenance, etc.) within BIG. Permanent stormwater infrastructure that would be constructed and operated include curb and gutter in roadways, underground stormwater conveyance infrastructure, inlets and catch basins, and on-site detention basins would contain runoff within the BIG footprint and prevent downstream runoff. Additionally, BMPs (MM BIG BIO-30) related to avoiding water quality impacts on jurisdictional aquatic resources would continue to be applied (e.g., no equipment maintenance or fueling should be performed within 100 feet of jurisdictional waters, where petroleum products or other pollutants from the equipment may enter these areas). Direct and indirect impacts to drainage patterns and water quality of jurisdictional aquatic resources upstream of BIG would not occur during operations and maintenance. Therefore, additional direct and indirect impacts on water quality and drainage patterns within jurisdictional aquatic resources are not anticipated during operations and maintenance of BIG.

MM BIG BIO-29 includes that compensatory mitigation for permanent and temporary impacts on jurisdictional aquatic resources are monitored and maintained to established performance standards in perpetuity. Therefore, after compliance with USACE IP, RWQCB, and/or CDFW requirements, including the associated compensatory mitigation, BIG would result in a less than significant impact on jurisdictional aquatic resources.

***Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?***

## Wildlife Corridor Impacts

### *Construction – Direct and Indirect Impacts*

#### Local Wildlife Movement

Direct impacts on localized wildlife movement could occur because of the destruction of habitat supporting dispersal within the BIG footprint. Project implementation would require removal of up to approximately 3,096 acres of natural habitat, which could displace local species moving within BIG during construction. However, various measures will be implemented to relocate wildlife off-site into areas of suitable habitat:

- Biological monitors will be present during all ground-disturbing activities with the authority to halt work should any wildlife be encountered during construction. Biological monitors would be responsible for moving wildlife out of harm's way (MM BIG BIO-3).
- Desert tortoise encountered during pre-construction clearance surveys will be translocated off site with the implementation of a desert tortoise translocation plan (MM BIG BIO-14).
- Burrowing owls encountered prior to and during construction will be relocated with the implementation of a Burrowing Owl Plan and compliance with CESA ITP conditions (MM BIG BIO-21).
- Mojave fringe-toed lizard encountered during construction will be relocated out of harm's way (MM BIG BIO-23).
- Non-natal American badger and desert kit fox dens would be passively excluded during construction (MM BIG BIO-26).

Additionally, temporary fencing, such as construction fencing, silt fencing, and desert tortoise exclusion fencing has the potential to restrict the movement of wildlife through BIG during construction. However, existing obstructions within and around BIG already prevent wildlife species from traveling into and through a majority of the site. The site is bound by National Trails Highway along the south, fragmenting BIG from larger blocks of undeveloped natural habitat southward. As such, the highway, both with its paved surface and volume of vehicular traffic, prevents the successful crossing of the roadway and dispersal into the project site. The site itself is also bisected by the existing raised track, further affecting patterns of movement between the northern and southern portions of BIG.

Culverts and vehicular crossings underneath the railway may also facilitate the movement of wildlife. Currently, five culverts and crossings along the railway (Mile Post [MP] 10.9, MP 10.06, MP 8.9, MP 8.2, and MP 7.0) occur in areas where development will severely limit their function as wildlife crossings. These structures will be removed (MP 7.0) and/or replaced with structures not favorable for wildlife movement (e.g., approximately 3,100-foot-long box culverts at MP 8.2 and MP 8.9; and 480-foot long culverts at MP 10.9B) and are sited in the middle of the block swap yard and container yard. Species likely to use these

culverts pre-construction for dispersal and travel between larger blocks of habitat are medium-sized mammals with larger home ranges such as coyote, desert kit fox, American badger, and bobcat; these species were documented during the wildlife movement study (**Attachment GG**). However, with the removal of these potential wildlife crossings, these species would still utilize other areas within BIG to travel through the project site. These other areas where these species were documented during the wildlife movement study include Lenwood Channel, and various culverts and openings along the southwestern lead track extension (**Attachment GG**). These crossings (vehicle crossings, culverts, channels, and river corridors) would be impacted during construction due to improvements to support BIG, such as the construction of the southwestern lead track and the associated culvert modifications, the widening of Hinkley Road Bridge, and the widening of Lenwood Channel. However, these impacts are considered temporary as the structures would continue to support wildlife movement and dispersal in their post-construction condition. For example, the vehicle crossings at MP 14.3 and 16.4 would remain after construction. During construction, the implementation of the appropriate avoidance and minimization measures, such as MM BIG BIO-26, would allow for the dispersal of wildlife that utilize the crossings into areas of adjacent habitat where the species would still persist until they can return to BIG crossing structures following construction.

A wildlife crossing at MP 12.5 is incorporated into the design of the project to mitigate potential impacts on wildlife movement (MM BIG BIO-32). The aquatic features associated with the Lenwood Channel and Hinkley Road Bridge improvements will also be slightly widened following construction and will continue to function as unobstructed corridors. Furthermore, the medium-sized wildlife anticipated to use structures and corridors within BIG to travel between larger blocks of habitat are not migratory species and therefore, do not travel through BIG en route to seasonal breeding grounds or nursery sites; temporary impacts to the existing wildlife crossing structures will not result in a disruption to wildlife migration patterns.

Due to existing manmade barriers within and surrounding BIG, wildlife movement through the site is largely restricted; both the railway and National Trails Highway would deter animals from moving onto the site from adjacent areas during construction. However, as wildlife may still occur and move through fragmented landscapes such as BIG, various features and measures will be implemented to avoid, minimize, and mitigate potential direct impacts on wildlife movement corridors. Wildlife moving through BIG would be flushed or relocated to adjacent natural areas to help prevent collisions with construction equipment. A wildlife crossing will be constructed at MP 12.5 to connect areas of natural habitat on either side of the railway. Wildlife movement will also continue to function at key areas following construction, including through Lenwood Channel, under the Hinkley Road Bridge through the river corridor, and at various locations along the southwestern lead track extension. Although wildlife movement through the middle of the block swap yard and container yard would be directly impacted from BIG construction, animals that would use these areas to travel between blocks of natural habitat would continue moving through the remaining maintained structures. Considering the pre- and post-construction conditions of BIG and with the implementation of the associated mitigation measures, direct impacts on local wildlife movement would be less than significant.

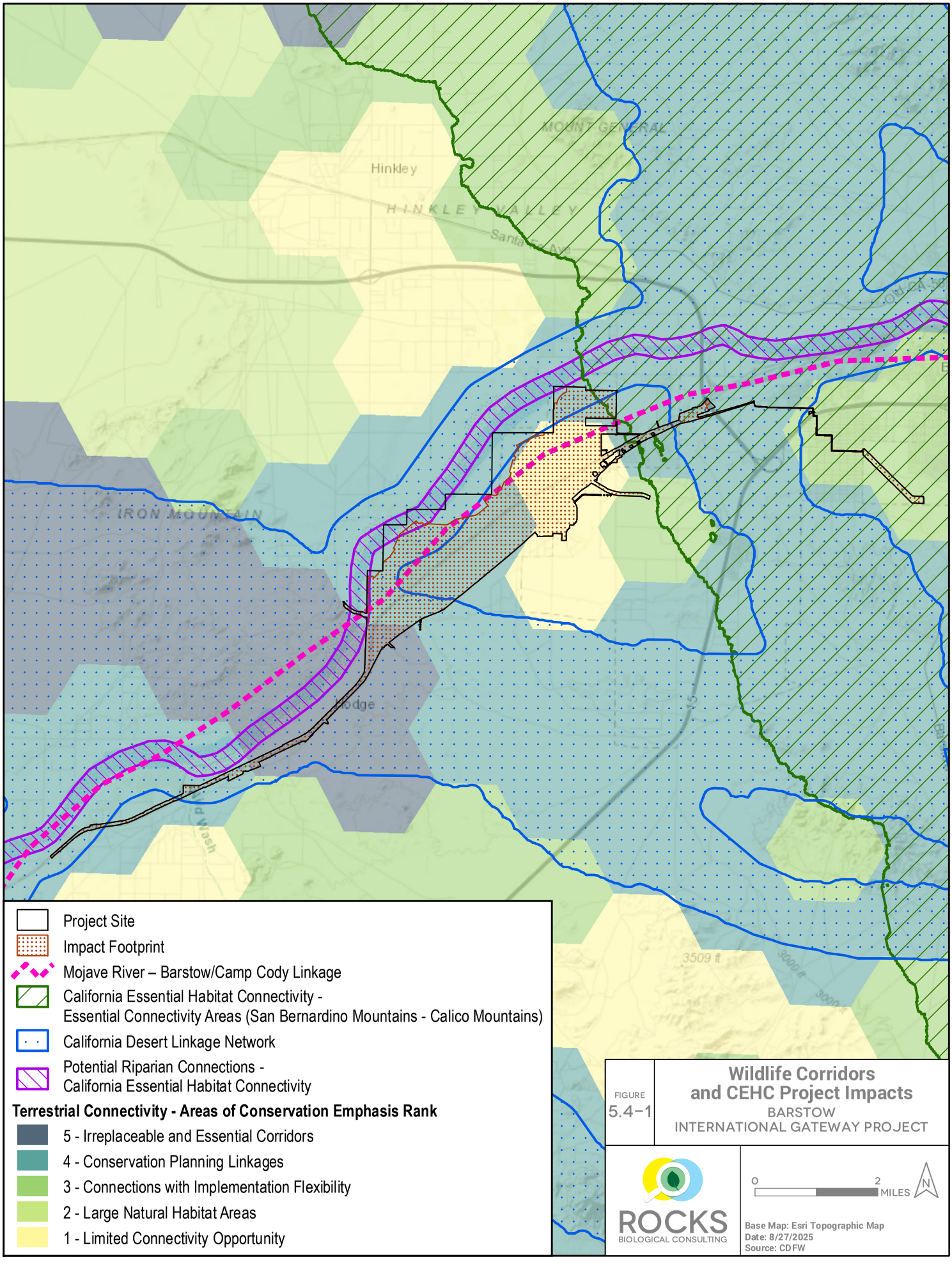
Indirect impacts on localized wildlife movement include but are not limited to the reduction in local gene flow that may occur due to the initial habitat fragmentation and loss of connectivity. Loss of connectivity could also lead to wildlife movement through disturbed areas immediately adjacent to the BIG footprint where there is greater risk of harassment, injury, and/or death due to increased human-wildlife encounters. These encounters may also include vehicle strikes due to the temporary fencing being installed along National Trails Highway. These direct and indirect impacts are potentially significant because they could disrupt localized movement between foraging areas, water sources, breeding grounds, and refuges and result in an overall reduction of gene flow within the project vicinity. However, BIG is already fragmented from larger blocks of habitat due to condition of National Trails Highway and the railway bisecting the project site. These existing obstructions deter wildlife from crossing into BIG, limiting the amount of genetic exchange than can occur between populations. Larger animals, such as coyotes, desert kit fox, and bobcat, would still be able to utilize other areas within the project site to travel between blocks of natural habitat, such as Lenwood Channel, the wildlife crossing designed at MP 12.5, and other vehicle-sized crossings along the lead track. Additionally, the medium-sized species utilizing the crossing structures are not migratory nor seasonally dependent on BIG for travel to breeding grounds. Therefore, indirect impacts on local wildlife movement due to construction would be less than significant.

### *Mapped Wildlife Corridors and Connectivity Areas*

Portions of the BIG footprint also serve as a corridor facilitating movement between larger blocks of natural habitat in the region. The following mapped corridors and linkages overlap with the BIG footprint and have the potential to be impacted: Ranks 1,3, 4 and 5 ACEs, CEHC California Desert Linkage Network, CEHC Potential Riparian Connection, and the Mojave River – Barstow/Camp Cody Linkage identified in the *Missing Linkages* project (Figure 5.4-1. Wildlife Corridor Impacts; CDFW, 2025g; CEHC, 2003, 2017; SCCW, 2014; Penrod et. al., 2001). Similar to the impacts associated with local wildlife movement, direct impacts to regional wildlife connectivity resulting from the removal of natural habitat within the BIG footprint may affect natural wildlife behavior by altering corridor conditions and potentially causing wildlife to avoid these areas, obstructing connectivity and movement between natural habitat blocks in the region. As a result, the natural landscape blocks in the region may have restricted populations of wildlife species.

Within the Terrestrial Connectivity ACE dataset, the northeastern portion of BIG is modeled as less valuable (Rank 1), likely due to the existing semi-rural and suburban development, and would not offer substantial conservation value (Figure 5.4-1). Southwestward, portions of the transload warehouse center, containing yard, block swap yard, intermodal facility, and southern extent of the southwestern lead track extension are modeled as Rank 3 and 4 and are considered connections with implementation flexibility and conservation planning linkages, respectively, however, this area of BIG already has limited value as a conservation area between larger blocks of habitat beyond the site with the obstructions of the existing railway and National Trails Highway. A portion of the southwestern lead track extension occurs within a Rank 5 Irreplaceable and Essential Corridor; however, the proposed lead track extension occurs within the rail right-of-way and does not impact additional lands planned for conservation or lands with conservation value within areas mapped as Rank 5 (Figure 5.4-1).

Other mapped corridors in the region include the Mojave River as a CEHC Potential Riparian Connection and the Mojave River – Barstow/Camp Cody Linkage identified in the *Missing Linkages* project. The project


Hinkley
HINKLEY VALLEY
MOUNT GENERAL
IRON MOUNTAIN
Lodge
3509 ft
Project Site
Impact Footprint
Mojave River – Barstow/Camp Cody Linkage
California Essential Habitat Connectivity -
Essential Connectivity Areas (San Bernardino Mountains - Calico Mountains)
California Desert Linkage Network
Potential Riparian Connections -
California Essential Habitat Connectivity
Terrestrial Connectivity - Areas of Conservation Emphasis Rank
5 - Irreplaceable and Essential Corridors
4 - Conservation Planning Linkages
3 - Connections with Implementation Flexibility
2 - Large Natural Habitat Areas
1 - Limited Connectivity Opportunity
FIGURE
5.4-1
Wildlife Corridors
and CEHC Project Impacts
BARSTOW
INTERNATIONAL GATEWAY PROJECT
ROCKS
BIOLOGICAL CONSULTING
0
2
MILES
N
Base Map: Esri Topographic Map
Date: 8/27/2025
Source: CDFW

was designed to avoid direct impacts on the Mojave River. The Hinkley Road Bridge will be constructed to span a greater distance across the river, and impacts associated with bridge improvements are considered temporary for the purposes of wildlife corridor impacts. The Mojave River corridor will remain unobstructed following construction and its function as a wildlife corridor and linkage (as mapped) would remain. Portions of the mapped California Desert Linkage Network also overlap with the project; the Mojave River is included in this layer but will not lose its function as a linkage as previously discussed. Although the southwestern portion of BIG will be developed in an area also mapped within the California Desert Linkage Network, connectivity of mapped areas north and south of the railway in proximity to the southwestern lead track extension are already constrained by the existing railway.

Although much of the potential impacts to mapped wildlife corridors and linkages are not anticipated to be substantially greater due the existing railway and avoidance of the Mojave River, a wildlife crossing will be constructed at MP 12.5 (MM BIG BIO-32) which would facilitate movement between landscapes of suitable habitat on either side of the crossing. The MP 12.5 crossing is consistent with the purpose of maintaining or creating linkages as intended with the California Desert Linkage Network, as well as facilitating access to the Mojave River corridor and beyond from the south of the railway. Therefore, direct impacts on mapped regional corridors and linkages would be less than significant.

Indirect impacts on regional wildlife corridors could occur as a result of elevated noise, dust, and lighting; site runoff into aquatic resources; and the introduction of invasive, non-native plant species. However, indirect impacts on wildlife movement and corridors that could occur during project construction will be avoided and minimized:

- Noise attenuation best practices shall be implemented during construction, such as the use of temporary noise barriers to reduce noise levels at or below 80 dBA $L_{eq}$ as described in GPU NOI-1 (EIR Appendix 5.12).
- A fugitive dust control plan shall be implemented and includes measures such as watering exposed surfaces and unpaved roads at least three times a day, suspending dust-generating activities when average wind speed exceeds 25 miles per hour, and watering or presoaking all land clearing, grubbing, scraping, excavation, and demolition activities as described in MM BIG AQ-1 (EIR Appendix 5.3).
- To reduce impacts on wildlife from nighttime construction and lighting, additional measures will be incorporated for nighttime construction per a Nighttime Construction and Lighting Plan (MM BIG BIO-4 and MM BIG BIO-8). Nighttime work would be restricted to certain areas already disturbed, follow reduced speed limits, and lighting would be shielded and directed away from adjacent habitat areas (MM BIG BIO-4 and MM BIG BIO-8).
- A Storm Water Pollution Prevention plan shall be implemented during construction to avoid impacts on desert tortoise adjacent to BIG related to erosion, runoff, and stormwater contaminants (MM BIG BIO-30).
- The introduction of weeds to areas adjacent to BIG has the potential to convert native habitat to disturbed habitat types unsuitable to support movement through wildlife corridors. To avoid and

minimize the spread of non-native and invasive plant species from BIG to adjacent undeveloped lands BIG shall implement an Adaptive Weed Control Plan (MM BIG BIO-6).

To further preserve the function of Mojave River, which is identified as a critical component of wildlife movement, connectivity, and conservation, approximately 500 acres of land adjacent to the river will be conserved and managed in perpetuity. Future human encroachment onto the Mojave River will be prevented by entering the adjacent lands into a conservation easement, restricting development on those lands, and identifying an entity to implement long-term maintenance and management activities on site. By limiting development adjacent to BIG, indirect impacts on the Mojave River will be avoided and minimized. The area proposed for conservation will also act as a buffer between BIG and the Mojave River and will further reduce indirect impacts from BIG construction that would influence wildlife movement through the river corridor to areas further up and downstream from BIG.

With the implementation of MMs, indirect impacts on wildlife corridors and movement during construction of BIG would be less than significant.

### *Operations & Maintenance – Direct and Indirect Impacts*

Operations and maintenance is not anticipated to result in any additional significant direct or indirect impacts on wildlife corridors; as a result, no additional MMs beyond what is presented above would be required.

***Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy, or ordinance?***

### San Bernardino County Burrowing Owl Overlay Zone

BIG is within the San Bernardino County Burrowing Owl Overlay Zone. Proposed projects located within this zone are conditioned to submit a biological resources report including the results of burrowing owl surveys, and if present, MMs to avoid or minimize impacts on burrowing owl. The County's Conditions of Approval for the project would incorporate the MMs from the biological report.

Focused burrowing owl surveys have been conducted for this project and the results of surveys are included within this biological technical report. The project would incorporate MMs to address potential impacts on burrowing owl. Therefore, BIG would meet the requirements for projects within the San Bernardino County Burrowing Owl Overlay Zone.

### San Bernardino County Code

BIG will result in impacts on plant species regulated under San Bernardino County Code Chapter 88.01: Plant Protection and Management, including plants regulated under the California Desert Native Plants Act. As previously discussed, impacts on regulated plants will be offset with the implementation of MM BIG BIO-37.

### San Bernardino Countywide Plan

As discussed above, the CWP contains biological resources-related goals and policies relevant to BIG. A primary objective of the Policy Plan is to maintain natural resources and enhance biological diversity

within the plan area, aiming to conserve suitable habitat for threatened and endangered species and facilitate mitigation through consultation with state and federal agencies. The project was evaluated for consistency with the Policy Plan's Natural Resources Element and the following three policies were identified as potentially applicable.

**Policy NR-5.5, Mitigation and Future Responsibility:** We require that new development satisfy habitat conservation responsibilities without shifting conservation responsibilities onto military property

Neither the project nor its proposed conservation sites selected for compensatory mitigation purposes include military property and would not shift any responsibilities onto military property. Therefore, BIG is consistent with this Policy.

**Policy NR-5.7, Development Review, Entitlement, and Mitigation:** We comply with federal and state regulations regarding protected species of animals and vegetation through the development review, entitlement, and environmental clearance processes

The project would not proceed until all necessary permits and authorizations have been issued by the appropriate regulatory agencies protecting plants and animals (e.g., USFWS and CDFW). In addition, the project would be required to adhere to any MMs established under these permits/authorizations.

In addition, MMs would support compliance with federal and state regulations regarding protected species of animals and vegetation. Therefore, BIG would be consistent with this Policy.

**Policy NR-5.8, Invasive Species:** We require the use of non-invasive plant species with new development and encourage the management of existing invasive plant species that degrade ecological function

The project would include preparation and implementation of an Adaptive Weed Control Plan (MM BIG BIO-6), including appropriate provisions to minimize the spread of invasive plant species and review and screening of proposed plants to identify and avoid potential invasive species. Therefore, BIG would be consistent with this Policy.

Through consultation with the USFWS and CDFW and implementation of MMs detailedbelow, BIG would be consistent with the goals and policies in the CWP that address biological resources. Therefore, the impact would be less than significant.

### City of Barstow 2020 General Plan

As previously discussed above, the Resources Conservation and Open Space Element of 2020 General Plan (2015-2020) contains biological resources-related goals, policies, and strategies relevant to BIG. A primary objective is to preserve biological resources within the plan area, aiming to conserve suitable habitat for threatened and endangered species and facilitate mitigation where impacts are unavoidable. With implementation of MMs detailed below, BIG would be consistent and does not conflict with the goals of the 2020 General Plan and impacts on biological resources would be less than significant.

***Conflict with the provisions of an adopted Habitat Conservation Plan; Natural Community Conservation Plan; or other approved local, regional, or state habitat conservation plan?***

Although the project site is located within the boundaries of the WMP, a Habitat Conservation Plan, the WMP does not apply to projects on private lands. As such, BIG would not conflict with provisions of the WMP, or any other adopted HCP, NCCP, or other approved local, regional, or state habitat conservation plan.

# 7.0 CUMULATIVE IMPACTS ON BIOLOGICAL RESOURCES

BIG, in combination with past, current, and probable future projects within proximity to BIG, has potential to result in significant cumulatively considerable biological impacts. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of likely future projects (CEQA § 21083). Cumulatively considerable impacts for BIG could include temporary and/or permanent loss or degradation of terrestrial and aquatic habitats for sensitive species, aquatic resources, and sensitive natural communities; introduction of non-native plants; habitat fragmentation and restrictions to wildlife movement which could result in decreased gene flow and genetic diversity within species; increased likelihood of wildlife collisions with vehicles; increased subsidies for the regional raven population; and increased light pollution.

However, through the environmental review process, all projects in the region would be individually required to reduce their own impacts through compensatory mitigation, as well as other MMs. Compensatory mitigation would be subject to agency approval and would be planned in consideration and proximity to other open space preserved in perpetuity to create large, undisturbed habitat blocks. Because the impacts associated with BIG would be fully mitigated as described in this document, the cumulative contribution to region-wide impacts on biological resources would be less than significant.

# 8.0 MITIGATION MEASURES

The following discussion provides project-specific MMs for potential impacts on sensitive biological and aquatic resources. These MMs would help avoid, minimize, or reduce the potential direct and indirect impacts on biological and aquatic resources identified within this report. The successful implementation of these measures would significantly decrease the project's degree of effects on sensitive biological and aquatic resources. Please note that these MMs are recommendations, and the resource agencies may identify additional required measures/conditions during the permitting process. When an implementing entity is specified as carrying out an MM, it is assumed that BNSF, or its contractor or agent, is implementing the MM under the supervision of Designated Biologists (CDFW-approved qualified biologist; DBs), as appropriate.

## *Mitigation Measures*

### Worker Environmental Awareness Program and Training

**MM BIG BIO-1:** Prior to construction mobilization, DBs shall prepare a WEAP, including a training presentation and key fact sheet, to train construction crews to be aware of and recognize sensitive biological resources that may be encountered within, or adjacent to, the BIG footprint as well as measures

required to minimize and avoid impacts to such resources. The WEAP training materials shall be submitted to the City for review.

Prior to start of construction mobilization, the DBs or BMs shall provide the approved WEAP training materials, including but not limited to the key fact sheet, to all construction personnel before their commencement of work on BIG. The fact sheet shall be provided to construction personnel in other languages, as necessary, to accommodate non-English speaking workers. Additionally, prior to beginning construction work, all construction personnel shall attend the WEAP training presentation. A refresher WEAP training shall be completed annually thereafter during construction.

At a minimum, WEAP training materials reviewed during the training shall include the following information:

- Key provisions of the FESA, CESA, the MBTA, CFGC § 1600, Porter-Cologne, and the CWA as they relate to BIG;
- Potential consequences and penalties for violation or noncompliance with these laws, regulations, and associated permits;
- General information and identification and characteristics of special status wildlife and plant species, jurisdictional waters, and sensitive natural communities present on and adjacent to the BIG footprint as well as the required construction footprint boundaries;
- A discussion concerning the threat of common ravens to desert tortoise and instructions to not feed wildlife or dispose of food waste in a way that could attract and provide food for ravens;
- Hazardous substance spill prevention and containment measures;
- Contact information for DBs and instructions to call in the event of the discovery of a special status species or injured or dead wildlife; and
- Relevant MMs and maps showing areas affected by resource-specific MMs, as applicable.

Upon completion of each WEAP training, each member of the construction personnel shall sign a form stating that they attended the training, understood the information presented, and agreed to comply with the WEAP training requirements. The DB or BM shall provide training updates to construction personnel, as needed.

### Biological Resource Monitoring

**MM BIG BIO-2:** At least 30 days prior to start of construction mobilization activities, the implementing entity shall submit for review and approval by USFWS and CDFW the DBs' and Species-Specific BMs' name(s) and qualifications of the DBs retained to oversee biological resource monitoring activities during BIG construction. No vegetation removal or mass grading shall begin until the implementing entity has received written confirmation from USFWS and CDFW that the DBs have been approved. A request for DB and Species-Specific BM approval shall be submitted in writing and shall include adequate information regarding the proposed DB and Species-Specific BM qualifications for a reasonable person to determine qualification status. If USFWS and/or CDFW do not respond within 30 days after a verifiable written request for DB and BM approval is submitted, the DB and/or and Species-Specific BM shall be deemed

approved. Should a new DB and/or and Species-Specific BM be necessary, the implementing entity shall seek approval through the same process as above, with the request being deemed approved after 30 days after the written request. Note that the implementing entity's selection of the General BMs does not require USFWS and CDFW approvals.

DBs shall oversee the timely implementation of all biological MMs as outlined in the project-specific Mitigation, Monitoring, and Reporting Program during construction and the applicable post-construction monitoring period as required by the City and CDFW/USFWS for permit validity. The DBs shall also be responsible for guiding and directing the BM's work. The DBs shall oversee the preparation of quarterly monitoring reports and the post-construction monitoring report summarizing compliance with BIG-specific MMs submitted to the City.

Species-Specific BMs shall be responsible for implementation of species-specific MMs for the species for which they have been approved and would report directly to a DB. Qualifications for Species-Specific BMs can be found in the species-specific MMs.

General BMs shall be responsible for conducting Worker Environmental Awareness Program (WEAP) training, facilitating implementation of general MMs, except where specified that a specific individual with specific qualifications (such as DB) must implement the MMs, conducting general compliance monitoring, and reporting on compliance monitoring activities. General BMs shall perform daily monitoring during initial vegetation removal and construction activities that result in the breaking of the ground surface. Following initial vegetation removal and construction activities, a General BM shall perform regular random checks (not less than once per week but could be required more frequently depending on the presence of special status species) to confirm that MMs are implemented. General BMs would report directly to a DB.

BMs shall confirm all MMs have been appropriately implemented; if MMs listed herein have not been executed properly, the BM has authority to stop work and the issue of non-compliance shall be corrected.

### Work Stoppage and Move Out of Harm's Way

**MM BIG BIO-3:** During all construction activities, the implementing entity shall adhere to the following guidelines:

- A DB with appropriate qualifications shall be retained to move special status species or other wildlife of low or limited mobility out of harm's way. Movement of wildlife out of harm's way shall be limited to only those individuals that would otherwise be injured or killed from BIG-related activities and shall be moved only as far as necessary to allow their safety.
- If a biological or aquatics resources issue or concern is observed during monitoring (e.g., a special status wildlife species within an active construction area), the DB or BM shall have the authority to stop work as soon as practicable and shall immediately notify the foreman and/or supervisor for the specific project activity/area. The foreman/ supervisor shall seek a timely resolution of the biological or aquatics resources issue or concern.

- If the issue or concern involves special status species, work shall not resume until the species has left the work area, or until a DB implements the appropriate species-specific measures to avoid incidental take in coordination with USFWS and/or CDFW.
- If construction personnel or BM observe a burrowing owl, desert tortoise, American badger, or desert kit fox individual or active burrow within the BIG footprint or in the vicinity of construction activities, the foreman/supervisor shall contact a DB immediately and all work in the vicinity of the animal/active burrow which could cause disturbance, injury, or mortality, shall cease until a DB or Species-Specific BM provides clearance.
- If construction personnel or a BM observe a Mojave fringe-toed lizard within the construction footprint, all work in the vicinity of the lizard which could cause disturbance, injury, or mortality, shall cease until a DB or Species-Specific BM provide clearance.
- If adverse impacts on southwestern willow flycatcher and/or yellow-billed cuckoo are documented by a Species-Specific BM, all work within 500 feet of occupied habitat, or as deemed necessary by the Species-Specific BM shall cease until a DB or Species-Specific BM provide clearance.
- If a bird nest is discovered by construction personnel, a DB shall be contacted immediately and all work within 500 feet of the nest shall cease until it can be determined if the nest is active (e.g. eggs, juveniles, and/or adults present) and, if necessary, the BM shall establish an appropriate buffer.
- If an injured wildlife species is observed within or adjacent BIG, a DB shall be notified immediately to determine if it is appropriate to release or transport the wildlife species to the nearest CDFW permitted veterinarian or rehabilitation center. The DB shall follow all relevant guidelines for sensitive species.
- If entrapped wildlife is discovered within an open excavation, project personnel shall halt work (when safe to do so) and contact a DB. Project personnel shall avoid the area to prevent disturbing the wildlife until a DB or BM provide clearance.
- If entrapped wildlife is discovered in any open pipes, culverts, and other similar structures, project personnel shall halt all work (when safe to do so) and contact a DB. Project personnel shall avoid disturbing the wildlife and shall not move the structures until a DB or BM provides clearance.

### Vehicles and Equipment

**MM BIG BIO-4:** During BIG construction, the implementing entity shall ensure that vehicle traffic within the construction limits is restricted to established roads, construction areas, and other permissible areas. Access routes (ingress and egress to the site) shall be flagged and marked, and measures shall be adopted to prevent off-road vehicle traffic into species habitats beyond the approved project limits.

If any vehicle must drive off established routes or cleared construction limits in suitable desert tortoise or burrowing owl habitat, a Species-Specific BM shall walk the vehicle path in search of desert tortoise and/or burrowing owl and confirm the species are absent from the area, prior to use of the path. The Species-Specific BM shall visually account for the route or construction site footprint plus a 15-foot buffer on each side.

During the construction phase, the implementing entity shall implement the following measures:

- Vehicles shall not exceed 25 miles per hour. Nighttime vehicle speeds will be reduced at the discretion of the DB and as described in the Nighttime Construction and Lighting Plan to be prepared per MM-BIO 8
- If special status species are present within or near BIG access routes, speed limits shall be reduced at the discretion of a DB. All personnel shall abide by the reduced speed limit within the designated area.
- A BM shall oversee the adherence to on-site speed limits within Mojave fringe-toed lizard occupied habitat during species' active periods; for the purposes of this measure the active period is defined as March through September when temperatures are above 70. The BM shall require additional speed limit signs, temporary speed bumps, or additional WEAP training to support compliance with this measure.
- All BIG and construction personnel shall stop and/or avoid wildlife that are present on roads (if safe to do so).
- BIG personnel shall not intentionally harm or harass wildlife that are present on roads.
- If wildlife are blocking vehicle and equipment access and do not move of their own volition within 10 minutes, BIG personnel shall contact a DB.
- All wildlife vehicle or equipment strikes shall be reported to a DB.
- Prior to moving a parked vehicle or staged equipment, all BIG personnel shall check under the vehicles and equipment for special-status wildlife. If wildlife is discovered under vehicles or equipment, project personnel shall halt work and allow wildlife to move safely away prior to moving vehicles or equipment. BIG personnel shall not harm or harass wildlife seeking refuge under vehicles and equipment. If wildlife does not move of their own volition within 10 minutes, project personnel shall contact a DB.
- If a vehicle or construction equipment is parked for more than 10 minutes outside of the desert tortoise exclusion fenced area within suitable desert tortoise habitat, the ground under the vehicle shall be inspected for the presence of desert tortoise before the vehicle or equipment is moved. If a desert tortoise is present, the vehicle or equipment shall not be moved until the desert tortoise moves on its own away from the vehicle or equipment. If, during construction, a desert tortoise does not move within 10 minutes, an agency-approved Species-Specific BM shall move the animal out of harm's way to a safe location no greater than 300 meters (984 feet), according to USFWS protocol.
- Drip pans shall be placed under parked (for an hour or more) or staged equipment that is near native habitat or aquatic resources that are to be avoided by BIG.

The implementing entity shall ensure that these measures have been properly communicated to all personnel associated with BIG.

### Compliance Reporting

**MM BIG BIO-5**: A DB shall report any non-compliance or unauthorized take of special-status species to the appropriate agencies within 48 hours of its occurrence. Monitoring reports that document compliance status with the MMs shall be prepared by DBs and submitted quarterly and post construction to the City. All MMs shall be implemented as stated herein except for necessary modifications approved by a qualified biologist. Failure to implement MMs shall be reported in monitoring reports.

### Weed Control and Landscaping

**MM BIG BIO-6:** Prior to the start of mobilization activities, the implementing entity would prepare an Adaptive Weed Control Plan to avoid and minimize the spread of non-native plant species from BIG to adjacent undeveloped lands during construction and operation. BIG landscape plans would be reviewed by a DB; any invasive plant species, as defined by the California Invasive Plant Council (www.cal-ipc.org), California Native Plant Society (www.cnps.org) or similar, will be prohibited. Provisions of the Adaptive Weed Control Plan may include the following: a) installation of container plants and/or hydro-seeding areas adjacent to existing, undisturbed native vegetation areas with native plant species that are common within adjacent areas; and b) review and screening of proposed plants to identify and avoid potential invasive species; and c) weed removal during the initial planting of landscaped areas; and d) methods to survey for and treat weeds during BIG construction and operations, particularly in disturbed areas after native vegetation and soils removal where weeds can quickly establish; and e) weed controls for heavy equipment that come onto the site, e.g., track outs, all equipment pieces are delivered clean as confirmed via inspection, etc. Any site landscaping shall use water-wise concepts, including drought-tolerant vegetation and native vegetation to the greatest extent feasible. To prevent weeds growing as a result of available water (and further ameliorate the water demands of BIG), water efficient and targeted irrigation systems (such as drip irrigation with a smart controller) shall be installed where necessary in lieu of traditional watering methods. Furthermore, BNSF would comply with 49 CFR § 213 which includes prohibitions and requirements regarding vegetation growth within and adjacent to the rail right-of-way.

### Delineation of Construction Work Limits

**MM BIG BIO-7:** To prevent inadvertent disturbance to areas outside the delineated construction work areas, prior to start of all construction activities, including equipment staging and maintenance and vegetation removal, the implementing entity shall clearly delineate the construction work limits (e.g., installation of flagging, staking, or other delineation methods approved by a DB), and require construction personnel not to go beyond the delineated areas. All construction work would be conducted within the delineated construction work limits, which would be maintained throughout BIG construction.

Should temporary visibility construction fencing be installed to delineate the construction work limits, that do not allow for dispersal of wildlife from construction work limits into adjacent undeveloped lands, a BM will check the perimeter fence at the beginning of each work day. The implementing entity would consult with approved DBs to confirm that marking of construction boundaries are adequate to prevent unauthorized access beyond the limits of work while facilitating wildlife escape from active construction areas

### Nighttime Work and Lighting

**MM BIG BIO-8:** Nighttime construction shall minimize impacts on wildlife habitat by using the following methods to be described in a Nighttime Construction and Lighting Plan and submitted to the City for review:

- Conduct nighttime work only within the boundaries of previously disturbed, cleared and grubbed areas;
- Observe slower vehicle speeds at nighttime at the discretion of the DB;
- Shield and direct nighttime lighting to avoid illuminating wildlife habitat, including movement corridors and bat roosts;
- When work safety considerations allow, use the minimum lighting levels approved by the Occupational Safety and Health Administration pursuant to 29 CFR 1926.56 for general construction (i.e., 5 foot-candles or 54 lux);
- Use low beams or turn off headlights when safety considerations permit; and
- Minimize the duration of lighting by using remote monitoring systems or other methods to allow security of the construction site during hours it is not in use.

### Wildlife Entrapment

**MM BIG BIO-9:** At the end of each workday during construction, the implementing entity's construction personnel shall cover all excavated, steep-sided holes or trenches more than eight inches deep and that have sidewalls steeper than 1:1 (45 degree) slope with plywood or similar materials, or provide a minimum of one escape ramp per 100 feet of trenching (with slopes no greater than 3:1) constructed of earth fill or wooden planks. A BM shall thoroughly inspect holes and trenches for trapped animals before they are covered or filled and/or if the work area is inactive for more than 24 hours.

The implementing entity's construction personnel shall screen, cover, or elevate at least one (1) foot above ground, construction pipe, culverts, or similar structures with a diameter of three (3) inches or greater that are stored outside overnight. These pipes, culverts, and similar structures shall be inspected by the General BM for wildlife before such material is moved, buried, or capped.

Construction pipe, culverts, or similar structure with a diameter greater than three inches that is stored less than eight inches above ground, located outside of desert tortoise exclusion fencing, and left unattended for more than 24 hours when desert tortoise is active (i.e., early March through early June and September through early November) shall be inspected for desert tortoise by an agency-approved Specifies-Specific BM before the material is moved, buried, or capped. As an alternative, all such structures shall be capped or placed on pipe racks.

### Trash Abatement

**MM BIG BIO-10:** The implementing entity or its contractor shall allow that fully covered trash receptacles that are animal-proof and weather-proof are used to contain all "micro-trash" (e.g., screws, nuts, washers), food scraps, food wrappers, and other miscellaneous trash. Receptacles shall be emptied at least once a week, to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.

### Dead Wildlife Disposal

**MM BIG BIO-11:** During construction, and ongoing during operations, the implementing entity shall remove any dead wildlife found on the BIG footprint, as practical, to reduce attraction of opportunistic predators. Dead and injured wildlife shall be promptly reported to a DB and handled and removed in accordance with any applicable project permits and plans.

### Domestic Dogs

**MM BIG BIO-12:** The implementing entity shall not permit pet dogs in active project areas. Service animals are exempt from this prohibition.

### Desert Tortoise Clearance Surveys

**MM BIG BIO-13:** Prior to construction mobilization activities, desert tortoise exclusion fencing shall be installed and maintained to avoid take of desert tortoise, including destruction of nests or their potential habitat in the impact footprint, where individuals are known to occur, recent sign has been observed, or construction activities have the potential to result in take. A Species-Specific BM shall be present during exclusion fence installation. Desert tortoise exclusion fencing in desert tortoise habitat shall be constructed to standards outlined in Chapter 8 of the Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii) (USFWS, 2009b) and shall be used to delineate the area. The desert tortoise exclusion fencing shall be maintained and monitored daily during the desert tortoise activity period (i.e., early March through early June and September through early November) to allow for fencing to be maintained in good condition, and to determine if tortoises are "trapped" along the fencing searching for a way to access the other side. Outside of the desert tortoise activity period, fence inspections shall occur at least once weekly by a Species-Specific BM. If failures in the exclusion fence are documented, desert tortoise clearance surveys shall be repeated for affected areas. At the discretion of the DB, Desert tortoise exclusion fencing design shall incorporate areas of shade and/or predation protection (e.g., artificial burrows) in the event a desert tortoise becomes trapped along the fence.

Desert tortoise guards, or other agency approved design, shall be installed and connected to the exclusionary fencing at construction area entry points to prohibit desert tortoise from crossing into the construction right-of-way. The desert tortoise guard shall have a clear escape route away from construction activity for any desert tortoise that should fall into the guard. The guard shall be inspected daily by a BM for desert tortoise and to confirm the escape route is free of obstruction and debris.

Immediately following the installation of desert tortoise exclusion fencing, Species-Specific BMs approved by the agencies in accordance with the Desert Tortoise Authorized Biologist Qualifications Form (Section 3.2) of the *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii*) (USFWS, 2009b) shall conduct clearance surveys in suitable habitat for desert tortoise. The survey(s) shall be conducted in general accordance with Chapter 6 of the *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii*) (USFWS, 2009b) or current clearance survey protocol. The survey(s) may be conducted any time of year, but preferably during the desert tortoise active period (i.e., early March through early June, and September through early November). Survey results shall be provided to the City.

If active desert tortoise burrows are identified in the impact footprint during desert tortoise clearance surveys and required to be moved off site, a desert tortoise translocation plan will be implemented as

approved by USFWS and CDFW. All unoccupied desert tortoise pallets and burrows that are not practical to avoid shall be examined and excavated by hand during the clearance survey by the Species-Specific BMs and collapsed to prevent re-entry following the procedures and precautions outlined in the *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii)* (USFWS, 2009b).

### Desert Tortoise Relocation and Translocation

**MM BIG BIO-14:** Prior to start of construction mobilization activities, a DB shall prepare a BIG-specific Desert Tortoise Translocation Plan based on the *Translocation of Mojave Desert Tortoises from Project Sites: Plan Development Guidance* (USFWS, 2020), *Health Assessment Procedures for the Mojave Desert Tortoise (Gopherus agassizii): A Handbook Pertinent to Translocation* (USFWS, 2016), and *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii)* (USFWS, 2009b) or other current USFWS guidelines and in accordance with applicable Incidental Take Permits and Biological Opinions. The BIG-specific Desert Tortoise Translocation Plan shall identify suitable relocation and translocation sites, provide details on desert tortoise surveys and for moving desert tortoise out of harm's way, and include the methodology for visual desert tortoise body condition assessments. A DB shall provide the BIG-specific Desert Tortoise Translocation Plan to the USFWS and CDFW for review and approval prior to the start of translocation. At a minimum, the Desert Tortoise Translocation Plan shall include the following measures:

- The Species-Specific BM shall implement the Desert Tortoise Translocation Plan during BIG construction.
- Only Species-Specific BMs authorized by the USFWS to handle DETO shall move the animal and project-specific ITPs for desert tortoise shall be acquired under CESA and FESA prior to such actions.
- Species-Specific BM shall move the desert tortoise found in construction work areas out of danger outside of the potential impact footprint, following the procedures and conditions outlined in the Incidental Take Permit and Biological Opinion.
- Prior to the Species-Specific BM moving DETO out of the construction work area, the BM shall survey the relocation and translocation site to confirm that suitable burrows for desert tortoise exist. If few or no burrows are available, artificial burrows and/or shade structures shall be created along the outer perimeter of the desert tortoise exclusion fencing following the guidelines in the *Desert Tortoise (Mojave Population) Field Manual (Gopherus agassizii)* (USFWS 2009b) and *Shade Structures for Desert Tortoise Exclusion Fence: Design Guidance* (USFWS 2018), or as updated or replaced by the USFWS.
- If needed, artificial burrows shall be installed outside of the construction work area (along the outer perimeter of the desert tortoise exclusion fencing if applicable) from where the individual was relocated to provide cover and prevent exposure to predators and dehydration. Prior to excavation of an occupied burrow, artificial burrows shall be installed.

### Common Raven Management

**MM BIG BIO-15:** Prior to the start of construction mobilization activities, the implementing entity shall prepare a Raven Management Plan to avoid attracting common ravens to BIG by creating food or water

subsidies, perch sites, roost sites, or nest sites. The Raven Management Plan may include the following measures to be implemented during construction:

- Water used for dust control purposes shall not be wasteful and when used, shall avoid creating unintentional ponded water and eliminate any unintentional created standing water.
- Water tanks shall be sealed and free of leaks. Standing water created from leaks shall be promptly repaired.
- Irrigation used during revegetation and landscaping shall be kept to a minimum to avoid standing water, where feasible.
- The implementing entity shall coordinate with CDFW and USFWS to remove inactive raven nests and/or other suitable stick nests during the non-breeding season each year of BIG construction. Active raven nests within the BIG footprint shall be reported to USFWS and CDFW.
- During BIG construction, a BM with knowledge of common raven identification (including nests) and desert tortoise remains (e.g., carcass, shell and bone fragments) shall conduct one survey per month for presence of common ravens and nests within 100 feet of the BIG footprint in occupied desert tortoise habitat for the purpose of identifying ravens that may prey upon desert tortoise. The location(s) of nest and desert tortoise remains shall be recorded using a GPS unit.

Additionally, the implementing entity shall participate in the interagency Raven Monitoring and Management Program to address indirect impacts to DETO related to the potential increase in the raven population. The implementing entity's participation in the program shall be subject to compensation through the payment of a onetime fee not to exceed $150 and no less than $105 per disturbed acre, as established by the Desert Managers Group. Payment shall be made prior to the start of ground disturbance or other project activities that may result in potential take of desert tortoise. Evidence of the USFWS and/or CDFW determination and payment of any required fees shall be submitted to the City of Barstow.

### Desert Tortoise Compensatory Mitigation Plan

**MM BIG BIO-16**: Prior to start of construction mobilization activities, the implementing entity shall prepare a Compensatory Mitigation Plan (CMP) in consultation with CDFW and USFWS that describes the compensatory mitigation that shall be provided at a minimum 1:1 ratio to offset permanent and temporary impacts on desert tortoise habitat. The CMP shall describe the following:

- A description of desert tortoise and habitat types for which compensatory mitigation is being provided.
- A description of the methods used to identify and evaluate mitigation options. Options may include one or more of the following:
    - Purchase of mitigation credits from an agency-approved mitigation bank (e.g., Mojave Desert Tortoise Conservation Bank or other CDFW/USFWS approved mitigation bank).
    - Incidental take permit coverage through an existing agency general conservation plan (e.g., USFWS Desert Tortoise General Conservation Plan), if applicable

  - Protection of desert tortoise habitat through acquisition of fee title or conservation easement and funding for long-term management of the habitat. Endowment funds shall be transferred to the applicable agency or entity and conservation easements shall be held by an entity approved in writing by the applicable regulatory agency. In circumstances where BNSF protects habitat through a conservation easement, the terms of the conservation easement shall be subject to approval of the applicable regulatory agencies, and the conservation easement shall identify applicable regulatory agencies as third-party beneficiaries with a right of access to the easement areas.
  - Payment to an existing in-lieu fee program.

- A summary of the estimated direct permanent and temporary impacts on desert tortoise and desert tortoise habitat.
- A description of the process that shall be used to confirm impacts. Actual impacts on desert tortoise and desert tortoise habitat could differ from estimates. Should this occur, adjustments shall be made to the proposed compensatory mitigation in consultation with CDFW/USFWS.
- Adjustments to impact estimates and compensatory mitigation shall occur in the following circumstances:
  - Impacts on DETO (typically measured as habitat loss) are reduced or increased as a result of changes in BIG design;
  - Pre-construction site assessments indicate that DETO habitat features are absent (e.g., because of errors in land cover mapping or land cover conversion);
  - The DETO habitat is determined to be unoccupied based on negative species surveys; or
  - Impacts initially categorized as permanent qualify as temporary impacts.
- An overview of the strategy for mitigating effects on DETO. The overview shall include the ratios to be applied to determine mitigation levels and the resulting mitigation totals.
- A description of habitat restoration or enhancement projects, if any, that would contribute to compensatory mitigation commitments.
- A description of the success criteria that shall be used to evaluate the performance of habitat restoration or enhancement projects, and a description of the types of monitoring that shall be used to verify that such criteria have been met.
- A description of the management actions that shall be used to maintain the habitat on the mitigation sites, and the funding mechanisms for long-term management, if applicable.
- A description of adaptive management approaches, if applicable, that shall be used in the management of species habitat.
- A description of financial assurances that shall be provided to demonstrate that the funding to implement mitigation is assured.

Final compensatory mitigation shall be determined in consultation with USFWS and CDFW. The CMP shall be submitted to the City of Barstow.

### Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo Construction Requirements

**MM BIG BIO-17:** Construction activities within suitable southwestern willow flycatcher and western yellow-billed cuckoo nesting habitat should occur outside of the breeding season (generally May 1 through August 31) when feasible. If construction activities must occur within the breeding season, any nesting habitat shall be removed prior to the breeding season.

If construction activities must occur within 500 feet of suitable riparian habitat (i.e., near the Mojave River) and within the nesting season for southwestern willow flycatcher and western yellow-billed cuckoo, pre-construction surveys shall be conducted prior to construction activities that occur within 500 feet of suitable habitat. Results shall be provided to the City. A Species-Specific BM shall conduct pre-construction surveys for southwestern willow flycatcher and western yellow-billed cuckoo within 30 days prior to start of construction activities that occur within 500 feet of suitable habitat. The Species-Specific BM shall hold a USFWS recovery permit and be authorized by the agency to conduct pre-construction southwestern willow flycatcher surveys and/or western yellow-billed cuckoo surveys.

If southwestern willow flycatcher or western yellow-billed cuckoo is documented nesting within the BIG footprint during pre-construction surveys, no work shall occur within a 500-foot buffer of the nest and consultation with USFWS and CDFW shall occur, and additional measures may be implemented to avoid take. Federal and state incidental take permits may be required for proposed actions that are determined to have adverse effects on southwestern willow flycatcher or western yellow-billed cuckoo.

If southwestern willow flycatcher or western yellow-billed cuckoo nesting behavior and/or breeding territories are documented within 500 feet of construction activities during pre-construction surveys and construction activities must proceed during the nesting season, no work shall occur within a 500-foot buffer of the nest and construction noise shall be monitored and minimized per a Wildlife Noise Study and Monitoring Plan to be implemented with DB oversight. Prior to and during construction, noise monitoring shall be conducted within suitable riparian habitat contiguous with occupied territories at the vegetation limit closest to impact area. Noise limits are only applicable to the occupied nest habitat and suitable contiguous riparian vegetation determined to be part of the nesting territory. Noise monitoring shall be conducted by a qualified noise specialist on coordination with a Species-Specific BM. While conducting noise monitoring, the BM shall monitor the active nests to allow normal breeding behaviors to not be indirectly impacted by noise from construction activities.

Construction noise levels shall not exceed pre-construction ambient levels or a 70 dBA hourly average, whichever is greater, in habitat occupied by nesting southwestern willow flycatcher and western yellow-billed cuckoo unless authorized by the appropriate regulatory authorities (i.e., CDFW and USFWS). Construction activities that exceeded noise limits in the nest territory would be adjusted to reduce noise to below pre-construction ambient levels, a 70dBA hourly average, or the agency-approved threshold. Alternatively, noise attenuation measures shall be implemented to reduce noise within occupied southwestern willow flycatcher and/or western yellow-billed cuckoo breeding territories to below the limit. Measures may include installation of sound barriers or walls, phasing of equipment use, changes in scheduling, and temporary avoidance of certain portions of the impact area. Noise monitoring shall be

conducted when attenuation measures are implemented to document a successful or unsuccessful reduction in noise to below the established threshold. If such adjustments or measures are not feasible and noise levels are found to result in average hourly noise levels greater than 70 dBA or pre-construction ambient levels, whichever is greater, work would be postponed until after the breeding season or after the southwestern willow flycatcher and/or western yellow-billed cuckoo fledglings are no longer dependent on the affected breeding territory, as confirmed by a qualified biologist unless authorized by the appropriate regulatory authorities (i.e., CDFW and USFWS). A noise level verification report shall be submitted by the implementing entity to CDFW and USFWS every two weeks during work that required noise monitoring for listed species as described above.

### Nesting Birds

**MM BIG BIO-18:** To comply with CFGC §§ 3503, 3503.5, and 3513, and to avoid potential impacts on nesting birds, vegetation removal shall be conducted outside of the bird nesting season (generally February through August) to the greatest extent feasible. Regardless of the time of year, a BM shall conduct a nesting bird survey no more than three (3) days prior to initial construction activities. Results shall be provided to the City. Pre-construction surveys shall focus on evidence of nesting, including nest locations and nesting behavior. The BM shall make every effort to avoid potential nest predation as a result of survey and monitoring efforts.

If active nests are identified during the nesting bird survey, a BM shall establish suitable exclusion buffers around the nests based on the level of construction activity within the vicinity and sensitivity of the species observed. The buffers area shall be avoided until the nests are no longer occupied, and the juvenile birds can survive independently from the nests, as determined by the BM. The BM familiar with the nesting phenology of the nesting species may increase or decrease the buffer based on nest and buffer monitoring results. Active nests and adequacy of the established buffer distance shall be monitored by the BM until the young have fledged or BIG construction has been completed. The BM has the authority to stop work if nesting pairs exhibit signs of distress.

If nests are documented during general biological monitoring activities, the BM shall implement exclusion buffers and stop or redirect construction to avoid taking of nesting birds.

If there are time lapses between construction activities, and prior to re-initiation of construction activities, pre-construction nesting bird surveys shall be repeated.

### Construction Noise

**MM BIG BIO-19:** During all construction, the implementing entity or their contractor shall ensure that noise-generating equipment use is restricted to hours least likely to disrupt wildlife to the maximum extent practicable. The use of generators shall be restricted except for temporary use in emergencies. Power shall be provided via low noise-level sources (e.g., solar photovoltaic systems, cogeneration systems, small hydroelectric systems, or small wind turbine systems). If generators must be temporarily used for an emergency, noise suppression devices such as mufflers or enclosures for generators shall be used.

### Swainson's Hawk Construction Requirements

**MM BIG BIO-20:** Swainson's hawk nest surveys shall be conducted and provided to the City of Barstow for the breeding season immediately prior to start of construction activities. Surveys shall be conducted within the annual area of BIG construction plus a 0.5-mile buffer by agency-approved Species-Specific BMs following the protocol outlined in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee, 2000). The Species-Specific BM shall be familiar with Swainson's hawk identification and life history and be approved to conduct surveys by CDFW.

If active Swainson's hawk nests are found during nest surveys, the Species-Specific BM shall establish an appropriate avoidance buffer around each nest in coordination with CDFW based on work activities proposed. The avoidance buffer will remain in place until a Species-Specific BM confirms that the Swainson's hawk young have fledged or the nest is no longer active.

### Western Burrowing Owl Construction Requirements

For the purposes of western burrowing owl MMs, Species-Specific BM for burrowing owl is a biologist who meets the requirements set forth in CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).

**MM BIG BIO-21:** No less than 14 days prior to the start of construction mobilization activities within suitable habitat, a Species-Specific BM shall conduct pre-construction surveys for burrowing owl and/or occupied nest burrows within the limits of the BIG construction footprint plus a 500-foot buffer.

Additionally, time lapses between BIG construction within suitable habitat shall trigger subsequent take avoidance surveys including but not limited to a final survey conducted within 24 hours prior to ground disturbance. The pre-construction surveys shall be repeated if there is a time lapse between construction activities of 14 days or more within previously surveyed areas. All surveys shall be conducted in accordance with the most current CDFW survey methods.

If burrowing owl or active burrows are not observed during the pre-construction surveys, no additional conditions shall be required to avoid direct impacts on burrowing owl within the surveyed areas.

If burrowing owl is documented during pre-construction surveys, occupied burrowing owl burrows shall not be disturbed during the nesting season (February 1 through August 31) unless an agency-approved Species-Specific BM verifies through non-invasive methods that either the birds have abandoned or failed nesting attempts, or that juveniles from the occupied burrows are foraging independently and capable of independent survival. A Species-Specific BM shall establish exclusion buffers to protect active nests in accordance with the recommendations included in CDFW's *Staff Report on Burrowing Owl Mitigation* (2012). A Species-Specific BM shall conduct ongoing monitoring during construction activities.

If burrowing owl is observed during the non-breeding season (September 1 through January 31) or confirmed to not be nesting during pre-construction surveys, a non-disturbance buffer between construction activities and the occupied burrow shall be installed by a Species-Specific BM in accordance with the recommendations included in the *Staff Report on Burrowing Owl Mitigation* (CDFW, 2012).

The implementing entity shall submit at least one burrowing owl pre-construction survey report for each surveyed area to the satisfaction of CDFW to document compliance with BIG's western burrowing owl MMs. Survey reports shall also be submitted to the City.

If avoidance is not possible, either directly or indirectly, an ITP under CESA shall be obtained from CDFW and a Burrowing Owl Plan shall be prepared and submitted for approval by CDFW. The plan shall also be submitted to the City. Once approved, the plan shall be implemented to relocate non-breeding burrowing owls from BIG. The plan shall detail methods for relocation of burrowing owls and provide guidance for the monitoring and management of the replacement burrow sites and associated reporting requirements. Details of the Burrowing Owl Plan shall be determined in consultation with CDFW, and is anticipated to include, but may not be limited to, the following:

- Seasonal restrictions of relocation efforts - Relocation efforts shall occur during the non-breeding season (September 1 through January 31). Relocation during the breeding season (February 1 through August 31) may only occur if a qualified biologist determines that the bird have not begun egg-laying, or that the fledged juveniles are foraging independently and are capable of independent survival.
- Climatic restrictions of relocation efforts - Relocation shall not occur when temperatures exceed 95 degrees Fahrenheit or during rain or high wind.
- Monitoring schedule and length - Full-time monitoring shall occur for at least two weeks following passive relocation and periodically thereafter.

### Western Burrowing Owl Compensatory Mitigation

**MM BIG BIO-242:** Prior to start of construction mobilization activities, the implementing entity shall prepare a Compensatory Mitigation Plan (CMP) in consultation with CDFW that describes the compensatory mitigation that shall be provided at a minimum 1:1 ratio to offset permanent and temporary impacts on burrowing owl habitat. The CMP shall describe the following:

- A description of burrowing owl and habitat types for which compensatory mitigation is being provided.
- A description of the methods used to identify and evaluate mitigation options. Options may include one or more of the following:
    - Purchase of mitigation credits from an agency-approved mitigation bank (e.g., Mojave Desert Tortoise Conservation Bank or other CDFW approved mitigation bank).
    - Protection of burrowing owl habitat through acquisition of fee title or conservation easement and funding for long-term management of the habitat. Endowment finds shall be transferred to the applicable agency or entity and conservation easements shall be held by an entity approved in writing by the applicable regulatory agency. In circumstances where implementing entity protects habitat through a conservation easement, the terms of the conservation easement shall be subject to approval of the applicable regulatory agencies, and the conservation easement shall identify applicable

regulatory agencies as third-party beneficiaries with a right of access to the easement areas.

  - Payment to an existing in-lieu fee program.

- A summary of the estimated direct permanent and temporary impacts on burrowing owl and burrowing owl habitat.
- A description of the process that shall be used to confirm impacts. Actual impacts on burrowing owl and burrowing habitat could differ from estimates. Should this occur, adjustments shall be made to the proposed compensatory mitigation in consultation with CDFW.

The burrowing owl CMP and mitigation requirements shall be submitted to the City of Barstow for review. If all or any portion of the acquired desert tortoise and/or Mojave fringe-toed lizard compensatory mitigation (MM BIG BIO-16 and MM BIG BIO-24, respectively) or other required compensatory mitigation lands/credits meet the criteria for burrowing owl compensatory mitigation, it may be used to fulfill that portion of the obligation for burrowing owl compensatory mitigation requirements.

### Mojave Fringe-toed Lizard Construction Requirements

**MM BIG BIO-23**: To the extent feasible, construction activities within Mojave fringe-toed lizard suitable habitat shall be conducted during the active season (March 1 – September 30).

A Species-Specific BM shall be present during the disturbance and removal of suitable Mojave fringe-toed lizard dune habitat and shall inspect the impact area daily to confirm the area remains clear of the species. Any observed Mojave fringe-toed lizard shall be relocated outside of active work areas and out of harm's way. If necessary, reports summarizing relocation activities shall be submitted to CDFW.

### Mojave Fringe-toed Lizard Compensatory Mitigation

**MM BIG BIO-24**: Prior to mobilization activities, the implementing entity shall prepare a compensatory mitigation plan for direct impacts on Mojave fringe-toed lizard and 1,009.1 acres of occupied dune habitat (active desert dunes, stabilized and partially stabilized dunes, disturbed stabilized and partially stabilized dunes). Dune habitat shall be mitigated in-kind through the acquisition and preservation of dune habitat suitable for Mojave fringe-toed lizard at a minimum 1:1 ratio to offset permanent and temporary impacts on Mojave fringe-toed lizard habitat.

Land selected for compensatory mitigation must be:

- Deposits of aeolian or fine windblown sands associated with dunes, washes, hillsides, margins of dry lakes, and/or sandy hummocks within the Mojave Desert;
- Occupied with Mojave fringe-toed lizard or with potential for connectivity to lands occupied by Mojave fringe-toed lizard;
- Near land currently under or planned for protection; and
- Not characterized as highly disturbed.

A Long-term Management Plan and endowment for land acquisition, preservation, and management in perpetuity shall be established by a qualified land manager/conservancy.

All or any portion of the compensatory mitigation lands/credits acquired for impacts on other sensitive resources (i.e., aquatic resources or sensitive vegetation communities) may also be used to fulfill compensatory mitigation requirements for Mojave fringe-toed lizard. For example, compensatory mitigation pursuant to MM BIG BIO-28 and MM BIG BIO-29 may also be used to fulfill compensatory mitigation requirements for Mojave fringe-toed lizard if acquired mitigation lands/credits meet the criteria above. Final compensatory mitigation for Mojave fringe-toed lizard shall be determined in coordination with CDFW.

### Dry Season Construction

**MM BIG BIO-25:** Construction within the Mojave River corridor shall be restricted to the dry season when there are no observable surface flows within 1,000 feet of the BIG construction footprint, to the greatest extent feasible.

If construction must occur outside of the dry season, BMs shall conduct daily pre-construction sweeps within 250 feet of direct impact areas occurring within the Mojave River corridor, such as construction associated with the Hinkley Road Bridge. If American beaver is observed, construction cannot be initiated until the species is able to disperse from the area. Construction activities may resume after a BM confirms American beaver is no longer present within direct and indirect impact areas.

### American Badger and Desert Kit Fox Construction Requirements

**MM BIG BIO-26:** Prior to the start of construction mobilization activities within suitable habitat, BMs familiar with American badger and desert kit fox shall conduct surveys within the limits of the BIG construction footprint for occupied natal dens. The survey(s) may be conducted concurrently with desert tortoise clearance surveys. The survey(s) shall occur no more than 48 hours prior to start of ground-disturbing activities in suitable habitat for American badger and desert kit fox within the potential impact footprint. Survey results shall be provided to CDFW and the City.

If American badger or desert kit fox natal dens are documented within the survey area, a BM shall establish a no-work exclusion buffer around the den and natal dens shall not be disturbed until a BM verifies through non-invasive methods that either the den is no longer occupied, or that juveniles from the natal den are foraging independently and capable of independent survival.

A BM shall monitor the natal den during construction activities approximately every other day. The definitive frequency and duration of monitoring shall be dependent upon the age and behavior of the American badger or desert kit fox pups and the efficacy of the exclusion buffers, as determined by a DB or BM and in coordination with CDFW. Passive relocation methods may be employed for non-natal dens that cannot be avoided by construction activities. For individual, non-natal badger and kit fox dens, a plan for passive relocation, burrow monitoring, and excavation of vacated burrows will be developed in coordination with CDFW.

### Bat Construction Requirements

**MM BIG BIO-27:** Prior to start of demolition or disturbance of structures suitable for roosting (i.e., bridges), pre-construction surveys for special status bat species shall be conducted by a BM. Pre-

construction surveys shall be conducted no more than 14 days prior to the start of demolition activities. Survey results shall be provided to CDFW and the City. If active bat roosting of is documented during pre-construction surveys within structures to be impacted, bat exclusion techniques, consistent with recommendations provided in California Department of Transportation Bat Mitigation: A Guide to Developing Feasible and Effective Solutions (H. T. Harvey & Associates, 2019), shall be implemented. If required, exclusion shall be implemented between September 1 and October 15 to the extent feasible. Exclusion shall not occur during the typical bat maternity season (April through August).

Prior to demolition and/or improvement of structures that could support roosting bats, including Hinkley Road Bridge, or trees that will be removed, a biologist with expertise in chiropterology (study of bats) shall survey these features and any areas that could provide suitable roosting habitat to confirm they do not contain maternity roosts or special-status bats. If bat special-status bats and/or maternity roosts are confirmed to be absent, MM BIG BIO-1 above will be followed prior to construction to reduce potential impacts to individual roosting bats to a less than significant level and no further mitigation is required. If a potential maternity roost and/or a special-status bat roost is present, a Bat Avoidance and Mitigation Plan will be developed in coordination with the City and CDFW which may include the following measures (at a minimum) to reduce potential impacts to special-status bat species to a less-than-significant level:

- **Maternity Roosting Season Avoidance**. All proposed demolition activities of active roost sites, including bat roost exclusion, shall occur outside the general bat maternity roosting season of March through August to reduce potentially significant impacts to maternity roosting bats. If the maternity roosting season cannot be avoided, then roost exclusion can occur outside the maternity roosting season (September through February) to exclude bats from the demolition area prior to the start of demolition during the maternity roosting season. The measures below will be required to ensure no avoid impacts to roosting bats during the exclusion process.
- **Replacement Roost Installation**. If there is a potential or known maternity roost within a structure to be demolished, a replacement roost shall be installed outside the maternity roosting season. At least one month prior to the exclusion of bats from a roost, the implementing entity will procure and install two or more (dependent on colony size) bat boxes from a reputable vendor, such as Bat Conservation and Management, to allow bats sufficient time to acclimate to a new potential roost location. The bat boxes shall be installed within close proximity to the trees and/or structures and in an area that is within close proximity to suitable foraging habitat (i.e. near the Mojave River). Additionally, the bat boxes will be oriented to the south or southwest, and the area chosen for the bat boxes must receive sufficient sunlight (at least 6 hours) to allow the bat boxes to reach an optimum internal temperature (approximately 90°F) to mimic the existing bat roost. The bat boxes will be suitable to house crevice-roosting bat species, and large enough to contain a minimum of 50 bats (e.g., Four Chamber Premium Bat House or Bat Bunker Plus). The bat boxes shall be installed on a 20-foot-tall steel pole.
- **Roost Exclusion**. Roost exclusion must only occur during the time when bats are most active (early spring or fall) to increase the potential to exclude all bats from roosts and avoid the maternity roosting season, thereby minimizing the potential for a significant impact to occur. Approximately 1 month after bat boxes have been installed, exclusion of the existing roost will occur. The primary exit points for roosting bats will be identified, and all secondary ingress/egress locations will be

covered with a tarp or wood planks to prevent bats from leaving from other locations. The primary exit point will remain uncovered to allow exclusion devices to be installed. Exclusion devices will consist of a screen (poly netting, window screen, or fiberglass screening) with mesh 1/6 of an inch or smaller, installed at the top of the roost location and sealed along the sides and passing 2 feet below the bottom of the primary exit point. The exclusion devices will be installed at night to increase the potential that bats have already left the roost and are less likely to return. Exclusion devices will be left in place for a 1- week period to ensure that any remaining bats in the roost are excluded. A passive acoustic monitoring detector will also be deployed during the exclusion period in order to verify excluded species and monitor if bat activity has decreased during the exclusion period. Periodic monitoring during the exclusion period should also be conducted to observe if any bats are still emerging from additional areas at BIG, and an active monitoring survey conducted on the final night of exclusion to ensure that no bats are emerging and determine that exclusion has been successful. Any continued presence of roosting bats will require an adjustment to the exclusion devices and schedule. The exclusion devices may remain in place until the start of demolition activities. If any bats are found roosting in any proposed demolition areas prior to demolition, additional exclusion will be required and follow the same methodology described in this mitigation measure.

- **Roost Habitat Creation**. If sensitive bat species area present within Hinkley Road Bridge or other structures that will persist post BIG construction but require bat displacement for improvements to be made, bat friendly roost designs shall be developed as part of project plans as feasible. Bat friendly designs shall be developed in coordination with a qualified biologist, the City, and CDFW.

### Compensatory Mitigation for Sensitive Natural Communities

**MM BIG BIO-28**: Prior to construction mobilization activities, the implementing entity shall provide compensatory mitigation for permanent impacts of up to 1,009.1 acres of dune vegetation communities, including high-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance (e.g., active desert dunes; 551.5 acres), moderate-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – partially stabilized (e.g., partially stabilized desert dunes; 7.1 acres), and low-quality *Dicoria canescens – Abronia villosa – Panicum urvilleanum* sparsely vegetated alliance – disturbed/stabilized (e.g., disturbed/stabilized desert dunes; 450.6 acres) at a minimum 1:1 ratio. Dune habitat shall be mitigated in-kind through the acquisition and preservation of dune habitat.

If all or any portion of the acquired Mojave fringe-toed lizard (MM BIG BIO-21) or other required compensatory mitigation lands/credits meet the criteria above, it may be used to fulfill that portion of the obligation for CDFW sensitive upland vegetation communities.

### Jurisdictional Aquatic Resources Permit Requirement

**MM BIG BIO-29**: Prior to impacting jurisdictional aquatic resources, the implementing entity shall obtain a CWA Section 404 IP from USACE for permanent impacts on non-wetland waters of the U.S. jurisdictional by USACE, a CWA Section 401 WQC (or other required permit) from the RWQCB for permanent impacts on non-wetland waters of the U.S./State jurisdictional by RWQCB, and a CFGC Section 1602 Lake and Streambed Alteration Agreement from CDFW for impacts on vegetated and unvegetated streambed and

watercourse jurisdictional by CDFW. The implementing entity shall implement/comply with all permit conditions and mitigation measures required by the resource agencies.

Compensatory mitigation to offset impacts on jurisdictional aquatic resources may be implemented through on-site and/or off-site, permittee-responsible mitigation, mitigation bank credit purchase (e.g., purchase of enhancement and/or preservation credits at the Mojave River Watershed Mitigation Bank or other approved mitigation bank), or a combination of these options depending on availability. The proposed mitigation strategy shall prioritize in-kind and in-watershed options per the regulatory agencies' preferences. A minimum compensatory mitigation ratio of 1:1 will be required; final mitigation ratios and credits shall be determined in consultation with USACE, RWQCB, and CDFW based on agency evaluation of current resource functions and values and through each agency's respective permitting process.

Should implementing entity-sponsored mitigation be implemented, a Habitat Mitigation and Monitoring Plan (HMMP) shall be prepared and approved by the agencies in accordance with the proposed program permits. The HMMP shall include but is not limited to a conceptual planting plan including planting zones, grading, and irrigation, as applicable; a conceptual planting plant palette; a long-term maintenance and monitoring plan; annual reporting requirements; and proposed success criteria. Any off-site applicant-sponsored mitigation shall be conserved and managed in perpetuity.

### Water Quality Best Management Practices

**MM BIG BIO-30:** Prior to construction mobilization activities, the implementing entity shall prepare a Storm Water Pollution Prevention Plan in conformance with CA Construction Stormwater General Permit Order 2022-0057-DWQ requirements to avoid and minimize impacts associated with erosion, runoff, and storm water contaminants. The Storm Water Pollution Prevent Plan shall include best management practices (BMPs) to avoid and minimize impacts on downstream jurisdictional aquatic resources including, but not limited to:

- Vehicles and equipment should not be operated in ponded or flowing water except as described in permits.
- Water containing mud, silt, or other pollutants from grading or other activities should not be allowed to enter jurisdictional waters adjacent to BIG or be placed in locations that may be subjected to high storm flows.
- Spoil sites should not be located within 30 feet from the boundaries of downstream jurisdictional waters or in locations that may be subject to high storm flows, where spoils might be washed back into drainages adjacent to BIG.
- Raw cement/concrete or washings thereof; asphalt, paint or other coating material; oil or other petroleum products; or any other substances that could be hazardous to vegetation or wildlife resources, resulting from BIG construction, should be prevented from contaminating the soil and/or entering avoided jurisdictional waters downstream of BIG.
- No equipment maintenance or fueling should be performed within 100 feet of jurisdictional waters downstream of BIG, where petroleum products or other pollutants from the equipment may enter these areas.

- Temporary structures, storage of construction materials, and staging/storage of construction equipment should be located outside jurisdictional waters downstream of BIG.

### Vegetation Removal

**MM BIG BIO-31:** The implementing entity shall confirm that all cut vegetation is hauled out of any waterways and stored, if necessary, where it cannot be washed by rainfall or runoff into waterways. When maintenance activities are completed, any excess materials or vegetation shall be removed from the BIG footprint.

### Wildlife Crossings

**MM BIG BIO-32:** With BIG implementation, a wildlife crossing shall be constructed at the Unnamed Stream (Milepost 12.5) below the BNSF tracks and Main Street to facilitate wildlife movement between areas of natural habitat on either side of the railway and road. The railway crossing feature shall be placed alongside four smaller culverts constructed to convey water: three 36-inch and one 48-inch diameter culverts. The wildlife crossing shall be an 84-inch diameter culvert designed to facilitate passage beneath the rail right-of-way, which would connect open space east of the railway to the Mojave River, thereby maintaining access to existing linkages (i.e., the Rank 4/5 ACE, California Desert Linkage Network, and CEHC Potential Riparian Connection). Design features for facilitating wildlife culvert usage shall include installing inlet and outlet points flush with the ground and maintaining one to six inches of native soil along the bottom of the culvert.

A long term management plan for the wildlife crossing shall be submitted to the City of Barstow for review and approval prior to start of vegetation removal and/or mass grading. The long-term management plan shall include:

- Additional measures to encourage wildlife use include, but are not limited to, maintenance or restoration of native vegetation near, but not obstructing, culvert mouths, and invasive plant removal.
- Routine clearing of debris and trash from the culvert shall be completed on a quarterly basis and following large storm events to allow ample space is available for wildlife travel.
- Access points to the culvert shall contain rocks or woody refuge sites to attract subterranean wildlife. Habitat quality (i.e., the percentage of invasive versus native plants and level of anthropogenic degradation) within a 200-meter radius surrounding the culvert access points shall be monitored quarterly by a qualified biologist to confirm wildlife corridor functionality.

A mitigation entity responsible for the implementation of the long-term management plan.

### Staging, Stockpiles, Materials and Equipment Storage

**MM BIG BIO-33:** During construction, all construction materials, staging, employee parking, storage, dispensing, fueling, maintenance activities, and spoils would be located only in areas cleared within the previous 48 hours by a DB or a previously disturbed area. For off-site construction activities, staging areas would be located within permanent impact areas or previously disturbed areas (e.g., developed areas, areas already disturbed by construction). Efforts will be made to discourage sensitive wildlife inhabitation

of spoils, stockpiles, and materials (i.e. covering with secured tarps, spreading out materials, etc.) in consultation with approved DBs. Uncovered/unmanaged spoils and stockpiles left undisturbed for 48 hours or more would be inspected before being disturbed as determined necessary by the DB.

### Permanent Security Fencing

**MM BIG BIO-34** Prior to final construction design, the DB should review and approve the fencing plans for portions of the BIG Specific Plan Area that are adjacent to natural habitats to confirm the fences provide a sufficient barrier to restrict wildlife from entering the BIG Specific Plan area.

If needed, the permanent security fencing should be enhanced with a barrier (e.g., fine-mesh fencing) that extends at least 12 inches below ground and 12 inches above ground to prevent special status reptile and mammal species, including desert tortoise, from moving through or underneath the fencing and gaining access to the BIG Specific Plan area. Where fencing is proposed between natural habitats and roadway right-of-way, at the 12-inch depth of the below-grade portion fence apron, the barrier would extend or be bent at an approximately 90-degree angle and oriented outward from the roadway right-of-way a minimum of 12 inches to prevent fossorial (burrowing) mammals and reptiles from digging or tunneling below the security fence and gaining access to BIG. A climber barrier (e.g., rigid curved or bent overhang) would be installed at the top of the apron to prevent reptiles and mammals from climbing over the apron.

The DBs shall confirm that the selected apron material and climber barrier do not cause harm, injury, entanglement, or entrapment to wildlife species. BNSF should provide quarterly inspection and repair of the fencing.

The specific design and method for installation method of an apron or barrier may vary as required by regulatory permits issued under the FESA or CESA. Prior to start of operations then quarterly, BMs would field-inspect the fencing that is adjacent to natural habitats and confirm appropriate installation and BNSF would carry out repair of the fencing, as needed. Fencing plan review and field inspection should be documented in a memorandum from the DBs and provided to the City.

### General Avian Safe Design

**MM BIG BIO-35:** Prior to final construction design, the implementing entity would ensure that fencing, electric lines, communication towers, and buildings are designed to be bird- and raptor-safe in accordance with recommendations presented in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (APLIC 2012). The DB would review the design for areas of high concern (e.g., areas adjacent to suitable raptor nesting habitat) to confirm the safety features provide sufficient protection for birds. Avian safe design features would be implemented and maintained by the implementing entity during the period of operations. The project would incorporate the following into the design:

- Sufficient spacing of phase conductors to prevent bird electrocution.
- Configuration of power lines to reduce vertical spread of lines and/or reductions in the span length if such options are feasible.

- Marking of lines and fences (e.g., with Bird Flight Diverters) to increase the visibility of lines and reduce potential collisions. Where fencing is necessary, use of bird-compatible design standards to increase visibility of fences to reduce collision and entanglement.
- Metal fence stakes plugged with bolts or other material to prevent raptor talons from becoming entrapped within the bolt holes.
- Perch guards to discourage avian presence on and near BIG facilities.
- Minimizing the use of guywires. Where the use of guywires is necessary, mark the guywires using the best available methods to minimize avian strikes (e.g., line markers).
- A monopole or dual-pole design versus a lattice tower design to minimize perching and nesting opportunities.
- Communication tower design in conformance with Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning (USFWS, 2021b).
- Facility lighting that does not attract birds or their prey to the BIG. This includes using non-steady burning lights (e.g., red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and avoiding the use of high-intensity lights (e.g., sodium vapor, quartz, and halogen).

Prior to start of operations, Biological Monitors (BMs) should field-inspect the avian safe design features and summarize findings in a memorandum to be provided to the City.

### Nighttime Lighting During Operations

**MM BIG BIO-36**: To address the permanent and intermittent impacts from lighting, the implementing entity shall implement measures to minimize the intensity, direction, and duration of operational lighting of permanent facilities (e.g., traction power facilities, radio sites, and maintenance facilities), as well as intermittent train lighting in compliance with BIG Specific Plan lighting standards (BIG Specific Plan section 3.6). These shall include the following measures to minimize light trespass into adjacent habitat:

- All lights shall be fully cutoff or fully shielded to prevent uplight and limit horizontal spill into adjacent habitat.
- Warm lighting (3,000K or lower) shall be used to reduce blue light emissions).
- All exterior lighting fixtures shall be directed downward to illuminate pedestrian pathways and parking areas and avoid unnecessary glare and light trespass.
- Within the transload warehouse center, pole-mounted or building-mounted lighting fixtures shall be no more than 50 feet in height to limit light trespass.

### Desert Native Plant Salvage Plan

**MM BIG BIO-37:** Prior to start of construction mobilization activities, the implementing entity shall prepare a Desert Native Plant Salvage Plan for the removal of any plant species regulated under the

California Desert Native Plants Act and County Code § 88.01.060. Adequate mitigation for California Desert Native Plants Act/County-protected plants may include the salvage of plants for translocation to a suitable recipient site if removal cannot be avoided. In the case of translocation, the Desert Native Plant Salvage Plan shall be prepared for review and approval by the City. The plan shall include a description and map showing plants to be salvaged, salvage and transport methods, the proposed recipient site, and disposition of the plant specimens at the recipient site. Recipient sites may include existing conservation areas, botanical preserves, museums and zoological societies, among other conservation organizations that provide adequate habitat and management of desert native plants.

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# ATTACHMENT A

# SITE PHOTOGRAPHS

Attachment A

Site Photographs



Photo 1. View of tamarisk thickets in the southwestern portion of the rail yard, facing southeast. August 10, 2021.



Photo 2. View of active desert dunes habitat in the northern portion of the transload warehouse center, northwest of the existing railroad tracks, facing north. October 20, 2021.



Photo 3. Representative photo of an inactive desert tortoise (*Gopherus agassizii*) burrow within allscale scrub near the center of the rail yard, facing south. October 24, 2021.



Photo 4. Representative photo of the entrance of a suitable unoccupied burrowing owl burrow with sign (whitewash and pellets) within disturbed creosote bush scrub within the center of the rail yard. January 13, 2022.



Photo 5. View of creosote bush scrub habitat near the center of the rail yard, facing north. March 16, 2022.



Photo 6. View of active desert dunes within the Mojave River in the southwestern portion of the transload warehouse center, facing east. March 24, 2022.



Photo 7. Representative photo of allscale scrub within an earthen drainage, near the center of the rail yard, facing south. April 12, 2022.



Photo 8. View of disturbed allscale scrub and earthen drainage adjacent to the railroad tracks, within the northern portion of the rail yard, facing northeast. April 12, 2022.



Photo 9. View of unvegetated channel within the northeastern portion of the rail yard, facing northwest. April 13, 2022.



Photo 10. View of earthen drainage and railroad culvert within disturbed habitat, in the northeastern portion of the rail yard, facing north. April 13, 2022.



Photo 11. View of allscale scrub in the foreground and agricultural fields in the distant background, in the center of the rail yard, facing northwest. April 13, 2022.



Photo 12. View of disturbed creosote bush scrub in the center of the rail yard, facing northwest. April 14, 2022.



Photo 13. View of disturbed habitat within the western portion of the transload warehouse center adjacent to the Mojave River, facing north. April 14, 2022.



Photo 14. View of disturbed active desert dunes, within the northeastern portion of the transload warehouse center, facing west. March 25, 2022.



Photo 15. View of allscale scrub in the southwest portion of the rail yard, facing west. June 20, 2022.



Photo 16. View of developed land (railroad tracks and embankment) and disturbed habitat in the southwestern portion of the rail yard, facing north. June 21, 2022.



Photo 17. View of Fremont cottonwood (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*) within riparian bird survey area near the southwestern portion of the rail yard. June 30, 2022.



Photo 18. View of tamarisk thickets within the riparian bird survey area south of Hinkley Road, north of the existing railroad tracks. June 30, 2022.



Photo 19. View of allscale scrub in the northeastern portion of the rail yard. January 4, 2023.



Photo 20. View of stabilized/partially stabilized desert dunes north of the railroad tracks in the northeastern portion of the transload warehouse center. January 4, 2023.



Photo 21. View of potential desert kit fox den within the solar farm, facing southeast. July 19, 2023.



Photo 22. Overview of the creosote bush scrub within the solar farm, facing northeast. June 28, 2023.



Photo 23. View of Bonanza Road within the Tortilla substation improvements, facing southeast. June 2, 2023.



Photo 24. View of creosote bush scrub within the Tortilla substation improvements; Tortilla Substation pictured in the background, facing southeast. April 27, 2023.



Photo 26. Representative photo of suitable unoccupied burrowing owl burrow, located in the center of the transload warehouse center. April 18, 2023.



Photo 27. View of the Mojave River flowing under Hinkley Road. April 18, 2023.

# ATTACHMENT B

# PLANT AND WILDLIFE SPECIES OBSERVED WITHIN THE BARSTOW INTERNATIONAL GATEWAY PROJECT SITE

Attachment B

Plant and Wildlife Species Observed within the
Barstow International Gateway Project Site

| Family | Common Name | Scientific Name |
|---|---|---|
| Plants | | |
| Agavaceae | Western Joshua tree (SCL, SBC) | *Yucca brevifolia* |
| Agavaceae | Mohave yucca (SBC) | *Yucca schidigera* |
| Amaranthaceae | White tumbleweed* | *Amaranthus albus* |
| Apiaceae | Mohave lomatium | *Lomatium mohavense* |
| Apocyinaceae | Desert milkweed | *Asclepias erosa* |
| Asteraceae | Rayless goldenhead | *Acamptopappus sphaerocephalus* |
| Asteraceae | Annual bur-sage | *Ambrosia acanthicarpa* |
| Asteraceae | White bur-sage | *Ambrosia dumosa* |
| Asteraceae | Cheesebush | *Ambrosia salsola* |
| Asteraceae | Scale bud | *Anisocoma acaulis* |
| Asteraceae | Mulefat | *Baccharis salicifolia* |
| Asteraceae | Desert marigold | *Baileya multiradiata* |
| Asteraceae | Wooly marigold | *Baileya pleniradiata* |
| Asteraceae | Fremont pincushion | *Chaenactis fremontii* |
| Asteraceae | Desert dicoria | *Dicoria canescens* |
| Asteraceae | Rubber rabbitbush | *Ericameria nauseosa* var. *hololeuca* |
| Asteraceae | Horseweed | *Erigeron canadensis* |
| Asteraceae | Wallace eriophyllum | *Eriophyllum wallacei* |
| Asteraceae | Desert sunflower | *Geraea canescens* |
| Asteraceae | Prickly lettuce* | *Lactuca serriola* |
| Asteraceae | Common goldfields | *Lasthenia gracilis* |
| Asteraceae | Scalebroom | *Lepidospartum squamatum* |
| Asteraceae | Valley lessingia | *Lessingia glandulifera* var. *glandulifera* |
| Asteraceae | Silver lake daisy | *Leucosyris arida* |
| Asteraceae | Dwarf cottonrose | *Logfia depressa* |
| Asteraceae | Snake's head | *Malacothrix coulteri* |
| Asteraceae | Desert dandelion | *Malacothrix glabrata* |
| Asteraceae | Mojave desert star | *Monoptilon bellioides* |
| Asteraceae | Western nicolletia | *Nicolletia occidentalis* |
| Asteraceae | Stinknet* | *Oncosiphon piluliferum* |
| Asteraceae | Desert chicory | *Rafinesquia neomexicana* |
| Asteraceae | Prickly sow-thistle* | *Sonchus asper* ssp. *asper* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Asteraceae | Wire lettuce | *Stephanomeria pauciflora* |
| Asteraceae | Desert nest straw | *Stylocline micropoides* |
| Asteraceae | Cocklebur | *Xanthium strumarium* |
| Asteraceae | Desert woodyaster | *Xylorhiza tortifolia* var. *tortifolia* |
| Bignoniaceae | Desert Willow | *Chilopsis linearis* |
| Boraginaceae | Devil's lettuce | *Amsinckia tessellata* var. *tessellata* |
| Boraginaceae | Bearded cryptantha | *Cryptantha barbigera* |
| Boraginaceae | Nevada cryptantha | *Cryptantha nevadensis* var. *nevadensis* |
| Boraginaceae | Winged nut cryptantha | *Cryptantha pterocarya* var. *pterocarya* |
| Boraginaceae | Small-flowered eremocarya | *Eremocarya micrantha* var. *micrantha* |
| Boraginaceae | Cushion cryptantha | *Greeneocharis circumscissa* var. *circumscissa* |
| Boraginaceae | Narrow-leaved johnstonella | *Johnstonella angustifolia* |
| Boraginaceae | Chuckwalla combseed | *Pectocarya heterocarpa* |
| Boraginaceae | Broad combseed | *Pectocarya platycarpa* |
| Boraginaceae | Recurved combseed | *Pectocarya recurvata* |
| Boraginaceae | Arizona popcornflower | *Plagiobothrys arizonicus* |
| Brassicaceae | Sahara mustard* | *Brassica tournefortii* |
| Brassicaceae | California mustard | *Caulanthus lasiophyllus* |
| Brassicaceae | Western tansymustard | *Descurainia pinnata* |
| Brassicaceae | California spectacle pod | *Dithyrea californica* |
| Brassicaceae | Garden rocket* | *Eruca vesicaria* ssp. *sativa* |
| Brassicaceae | Yellow pepper grass | *Lepidium flavum* var. *flavum* |
| Brassicaceae | Desert pepper grass | *Lepidium fremontii* |
| Brassicaceae | Shaggyfruit pepperweed | *Lepidium lasiocarpum* ssp. *lasiocarpum* |
| Brassicaceae | Sand peppergrass | *Lepidium lasiocarpum* ssp. *lasiocarpum* |
| Brassicaceae | Tumbled mustard* | *Sisymbrium altissimum* |
| Brassicaceae | London rocket* | *Sisymbrium irio* |
| Brassicaceae | Hare's-ear cabbage* | *Sisymbrium orientale* |
| Brassicaceae | Longbeak streptanthella | *Streptanthella longirostris* |
| Cactaceae | Silver cholla | *Cylindropuntia echinocarpa* |
| Cactaceae | Diamond cholla | *Cylindropuntia ramosissima* |
| Cactaceae | Cottontop cactus | *Echinocactus polycephalus* var. *polycephalus* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Cactaceae | Barrel cactus | *Ferocactus cylindraceus* |
| Cactaceae | Beavertail cactus | *Opuntia basilaris* var. *basilaris* |
| Cactaceae | Mojave fishhook cactus (CRPR 4.2, SBC) | *Sclerocactus polyancistrus* |
| Chenopodiaceae | Four-wing saltbush | *Atriplex canescens* |
| Chenopodiaceae | Spiny saltbush | *Atriplex confertifolia* |
| Chenopodiaceae | Desert holly (SBC) | *Atriplex hymenelytra* |
| Chenopodiaceae | Big saltbush | *Atriplex lentiformis* |
| Chenopodiaceae | Allscale saltbush | *Atriplex polycarpa* |
| Chenopodiaceae | Spinescale saltbush | *Atriplex spinifera* |
| Chenopodiaceae | Torrey's saltbush | *Atriplex torreyi* var. *torreyi* |
| Chenopodiaceae | Halogeton* | *Halogeton glomeratus* |
| Chenopodiaceae | Paulsen's Russian thistle* | *Salsola paulsenii* |
| Chenopodiaceae | Russian-thistle* | *Salsola* sp. |
| Chenopodiaceae | Tumbleweed* | *Salsola tragus* |
| Chenopodiaceae | Bush seepweed | *Suaeda nigra* |
| Cleomaceae | Mojave cleomella | *Cleomella obtusifolia* |
| Cleomaceae | Bladderpod | *Peritoma arborea* |
| Cucurbitaceae | Coyote melon | *Cucurbita palmata* |
| Ehretiaceae | Nuttall's coldenia | *Tiquilia nuttallii* |
| Ehretiaceae | Plicate coldenia | *Tiquilia plicata* |
| Ephedraceae | California ephedra | *Ephedra californica* |
| Ephedraceae | Green ephedra | *Ephedra viridis* |
| Euphorbiaceae | Desert croton | *Croton californicus* |
| Euphorbiaceae | Whitemargain sandmat | *Euphorbia albomarginata* |
| Euphorbiaceae | Small-seed sandmat | *Euphorbia polycarpa* |
| Fabaceae | Keel-back locoweed | *Astragalus acutirostris* |
| Fabaceae | Layne’s milkvetch | *Astragalus layneae* |
| Fabaceae | Freckeled milkvetch | *Astragalus lentiginosus* var. *lentiginosus* |
| Fabaceae | Bird of paradise* | *Caesalpinia gilliesii* |
| Fabaceae | Desert lupine | *Lupinus shockleyi* |
| Fabaceae | Shockley lupine | *Lupinus shockleyi* |
| Fabaceae | Alfalfa* | *Medicago sativa* |
| Fabaceae | Honey mesquite (SBC) | *Neltuma odorata* |
| Fabaceae | Mesquite | *Neltuma* sp. |

| Family | Common Name | Scientific Name |
|---|---|---|
| Fabaceae | Jerusalem thorn | *Parkinsonia aculeata* |
| Fabaceae | Blue palo verde | *Parkinsonia florida* |
| Fabaceae | Mojave indigo bush (CRPR 4.3) | *Psorothamnus arborescens* var. *arborescens* |
| Fabaceae | Dotted dalea | *Psorothamnus polydenius* |
| Fabaceae | Black locust* | *Robinia pseudoacacia* |
| Fabaceae | Desert senna | *Senna armata* |
| Fabaceae | Screwbean mesquite | *Strombocarpa pubescens* |
| Fourquieriaceae | Ocotillo | *Fouquieria splendens* |
| Geraniaceae | Redstem filaree* | *Erodium cicutarium* |
| Geraniaceae | Desert heron's bill | *Erodium texanum* |
| Heliotropiaceae | Salt heliotrope | *Heliotropium curassavicum* var. *oculatum* |
| Hydrophyllaceae | Fremont's phacelia | *Phacelia fremontii* |
| Hydrophyllaceae | Tansy leafed phacelia | *Phacelia tanacetifolia* |
| Lamiaceae | Mexican bladder sage | *Scutellaria mexicana* |
| Lennoaceae | Sand plant | *Pholisma arenarium* |
| Loasaceae | White-stem blazing star | *Mentzelia albicaulis* |
| Loasaceae | Sandpaper plant | *Petalonyx thurberi* |
| Malvaceae | Trailing mallow | *Eremalche exilis* |
| Malvaceae | Dwarf mallow* | *Malva neglecta* |
| Malvaceae | Cheeseweed* | *Malva parviflora* |
| Malvaceae | Apricot mallow | *Sphaeralcea ambigua* var. *ambigua* |
| Malvaceae | Narrow leaved desert mallow | *Sphaeralcea angustifolia* |
| Nyctaginaceae | Desert wishbone plant | *Mirabilis laevis* |
| Nyctaginaceae | Wishbone bush | *Mirabilis laevis* var. *retrorsa* |
| Onagraceae | Mojave sun cup | *Camissonia campestris* |
| Onagraceae | Yellow cups | *Chylismia brevipes* |
| Onagraceae | Pinnate-leaf evening-primrose | *Chylismia claviformis* |
| Onagraceae | Browneyes | *Chylismia claviformis* ssp. *claviformis* |
| Onagraceae | Booth's evening primrose | *Eremothera boothii* |
| Onagraceae | Clustered booth's desert primrose | *Eremothera boothii* ssp. *condensata* |
| Onagraceae | California evening primrose | *Oenothera californica* ssp. *californica* |
| Onagraceae | Dune evening primrose | *Oenothera deltoides* |
| Onagraceae | Yellow desert evening primrose | *Oenothera primiveris* ssp. *primiveris* |
| Papaveraceae | Mojave prickly poppy | *Argemone corymbosa* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Papaveraceae | Coville's poppy | *Eschscholzia minutiflora* ssp. *minutiflora* |
| Pinaceae | Aleppo pine* | *Pinus halepensis* |
| Plantaginaceae | Desert plantain | *Plantago ovata* |
| Plantaginaceae | Woolly plantain | *Plantago ovata var. fastigiata* |
| Poaceae | Wild oat* | *Avena fatua* |
| Poaceae | Ripgut grass* | *Bromus diandrus* |
| Poaceae | Red brome* | *Bromus rubens* |
| Poaceae | Cheatgrass* | *Bromus tectorum* |
| Poaceae | Bermuda grass* | *Cynodon dactylon* |
| Poaceae | Desert saltgrass | *Distichlis spicata* |
| Poaceae | Quackgrass* | *Elymus repens* |
| Poaceae | Big galleta | *Hilaria rigida* |
| Poaceae | Foxtail barley* | *Hordeum murinum* |
| Poaceae | Desert panicgrass | *Panicum urvilleanum* |
| Poaceae | Canary grass* | *Phalaris* sp. |
| Poaceae | Mediterranean grass* | *Schismus barbatus* |
| Poaceae | Indian rice grass | *Stipa hymenoides* |
| Polemoniaceae | Giant eriastrum | *Eriastrum densifolium* ssp. *densifolium* |
| Polemoniaceae | Desert woolly-star | *Eriastrum eremicum* ssp. *eremicum* |
| Polemoniaceae | Showy gilia | *Gilia cana* |
| Polemoniaceae | Broad-flowered gilia | *Gilia latiflora* ssp. *latiflora* |
| Polemoniaceae | Cinder gilia | *Gilia sinuata* |
| Polemoniaceae | Desert calico | *Loeseliastrum matthewsii* |
| Polemoniaceae | Schott's calico | *Loeseliastrum schottii* |
| Polygonaceae | Brittle spineflower | *Chorizanthe brevicornu* var. *brevicornu* |
| Polygonaceae | Rigid spineflower | *Chorizanthe rigida* |
| Polygonaceae | Yellow buckwheat | *Eriogonum brachyanthum* |
| Polygonaceae | Desert skeleton weed | *Eriogonum deflexum var. deflexum* |
| Polygonaceae | Rose-and-white buckwheat | *Eriogonum gracillimum* |
| Polygonaceae | Desert trumpet | *Eriogonum inflatum* |
| Polygonaceae | Yellow turbans | *Eriogonum pusillum* |
| Polygonaceae | Kidney-leaf buckwheat | *Eriogonum reniforme* |
| Polygonaceae | Little desert buckwheat | *Eriogonum trichopes* |
| Polygonaceae | Wild rhubarb | *Rumex hymenosepalus* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Ranulaceae | Desert larkspur | *Delphinium parishii* |
| Rutaceae | Turpentine-broom | *Thamnosma montana* |
| Salicaceae | Fremont cottonwood | *Populus fremontii* |
| Salicaceae | Goodding's black willow | *Salix gooddingii* |
| Salicaceae | Red willow | *Salix laevigata* |
| Solanaceae | Western Jimson weed | *Datura wrightii* |
| Solanaceae | Rabbit thorn | *Lycium pallidum* var. *oligospermum* |
| Solanaceae | Box-thorn | *Lycium* sp. |
| Solanaceae | White/silver-leaf horsenettle* | *Solanum elaeagnifolium* |
| Solinaceae | Cooper's box thorn | *Lycium cooperi* |
| Tamaricaceae | Athel* | *Tamarix aphylla* |
| Tamaricaceae | Saltcedar* | *Tamarix ramosissima* |
| Themidaceae | Blue dicks | *Dipterostemon capitatus* |
| Ulmaceae | Siberian elm* | *Ulmus pumila* |
| Viscaceae | California mesquite mistletoe | *Phoradendron californicum* |
| Zygophyllaceae | Creosote bush[1](SBC) | *Larrea tridentata* |
| Zygophyllaceae | Puncture vine* | *Tribulus terrestris* |
| Invertebrates | | |
| Bombyliidae | Woolly bee fly | *Systoechus* sp. |
| Buprestidae | Metallic wood-boring beetle | *Buprestidae* sp. |
| Chrysomelidae | Tamarisk beetle | *Diorhabda* sp. |
| Cicadidae | Pale-winged desert cicada | *Okanagodes gracilis* |
| Coliadinae | Orange sulphur | *Colias eurytheme* |
| Curculionidae | Broad-nosed weevil | *Ophryastes argentatus* |
| Formicidae | Carpenter ant | *Camponotus* sp. |
| Heteronemiidae | Western short-horned walkingstick | *Parabacillus hesperus* |
| Lycaenidae | Western pygmy blue | *Brephidium exilis* |
| Papilionidae | Desert black swallowtail | *Papilio polyxenes coloro* |
| Syrphidae | White-bowed smoothwing | *Scaeva affinis* |
| Tenebrionidae | Darkling beetle | *Eleodes* sp. |
| Birds | | |
| Accipitridae | Cooper's hawk (WL; nesting) † | *Accipiter cooperii* |
| Accipitridae | Golden eagle (FP, BLM, WL; nesting and wintering) † | *Aquila chrysaetos* |
| Accipitridae | Sharp-shinned hawk (WL; nesting) | *Accipiter striatus* |
| Accipitridae | Red-tailed hawk | *Buteo jamaicensis* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Accipitridae | Swainson's hawk (ST, BLM) | *Buteo swainsoni* |
| Accipitridae | Northern harrier (SSC; nesting) † | *Circus hudsonius* |
| Aegithalidae | Bushtit | *Psaltriparus minimus* |
| Alaudidae | Horned lark[2] | *Eremophila alpestris* |
| Anatidae | Mallard | *Anas platyrhynchos* |
| Anatidae | Canada goose | *Branta canadensis* |
| Ardeiade | Great blue heron | *Ardea herodias* |
| Caprimulgidae | Lesser nighthawk | *Chordeiles acutipennis* |
| Cardinalidae | Lazuli bunting | *Passerina amoena* |
| Cardinalidae | Blue grosbeak | *Passerina caerulea* |
| Cardinalidae | Black-headed grosbeak | *Pheucticus melanocephalus* |
| Cardinalidae | Western tanager | *Piranga ludoviciana* |
| Cathartidae | Turkey vulture | *Cathartes aura* |
| Charadriidae | Killdeer | *Charadrius vociferus* |
| Columbidae | Rock pigeon* | *Columba livia* |
| Columbidae | Eurasian collared-dove* | *Streptopelia decaocto* |
| Columbidae | Mourning dove | *Zenaida macroura* |
| Corvidae | American crow | *Corvus brachyrhynchos* |
| Corvidae | Common raven | *Corvus corax* |
| Cuculidae | Western yellow-billed cuckoo (FT, SE, BLM) | *Coccyzus americanus occidentalis* |
| Cuculidae | Greater roadrunner | *Geococcyx californianus* |
| Falconidae | Prairie falcon (WL; nesting) † | *Falco mexicanus* |
| Falconidae | Peregrine falcon (nesting) † | *Falco peregrinus* |
| Falconidae | American kestrel | *Falco sparverius* |
| Fringillidae | House finch | *Haemorhous mexicanus* |
| Fringillidae | Lesser goldfinch | *Spinus psaltria* |
| Hirundinidae | Cliff swallow | *Petrochelidon pyrrhonota* |
| Hirundinidae | Tree swallow | *Tachycineta bicolor* |
| Hirundinidae | Violet-green swallow | *Tachycineta thalassina* |
| Icteridae | Tricolored blackbird (ST, BLM, SSC, BCC; nesting colony) | *Agelaius tricolor* |
| Icteridae | Brewer's blackbird | *Euphagus cyanocephalus* |
| Icteridae | Bullock's oriole | *Icterus bullockii* |
| Icteridae | Hooded oriole | *Icterus cucullatus* |
| Icteridae | Brown-headed cowbird | *Molothrus ater* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Icteridae | Great-tailed grackle | *Quiscalus mexicanus* |
| Icteridae | Western meadowlark | *Sturnella neglecta* |
| Laniidae | Loggerhead shrike (SSC, BLM; nesting) † | *Lanius ludovicianus* |
| Lauridae | Ring-billed gull | *Larus delawarensis* |
| Mimidae | Northern mockingbird | *Mimus polyglottos* |
| Mimidae | Sage thrasher | *Oreoscoptes montanus* |
| Mimidae | LeConte's thrasher (BCC, SSC) | *Toxostoma lecontei* |
| Mimidae | California thrasher | *Toxostoma redivivum* |
| Motacillidae | American pipet | *Anthus rubescens* |
| Odontiphoridae | California quail | *Callipepla californica* |
| Odontiphoridae | Gambel's quail | *Callipepla gambelii* |
| Pandionidae | Osprey (WL) | *Pandion haliaetus* |
| Parulidae | Wilson’s warbler | *Cardellina pusilla* |
| Parulidae | MacGillivray’s warbler | *Geothlypis tolmiei* |
| Parulidae | Common yellowthroat | *Geothlypis trichas* |
| Parulidae | Orange-crowned warbler | *Leiothlypis celata* |
| Parulidae | Lucy’s warbler (SSC, BLM) | *Leiothlypis luciae* |
| Parulidae | Yellow-rumped warbler | *Setophaga coronata* |
| Parulidae | Yellow warbler (SSC) | *Setophaga petechia* |
| Parulidae | Townsend’s warbler | *Setophaga townsendi* |
| Paserellidae | Dark-eyed junco | *Junco hyemalis* |
| Passerellidae | Black-throated sparrow | *Amphispiza bilineata* |
| Passerellidae | Bell’s sparrow (WL) | *Artemisiospiza belli belli* |
| Passerellidae | Sagebrush sparrow | *Artemisiospiza nevadensis* |
| Passerellidae | Lark sparrow | *Chondestes grammacus* |
| Passerellidae | California towhee | *Melozone crissalis* |
| Passerellidae | Savannah sparrow | *Passerculus sandwichensis* |
| Passerellidae | Brewer’s sparrow | *Spizella breweri* |
| Passerellidae | Chipping sparrow | *Spizella passerina* |
| Passerellidae | White-crowned sparrow | *Zonotrichia leucophrys* |
| Passeridae | House sparrow* | *Passer domesticus* |
| Picidae | Northern flicker | *Colaptes auratus* |
| Picidae | Nuttall’s woodpecker | *Dryobates nuttallii* |
| Picidae | Ladder-backed woodpecker | *Picoides scalaris* |
| Polioptilidae | Blue-gray gnatcatcher | *Polioptila caerulea* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Polioptilidae | Black-tailed gnatcatcher (WL) | *Polioptila melanura* |
| Ptilogonatidae | Phainopepla | *Phainopepla nitens* |
| Regulidae | Ruby-crowned kinglet | *Regulus calendula* |
| Remizidae | Verdin | *Auriparus flaviceps* |
| Strigidae | Long-eared owl (BCC, SSC; nesting) | *Asio otus* |
| Strigidae | Western burrowing owl (BCC, SSC, BLM, SCL; Burrow sites and some wintering sites) | *Athene cunicularia* ssp. *hypugaea* |
| Strigidae | Great horned owl | *Bubo virginianus* |
| Scolopacidae | Greater yellowlegs | *Tringa melanoleuca* |
| Sturnidae | European starling* | *Sturnus vulgaris* |
| Trochilidae | Black-chinned hummingbird | *Archilochus alexandri* |
| Trochilidae | Anna's hummingbird | *Calypte anna* |
| Trochilidae | Costa's hummingbird (BCC) | *Calypte costae* |
| Troglodytidae | Rock wren | *Salpinctes obsoletus* |
| Troglodytidae | Bewick's wren | *Thryomanes bewickii* |
| Turdidae | Swainson's thrush | *Catharus ustulatus* |
| Tyrannidae | Olive-sided flycatcher (SSC, BCC) | *Contopus cooperi* |
| Tyrannidae | Western wood-pewee | *Contopus sordidulus* |
| Tyrannidae | Pacific-slope flycatcher | *Empidonax difficilis* |
| Tyrannidae | Willow flycatcher | *Empidonax traillii* |
| Tyrannidae | Gray flycatcher | *Empidonax wrightii* |
| Tyrannidae | Ash-throated flycatcher | *Myiarchus cinerascens* |
| Tyrannidae | Vermilion flycatcher (SSC; nesting) | *Pyrocephalus rubinus* |
| Tyrannidae | Black phoebe | *Sayornis nigricans* |
| Tyrannidae | Say's phoebe | *Sayornis saya* |
| Tyrannidae | Western kingbird | *Tyrannus verticalis* |
| Tyrannidae | Cassin's kingbird | *Tyrannus vociferans* |
| Tytonidae | Barn owl | *Tyto alba* |
| Vireonidae | Cassin's vireo | *Vireo cassinii* |
| Vireonidae | Warbling vireo | *Vireo gilvus* |
| Reptiles | | |
| Colubridae | Red racer | *Coluber flagellum piceus* |
| Colubridae | Great Basin gopher snake | *Pituophis catenifer deserticola* |
| Crotaphytidae | Long-nosed leopard lizard | *Gambelia wislizenii* |
| Iguanidae | Desert iguana | *Dipsosaurus dorsalis* |

| Family | Common Name | Scientific Name |
|---|---|---|
| Phrynosomatidae | Zebra-tailed lizard | *Callisaurus draconoides* |
| Phrynosomatidae | Desert horned lizard | *Phrynosoma platyrhinos* |
| Phrynosomatidae | Great Basin fence lizard | *Sceloporus occidentalis longipes* |
| Phrynosomatidae | Yellow-backed spiny lizard | *Sceloporus uniformis* |
| Phrynosomatidae | Mojave fringe-toed lizard (SSC, BLM) | *Uma scoparia* |
| Phrynosomatidae | Western side-blotched lizard | *Uta stansburiana elegans* |
| Teiidae | Great Basin whiptail | *Aspidoscelis tigris tigris* |
| Testudinidae | Desert tortoise (FE, SE) | *Gopherus agassizii* |
| Viperidae | Mojave Desert sidewinder | *Crotalus cerastes cerastes* |
| Viperidae | Northern Mojave rattlesnake | *Crotalus scutulatus* |
| Mammals | | |
| Canidae | Domestic dog* | *Canis familiaris* |
| Canidae | Coyote | *Canis latrans* |
| Canidae | Desert kit fox (FBM) | *Vulpes macrotis* |
| Castoridae | American beaver (FBM) | *Castor canadensis* |
| Cricetidae | Woodrat | *Neotoma* sp. |
| Cricetidae | Deer mouse | *Peromyscus maniculatus* |
| Felidae | Bobcat | *Lynx rufus* |
| Heteromyidae | Desert pocket mouse | *Chaetodipus pencillatus* |
| Heteromyidae | Merriam's kangaroo rat | *Dipodomys merriami* |
| Leporidae | Black-tailed jackrabbit | *Lepus californicus* |
| Leporidae | Audubon's cottontail | *Sylvilagus audubonii* |
| Muridae | House mouse* | *Mus musculus* |
| Muridae | Black rat* | *Rattus rattus* |
| Sciuridae | White-tailed antelope squirrel | *Ammospermophilus leucurus* |
| Sciuridae | California ground squirrel | *Otospermophilus beecheyi* |
| Sciuridae | Round-tailed ground squirrel | *Xerospermophilus tereticaudus* |
| Vespertilionidae | Canyon bat | *Parastrellus hesperus* |

*Non-native species
[1]: Clonal ring form observed
†: Special-status species not observed nesting during project surveys
[2]: Species often misidentified as sensitive subspecies California horned lark (*Eremophila alpestris actia*; WL) which breeds and resides in the coastal region of the state from Sonoma County southeast to the United States/Mexican border, including most of the San Joaquin Valley, and eastward to the foothills of the Sierra Nevada (outside of the vicinity of BIG).
BCC: USFWS Bird of Conservation Concern
BLM: BLM Sensitive Species
CRPR: California Rare Plant Rank
FBM: Furbearing Mammal under California Code of Regulations

| Family | Common Name | Scientific Name |
|---|---|---|
| FE: Federally Endangered<br>FT: Federally Threatened<br>FP: CDFW Fully Protected<br>SBC: County of San Bernardino Code 88.01 Regulated Plant<br>SE: State Endangered<br>ST: State Threatened<br>SCL: State Candidate for Listing<br>SSC: CDFW Species of Special Concern<br>WL: CDFW Watch List | | |

# ATTACHMENT C

# BARSTOW INTERNATIONAL GATEWAY (BIG) PROJECT AUGUST 2025 AQUATIC RESOURCES DELINEATION REPORT (ARDR) ADDENDUM

ROCKS
BIOLOGICAL CONSULTING





# BARSTOW INTERNATIONAL GATEWAY (BIG) AQUATIC RESOURCES DELINEATION REPORT (ARDR) AUGUST 2025 ADDENDUM

San Bernardino County, California

September 10, 2025


Prepared for:
BNSF Railway Company
2500 Lou Menk Drive, AOB-3
Fort Worth, TX 76131
(817) 352-2383

Prepared by:
Rocks Biological Consulting
4312 Rialto Street
San Diego, CA 92107
(619) 701-6798

To: Deanna Cummings, U.S. Army Corps of Engineers

From: Keoni Calantas, Rocks Biological Consulting

Date: September 10, 2025

Subject: Barstow International Gateway (BIG) Aquatic Resources Delineation Report (ARDR) August 2025 Addendum

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This memorandum serves as an addendum (August 2025 Aquatic Resources Delineation Report [ARDR] Addendum) to the following ARDR documents for the Barstow International Gateway (BIG) project (project):

- September 23, 2022 *Big Barstow Aquatic Resources Delineation Report* (2022 ARDR; Attachment A)
- August 9, 2023 *Big Barstow Aquatic Resources Delineation Report 2023 Addendum* (2023 Addendum; Attachment B)
- June 13, 2024 *Big Barstow Aquatic Resources Delineation Report 2024 Addendum* (2024 Addendum; Attachment C)
- March 7, 2025 *Big Barstow Aquatic Resources Delineation Report March 2025 Addendum* (March 2025 Addendum; Attachment D)

The 2022 ARDR, 2023 addendum, 2024 addendum, and March 2025 addendum are herein referred to collectively as the March 2025 ARDR. This document addresses the latest update to the project footprint for the Barstow International Gateway Project (project; formerly 'Big Barstow') related to the expansion of the 33 kilovolt (kV) alignment surrounding Bonanza Road (Figure 1). The August 2025 ARDR addendum review area occurs outside of the previous ARDR review areas referenced in the 2022 ARDR, 2023 Addendum, 2024 Addendum, and March 2025 Addendum (collectively referred to in this addendum as the March 2025 ARDR review area). Specifically, the proposed additional project areas discussed in this August 2025 ARDR addendum include a 150-foot expansion of the March 2025 ARDR review area on either side of Bonanza Road (August 2025 ARDR addendum review area; Figure 1). The analysis provided herein focuses on the August 2025 ARDR addendum review area totaling 26.08 acres while also describing and summarizing jurisdictional connections to the March 2025 ARDR review area to account for aquatic resources across the entire project.

## 1.1 Site Descriptions, Landscape Setting

The 26.08-acre August 2025 ARDR addendum review area increases slightly in topography moving northeast towards Tortilla Substation, ranging in elevation from approximately 2,480 to 2,700 feet above mean sea level (amsl; Figure 2). The approximate center of the August 2025 ARDR addendum review area is located at 34.869190, -117.039573. The August 2025 ARDR addendum review area is within the Mojave Hydrologic Unit Code (HUC) 8

(18090208), Daggett Wash-Mojave River HUC 10 (1809020811), and City of Barstow-Mojave River HUC 12 (180902081105; Figure 3). The Mojave River headwaters in the San Bernardino Mountains, continues for approximately 120 miles via surface and subsurface flows through the Mojave Desert, then drains into Soda Dry Lake (Lahontan Regional Water Quality Control Board [LRWQCB] 2002). The Mojave River typically only conveys surface flows during large storm events or in areas where geologic structures force groundwater to the surface (LRWQCB 2002).

## 1.2 Methods

Rocks Biological Consulting (RBC) conducted aquatic resources delineation field visits for the August 2025 ARDR addendum review area on August 13 and 14, 2025. Field conditions during these field visits are provided below in Table 1. Field methods are consistent with and detailed in Section 3 of the 2022 ARDR (Attachment A).

Table 1. Field Conditions

| Date | Survey Time Start – End | Temperature (°F) Start – End | Wind Speed Range (miles per hour) Start – End | Cloud Cover (%) Start – End | Personnel[1] |
|---|---|---|---|---|---|
| 8/13/2025 | 1000 – 1545 | 90 – 102 | 5 to 8 – 5 to 8 | 0 – 5 | KW, MT, SG |
| 8/14/2025 | 0638 – 0930 | 79 – 88 | 10 to 12 – 5 to 8 | 2 – Trace | KW, MT, SG |

[1]*KW = Kelsey Woldt, MT = Melissa Tamarkin, SG = Sarah Gulyas*

## 1.3 Current Site Conditions

### 1.3.1 Soils

Based on the Natural Resources Conservation Service (NRCS) soils map (Figure 4), four soil map units occur within the August 2025 ARDR addendum review area (Table 2).

Table 2. Soils Mapped within the August 2025 ARDR Addendum Review Area

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Badland | N/A[2] | N/A[2] | N/A[2] |
| Cajon gravelly sand, 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon sand, 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Nebona-Cuddleback complex, 2 to 9 percent slopes | Nebona | Loamy, mixed, superactive, thermic, shallow Typic Haplodurids | Yes |
| | Cuddleback | Fine-loamy, mixed, superactive, thermic Typic Argidurids | |

Source: NRCS Official Soil Series Description and Series Classification database (NRCS n.d.a); *Soil Survey of San Bernardino County California, Mojave River Area* (USDA 1986); NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.b).
[1] Based on the NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.b). As stated in the Arid West Supplement (Corps 2008), RBC used the hydric soils list as a tool and made final hydric soils determinations based on field-collected data at representative wetland delineation sample points deemed appropriate on site. No additional data sheets were filled out during the August 2025 ARDR addendum.

[2] *Badland* is used to describe a type of terrain/bedrock characterized by extensive erosion. Badlands are devoid of soil and vegetation and are not recognized as a soil unit by the NRCS (NRCS n.d.a.)

The National Technical Committee for Hydric Soils defines hydric soils; *Changes in Hydric Soils Database Selection Criteria* (77 FR 12234) outlines the current four hydric soil criteria. As shown above in Table 2, the NRCS Soil Data Access (SDA) Hydric Soils List specifies one soil map unit within the August 2025 ARDR addendum review area as hydric (NRCS n.d.b).

### 1.3.2 Vegetation

Table 3 provides vegetation community acreages within the August 2025 ARDR addendum review area based on vegetation mapping conducted by RBC concurrent with the August 2025 aquatic resource delineation. Vegetation communities within the August 2025 ARDR addendum review area are shown on Figure 6. The vegetation community classifications generally follow *A Manual of California Vegetation* (Sawyer et al. 2009) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Please refer to Attachment A for descriptions of these vegetation communities as they occur in the August 2025 ARDR addendum review area.

Table 3. Vegetation Communities within the August 2025 ARDR Addendum Review Area

| Manual of California Vegetation Community/Land Cover Type | Holland 1986 Vegetation Community/Land Cover Type | Acre(s)[1] |
|---|---|---|
| Disturbed | Disturbed | 0.10 |
| *Larrea tridentata – Ambrosia dumosa* Shrubland Alliance | Mojavean Creosote Bush (White Bursage) Scrub | 25.79 |
| Unvegetated Channel | Unvegetated Channel | 0.19 |
| | Total | 26.08 |

[1] Acreages summed using raw numbers provided during GIS analysis (available upon request) and thus the sum of the total rounded numbers may not directly add up in this table.

## 1.4 Precipitation Data and Analysis

### 1.4.1 Precipitation Summary

Table 4 describes the estimated monthly total precipitation for the August 2025 ARDR addendum review area for the 12 months prior to the aquatic resources delineation (August 2024 to July 2025) to provide pertinent pre-site visit precipitation data from the NRCS database for the Barstow station (NRCS 2025).

Table 4. Precipitation Data for August 2024 – July 2025

| | Aug | Sep | Oct | Nov | Dec | Fan | Feb | Mar | Apr | May | Jun | Jul |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monthly Total Precipitation (inch[es]) | T | 0.02 | T | 0.01 | 0.00 | 0.48 | 0.52 | 0.69 | T | 0.42 | 0.00 | 0.00 |

Source: NRCS Agricultural Applied Climate Information System (AgACIS) database (NRCS 2025)
[1] Per AgACIS database: Value of 'T' indicates a trace.

### 1.4.2 Antecedent Precipitation Tool Data

Table 5 summarizes the key data extrapolated from the Corps' Antecedent Precipitation Tool (APT) output to compare the current year 30-day rolling total to the averaged 30-year normal for the weather stations with comprehensive historical data within 30 miles of the review area: estimated drought conditions, wet or dry season determination, antecedent runoff condition (ARC) score, and antecedent precipitation condition. The APT output summarized in Table 5 noted a PDSI class of "extreme drought" during the August 2025 field surveys (Corps 2025). The precipitation and climatic conditions were classified as "normal conditions" for the review area during August 2025 field surveys based on the 30-day rolling totals for the three months preceding the field survey dates (Corps 2025).

Table 5. Antecedent Precipitation Tool Data for August 2025 ARDR Addendum Review Area

| Field Survey Date | PDSI Value | PDSI Class | Season | ARC Score | Antecedent Precipitation Condition |
|---|---|---|---|---|---|
| 8/13/2025 | -4.27 | Extreme drought | Dry Season | 12 | Normal Conditions |
| 8/14/2025 | | | | | |

Source: Antecedent Precipitation Tool (Corps 2025)

## 1.5 Description of Observed Potential Aquatic Resources

The following descriptions of observed potential aquatic resources within the August 2025 ARDR addendum review area document the presence or absence of aquatic resource indicators per the methods discussed in Section 3 of the 2022 ARDR. The subsections below are intended to be reviewed independently under each agency's purview unless otherwise directed in the text (i.e., the aquatic resource description is the same between two or more agencies) given the various regulatory definitions and standards per each agency and in conjunction with Section 6 of the 2022 ARDR (Attachment A), Section 1.5 of the 2023 Addendum (Attachment B), Section 1.5 of the 2024 Addendum (Attachment C), and Section 1.5 of the March 2025 Addendum (Attachment D).

Note that the nomenclature used in this report for the Ordinary High Water Mark (OHWM) Datasheet Points (ODPs) and aquatic resources is sequential with that used in the March 2025 ARDR; therefore, the ODP numbering within this addendum begins at ODP 49 (Attachment E). No additional Wetland Data Point (WDP) forms were filled out during the August 2025 delineation. Additionally, novel aquatic feature nomenclature in this addendum begins at non-wetland water (NWW)-317, resuming numerical sequence with the features described in the March 2025 ARDR. If an existing feature from the March 2025 ARDR was extended in the 2025 August ARDR Addendum review area, its original NWW numbering was used; however, only new acreage (occurring outside of the March 2025 ARDR Addendum) is discussed herein.

Attachment G provides representative site photographs of the aquatic resources within the August 2025 ARDR addendum review area; Figures 5A – 5C display representative photo points (1 – 8).

### 1.5.1 Corps/RWQCB Wetland Waters of the U.S./state

Due to a lack of hydrophytic vegetation and hydrology indicators within the August 2025 ARDR addendum review area, RBC did not collect additional data at any WDPs to determine the presence or absence of jurisdictional wetland waters of the U.S./State. Specifically, NWWs within the 2025 ARDR review area were comprised of upland or National Wetland Plant List (NWPL) non-listed species and lacked wetland hydrology indicators such as soil cracking or drift deposits. One hydric soil, Nebona-Cuddleback complex, 2 to 9 percent slopes, is present within the center of the August 2025 ARDR addendum review area within NWW-146. A WDP was previously completed at this feature within the hydric soil region during the 2023 delineation (2023 Addendum, Attachment B; WDP 13). The extended area of NWW-146 in the August 2025 ARDR addendum review area contains Badlands, a non-hydric landform characterized by erosion which is devoid of soil and vegetation and is unrecognized by the NRCS. No previous WDP forms indicated any wetland waters of the U.S./State within the 2025 August ARDR addendum review area.

### 1.5.2 Corps/RWQCB Non-Wetland Waters of the U.S./State

RBC collected data at two representative ODPs within the August 2025 ARDR addendum review area to determine the presence of potential waters of the U.S./State (ODPs 49 and 50; Figures 5A and 5B; Attachment E). RBC selected ODP 49-50 locations as their associated streams were representative of the range of aquatic features within the 2025 August ARDR addendum review area. There were multiple single-thread dry washes, unvegetated ephemeral streambeds, and braided channel systems with similar hydrology and OHWM characteristics within the 2025 August ARDR addendum review area. Overall, the August 2025 ARDR addendum review area supports 117 aquatic features (continuing several previously mapped features between NWW-124 through NWW-182 [Attachment D] and novel features NWW-317 through NWW-393), including both single-thread and multi-thread dry washes. The OHWMs within the August 2025 ARDR addendum review area varied in width from an average minimum of two feet and an average maximum of four feet. These features were primarily unvegetated and surrounded by the *Larrea tridentata* – (Not Listed/Upland [NL/UPL]) *Ambrosia dumosa* (NL/UPL) shrubland alliance or disturbed land. See Attachment H, Table H-1 for descriptions of all NWWs within the August 2025 ARDR addendum review area. All features in the March 2025 ARDR and August 2025 ARDR addendums are accounted for in Attachments D and H.

All NWWs delineated within the August 2025 ARDR addendum review area flow in a northerly direction toward the Mojave River (Figures 5A through 5C). NWWs within the review area are unvegetated and earthen in composition. Figures 5A and 5B display the limits of observed OHWM indicators within the August 2025 ARDR addendum review area.

Staff concluded based on field observations that NWWs within the 2025 ARDR addendum review area are ephemeral features that only receive flows from runoff in direct response to precipitation, mirroring analysis of all previously recorded aquatic features contained in the March 2025 ARDR. The general characteristics of each of the observed features within the review area are provided in Attachment H, Table H-1. Staff did not observe standing water at

any features within the August 2025 ARDR addendum review area during the August 2025 field survey.

Staff determined the presence of an OHWM at one location within each of the following features within the August 2025 ARDR addendum review area: NWW-177 (ODP 49) and NWW-167 (ODP 50). Observed OHWM indicators included a change in average sediment texture, change in vegetation cover, and change in vegetation species between the active floodplain and upland areas as well as a visible break in bank slope along the active channel (Attachment E, ODP 49 and 50). The OHWMs present at these two locations were representative of the OHWMs within all earthen, unvegetated features delineated during field surveys of the August 2025 ARDR addendum review area.

### 1.5.3 CDFW Streambed and Associated Riparian and Wetland Habitats

Figure 5C displays the estimated extent of streambed within the August 2025 ARDR addendum review area. Overall, the August 2025 ARDR addendum review area supports 117 aquatic features (several features between NWW-124 through NWW-182 and novel features NWW-317 through NWW-393), including both single-thread and multi-thread dry washes. The top of banks (ToBs) within the August 2025 ARDR addendum review area varied in width from an average minimum of 11 feet and an average maximum of 17 feet. These features were primarily unvegetated and generally surrounded by the *Larrea tridentata* – (Not Listed/Upland [NL/UPL]) *Ambrosia dumosa* (NL/UPL) shrubland alliance as well as disturbed land. See Attachment H, Table H-2 for descriptions of NWW-124 through NWW-393 within the August 2025 ARDR addendum review area. All features in the March 2025 ARDR and August 2025 ARDR addendum are accounted for in Attachments D and H.

All NWWs delineated within the August 2025 ARDR addendum review area flow in a northerly direction toward the Mojave River (Figures 5A through 5C). NWWs within the review area are unvegetated and earthen in composition. Figure 5C displays the limits of observed CDFW jurisdictional indicators within the August 2025 ARDR addendum review area.

No riparian habitat was mapped within the August 2025 ARDR addendum review area; however, 13 watercourses were recorded (Figure 5C). All mapped watercourses occur within the *Larrea tridentata – Ambrosia dumosa* shrubland alliance (Figure 5C). Watercourses within the August 2025 ARDR review area drain north, following decreases in topography in their respective locations. All 13 watercourses are labeled with their associated NWW; watercourses throughout the 2025 ARDR addendum review area share hydrological connections with NWWs at either their upstream or downstream extents (Figure 5C). The general characteristics of each of the observed features within the August 2025 ARDR addendum review area are provided in Attachment H, Table H-2.

### 1.5.4 Other Features

RBC field staff did not record any additional areas with potential aquatic resource indicators within the August 2025 ARDR addendum review area; as such, no non-jurisdictional aquatic features (i.e., swales or erosional features) are discussed herein.

### Results and Conclusions

The results provided in this section include the extent of delineated aquatic resources within the August 2025 ARDR addendum review area based on observed field indicators of potential waters of the U.S., waters of the State, and CDFW streambed and watercourse per the methodologies presented in Section 3 of the 2022 ARDR (Attachment A). Table 6 provides a summary of the aquatic resources delineated, by resource agency, within the August 2025 ARDR addendum and March 2025 ARDR review areas. Further details for each aquatic resource mapped within the 2025 ARDR addendum review area are provided in Attachment H.

This section, however, does not analyze the Corps' jurisdictional status of the delineated features per the current regulations, guidance, and standard operating procedures.

Table 6. Total Delineated Aquatic Resources within March 2025 ARDR Review Area and August 2025 ARDR Addendum Review Area

| Agency | Aquatic Resource Type | March 2025 ARDR Review Area | | August 2025 ARDR Addendum Review Area | | TOTAL[1] | |
|---|---|---|---|---|---|---|---|
| | | Acres | Linear Feet | Acres | Linear Feet | Acres | Linear Feet |
| Corps | Non-Wetland Waters of the U.S. | 141.12 | 239,151 | 1.70 | 22,201 | 142.79 | 259,504 |
| | ***Total Corps Aquatic Resources*** | ***141.12*** | ***239,151*** | ***1.70*** | ***22,201*** | ***142.79*** | ***259,504*** |
| RWQCB | Non-Wetland Waters of the U.S./State | 141.12 | 239,151 | 1.70 | 22,201 | 142.79 | 259,504 |
| | ***Total RWQCB Aquatic Resources[1]*** | ***141.12*** | ***239,151*** | ***1.70*** | ***22,201*** | ***142.79*** | ***259,504*** |
| CDFW | Unvegetated Streambed | 54.21 | 238,429 | 2.39 | 22,201 | 58.98 | 259,504 |
| | Vegetated Streambed | 594.43 | 17,982 | 0.00 | 0.00 | 594.42[3] | 17,982 |
| | Watercourse | 56.86 | N/A[2] | 2.81 | N/A[2] | 62.97 | N/A[2] |
| | ***Total CDFW Aquatic Resources[1]*** | ***705.50*** | ***256,411*** | ***5.21*** | ***22,201*** | ***716.38*** | ***259,504*** |

[1] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.
[2] Linear feet not calculated for watercourse to avoid redundant linear foot calculation where such areas overlap with streambed.
[3] Calculations were summed using raw numbers provided during GIS analysis (available upon request) and thus, the acreage varies slightly from previous numbers.

### 1.6.1 Corps

NWWs within the August 2025 ARDR addendum review area displayed clear indicators of an OHWM, including a break in bank slope, change in average sediment texture, and change in

vegetation cover and/or species between the floodplain and adjacent uplands (Attachment E); however, these features did not meet the necessary parameters to qualify as wetland waters of the US.

Approximately 1.70 acres (22,201 linear feet) of potential NWWs of the U.S. occur within the August 2025 ARDR addendum review area, as further detailed in Attachment H, Table H-1 and as shown on Figure 5A.

Cumulatively, based on the results of this addendum and the March 2025 ARDR, approximately 142.79 acres (259,504 linear feet) of potential non-wetland waters of the U.S. associated with NWW-1 through NWW-393 occur within the ARDR review area of the entire BIG project. The ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet is included as Attachment I and supersedes Attachment I of the March 2025 ARDR addendum, Attachment I of the 2024 ARDR addendum, Attachment G of the 2023 ARDR addendum, and Appendix I of the 2022 ARDR.

### 1.6.2 RWQCB

NWWs within the August 2025 ARDR addendum review area displayed clear indicators of an OHWM, including a break in bank slope, change in average sediment texture, and change in vegetation cover and/or species between the floodplain and adjacent uplands (Attachment E); however, these features did not meet the necessary parameters to qualify as wetland waters of the US.

Approximately 1.70 acres (22,201 linear feet) of potential NWWs of the U.S. occur within the August 2025 ARDR addendum review area, as further detailed in Attachment H, Table H-1 and as shown on Figure 5A.

Cumulatively, based on the results of this addendum and the March 2025 ARDR, approximately 142.79 acres (259,504 linear feet) of potential non-wetland waters of the U.S. associated with NWW-1 through NWW-393 occur within the ARDR review area of the entire BIG project. The ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet is included as Attachment I and supersedes Attachment I of the March 2025 ARDR addendum, Attachment I of the 2024 ARDR addendum, Attachment G of the 2023 ARDR addendum, and Appendix I of the 2022 ARDR.

### 1.6.3 CDFW

NWWs within the 2025 August ARDR addendum review area also qualify as CDFW streambed (Figure 5C).

Approximately 5.21 acres (22,201 linear feet) of unvegetated streambed occurs throughout NWWs within the 2025 August ARDR addendum review area, as further detailed in Attachment H, Table H-2 and as shown on Figure 5C. Additionally, 2.81 acres of CDFW watercourse occurs within the August 2025 ARDR Addendum review area (Figure 5C).

Cumulatively, based on the results of this addendum and the March 2025 ARDR, approximately 594.42 acres (17,982 linear feet) of vegetated streambed, 58.98 acres (259,504 linear feet) of unvegetated streambed, and 62.97 acres of watercourse associated

with NWW-1 through NWW-393 occur within the ARDR review area of the entire BIG project.

## 2 References

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U.S. Geological Survey (USGS). (2025). *The national map, advanced viewer.* U.S. Department of Interior. Retrieved August 2025, from https://apps.nationalmap.gov/viewer/

### Figures

Figure 1. Project Location

Figure 2. USGS Topo and NHD

Figure 3. Watershed

Figure 4. NRCS Soils Survey Data and NWI

Figure 5A. Corps Aquatic Resources

Figure 5B. RWQCB Aquatic Resources

Figure 5C. CDFW Streambed and Watercourse

Figure 6. Vegetation

### Attachments

Attachment A. *Big Barstow Aquatic Resources Delineation Report*, prepared by RBC and dated September 23, 2022

Attachment B. *Big Barstow Aquatic Resources Delineation Report 2023 Addendum*, prepared by RBC and dated August 16, 2023

Attachment C. *Big Barstow Aquatic Resources Delineation Report 2024 Addendum*, prepared by RBC and dated June 13, 2024

Attachment D. *Big Barstow Aquatic Resources Delineation Report March 2025 Addendum*, prepared by RBC and dated March 7, 2025

Attachment E. Ephemeral and Intermittent Streams OHWM Datasheets

Attachment F. Antecedent Precipitation Tool Output

Attachment G. Site Photographs

Attachment H. Aquatic Resource Summary Tables for August 2025 ARDR Addendum Review Area

Attachment I. ORM Bulk Upload Aquatic Resources or Consolidated Excel Spreadsheet (*supersedes Appendix I of the 2022 ARDR, Attachment G of the 2023 ARDR Addendum, Attachment I of the 2024 ARDR Addendum, and Attachment I of the March 2025 ARDR Addendum*)

Attachment J. GIS Data (provided electronically to agencies)

August 2025 ARDR Addendum Review Area
2022-2025 ARDR Review Areas

L St
Barstow Rd
Rimrock Rd
34.87523,
-117.047328
P St
H St
Linda Vista Rd
34.862579,
-117.033212
15
247

ARDR Review Area
Boron
Barstow
Lake Los Angeles
Adelanto
Victorville
Apple Valley
Hesperia
Wrightwood
EL MIRAGE VALLEY
ORD MOUNTAINS
58
15
40
395
18

Key Map

FIGURE 1

Project Location

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL CONSULTING

0 1,200 FEET
1 INCH = 1,200 FEET

Date: 8/20/2025
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012

August 2025 ARDR Addendum Review Area
2022-2025 ARDR Review Areas
Township, Range and Section
**USGS National Hydrography Dataset (NHD)**
Wash
Reservoir
Stream/River

09N 02W 11
09N 02W 10
09N 02W 14
09N 02W 13
09N 01W 18
09N 02W 24
09N 01W 19

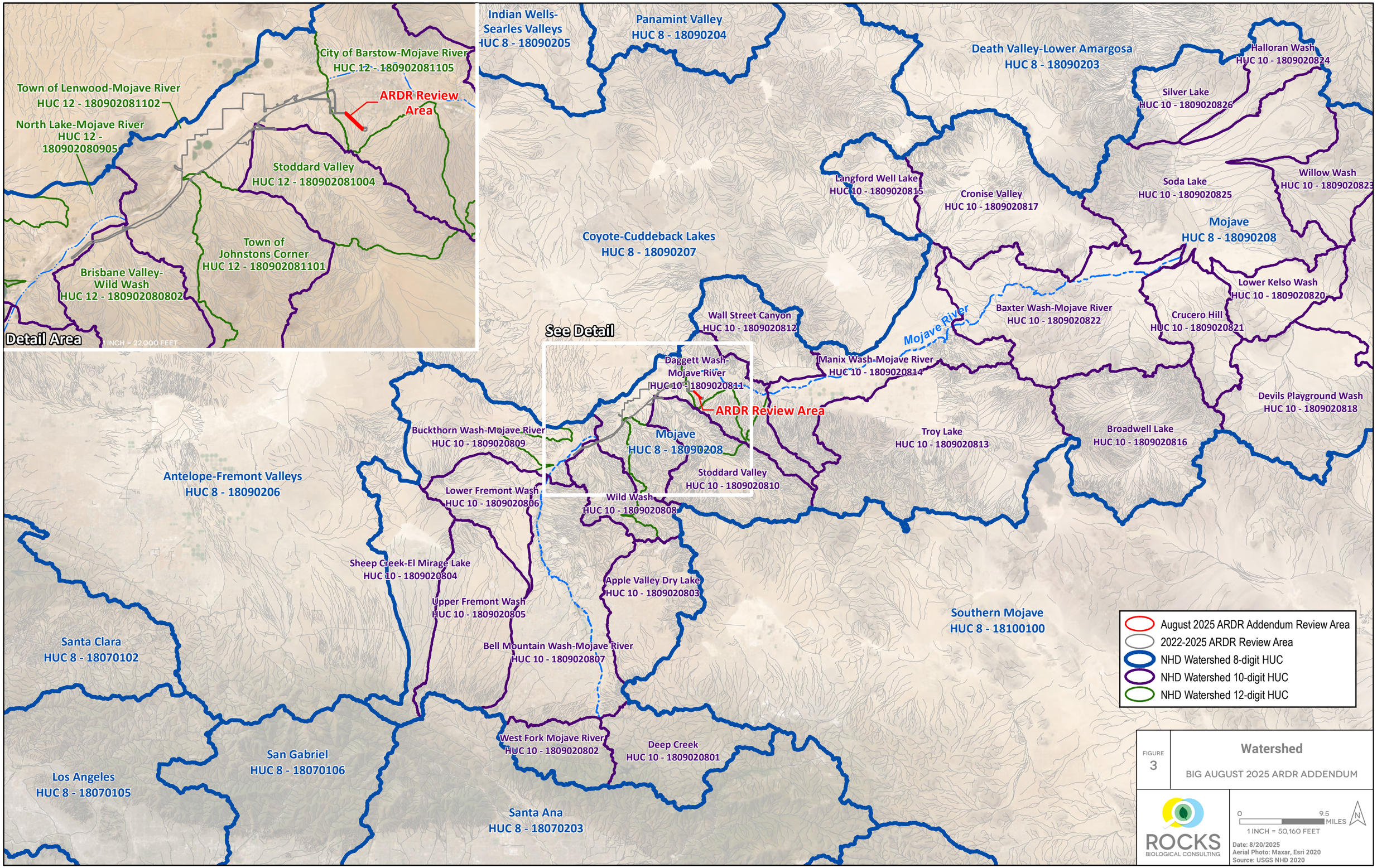
FIGURE 2

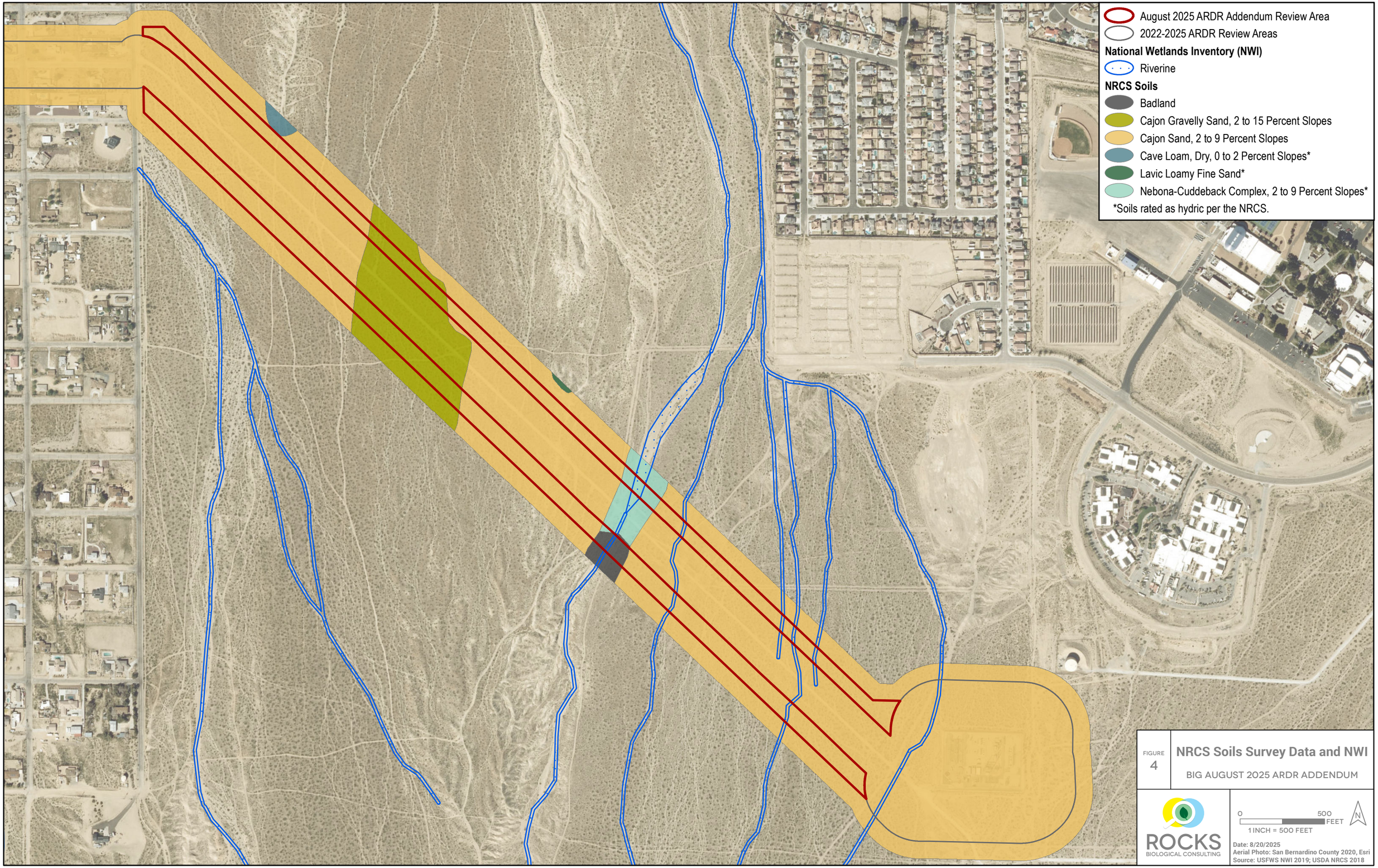
## USGS Topo and NHD

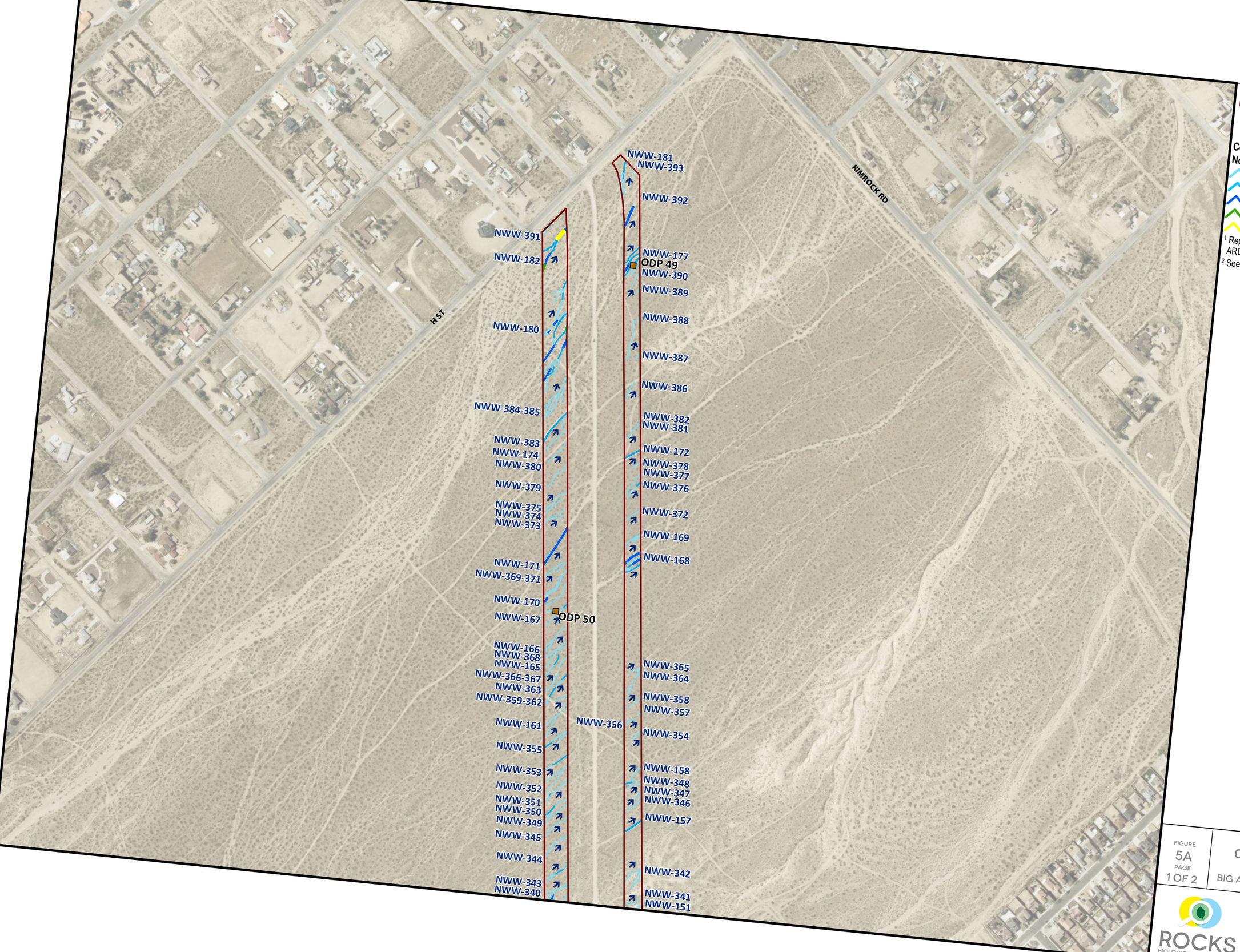
BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL CONSULTING

0 1,400 FEET
1 INCH = 1,400 FEET
Date: 8/20/2025
Source: USGS NHD 2020
USGS 7.5' Quadrangles (Hodge; Hinkley; Barstow SE; Barstow)


Detail Area
1 INCH = 22,000 FEET
Town of Lenwood-Mojave River
HUC 12 - 180902081102
North Lake-Mojave River
HUC 12 -
180902080905
City of Barstow-Mojave River
HUC 12 - 180902081105
ARDR Review Area
Stoddard Valley
HUC 12 - 180902081004
Town of
Johnstons Corner
HUC 12 - 180902081101
Brisbane Valley-
Wild Wash
HUC 12 - 180902080802
Indian Wells-
Searles Valleys
HUC 8 - 18090205
Panamint Valley
HUC 8 - 18090204
Death Valley-Lower Amargosa
HUC 8 - 18090203
Halloran Wash
HUC 10 - 1809020824
Silver Lake
HUC 10 - 1809020826
Langford Well Lake
HUC 10 - 1809020815
Cronise Valley
HUC 10 - 1809020817
Soda Lake
HUC 10 - 1809020825
Willow Wash
HUC 10 - 1809020823
Coyote-Cuddeback Lakes
HUC 8 - 18090207
Mojave
HUC 8 - 18090208
Lower Kelso Wash
HUC 10 - 1809020820
Baxter Wash-Mojave River
HUC 10 - 1809020822
Crucero Hill
HUC 10 - 1809020821
Mojave River
Wall Street Canyon
HUC 10 - 1809020812
See Detail
Manix Wash-Mojave River
HUC 10 - 1809020814
Devils Playground Wash
HUC 10 - 1809020818
Daggett Wash-
Mojave River
HUC 10 - 1809020811
ARDR Review Area
Buckthorn Wash-Mojave River
HUC 10 - 1809020809
Mojave
HUC 8 - 18090208
Troy Lake
HUC 10 - 1809020813
Broadwell Lake
HUC 10 - 1809020816
Antelope-Fremont Valleys
HUC 8 - 18090206
Stoddard Valley
HUC 10 - 1809020810
Lower Fremont Wash
HUC 10 - 1809020806
Wild Wash
HUC 10 - 1809020808
Sheep Creek-El Mirage Lake
HUC 10 - 1809020804
Apple Valley Dry Lake
HUC 10 - 1809020803
Upper Fremont Wash
HUC 10 - 1809020805
Southern Mojave
HUC 8 - 18100100
Santa Clara
HUC 8 - 18070102
Bell Mountain Wash-Mojave River
HUC 10 - 1809020807
West Fork Mojave River
HUC 10 - 1809020802
Deep Creek
HUC 10 - 1809020801
San Gabriel
HUC 8 - 18070106
Los Angeles
HUC 8 - 18070105
Santa Ana
HUC 8 - 18070203
August 2025 ARDR Addendum Review Area
2022-2025 ARDR Review Area
NHD Watershed 8-digit HUC
NHD Watershed 10-digit HUC
NHD Watershed 12-digit HUC
FIGURE
3
Watershed
BIG AUGUST 2025 ARDR ADDENDUM
ROCKS
BIOLOGICAL CONSULTING
0
9.5
MILES
1 INCH = 50,160 FEET
N
Date: 8/20/2025
Aerial Photo: Maxar, Esri 2020
Source: USGS NHD 2020


August 2025 ARDR Addendum Review Area
2022-2025 ARDR Review Areas
National Wetlands Inventory (NWI)
Riverine
NRCS Soils
Badland
Cajon Gravelly Sand, 2 to 15 Percent Slopes
Cajon Sand, 2 to 9 Percent Slopes
Cave Loam, Dry, 0 to 2 Percent Slopes*
Lavic Loamy Fine Sand*
Nebona-Cuddeback Complex, 2 to 9 Percent Slopes*
*Soils rated as hydric per the NRCS.
FIGURE 4
NRCS Soils Survey Data and NWI
BIG AUGUST 2025 ARDR ADDENDUM
ROCKS BIOLOGICAL CONSULTING
0 500 FEET
1 INCH = 500 FEET
N
Date: 8/20/2025
Aerial Photo: San Bernardino County 2020, Esri
Source: USFWS NWI 2019; USDA NRCS 2018




August 2025 ARDR Addendum Review Area (26.1 Ac)[1]

OHWM Datasheet Point (ODP)

Flow Direction

**Corps Aquatic Resources**

**Non-Wetland Waters (1.696 ac)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

[1] Represents total acreage for the August 2025 ARDR addendum review area.

[2] See attachment H for width ranges.

FIGURE 5A
PAGE 1 OF 2

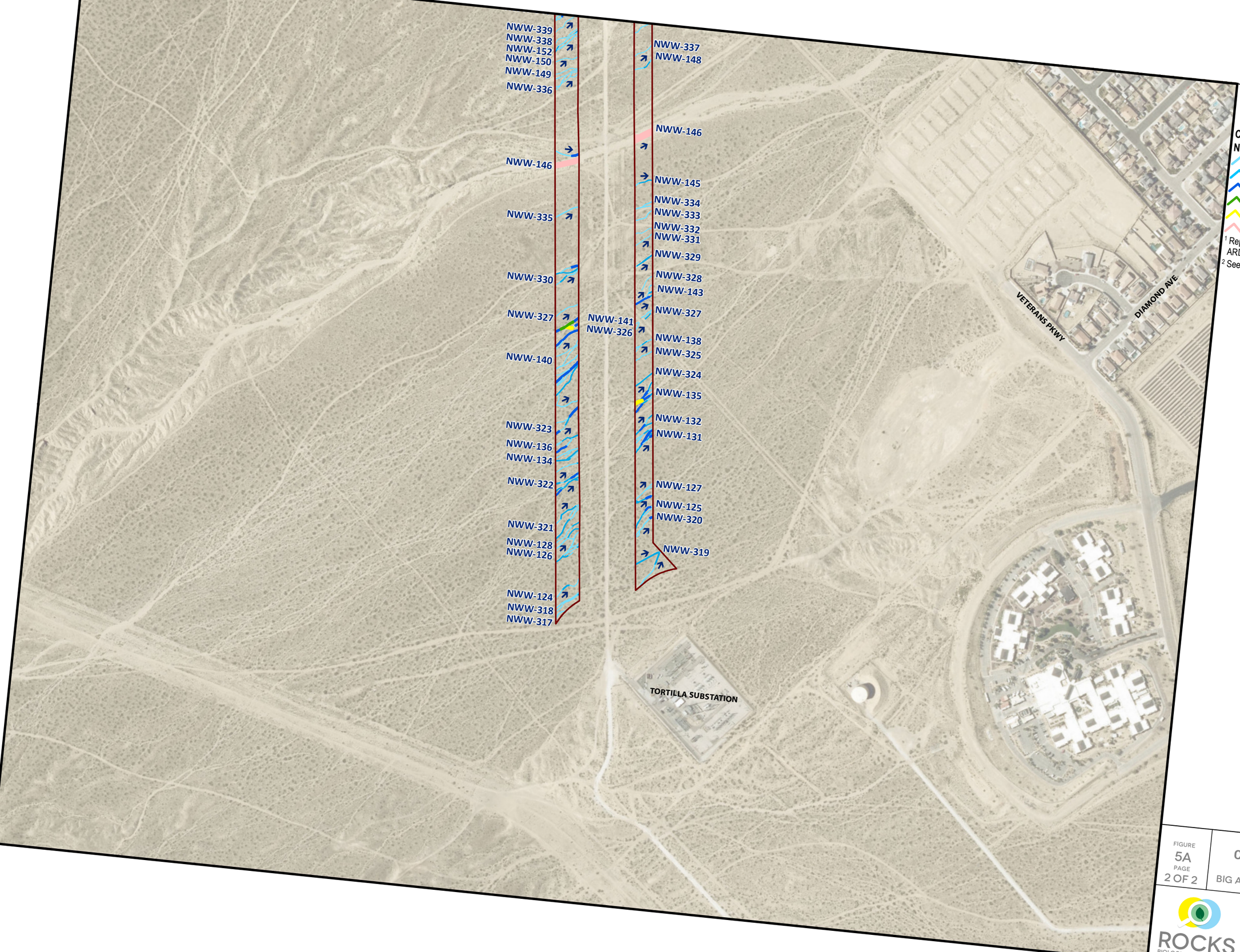
**Corps Aquatic Resources**

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL

0 400 FEET

1 INCH = 400 FEET




August 2025 ARDR Addendum Review Area (26.1 Ac)[1]

Flow Direction

**Corps Aquatic Resources**

**Non-Wetland Waters (1.696 ac)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'

[1] Represents total acreage for the August 2025 ARDR addendum review area.

[2] See attachment H for width ranges.

FIGURE 5A
PAGE 2 OF 2

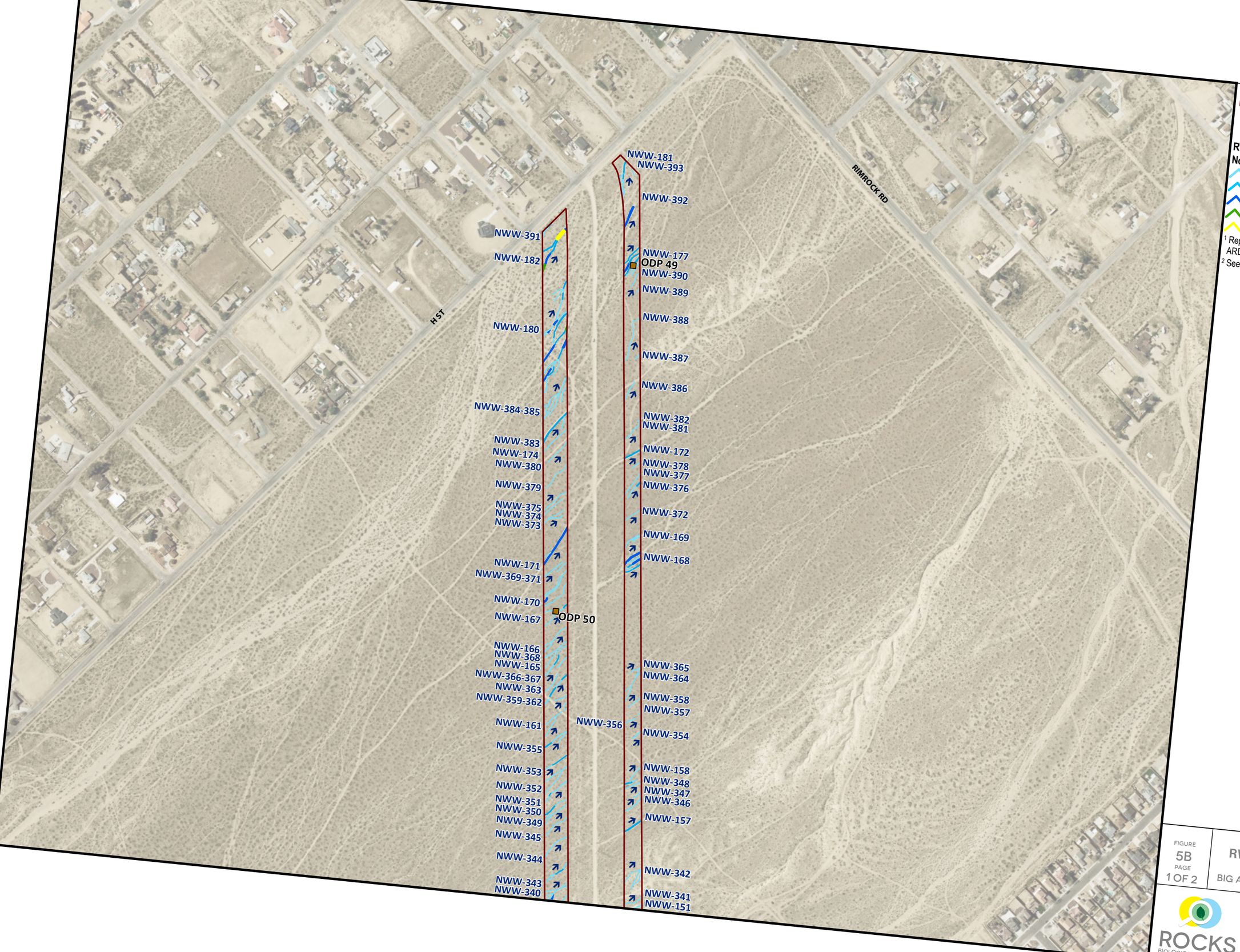
**Corps Aquatic Resources**

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS

0 400 FEET

1 INCH = 400 FEET




August 2025 ARDR Addendum Review Area (26.1 Ac)[1]

OHWM Datasheet Point (ODP)

Flow Direction

**RWQCB Aquatic Resources**

**Non-Wetland Waters (1.696 ac)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

[1] Represents total acreage for the August 2025 ARDR addendum review area.

[2] See attachment H for width ranges.

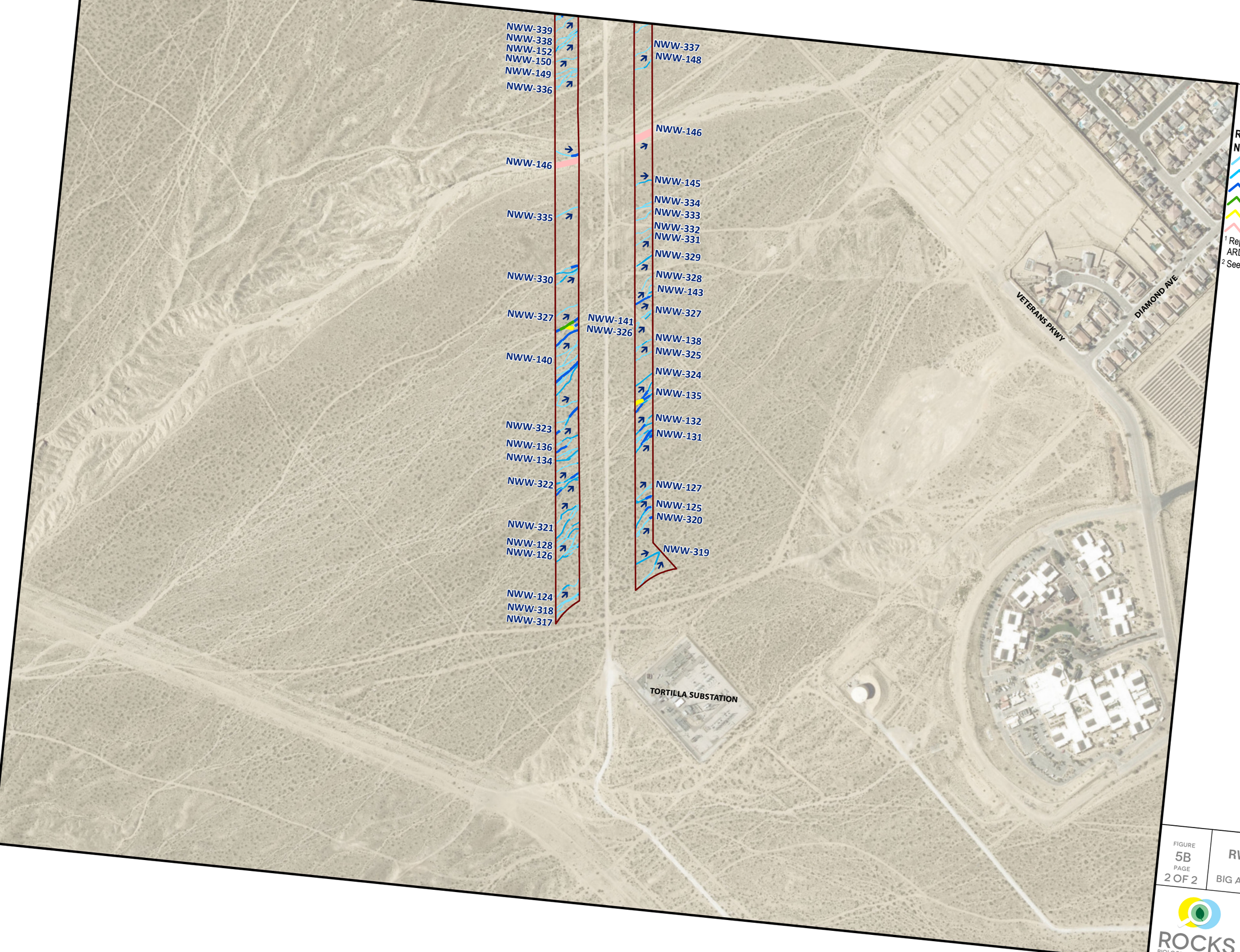
FIGURE 5B
PAGE 1 OF 2

**RWQCB Aquatic Resources**

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL

0 400 FEET
1 INCH = 400 FEET




August 2025 ARDR Addendum Review Area (26.1 Ac)[1]

Flow Direction

**RWQCB Aquatic Resources**

**Non-Wetland Waters (1.696 ac)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'

[1] Represents total acreage for the August 2025 ARDR addendum review area.

[2] See attachment H for width ranges.

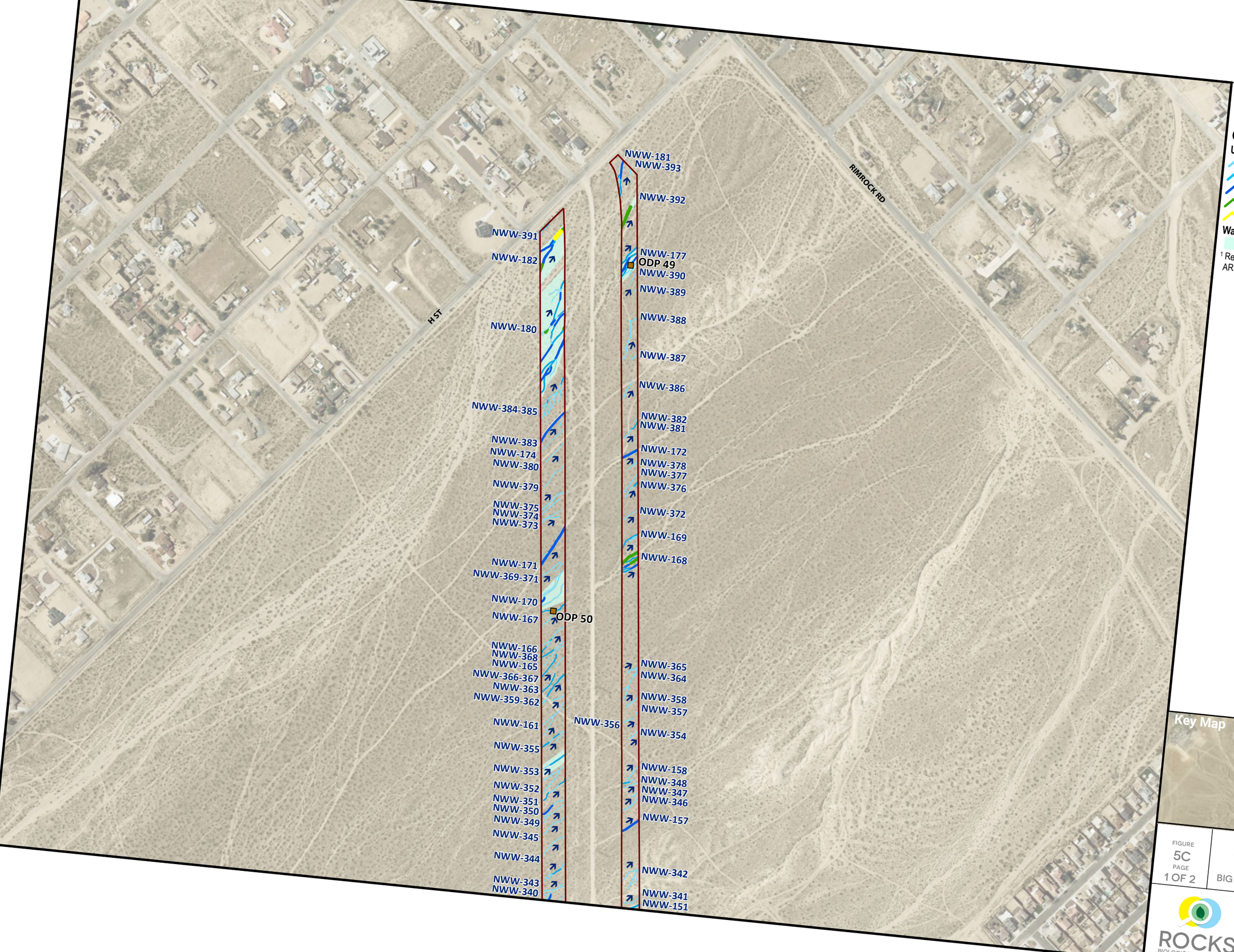
FIGURE 5B
PAGE 2 OF 2

**RWQCB Aquatic Resources**

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET




August 2025 ARDR Addendum Review Area (26.1 Ac)

OHWM Datasheet Point (ODP)

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (5.21 ac)[2]**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

**Watercourse (2.81 ac)**

Watercourse

[1] Represents total acreage for the August 2025 ARDR addendum review area.

Key Map

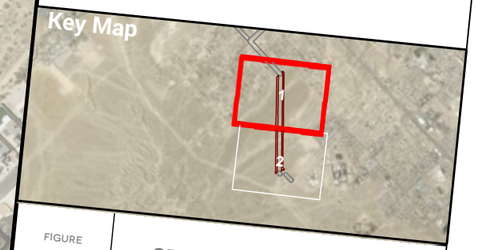


FIGURE 5C
PAGE 1 OF 2

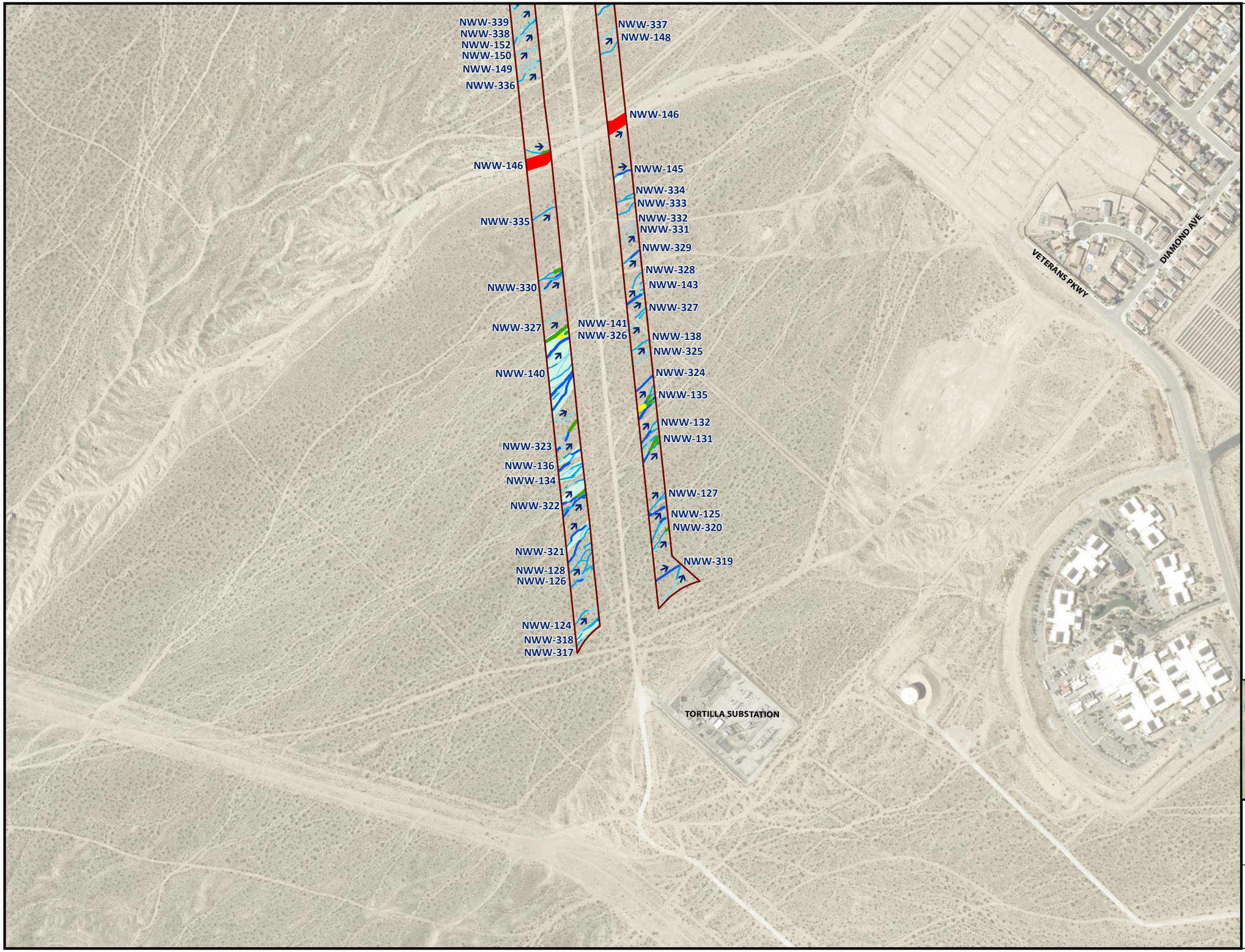
**CDFW Aquatic Resources**

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL

0 420 FEET

1 INCH = 400 FEET




August 2025 ARDR Addendum Review Area (26.1 Ac)[1]

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (5.21 ac)[2]**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- >30'

**Watercourse (2.81 ac)**

- Watercourse

[1] Represents total acreage for the August 2025 ARDR addendum review area.

[2] See attachment H for width ranges.

Key Map

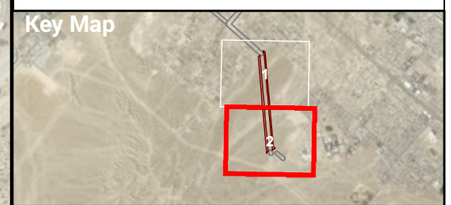


FIGURE 5C
PAGE 2 OF 2

# CDFW Aquatic Resources

BIG AUGUST 2025 ARDR ADDENDUM

ROCKS BIOLOGICAL CONSULTING

0 420 FEET

1 INCH = 400 FEET

Date: 8/22/2025

Aerial Photo: San Bernardino County 2024, Esri

# ATTACHMENT A

## *BIG BARSTOW AQUATIC RESOURCES DELINEATION REPORT*, PREPARED BY RBC AND DATED SEPTEMBER 23, 2022

ROCKS
BIOLOGICAL CONSULTING





# BIG BARSTOW
# AQUATIC RESOURCES DELINEATION REPORT

San Bernardino County, California

September 23, 2022

Prepared for:
BNSF Railway Company
2500 Lou Menk Drive, AOB-3
Fort Worth, TX 76131
(817) 352-2383

Prepared by:
Rocks Biological Consulting
4312 Rialto Street
San Diego, CA 92107
(619) 701-6798

# TABLE OF CONTENTS

1 Introduction ....3
2 Site Description, Landscape Setting ....3
2.1 Location ....3
2.2 Topography ....3
2.3 Watershed ....4
3 Methods ....4
3.1 Pre-Field Review ....4
3.2 On-Site Delineation and Mapping ....4
3.2.1 Corps ....5
3.2.2 RWQCB ....6
3.2.3 CDFW ....7
4 Site Alterations, Current and Past Land Use ....8
4.1 Soils ....9
4.2 Hydrology ....13
4.3 Vegetation ....14
5 Precipitation Data and Analysis ....16
5.1 Precipitation Summary ....16
5.2 Antecedent Precipitation Tool Data ....16
6 Description of Observed Potential Aquatic Resources ....17
6.1 Corps/RWQCB Wetland Waters of the U.S./State ....18
6.2 Corps/RWQCB Non-Wetland Waters of the U.S./State ....18
6.3 CDFW Streambed and Watercourse ....19
6.4 Other Features ....20
7 Deviation from NWI and NHD ....22
8 Results and Conclusions ....22
8.1 Corps ....23
8.2 RWQCB ....23
8.3 CDFW ....23
8.4 Disclaimer Statement ....23
9 Contact Information ....24

## TABLES

Table 1. Field Conditions ....5
Table 2. Soils Mapped within Review Area ....9
Table 3. Vegetation Communities within Review Area ....14

Table 4. Precipitation Data for October 2020 – August 2021 .....16
Table 5. Precipitation Data for October 2021 – May 2022.....16
Table 6. Antecedent Precipitation Tool Data for Review Area.....17
Table 7. Total Acreages of Delineated Aquatic Resources within Review Area .....22

## FIGURES

Figure 1. Project Location
Figure 2. USGS Topo and NHD
Figure 3. Watershed
Figure 4. NRCS Soils Survey Data and NWI
Figure 5A. Corps Aquatic Resources
Figure 5B. RWQCB Aquatic Resources
Figure 5C. CDFW Streambed and Watercourse
Figure 6. Vegetation

## APPENDICES

Appendix A. Checklist: Minimum Standards for Acceptance of Aquatic Resource Delineation Reports
Appendix B. Jurisdictional Determination Request Forms
Appendix C. Applicable Aquatic Resource Protection Regulations
Appendix D. Recent and Historic Aerials Analysis
Appendix E. Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets
Appendix F. Antecedent Precipitation Tool Output
Appendix G. Site Photographs
Appendix H. Aquatic Resource Summary Tables
Appendix I. ORM Bulk Upload Aquatic Resources or Consolidated Excel Spreadsheet
Appendix J. Literature Citations and References
Appendix K. GIS Data (provided electronically to agencies)

# 1 INTRODUCTION

On behalf of Burlington Northern Santa Fe (BNSF) Railway Company, Rocks Biological Consulting (RBC) conducted a formal aquatic resources delineation for the Big Barstow review area, composed of approximately 5,105 acres (Figure 1), to identify areas that may be considered jurisdictional under the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act; the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act; and the California Department of Fish and Wildlife (CDFW) pursuant to Section 1602 of the California Fish and Game Code (CFGC). The information provided in this aquatic resources delineation report (ARDR) is necessary to define the presence or absence of aquatic resources within the review area. This ARDR can also be used by the agencies to inform the jurisidictional status of delineated aquatic resources and by the applicant and agencies to assess conformance with state and federal regulations and to estimate potential impacts and associated permitting requirements. Furthermore, the information contained in this report is in compliance with the Corps Los Angeles District's *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (Minimum Standards; Corps 2017). Appendix A provides a checklist to ensure compliance with the Minimum Standards.

This ARDR also serves as a request for the Corps to complete a Preliminary Jurisdictional Determination (PJD) based on the information provided in this report. Appendix B provides the requried forms associated with the PJD request.

# 2 SITE DESCRIPTION, LANDSCAPE SETTING

## 2.1 LOCATION

The review area is generally located south of and partially within the Mojave River, south and west of California State Route (CA)-58, northwest of National Trails Highway, and extends west-southwest from the City of Barstow for approximately 14.1 miles along the existing BNSF railroad tracks, within the City of Barstow and unincorporated San Bernardino County, California (Figure 1). The review area is generally bounded by the Mojave River to the north/northwest; National Trails Highway, undeveloped land, and/or low-density residential to the south/southeast; BNSF railroad tracks and undeveloped land to the west; and BNSF railroad tracks, undeveloped land, and/or low-density residential to the east. The latitude and longitude of the approximate center of the review area is 34.853903, -117.159799. The review area sits on Township 8 North, Range 4 West, including Sections 12 to 15 and 22; Township 8 North, Range 3 West, including Sections 3 to 5 and 7 to 9; Township 9 North, Range 3 West, including Sections 12 to 14, 22 to 28, and 33 to 35; and Township 9 North, Range 2 West, including Sections 7 to 9, and 17 to 19 within the Hodge, Barstow SE, Barstow, and Hinkley 7.5-minute quadrangles, as mapped by the U.S. Geological Survey (USGS; Figure 2).

## 2.2 TOPOGRAPHY

The review area consists of elevations ranging from approximately 2,189 to 2,413 feet above mean sea level (amsl; Figure 2). The review area is relatively flat except for the presence of dunes within portions of the review area north of the railroad tracks and several hillslopes within the central portion of the review area south of the railroad tracks. Overall, the review area gradually decreases

in elevation moving northwest towards the Mojave River. Drainage patterns within the Mojave River trend southwest to northeast. Drainage patterns within the remainder of the review area generally trend southeast to north/northwest towards the Mojave River.

### 2.3 WATERSHED

The review area is within the Mojave Hydrologic Unit Code (HUC) 8 (18090208), Daggett Wash-Mojave River HUC 10 (1809020811), Stoddard Valley HUC 10 (1809020810), Buckthorn Wash-Mojave River HUC 10 (1809020809), Town of Lenwood-Mojave River HUC 12 (180902081102), Town of Johnstons Corner HUC 12 (180902081101), North Lake-Mojave River HUC 12 (180902080905), and Stoddard Valley HUC 12 (180902081004) (Figure 3). The Mojave River headwaters in the San Bernadino Mountains, continues for approximately 120 miles via surface and subsurface flows through the Mojave Desert, then drains into Soda Dry Lake (Lahontan Regional Water Quality Control Board [LRWQCB] 2002). The Mojave River typically only conveys surface flows during large storm events or in areas where geologic structures force groundwater to the surface (LRWQCB 2002).

In addition to the watersheds defined by the USGS and commonly used by the Corps, the RWQCB also defines watershed boundaries by Hydrologic Units (HUs). The review area is within the South Lahontan Hydrologic Basin, the Mojave HU, and the Middle Mojave Hydrologic Area (LRWQCB 2021).

## 3 METHODS

### 3.1 PRE-FIELD REVIEW

Prior to the on-site delineations, field maps were created using a Geographic Information System (GIS) and a color aerial photograph at a 1:450 scale. RBC staff also reviewed USGS National Hydrography Dataset (NHD) and topography data (Figure 2), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data (Figure 4), and Natural Resources Conservation Service (NRCS) soils data (Figure 4) to further determine the potential locations of aquatic resources within the review area. RBC also utilized Google Earth to assess current and historic presence or absence of flows and/or ponding in the review area (Google Earth Pro 2022).

### 3.2 ON-SITE DELINEATION AND MAPPING

RBC conducted a constraints-level wetland/non-wetland waters jurisdictional assessment for the review area on August 10, 2021. RBC conducted formal aquatic resources delineation field visits for the review area on October 20, 2021; December 1, 2021; March 16, 23, and 24, 2022; April 12, 13, and 15, 2022; May 17, 2022; and June 20, 2022. Field visits were conducted over portions of the review area based on when access was granted to each parcel/portion of the review area. Areas where access was prohibited were visually assessed with binoculars and/or the use of aerial imagery. Field conditions during these field visits are provided below in Table 1.

Table 1. Field Conditions

| Date | Survey Time Start – End | Temperature (°F) Start – End | Wind Speed Range (miles per hour) Start – End | Cloud Cover (%) Start – End | Personnel[1] |
|---|---|---|---|---|---|
| 8/10/2021 | 0800 – 1550 | 87 – 103 | 0 to 1 – 0 to 1 | 0 – 0 (hazy from fires) | SK, IH |
| 10/20/2021 | 0930 – 1545 | 54 – 75 | 0 to 2 – 0 to 1 | 5 – 10 | NF, SK, SS |
| 12/01/2021 | 0940 – 1300 | 55 – 73 | 0 to 2 – 0 to 2 | 0 – 0 | NF, SK |
| 3/16/2022 | 0820 – 1450 | 56 – 77 | 8 to 10 – 7 to 12 | 0 – 5 | AG, KW, RL, SK |
| 3/23/2022 | 0815 – 1530 | 56 – 80 | 1 to 3 – 7 to 12 | 0 – 0 | KW, RL |
| 3/24/2022 | 0700 – 1315 | 52 – 82 | 4 to 8 – 4 to 6 | 0 – 1 | KW, RL |
| 4/12/2022 | 0730 – 1500 | 43 – 61 | 2 to 5 – 0 to 3 | 0 – 0 | ET, KW, RL, SK |
| 4/13/2022 | 0730 – 1430 | 43 – 64 | 0 to 1 – 0 to 1 | 0 – 0 | ET, KW, RL |
| 4/15/2022 | 1045 – 1200 | 66 – 70 | 5 to 8 – 2 to 5 | 2 – 2 | ET |
| 5/17/2022 | 0830 – 1130 | 72 – 81 | 12 to 14 – 12 to 14 | 0 – 0 | KW, RL |
| 6/20/2022 | 0715 – 1640 | 59 – 91 | 3 to 5 – 3 to 6 | 0 – 0 | KW, RL |

[1] AG = Alec Goodman, ET = Emily Trevino, IH = Ian Hirschler, KW = Kelsey Woldt, NF = Natasha Foti, RL = Ryan Layden, SK = Sarah Krejca, SS = Shanti Santulli

Figure 1 and Figures 5A – 5C depict the approximately 5,105-acre review area.

Areas with depressions, drainage patterns, and/or wetland vegetation within the review area were evaluated, with focus on the presence of defined channels and/or wetland vegetation, soils, and hydrology. While in the field, potential aquatic resources were recorded using a hand-held Global Positioning System (GPS) unit with a level of accuracy ranging from 4 to 30 feet. RBC staff refined the data using aerial photographs and topographic maps with one-foot contours to ensure accuracy.

All figures generated for this ARDR follow the Corps' Updated Map and Drawing Standards for the South Pacific Division Regulatory Program (Corps 2016).

The below subsections provide the aquatic resources delineation methods used per agency; Appendix C provides additional details regarding the agencies' applicable regulations and guidance associated with this ARDR.

### 3.2.1 CORPS

#### *Ordinary High Water Mark Delineation*

Aquatic resources with a defined ordinary high water mark (OHWM) would be considered potential non-wetland waters of the U.S. Corps regulations at 33 Code of Federal Regulations (CFR) 329.11 define an OHWM as "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas" (51 Federal Register

[FR] 41251, November 13, 1986). RBC staff used guidance provided in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (OHWM Field Guide; Lichvar & McColley 2008) and Regulatory Guidance Letter (RGL) 05-05 to estimate the extent of an OHWM in the field. For each feature exhibiting the potential presence of an OHWM, RBC completed a 2010 Arid West Ephemeral and Intermittent Streams OHWM Datasheet following the guidance provided in the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (OHWM Datasheet; Curtis & Lichvar 2010). Per the 2010 OHWM Datasheet, common indicators of an OHWM include a break in slope (i.e., abrupt cut in bank slope created by hydrogeomorphic processes across the landscape), changes in average sediment texture between floodplain units (i.e., low-flow, active floodplain, low terrace), and changes in vegetation species and/or cover between floodplain units.

#### *Wetland Delineation*

Field staff examined potential wetland waters of the U.S. using the routine determination methods set forth in Part IV, Section D, Subsection 2 of the Corps 1987 *Wetland Delineation Manual* (Wetland Manual; Environmental Laboratory 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (Arid West Supplement; Corps 2008). Areas that met the three parameters per the Arid West Supplement (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology, following methods set forth in the Wetland Manual and Arid West Supplement) were considered wetland waters of the U.S. RBC staff based wetland plant indicator status (i.e., Obligate [OBL], occurs 99+% in wetlands; Facultative Wetland [FACW], occurs 67-99% in wetlands; Facultative [FAC], occurs 34-66% in wetlands; Facultative Upland [FACU], occurs 1-33% in wetlands; Upland [UPL], occurs 99+% in uplands; and Not Listed [NL], considered UPL for wetland delineation purposes) on the *National Wetland Plant List* (NWPL; Corps 2020a) and hydric soils indicators on *Field Indicators of Hydric Soils in the United States, Version 8.2* (NRCS 2018). Soil chromas were identified in the field according to *Munsell Soil-Color Charts with Genuine Munsell Color Chips* (Munsell Color 2015) and per the Wetland Manual and Arid West Supplement. Plants were identified according to *The Jepson Manual: Vascular Plants of California, 2nd edition* (Baldwin et al. 2012) and nomenclature follows Jepson eFlora (Jepson Flora Project 2022).

### 3.2.2 RWQCB

#### *Ordinary High Water Mark Delineation*

The State Water Resources Control Board (SWRCB) and RWQCBs do not have regulations or guidance on defining the extent of non-wetland waters of the State. As such, field staff identified the lateral limits of potential non-wetland waters of the State using the same methodology for determining an OHWM per the Corps as described in Section 3.2.1. as they have generally been considered coincident.

#### *Wetland Delineation*

The State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (the Procedures; SWRCB 2021) defines wetland waters of the State. The Procedures were adopted on April 2, 2019, went into effect on May 28,

2020, and were revised on April 6, 2021. As detailed in the Procedures, the SWRCB and RWQCBs define a wetland as follows: “An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area’s vegetation is dominated by hydrophytes or the area lacks vegetation” (SWRCB 2021).

The Procedures provide that RWQCBs shall rely on a wetland delineation from a final ARDR verified by the Corps to determine the extent of wetland waters of the State. If any potential wetland areas have not been delineated in a final ARDR verified by the Corps, the limits of such potential wetland waters of the State shall be identified using the same wetland delineation methods per the Corps as described in Section 3.2.1, except that a lack of vegetation (i.e., less than 5 percent areal coverage of plants during the peak of the growing season) does not preclude an area from meeting the definition of a wetland waters of the State (SWRCB 2021).

### 3.2.3 CDFW

***River, Lake, Stream, Watercourse, and Associated Riparian and Wetland Habitat Delineation***

CDFW jurisdiction relies on the presence of a river, lake, and/or stream and associated riparian or wetland habitat (CFGC § 1600 et seq). Lakes include “natural lakes or man-made reservoirs” (14 California Code of Regulations [CCR] § 1.56). CDFW regulations define a stream as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation" (14 CCR § 1.72). The 1987 *Rutherford v. State of California* (188 Cal. App. 3d 1268) decision further provided that a streambed is the “channel of a water course; the depression between the banks worn by the regular and usual flow of the water.” A streambed includes the “[a]rea extending between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including sand bars which may exist between the foot of said banks…” (188 Cal. App. 3d 1268). The bank is defined as “the slope or elevation of land that bounds the bed of the stream in a permanent or long-standing way, and that confines the stream water up to its highest level” (*The People v. Phillip Wright Osborn*, 116 Cal. App. 4$^{th}$ 764 (2004)).

RBC staff utilized a combination of field indicators (e.g., evidence of ponding such as moist and/or cracked soils and secondary channels), 50- and 100-year floodplain modeling, and local topography to delineate the extent of streambed associated with the Mojave River in areas where the active desert dunes continually erase signs of hydrology and bed and bank; RBC confirmed the use of this approach with Brandy Wood, CDFW Senior Environmental Scientist (Supervisor) with the Inland Deserts Region. Floodplain mapping throughout the extent of the Mojave River within the review area was not available through the Federal Emergency Management Agency’s (FEMA’s) National Flood Hazard Layer (NFHL) Viewer (FEMA n.d.) or the County of San Bernardino Department of Public Works’ ArcGIS web maps (County of San Bernardino Department of Public Works 2022). As such, the project engineer, TranSystems, performed hydraulic modeling of the Mojave River using Sedimentation and River Hydraulics – Two-Dimension (SRH-2D) software developed by the U.S. Bureau of Reclamation, in collaboration with the Federal Highway Administration in the U.S. and the Water Resources Agency in Taiwan (Bureau of Reclamation

2020). SRH-2D is hydraulic modeling software capable of analyzing 2-dimensional (2D) flow simulations for riverine systems. Further details regarding TranSystems' hydraulic modeling methods and results are available upon request.

Riparian habitat refers to vegetation and habitat associated with a stream. CDFW-jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond the banks of a stream. Isolated riparian habitat (i.e., where riparian vegetation does not appear associated with an ephemeral wash) is not considered CDFW-jurisdictional.

To assist in assessing CDFW-jurisdictional limits in desert areas, RBC staff utilized the methods outlined in the *MESA – Mapping Episodic Stream Activity Field Guide* (MESA Field Guide; Vyverberg & Brady 2013). The MESA Field Guide was developed to describe the methodology for delineating episodic streams and the active watercourse within the arid and semi-arid California desert regions. The MESA guidelines indicate the active watercourse extends beyond the streambed and can consist of associated features such as low-flow, active, and braided channels and banks associated with islands, and secondary channels within the bounds of a larger channel complex (Vyverberg & Brady 2013).

CDFW follows the USFWS wetland definition and classification system, which defines a wetland as transitional land between terrestrial and aquatic systems having one or more of the following attributes: "(1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year" (Cowardin et al. 1979). A wetland is presumed when all three attributes are present; if less than three attributes are present the presumption of a wetland must be supported by "the demonstrable use of wetland areas by wetland associated fish or wildlife resources, related biological activity, and wetland habitat values" (California Fish and Game Commission [CFGC] 1994).

Potential CDFW-jurisdictional wetland boundaries were determined based on the presence of wetland areas supported by a river, lake, or stream. Wetland delineation methods to determine the presence of one or more wetland attributes included the same methods per the Corps as described in Section 3.2.1.

Based on the above, potential CDFW-jurisdictional aquatic resources delineated included rivers, lakes, and/or streams and their associated riparian and wetland habitats, and active watercourse. Field staff delineated the lateral extent of potential CDFW jurisdiction to be "bank to bank" for a streambed or to the "dripline" of riparian habitat and/or wetland boundary, if present.

# 4 SITE ALTERATIONS, CURRENT AND PAST LAND USE

RBC staff reviewed Google Earth Pro (Google Earth Pro 2022), NetrOnline Historic Aerials (NetrOnline 2022), and the University of California – Santa Barbara (UCSB; UCSB n.d.) database to assess historic and ongoing land uses within the review area. The railroad tracks and National Trails Highway occurred within their current locations within the review area at least as far back as October 1929 (i.e., the earliest aerial image available; UCSB n.d.; Appendix D). Development of ranchland and/or residential uses increased somewhat between 1929 and 1952, with minor changes in development/land use continuing through at least 1984, particularly in the far northwestern portion of the review area (UCSB n.d.; NetrOnline 2022; Appendix D). Between July

1973 and December 1984, a large agricultural (row crop) operation was established within/around the northwestern portion of the review area (UCSB n.d; NetrOnline 2022; Appendix D). Additionally, portions of the Mojave River appear to have been bermed sometime between May 1952 and January 1953, redirecting and constricting the Mojave River's natural flow path (UCSB n.d.; Appendix D). Additional berming of the Mojave River appears to have occurred between January 1953 and June 1959, between June 1959 and November 1963, and again, between November 1963 and July 1973 (UCSB n.d.). The bermed areas appeared to remain relatively consistent from July 1973 through June 2022 (the last survey date) (UCSB n.d.; NetrOnline 2022; Google Earth Pro 2022; Appendix D). Basin (B-) 2 was constructed between July 1973 and December 1984 and is currently used for irrigation purposes (UCSB n.d.; NetrOnline 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). Construction of B-1 began around May 2009 along with installation of the nearby basketball court, fishing docks, and playground; B-1 is currently used for recreational purposes (Google Earth Pro 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). Since May 2009, minor changes in development and land use have occurred within the review area; much of the review area remains undeveloped to this day (Google Earth Pro 2022; Appendix D). Normal circumstances, as defined in the Corps 1987 Wetland Manual (Environmental Laboratory 1987), were assumed to be present within the review area; no evidence of recent natural events or human activities that would affect the results of the delineation were observed within the review area during the 2021 and 2022 field delineations.

The following sections provide additional details regarding site alterations and land use specific to on-site soils, hydrology, and vegetation based on available data and the site visit.

## 4.1 SOILS

Based on the NRCS soils data map (Figure 4), 20 soil map units, outlined below in Table 2, occur within the review area:

Table 2. Soils Mapped within Review Area

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Bryman loamy fine sand, 2 to 5 percent slopes | Bryman | Fine-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Cajon gravelly sand, 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon loamy sand, 5 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon sand, 0 to 2 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| Cajon sand, 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon-Arizo complex[1], 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| | Arizo | Sandy-skeletal, mixed, thermic Typic Torriorthents | |

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Cajon-Wasco, cool complex[1], 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| | Wasco | Coarse-loamy, mixed, superactive, nonacid, thermic Typic Torriorthents | |
| Cave loam, dry, 0 to 2 percent slopes | Cave | Loamy, mixed, superactive, thermic, shallow Typic Petrocalcids | Yes |
| Dune land | Dune land | – | Yes |
| Helendale loamy sand, 0 to 2 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Helendale loamy sand, 2 to 5 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Joshua loam, 2 to 5 percent slopes | Joshua | Fine-loamy, mixed, superactive, thermic Argidic Argidurids | No |
| Nebona-Cuddeback complex[1], 2 to 9 percent slopes | Nebona | Loamy, mixed, superactive, thermic, shallow Typic Haplodurids | Yes |
| | Cuddeback | Fine-loamy, mixed, superactive, thermic Typic Argidurids | |
| Norob-Halloran complex[1], 0 to 5 percent slopes | Norob | Fine-loamy, mixed, superactive, thermic Typic Natrargids | Yes |
| | Halloran | Coarse-loamy, mixed, superactive, thermic Typic Natrargids | |
| Riverwash | Riverwash | – | Yes |
| Rock Outcrop-Lithic Torriorthents complex, 15 to 50 percent slopes | Rock Outcrop | – | No |
| | Torriorthents | Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Torriorthents | |
| Rosamond loam, saline-alkali | Rosamond | Fine-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |
| Victorville sandy loam | Victorville | Coarse-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |
| Villa loamy sand | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |
| Villa loamy sand, hummocky | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |

Source: NRCS Official Soil Series Description and Series Classification database (NRCS n.d.b); *Soil Survey of San Bernardino County California, Mojave River Area* (USDA 1986); NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.).a).

[1] Based on the NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.)..a). As stated in the Arid West Supplement (Corps 2008), RBC used the hydric soils list as a tool and made final hydric soils determinations based on field-collected data at representative wetland delineation sample points deemed appropriate on site as recorded on the attached Arid West Wetland Determination Data Forms (Appendix E) discussed further in Section 6.1.

[2] A complex consists of two or more soils or miscellaneous areas that either contain such small areas or are so complexly mapped that they are unable to be displayed separately (Ditzler 2015).

The National Technical Committee for Hydric Soils defines hydric soils; *Changes in Hydric Soils Database Selection Criteria* (77 FR 12234) outlines the current four hydric soil criteria. The NRCS Soil Data Access (SDA) Hydric Soils List specifies 11 soil map units within the review area as hydric per Critiera 2, 3, and/or 4 (NRCS n.d.a). The soil series/units outlined above in Table 2 are further described below per the USDA's NRCS Official Soil Series Description and Series Classification database (NRCS n.d.b) and the USDA's *Soil Survey of San Bernardino County California, Mojave River Area* (USDA 1986).

*Arizo* – The Arizo series consists of very deep, excessively drained soils that have negligible to medium runoff. These soils formed in mixed alluvium on recent alluvial fans, inset fans, fan apron, fan skirts, stream terraces, and floodplains of intermittent streams and channels with slopes ranging from 0 to 15 percent at elevations of 750 to 4,600 feet amsl. Arizo soil is used primarily for rangeland and wildlife habitat. Native vegetation consists primarily of creosote bush (*Larrea tridentata*) and burrobush (*Hymenoclea* sp.).

*Bryman* – The Bryman series consists of deep, well-drained soils that have slow runoff and moderately slow permeability. These soils formed in mixed alluvium derived primarily from granitic rock and occur on terraces and older alluvial fans with slopes ranging from 0 to 15 percent at elevations of 2,800 to 3,800 feet amsl. Bryman soil is used primarily for irrigated crops, homesites, and recreation. Native vegetation consists of creosote bush, bursage (*Ambrosia* sp.), green ephedra (*Ephedra viridis*), Joshua tree (*Yucca brevifolia*), and annual forbs and grasses.

*Cajon* – The Cajon series consists of very deep, somewhat excessively drained soils that have slight to low runoff and rapid permeability. These soils formed in sandy alluvium and occur on alluvial fans, fan aprons, fan skirts, inset fans, and river terraces with slopes ranging from 0 to 15 percent at elevations of 200 to 4,300 feet amsl. Cajon soil is used primarily for range, watershed, and recreation, and irrigated areas are used for growing alfalfa and other crops. Uncultivated areas consist of desert shrubs.

*Cave* – The Cave series consists of very shallow, well-drained soils that have medium to very high runoff and moderate or moderately rapid permeability. These soils formed in mixed alluvium and occur on fan remnants, fan piedmonts, and stream terraces with slopes ranging from 0 to 35 percent at elevations of 1,500 to 5,060 feet amsl. Cave soil is used primarily for livestock grazing, wildlife habitat, and urban development. Native vegetation consists of creosote bush, blackbrush (*Coleogyne ramosissima)*, bursage, Joshua tree, mesquite (*Prosopis* sp.), cactus, and annual grasses and weeds.

*Cuddeback* – The Cuddeback series consists of moderately deep, well-drained soils that have medium to rapid runoff and moderately slow permeability above the duripan but very slow in the duripan. These soils formed in mixed alluvium on terraces and alluvial fans with slopes ranging from 2 to 9 percent at elevations of 2,200 to 3,000 feet amsl. Cuddeback soil is used mainly for wildlife habitat and recreation. Native vegetation consists of very sparse stands of creosote bush yucca species, and annual grasses and forbs.

*Dune Land* – The Dune Land miscellaneous areas consists of excessively drained soils with slow runoff and very rapid permeability. These soils formed from wind-deposited sand and occur on unstable hills and ridges of loose, wind-deposited sand with slopes ranging from 5 to 15 percent. Dunes are generally less than 15 feet high but can sometimes reach 25 feet high. Dune Land soil is

used primarily for wildlife habitat and recreation and is essentially barren of vegetation.

*Halloran* – The Halloran series consists of deep, moderately well-drained soils that have slow runoff and moderately slow permeability. These soils formed in mixed alluvium dominantly from granitic sources and occur on old alluvial derraces and depressional areas with slopes ranging from 0 to 2 percent at elevations of 1,800 to 1,850 feet amsl. Halloran soil is used primarily for wildlife habitat and recreation. Native vegetation consists of creosote bush, saltbush (*Atriplex* sp.), and alkali-tolerant vegetation.

*Helendale* – The Helendale series consists of very deep, well-drained soils that have negligible to low runoff and moderately high to high saturated hydraulic conductivity. These soils formed in alluvium from granitic sources and occur on fan piedmonts, fan remnants, alluvial fans, and terraces with slopes ranging from 0 to 15 percent at elevations of 2,500 to 3,800 feet amsl. Helendale soil is used primarily for irrigated agriculture and pasture, residential development, military operations, recreation, and wildlife habitat. Native vegetation consists of creosote bush, cheesebush (*Ambrosia salsola*), Nevada jointfir (*Ephedra nevadensis*), Joshua tree (*Yucca brevifolia*), and annural forbs and grasses.

*Joshua* – The Joshua series consists of moderately deep, well-drained soils that have medium to rapid runoff and moderately slow to slow permeability. These soils formed in material derived from mixed sources and occur on old terraces with a well-developed erosion pavement with slopes ranging from 2 to 15 percent at elevations of 2,600 to 3,000 feet amsl. Joshua soil is used primarily for wildlife habitat and recreation. Native vegetation consists of very sparse strands of creosote bush, white bursage (*Ambrosia dumosa*), yucca species, saltbush, and annual grasses and forbs.

*Lithic Torriorthents* – Lithic Torriorthents consists of very shallow and shallow, well-drained soils that have medium to rapid runoff and rapid to very rapid permeability. These soils formed from weathering of granitic rock and occur between areas of Rock outcrop (i.e., exposed granitic rock), in small depressional areas, and on relatively stable hillslopes ranging from 15 to 50 percent at elevations of 3,000 to 4,950 feet amsl. Lithic Torriorthents soil is used primarily for wildlife habitat.

*Nebona* – The Nebona series consists of shallow, well-drained soils that have medium to rapid runoff and moderately rapid permeability in the upper part but very slow in the duripan. These soils formed in mixed alluviam and occur on terraces with slopes ranging from 2 to 9 percent at elevations of 2,200 to 3,000 feet amsl. Nebona soil is used mainly for wildlife habitat and recreation. Native vegetation consists of very sparse stands of creosote bush, white bursage, yucca species, some saltbush, and annual grasses and forbs.

*Norob* – The Norob series consists of very deep, moderately well-drained soils that have negligible to medium runoff with slow permeability. These soils formed in mixed alluvium and occur on alluvial plains and alluvial flats in the Mojave Desert with slopes ranging from 0 to 5 percent at elevations of 2,300 to 3,200 feet amsl. Norob soil is used primarily for livestock grazing, military operations, and recreation. Native vegetation consists of saltbush, creosote bush, and scattered annual grasses and forbs.

*Riverwash* – The Riverwash miscellaneous areas consists of excessively drained soils in the Mojave River riverbed and in beds of intermittent streams subject to flooding during prolonged storms of high intensity. These soils formed in areas of alluvium derived primarily from granitic rocks and occur on unstable sandy and gravelly alluvium that is frequently removed, resorted, and

redeposited with slopes ranging from 0 to 2 percent at elevations of 1,700 to 3,100 feet amsl. Riverwash soil is used mainly for wildlife habitat and areas of Riverwash are essentially barren of vegetation. Small areas of Villa loamy sand and Victorville sandy loam soils are also included in this unit on low stream terraces along the Mojave River.

*Rock Outcrop* – The Rock Outcrop miscellaneous areas consists of exposed granitic bedrock on mountainsides, ridges, and rugged hills at elevations of 3,000 to 4,950 feet amsl. Rock outcrop is used primarily for wildlife habitat.

*Rosamond* – The Rosamond series consists of deep, well-drained soils that have medium runoff and moderate to moderately slow permeability. These soils formed in alluvium derived primarily from granitic rock and occur on slopes ranging from 0 to 2 percent at elevations from 2,200 to 2,900 feet amsl. Rosamond series is used primarily for desert range in larger areas, and irrigated areas are used for growing alfalfa and row crops. Native vegetation consists primarily of rabbitbrush, big sagebrush (*Artemisia tridentata*), saltbush, and annual and perennial grass and weeds.

*Victorville* – The Victorville series consists of deep, moderately well-drained soils that have medium runoff and moderately rapid permeability. These soils formed in mixed alluvium, dominantly from granitic sources and occur on low river terraces and flood plains with slopes ranging from 0 to 2 percent at elevations of 2,200 to 2,800 amsl. Victorville soil is used mainly for irrigated crops such as alfalfa, pasture, and small grains. Native vegetation consists of rabbitbrush , salt grass (*Distichlis spicata*), annual weeds and grasses, and some cottonwood (*Populus* sp.) trees.

*Villa* – The Villa series consists of deep, moderately well-drained soils that have slow runoff and moderately rapid permeability. These soils formed in alluvium derived primarily from granitic rock and occur on river flood plains with slopes of 0 to 2 percent at elevations of 2,100 to 2,800 feet amsl. Villa soil is used mainly for irrigated crops such as alfalfa. Native vegetation consists of saltbush, mesquite, creosote bush, and annual grasses and forbs.

*Wasco* – The Wasco series consists of very deep, well-drained soils that have negligible or very low runoff and moderately rapid permeability. These soils formed in mixed alluvium derived mainly from igneous and/or sedimentary rock sources with slopes ranging from 0 to 5 percent at elevations of 225 to 1,000 feet amsl in the southern San Joaquin Valley and as high as 3,700 feet amsl in the Mojave Desert. Wasco soil is used primarily for growing field, forage, and row crops, and some areas are used for livestock grazing, wildlife habitat, recreation, and homesites. Native vegetation consists of *Atriplex* species and annual grasses and forbs.

As stated in the Arid West Supplement, RBC used the hydric soils list as a tool and made final hydric soils determinations based on field-collected data at representative wetland delineation sample points deemed appropriate on site as recorded on the attached Arid West Wetland Determination Data Forms (Appendix E) discussed further in Section 6.1.

## 4.2 HYDROLOGY

Per the review of on-line data sources, USGS NHD maps “Stream/River” (ephemeral), “Stream/River” (intermittent) (for the extent of the Mojave River), “Lake/Pond”, “Reservoir,” and “Wash” features in the review area as shown in Figure 2 (USGS 2021). USFWS NWI maps features with a designation of “Riverine,” “Freshwater Emergent Wetland,” “Freshwater Pond,” and

"Freshwater Forested/Shrub Wetland" in the review area as shown in Figure 4 (USFWS 2021).

Known hydrologic sources for the observed on-site drainages, discussed further below, are direct precipitation, upstream Mojave River flows, and runoff from surrounding roads and development. Based on field observations, features within the review area south of the railroad tracks generally drain southeast to northwest, following a slight change in topography towards the railroad tracks. The USGS NHD web map indicates flows from the Mojave River continue northeast and ultimately drain into Soda Dry Lake (USGS 2021).

## 4.3 VEGETATION

Table 3 provides vegetation community acreages within the review area based on vegetation mapping conducted by RBC biologists for the BNSF Lenwood Staging Track Component (BNSF Lenwood Component) during December 2018, August 2019, and June 2020 field visits, as well as constraints-level vegetation mapping conducted by RBC biologists on August 10, 2021 for portions of the review area that were not mapped as part of the BNSF Lenwood Component. Vegetation communities within the review area are shown on Figure 6. The review area primarily consists of active desert dunes and allscale scrub habitat. The vegetation community classifications generally follow *A Manual of California Vegetation* (Sawyer et al. 2009) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

Table 3. Vegetation Communities within Review Area

| Vegetation Community/Land Cover Type | Acre(s)[1] |
|---|---|
| Active Desert Dunes | 1,172.91 |
| Active Desert Dunes – Disturbed | 333.79 |
| Agriculture | 319.85 |
| Allscale Scrub | 1,065.88 |
| Allscale Scrub – Disturbed | 218.23 |
| Creosote Bush Scrub | 550.97 |
| Creosote Bush Scrub – Disturbed | 420.91 |
| Developed | 379.50 |
| Disturbed Habitat | 582.68 |
| Ornamental | 1.86 |
| Pasture | 16.07 |
| Tamarisk Thickets | 16.47 |
| Unvegetated Channel | 25.38 |
| Total | 5,104.49 |

[1] Acreages summed using raw numbers provided during GIS analysis (available upon request) and thus the sum of the total rounded numbers may not directly add up in this table.

*Active Desert Dunes* – Active desert dunes within the review area consist of generally barren expanses of actively moving sand with sparse to intermittent cover of seasonal annuals and scattered perennials, such as desert panicgrass (*Panicum urvilleanum*).

*Active Desert Dunes – Disturbed* – Active desert dunes – disturbed within the review area is similar to active desert dunes, though it has been substantially altered by human disturbance.

*Agriculture* – Agriculture within the review area supports large areas of monotypic crop plantings or disturbed, bare soils.

*Allscale Scrub* – Allscale scrub within the review area supports widely spaced stands of allscale (*Atriplex polycarpa*) with bare ground or weedy, non-native species including Bermuda grass (*Cynodon dactylon*) and tumbleweed (*Salsola australis*).

*Allscale Scrub – Disturbed* – Allscale scrub – disturbed within the review area is similar to allscale scrub, though it has been substantially altered by human disturbance.

*Creosote Bush Scrub* – Creosote bush scrub occurs on alluvial fans, bajadas, and upland slopes, and is dominated by widely spaced stands of creosote bush containing patches of open soil in between shrubs. Annual plant species and other various shrub species such as white bursage are also present.

*Creosote Bush Scrub – Disturbed* – Creosote bush scrub – disturbed within the review area is similar to creosote bush scrub, though it has been substantially altered by human disturbance.

*Developed* – Developed areas within the review area include the railroad tracks, roads, commercial buildings, residences, and storage yards. The high level of soil disturbance in these areas precludes native vegetation resulting in barren areas or sparse weedy vegetation.

*Disturbed Habitat* – Disturbed habitat within the review area has been graded, cleared, or used to the point where the land cannot support native vegetation. These areas consist of bare soils and non-native species.

*Ornamental* – Ornamental areas within the review area consist of non-native tree and grass species including Siberian elm (*Ulmus pumila*) and Bermuda grass.

*Pasture* – Pasture within the review area consists of a dense cover of grass species or row crops.

*Tamarisk Thickets* – Tamarisk thickets within the review area primarily consist of salt cedar (*Tamarix ramosissima*) with a few weedy species. Tamarisk thickets typically occur on sandy or gravelly soils within, or in close proximity to washes or streams and often become established in these areas following major disturbance. Tamarisk thickets observed within the review area appeared associated with road runoff rather than potentially jurisdictional aquatic resource areas/watercourses.

*Unvegetated Channel* – Unvegetated channel within the review area includes relatively large, well-defined waterways (including portions of the Mojave River) that are sandy, gravelly, and largely unvegetated. Vegetation within unvegetated channels is typically non-permanent and accounts for less than 10 percent total cover.

# 5 PRECIPITATION DATA AND ANALYSIS

RBC utilized the NRCS Agricultural Applied Climate Information System (AgACIS) database for the Barstow station (approximately 5 miles northeast from the review area's northeastern-most reach) to access pre-site visit precipitation data (NRCS 2022), as shown in Tables 4 and 5.

RBC also utilized the Corps' Antecedent Precipitation Tool (APT) to assess whether or not the delineation date occurred in a drier, average, or wetter than normal period for the review area (Corps 2020b). The Corps created the APT to assist with determining the normal periodic range of precipitation and other climate variables for the waterbody or waterbodies within a review area. Additionally, the APT can generally inform the regulatory agencies whether or not normal hydrologic/climatic conditions were on site at the time of the site visit and assist with completion of the Wetland Determination Data Forms (Appendix E).

## 5.1 PRECIPITATION SUMMARY

Tables 4 and 5 describe the estimated monthly total precipitation for the review area from October 2020 to July 2021 and August 2021 to May 2022 to provide the pertinent pre-site visit precipitation data from the NRCS database for the Barstow station (NRCS 2022).

Table 4. Precipitation Data for October 2020 – July 2021

| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul |
|---|---|---|---|---|---|---|---|---|---|---|
| Monthly Total Precipitation (inch[es]) | 0.00 | T[1] | 0.17 | 0.39 | 0.01 | M[1] | 0.00 | 0.00 | 0.02 | 0.38 |

[1] Per AgACIS database: "Values of 'M' indicate missing data and 'T' indicates a trace."

Table 5. Precipitation Data for August 2021 – May 2022

| | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|
| Monthly Total Precipitation (inch[es]) | 0.00 | 0.00 | 0.55 | 0.00 | 0.67 | 0.08 | T[1] | T[1] | 0.01 | 0.00 |

[1] Per AgACIS database: "Values of 'T' indicates a trace."

## 5.2 ANTECEDENT PRECIPITATION TOOL DATA

The APT provides three climatological parameters: Palmer Drought Severity Index (PDSI), season, and antecedent precipitation condition. The PDSI is a standardized index calculated on a monthly basis with PDSI value outputs ranging from -10 (extremely dry) to +10 (extremely wet) (National Oceanic and Atmospheric Administration [NOAA] 2020) to assess drought conditions (i.e., PDSI Class). The APT determines wet versus dry season based on related procedures provided in the applicable regional supplement for the review area (i.e., Arid West Supplement). The antecedent precipitation condition is classified as drier than normal with an antecedent runoff condition (ARC) score less than 10; normal with an ARC score between 10 to 14; or wetter than normal with an ARC score greater than 14 (Sprecher & Warne 2000).

Table 6 summarizes the key data extrapolated from the APT output to compare the current year 30-day rolling total to the averaged 30-year normal for the weather stations with comprehensive historical data within 30 miles of the review area: estimated drought conditions, wet or dry season determination, ARC score, and antecedent precipitation condition. The APT output provided in Appendix F and summarized in Table 6 noted a PDSI class of "severe drought" during the October 2021 and December 2021 field surveys and a PDI class of "extreme drought" during the August 2021, March 2022, April 2022, May 2022, and June 2022 field surveys. The precipitation and climatic conditions were classified as "normal conditions" for the review area during the October 2021, December 2021, April 12 and 13, 2022, May 2022, and June 2022 field surveys; "wetter than normal" for the review area during the August 2021 field survey; and "drier than normal" for the review area during the March 2022 and April 15, 2022 field surveys based on the 30-day rolling totals for the three months preceding the field survey dates. Field staff considered the "severe drought" and "extreme drought" conditions during the field delineation; evaluated how the drought conditions could affect the data collected on the Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets (Appendix E); and used recent and historic aerials to ensure appropriate representation of the extent of the on-site aquatic features for this ARDR considering the 2021 and 2022 drought conditions.

Table 6. Antecedent Precipitation Tool Data for Review Area

| Field Survey Date | PDSI Value | PDSI Class | Season | ARC Score | Antecedent Precipitation Condition |
|---|---|---|---|---|---|
| 8/10/2021 | -4.11 | Extreme drought | Dry season | 17 | Wetter than normal |
| 10/20/2021 | -3.54 | Severe drought | Dry season | 12 | Normal conditions |
| 12/01/2021 | -3.95 | Severe drought | Wet season | 14 | Normal conditions |
| 3/16/2022 | -4.45 | Extreme drought | Dry season | 7 | Drier than normal |
| 3/23/2022 | -4.45 | Extreme drought | Dry season | 9 | Drier than normal |
| 3/24/2022 | -4.45 | Extreme drought | Dry season | 8 | Drier than normal |
| 4/12/2022 | -4.45 | Extreme drought | Dry season | 11 | Normal conditions |
| 4/13/2022 | -4.45 | Extreme drought | Dry season | 11 | Normal conditions |
| 4/15/2022 | -4.85 | Extreme drought | Dry season | 6 | Drier than normal |
| 5/17/2022 | -4.85 | Extreme drought | Dry season | 11 | Normal conditions |
| 6/20/2022 | -5.17 | Extreme drought | Dry season | 12 | Normal conditions |

# 6 DESCRIPTION OF OBSERVED POTENTIAL AQUATIC RESOURCES

The following descriptions of observed potential aquatic resources within the review area document the presence or absence of aquatic resource indicators per the methods discussed in Section 3. The subsections below are intended to be reviewed independently under each agency's purview unless otherwise directed in the text (i.e., the aquatic resource description is the same between two or more agencies) given the various regulatory definitions and standards per each

agency. Areas that were investigated but determined to not qualify as a potential aquatic resource are discussed briefly in Section 6.4.

Appendix G provides site photographs of the features within the review area; all figures in the Figure 5 series display representative photo points.

## 6.1 CORPS/RWQCB WETLAND WATERS OF THE U.S./STATE

RBC collected data at 11 representative Wetland Data Form Points (WDP) within the review area to determine the presence or absence of jurisdictional wetland waters of the U.S./State (WDP 1 through 11; Figures 5A and 5B; Appendix E). Note that data at WDP 1 through WDP 8 was originally collected by RBC regulatory specialists for the BNSF Lenwood Component during December 2018 and August 2019 field visits. RBC regulatory specialists verified the conditions at WDP 1 through WDP 8 and updated the associated datasheets accordingly during the April 2022 field visits. Overall, conditions at WDP 1 through WDP 8 remained consistent from 2018/2019 to 2022. The delineated aquatic features on site did not meet the appropriate wetland parameters to qualify as wetland waters of the U.S./State based on the data collected during the field delineation, as discussed further in Section 6.2.

## 6.2 CORPS/RWQCB NON-WETLAND WATERS OF THE U.S./STATE

RBC collected data at 29 representative OHWM Datasheet Points (ODPs) within the review area to determine the presence of potential waters of the U.S. (ODP 1 through 29; Figures 5A and 5B; Appendix E). RBC selected representative ODP locations as there were multiple dry washes (i.e., features) with similar hydrology or OHWM characteristics (Appendix E). Note that data at ODP 1 through ODP 22 was originally collected by RBC regulatory specialists for the BNSF Lenwood Component during December 2018 and August 2019 field visits. RBC regulatory specialists reverified the conditions at ODP 1 through ODP 22 and updated the associated datasheets accordingly during the April 2022 field visits. Overall, conditions at ODP 1 through ODP 22 remained consistent from 2018/2019 and 2022. Overall, the review area supports 109 features (Non-Wetland Water [NWW-] 1 through NWW-109 [Mojave River]) which vary from single-thread, small, unvegetated dry washes to large, braided, unvegetated dry wash systems to the larger Mojave River. The OHWMs for NWW-1 through NWW-108 varied in width from an average minimum of 4 feet and an average maximum of 9 feet; these features were primarily unvegetated and surrounded by allscale (FACU), four-wing saltbush/shadscale (*Atriplex canescens*; NL/UPL), creosote bush (NL/UPL), and white bursage (NL/UPL). The OHWM for the portions of the NWW-109 (Mojave River) within the review area ranged from approximately 500 feet to 1,400 feet; this feature was sparsely vegetated and generally composed of active desert dune habitat. See Appendix H, Table H-1 for the estimated OHWM and representative OHWM and wetland data for NWW-1 through NWW-109 (Mojave River).

All of the delineated features, except NWW-9, NWW-43, NWW-60, NWW-98, and NWW-109 (Mojave River), generally drain southeast to northwest (Figures 5A and 5B). Figures 5A and 5B display the limits of where OHWM indicators were observed within the review area. There are 19 sets of culvert/railroad crossings located along the railroad tracks within the review, which could allow for flows to continue north. NWW-9, NWW-43, and NWW-98 commence at the dirt road north of the railroad tracks before continuing northwest and off site. NWW-60 is a small, localized

feature north of the railroad tracks that receives flows off the dirt road north of the railroad tracks. NWW-109 (Mojave River) is a sparsely vegetated, dry, sandy wash that generally flows southwest to northeast before continuing off site.

Staff concluded based on field observations that NWW-1 through NWW-108 were ephemeral features that only receive flows from runoff in direct response to precipitation; NWW-109 (Mojave River) is an intermittent feature based on field observations and the USGS NHD database (USGS 2021). The general characteristics of each of the observed features within the review area are provided in Appendix H, Table H-1. Staff did not observe standing water at any of the features during the 2021 and 2022 field surveys.

Staff determined the presence of an OHWM at one location within each of the following features: NWW-20, NWW-36, NWW-44, NWW-45, NWW-60, NWW-68, NWW-69, NWW-70, NWW-73, NWW-76, NWW-82, NWW-85, NWW-87, NWW-90, NWW-91, NWW-92, NWW-94, NWW-95, and NWW-97 (Appendix E, ODP 1 – 4, 8 – 12, 14 – 19, 21, 24, 27, and 29). Staff determined the presence of an OHWM at two locations within NWW-80 (Appendix E, ODP 13 and 22) and five locations within NWW-89 (Appendix E, ODP 5 – 7, 23, and 25). Indicators of an OHWM for NWW-1 through NWW-108 generally included a change in average sediment texture and vegetation cover between the active floodplain and upland areas as well as a typically small break in slope along the active channel (Appendix E). The OHWMs present at these locations were representative of the OHWM within NWW-1 through NWW-19, NWW-21 through NWW-35, NWW-37 through NWW-43, NWW-46 through NWW-59, NWW-61 through NWW-67, NWW-71 through NWW-72, NWW-74, NWW-75, NWW-77 through NWW-79, NWW-81, NWW-83, NWW-84, NWW-86, NWW-88, NWW-93, NWW-93, and NWW-98 through NWW-108. Staff also determined the presence of an OHWM at two locations within NWW-109 (Mojave River) (Appendix E, ODP 26 and 28). Indicators of an OHWM for NWW-109 (Mojave River) included a break in bank slope, change in vegetation cover and species, and a change in average sediment texture between the active floodplain and upland/low terrace areas (Appendix E, ODP 26 and 28).

## 6.3 CDFW STREAMBED AND WATERCOURSE

Figure 5C displays the estimated extent of streambed and associated watercourse within the review area. The extent of streambed was delineated based on the top of the channel banks and the extent of the associated watercourse was delineated beyond the streambed, consisting of associated features such as low-flow, active, and braided channels and banks associated with islands, and secondary channels within the bounds of the larger channel complex (Vyverberg & Brady 2013).

Overall, the features observed within the review area (NWW-1 through NWW-109 [Mojave River]) vary from single-thread, small, unvegetated dry streambeds with a well-defined bed and bank to large watercourses with multiple tributaries and vegetated islands to the larger Mojave River. No associated riparian or wetland habitat occurs within the review area. NWW-1 through NWW-108 vary in width from an average minimum of 4 feet and an average maximum of 12 feet and were primarily unvegetated and surrounded by allscale (FACU), four-wing saltbush/shadscale (*Atriplex canescens*; NL/UPL), creosote bush (NL/UPL), and white bursage (NL/UPL). Portions of NWW-109 (Mojave River) within the review area varied in width from approximately 50 feet to 3,100 feet; this feature was sparsely vegetated and generally composed of active desert dune habitat. See

Appendix H, Table H-2 for the estimated extent of CDFW jurisdiction for NWW-1 through NWW-109 (Mojave River).

All of the delineated features, except NWW-9, NWW-43, NWW-60, NWW-98, and NWW-109 (Mojave River), generally drain southeast to northwest (Figure 5C). Figure 5C displays the limits of where streambed indicators were observed within the review area. There are 19 sets of culvert/railroad crossings located along the railroad tracks within the review area, which could allow for flows to continue north. NWW-9, NWW-43, and NWW-98 commence at the dirt road north of the railroad tracks before continuing northwest and off site. NWW-60 is a small, localized feature north of the railroad tracks that receives flows off the dirt road north of the railroad tracks.

The Mojave River (NWW-109) is a sparsely vegetated, dry, sandy wash that extends into active desert dune habitat and generally flows southwest to northeast before continuing off site. Overall, the mapped watercourses within the review area are associated with the following delineated streambed: NWW-27, NWW-28, NWW-32, NWW-36, NWW-37, NWW-40, NWW-45, NWW-49, NWW-59, NWW-68 – NWW-70, NWW-76, NWW-80, NWW-89, and NWW-106. Watercourse A was associated with a streambed that occurs off site and upstream, and as such, is labeled separately. The streambed bed and bank associated with Watercourse A was difficult to distinguish within the review area (i.e, no OHWM or well-defined bed and bank) and thus no streambed (NWW) was mapped within this on-site watercourse area; as such, this on-site watercourse area is labeled separately as Watercourse A. As further detailed in Section 3.2.3, the extent of the Mojave River was delineated based on the presence of field indicators, including evidence of ponding (e.g., mud cracks and moist soils) and secondary channels (Appendix G, Photo 43 and 44), as well as topography and 50- and 100-year floodplain modeling for the Mojave River; no field indicators of flows were observed within the agricultural fields just south of the Mojave River.

The general characteristics of each of the observed features within the review area are provided in Appendix H, Table H-2.

## 6.4 OTHER FEATURES

Field staff further investigated several areas with potential aquatic resource indicators, including a swale and two basins, as described below. Additionally, WDP 6 was taken adjacent to a dirt road and old concrete berm structure in a concave area mapped as containing hydric soils per the NRCS (Figures 5A – 5C; Figure 4; Appendix E, WDP 6; Appendix G, Photo 22); WDP 5, WDP 7, WDP 8, and WDP 9 were taken in areas dominated by salt cedar (FAC) (Figures 5A – 5C; Appendix E, WDP 5, 7, 8, and 9; Appendix G, Photos 15, 26, 31, and 34); and WDP 11 was taken in a concave area exhibiting surface soil cracks and some ponding on aerial imagery (Figures 5A – 5C; Appendix E, WDP 11; Appendix G, Photo 40). These areas did not meet all three federal wetland parameters, did not display an OHWM or exhibit bed and bank indicators, and did not appear to convey surface flows.

Furthermore, the features discussed in this section are not discussed further in this ARDR as they did not have aquatic resource field indicators and are not anticipated to be jurisdictional under Corps, RWQCB, or CDFW regulations, policy, and/or guidance based on the information provided in this section.

*Swale 1*

One roadside swale (S-1; Figures 5A – 5C) was observed during the field delineation. S-1 is a slightly concave drainage area adjacent to National Trails Highway within the southwest portion of the review area that did not display an observable OHWM or bed and bank and instead appeared to convey surface flows as runoff from National Trails Highway. ODP 20, taken in an area of disturbed habitat, contained a slight change in vegetation cover between the swale and the adjacent upland area; however, ODP 20 did not show evidence of a break in slope or a defined bed and bank between the swale and adjacent uplands. Additionally, ODP 20 did not contain a change in average sediment texture, change in upland vegetation species, or any additional OHWM indicators between the swale and the adjacent upland area (Figures 5A – 5C; Attachment E, ODP 20; Appendix G, Photo 25). Thus, this swale was determined to not have an OHWM or defined bed and bank and did not appear to convey flows to downstream aquatic resources via observed flow patterns, culverts, or other flow paths and thus does not provide/has no impact on downstream beneficial uses and/or aquatic resource functions.

*Basin 1 and 2*

Two basins (B-1 and B-2; Figures 5A – 5C) that occur within the northwestern portion of the review area displayed some concavity within the otherwise flat landscape. Note that RBC was not allowed to access B-1 or B-2; as such, these areas were assessed based on a review of current and historic aerial imagery (Appendix D). B-1 consisted of an unvegetated, artificially excavated basin used for recreational purposes (Figures 5A – 5C; Google Earth Pro 2022; C. Stevens, personal communication, May 26, 2022). As discussed previously in Section 4, construction of B-1 began around May 2009 along with installation of the nearby basketball court, fishing docks, and playground (Google Earth Pro 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). Based upon the absence of vegetation within B-1 in aerial imagery from 2009 through 2020 and the similar conditions observed at WDP 11 (concavity and ponding visible on aerial imagery), B-1 did not meet all three wetland parameters.

B-2 consisted of a sparsely vegetated, artifically excavated basin used for irrigation purposes (UCSB n.d.; NetrOnline 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). As discussed previously in Section 4, B-2 was constructed between July 1973 and December 1984 (UCSB n.d.; NetrOnline 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). The conditions observed at WDP 7 (slight concavity and area dominated by salt cedar) and WDP 11 (concavity and ponding visible on aerial imagery) were representative of the conditions within B-2; as such, B-2 did not meet all three wetland parameters.

Both basins do not convey flows to downstream aquatic resources via observed flow patterns, culverts, or other flow paths. As such, B-1 and B-2 would not qualify as aquatic resources jurisdictional per the Corps or RWQCB, as they are maintained artificial structures with no downstream connectivity and which do not provide/have no impact on downstream beneficial uses and/or aquatic resource functions. B-1 and B-2 would also not qualify as streambed jurisdictional per the CDFW, as B-1 and B-2 lacked association with a natural feature/streambed and did not support wildlife habitat.

Field staff did not observe additional areas with potential aquatic resource indicators, including other areas showing evidence of drainage, ponding, or flow patterns. Data collected for the

features discussed in Sections 6.1, 6.2, and 6.3 defined the extent of aquatic resource and upland areas within the review area.

# 7 DEVIATION FROM NWI AND NHD

The delineated extent of several of the non-wetland water/dry wash features generally occur within the features mapped by the USFWS NWI as "Riverine" (Figure 4) and by the USGS as "Stream/River" (Figure 2). The delineated extent of B-1 generally occurs within the feature mapped by the USFWS NWI as "Freshwater Pond" (Figure 4) and by the USGS NHD as "Reservoir" (Figure 2). The delineated extent of B-2 generally occurs within the feature mapped by the USGS NHD as "Lake/Pond" (Figure 2). The delineated extent of the Mojave River (NWW-109) generally occurs within the feature mapped by the USFWS NWI as "Riverine" (Figure 4) and by the USGS NHD as "Wash" and "Riverine" (Figure 2).

# 8 RESULTS AND CONCLUSIONS

The results provided in this section include the extent of delineated aquatic resources within the review area based on observed field indicators of potential waters of the U.S., waters of the State, and CDFW streambed and associated wetland and/or riparian habitat per the methodologies discussed in Section 3. Table 7 provides a summary of the aquatic resources delineated within the review area per agency. Further details for each aquatic resource (NWW-1 through NWW-109, as well as Watercourse A for CDFW) are provided in Appendix H.

This section, however, does not analyze the Corps' jurisdictional status of the delineated features per the current regulations, guidance, and standard operating procedures. A request for the Corps to complete a PJD based on the information provided in this report is included as Appendix B.

Table 7. Total Acreages of Delineated Aquatic Resources within Review Area

| Agency | Aquatic Resource Type | Acres | Linear Feet |
|---|---|---|---|
| Corps | Non-Wetland Waters of the U.S. | 125.58 | 177,864 |
| | ***Total Corps Aquatic Resources*** | ***125.58*** | ***177,864*** |
| RWQCB | Non-Wetland Waters of the State | 125.58 | 177,864 |
| | ***Total RWQCB Aquatic Resources*** | ***125.58*** | ***177,864*** |
| CDFW | Unvegetated Streambed | 34.49 | 195,124 |
| | Vegetated Streambed | 580.30 | |
| | Watercourse | 55.18 | N/A[1] |
| | ***Total CDFW Aquatic Resources[2]*** | ***669.96*** | ***195,124*** |

[1] Linear feet not calculated for watercourse to avoid redundant linear foot calculation where such areas overlap with streambed.
[2] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.

## 8.1 CORPS

NWW-1 through NWW-109 (Mojave River) displayed clear indicators of an OHWM, such as a break in bank slope, change in average sediment texture, and change in vegetation cover between the drainage and adjacent uplands (Appendix E); however, these features did not meet the three wetland parameters.

As such, NWW-1 through NWW-109 (Mojave River) may be considered non-wetland waters of the U.S. Approximately 125.58 acres (177,864 linear feet) of potential non-wetland waters of the U.S. associated with NWW-1 through NWW-109 (Mojave River) occur within the review area as further detailed in Appendix H, Table H-1 and as shown on Figure 5A. The ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet is included as Appendix I.

## 8.2 RWQCB

NWW-1 through NWW-109 (Mojave River) displayed clear indicators of an OHWM, such as a break in bank slope, change in average sediment texture, and change in vegetation cover between the drainage and adjacent uplands (Appendix E); however, these features did not meet the three wetland parameters.

As such, NWW-1 through NWW-109 (Mojave River) may be considered non-wetland waters of the State. Approximately 125.58 acres (177,864 linear feet) of potential non-wetland waters of the U.S. associated with NWW-1 through NWW-109 (Mojave River) occur within the review area, as further detailed in Appendix H, Table H-1 and as shown on Figure 5B.

## 8.3 CDFW

NWW-1 through NWW-108 and the Mojave River (NWW-109) qualify as CDFW streambed; NWW-27, NWW-28, NWW-32, NWW-36, NWW-37, NWW-40, NWW-45, NWW-49, NWW-59, NWW-68 – NWW-70, NWW-76, NWW-80, NWW-89, NWW-106, and Watercourse A include associated CDFW watercourse (Figure 5C).

Approximately 580.29 acres (17,982 linear feet) of vegetated streambed, 34.49 acres (177,143 linear feet) of unvegetated streambed, and 55.18 acres of associated watercourse occur within the review area, as further detailed in Appendix H, Table H-2 and as shown on Figure 5C.

## 8.4 DISCLAIMER STATEMENT

The aquatic resources acreages and linear feet estimated in this section represent the existing conditions during the time of the field surveys. Please note that the applicable agencies will make final jurisdictional determinations. RBC recommends early coordination with the resource agencies to determine the final jurisdictional boundaries, applicable permitting processes, compensatory mitigation requirements, and other potential permitting issues specific to the proposed work within the review area. Agency representatives may request to access the site to field-verify the results of this ARDR with the applicant, or a designated representative.

The information provided in this report should remain valid for up to five years from the date of the field effort for the jurisdictional delineation unless site conditions change substantially, or a regulatory agency requires an updated report.

# 9 CONTACT INFORMATION

*Applicant/Land Owner:*

David Rankin

BNSF Railway Company

2500 Lou Menk Drive, AOB-3

Fort Worth, TX  76131

David.Rankin@BNSF.com

817-352-2383

*Agent:*

Sarah Krejca

Rocks Biological Consulting

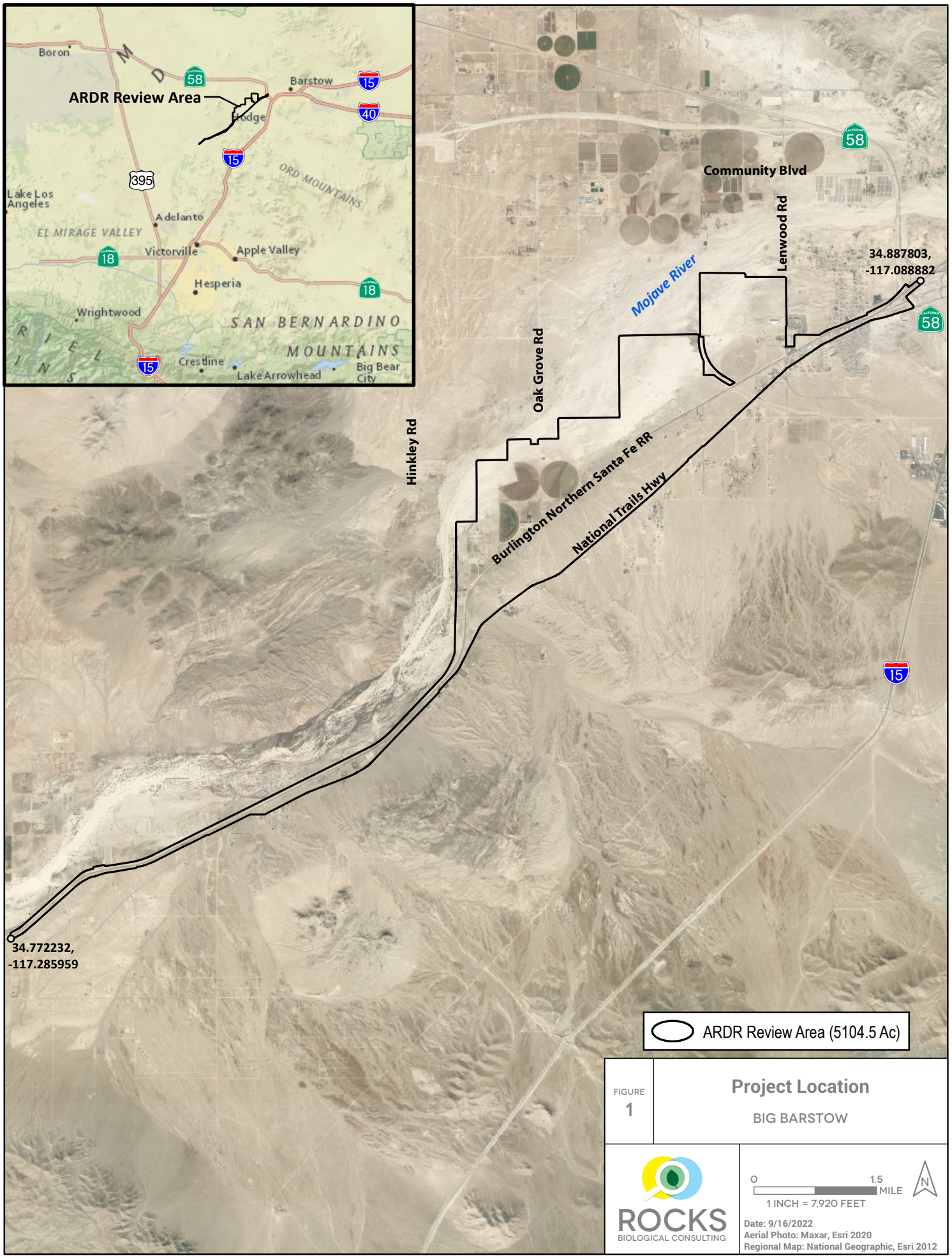
4312 Rialto Street

San Diego, CA 92107

sarah@rocksbio.com

619-813-8790

Agency access to the review area can be coordinated with the applicant and/or agent upon request.


ARDR Review Area
Boron
Barstow
Lodge
Lake Los Angeles
Adelanto
EL MIRAGE VALLEY
Victorville
Apple Valley
Hesperia
Wrightwood
SAN BERNARDINO MOUNTAINS
Crestline
Lake Arrowhead
Big Bear City
ORD MOUNTAINS
Community Blvd
Lenwood Rd
Mojave River
34.887803,
-117.088882
Oak Grove Rd
Hinkley Rd
Burlington Northern Santa Fe RR
National Trails Hwy
34.772232,
-117.285959
ARDR Review Area (5104.5 Ac)
FIGURE
1
Project Location
BIG BARSTOW
ROCKS
BIOLOGICAL CONSULTING
0
1.5
MILE
1 INCH = 7,920 FEET
N
Date: 9/16/2022
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012

ARDR Review Area (5104.5 Ac)
Township, Range and Section
**USGS National Hydrography Dataset (NHD)**
Wash
Lake/Pond
Reservoir
Stream/River

09N 02W 9
34.887803, -117.088882
09N 02W 7
09N 03W 12
09N 02W 8
09N 02W 18
09N 02W 17
09N 03W 14
09N 03W 13
09N 02W 19
09N 03W 22
09N 03W 23
09N 03W 24
09N 03W 25
09N 03W 28
09N 03W 27
09N 03W 26
09N 03W 35
09N 03W 33
09N 03W 34
08N 03W 3
08N 03W 4
08N 03W 5
08N 03W 9
08N 03W 7
08N 03W 8
08N 04W 12
08N 04W 14
08N 04W 13
08N 04W 15
34.772232, -117.285959
08N 04W 22

Mojave River
Oak Grove Rd
Burlington Northern Santa Fe RR
National Trails Hwy
Grandview
Lenwood
15

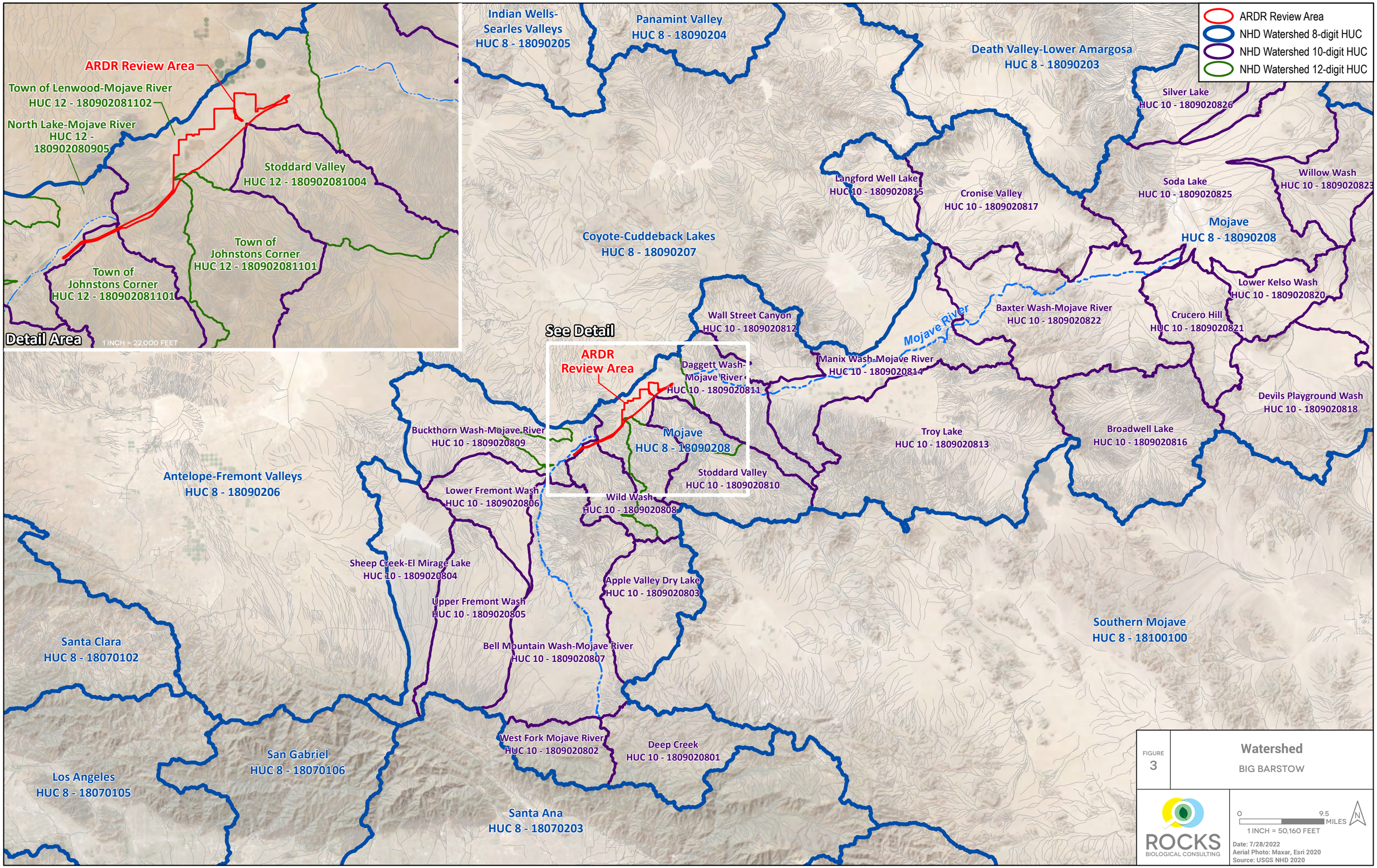
FIGURE 2

# USGS Topo and NHD

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 4,500 FEET
1 INCH = 4,500 FEET
Date: 9/16/2022
Source: USGS NHD 2020
USGS 7.5' Quadrangles (Hodge; Hinkley; Barstow SE; Barstow)


ARDR Review Area
NHD Watershed 8-digit HUC
NHD Watershed 10-digit HUC
NHD Watershed 12-digit HUC
Indian Wells-Searles Valleys HUC 8 - 18090205
Panamint Valley HUC 8 - 18090204
Death Valley-Lower Amargosa HUC 8 - 18090203
Silver Lake HUC 10 - 1809020826
Willow Wash HUC 10 - 1809020823
Soda Lake HUC 10 - 1809020825
Langford Well Lake HUC 10 - 1809020815
Cronise Valley HUC 10 - 1809020817
Mojave HUC 8 - 18090208
Coyote-Cuddeback Lakes HUC 8 - 18090207
Lower Kelso Wash HUC 10 - 1809020820
Baxter Wash-Mojave River HUC 10 - 1809020822
Crucero Hill HUC 10 - 1809020821
Mojave River
Wall Street Canyon HUC 10 - 1809020812
Manix Wash-Mojave River HUC 10 - 1809020814
Devils Playground Wash HUC 10 - 1809020818
Broadwell Lake HUC 10 - 1809020816
Troy Lake HUC 10 - 1809020813
Buckthorn Wash-Mojave River HUC 10 - 1809020809
Antelope-Fremont Valleys HUC 8 - 18090206
Lower Fremont Wash HUC 10 - 1809020806
Wild Wash HUC 10 - 1809020808
Stoddard Valley HUC 10 - 1809020810
Sheep Creek-El Mirage Lake HUC 10 - 1809020804
Upper Fremont Wash HUC 10 - 1809020805
Apple Valley Dry Lake HUC 10 - 1809020803
Bell Mountain Wash-Mojave River HUC 10 - 1809020807
Southern Mojave HUC 8 - 18100100
Santa Clara HUC 8 - 18070102
West Fork Mojave River HUC 10 - 1809020802
Deep Creek HUC 10 - 1809020801
San Gabriel HUC 8 - 18070106
Los Angeles HUC 8 - 18070105
Santa Ana HUC 8 - 18070203
See Detail
ARDR Review Area
Daggett Wash-Mojave River HUC 10 - 1809020811
Mojave HUC 8 - 18090208
Stoddard Valley HUC 10 - 1809020810
Wild Wash HUC 10 - 1809020808
Detail Area
1 INCH = 22,000 FEET
ARDR Review Area
Town of Lenwood-Mojave River HUC 12 - 180902081102
North Lake-Mojave River HUC 12 - 180902080905
Stoddard Valley HUC 12 - 180902081004
Town of Johnstons Corner HUC 12 - 180902081101
Town of Johnstons Corner HUC 12 - 180902081101
FIGURE 3
Watershed
BIG BARSTOW
ROCKS BIOLOGICAL CONSULTING
0 9.5 MILES
1 INCH = 50,160 FEET
N
Date: 7/28/2022
Aerial Photo: Maxar, Esri 2020
Source: USGS NHD 2020

ARDR Review Area (5104.5 ac)

Wetland Data Form Point (WDP)

**National Wetlands Inventory (NWI)**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Riverine
- Freshwater Pond

**NRCS Soils**

- Bryman Loamy Fine Sand, 2 to 5 Percent Slopes
- Cajon Gravelly Sand, 2 to 15 Percent Slopes
- Cajon Loamy Sand, 5 to 9 Percent Slopes
- Cajon Sand, 0 to 2 Percent Slopes*
- Cajon Sand, 2 to 9 Percent Slopes
- Cajon-Arizo Complex, 2 to 15 Percent Slopes
- Cajon-Wasco, Cool Complex, 2 to 9 Percent Slopes*
- Cave Loam, Dry, 0 to 2 Percent Slopes*
- Dune Land*
- Helendale Loamy Sand, 0 to 2 Percent Slopes
- Helendale Loamy Sand, 2 to 5 Percent Slopes
- Joshua Loam, 2 to 5 Percent Slopes
- Nebona-Cuddeback Complex, 2 to 9 Percent Slopes*
- Norob-Halloran Complex, 0 to 5 Percent Slopes*
- Riverwash*
- Rock Outcrop-Lithic Torriorthents Complex, 15 to 50 Percent Slopes
- Rosamond Loam, Saline-Alkali*
- Victorville Sandy Loam*
- Villa Loamy Sand*
- Villa Loamy Sand, Hummocky*

*Soils rated as hydric per the NRCS.

34.887803, -117.088882

34.772232, -117.285959

WDP 1
WDP 2
WDP 3
WDP 4
WDP 5
WDP 6
WDP 7
WDP 8
WDP 9
WDP 10
WDP 11

Mojave River

Oak Grove Rd

Burlington Northern Santa Fe RR

National Trails Hwy

Lenwood Rd

58

15

FIGURE 4

# NRCS Soils Survey Data and NWI

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 4,500 FEET

1 INCH = 4,500 FEET

N

Date: 9/16/2022

Aerial Photo: San Bernardino County 2020, Esri

Source: USFWS NWI 2019; USDA NRCS 2018




ARDR Review Area (5104.5 ac)[1]

Culvert

Flow Direction

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

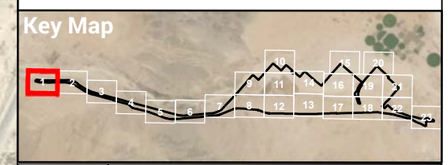


FIGURE 5A

PAGE 1 OF 23

# Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

Flow Direction

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

11'-15'

24'-30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

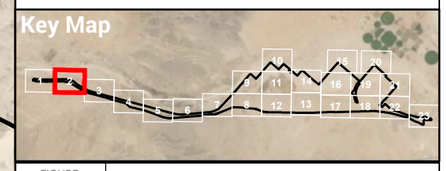


FIGURE 5A

PAGE 2 OF 23

# Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**Corps Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
24'-30'
>30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

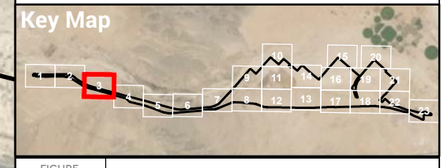


FIGURE 5A

PAGE 3 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

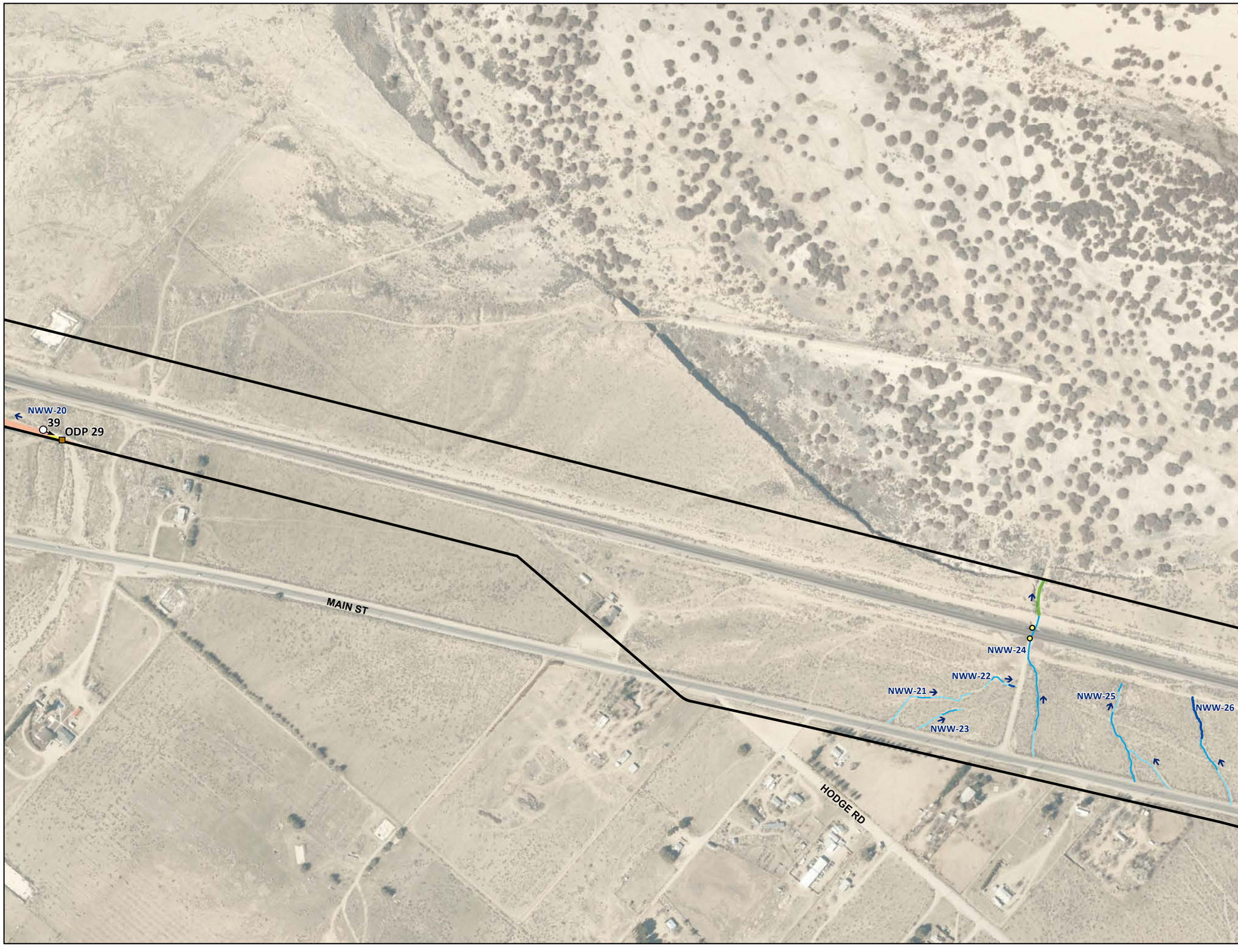
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

24'-30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5A

PAGE 4 OF 23

Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

Wetland Data Form Point (WDP)

Flow Direction

Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

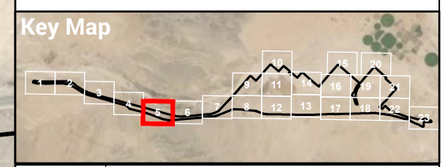


FIGURE 5A

PAGE 5 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

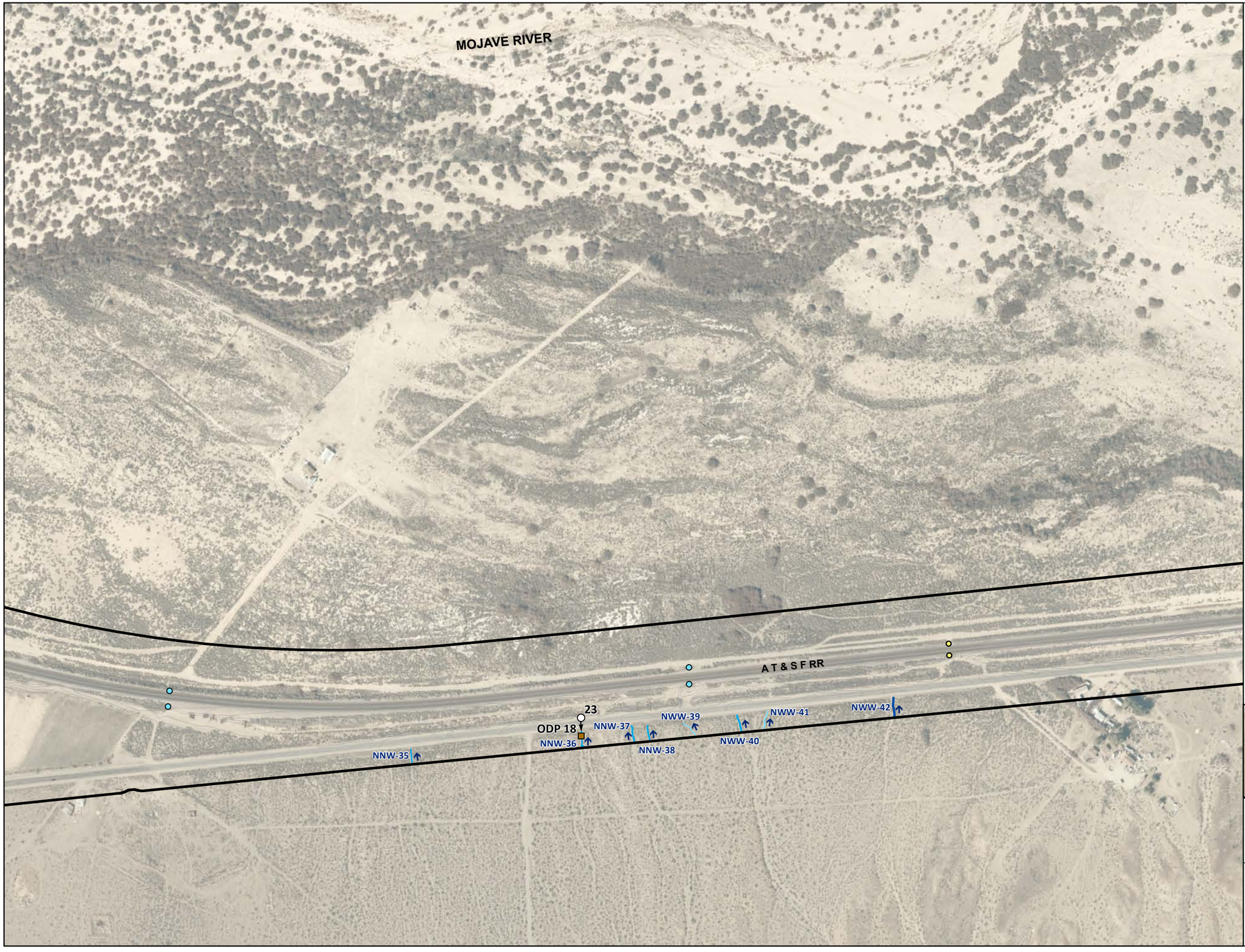
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Railroad Crossing

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

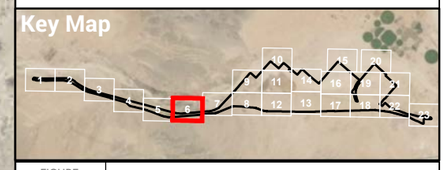


FIGURE 5A

PAGE 6 OF 23

# Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

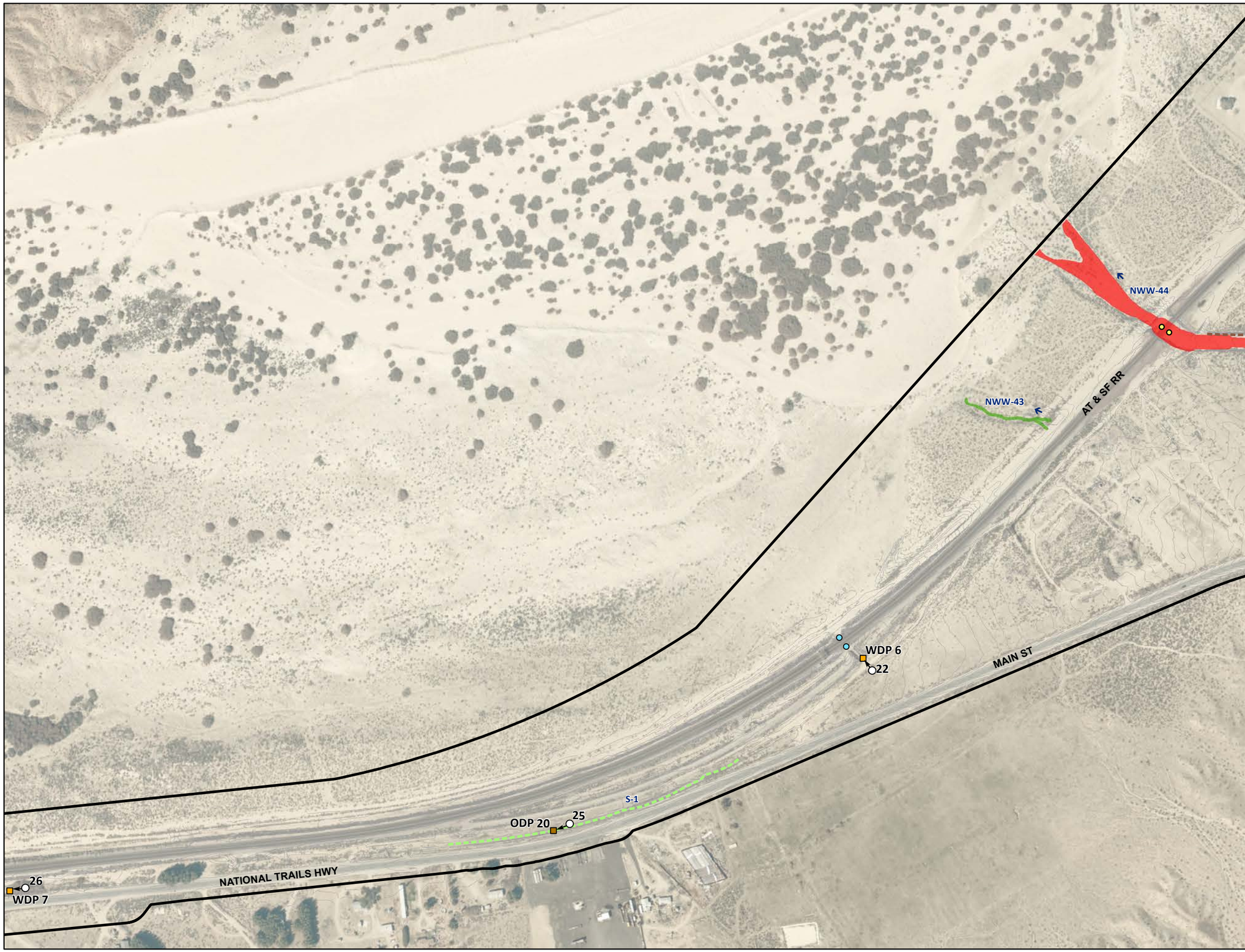
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Berm - Earthen Lined
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

11'-15'
>30'

## Other Features[3]

Swale

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking OHWM or three-parameter wetland, and thus anticipated to be non-jurisdictional.

Key Map

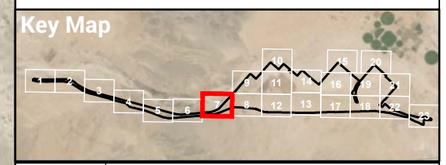


FIGURE 5A

PAGE 7 OF 23

Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

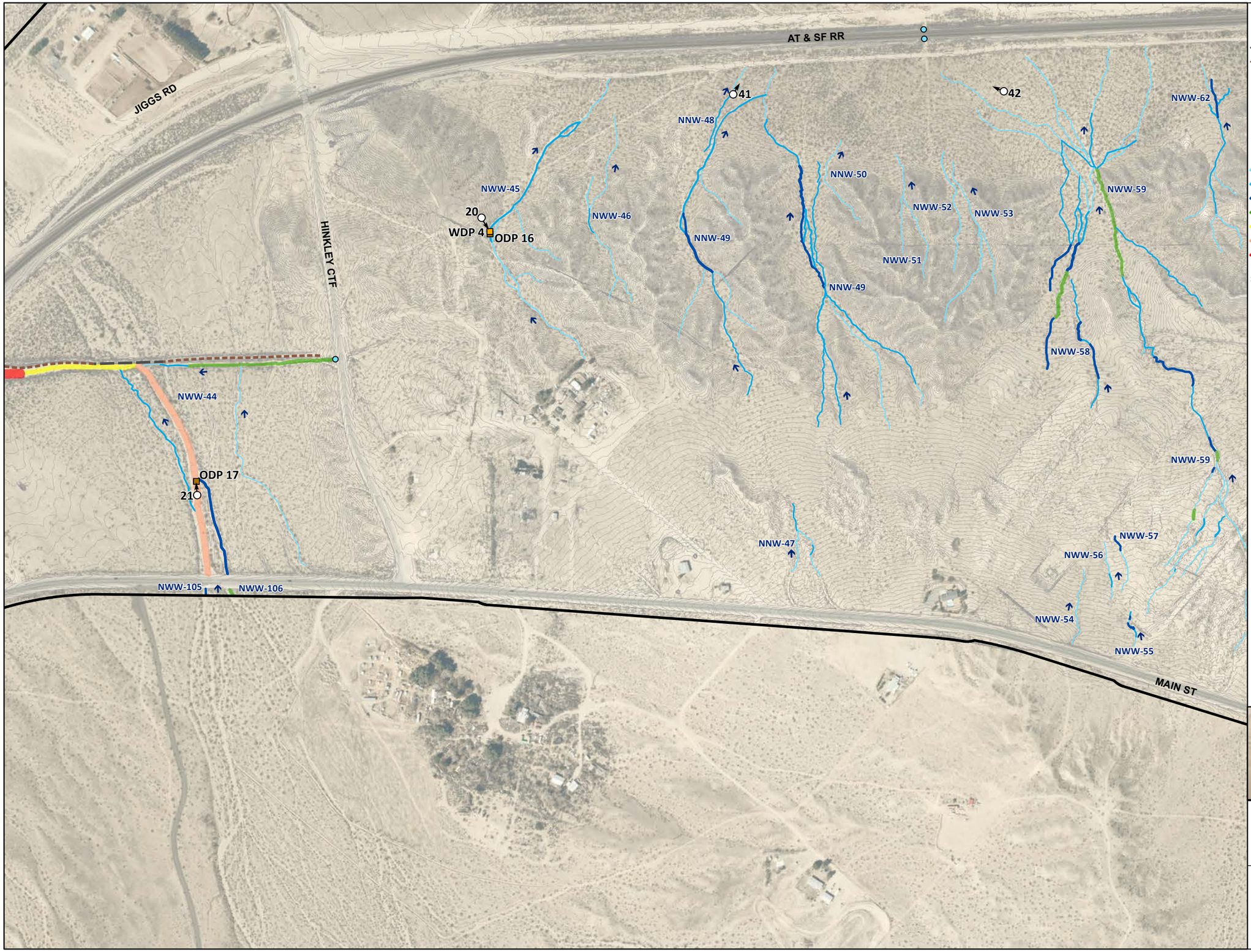
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'
- >30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

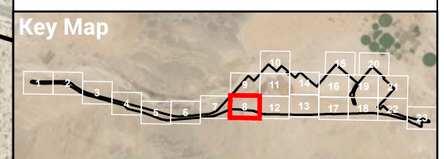


FIGURE 5A

PAGE 8 OF 23

Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

4'-6'
11'-15'
>30'

## Other Features[3]

Basin

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking OHWM or three-parameter wetland, and thus anticipated to be non-jurisdictional.

Key Map

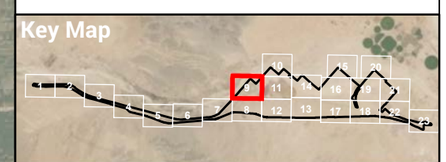


FIGURE 5A

PAGE 9 OF 23

Corps Aquatic Resources

BIG BARSTOW

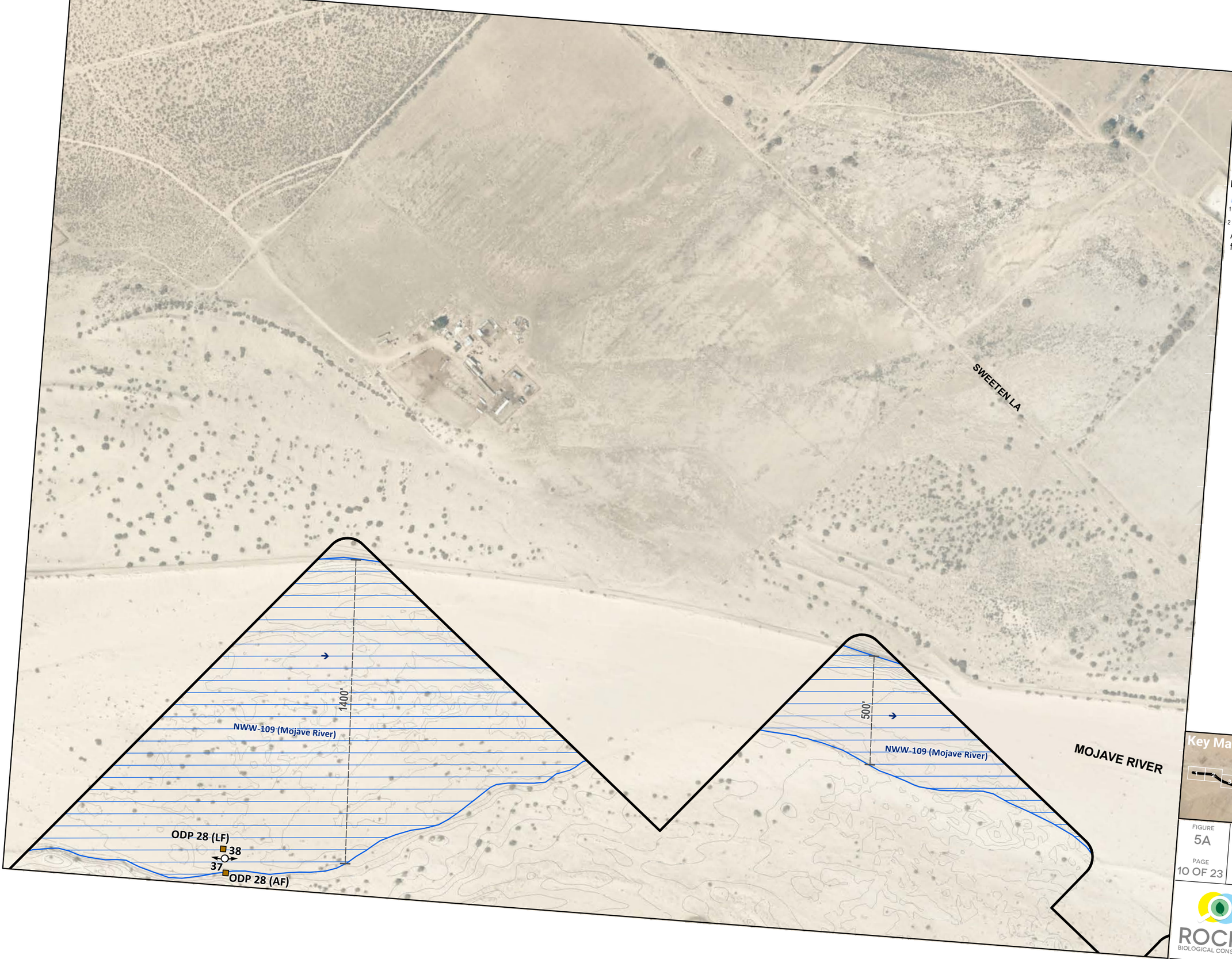
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

OHWM Datasheet Point (ODP)

AF = Active Floodplain

LF = Low-Flow Channel

Flow Direction

Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1]**

Mojave River Extent

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.




FIGURE 5A

PAGE 10 OF 23

Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022




ARDR Review Area (5104.5 ac)[1]

Photo Location

[1] Represents total acreage for ARDR review area.

Key Map

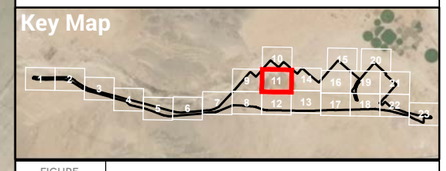


FIGURE 5A

PAGE 11 OF 23

## Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

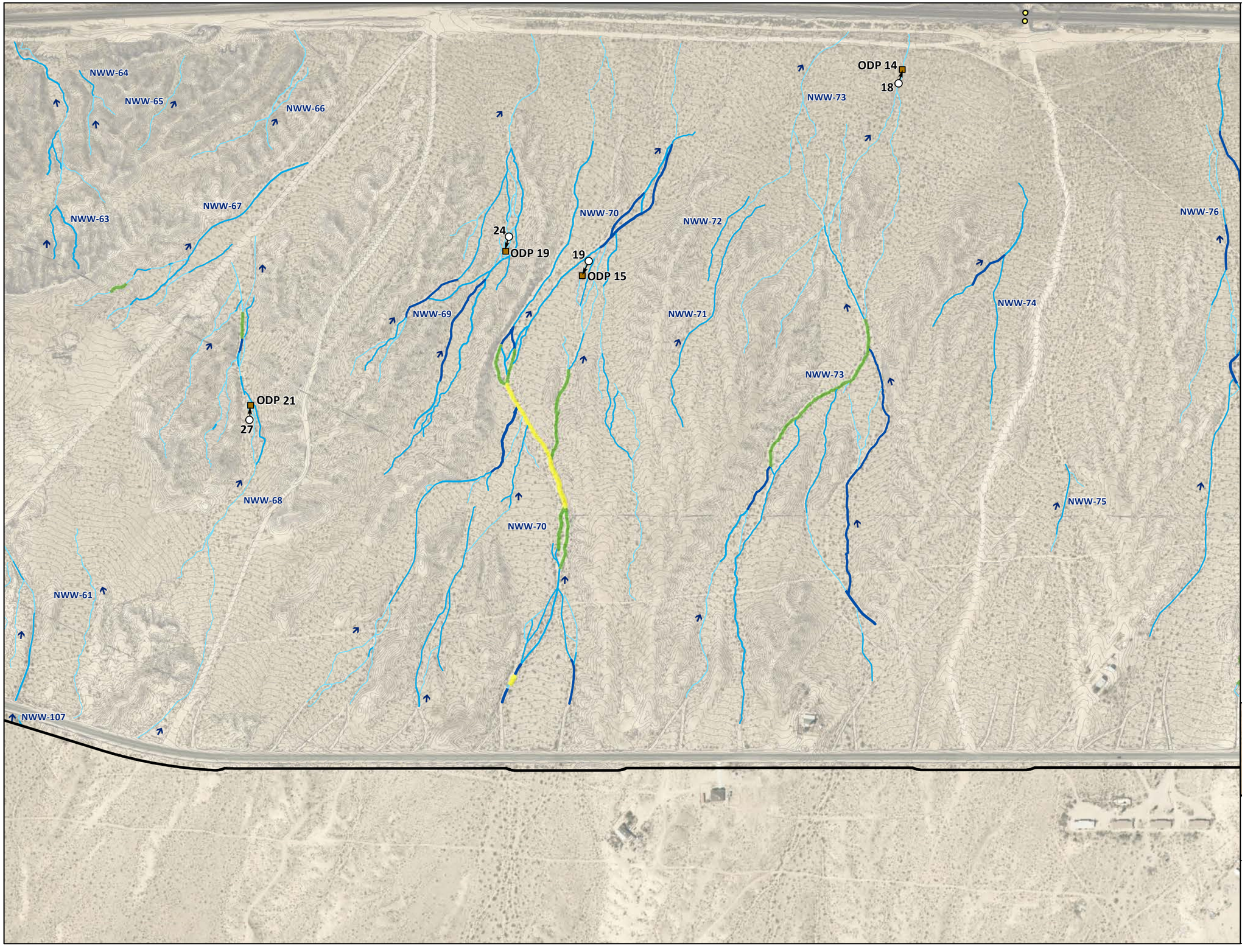
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

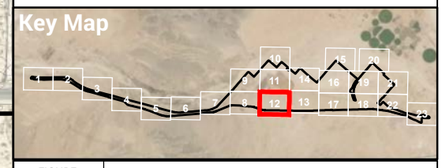


FIGURE 5A

PAGE 12 OF 23

Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

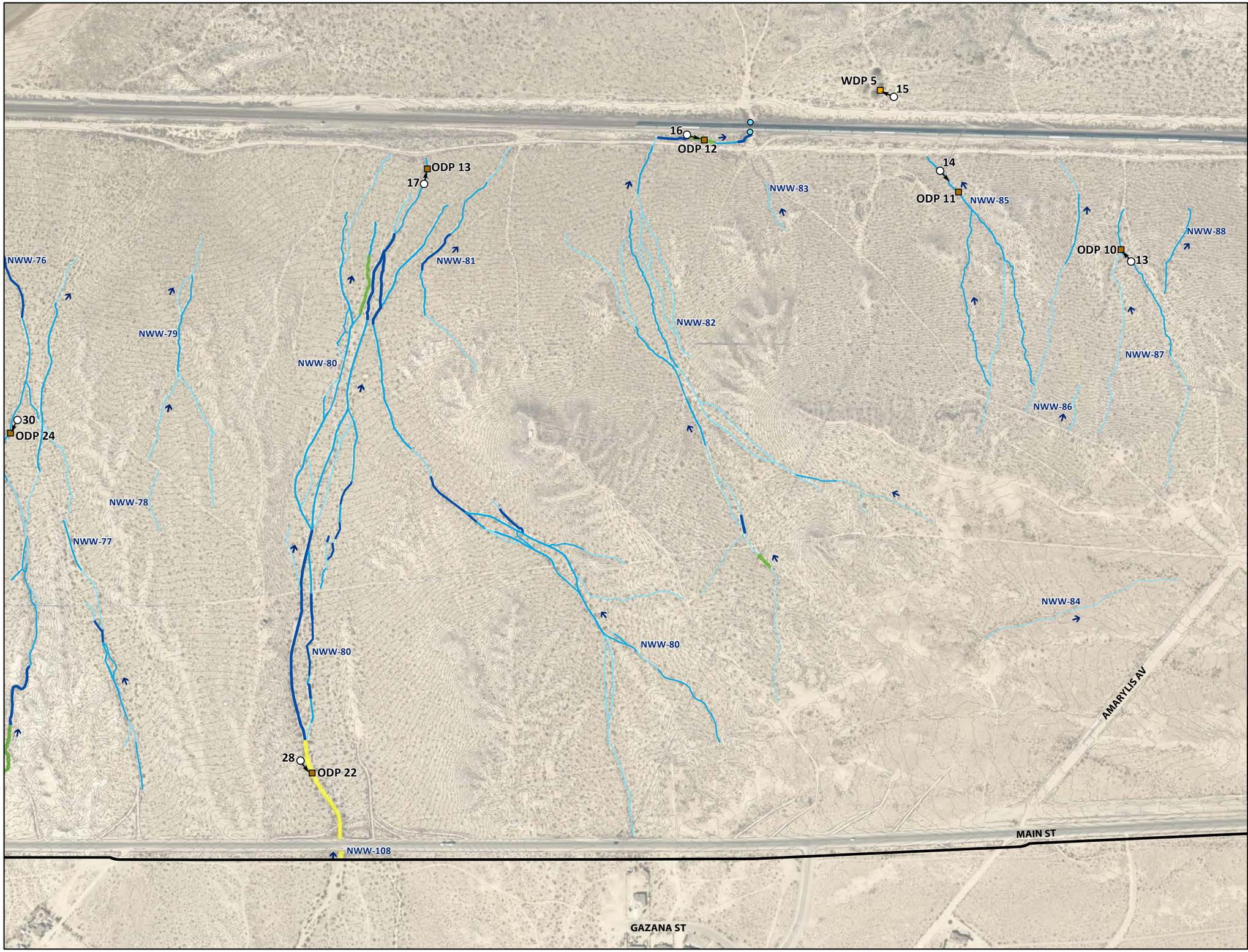
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

**Corps Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

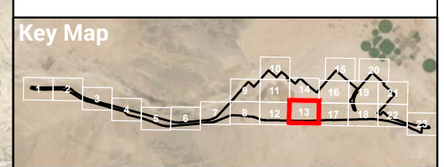


FIGURE 5A

PAGE 13 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

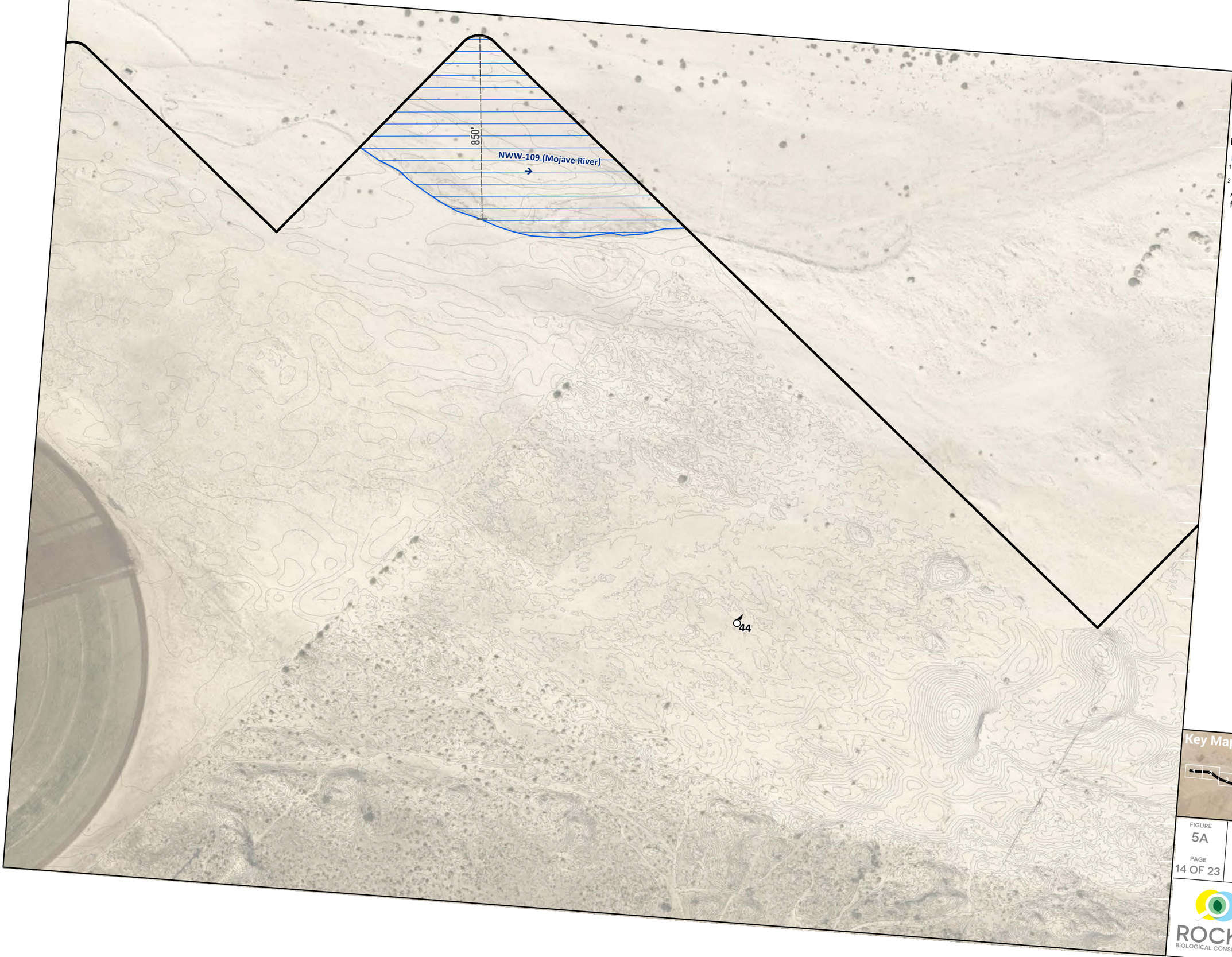
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

**Corps Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1]**

Mojave River Extent

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map



FIGURE 5A

PAGE 14 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

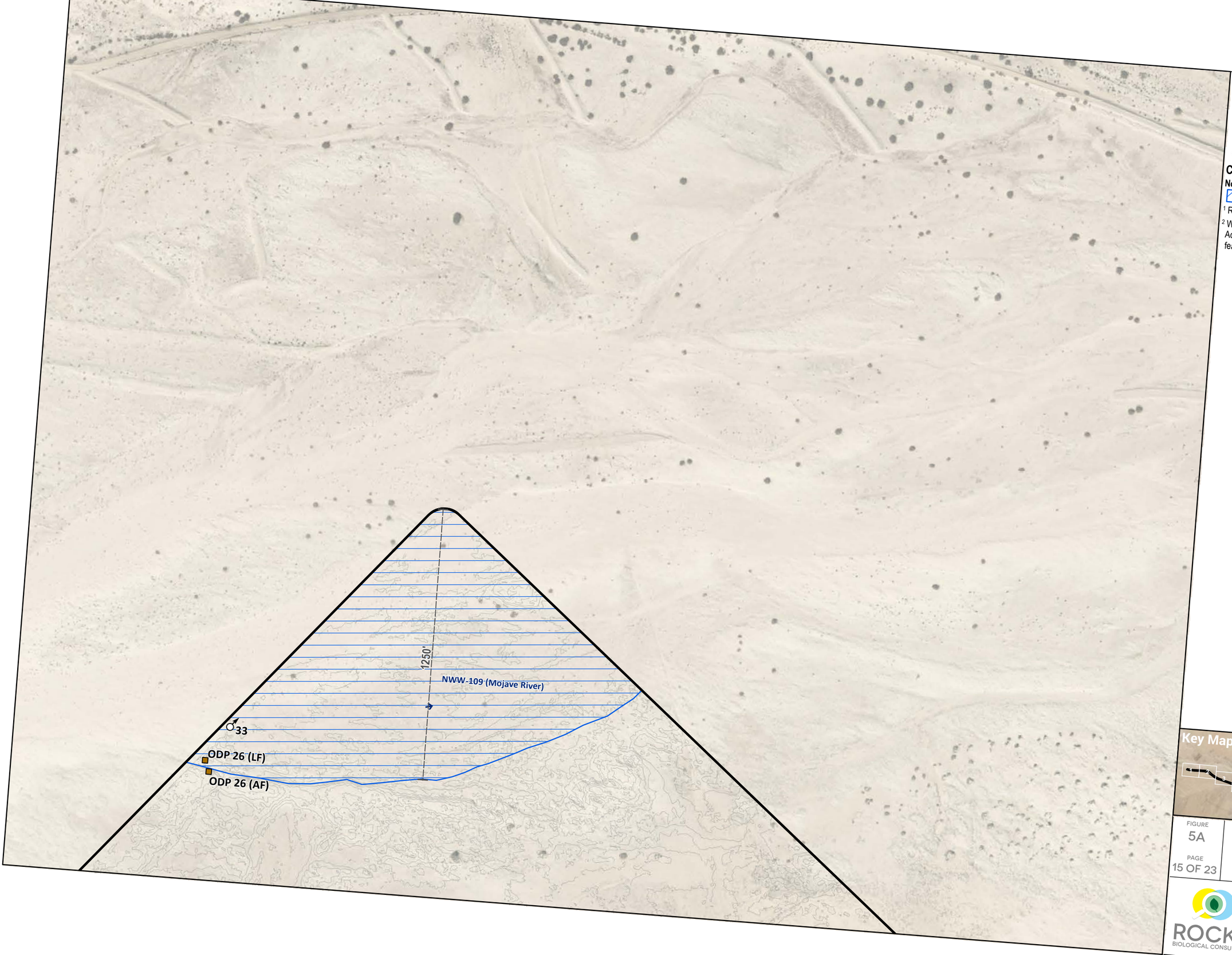
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022




ARDR Review Area (5104.5 ac)[1]
OHWM Datasheet Point (ODP)
AF = Active Floodplain
LF = Low-Flow Channel
Flow Direction
Photo Location

**Corps Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1]**
Mojave River Extent

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

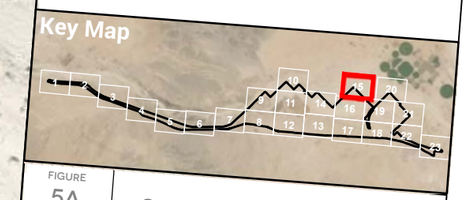



FIGURE 5A
PAGE 15 OF 23

Corps Aquatic Resources
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 9/22/2022




ARDR Review Area (5104.5 ac)[1]

Photo Location

[1] Represents total acreage for ARDR review area.

Key Map

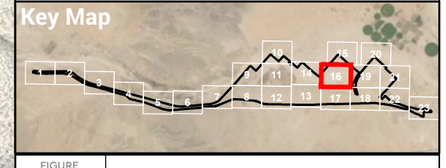


FIGURE
5A

PAGE
16 OF 23

**Corps Aquatic Resources**

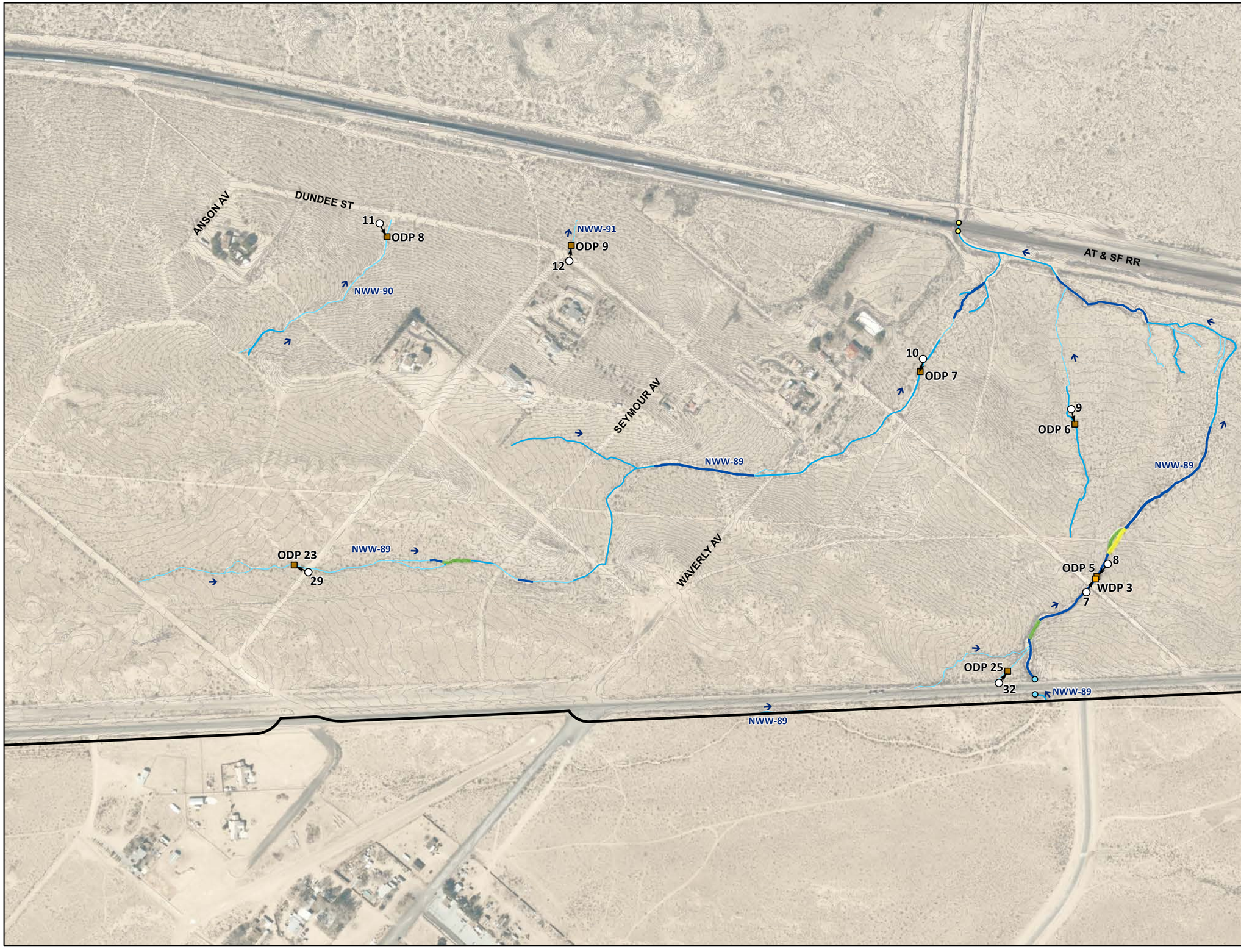
BIG BARSTOW

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

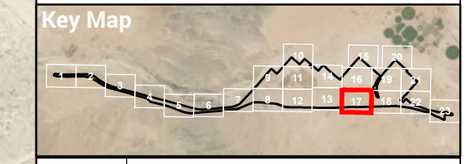


FIGURE 5A

PAGE 17 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location
Off-site Flow Path

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**
4'-6'
11'-15'
16'-21'
>30'

**Non-Wetland Waters - Rip-rap (0.06 ac)[1] (widths[2])**
3'
20'

**Non-Wetland Waters - Concrete (0.02 ac)[1] (widths[2])**
6'

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5A
PAGE 18 OF 23

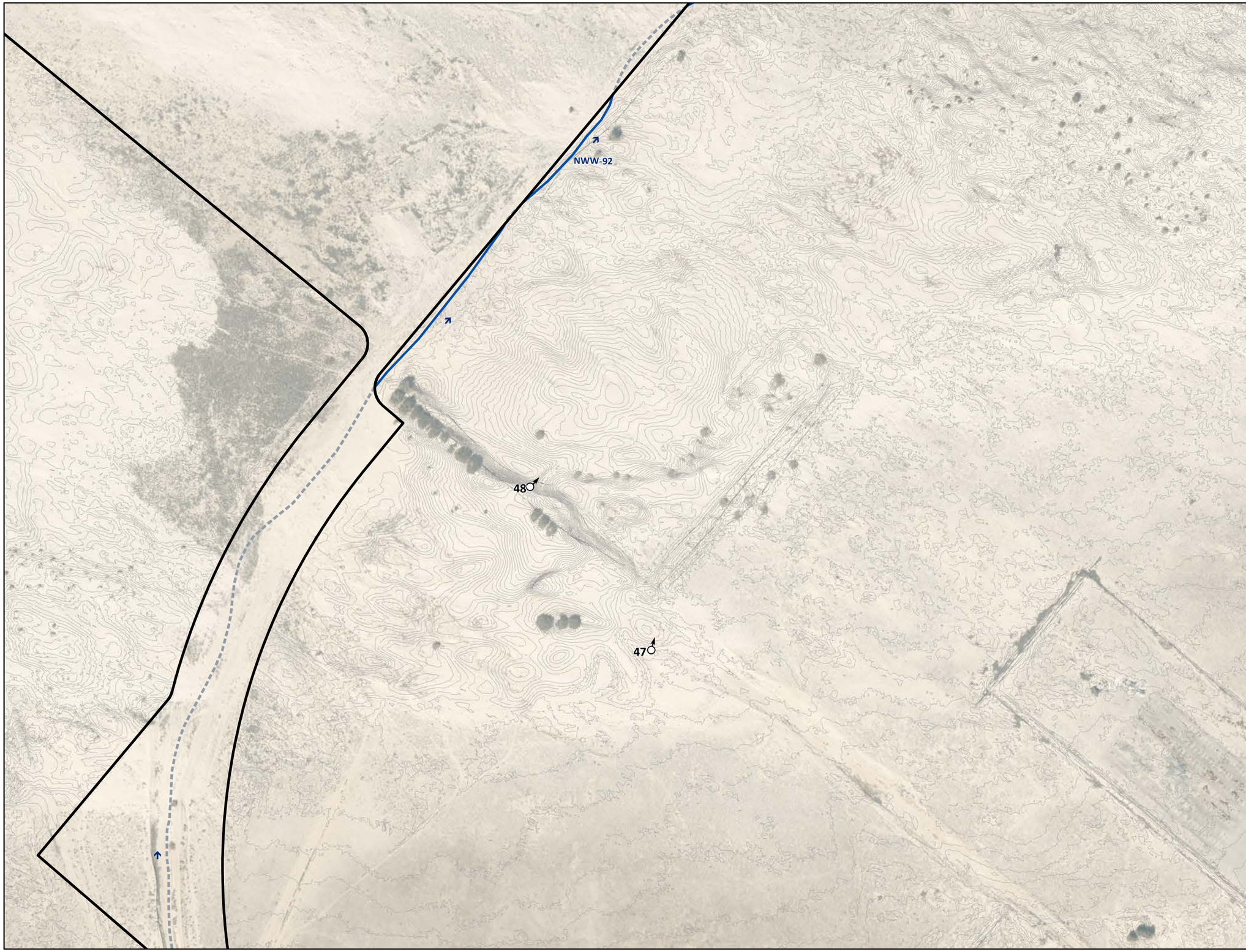
# Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

Off-site Flow Path

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

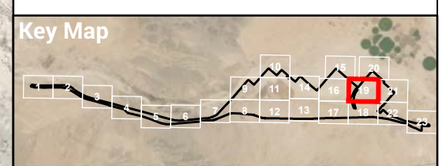


FIGURE 5A

PAGE 19 OF 23

## Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

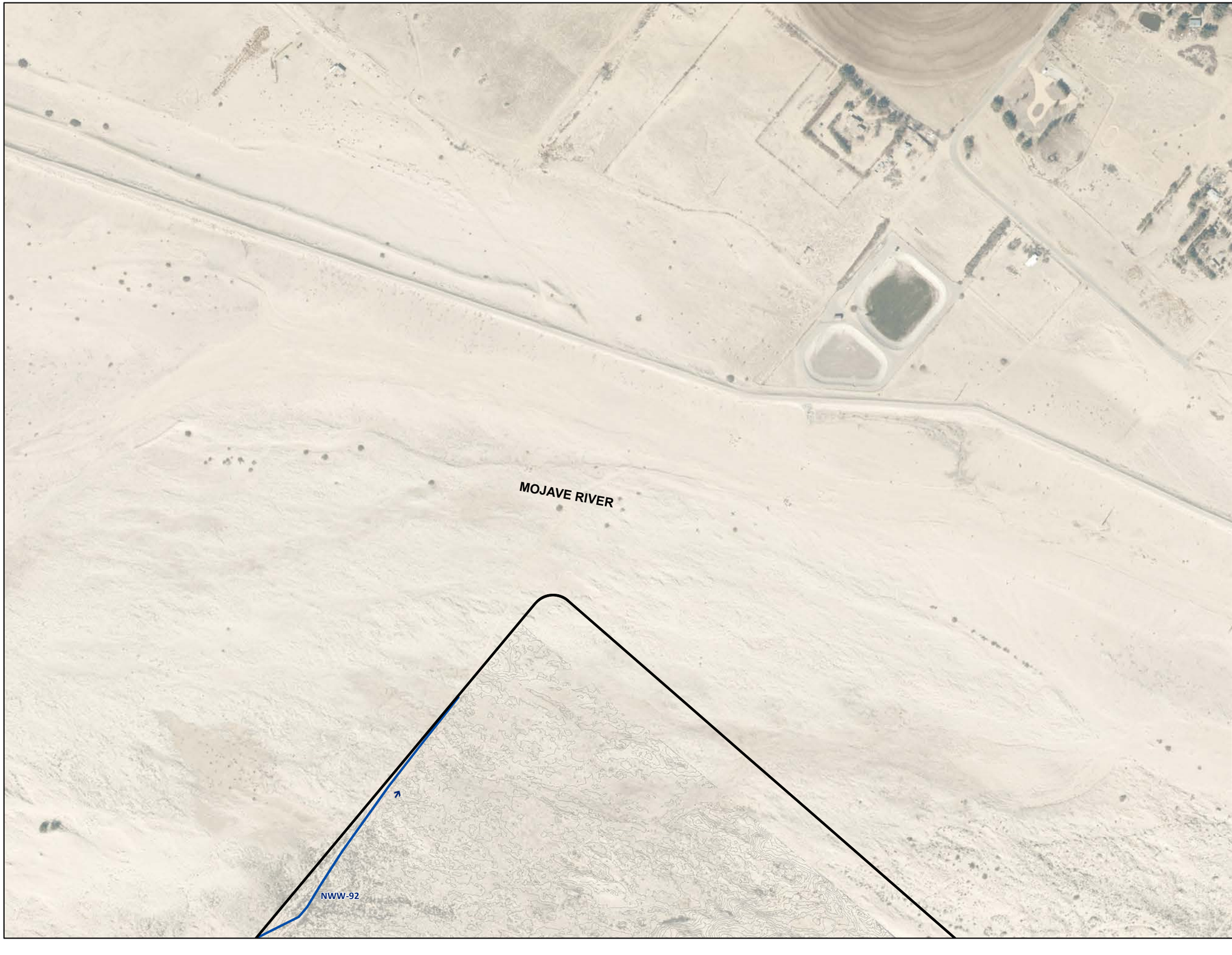
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

**Corps Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

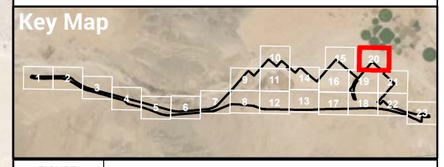


FIGURE 5A

PAGE 20 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

[1] Represents total acreage for ARDR review area.

Key Map

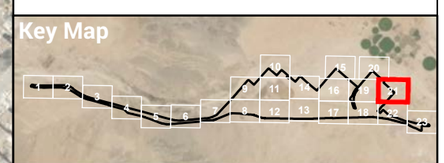


FIGURE
5A

PAGE
21 OF 23

Corps Aquatic Resources

BIG BARSTOW

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Wetland Data Form Point (WDP)

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

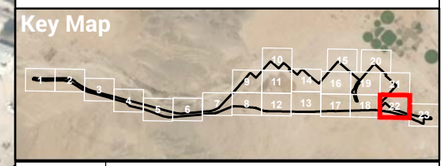


FIGURE 5A

PAGE 22 OF 23

**Corps Aquatic Resources**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

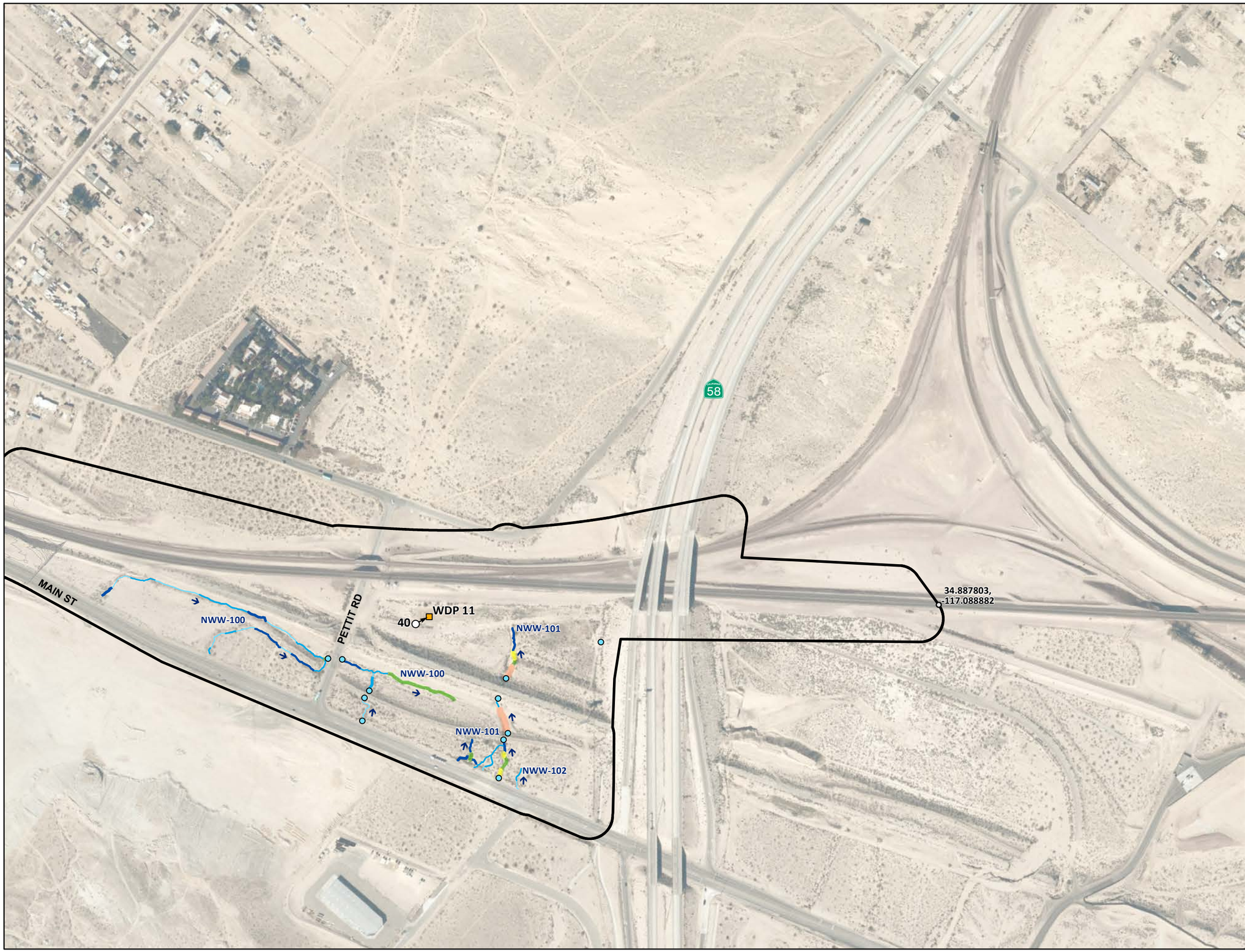
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Wetland Data Form Point (WDP)

Flow Direction

Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

24'-30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5A

PAGE 23 OF 23

# Corps Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri

LORDS RD

AT & SF RR

34.772232,
-117.285959

NWW-1
NWW-2
NWW-3
NWW-4
NWW-5
NWW-6
NWW-7
NWW-8
NWW-9
NWW-10
NWW-11
NWW-12
NWW-13
NWW-14
NWW-15

ARDR Review Area (5104.5 ac)[1]
Culvert
Flow Direction

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE
5B

PAGE
1 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

Flow Direction

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

11'-15'

24'-30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

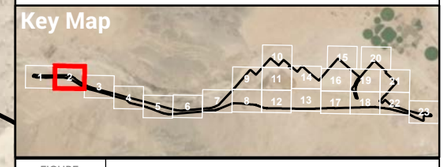


FIGURE 5B

PAGE 2 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Railroad Crossing

Flow Direction

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

24'-30'

>30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

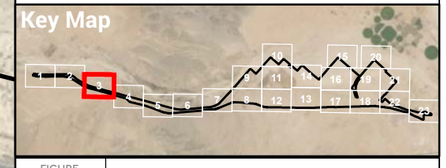


FIGURE 5B

PAGE 3 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

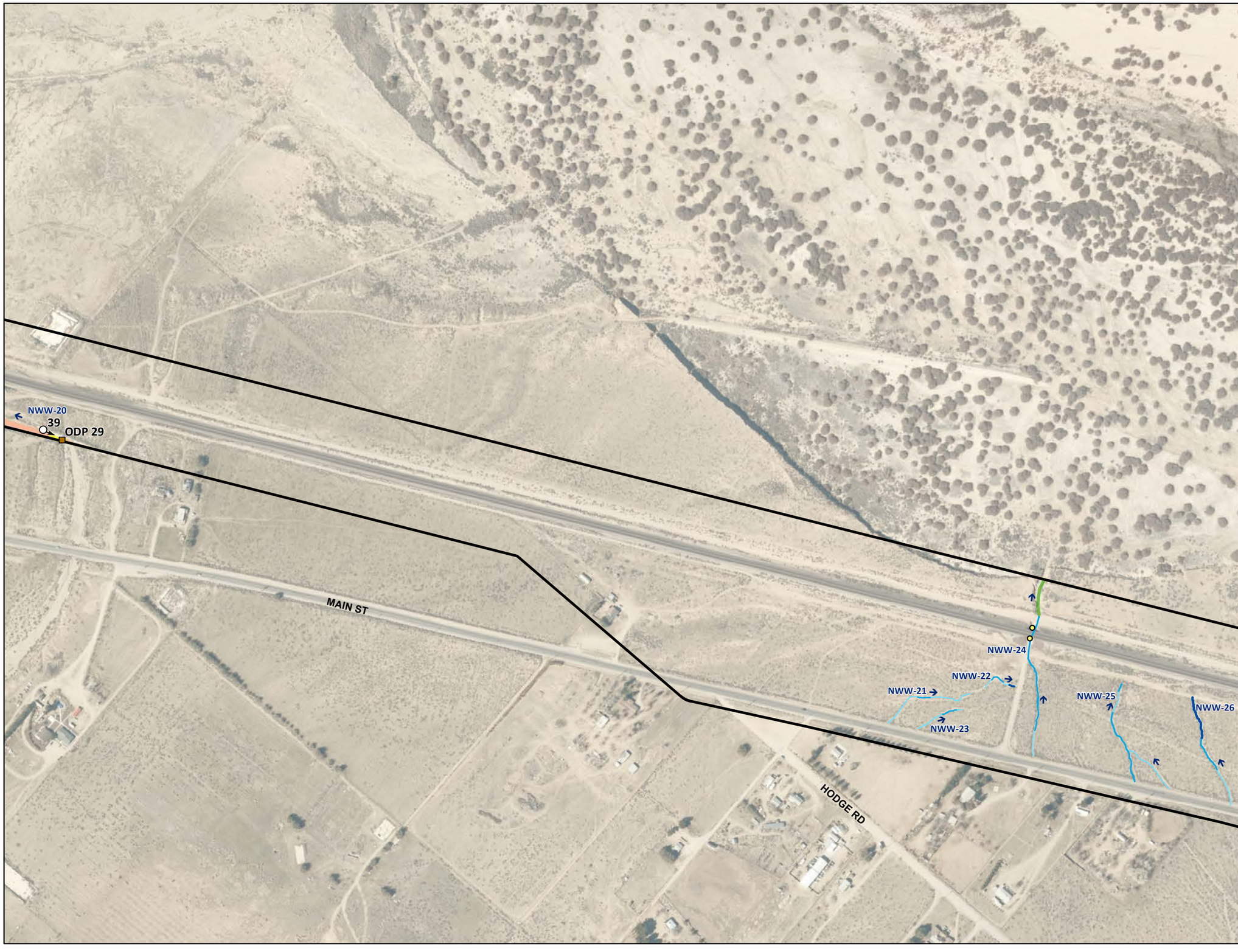
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

24'-30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 4 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

Wetland Data Form Point (WDP)

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

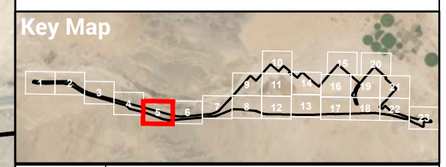


FIGURE 5B

PAGE 5 OF 23

**RWQCB Aquatic Resources**

BIG BARSTOW

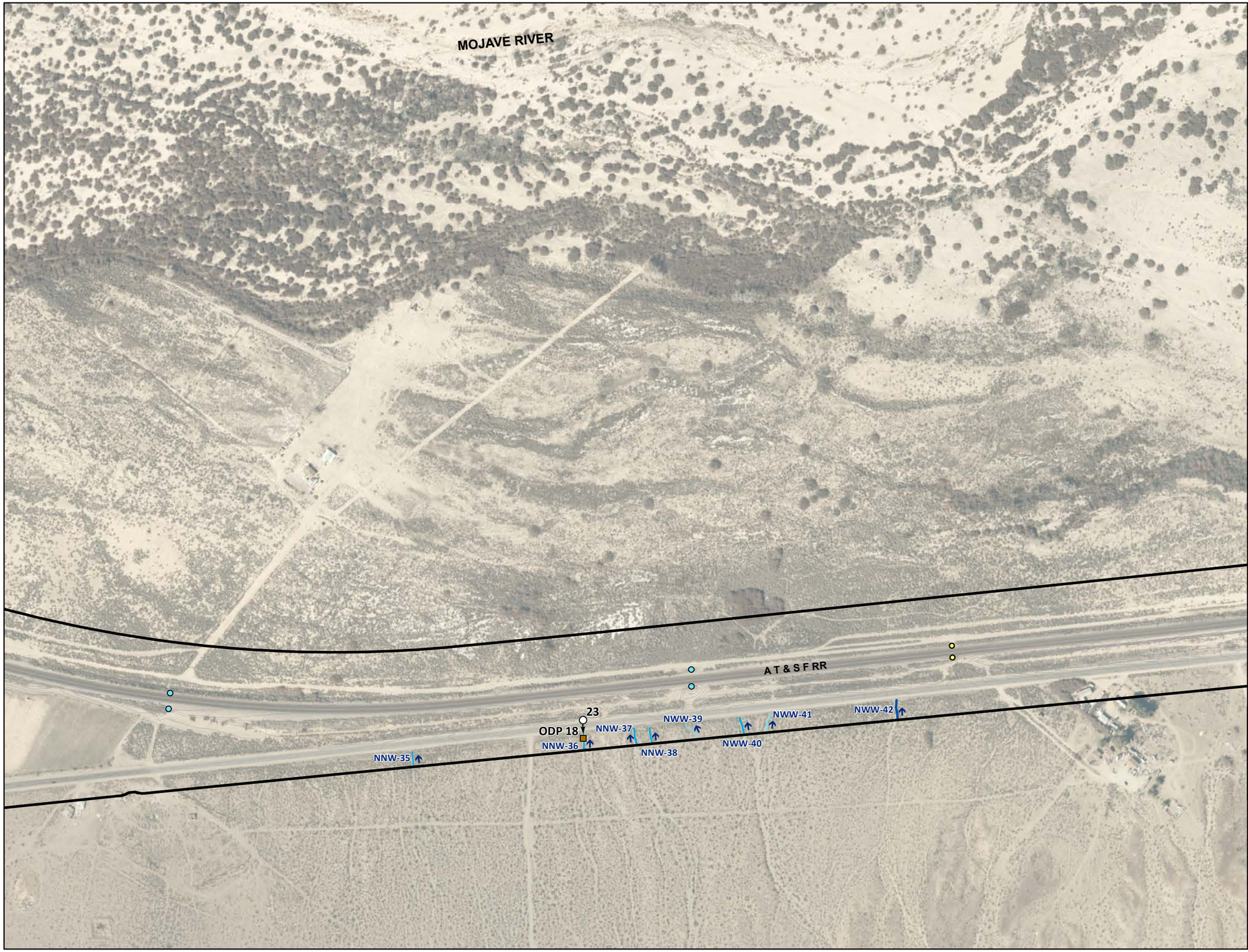
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Railroad Crossing

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

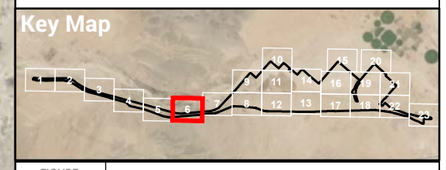


FIGURE 5B

PAGE 6 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

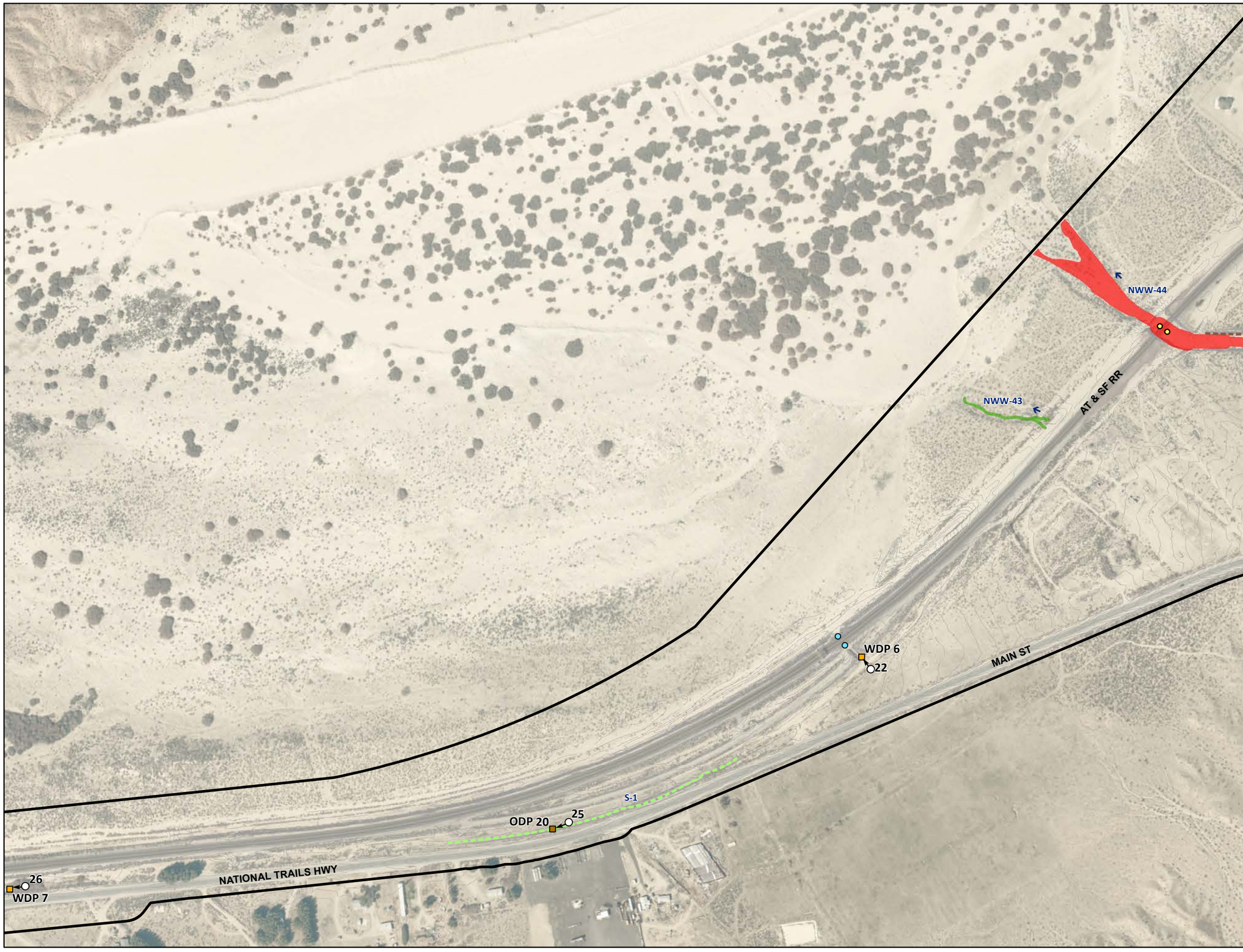
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Berm - Earthen Lined
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

11'-15'
>30'

## Other Features[3]

Swale

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking OHWM or three-parameter wetland, and thus anticipated to be non-jurisdictional.

Key Map

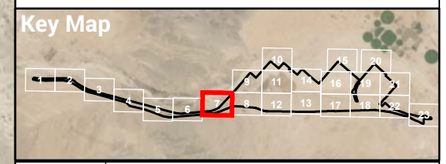


FIGURE 5B

PAGE 7 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

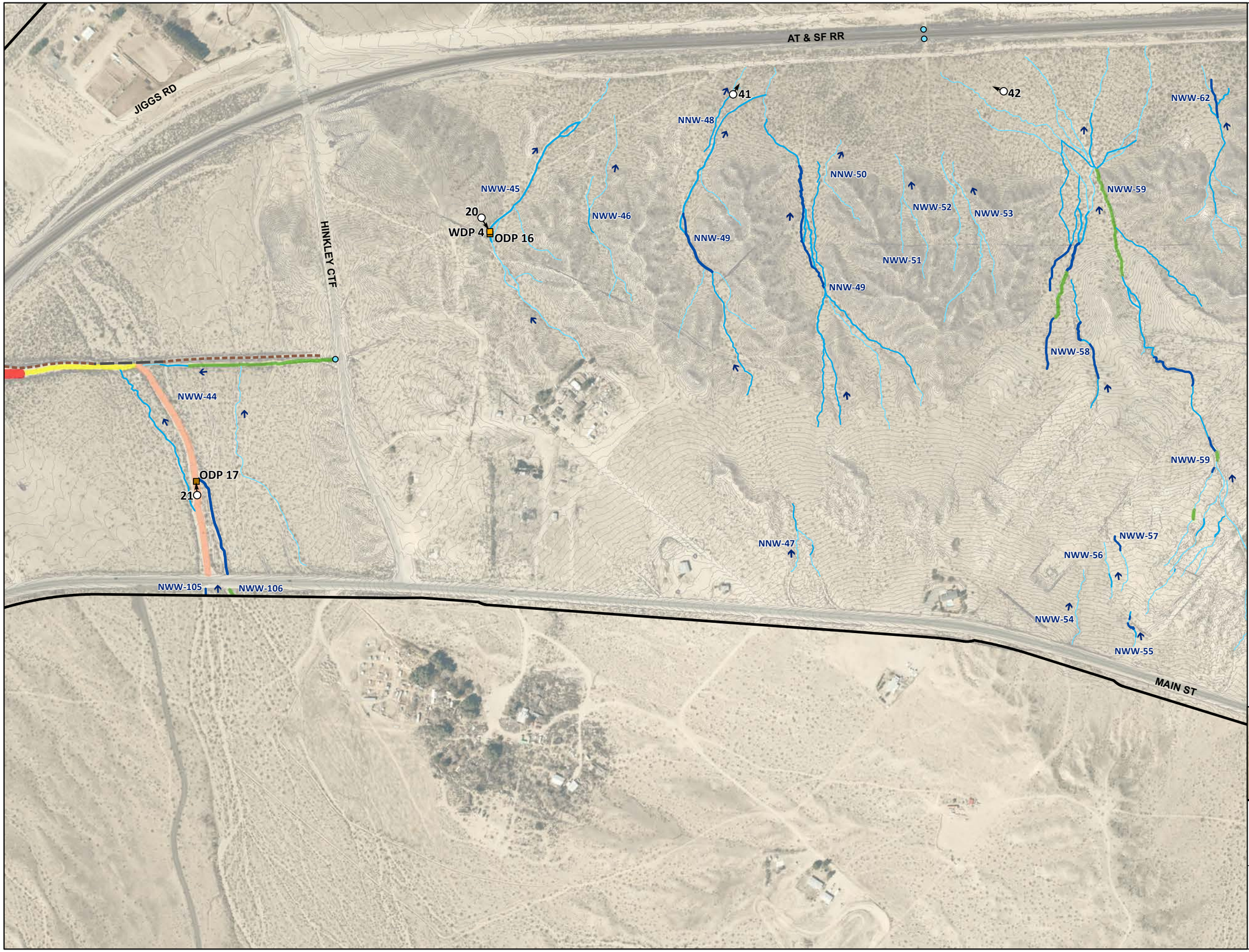
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 24'-30'
- >30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

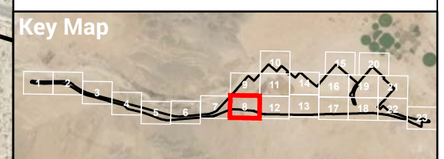


FIGURE 5B

PAGE 8 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Wetland Data Form Point (WDP)

OHWM Datasheet Point (ODP)

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

4'-6'

11'-15'

>30'

## Other Features[3]

Basin

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking OHWM or three-parameter wetland, and thus anticipated to be non-jurisdictional.

Key Map

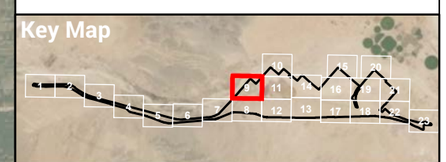


FIGURE 5B

PAGE 9 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri

ARDR Review Area (5104.5 ac)[1]

OHWM Datasheet Point (ODP)

AF = Active Floodplain

LF = Low-Flow Channel

Flow Direction

Photo Location

**RWQCB Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1]**

Mojave River Extent

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

SWEETEN LA

1400'

NWW-109 (Mojave River)

500'

NWW-109 (Mojave River)

MOJAVE RIVER

ODP 28 (LF)

38

37

ODP 28 (AF)

Key Map

FIGURE 5B

PAGE 10 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022




ARDR Review Area (5104.5 ac)[1]

Photo Location

[1] Represents total acreage for ARDR review area.

Key Map

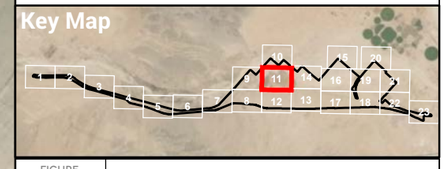


FIGURE 5B

PAGE 11 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

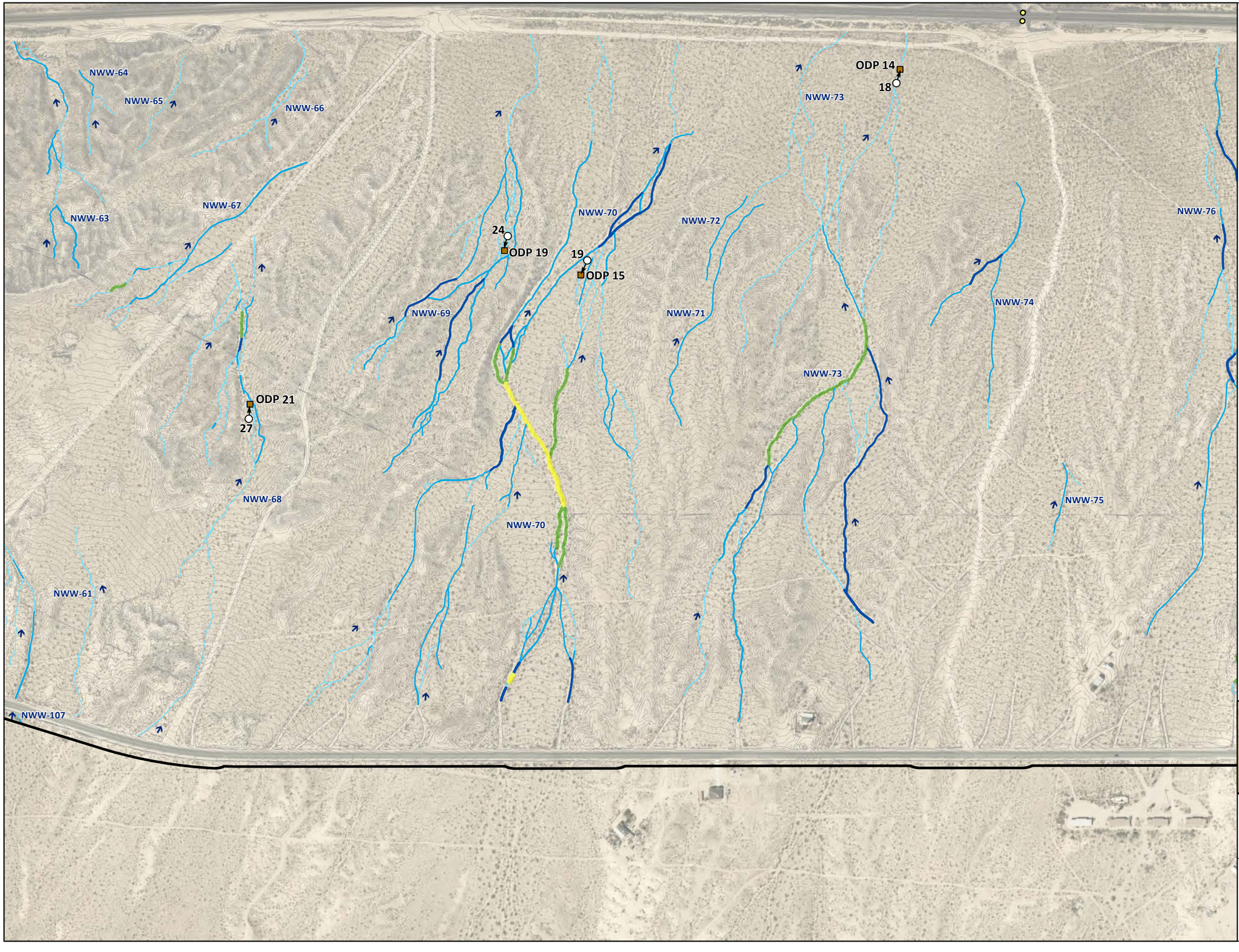
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Railroad Crossing

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

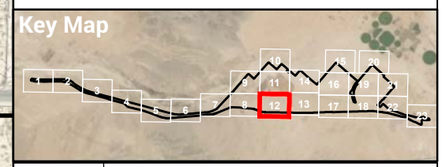


FIGURE 5B

PAGE 12 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

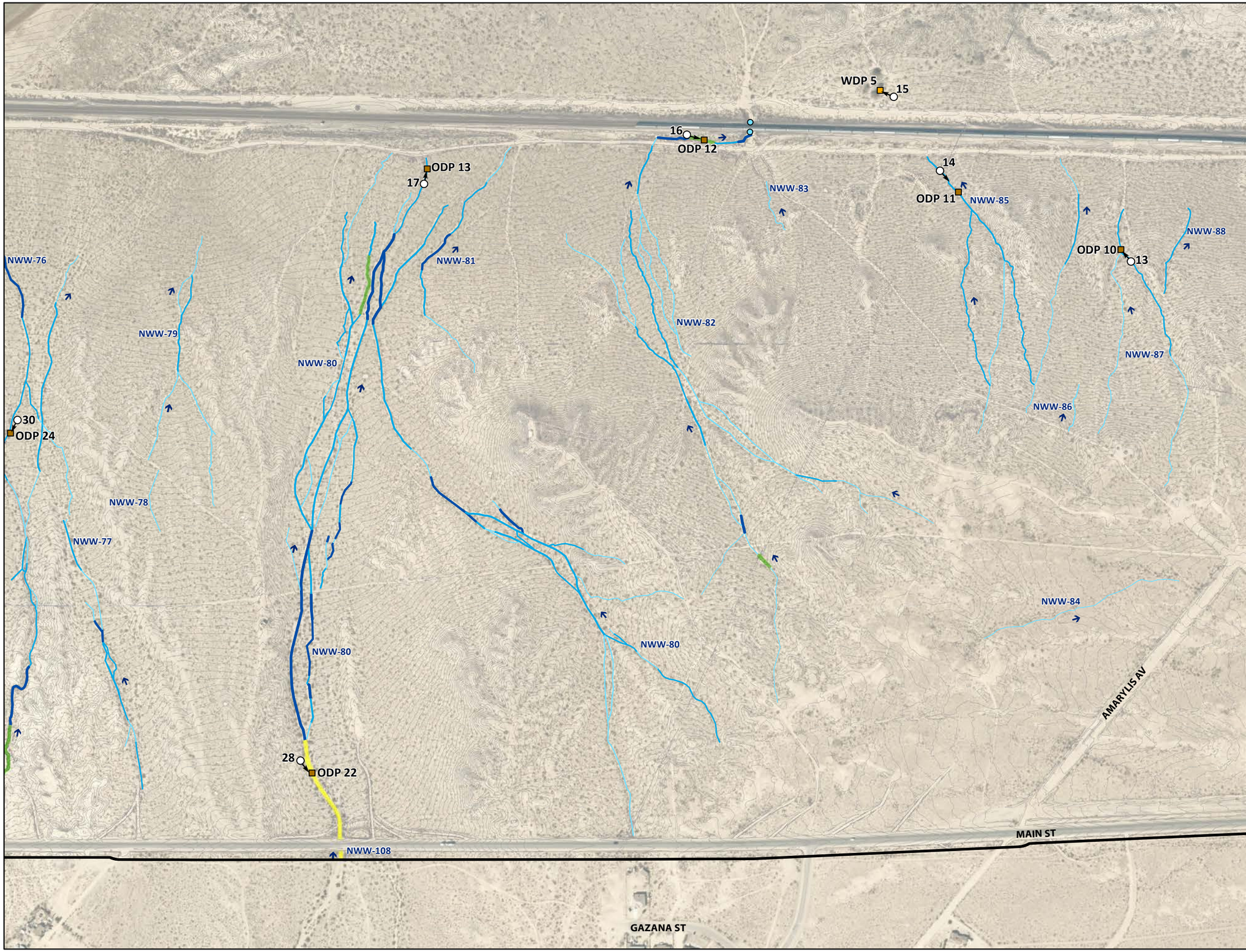
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 13 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

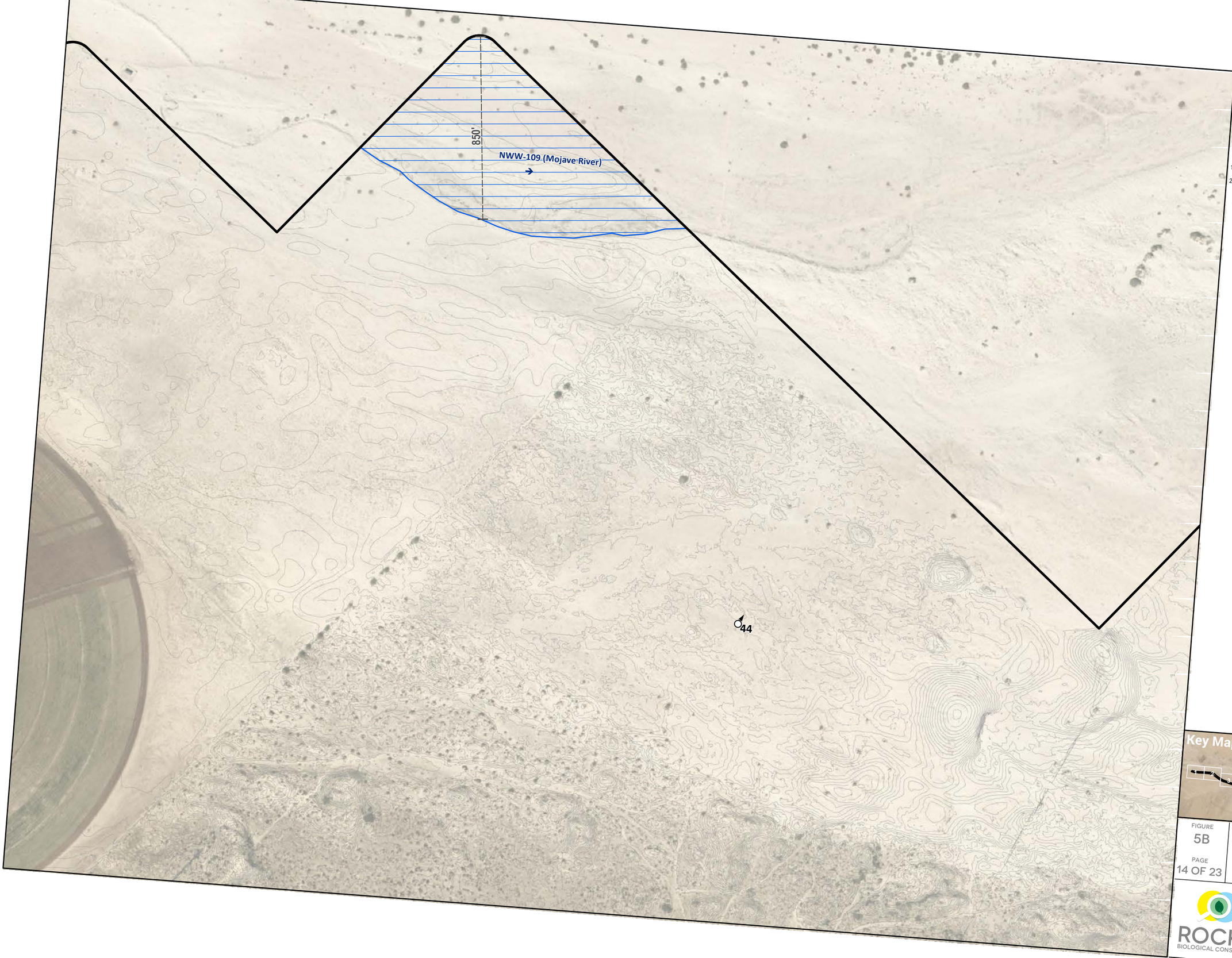
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

**RWQCB Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1]**

Mojave River Extent

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map



FIGURE 5B

PAGE 14 OF 23

**RWQCB Aquatic Resources**

BIG BARSTOW

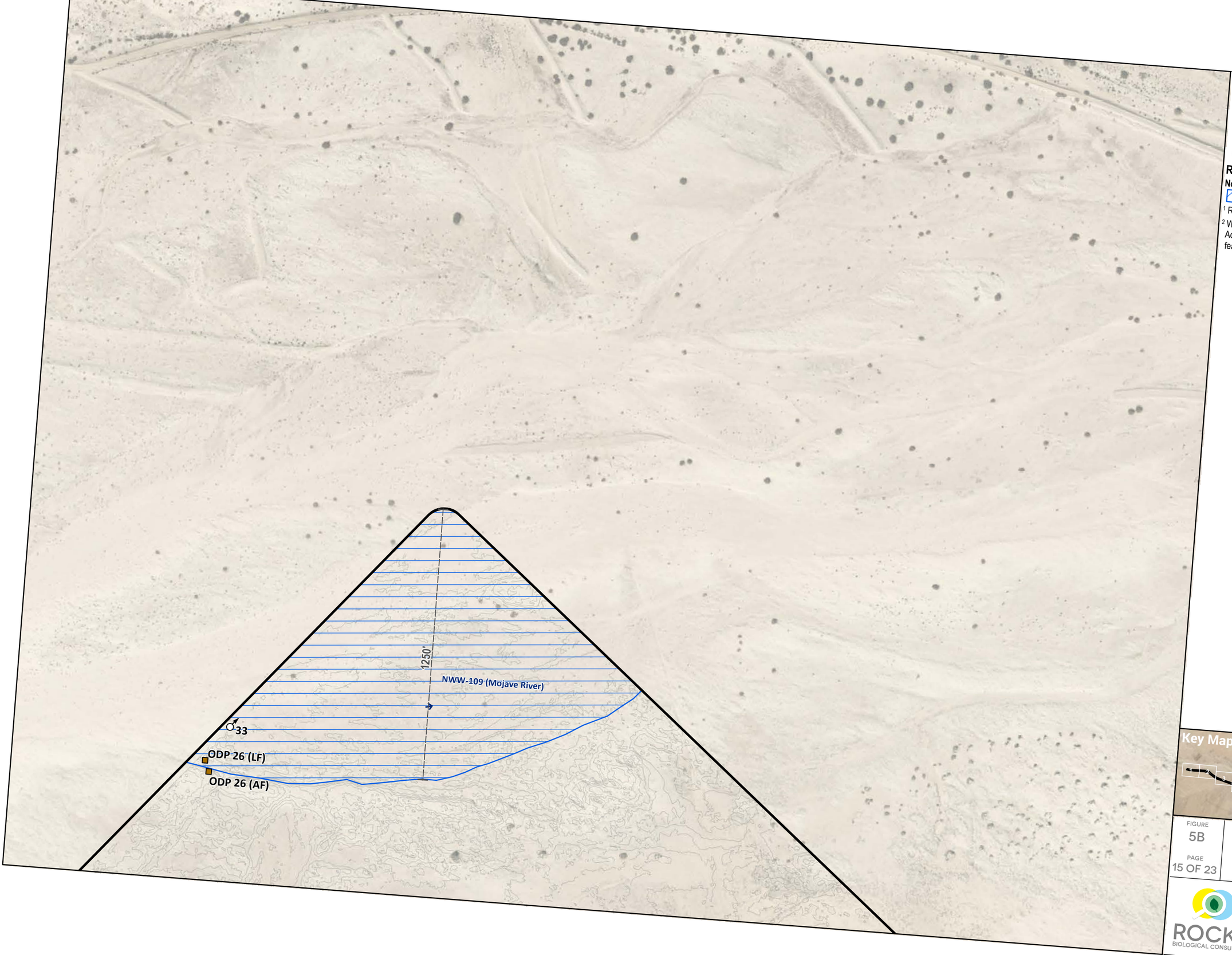
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022




ARDR Review Area (5104.5 ac)[1]

OHWM Datasheet Point (ODP)

AF = Active Floodplain

LF = Low-Flow Channel

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1]**

Mojave River Extent

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

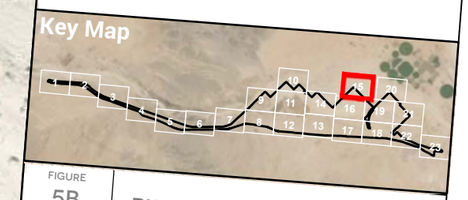


FIGURE 5B

PAGE 15 OF 23

RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022




ARDR Review Area (5104.5 ac)[1]

Photo Location

[1] Represents total acreage for ARDR review area.

Key Map

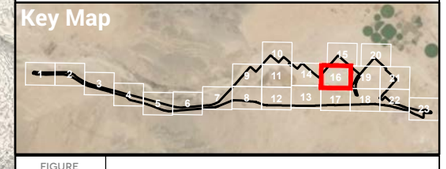


FIGURE
5B

PAGE
16 OF 23

**RWQCB Aquatic Resources**

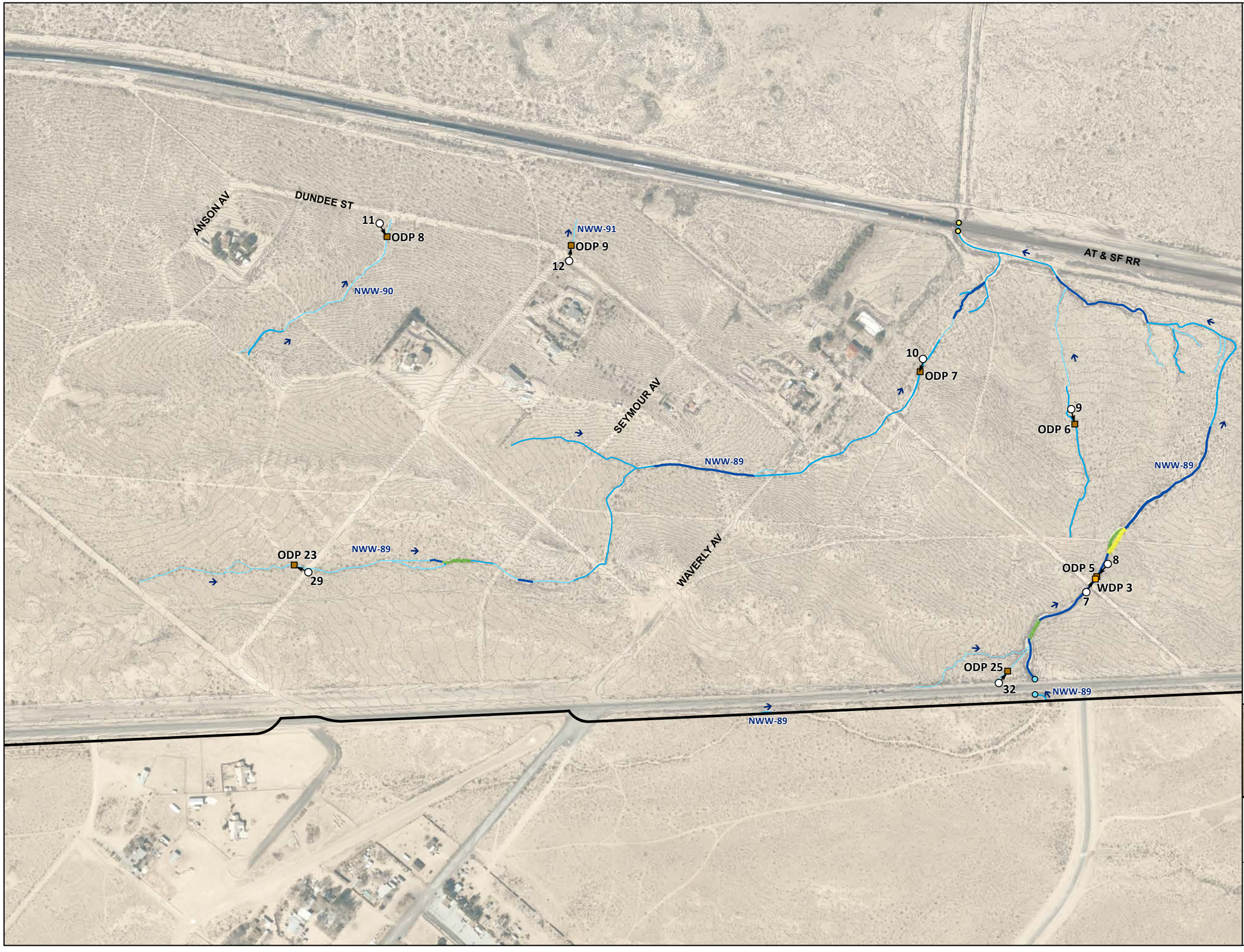
BIG BARSTOW

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 17 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location
Off-site Flow Path

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**
4'-6'
11'-15'
16'-21'
>30'

**Non-Wetland Waters - Rip-rap (0.06 ac)[1] (widths[2])**
3'
20'

**Non-Wetland Waters - Concrete (0.02 ac)[1] (widths[2])**
6'

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

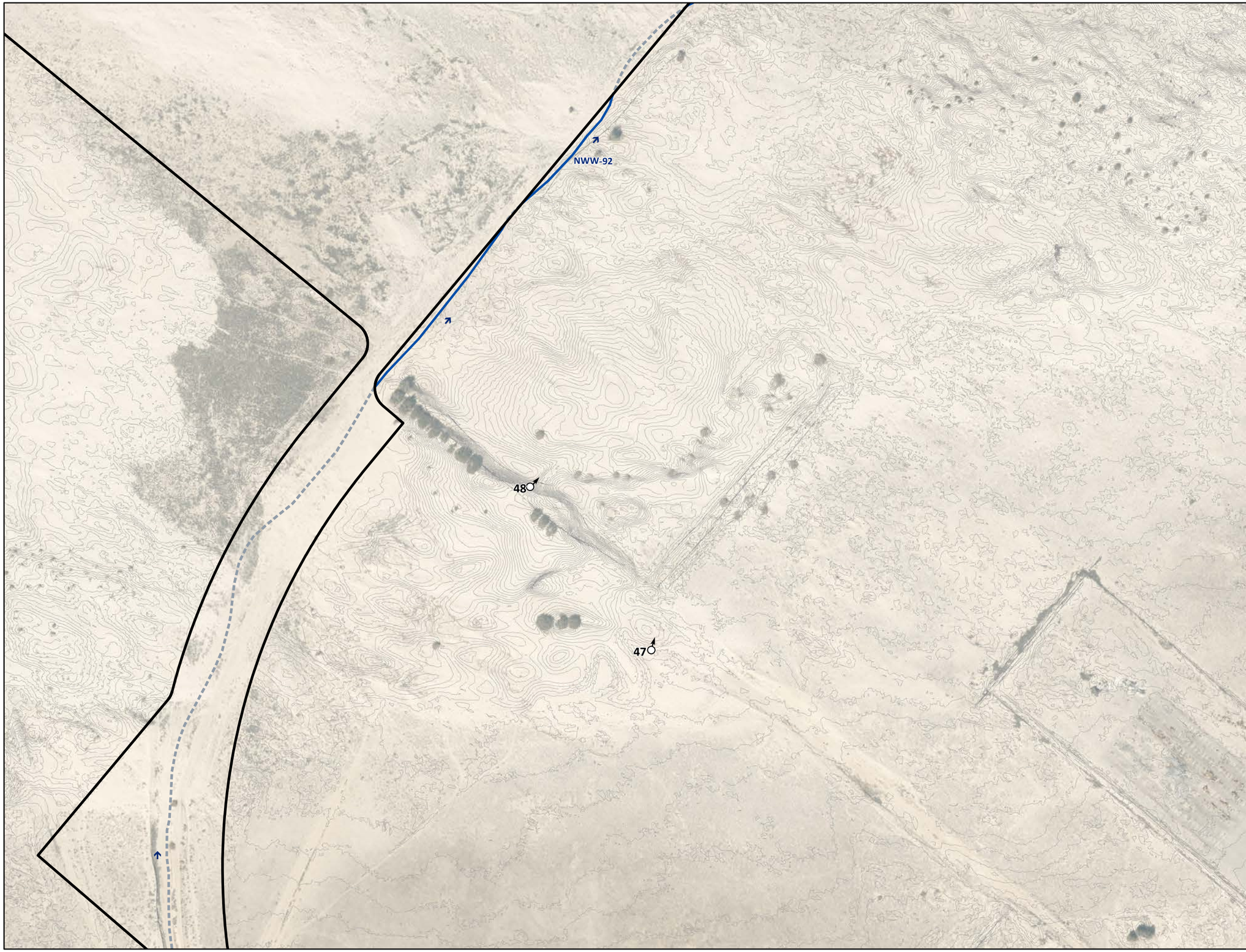
FIGURE 5B
PAGE 18 OF 23

RWQCB Aquatic Resources
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

Off-site Flow Path

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map



FIGURE 5B

PAGE 19 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

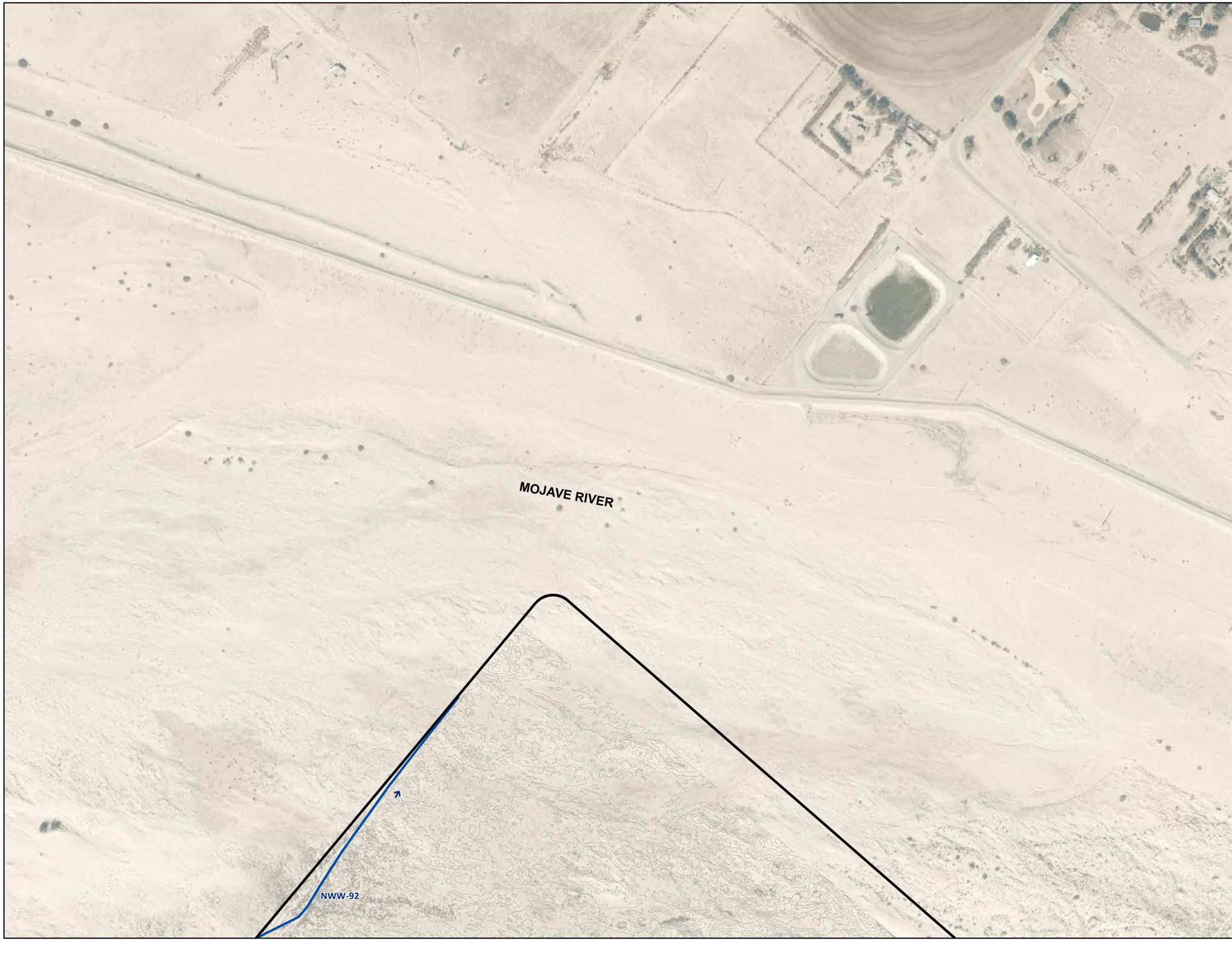
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

**RWQCB Aquatic Resources**

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

7'-10'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

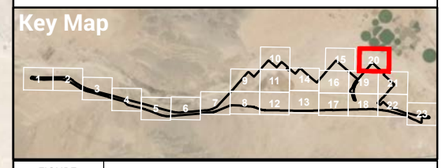


FIGURE 5B

PAGE 20 OF 23

**RWQCB Aquatic Resources**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

[1] Represents total acreage for ARDR review area.

Key Map

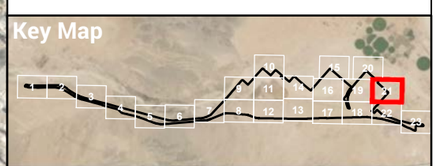


FIGURE
5B

PAGE
21 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 9/22/2022
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Wetland Data Form Point (WDP)

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

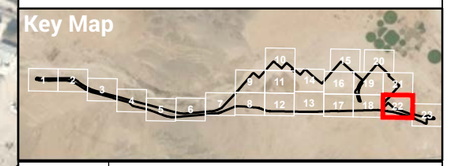


FIGURE 5B

PAGE 22 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

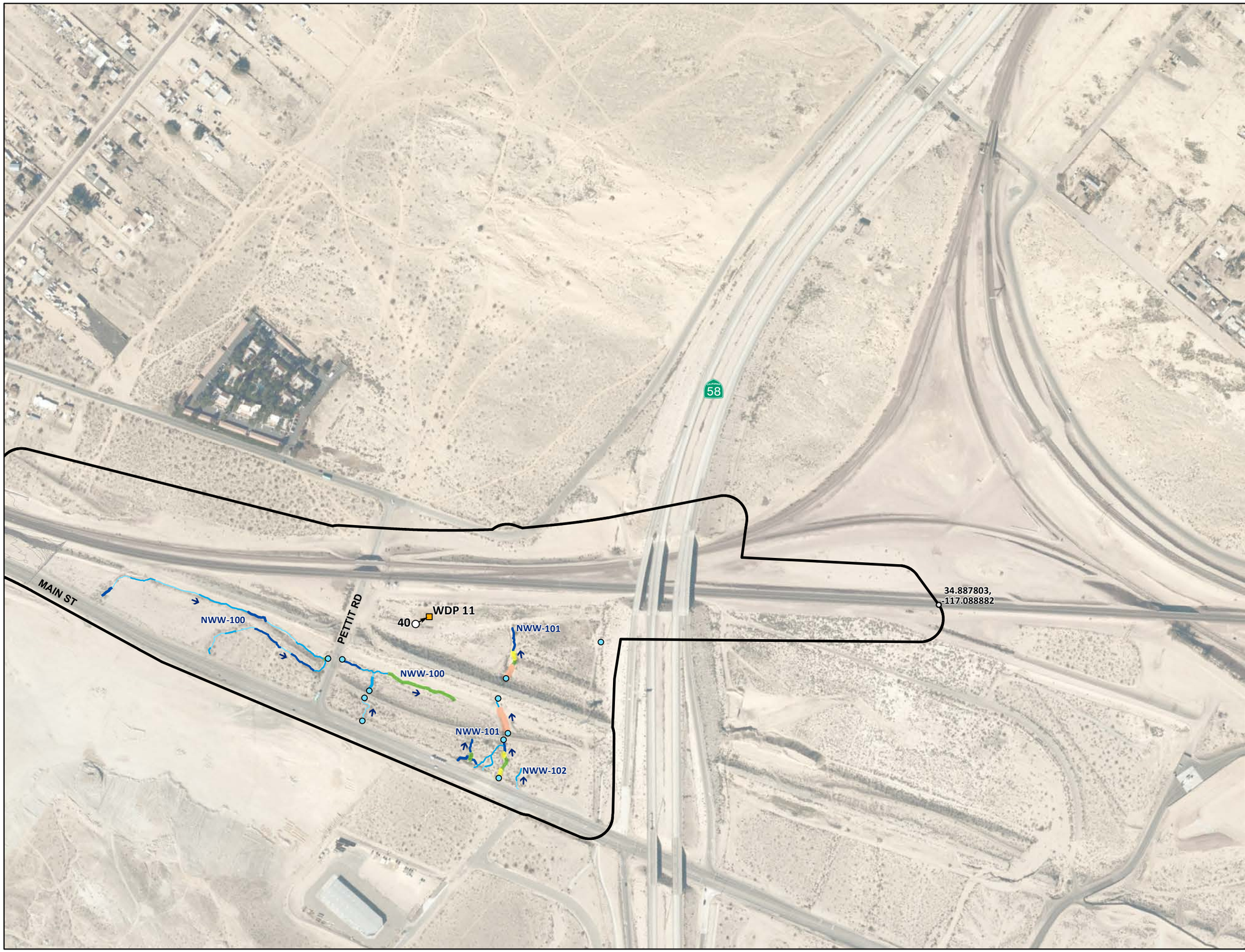
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Wetland Data Form Point (WDP)

Flow Direction

Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (125.50 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

16'-21'

24'-30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 23 OF 23

# RWQCB Aquatic Resources

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

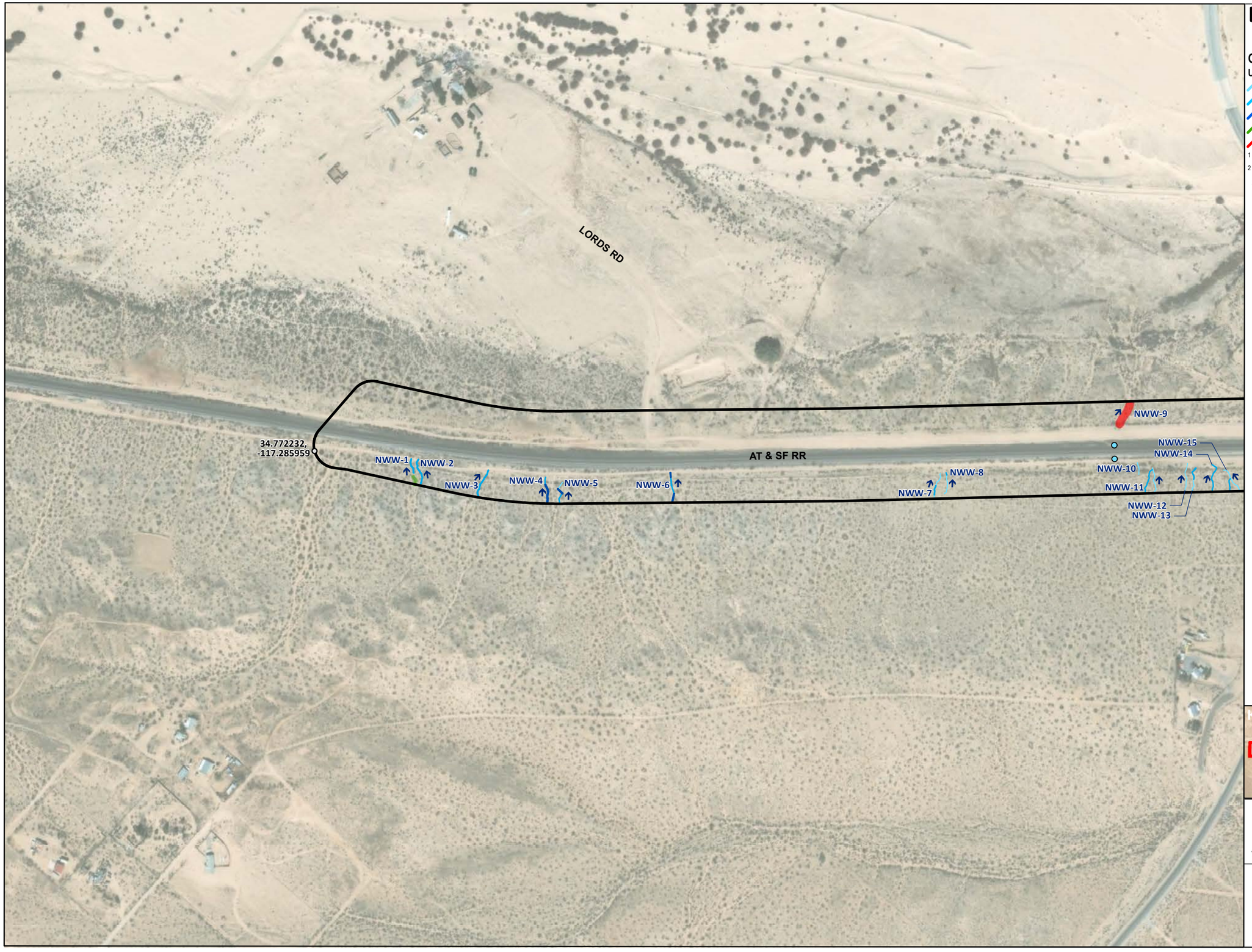
0 400 FEET

1 INCH = 400 FEET

N

Date: 9/22/2022

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Culvert

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

>30'

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

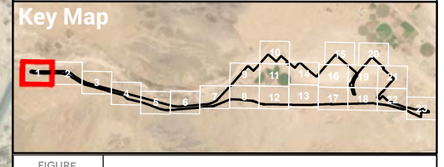


FIGURE 5C

PAGE 1 OF 23

CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

16'-21'
22'-30'

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

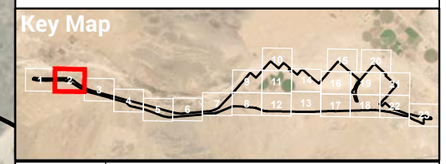


FIGURE 5C

PAGE 2 OF 23

**CDFW Streambed and Watercourse**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
1'-3'
4'-6'
>30'

**Watercourse (55.18 ac)[1]**
Watercourse

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

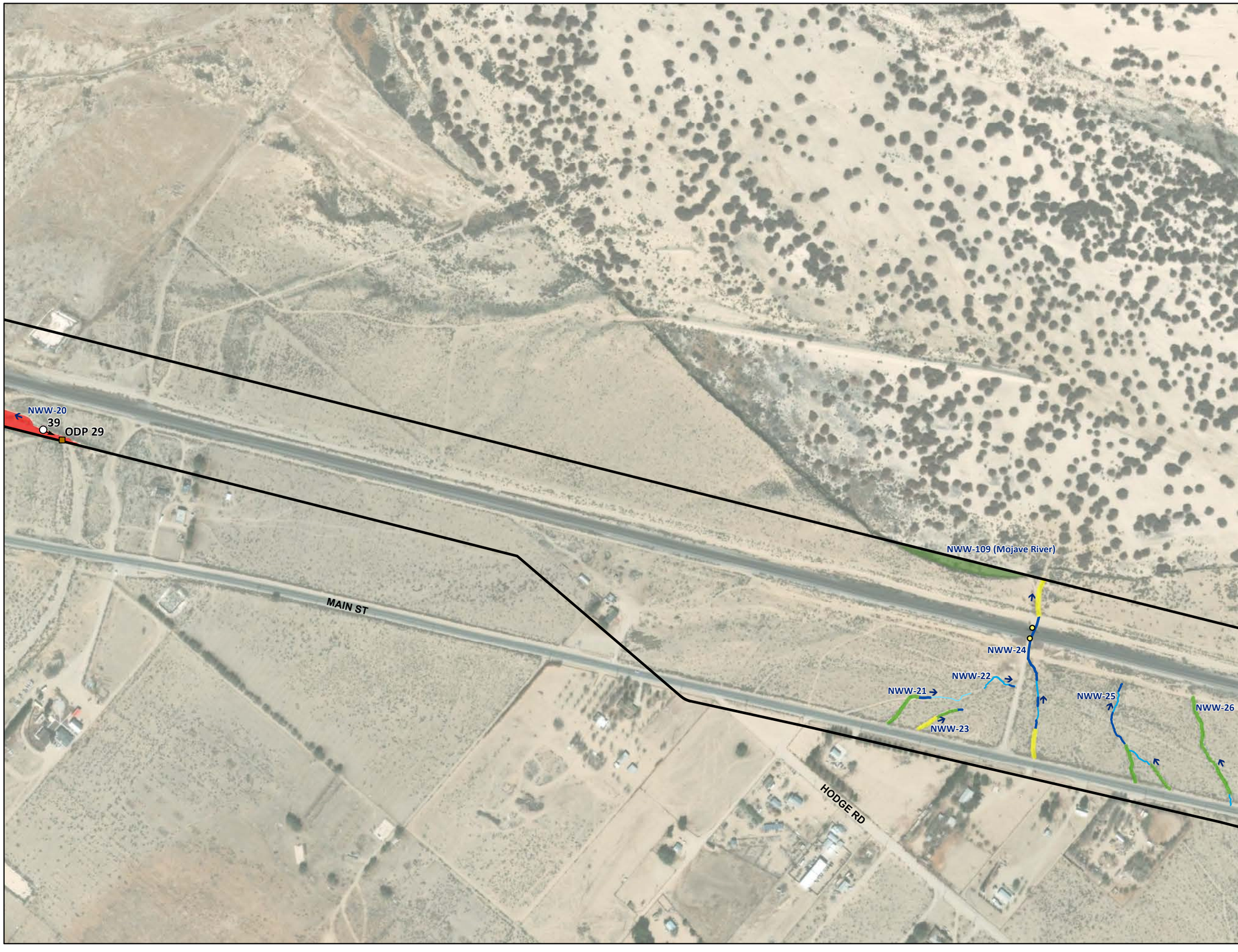
FIGURE 5C
PAGE 3 OF 23

CDFW
Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
>30'

**Mojave River Extent (590.34 ac)[1]**
Vegetated Streambed

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 4 OF 23

# CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Railroad Crossing
Wetland Data Form Point (WDP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (55.18 ac)[1]**
Watercourse

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 5 OF 23

# CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

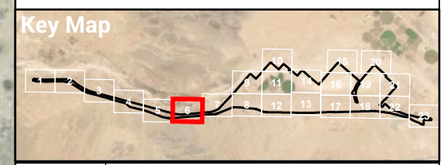


FIGURE 5C
PAGE 6 OF 23

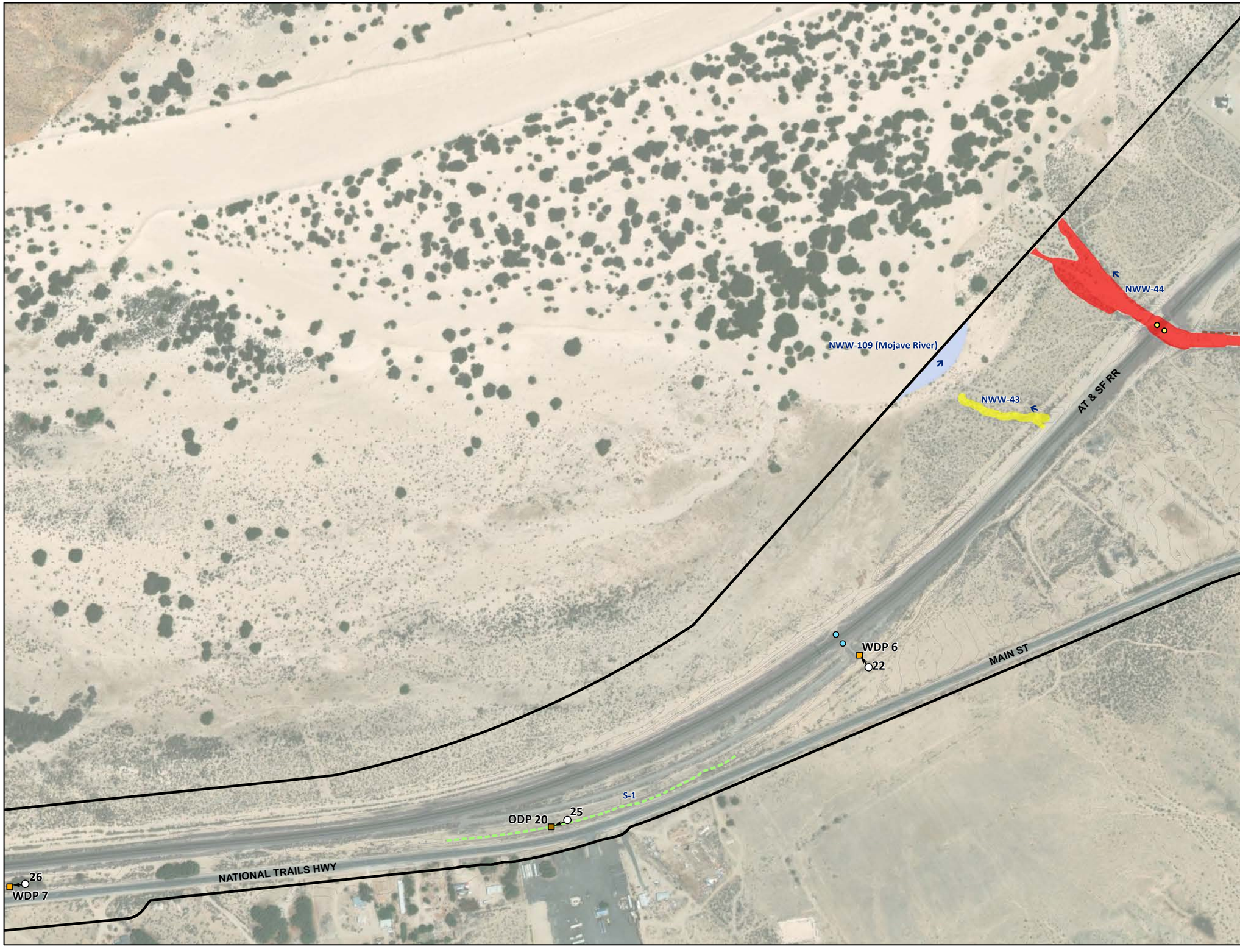
# CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Berm - Earthen Lined
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

16'-21'

>30'

**Mojave River Extent (590.34 ac)[1]**

Unvegetated Streambed

## Other Features[3]

Swale

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.

Key Map

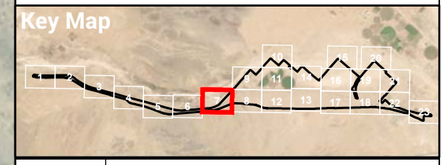


FIGURE 5C

PAGE 7 OF 23

# CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

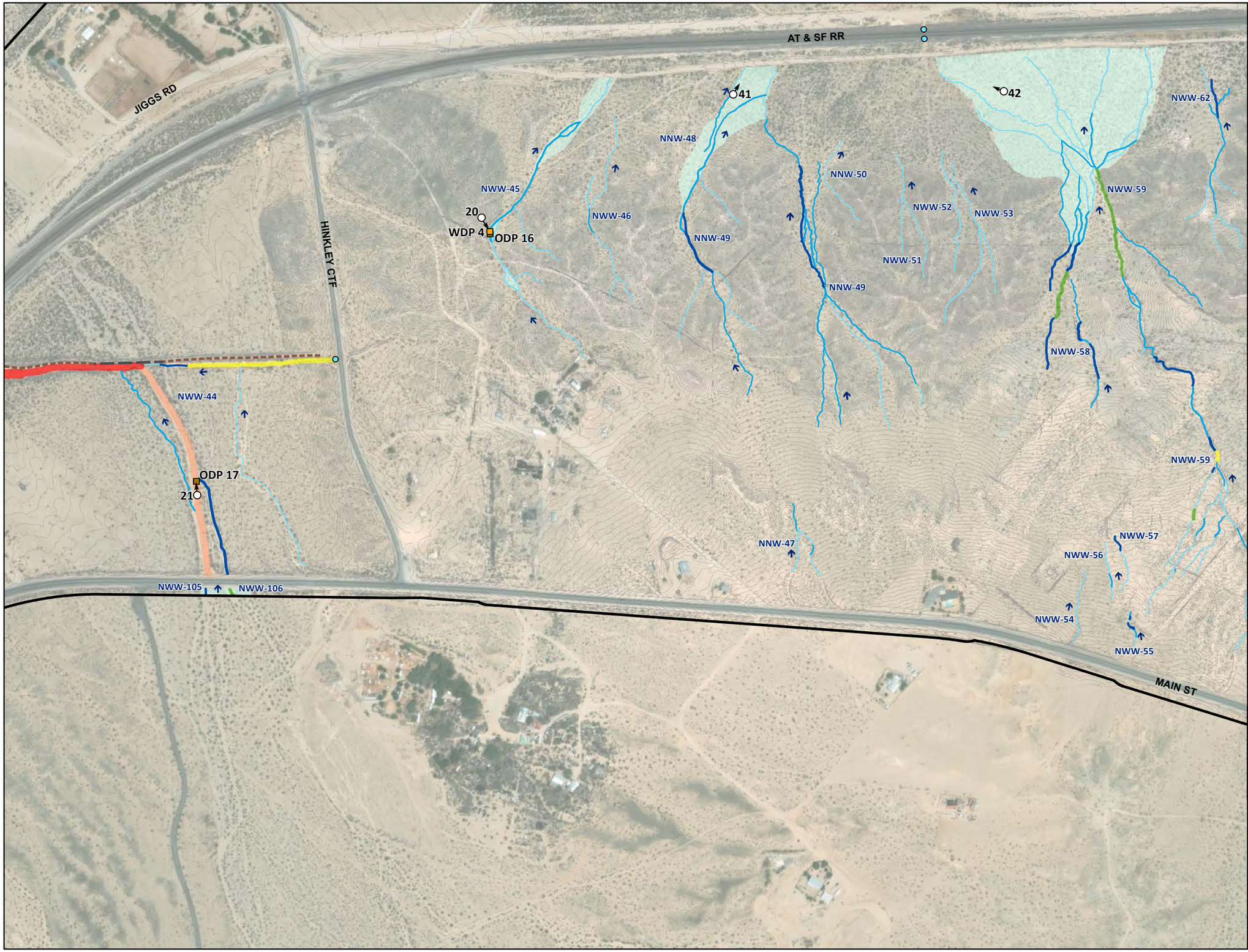
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Berm - Concrete Slab
Berm - Earthen Lined
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

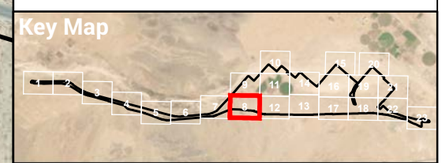


FIGURE 5C

PAGE 8 OF 23

**CDFW Streambed and Watercourse**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Vegetated Streambed (0.28 ac)[1] (widths[2])**
4'-6'
11'-15'
>30'

**Mojave River Extent (590.34 ac)[1]**
Vegetated Streambed
Unvegetated Streambed

**Other Features[3]**
Basin

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.
[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.

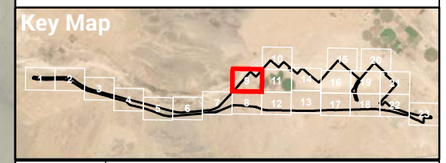


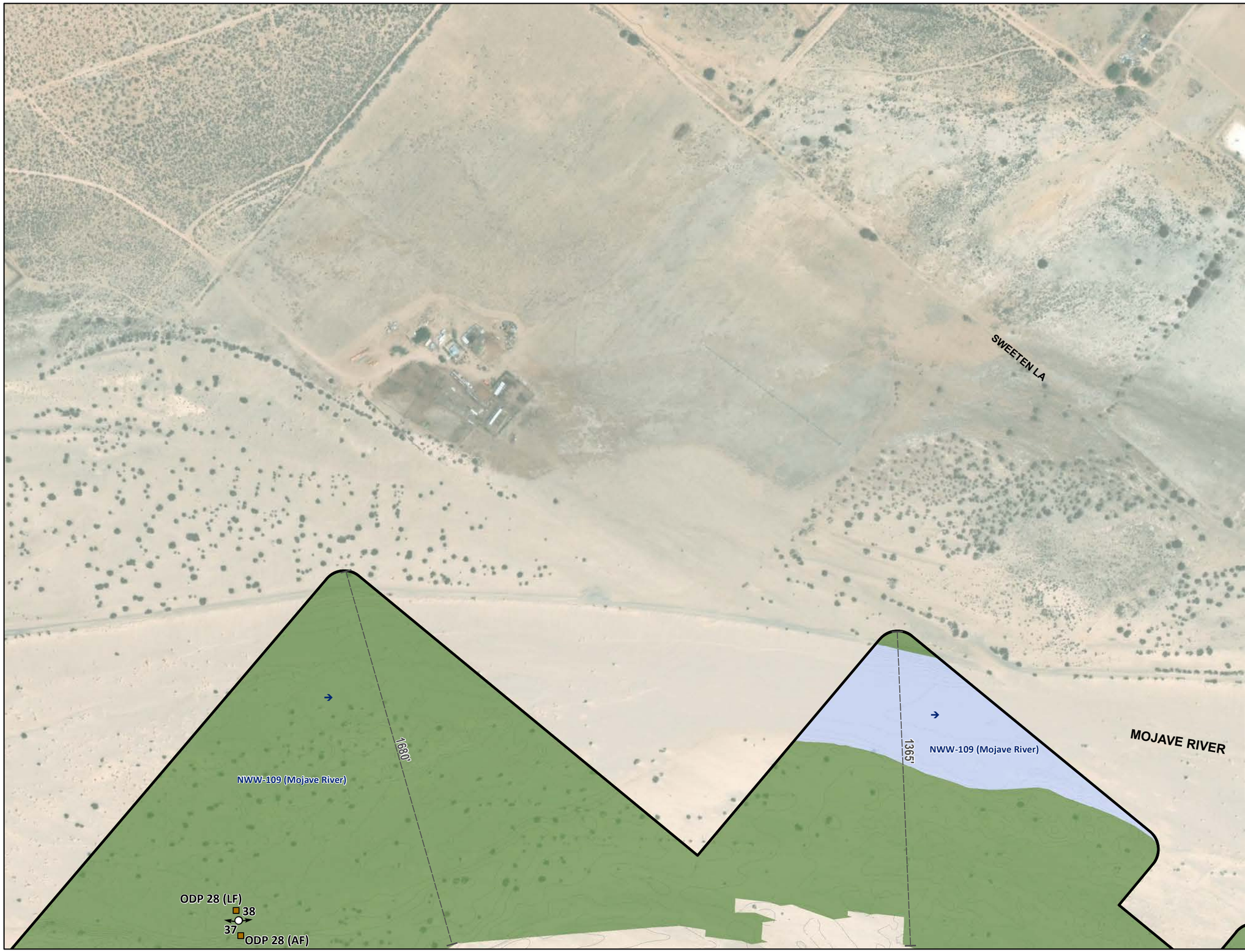

FIGURE 5C
PAGE 9 OF 23

CDFW Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
OHWM Datasheet Point (ODP)
AF = Active Floodplain
LF = Low-Flow Channel
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Mojave River Extent (590.34 ac)[1]**

Vegetated Streambed
Unvegetated Streambed

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

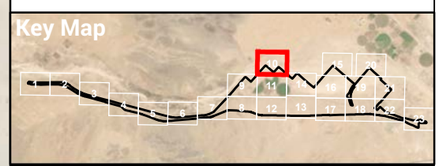


FIGURE 5C
PAGE 10 OF 23

CDFW Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

**CDFW Streambed and Watercourse**

**Mojave River Extent (590.34 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for ARDR review area.




FIGURE 5C

PAGE 11 OF 23

**CDFW Streambed and Watercourse**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

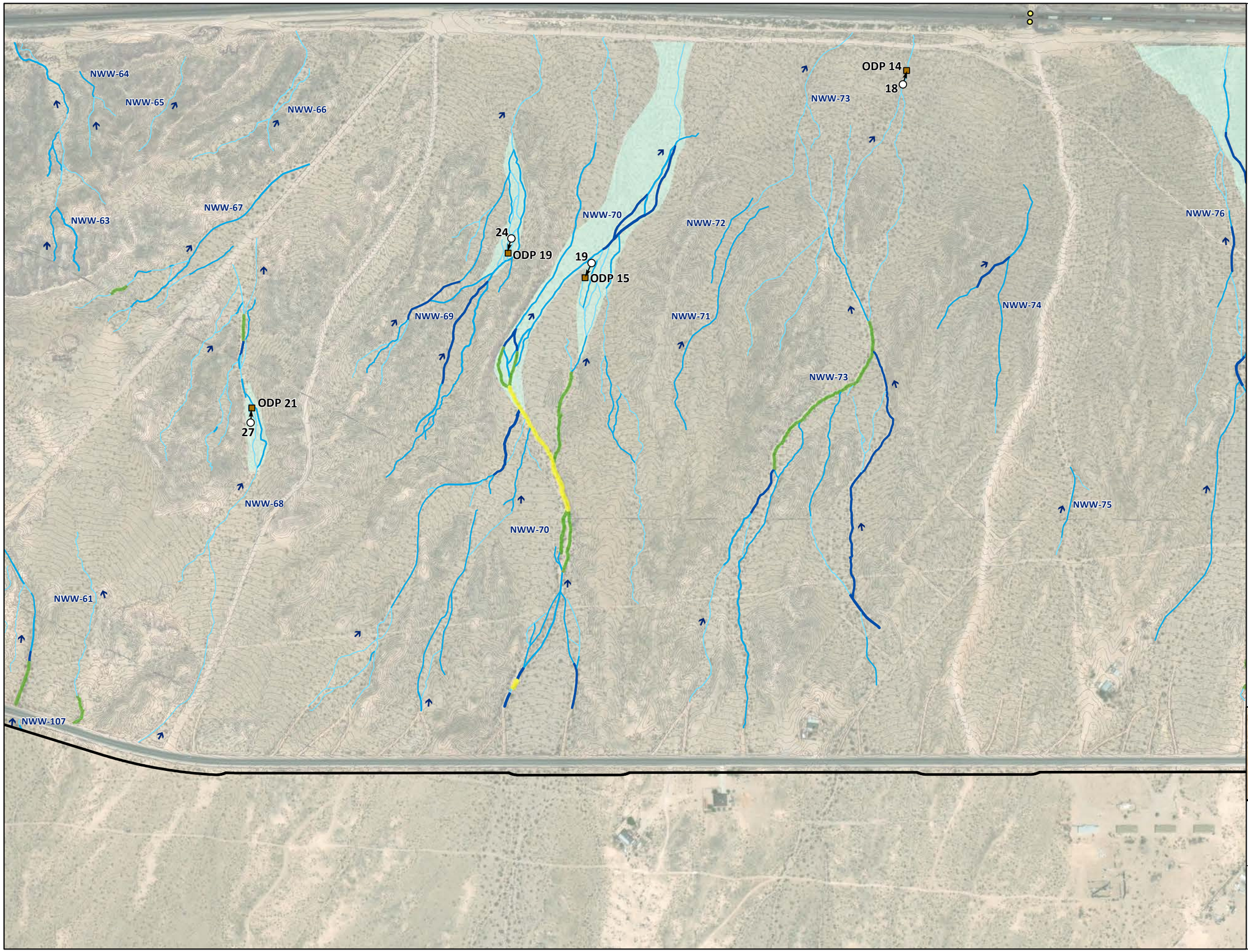
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

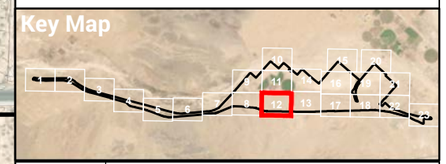


FIGURE 5C

PAGE 12 OF 23

CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri

WDP 5
15
16
ODP 12
ODP 13
17
14
ODP 11
NWW-83
NWW-85
NWW-88
ODP 10
13
NWW-76
NWW-81
NWW-82
NWW-79
NWW-80
NWW-87
NWW-86
30
ODP 24
NWW-78
NWW-77
NWW-80
NWW-84
NWW-80
AMARYLIS AV
28
ODP 22
NWW-108
MAIN ST
GAZANA ST

ARDR Review Area (5104.5 ac)[1]
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Watercourse (55.18 ac)[1]**
Watercourse

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

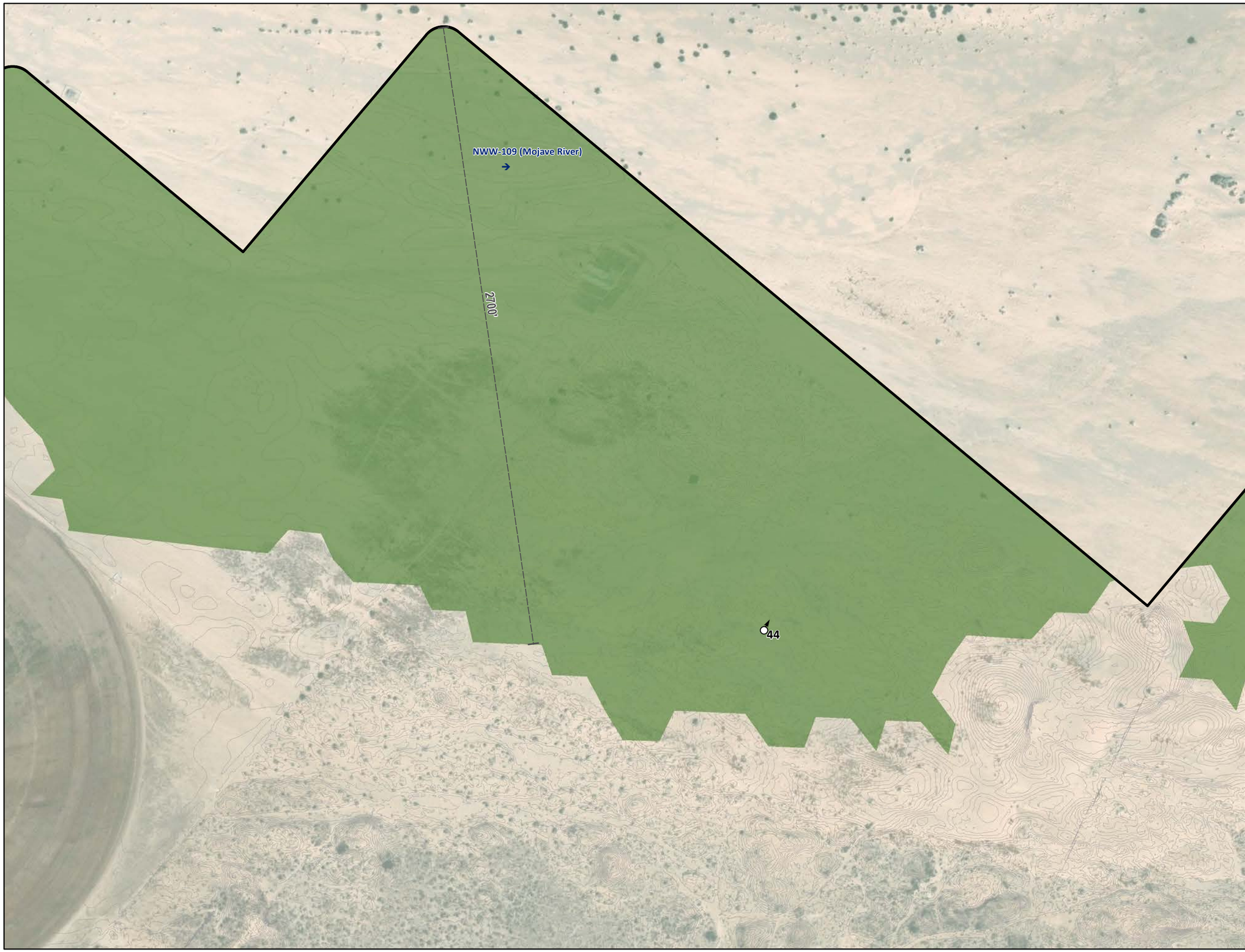
FIGURE 5C
PAGE 13 OF 23

CDFW Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

**CDFW Streambed and Watercourse**

**Mojave River Extent (590.34 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

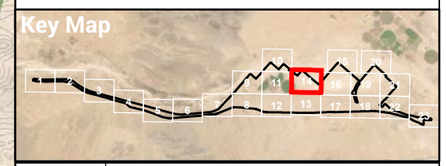


FIGURE 5C

PAGE 14 OF 23

# CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

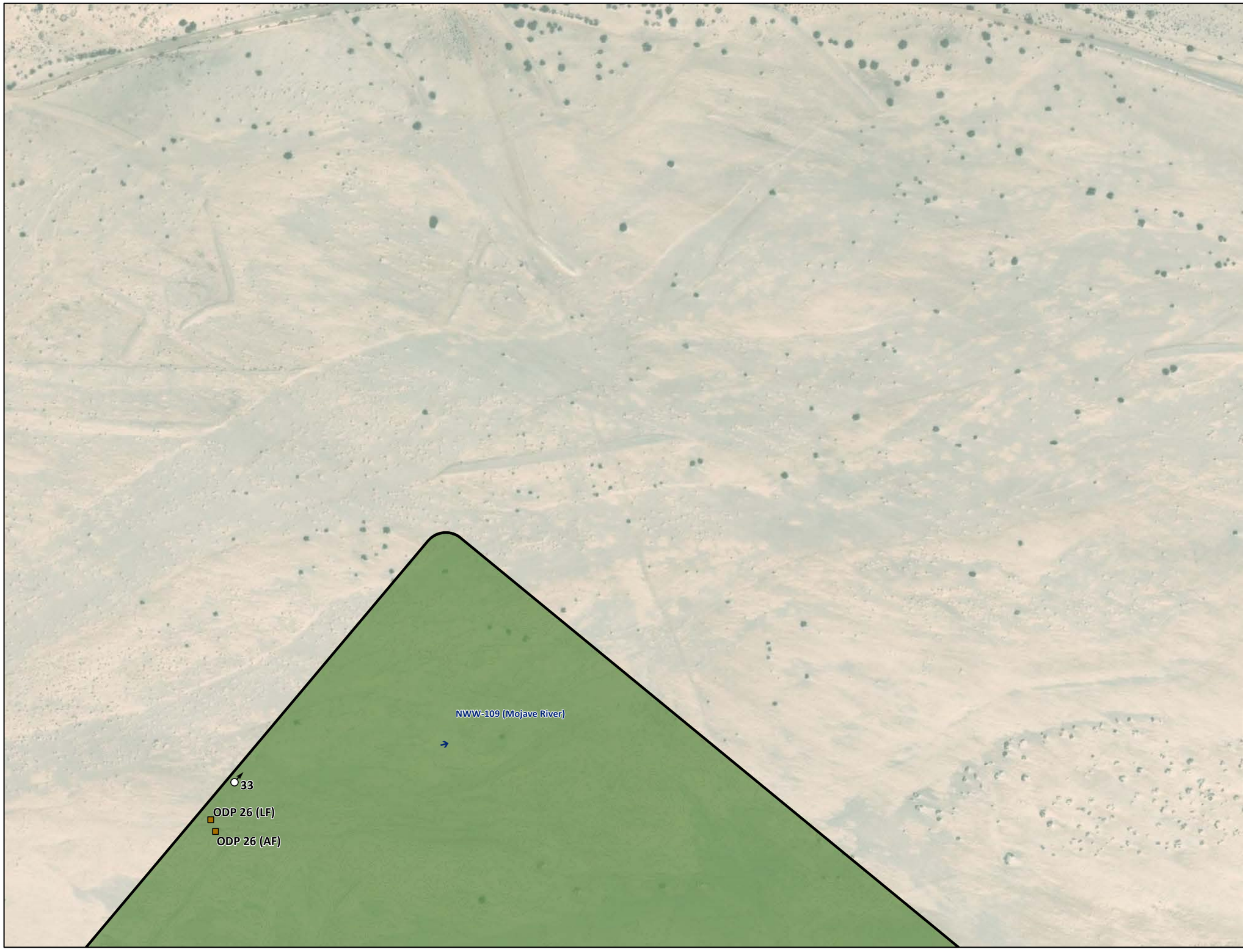
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

OHWM Datasheet Point (ODP)

AF = Active Floodplain

LF = Low-Flow Channel

Flow Direction

Photo Location

## CDFW Streambed and Watercourse

**Mojave River Extent (590.34 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

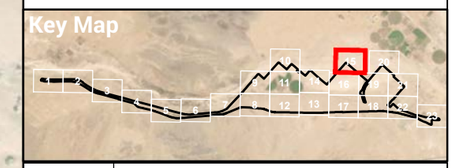


FIGURE 5C

PAGE 15 OF 23

CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

Photo Location

**CDFW Streambed and Watercourse**

**Mojave River Extent (590.34 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for ARDR review area.

Key Map

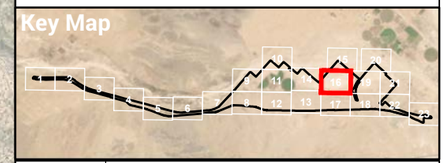


FIGURE 5C

PAGE 16 OF 23

**CDFW Streambed and Watercourse**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 17 OF 23

CDFW Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location
Off-site Flow Path

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
7'-10'
16'-21'
>30'

**Unvegetated Streambed - Rip-Rap (0.06 ac)[1] (widths[2])**
3'
20'

**Unvegetated Streambed - Concrete (0.04 ac)[1] (widths[2])**
10'

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 18 OF 23

CDFW Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Flow Direction
Photo Location
Off-site Flow Path

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
7'-10'

**Mojave River Extent (590.34 ac)[1]**
Vegetated Streambed

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 19 OF 23

CDFW
Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

7'-10'

**Mojave River Extent (590.34 ac)[1]**

Vegetated Streambed

[1] Represents total acreage for ARDR review area.

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

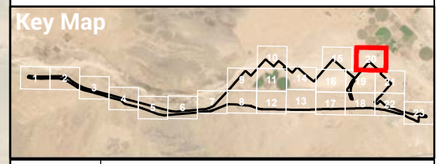


FIGURE 5C

PAGE 20 OF 23

CDFW Streambed and Watercourse

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]

[1] Represents total acreage for ARDR review area.

Key Map

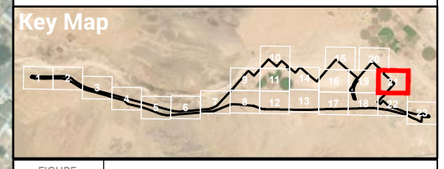


FIGURE
5C

PAGE
21 OF 23

**CDFW**
**Streambed and Watercourse**
BIG BARSTOW

ROCKS
BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Vegetated Streambed (0.28 ac)[1] (widths[2])**
4'-6'
7'-10'
11'-15'

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

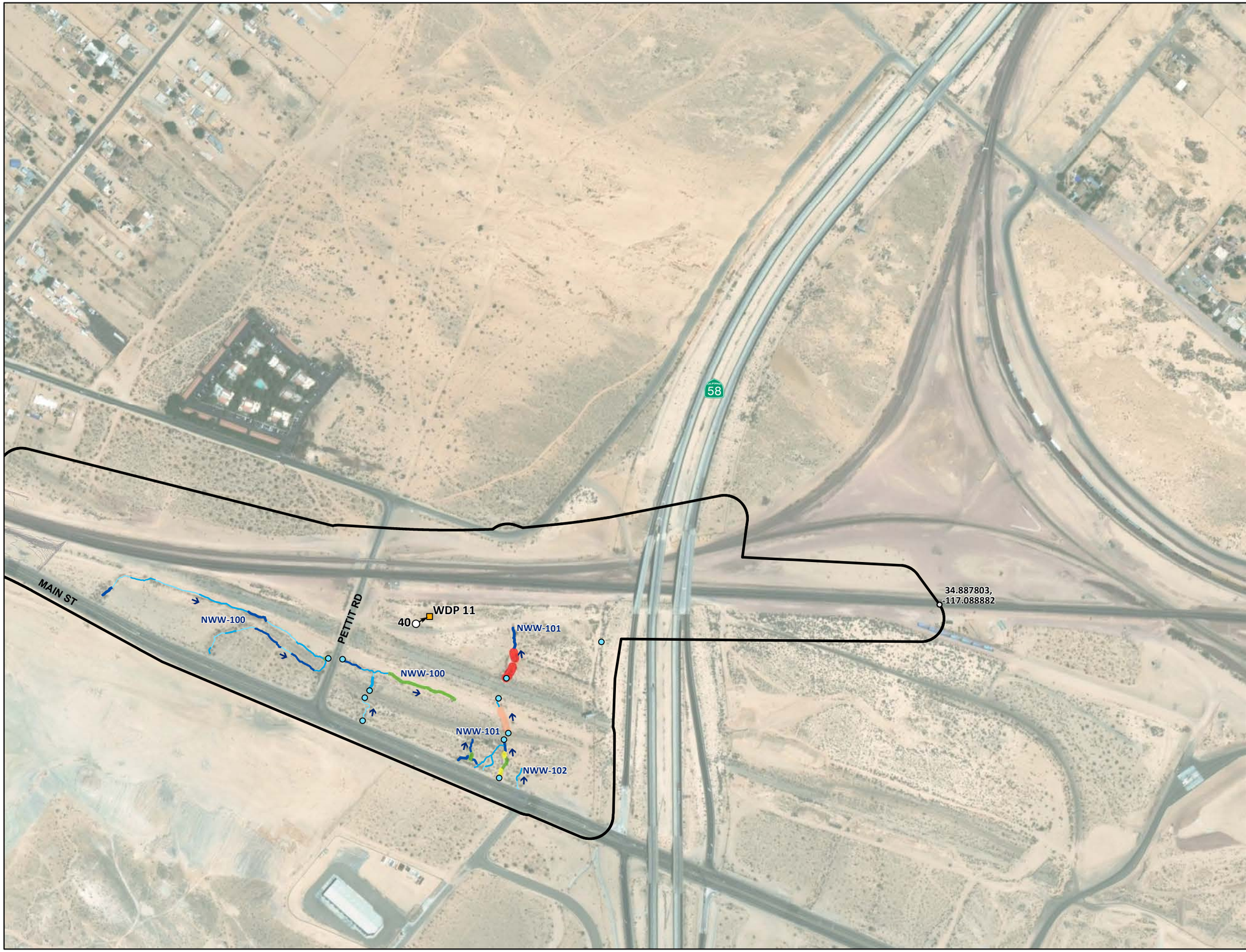
FIGURE 5C
PAGE 22 OF 23

CDFW Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 ac)[1]
Culvert
Wetland Data Form Point (WDP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (24.06 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

[1] Represents total acreage for ARDR review area.
[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 23 OF 23

CDFW
Streambed and Watercourse
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat

**Key Map**

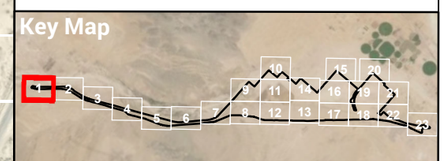



FIGURE 6

PAGE 1 OF 23

## Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat

Key Map

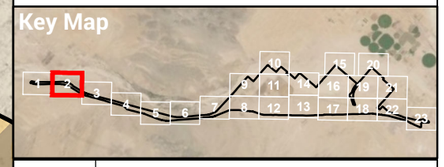


FIGURE 6

PAGE 2 OF 23

# Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat

**Key Map**

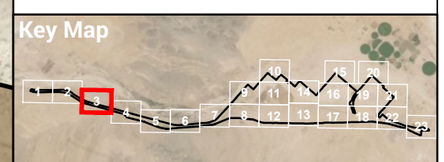


FIGURE 6

PAGE 3 OF 23

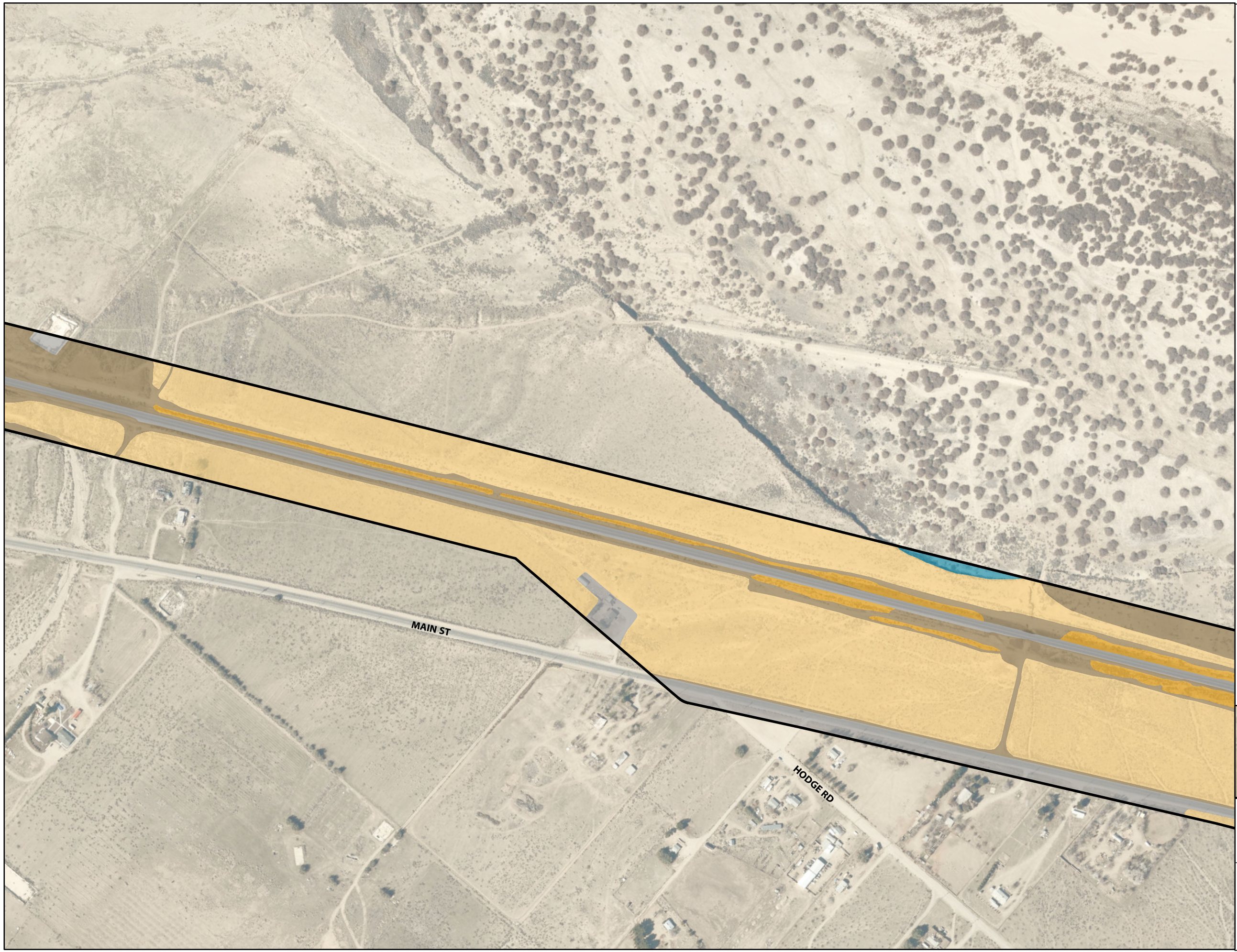
# Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

Key Map




FIGURE 6

PAGE 4 OF 23

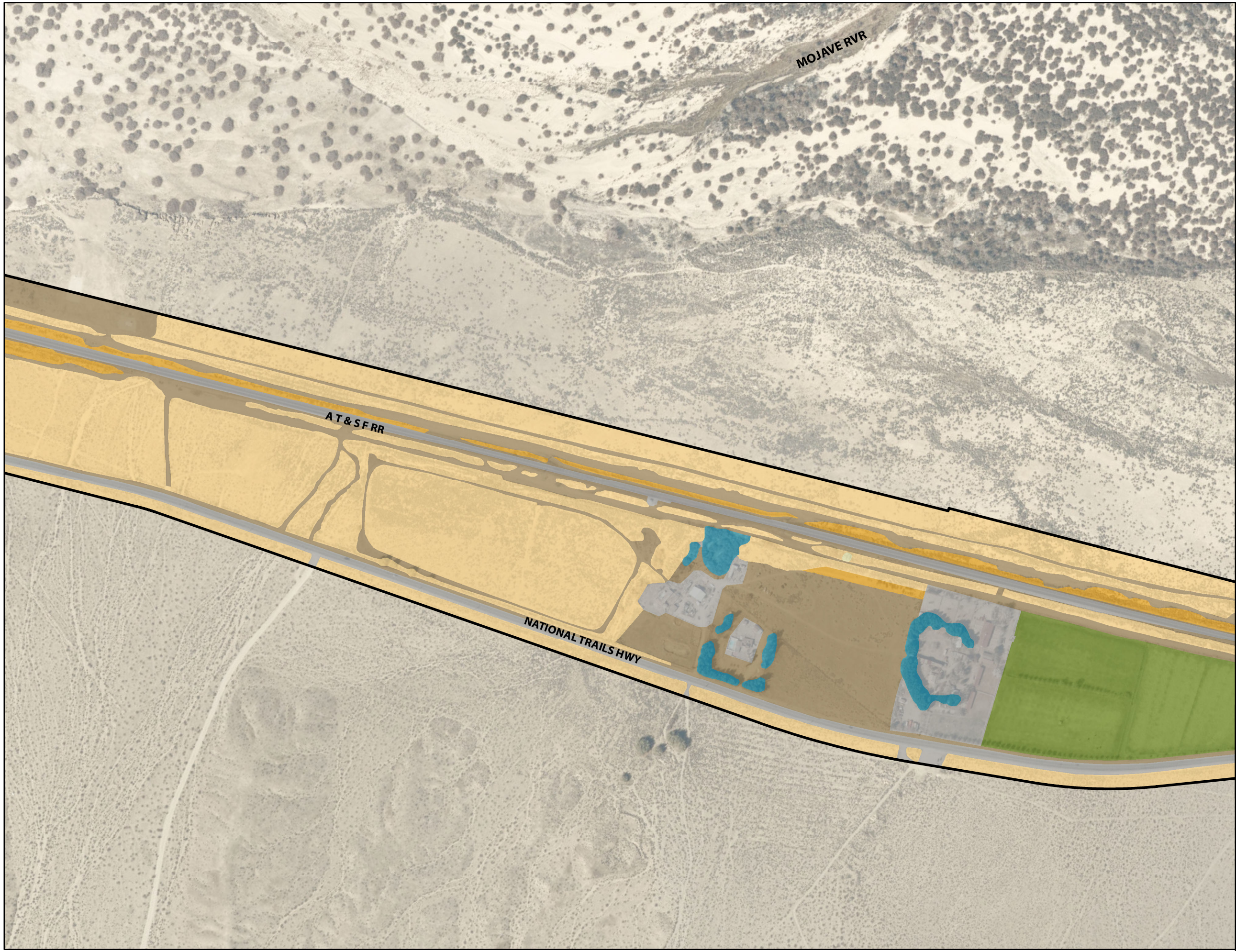
## Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Developed
- Disturbed Habitat
- Pasture
- Tamarisk Thickets

Key Map

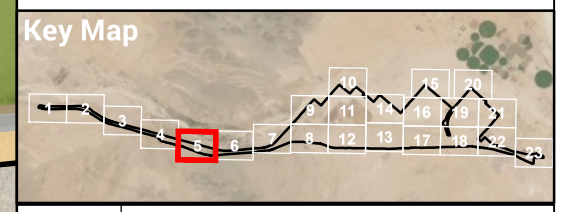


FIGURE 6

PAGE 5 OF 23

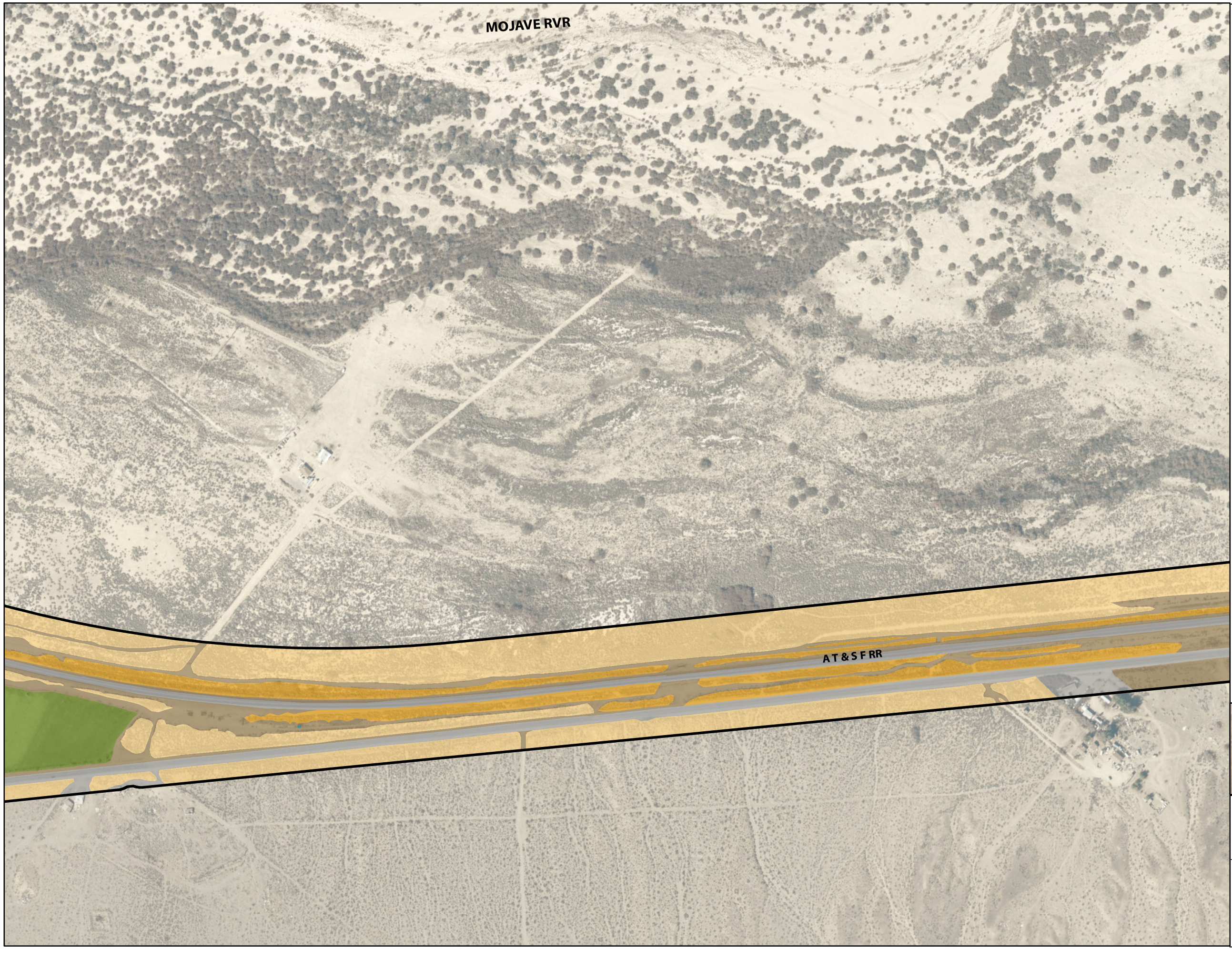
**Vegetation**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat
- Pasture
- Tamarisk Thickets

**Key Map**

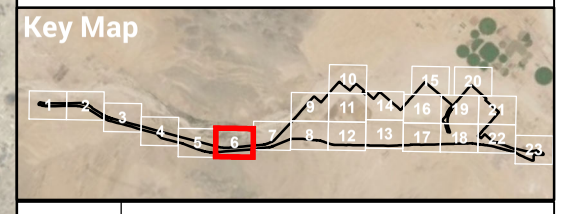



FIGURE 6

PAGE 6 OF 23

**Vegetation**

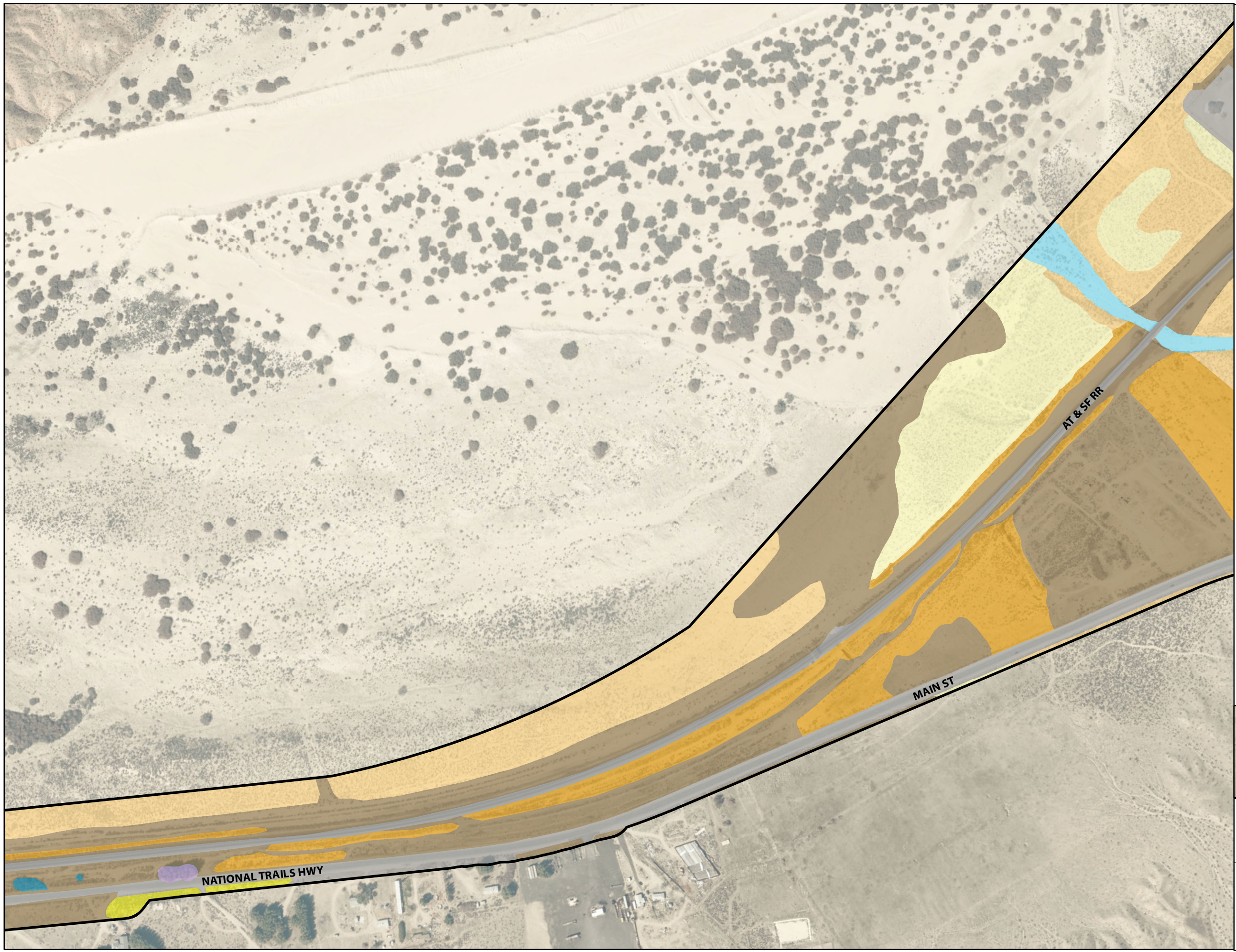
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Ornamental
- Tamarisk Thickets
- Unvegetated Channel

**Key Map**

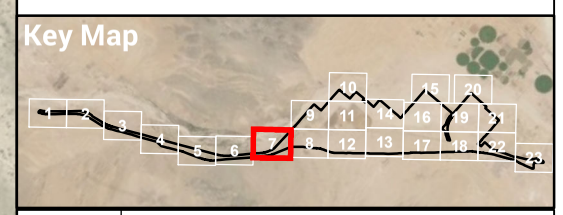



FIGURE 6

PAGE 7 OF 23

**Vegetation**

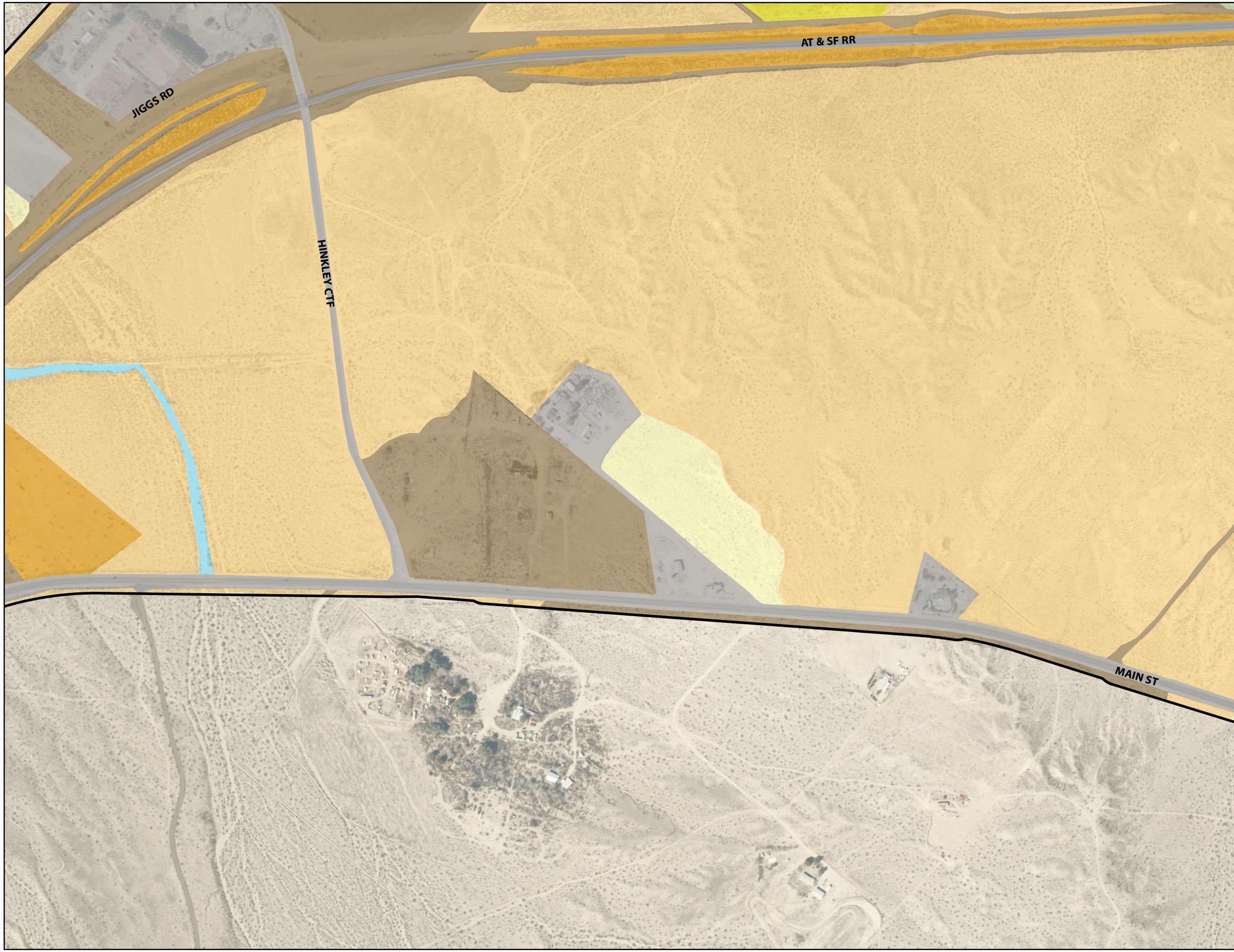
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Agriculture
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Unvegetated Channel

Key Map

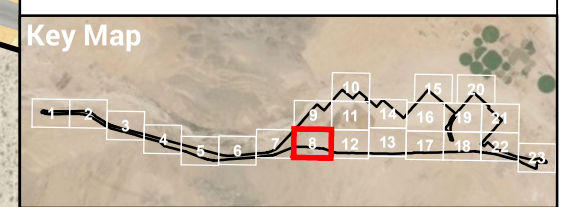


FIGURE 6

PAGE 8 OF 23

# Vegetation

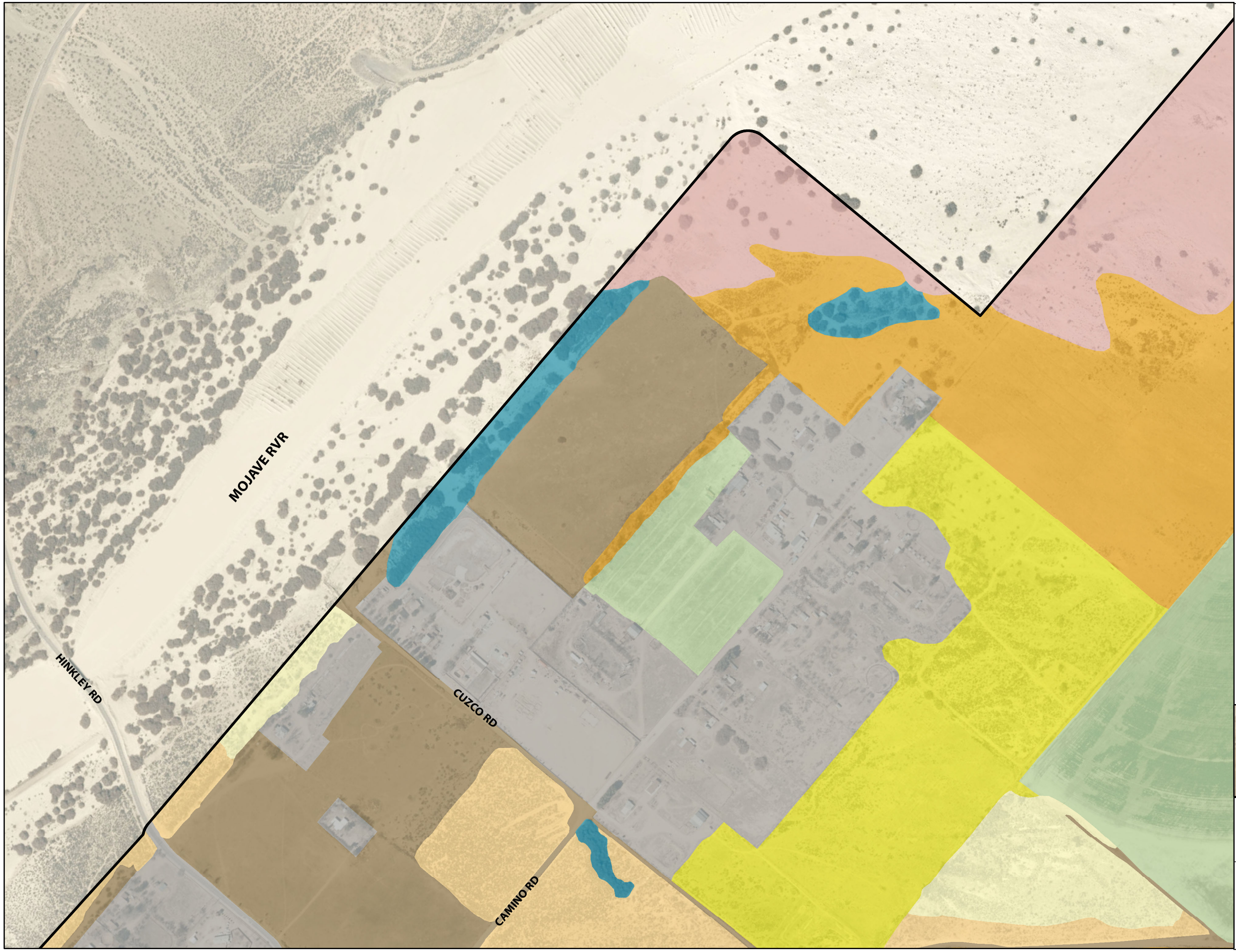
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Agriculture
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

Key Map

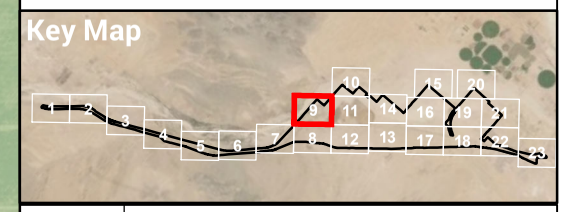


FIGURE 6

PAGE 9 OF 23

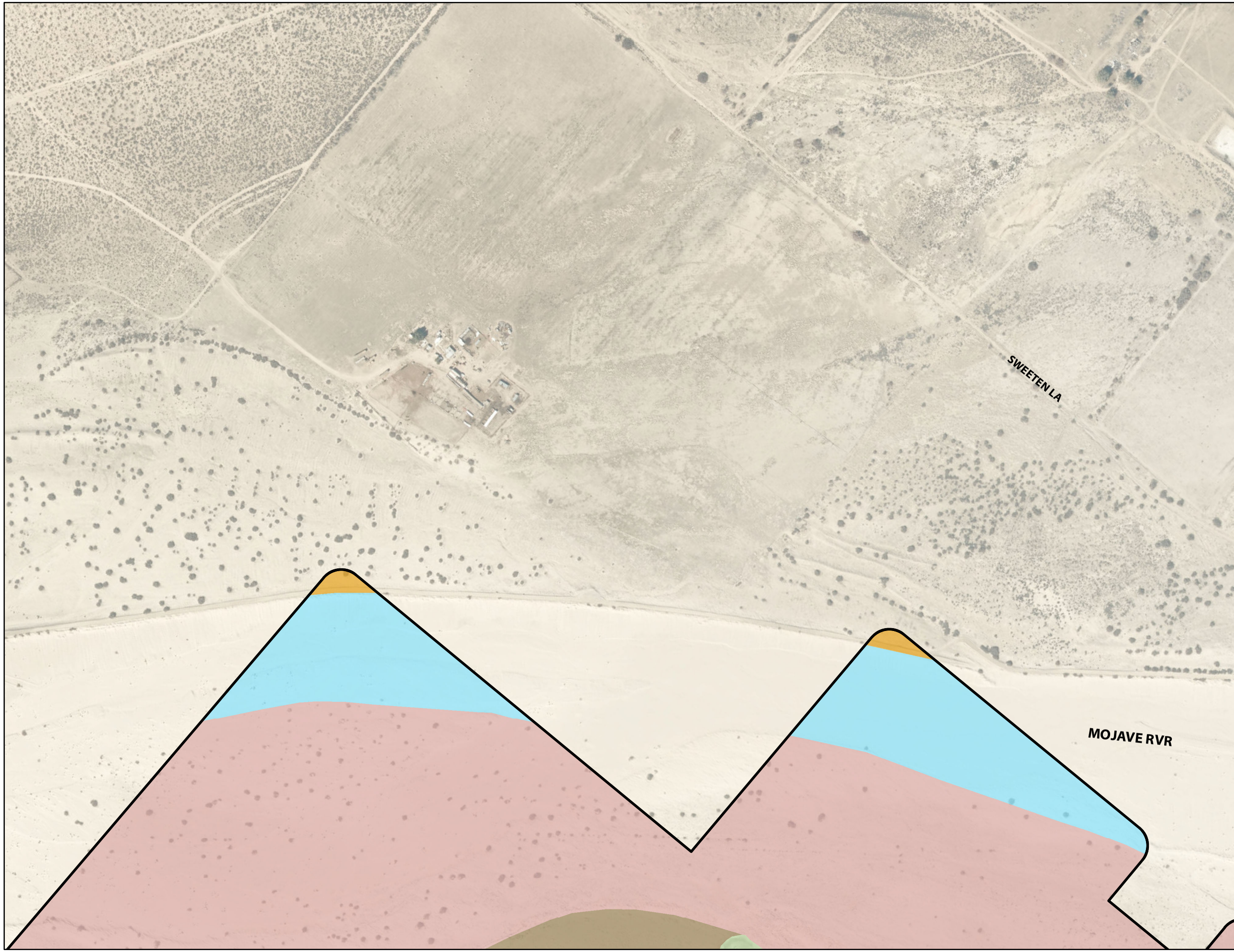
# Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Agriculture
- Allscale Scrub - Disturbed
- Disturbed Habitat
- Unvegetated Channel

Key Map

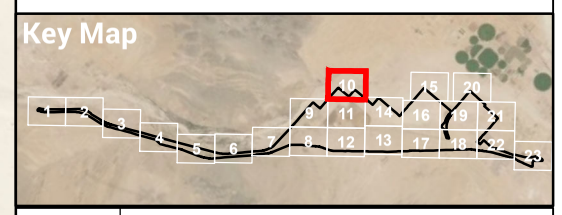



FIGURE 6

PAGE 10 OF 23

Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri

ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Agriculture
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

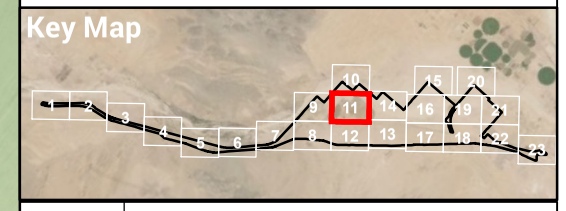



FIGURE 6

PAGE 11 OF 23

# Vegetation

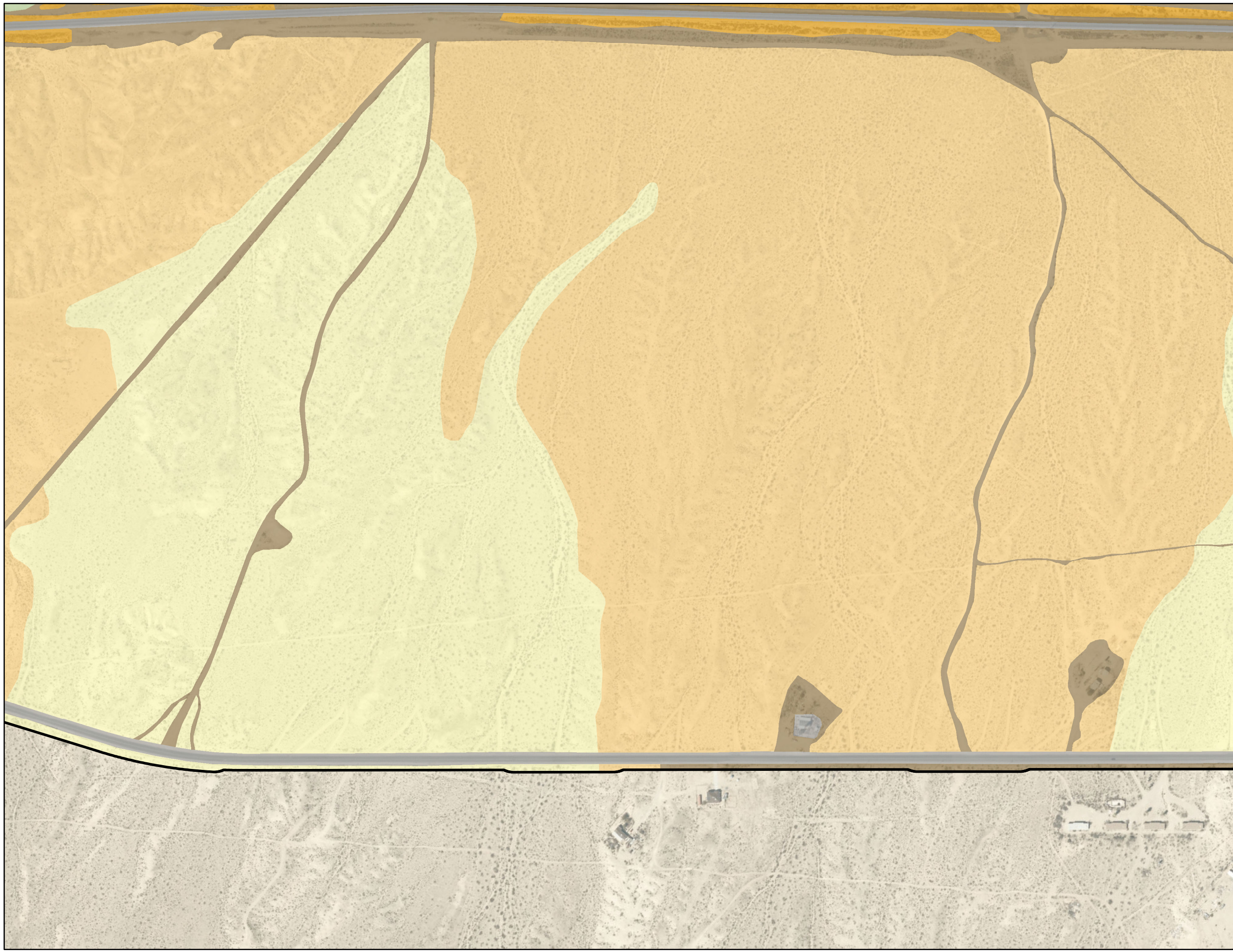
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri



ARDR Review Area (5104.5 Ac)

**Vegetation**

- Agriculture
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Developed
- Disturbed Habitat

Key Map

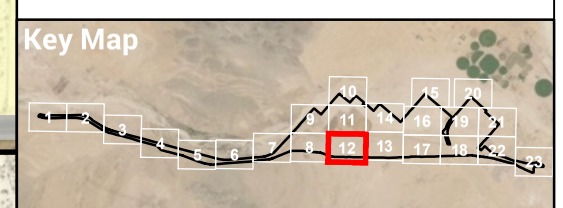



FIGURE 6

PAGE 12 OF 23

**Vegetation**

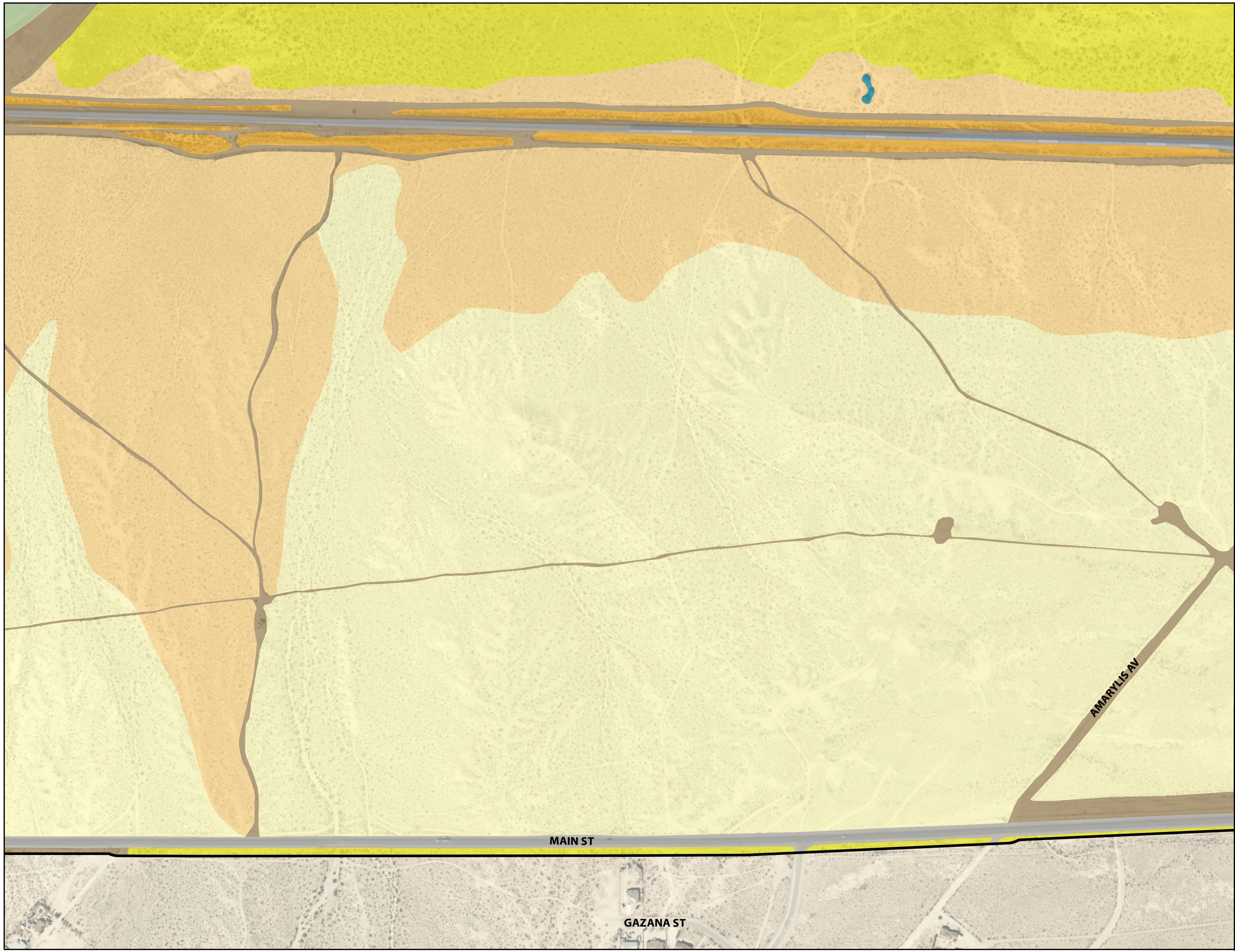
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Agriculture
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

Key Map

FIGURE 6

PAGE 13 OF 23

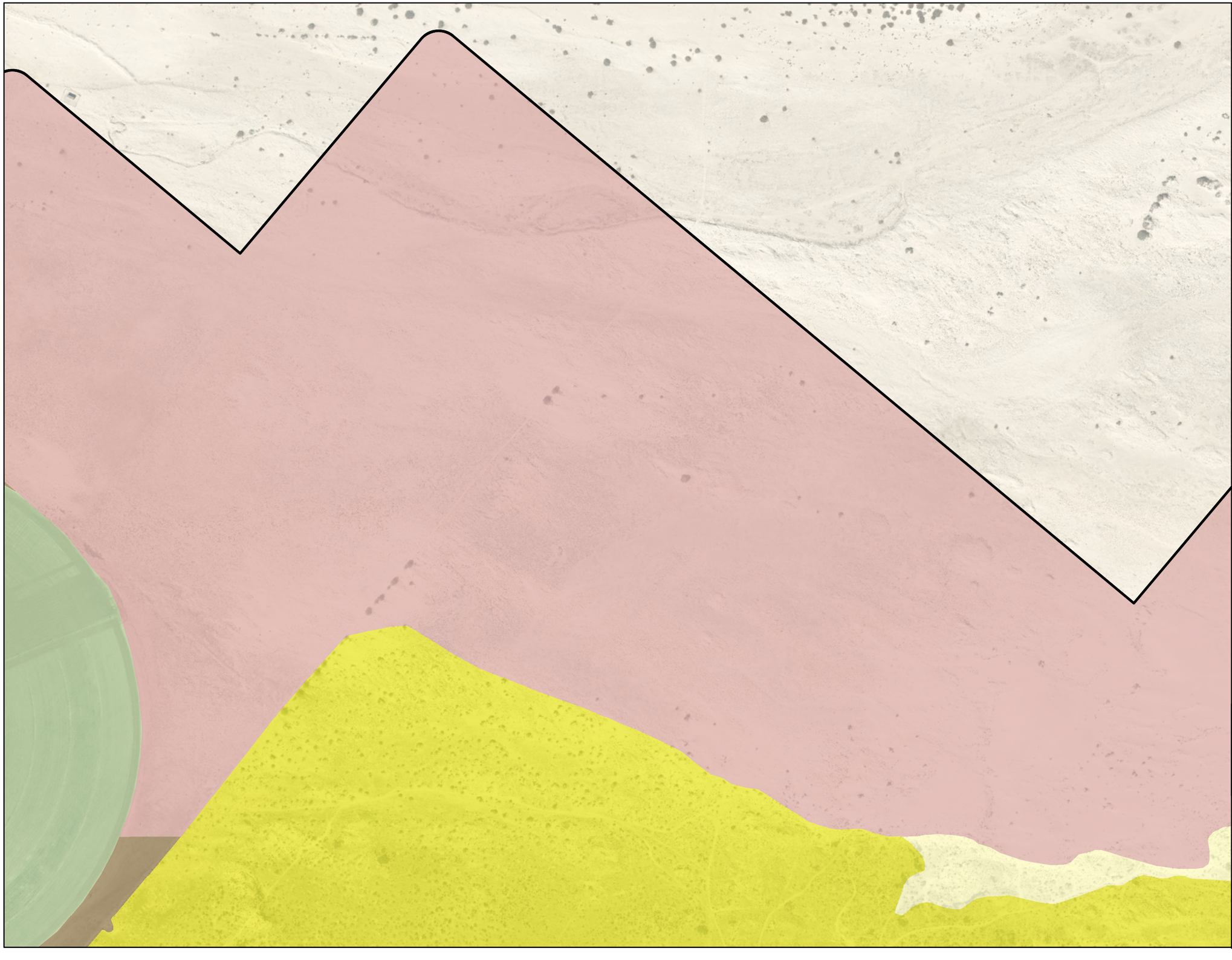
# Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri



ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Agriculture
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Disturbed Habitat

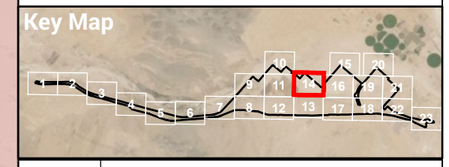



FIGURE 6

PAGE 14 OF 23

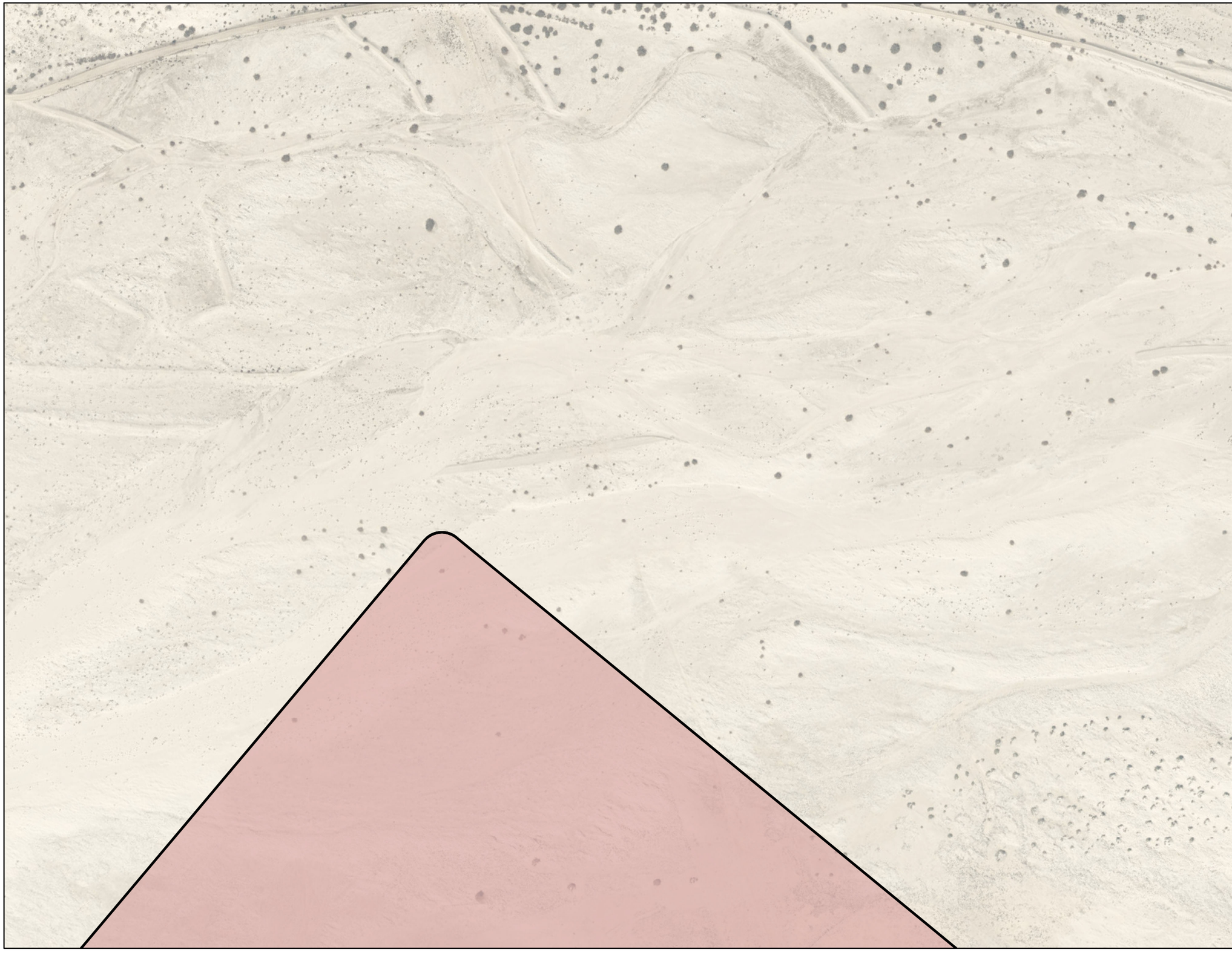
**Vegetation**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri



ARDR Review Area (5104.5 Ac)

**Vegetation**

Active Desert Dunes

Key Map

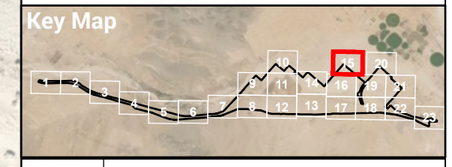



FIGURE 6

PAGE 15 OF 23

**Vegetation**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri

ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Allscale Scrub
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Disturbed Habitat

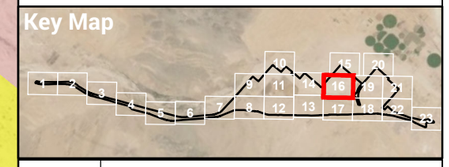



FIGURE 6

PAGE 16 OF 23

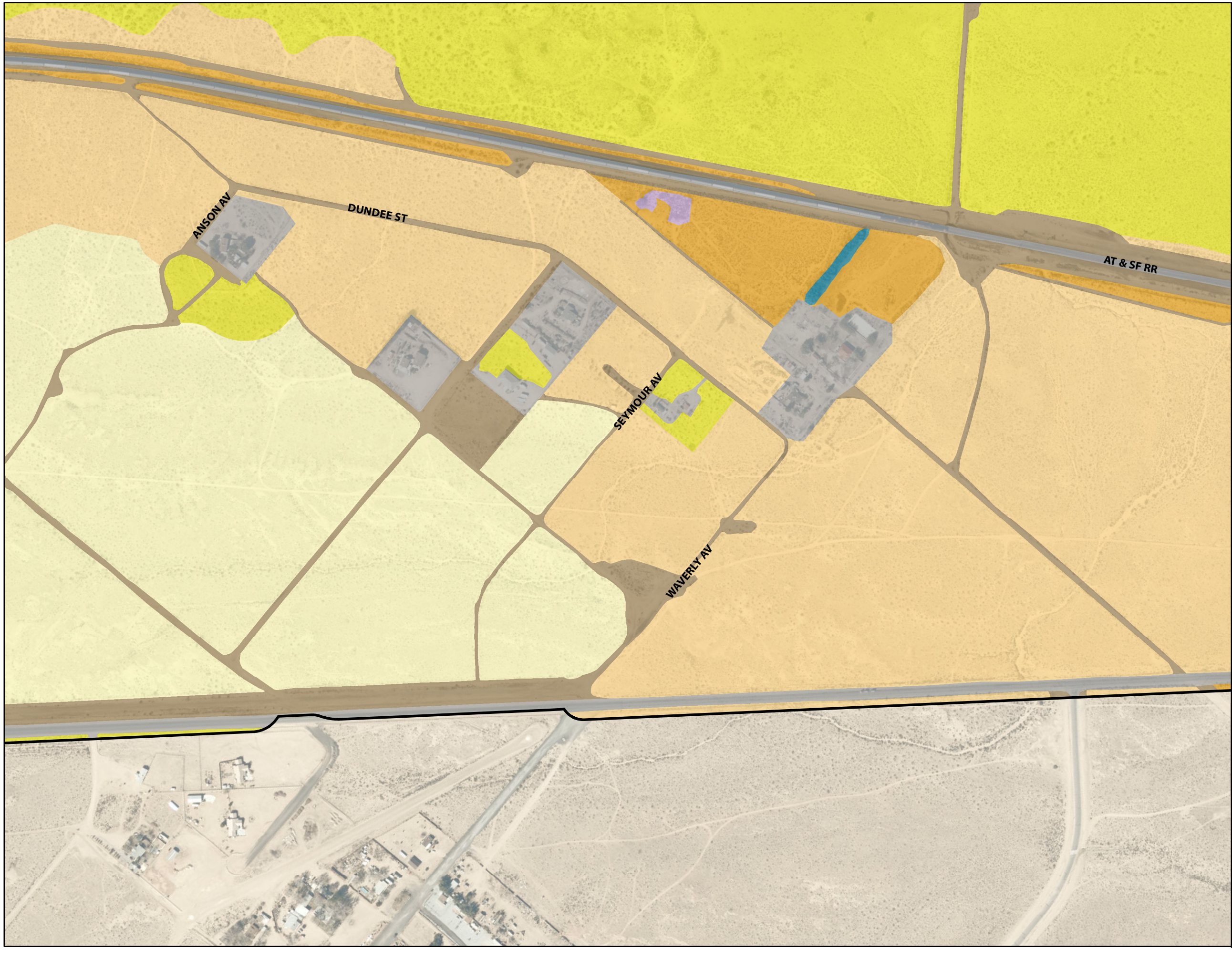
**Vegetation**

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Ornamental
- Tamarisk Thickets

Key Map

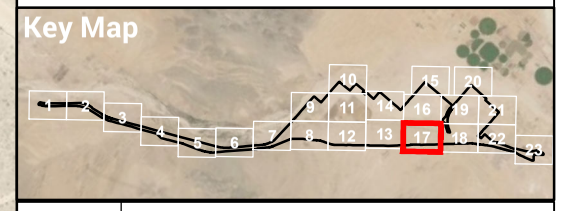


FIGURE 6

PAGE 17 OF 23

**Vegetation**

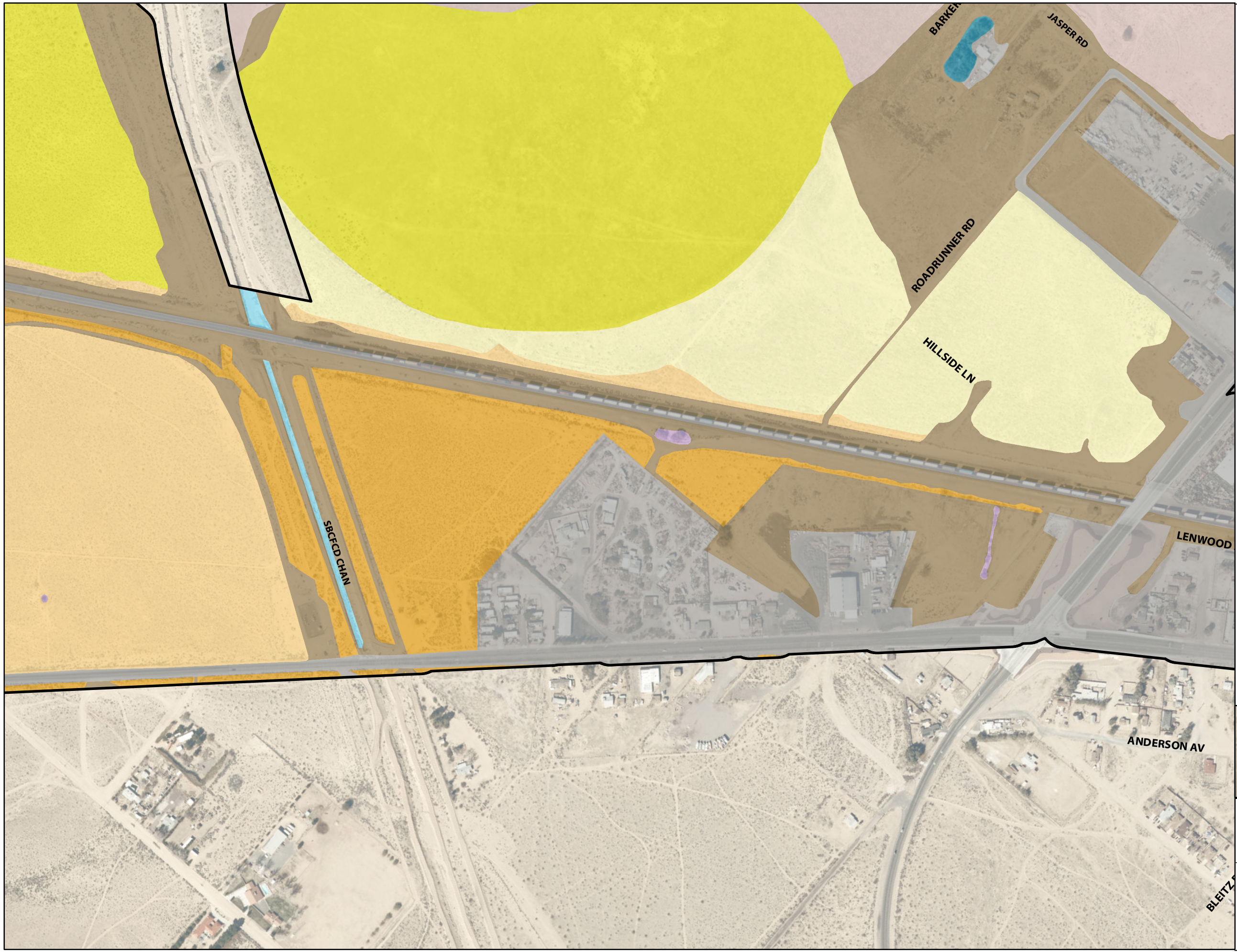
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes - Disturbed
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Ornamental
- Tamarisk Thickets
- Unvegetated Channel

Key Map

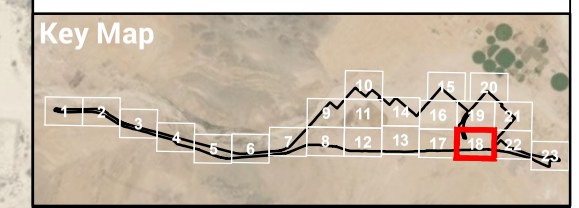



FIGURE 6

PAGE 18 OF 23

**Vegetation**

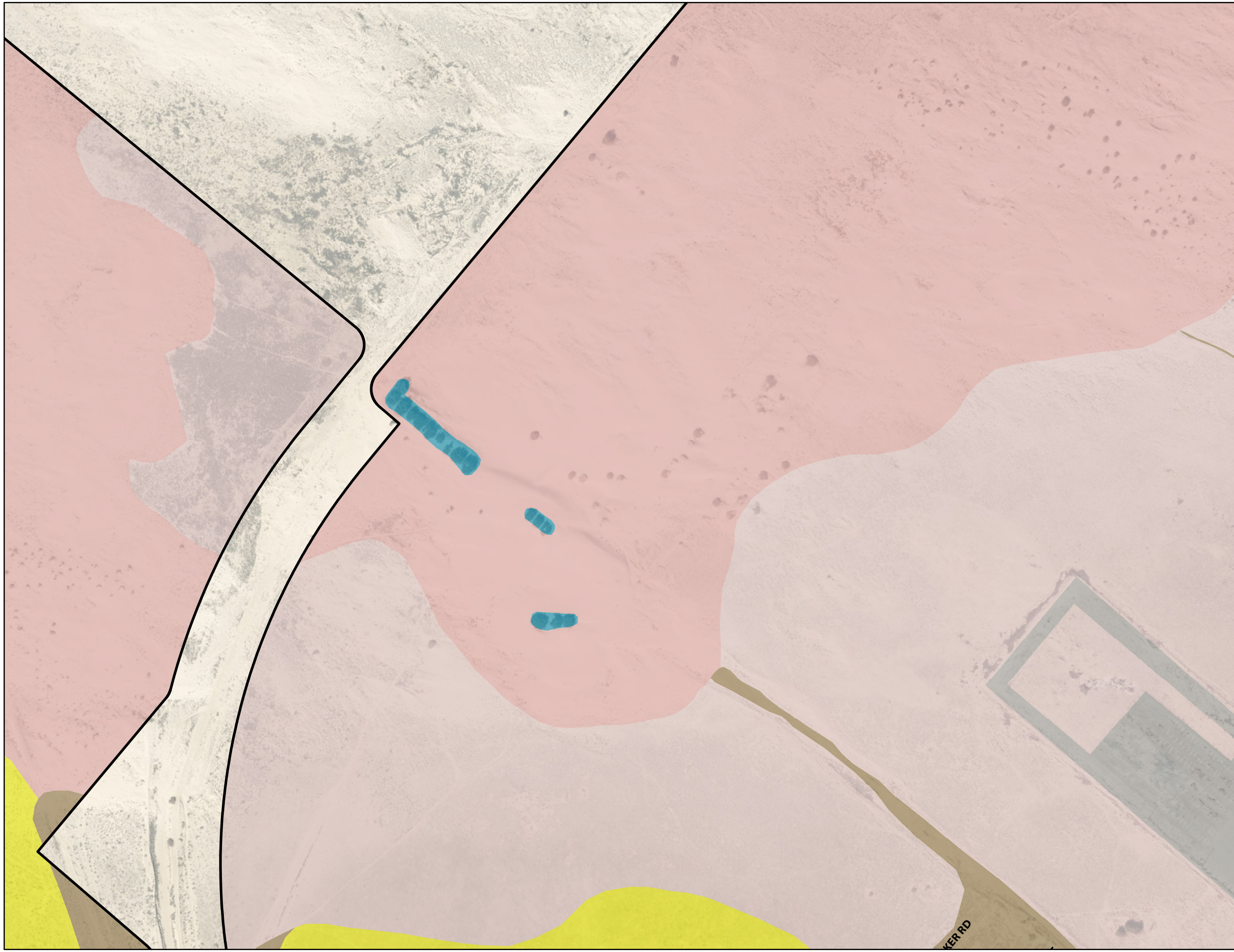
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Active Desert Dunes - Disturbed
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

Key Map

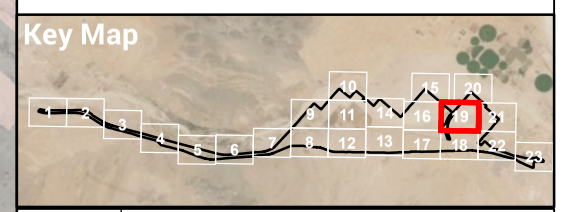


FIGURE 6

PAGE 19 OF 23

# Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

Active Desert Dunes

Key Map

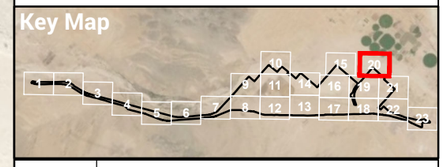



FIGURE 6

PAGE 20 OF 23

**Vegetation**

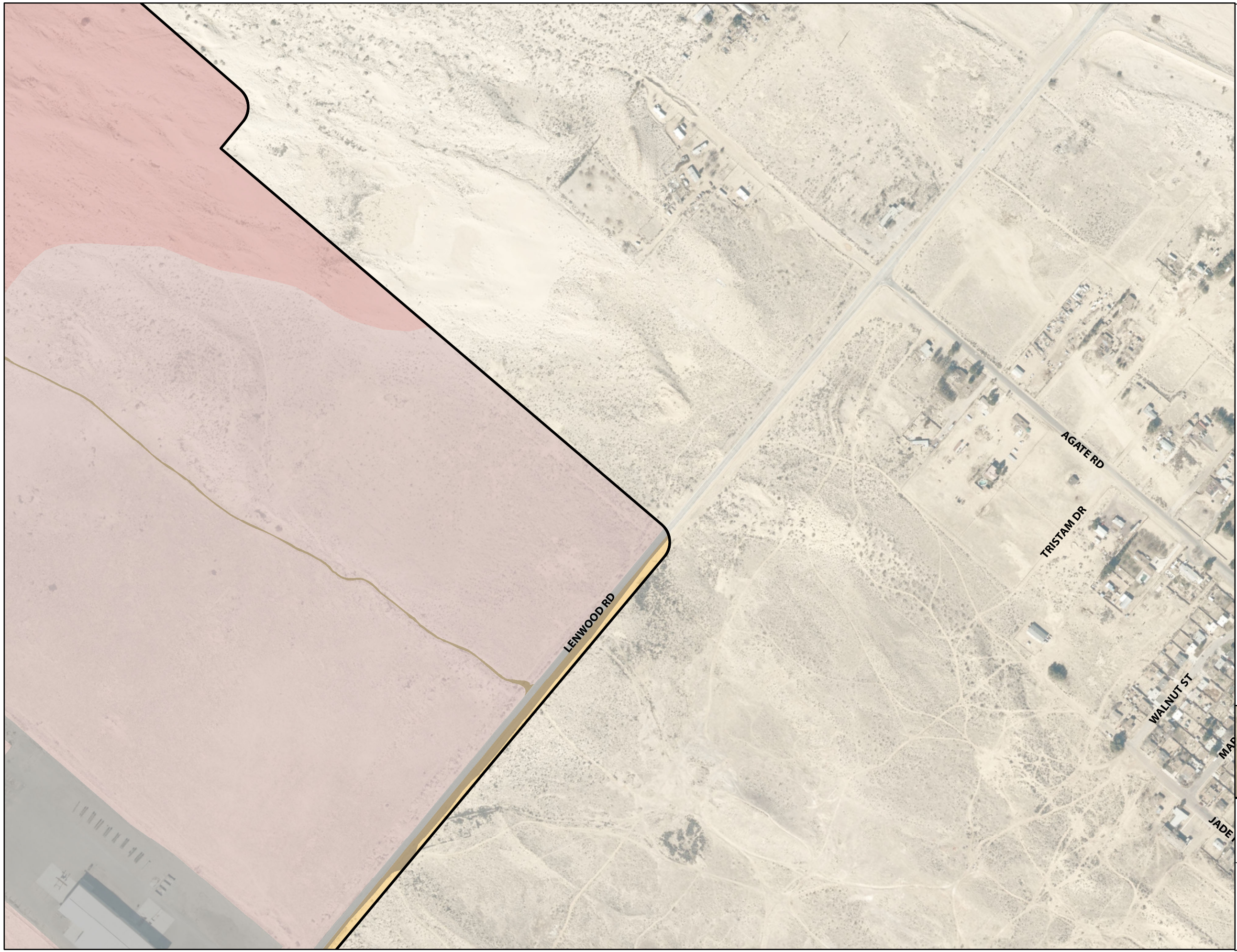
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Active Desert Dunes - Disturbed
- Allscale Scrub
- Developed
- Disturbed Habitat

Key Map

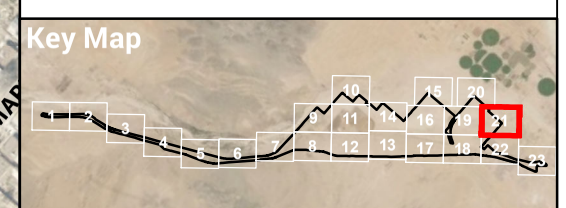


FIGURE 6

PAGE 21 OF 23

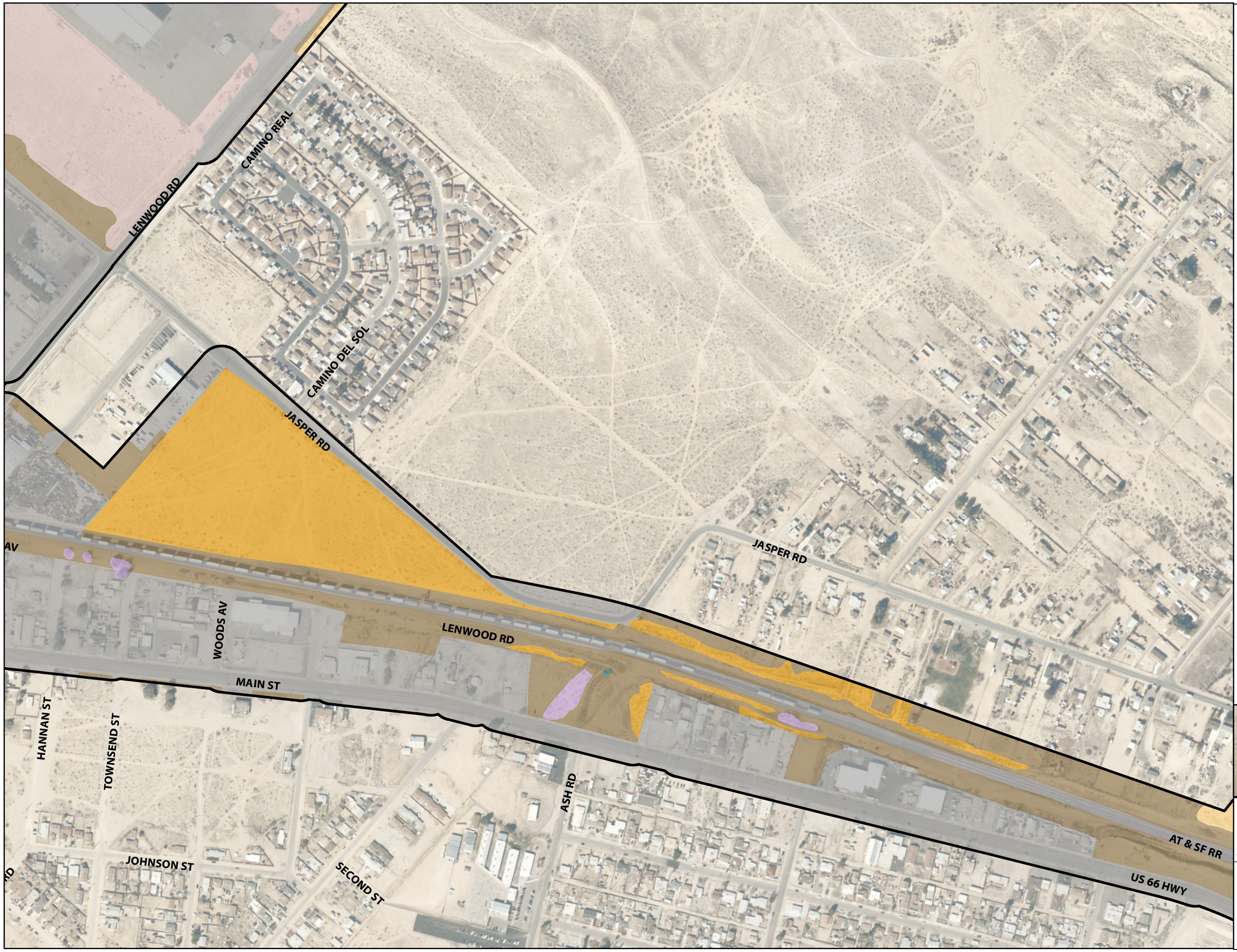
# Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes - Disturbed
- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat
- Ornamental
- Tamarisk Thickets

Key Map

FIGURE 6

PAGE 22 OF 23

Vegetation

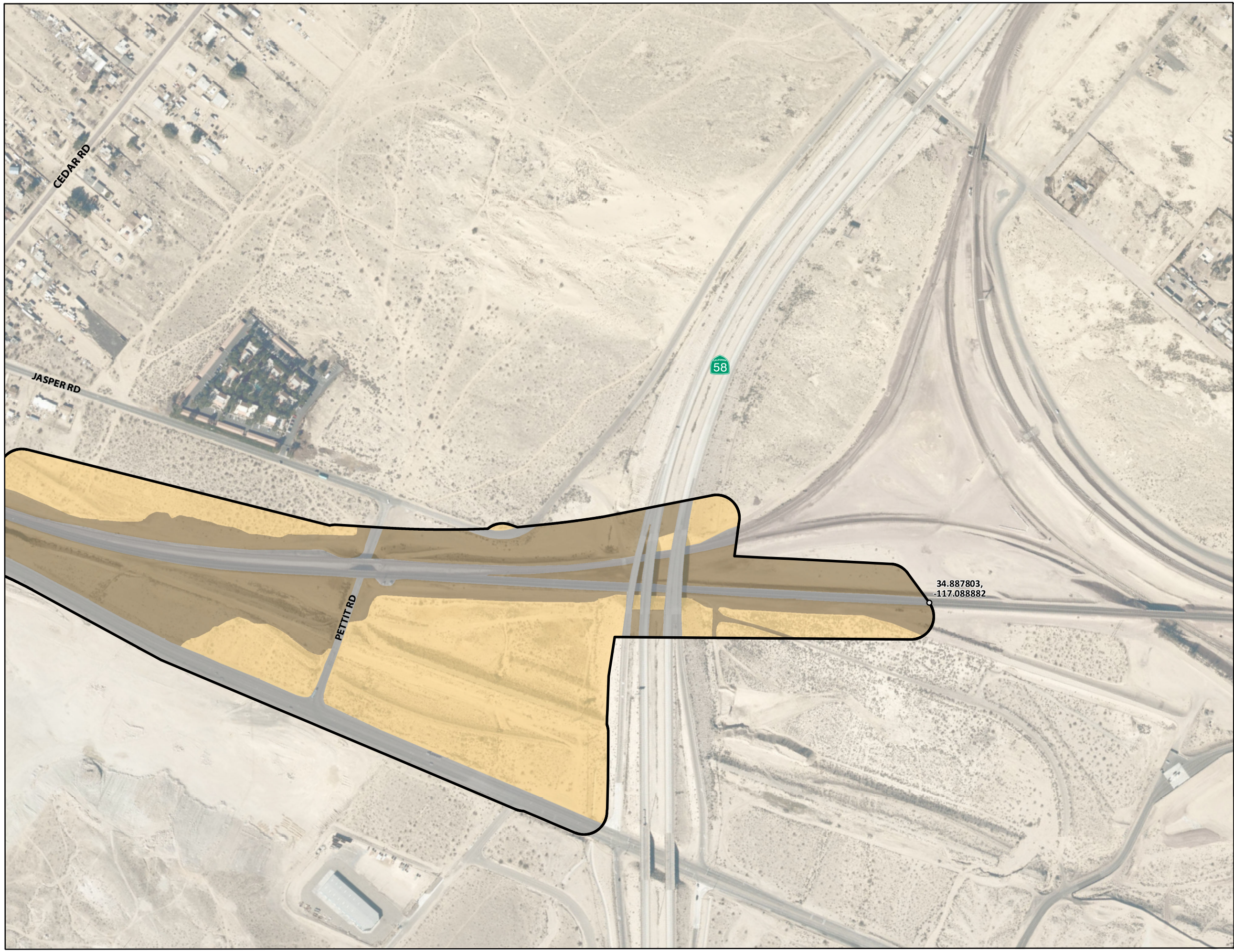
BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET

N

Aerial Photo: San Bernardino County 2020, Esri




ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Developed
- Disturbed Habitat

**Key Map**

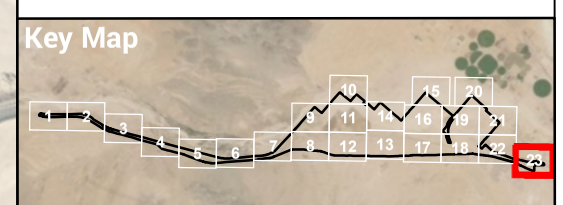


FIGURE 6

PAGE 23 OF 23

## Vegetation

BIG BARSTOW

ROCKS BIOLOGICAL CONSULTING

0 450 FEET N

Aerial Photo: San Bernardino County 2020, Esri

# APPENDIX A

# CHECKLIST: MINIMUM STANDARDS FOR ACCEPTANCE OF AQUATIC RESOURCES DELINEATION REPORTS

## APPENDIX A. CHECKLIST: MINIMUM STANDARDS FOR ACCEPTANCE OF AQUATIC RESOURCES DELINEATION REPORTS, LOS ANGELES DISTRICT REGULATORY DIVISION, USACE, MARCH 16, 2017

| Report Section/ Page Number | Minimum Standards for Acceptance of Aquatic Resources Delineation Reports | Additional Notes |
|---|---|---|
| Section 1; Appendix B | 1. JD REQUEST AND FORMS: ☑ A cover letter indicating whether you are requesting a jurisdictional determination (JD)*. ☑ If you are requesting a JD, you must complete, sign, and return the Request for Corps Jurisdictional Determination (JD) sheet. ☑ For preliminary jurisdictional determinations the Preliminary Jurisdictional Determination Form must be signed and submitted. | *Text provided in ARDR in lieu of formal cover letter. |
| Section 9 | 2. CONTACT INFORMATION: Contact information for the ☑ applicant(s), ☑ property owner(s), and ☑ agent(s). | |
| N/A | 3. SITE ACCESS: If the property owner or their representatives will not accompany the Corps to the site, a signed statement from the property owner(s) allowing Corps personnel to enter the property and to collect samples during normal business hours. If the property lacks direct access by public roads (in other words, access requires passage through private property not owned by the applicant), the owner or proponent must obtain permission from the adjacent property owner(s) to provide access for Corps personnel. | Property owner and/or representatives will accompany the Corps/RWQCB/CDFW for a site visit upon request. |
| Section 2.1 | 4. LOCATION: ☐ Directions to the survey area, ☐ an address (if available) and ☑ one or more set of geographic coordinates expressed in decimal degrees. | |
| Section 3.2.1 | 5. DELINEATION MANUAL CONFIRMATION: ☑ A statement confirming the delineation has been conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and applicable regional supplement(s). ☑ The regional supplement(s) used must be identified. ☑ For OHWM delineations, a statement must be included confirming the use of the OHWM field guide or that it is not applicable. | |
| Section 6; Appendix H, Table H-1 | 6. AQUATIC RESOURCE(S) DESCRIPTION: ☑ A narrative describing all aquatic resources on-site and an explanation of the mapped boundaries and any complex transition zones. ☑ If the site contains resources that only meet one or two of the three wetland criteria or do not exhibit a clear OHWM, describe the rationale for their inclusion or exclusion from the delineation. ☑ Also explain if any erosional features, upland swales, ditches and other potential aquatic features were considered but not included in the delineation. | |
| Figure 1 and Figure 5 series; Section 6; Table 7; Appendix H, Table H-1 | 7. AQUATIC RESOURCE MAPPING AND ACREAGE: ☑ Map of the outside survey boundary, ☑ total extent of aquatic and proposed non-aquatic features, ☑ type of feature(s) (waters of the United States or wetland), and include ☑ the total acreage for each polygon. | |
| Section 3.2 | 8. FIELD WORK DATES: ☑ Date(s) field work was completed. | |
| Appendix H, Table H-1 | 9. AQUATIC RESOURCE TABLE: A table listing all aquatic resources. The table must include ☑ the name of each aquatic resource (actual or arbitrary), ☑ its Cowardin type, ☑ acreage, ☑ summary of OHWM/wetland presence, ☑ dominant vegetation for each, and ☑ location (latitude/longitude in decimal | |

| | | |
|---|---|---|
| | degrees). ☑ For linear features, the table must show both acreage and linear feet as well as channel measurements (active channel width). | |
| Section 4; Tables 1 and 4 through 6; Appendices D, E, and F | 10. FIELD CONDITIONS: A description of existing field conditions, including ☑ current land use, ☑ normal conditions, ☑ flood/drought conditions, ☐ irrigation practices, ☑ past or recent manipulation to the site, and ☑ characteristics considered atypical (for criteria see OHWM and wetland supplement guides). ☑ Include WETS tables or pre-site visit precipitation data as appropriate: https://www.wcc.nrcs.usda.gov/climate/wets_doc.html.* | N/A for unchecked; APT data provided in lieu of WETS tables |
| Section 4.2 | 11. HYDROLOGY: ☑ A discussion of the hydrology at the site, including ☑ all known surface or subsurface sources, ☑ drainage gradients, ☑ downstream connections to the nearest traditional navigable waterway or interstate water, and ☑ any influence from manmade water sources such as irrigation. | |
| N/A | 12. REMOTE SENSING: ☐ If remote sensing was used in the delineation, provide an explanation of how it was used and include the name, date and source of the tools and data used and copies of the maps/photographs. | N/A |
| Section 4.1; Figure 4; Appendix G | 13. SOILS: ☑ Soil descriptions, ☑ soil map(s), ☑ soil photos, and ☑ a discussion of hydric soils (for wetland delineations only). | |
| Figure 2 | 14. USGS QUADRANGLE: ☑ A site location map on a 7.5-minute USGS quadrangle. The map must provide ☑ the name of the USGS quadrangle, ☑ Section, ☑ Township, ☑ Range, and ☑ the latitude and longitude in decimal degree format. | |
| Appendix I | 15. BULK UPLOAD FORM: ☑ For sites with 3 or more separate aquatic features a completed copy of the ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet must be submitted. | |
| Figure 5 series | 16. FIGURES: ☑ Map(s) of all delineated aquatic resources in accordance with the Final Map and Drawing Standards for the South Pacific Division Regulatory Program. | |
| Figure 5 series and Appendix G | 17. SITE PHOTOGRAPHS: ☑ Ground photographs showing representative aquatic resource sites (or lack of), ☑ as well as an accompanying map of photo-points and table of photographic information (see Final Map and Drawing Standards for the South Pacific Division Regulatory Program item no. 8 a-c). | |
| Appendix E | 18. DATA FORMS: ☑ Completed data forms including all essential information to make a jurisdictional determination [e.g. 2006 Wetland Determination Data Form -- Arid West Supplement; 2010 Arid West Ephemeral and Intermittent Streams OHWM Datasheet]. | |
| Section 3 | 19. METHODS: ☑ A description of the methods used to survey the aquatic resource boundaries. ☑ If GPS data is used, the level of accuracy must be included. Ideally, the GPS equipment should have the capability of sub-meter (<=1 meter) level horizontal accuracy. | |
| Appendix K | 20. GIS DATA: ☑ Digital data for the site, aquatic resource boundaries, and data point locations must be provided in a geographic information system (GIS) format, preferably either ESRI shapefiles or Geodatabase format, but GoogleEarth KMZ or KML files may be acceptable non-complex projects. Each GIS data file must be accompanied by a metadata file containing the appropriate geographic coordinate system, projection, datum, and labeling description. If GIS data is unavailable or otherwise cannot be produced and the Corps determines a site visit is necessary, the aquatic resource boundaries should be physically marked with numbered flags or stakes to facilitate verification by the Corps. | |

# APPENDIX B

# JURISDICTIONAL DETERMINATION REQUEST FORMS

## Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: District Name Here

- I am requesting a JD on property located at: south of and within the Mojave River, northwest of National Trails Highway, and south and west of California State Route (CA)-58
  (Street Address)
  City/Township/Parish: Barstow/Unincorp County: San Bernardino State: CA
  Acreage of Parcel/Review Area for JD: 5,104.49 acres
  Section: Various Township: 8N; 9N Range: 4W & 3W; 3W & 2W
  Latitude (decimal degrees): 34.853903 Longitude (decimal degrees): -117.159799
  (For linear projects, please include the center point of the proposed alignment.)
- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ✓ I currently own this property. ✓ I plan to purchase this property.
  ___ I am an agent/consultant acting on behalf of the requestor.
  ✓ Other (please explain): Right-of-entry to Corps staff limited to BNSF-owned properties until other properties purchased by BNSF.
- Reason for request: (check as many as applicable)
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ✓ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ___ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ___ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ___ A Corps JD is required in order to obtain my local/state authorization.
  ___ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ___ I believe that the site may be comprised entirely of dry land.
  ___ Other: _____
- Type of determination being requested:
  ___ I am requesting an approved JD.
  ✓ I am requesting a preliminary JD.
  ___ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ___ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

**Note: Right-of-entry to Corps staff limited to BNSF-owned properties until other properties purchased by BNSF.**

*Signature: David Rankin Date: 9/22/22

- Typed or printed name: David Rankin

Company name: BNSF Railway Company

Address: 2500 Lou Menk Drive, AOB-3
Forth Worth, TX 76131

Daytime phone no.: 817-352-2383

Email address: David.Rankin@BNSF.com

*Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

**Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM**

**BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR PJD:**

**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:** David Rankin, BNSF Railway, 2500 Lou Menk Dr, AOB-3, Forth Worth, TX 76131

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:** Los Angeles District

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**
**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: CA County/parish/borough: San Bernardino City: Barstow/Unincorporated

Center coordinates of site (lat/long in degree decimal format):

Lat.: 34.853903 Long.: -117.159799

Universal Transverse Mercator: 11S 485392.2m E 3856853.3m N

Name of nearest waterbody: Mojave River

**E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.**

| Site number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| | | SEE | ATTACHED | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: 2022 ARDR, prepared by Rocks Biological Consulting.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [ ] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: _____.
- [ ] Data sheets prepared by the Corps: _____.
- [ ] Corps navigable waters' study: _____.
- [x] U.S. Geological Survey Hydrologic Atlas: 2022 ARDR, Figure 2; USGS NHD 2020.
  - [x] USGS NHD data.
  - [x] USGS 8 and 12 digit HUC maps.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: 2022 ARDR, Figure 2; 1" = 4,500'; USGS 7.5' Quads (Hodge, Hinkley, Barstow SE, Barstow).
- [x] Natural Resources Conservation Service Soil Survey. Citation: 2022 ARDR, Figure 4; USDA NRCS 2018.
- [x] National wetlands inventory map(s). Cite name: 2022 ARDR, Figure 4; USFWS NWI 2019.
- [ ] State/local wetland inventory map(s): _____.
- [ ] FEMA/FIRM maps: _____.
- [ ] 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): See 2022 ARDR, Figures 1 & 4-6 (Maxar, Esri 2020; San Bernardino County, Esri 2020); Appendix D, Recent and Historic Aerials.
  or [x] Other (Name & Date): See 2022 ARDR Appendix G, Site Photographs.
- [ ] Previous determination(s). File no. and date of response letter: _____.
- [x] Other information (please specify): 2022 ARDR, prepared by Rocks Biological Consulting.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

| | |
|---|---|
| _____ | David Rambo 9/22/2022 |
| Signature and date of Regulatory staff member completing PJD | Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1] |

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.**

| Site number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resources (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|---|---|---|---|---|---|
| NWW-1 | 34.772787 | -117.284653 | 0.02 ac/123 ln ft | Non-wetland waters | Section 404 |
| NWW-2 | 34.772847 | -117.284610 | 0.01 ac/121 ln ft | Non-wetland waters | Section 404 |
| NWW-3 | 34.773221 | -117.283817 | 0.02 ac/132 ln ft | Non-wetland waters | Section 404 |
| NWW-4 | 34.773653 | -117.283036 | 0.01 ac/113 ln ft | Non-wetland waters | Section 404 |
| NWW-5 | 34.773734 | -117.282869 | 0.01 ac/109 ln ft | Non-wetland waters | Section 404 |
| NWW-6 | 34.774652 | -117.281701 | 0.01 ac/126 ln ft | Non-wetland waters | Section 404 |
| NWW-7 | 34.776674 | -117.278786 | 0.01 ac/119 ln ft | Non-wetland waters | Section 404 |
| NWW-8 | 34.776786 | -117.278705 | 0.01 ac/96 ln ft | Non-wetland waters | Section 404 |
| NWW-9 | 34.778794 | -117.277384 | 0.03 ac/107 ln ft | Non-wetland waters | Section 404 |
| NWW-10 | 34.778399 | -117.276743 | <0.01 ac/52 ln ft | Non-wetland waters | Section 404 |
| NWW-11 | 34.778377 | -117.276478 | 0.02 ac/223 ln ft | Non-wetland waters | Section 404 |
| NWW-12 | 34.778670 | -117.276121 | 0.01 ac/127 ln ft | Non-wetland waters | Section 404 |
| NWW-13 | 34.778712 | -117.276024 | 0.01 ac/113 ln ft | Non-wetland waters | Section 404 |
| NWW-14 | 34.778886 | -117.275827 | 0.01 ac/133 ln ft | Non-wetland waters | Section 404 |
| NWW-15 | 34.778978 | -117.275585 | 0.01 ac/184 ln ft | Non-wetland waters | Section 404 |
| NWW-16 | 34.784276 | -117.262668 | 0.07 ac/214 ln ft | Non-wetland waters | Section 404 |
| NWW-17 | 34.784361 | -117.262104 | 0.05 ac/81 ln ft | Non-wetland waters | Section 404 |
| NWW-18 | 34.786948 | -117.252605 | 0.01 ac/104 ln ft | Non-wetland waters | Section 404 |
| NWW-19 | 34.787318 | -117.251761 | 0.01 ac/114 ln ft | Non-wetland waters | Section 404 |
| NWW-20 | 34.791189 | -117.241868 | 0.65 ac/852 ln ft | Non-wetland waters | Section 404 |
| NWW-21 | 34.795810 | -117.228450 | 0.03 ac/428 ln ft | Non-wetland waters | Section 404 |
| NWW-22 | 34.796559 | -117.227801 | 0.02 ac/176 ln ft | Non-wetland waters | Section 404 |
| NWW-23 | 34.795776 | -117.228162 | 0.02 ac/221 ln ft | Non-wetland waters | Section 404 |
| NWW-24 | 34.797160 | -117.227759 | 0.11 ac/801 ln ft | Non-wetland waters | Section 404 |
| NWW-25 | 34.796981 | -117.225815 | 0.07 ac/727 ln ft | Non-wetland waters | Section 404 |
| NWW-26 | 34.797595 | -117.225008 | 0.07 ac/522 ln ft | Non-wetland waters | Section 404 |
| NWW-27 | 34.798258 | -117.223204 | 0.18 ac/1,155 ln ft | Non-wetland waters | Section 404 |
| NWW-28 | 34.797819 | -117.222127 | 0.01 ac/109 ln ft | Non-wetland waters | Section 404 |
| NWW-29 | 34.798766 | -117.222983 | <0.01 ac/96 ln ft | Non-wetland waters | Section 404 |
| NWW-30 | 34.798508 | -117.221906 | 0.03 ac/311 ln ft | Non-wetland waters | Section 404 |
| NWW-31 | 34.798583 | -117.221247 | 0.01 ac/145 ln ft | Non-wetland waters | Section 404 |
| NWW-32 | 34.798456 | -117.220065 | <0.01 ac/32 ln ft | Non-wetland waters | Section 404 |
| NWW-33 | 34.799322 | -117.219846 | 0.02 ac/171 ln ft | Non-wetland waters | Section 404 |
| NWW-34 | 34.800955 | -117.215818 | 0.03 ac/572 ln ft | Non-wetland waters | Section 404 |

| | | | | | |
|---|---|---|---|---|---|
| NWW-35 | 34.807290 | -117.203290 | 0.01 ac/66 ln ft | Non-wetland waters | Section 404 |
| NWW-36 | 34.808738 | -117.201555 | 0.01 ac/183 ln ft | Non-wetland waters | Section 404 |
| NWW-37 | 34.809189 | -117.201054 | 0.01 ac/150 ln ft | Non-wetland waters | Section 404 |
| NWW-38 | 34.809316 | -117.200892 | 0.01 ac/141 ln ft | Non-wetland waters | Section 404 |
| NWW-39 | 34.809671 | -117.200471 | <0.01 ac/182 ln ft | Non-wetland waters | Section 404 |
| NWW-40 | 34.810099 | -117.199975 | 0.01 ac/155 ln ft | Non-wetland waters | Section 404 |
| NWW-41 | 34.810323 | -117.199718 | 0.01 ac/172 ln ft | Non-wetland waters | Section 404 |
| NWW-42 | 34.811425 | -117.198424 | 0.02 ac/175 ln ft | Non-wetland waters | Section 404 |
| NWW-43 | 34.826693 | -117.188511 | 0.13 ac/475 ln ft | Non-wetland waters | Section 404 |
| NWW-44 | 34.829248 | -117.186429 | 3.13 ac/5,956 ln ft | Non-wetland waters | Section 404 |
| NWW-45 | 34.834684 | -117.182237 | 0.21 ac/2,468 ln ft | Non-wetland waters | Section 404 |
| NWW-46 | 34.835168 | -117.181479 | 0.06 ac/1,172 ln ft | Non-wetland waters | Section 404 |
| NWW-47 | 34.833706 | -117.176283 | 0.04 ac/580 ln ft | Non-wetland waters | Section 404 |
| NWW-48 | 34.836991 | -117.181122 | 0.03 ac/481 ln ft | Non-wetland waters | Section 404 |
| NWW-49 | 34.836110 | -117.179064 | 0.73 ac/7,138 ln ft | Non-wetland waters | Section 404 |
| NWW-50 | 34.837239 | -117.179203 | 0.02 ac/461 ln ft | Non-wetland waters | Section 404 |
| NWW-51 | 34.837464 | -117.178078 | 0.04 ac/842 ln ft | Non-wetland waters | Section 404 |
| NWW-52 | 34.837867 | -117.177679 | 0.04 ac/562 ln ft | Non-wetland waters | Section 404 |
| NWW-53 | 34.837648 | -117.177101 | 0.07 ac/1,131 ln ft | Non-wetland waters | Section 404 |
| NWW-54 | 34.835210 | -117.172619 | 0.02 ac/354 ln ft | Non-wetland waters | Section 404 |
| NWW-55 | 34.835454 | -117.171863 | 0.02 ac/170 ln ft | Non-wetland waters | Section 404 |
| NWW-56 | 34.835773 | -117.172617 | 0.02 ac/252 ln ft | Non-wetland waters | Section 404 |
| NWW-57 | 34.836014 | -117.172631 | 0.02 ac/264 ln ft | Non-wetland waters | Section 404 |
| NWW-58 | 34.838348 | -117.176084 | 0.50 ac/4,358 ln ft | Non-wetland waters | Section 404 |
| NWW-59 | 34.838248 | -117.174160 | 0.75 ac/8,262 ln ft | Non-wetland waters | Section 404 |
| NWW-60 | 34.840401 | -117.179750 | 0.17 ac/188 ln ft | Non-wetland waters | Section 404 |
| NWW-61 | 34.837031 | -117.169791 | 0.05 ac/910 ln ft | Non-wetland waters | Section 404 |
| NWW-62 | 34.840397 | -117.175307 | 0.14 ac/1,696 ln ft | Non-wetland waters | Section 404 |
| NWW-63 | 34.840934 | -117.174275 | 0.20 ac/2,174 ln ft | Non-wetland waters | Section 404 |
| NWW-64 | 34.841711 | -117.174418 | 0.04 ac/538 ln ft | Non-wetland waters | Section 404 |
| NWW-65 | 34.842293 | -117.173643 | 0.02 ac/482 ln ft | Non-wetland waters | Section 404 |
| NWW-66 | 34.843147 | -117.172457 | 0.08 ac/1,260 ln ft | Non-wetland waters | Section 404 |
| NWW-67 | 34.841131 | -117.171984 | 0.22 ac/2,373 ln ft | Non-wetland waters | Section 404 |
| NWW-68 | 34.839992 | -117.170094 | 0.34 ac/5,708 ln ft | Non-wetland waters | Section 404 |
| NWW-69 | 34.842933 | -117.168625 | 0.68 ac/6,858 ln ft | Non-wetland waters | Section 404 |
| NWW-70 | 34.842209 | -117.166408 | 2.09 ac/18,554 ln ft | Non-wetland waters | Section 404 |
| NWW-71 | 34.844554 | -117.165718 | 0.10 ac/1,128 ln ft | Non-wetland waters | Section 404 |
| NWW-72 | 34.845370 | -117.166236 | 0.04 ac/427 ln ft | Non-wetland waters | Section 404 |
| NWW-73 | 34.844453 | -117.163545 | 1.24 ac/13,348 ln ft | Non-wetland waters | Section 404 |
| NWW-74 | 34.846950 | -117.162756 | 0.17 ac/1,582 ln ft | Non-wetland waters | Section 404 |
| NWW-75 | 34.845550 | -117.159978 | 0.04 ac/487 ln ft | Non-wetland waters | Section 404 |
| NWW-76 | 34.848019 | -117.159133 | 0.86 ac/8,649 ln ft | Non-wetland waters | Section 404 |
| NWW-77 | 34.847129 | -117.156396 | 0.16 ac/1,677 ln ft | Non-wetland waters | Section 404 |

| | | | | | |
|---|---|---|---|---|---|
| NWW-78 | 34.848845 | -117.157242 | 0.01 ac/278 ln ft | Non-wetland waters | Section 404 |
| NWW-79 | 34.850248 | -117.158057 | 0.13 ac/1,874 ln ft | Non-wetland waters | Section 404 |
| NWW-80 | 34.850680 | -117.154564 | 2.02 ac/15,877 ln ft | Non-wetland waters | Section 404 |
| NWW-81 | 34.853340 | -117.156269 | 0.12 ac/1,229 ln ft | Non-wetland waters | Section 404 |
| NWW-82 | 34.854433 | -117.152784 | 0.64 ac/8,328 ln ft | Non-wetland waters | Section 404 |
| NWW-83 | 34.856239 | -117.153167 | 0.01 ac/250 ln ft | Non-wetland waters | Section 404 |
| NWW-84 | 34.854958 | -117.146066 | 0.02 ac/909 ln ft | Non-wetland waters | Section 404 |
| NWW-85 | 34.857281 | -117.149898 | 0.31 ac/3,921 ln ft | Non-wetland waters | Section 404 |
| NWW-86 | 34.856698 | -117.147965 | 0.02 ac/218 ln ft | Non-wetland waters | Section 404 |
| NWW-87 | 34.857936 | -117.147949 | 0.13 ac/2,162 ln ft | Non-wetland waters | Section 404 |
| NWW-88 | 34.858906 | -117.148308 | 0.04 ac/403 ln ft | Non-wetland waters | Section 404 |
| NWW-89 | 34.863711 | -117.134655 | 1.39 ac/12,490 ln ft | Non-wetland waters | Section 404 |
| NWW-90 | 34.860552 | -117.142795 | 0.08 ac/995 ln ft | Non-wetland waters | Section 404 |
| NWW-91 | 34.863147 | -117.140564 | 0.01 ac/150 ln ft | Non-wetland waters | Section 404 |
| NWW-92 | 34.874455 | -117.131291 | 1.32 ac/4,629 ln ft | Non-wetland waters | Section 404 |
| NWW-93 | 34.873485 | -117.118709 | 0.06 ac/409 ln ft | Non-wetland waters | Section 404 |
| NWW-94 | 34.874055 | -117.117372 | 0.06 ac/401 ln ft | Non-wetland waters | Section 404 |
| NWW-95 | 34.877087 | -117.110926 | 0.03 ac/307 ln ft | Non-wetland waters | Section 404 |
| NWW-96 | 34.878268 | -117.108708 | 0.05 ac/439 ln ft | Non-wetland waters | Section 404 |
| NWW-97 | 34.879422 | -117.105552 | 0.03 ac/506 ln ft | Non-wetland waters | Section 404 |
| NWW-98 | 34.880017 | -117.105950 | 0.01 ac/124 ln ft | Non-wetland waters | Section 404 |
| NWW-99 | 34.880936 | -117.101226 | 0.03 ac/353 ln ft | Non-wetland waters | Section 404 |
| NWW-100 | 34.882602 | -117.095407 | 0.34 ac/2,524 ln ft | Non-wetland waters | Section 404 |
| NWW-101 | 34.883416 | -117.092671 | 0.29 ac/1,003 ln ft | Non-wetland waters | Section 404 |
| NWW-102 | 34.883038 | -117.091930 | 0.01 ac/99 ln ft | Non-wetland waters | Section 404 |
| NWW-103 | 34.797426 | -117.223080 | 0.01 ac/43 ln ft | Non-wetland waters | Section 404 |
| NWW-104 | 34.797510 | -117.222886 | 0.01 ac/70 ln ft | Non-wetland waters | Section 404 |
| NWW-105 | 34.828712 | -117.182373 | 0.01 ac/29 ln ft | Non-wetland waters | Section 404 |
| NWW-106 | 34.828907 | -117.182084 | 0.01 ac/36 ln ft | Non-wetland waters | Section 404 |
| NWW-107 | 34.835555 | -117.169501 | <0.01 ac/51 ln ft | Non-wetland waters | Section 404 |
| NWW-108 | 34.847053 | -117.151904 | 0.01 ac/36 ln ft | Non-wetland waters | Section 404 |
| NWW-109 | 34.863277 | -117.170128 | 104.30 ac/4,818 ln ft | Non-wetland waters | Section 404 |

# APPENDIX C

# APPLICABLE AQUATIC RESOURCE PROTECTION REGULATIONS

# APPENDIX C. APPLICABLE AQUATIC RESOURCE PROTECTION REGULATIONS

Several regulations have been established by federal, state, and local agencies to protect and conserve aquatic resources. The descriptions below provide a brief overview of agency regulations that may be applicable to the project.

### *Executive Order 11990*

Executive Order 11990 aims to avoid direct or indirect impacts on wetlands from federal or federally approved projects when a practicable alternative is available. If wetland impacts cannot be avoided, all practicable measures to minimize harm must be included.

### *Clean Water Act*

Pursuant to Section 404 of the Clean Water Act (33 U.S. Code [USC] § 1251 et seq.; CWA), the U.S. Army Corps of Engineers (Corps) is authorized to regulate any activity that would result in the discharge of dredged or fill material into waters of the U.S. (including wetlands), which include those waters listed in 33 Code of Federal Regulations (CFR) 328.3 (51 Federal Register [FR] 41217, November 13, 1983; 53 FR 20764, June 6, 1988) and further defined by the 2001 *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (SWANCC; 531 U.S. 159) decision and the 2006 *Rapanos v. United States* (547 U.S. 715) decision. The Corps, with oversight from the U.S. Environmental Protection Agency (USEPA), has the principal authority to issue CWA Section 404 permits. The Corps would require a Standard Individual Permit (SIP) for more than minimal impacts to waters of the U.S. as determined by the Corps. Projects with minimal individual and cumulative adverse effects on the environment may meet the conditions of an existing Nationwide Permit (NWP).

A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for all Section 404 permitted actions. The Regional Water Quality Control Board (RWQCB), a division of the State Water Resources Control Board, provides oversight of the Section 401 certification process in California. The RWQCB is required to provide Water Quality Certification for licenses or permits that authorize an activity that may result in a discharge from a point source into a water of the U.S. Water Quality Certification authorization "is limited to assuring that a discharge from a Federally licensed or permitted activity will comply with water quality requirements" (40 CFR 121.3).

The National Pollutant Discharge Elimination System (NPDES) is the permitting program for discharge of pollutants into surface waters of the U.S. under Section 402 of the CWA.

### *Porter-Cologne Water Quality Control Act*

The Porter-Cologne Water Quality Control Act (Water Code Section 13000 et seq.) provides for statewide coordination of water quality regulations. The SWRCB was established as the statewide authority and nine separate RWQCBs were developed to oversee water quality on a day-to-day basis. The RWQCBs have primary responsibility for protecting water quality in California. As discussed above, the RWQCBs regulate discharges to surface waters under the CWA. In addition, the RWQCBs are responsible for administering the Porter-Cologne Water Quality Control Act.

Pursuant to the Porter-Cologne Water Quality Control Act, the state is given authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. As such, any person proposing to discharge waste into a water body that could

affect its water quality must first file a Report of Waste Discharge if a Section 404 permit is not required for the activity. “Waste” is partially defined as any waste substance associated with human habitation, including fill material discharged into water bodies.

### *California Fish and Game Code Section 1600-1602*

Pursuant to Division 2, Chapter 6, Section 1602 of the California Fish and Game Code (CFGC), California Department of Fish and Wildlife (CDFW) regulates all diversions, obstructions, or changes to the natural flow or bed, channel or bank of any river, stream or lake that supports fish or wildlife. A Notification of Lake or Streambed Alteration must be submitted to CDFW for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” CDFW has jurisdiction over riparian habitats associated with watercourses and wetland habitats supported by a river, lake, or stream. Jurisdictional waters are delineated by the outer edge of riparian vegetation (i.e., drip line) or at the top of the bank of streams or lakes, whichever is wider. CDFW jurisdiction does not include tidal areas or isolated resources (e.g., riparian or wetland areas not supported by a river, lake, or stream). CDFW reviews the proposed actions and, if necessary, submits (to the applicant) a proposal that includes measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and applicant is the Lake or Streambed Alteration Agreement.

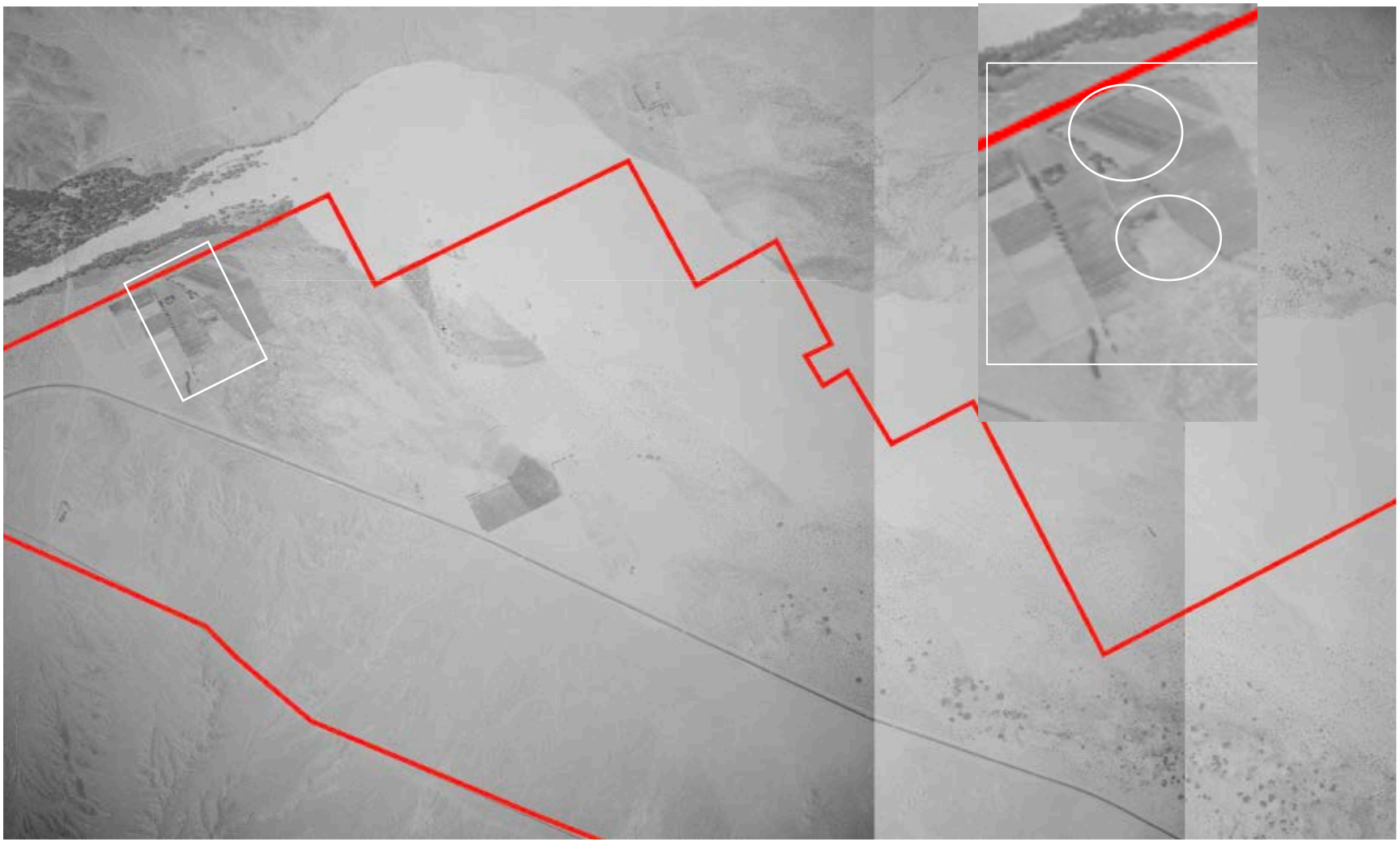
# APPENDIX D

# RECENT AND HISTORIC AERIALS ANALYSIS

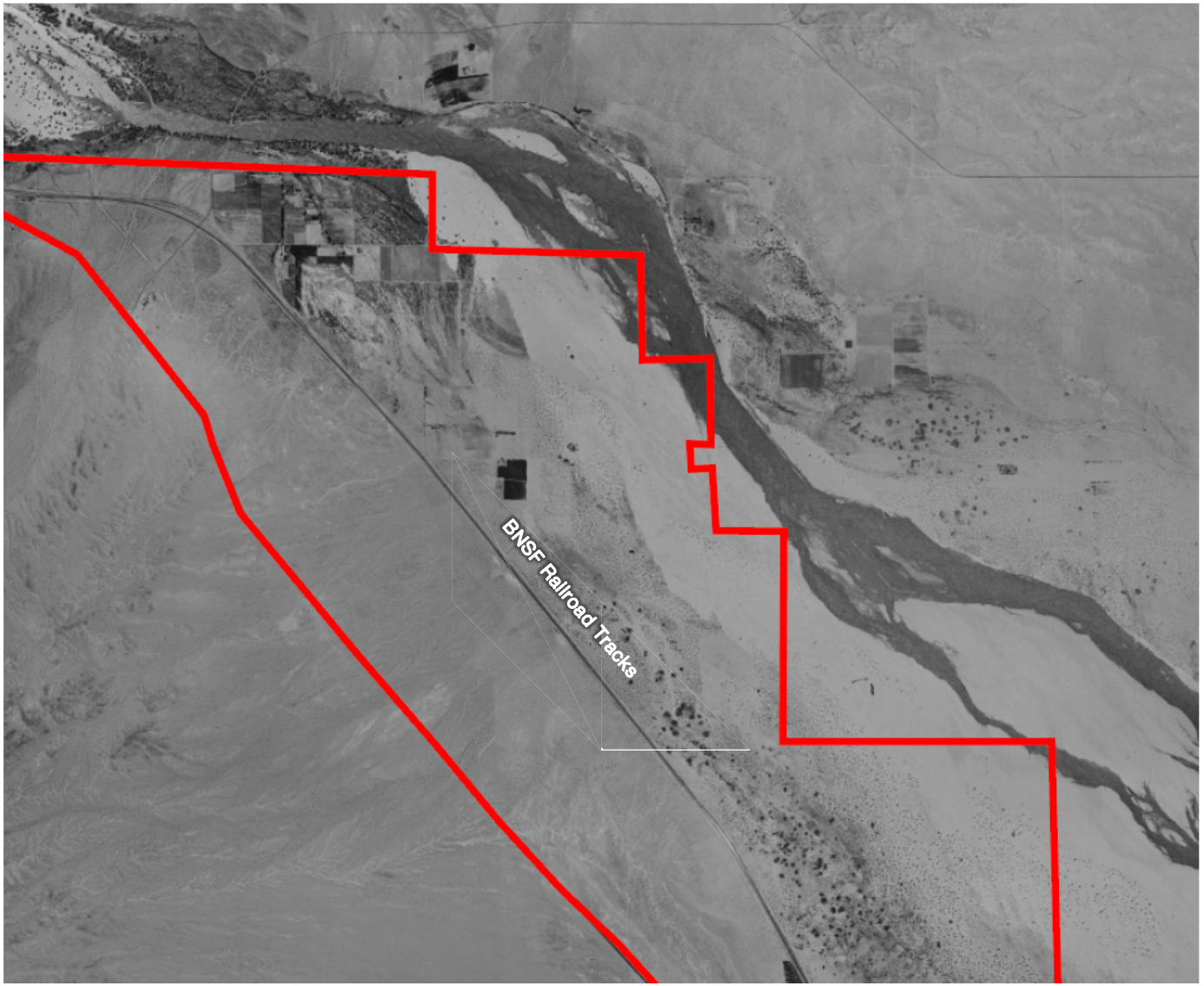
Appendix D

Recent and Historic Aerials Analysis

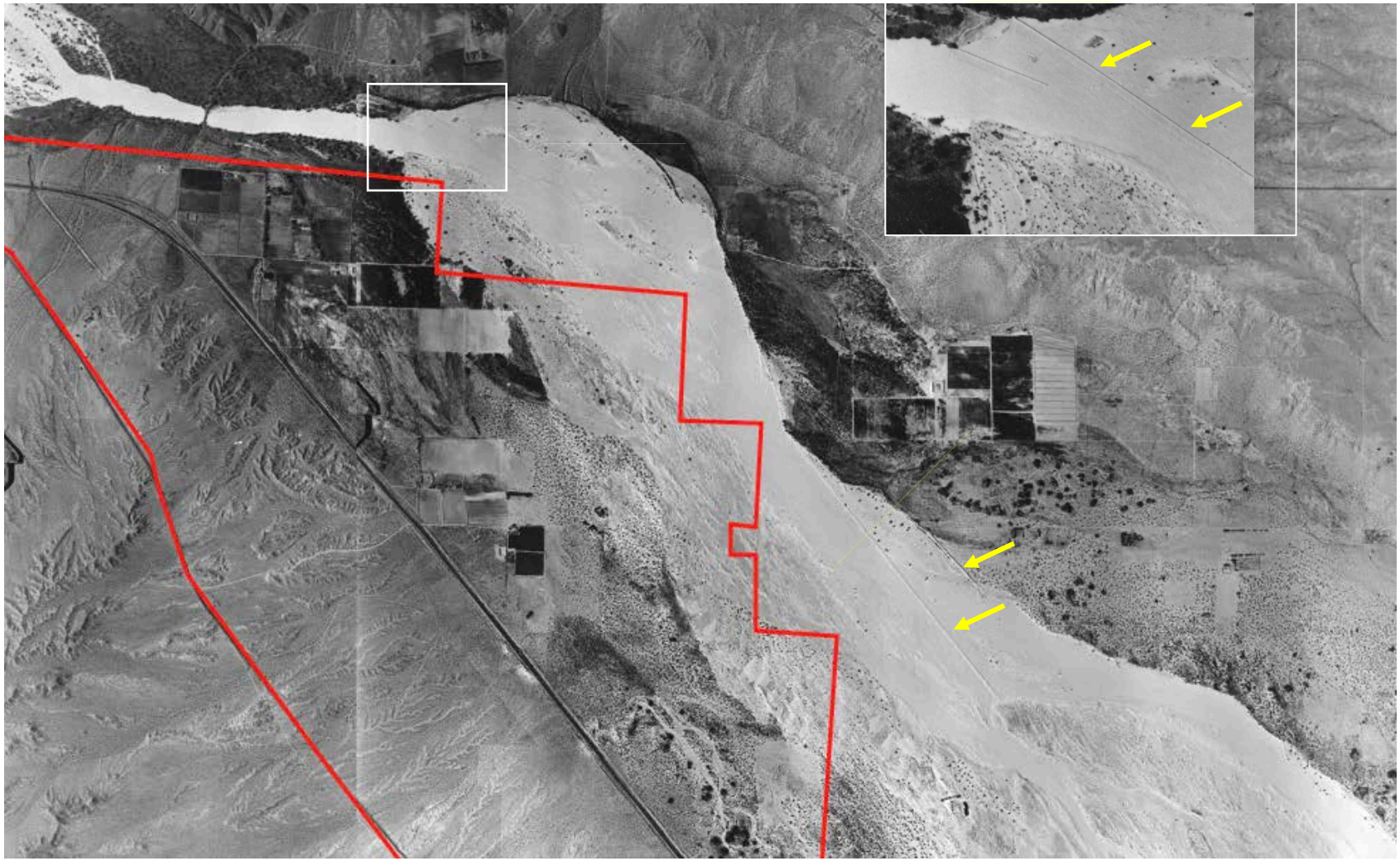
Source: Google Earth Pro, University of California – Santa Barbara, & NetrOnline



October 1929 – Very little development occurs within and surrounding the review area in the October 1929 aerial. The railroad tracks and National Trails Highway are visible in their present-day locations; small areas of agricultural/ranch land are present on site. Basin (B-) 1 and B-2 are not present/visible in the October 1929 aerial.




May 1952 – Agricultural development expanded north and south of the Mojave River between October 1929 and May 1952. The May 1952 aerial displays the active flooding of the Mojave River and its intersection with the review area at multiple points.



**January 1953 –** Berms were installed within portions of the Mojave River (yellow arrows) between May 1952 and January 1953, redirecting and constricting the river's natural flow path. Development of ranchland and/or residential uses within and surrounding the review area increased slightly between May 1952 and January 1953.



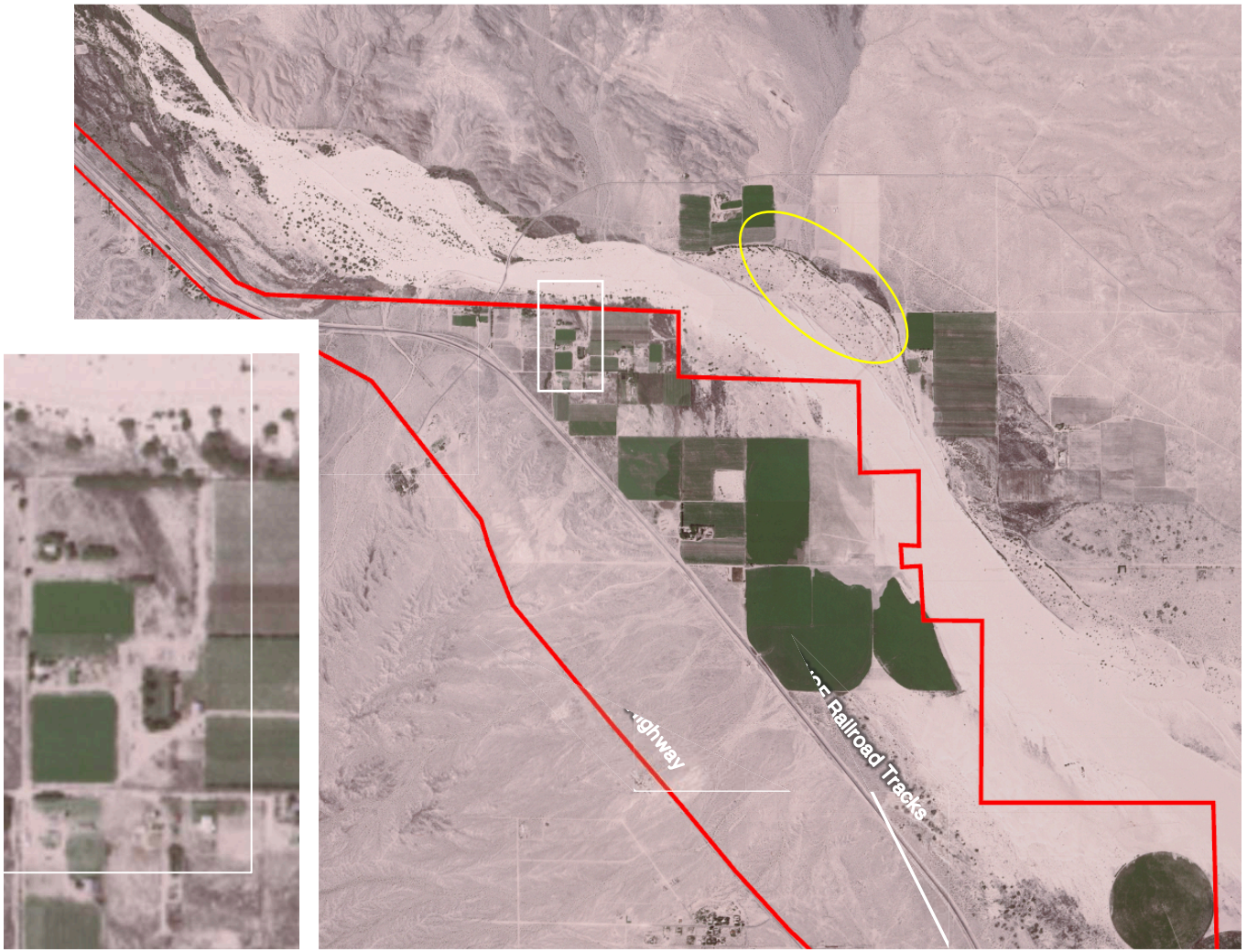

June 1959 – Minor changes in development or land use within and surrounding the review area occurred between January 1953 and June 1959. The berms within the Mojave River (yellow arrows) appear consistent from January 1953 to June 1959.



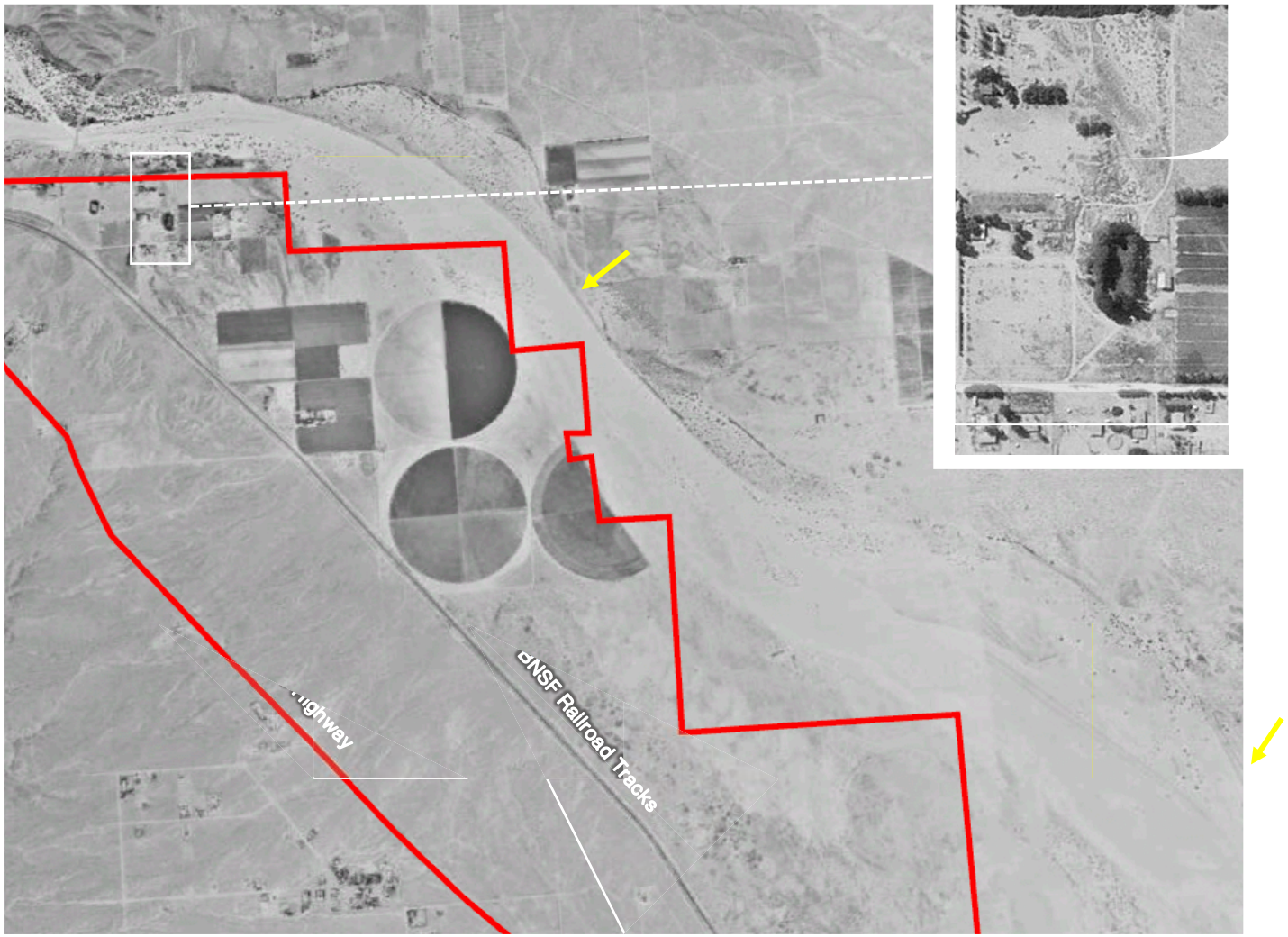
**November 1963 –** Additional berms within/along the Mojave River (yellow arrows) appear between June 1959 and November 1963. Manipulation in the form of the removal and installation of berms to manage/direct flow within the Mojave River continues throughout this time period.



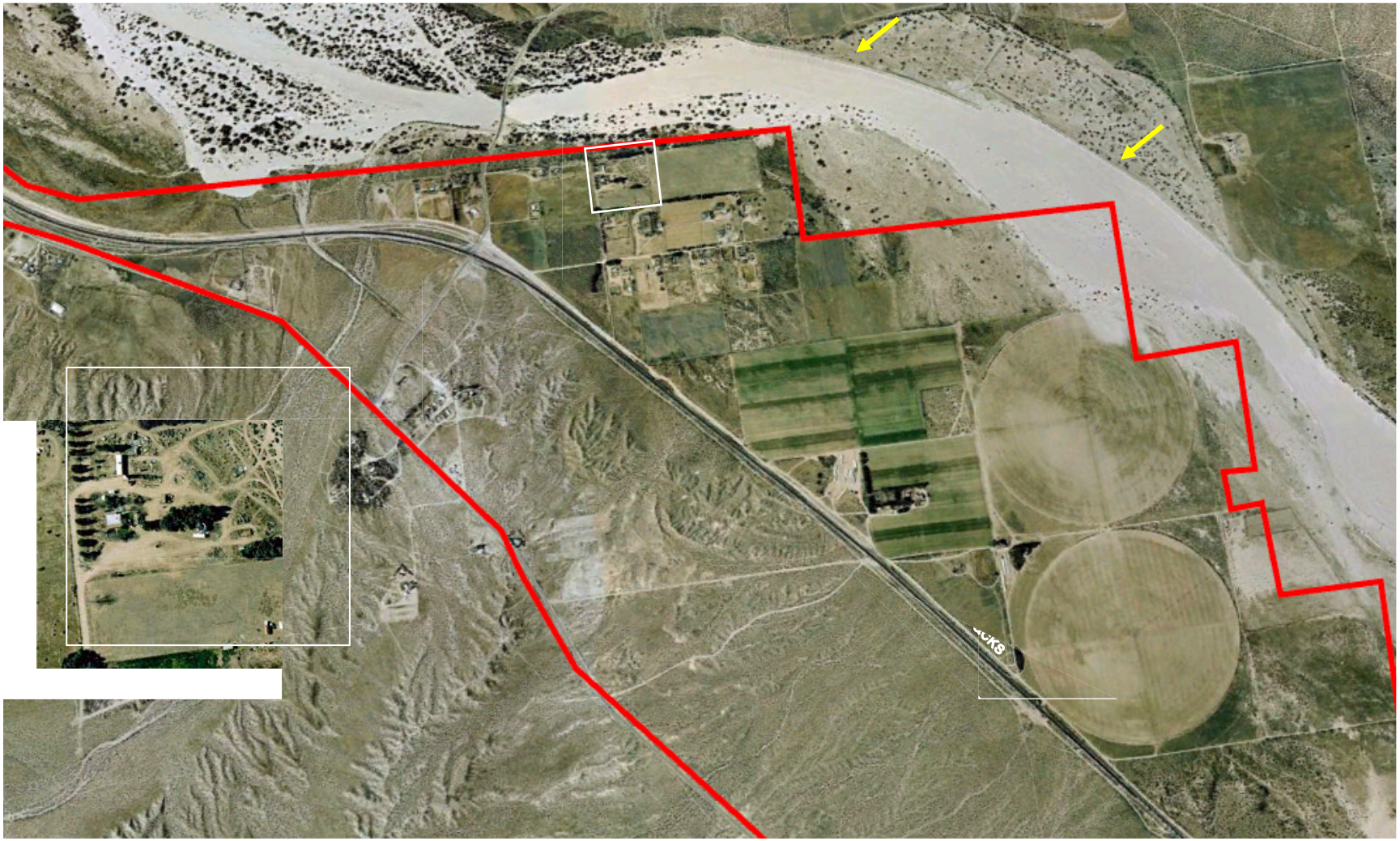
**July 1973 –** Minor changes in development or land use occurred within and surrounding the review area between November 1963 and July 1973; agricultural/ranch land use continued, expanding slightly northwest of the Mojave River. Between November 1963 and July 1973, additional berms were installed within the Mojave River (yellow arrows), further redirecting flow.



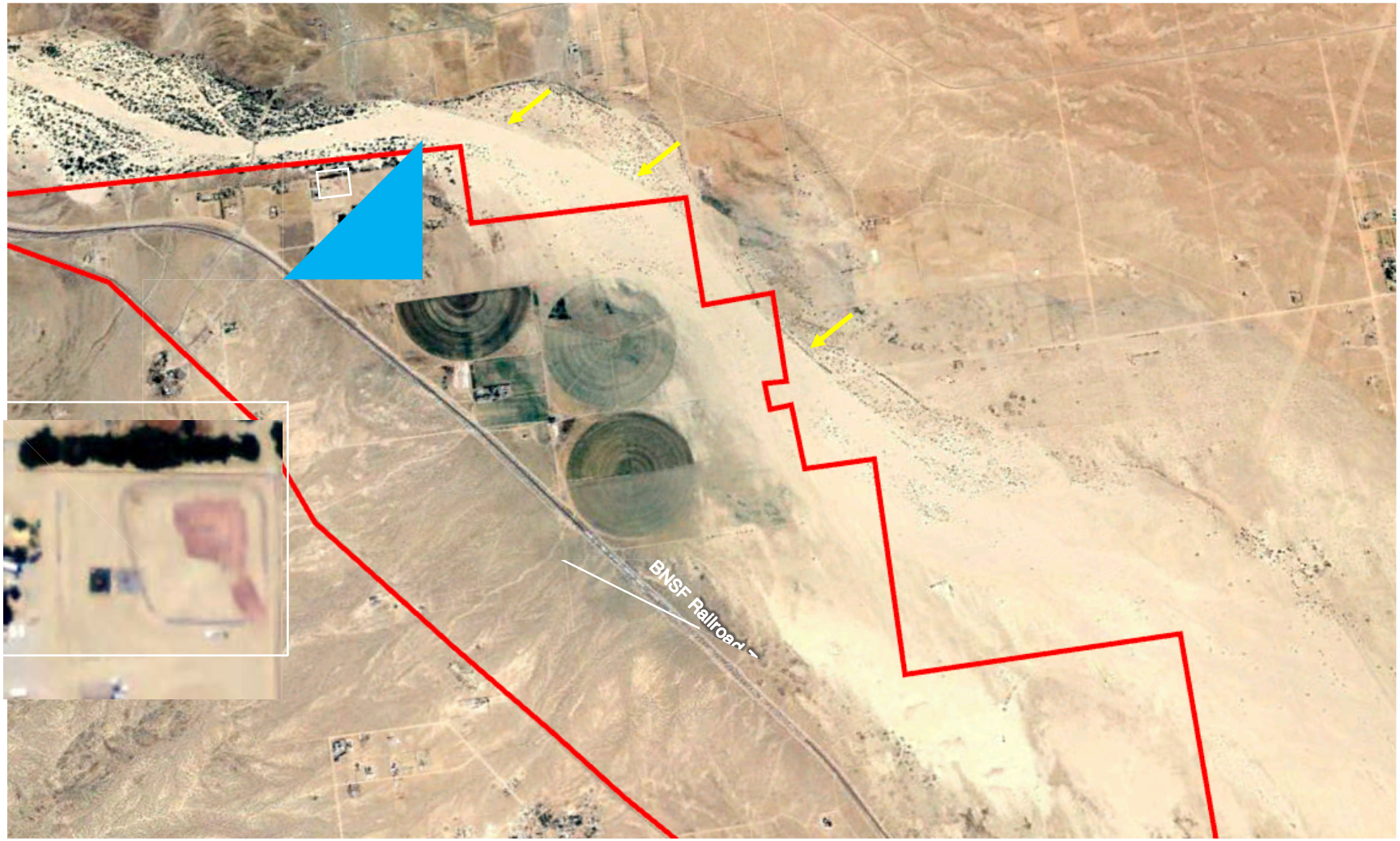

December 1984 – A large agricultural (row crop) operation was established within/around the northwestern portion of the review area (southwest of the Mojave River) between July 1973 and December 1984. The area northwest of the Mojave River berms (yellow circle) has become more vegetated since July 1973. B-2 was constructed between July 1973 and December 1984; however, B-1 is not yet present/visible in the December 1984 aerial.



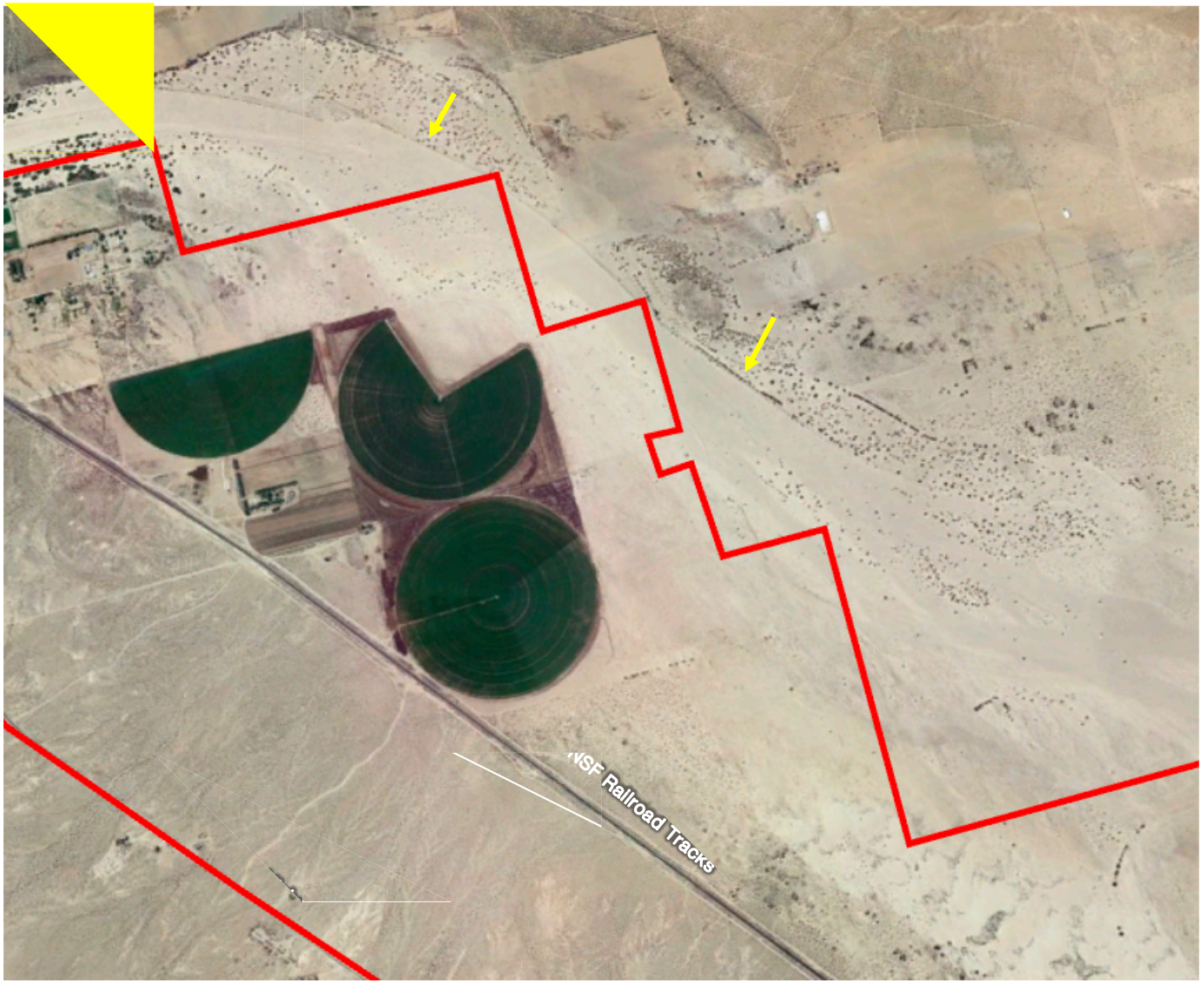

**October 1995** – Little has changed within and surrounding the review area between December 1984 and October 1995. The berms within/along the Mojave River (yellow arrows) appear to remain consistent between December 1984 and October 1995. B-2 is visible in the October 1995 aerial; however, B-1 is not yet present/visible.



**December 2005 –** Agricultural practices continue within the review area. B-2 is still visible (blue arrow) in the December 2005 aerial; however, B-1 is not yet present/visible. The berms within/along the Mojave River (yellow arrows) appear to remain consistent between October 1994 and December 2005.




May 2009 – Agricultural practices continue within the review area. B-2 is still visible (blue arrow) within the May 2009 aerial, while construction of B-1 began between December 2005 and May 2009. The berms within/along the Mojave River (yellow arrows) remain consistent from December 2005 to May 2009.




**September 2015 –** The large agricultural (row crop) operation remains active in the northwestern portion of the review area. B-1 and B-2 are visible on the September 2015 aerial. The berms within/along the Mojave River (yellow arrows) remain consistent from October 1994 to September 2015.

# APPENDIX E

# ARID WEST WETLAND DETERMINATION DATA FORMS AND EPHEMERAL AND INTERMITTENT STREAMS OHWM DATASHEETS

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/13/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 1

Investigator(s): Ryan Layden, Emily Trevino, Kelsey Woldt Section, Township, Range: S08, T09N, R02W

Landform (hillslope, terrace, etc.): Within drainage Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.87856910 Long: -117.108756418 Datum: WGS 84

Soil Map Unit Name: Cajon sand, 2 to 9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes _____ | No ✔ | |

Remarks:

Representative sample point taken within vegetated drainage which receives flows from road. Most water ponds adjacent to road before culvert under railroad. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated on 12/10/2018; conditions reassessed on 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 5-foot radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Tamarix ramosissima | 30% | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 30% = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | N/A = Total Cover | | |
| **Herb Stratum** (Plot size: 5-foot radius) | | | |
| 1. Cynodon dactylon | 69% | Yes | FACU |
| 2. Solanum elaeagnifolium | 25% | Yes | NL/UPL |
| 3. Bromus tectorum | 4% | No | NL/UPL |
| 4. Hordeum murinum | 2% | No | FACU |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 100% = Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes _____ No ✔

Remarks:

Sample point taken within area mapped as tamarisk thickets. Five-foot radius for tree stratum used to only account for vegetation within area growing under same soil and hydrologic conditions. Tamarix ramosissima is synonymous with Tamarix chinensis (FAC) per NWPL. Ulmus pumila located further upstream (UPL). Hydric soil and wetland hydrology parameters not met; thus, prevalence index worksheet not required/needed.

## SOIL

Sampling Point: WDP 1

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-20 | 7.5 YR 4/4 | 100% | N/A | N/A | N/A | N/A | Sandy loam | No evidence of redox observed |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: N/A

Depth (inches): N/A

**Hydric Soil Present? Yes ____ No ✔**

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes ____ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

FAC-Neutral test not met. Drift deposits observed as trash and dried Cynodon dactylon; however, no other primary or secondary wetland hydrology indicators were met.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/13/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 2

Investigator(s): Emily Trevino, Kelsey Woldt, Ryan Layden Section, Township, Range: S18, T09N, R02W

Landform (hillslope, terrace, etc.): Within Channel Local relief (concave, convex, none): Slighty concave Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.873737305 Long: -117.117380668 Datum: WGS 84

Soil Map Unit Name: Cajon sand, 0 to 2 percent slopes (soil rated as hydric per the NRCS) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes ✔ | No _____ | |

Remarks:

Flows received from a culvert/storm drain structure at the intersection of Lenwood Rd & National Trails Hwy; area constructed after 2014 based on aerials. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated on 12/10/2018; conditions reassessed on 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | N/A = Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: 5-foot radius)** | | | |
| 1. Atriplex polycarpa | 4% | Yes | FACU |
| 2. Tribulus terrestris | 2% | Yes | NL/UPL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 6% = Total Cover | | |
| **Herb Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A = Total Cover | | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 90% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes _____ No ✔

Remarks:

Sample point taken within area mapped as disturbed habitat. Hydric soil parameter not met; thus, prevalence index worksheet not required/needed.

## SOIL

Sampling Point: WDP 2

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-20 | 10 YR 4/6 | 100% | N/A | N/A | N/A | N/A | Sandy loam | No evidence of redox observed |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: N/A

Depth (inches): N/A

**Hydric Soil Present? Yes ____ No ✔**

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✔ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes ✔ No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

Some surface soil cracks observed; drift deposits present as trash. FAC-Neutral test not met.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/13/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 3

Investigator(s): Emily Trevino, Ryan Layden, Kelsey Woldt Section, Township, Range: S18, T09N, R02W

Landform (hillslope, terrace, etc.): Within channel Local relief (concave, convex, none): None Slope (%): 1-2

Subregion (LRR): LRR D - Interior Deserts Lat: 34.864014091 Long: -117.131613178 Datum: WGS 84

Soil Map Unit Name: Norob-Halloran complex, 0 to 5 percent slopes (soils rated as hydric per the NRCS) NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation ✔, Soil ✔, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes _____ | No ✔ | |

Remarks:

Vegetation and soils considered significantly disturbed as wash appears to be heavily used by off-road vehicles; other similar washes in area were also unvegetated without signs of road use. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated 12/10/2018; conditions reassessed 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | N/A | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | N/A | = Total Cover | |
| **Herb Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A | = Total Cover | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| | N/A | = Total Cover | |

% Bare Ground in Herb Stratum 100% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes _____ No ✔

Remarks:

Sample point taken in unvegetated sandy wash within area mapped as allscale scrub habitat.

## SOIL

Sampling Point: WDP 3

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-7 | 10 YR 5/4 | 100% | N/A | N/A | N/A | N/A | Loamy sanc | No evidence of redox observed |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Shovel refusal - compacted soils

Depth (inches): 7 inches

**Hydric Soil Present? Yes ____ No ✔**

Remarks:

Pit only dug to 7 inches due to hard compacted soils. Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes ____ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

FAC-Netural test not met (no vegetation). Drift deposits observed as dead plant material; however, no other primary or secondary wetland hydrology indicators were met.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/12/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 4

Investigator(s): Emily Trevino, Kelsey Woldt, Ryan Layden Section, Township, Range: S34, T09N, R03W

Landform (hillslope, terrace, etc.): Within Channel Local relief (concave, convex, none): Concave Slope (%): 2-5

Subregion (LRR): LRR D - Interior Deserts Lat: 34.834144855 Long: -117.182577641 Datum: WGS 84

Soil Map Unit Name: Nebona-Cuddeback complex, 2 to 9 percent slopes (soil rated as hydric per the NRCS) NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes ✔ | No _____ | |

Remarks:

Representative sample point taken within unvegetated sandy wash. Hydrology considered significantly disturbed as wash is located adjacent to dirt road. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated 12/11/2018; conditions reassessed 04/12/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | N/A | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | N/A | = Total Cover | |
| **Herb Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A | = Total Cover | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| | N/A | = Total Cover | |

% Bare Ground in Herb Stratum 100% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes _____ No ✔

Remarks:

Sample point taken in unvegetated sandy wash within area mapped as allscale scrub habitat.

## SOIL

Sampling Point: WDP 4

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-20 | 10 YR 4/6 | 100% | N/A | N/A | N/A | N/A | Loamy sanc | No evidence of redox observed |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: N/A

Depth (inches): N/A

**Hydric Soil Present? Yes ____ No ✔**

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ✔ Sediment Deposits (B2) (**Riverine**)
- ✔ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes ✔ No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

Drift deposits observed as trash; sediment deposits observed on plants.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 12/11/2018

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 5

Investigator(s): Emily Trevino, Kelsey Woldt, Ryan Layden Section, Township, Range: S23, T09N, R03W

Landform (hillslope, terrace, etc.): Adjacent channel Local relief (concave, convex, none): None Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.858104785 Long: -117.153040231 Datum: WGS 84

Soil Map Unit Name: Cajon sand, 2 to 9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes _____ | No ✔ | |

Remarks:

Representative sample point taken within area mapped as tamarisk thickets adjacent to railroad tracks. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated on 12/11/2018; conditions reassessed on 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 10-foot radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Tamarix ramosissima | 40% | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 40% = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 5-foot radius) | | | |
| 1. Atriplex polycarpa | 5% | Yes | FACU |
| 2. Larrea tridentata | 5% | Yes | NL/UPL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 10% = Total Cover | | |
| **Herb Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A = Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 50% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes _____ No ✔

Remarks:

Sample point taken within area mapped as tamarisk thickets. Ten-foot radius for tree stratum used to only account for vegetation within area growing under same soil and hydrologic conditions. Tamarix ramosissima is synonymous with Tamarix chinensis (FAC) per NWPL. Hydric soil and wetland hydrology parameters not met; thus, prevalence index worksheet not required/needed

## SOIL

Sampling Point: WDP 5

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-20 | 10 YR 4/4 | 100% | N/A | N/A | N/A | N/A | Loamy sanc | No evidence of redox observed |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: N/A

Depth (inches): N/A

**Hydric Soil Present? Yes _____ No ✔**

Remarks:

Top 14 inches of soil very dry; soils moistened with spray bottle to record soil color. Bottom 6 inches of soil profile slightly moist. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No ✔ Depth (inches): N/A

Water Table Present? Yes _____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes _____ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

FAC-Neutral test not met. No wetland hydrology indicators observed.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/13/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 6

Investigator(s): Kelsey Woldt, Emily Trevino, Ryan Layden Section, Township, Range: S34, T09N, R03W

Landform (hillslope, terrace, etc.): Between concrete walls Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.823367355 Long: -117.187893481 Datum: WGS 84

Soil Map Unit Name: Victorville sandy loam (soil rated as hydric per the NRCS) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✔, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes _____ | No ✔ | |

Remarks:

Very sparsely vegetated wash within area of NRCS mapped hydric soils. Soil considered disturbed due to presence of rocks/fill at 15 inches. Hydrology considered disturbed due to concrete structures & channelization of flows further south. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated on 12/12/2018; conditions reassessed on 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | N/A = Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | N/A = Total Cover | | |
| **Herb Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A = Total Cover | | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 98% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** **Yes** _____ **No** ✔

Remarks:

Sample point taken within area mapped as disturbed allscale scrub. Less than 5% herbaceous cover (approximately 2%), therefore, per Arid West Manual no herb stratum.

## SOIL

Sampling Point: WDP 6

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-15 | 10 YR 3/3 | 100% | N/A | N/A | N/A | N/A | Sandy clay loan | No evidence of redox observed |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Shovel refusal - rocks/fill and compacted soils

Depth (inches): 15 inches

**Hydric Soil Present? Yes ____ No ✔**

Remarks:

Sample pit only dug to 15 inches due to rocks and compact soils. Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes ____ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

FAC-Neutral test not met (no vegetation). Flows may have historically occurred here; however, no wetland hydrology indicators were observed during field visit.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/13/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 7

Investigator(s): Emily Trevino, Ryan Layden, Kelsey Woldt Section, Township, Range: S04, T08N, R03W

Landform (hillslope, terrace, etc.): Within roadside ditch Local relief (concave, convex, none): slightly concave Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.814749092 Long: -117.195136063 Datum: WGS 84

Soil Map Unit Name: Cajon-Wasco, cool complex, 2 to 9 percent slopes (soil rated as hydric per the NCRS) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✔ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes _____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes ✔ | No _____ | |

Remarks:

Hydrology considered disturbed due to proximity to National Trails Hwy; area appears to primarily collect water adjacent to roadways. Soil cracks and Tamarix ramosissima present in slightly concave area. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated on 12/12/2018; conditions reassessed on 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 10-foot radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Tamarix ramosissima | 40% | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 40% = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 5-foot radius) | | | |
| 1. Atriplex polycarpa | 35% | Yes | FACU |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 35% = Total Cover | | |
| **Herb Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A = Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes _____ No ✔

Remarks:

Sample point taken within area mapped as tamarisk thickets. Ten-foot radius for tree stratum used to only account for vegetation within area growing under same soil and hydrologic conditions. Tamarix ramosissima is synonymous with Tamarix chinensis (FAC) per NWPL. Hydric soil parameter not met; thus, prevalence index worksheet not required/needed

## SOIL

Sampling Point: WDP 7

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-20 | 10 YR 3/3 | 100% | N/A | N/A | N/A | N/A | Silty clay loam | No evidence of redox observed. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: N/A

Depth (inches): N/A

**Hydric Soil Present?** Yes ____ No ✔

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✔ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present?** Yes ✔ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

Surface soil cracks present. FAC-Neutral test not met.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 04/13/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 8

Investigator(s): Kelsey Woldt, Emily Trevino, Ryan Layden Section, Township, Range: S08, T08N, R03W

Landform (hillslope, terrace, etc.): mid-slope terrace Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.802059 Long: -117.215235 Datum: WGS 84

Soil Map Unit Name: Cajon Sand, 2 to 9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✔ | No ____ | **Is the Sampled Area within a Wetland?** Yes ____ No ✔ |
| Hydric Soil Present? | Yes ____ | No ✔ | |
| Wetland Hydrology Present? | Yes ____ | No ✔ | |

Remarks:

Wetland sample point taken based on presence of Tamarix ramosissima. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic). Originally delineated on 08/20/2019, conditions reassessed on 04/13/2022.

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 15-foot radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Tamarix ramosissima | 70% | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 70% = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | N/A = Total Cover | | |
| **Herb Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A = Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 30% % Cover of Biotic Crust N/A

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

✔ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ✔ No ____

Remarks:

Sample point taken within area mapped as tamarisk thickets. Fifteen-foot radius for tree stratum used to only account for vegetation within area growing under same soil and hydrologic conditions. Tamarix ramosissima is synonymous with Tamarix chinensis (FAC) per NWPL. Bare ground covered with vegetative litter.

## SOIL

Sampling Point: WDP 8

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-20 | 10 YR 4/3 | 100 | N/A | N/A | N/A | N/A | Silty loam | No evidence of redox observed. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: N/A

Depth (inches): N/A

**Hydric Soil Present? Yes _____ No ✔**

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No ✔ Depth (inches): N/A

Water Table Present? Yes _____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes _____ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

FAC-Neutral test not met. No wetland hydrology indicators observed.

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 4/12/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 9

Investigator(s): Sarah Krejca, Emily Trevino Section, Township, Range: S27, T09N, R03W

Landform (hillslope, terrace, etc.): Slight depression Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR): LRR D - Interior Deserts Lat: 34.837732 Long: 1177.184099 Datum: WGS 84

Soil Map Unit Name: Victorville sandy loam (soil rated as hydric per the NCRS) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✔ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ✔ | No _____ | **Is the Sampled Area within a Wetland?** Yes _____ No ✔ |
| Hydric Soil Present? | Yes _____ | No ✔ | |
| Wetland Hydrology Present? | Yes _____ | No ✔ | |

Remarks:

Representative sample point taken with area mapped as tamarisk thickets habitat. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic).

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 10-foot radius) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Tamarix ramosissima | 85% | Yes | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 85% = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | N/A = Total Cover | | |
| **Herb Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A = Total Cover | | |
| **Woody Vine Stratum** (Plot size: N/A) | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 15% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ (A) | _____ (B) |

Prevalence Index = B/A = _____

**Hydrophytic Vegetation Indicators:**

✔ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ✔ No _____

Remarks:

Sample point taken within area mapped as tamarisk thickets. Ten-foot radius for tree stratum used to only account for vegetation within area growing under same soil and hydrologic conditions. Tamarix ramosissima is synonymous with Tamarix chinensis (FAC) per NWPL.

## SOIL

Sampling Point: WDP 9

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-14 | 10 YR 3/4 | 100% | N/A | N/A | N/A | N/A | Sandy loam | No evidence of redox observed. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Shovel refusal - compacted soils

Depth (inches): @ 14 inches

**Hydric Soil Present? Yes _____ No ✔**

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes _____ No ✔ Depth (inches): N/A

Water Table Present? Yes _____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes _____ No ✔**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

FAC-Neutral test not met. No wetland hydrology indicators observed.

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 3/24/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 10

Investigator(s): Ryan Layden, Kelsey Woldt Section, Township, Range: S27, T09N, R03W

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): none Slope (%): 0-3

Subregion (LRR): LRR D - Interior Deserts Lat: 34.840370 Long: -117.179805 Datum: WGS 84

Soil Map Unit Name: Cajon sand, 2 to 9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)

Are Vegetation ____, Soil ✔, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes ____ No ✔ |
| Hydric Soil Present? | Yes ____ | No ✔ | |
| Wetland Hydrology Present? | Yes ✔ | No ____ | |

Remarks:

Representative sample point taken within area displaying surface soil cracks just north of dirt road and culvert. Soil considered significantly disturbed due to presence of rocks/rock bed at 10 inches. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic).

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | N/A = Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: 5-foot radius)** | | | |
| 1. Suaeda nigra | 12% | Yes | OBL |
| 2. Atriplex polycarpa | 2% | No | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 14% = Total Cover | | |
| **Herb Stratum (Plot size: 5-foot radius)** | | | |
| 1. Schismus barbatus | 5% | Yes | NL/UPL |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 5% = Total Cover | | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| | N/A = Total Cover | | |

% Bare Ground in Herb Stratum 80% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species ____ | x 1 = ____ |
| FACW species ____ | x 2 = ____ |
| FAC species ____ | x 3 = ____ |
| FACU species ____ | x 4 = ____ |
| UPL species ____ | x 5 = ____ |
| Column Totals: ____ (A) | ____ (B) |

Prevalence Index = B/A = ____

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ____ No ✔

Remarks:

Sample point taken within an area mapped as creosote bush scrub in a dry floodplain north of railroad culvert. Hydric soil parameter not met; thus, prevalence index worksheet not required/needed.

## SOIL

Sampling Point: WDP 10

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10 YR 4/4 | 100% | N/A | N/A | N/A | N/A | Sand | No evidence of redox observed. |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

**Indicators for Problematic Hydric Soils[3]:**

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Shovel refusal - rocks/rock bed

Depth (inches): @10 inches

**Hydric Soil Present? Yes ____ No ✔**

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ✔ Drift Deposits (B3) (**Nonriverine**)
- ✔ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present? Yes ✔ No ____**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

Drift deposits present as dead plant material; surface soil cracks prominent throughout sample area. FAC-Netural test not met.

## WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Barstow City/County: Barstow/San Bernardino Sampling Date: 6/20/2022

Applicant/Owner: BNSF Railway State: CA Sampling Point: WDP 11

Investigator(s): Ryan Layden, Kelsey Woldt Section, Township, Range: S09, T09N, R02W

Landform (hillslope, terrace, etc.): Depressional area Local relief (concave, convex, none): concave Slope (%): 1-3

Subregion (LRR): LRR D - Interior Deserts Lat: 34.883818 Long: -117.094404 Datum: WGS 84

Soil Map Unit Name: Cajon sand, 2 to 9 percent slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✔ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ✔ naturally problematic? (If needed, explain any answers in Remarks.)

### SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No ✔ | **Is the Sampled Area within a Wetland?** Yes ____ No ✔ |
| Hydric Soil Present? | Yes ____ | No ✔ | |
| Wetland Hydrology Present? | Yes ✔ | No ____ | |

Remarks:

Representative sample point taken within concave area where ponding is visible on aerials, near the railway and Pettit Road. Drought conditions per APT (i.e., atypical hydrologic conditions/naturally problematic).

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: N/A) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | N/A | = Total Cover | |
| **Sapling/Shrub Stratum (Plot size: 5-foot radius)** | | | |
| 1. Salsola tragus | 5% | Yes | FACU |
| 2. Atriplex polycarpa | 2% | Yes | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 7% | = Total Cover | |
| **Herb Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | N/A | = Total Cover | |
| **Woody Vine Stratum (Plot size: N/A)** | | | |
| 1. | | | |
| 2. | | | |
| | N/A | = Total Cover | |

% Bare Ground in Herb Stratum 93% % Cover of Biotic Crust 0%

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ____ No ✔

Remarks:

Sample point taken within area mapped as allscale scrub. Hydric soil and wetland parameters not met; thus, prevalence index worksheet not required/needed.

## SOIL

Sampling Point: WDP 11

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 10 YR 5/4 | 100% | N/A | N/A | N/A | N/A | Sand | No evidence of redox observed. |
| | | | | | | | | |
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| | | | | | | | | |

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**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

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- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: Shovel refusal - compact soils

Depth (inches): @8 inches

**Hydric Soil Present?** Yes ____ No ✔

Remarks:

Dry soils; soils moistened with spray bottle to record soil color. Uniform soils throughout. No hydric soil indicators observed.

## HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
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- ___ Drift Deposits (B3) (**Nonriverine**)
- ✔ Surface Soil Cracks (B6)
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- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
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- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

**Field Observations:**

Surface Water Present? Yes ____ No ✔ Depth (inches): N/A

Water Table Present? Yes ____ No ✔ Depth (inches): N/A

Saturation Present? (includes capillary fringe) Yes ____ No ✔ Depth (inches): N/A

**Wetland Hydrology Present?** Yes ✔ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

N/A

Remarks:

Surface soil cracks prominent throughout sample area. FAC-Neutral test not met.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 1
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/22 **Time:** 1010
**Town:** Barstow **State:** CA
**Photo begin file#:** 1 **Photo end file#:** 1

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.879643,-117.105536

**Potential anthropogenic influences on the channel system:**
Runoff from adjacent commercial lots, National Trails Hwy, and active railroad tracks.

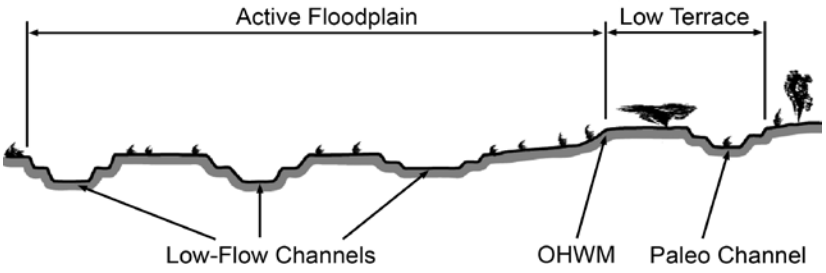
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

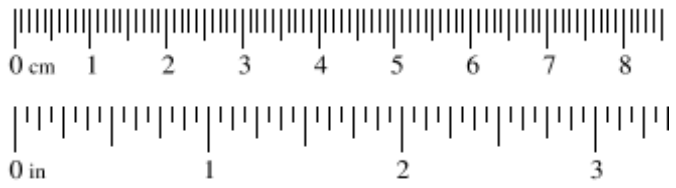



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

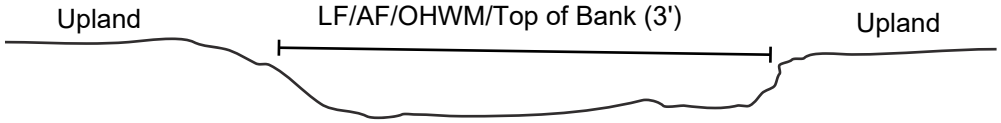
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 1 **Date:** 04/13/22 **Time:** 1010

## Cross section drawing:




## OHWM

**GPS point:** 34.879643,-117.105536

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide OHWM defined by a clear break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography. Small unvegetated channel which flows into culvert under railroad tracks; two small channels input into this main sandy feature.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 1 **Date:** 04/13/22 **Time:** 1010

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide AF with clear break in bank slope. Drift/debris present as trash. Coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very fine sand

Total veg cover: 50 % Tree: 0 % Shrub: 35 % Herb: 15 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Cynodon dactylon and Salsola sp. Very fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 2
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 0951
**Town:** Barstow **State:** CA
**Photo begin file#:** 3 **Photo end file#:** 3

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.87744646, -117.11103257

**Potential anthropogenic influences on the channel system:**
Upstream input from culvert crossing at National Trails Highway; runoff from adjacent residential lots.

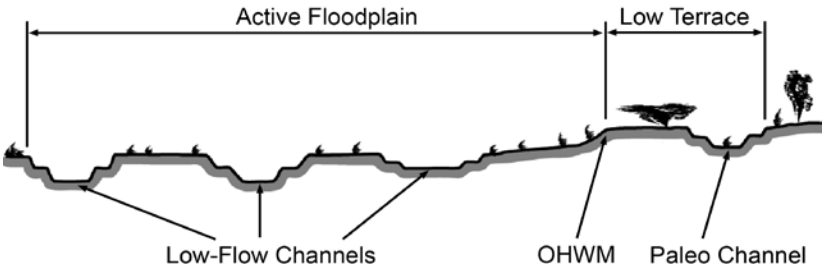
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

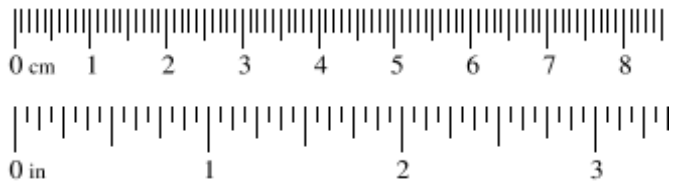



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

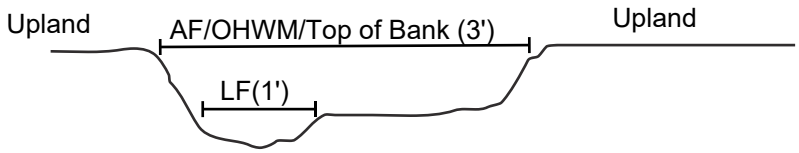
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 2 **Date:** 04/13/2022 **Time:** 0951

## Cross section drawing:




## OHWM

**GPS point:** 34.87744646, -117.11103257

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography. Feature dwindles out at road, field staff did not observe a connection downstream.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Just below AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☑ Other: coarser sediment texture
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide low-flow channel (LF) characterized by a break in bank slope. Granule sediment texture throughout.

**Project ID:** Big Barstow **Cross section ID:** ODP 2 **Date:** 04/13/2022 **Time:** 0951

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: 5 % Tree: 0 % Shrub: 0 % Herb: 5 %

Community successional stage:

- ☐ NA
- ☑ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide active floodplain (AF) with visible bed and bank. Vegetation dominated by sparse upland grasses and herbs. Drift/debris present as trash. Coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Pebble

Total veg cover: 20 % Tree: 0 % Shrub: 15 % Herb: 5 %

Community successional stage:

- ☐ NA
- ☑ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Atriplex polycarpa and creosote dominant vegetation with annual non-native grasses on upland slopes directly adjacent to channel. Pebble sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 3
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1025
**Town:** Barstow **State:** CA
**Photo begin file#:** 4 **Photo end file#:** 4

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.87408624, -117.11735678

**Potential anthropogenic influences on the channel system:**
Concrete storm drain feature diverts flows into delineated area creating channel; surrounded by road/intersection, active railroad, and housing.

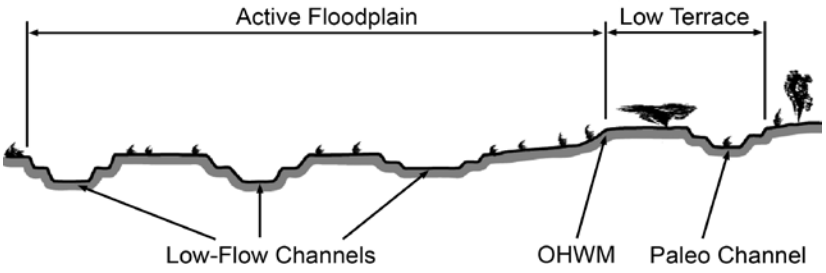
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

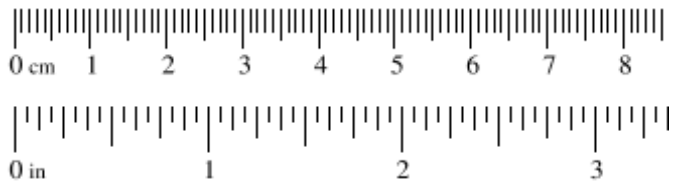



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

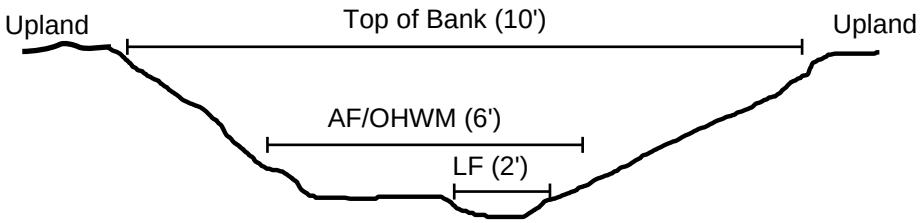
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 3 **Date:** 04/13/2022 **Time:** 1025

**Cross section drawing:**




## OHWM

**GPS point:** 34.87408624, -117.11735678

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide OHWM; width noted from portion of the feature that is not a part of the storm drain structure (concrete 4' channel). OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Just below AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☑ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☑ Other: coarser sediment texture
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 2-foot wide low-flow channel (LF) exhibiting small areas with mudcracks. Granule sediment texture throughout.

**Project ID:** Big Barstow **Cross section ID:** ODP 3 **Date:** 04/13/2022 **Time:** 1025

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very fine sand

Total veg cover: 5 % Tree: 0 % Shrub: 5 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide active floodplain (AF) with visible bed and bank. Vegetation dominated by Atriplex polycarpa. Drift/debris present as trash. Very fine sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse silt

Total veg cover: 20 % Tree: 0 % Shrub: 20 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☑ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace; continues from AF to upland. Vegetation dominated by Atriplex polycarpa and Sphaeralcea sp. on upland adjacent to channel; gravel on western slope within landscaped area, eastern slope/bank not landscaped. Coarse silt sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 4
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 0757
**Town:** Barstow **State:** CA
**Photo begin file#:** 6 **Photo end file#:** 6

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.86896511, -117.12867725

**Potential anthropogenic influences on the channel system:**
Highly manipulated/disturbed (off-road vehicle use) trapezoidal channel flowing under railroad tracks.

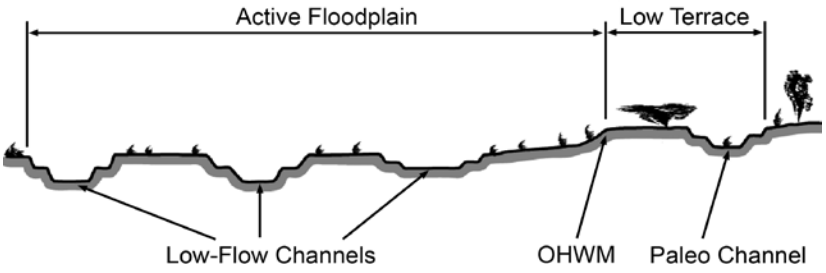
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

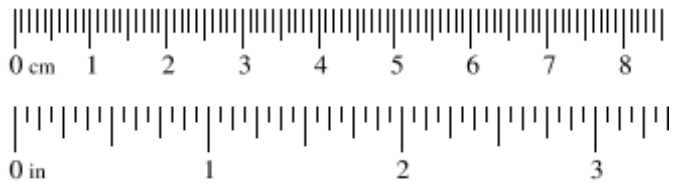



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

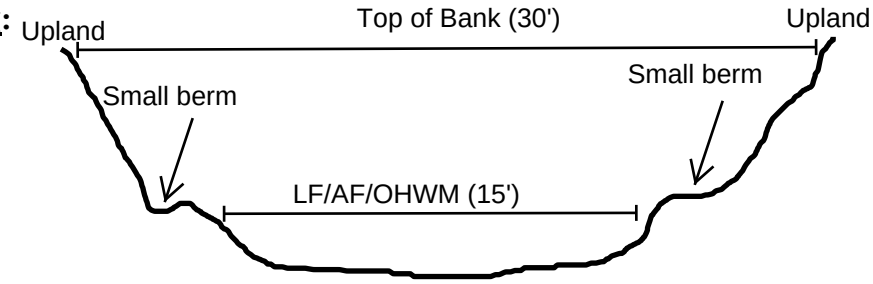
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 4 **Date:** 04/13/2022 **Time:** 0757

**Cross section drawing:**




## OHWM

**GPS point:** 34.86896511, -117.12867725

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 15-foot wide OHWM; wider upstream with larger sediment/pebbles in channel. OHWM defined by a break in bank slope and change in average sediment texture. Highly manipulated trapezoidal channel; evidence of off-road vehicle use throughout. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 4 **Date:** 04/13/2022 **Time:** 0757

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very fine sand

Total veg cover: 5 % Tree: 0 % Shrub: 5 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☑ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☐ Surface relief
- ☑ Drift and/or debris
- ☐ Other: _____
- ☑ Presence of bed and bank
- ☐ Other: _____
- ☐ Benches
- ☐ Other: _____

**Comments:**

Approximately 15-foot wide AF; soils may have been recently compacted by off-road vehicle use or other disturbance. Vegetation dominated by Salsola sp. Drift/debris present as dead plant material. Very fine sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Soil development
- ☐ Ripples
- ☑ Surface relief
- ☐ Drift and/or debris
- ☐ Other: _____
- ☐ Presence of bed and bank
- ☐ Other: _____
- ☐ Benches
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Manipulated/channelized features--upland slopes highly disturbed. Surface relief defines uplands. Granule sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 5
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 0804
**Town:** Barstow **State:** CA
**Photo begin file#:** 8 **Photo end file#:** 8

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.86403251, -117.13160838

**Potential anthropogenic influences on the channel system:**
Wash appears to be regularly driven and manipulated by off-road vehicles, and is bisected by other dirt roads.

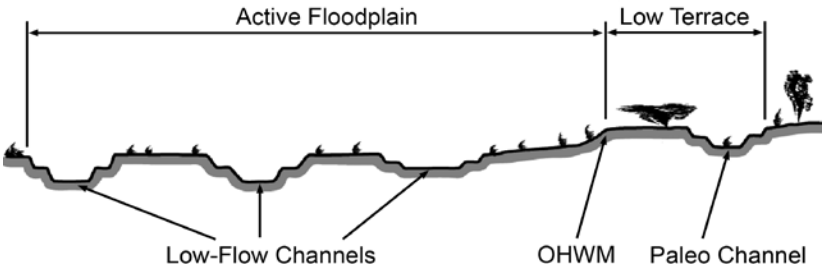
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

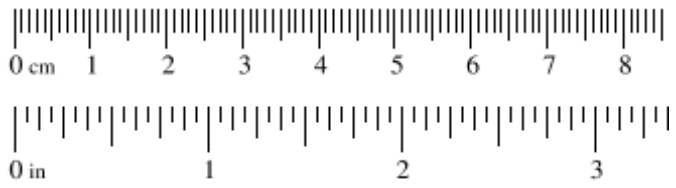



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

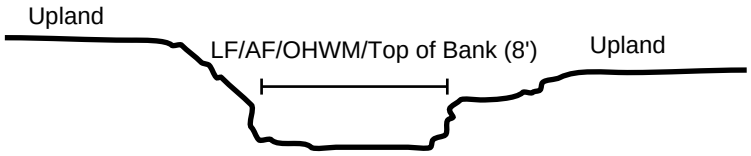
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 5 **Date:** 04/13/2022 **Time:** 0804

**Cross section drawing:**




## OHWM

**GPS point:** 34.86403251, -117.13160838

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 8-foot wide OHWM defined by change in average sediment texture, change in vegetation cover, and change in average sediment texture. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 5 **Date:** 04/13/2022 **Time:** 0804

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 8-foot wide AF with sandy wash characteristics. Drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very fine sand

Total veg cover: 2 % Tree: 0 % Shrub: 2 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☑ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Ephedra sp. and Atriplex polycarpa. Very fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 6
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 0810
**Town:** Barstow **State:** CA
**Photo begin file#:** 9 **Photo end file#:** 9

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.865122044,-117.13308065

**Potential anthropogenic influences on the channel system:**
Upstream runoff from adjacent dirt road leading from National Trails Highway.

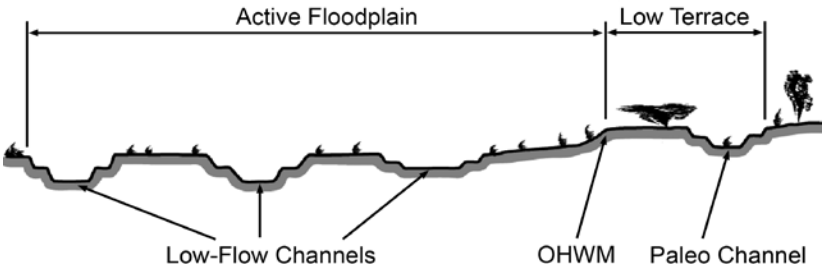
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

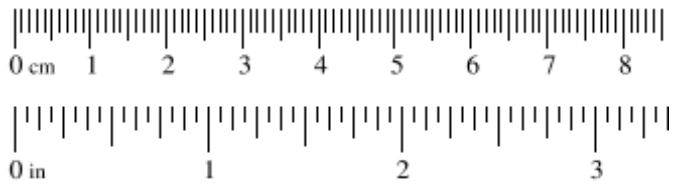



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

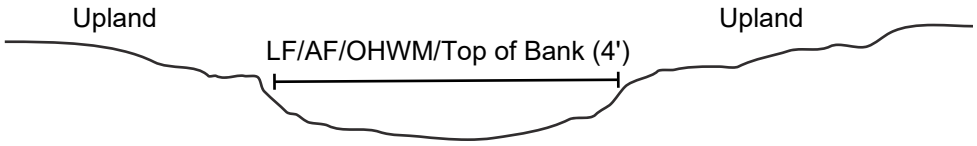
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 6 **Date:** 04/13/2022 **Time:** 0810

## Cross section drawing:




## OHWM

**GPS point:** 34.865122044,-117.13308065

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide OHWM defined by change in vegetation cover and change in average sediment texture. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 6 **Date:** 04/13/2022 **Time:** 0810

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide AF. Drift present as dead plant material deposited on Atriplex scrub adjacent to channel. Very coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Atriplex sp. Fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 7
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 0823
**Town:** Barstow **State:** CA
**Photo begin file#:** 10 **Photo end file#:** 10

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.86456294, -117.13547279

**Potential anthropogenic influences on the channel system:**
Off-road vehicle use and potential influence by adjacent homes. Upstream log obstruction likely placed by adjacent residents.

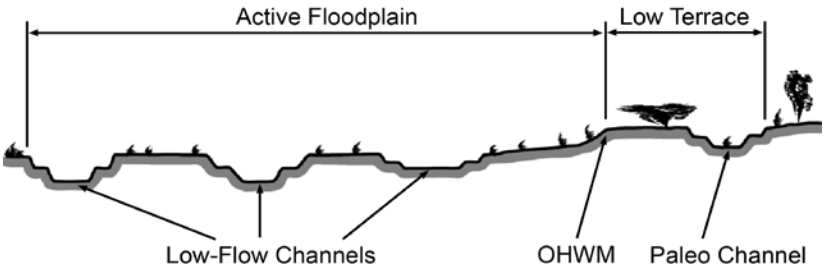
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

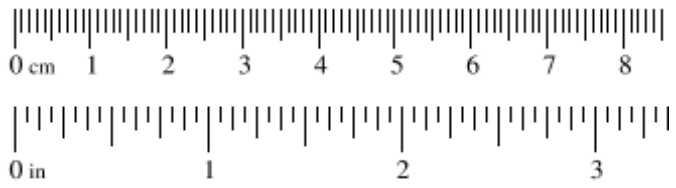



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

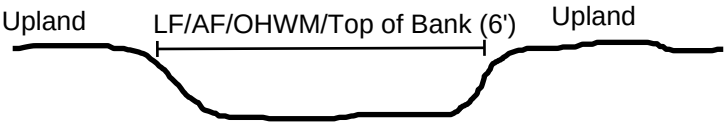
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 7 **Date:** 04/13/2022 **Time:** 0823

**Cross section drawing:**




## OHWM

**GPS point:** 34.86456294, -117.13547279

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 7 **Date:** 04/13/2022 **Time:** 0823

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide AF with clear break in slope; Drift/debris present as dead plant material. Very coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Fine sand

Total veg cover: 17 % Tree: 0 % Shrub: 15 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by creosote bush/Atriplex scrub. Fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 8
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1326
**Town:** Barstow **State:** CA
**Photo begin file#:** 11 **Photo end file#:** 11

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.86171543, -117.14261952

**Potential anthropogenic influences on the channel system:**
Residential dirt roads and housing may be contributing to localized flows that do not appear to connect downstream.

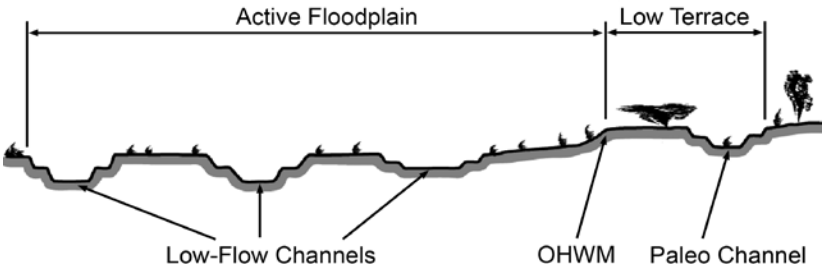
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/10/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

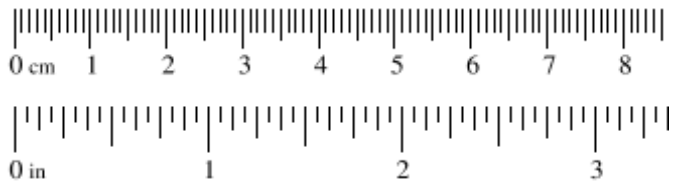



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

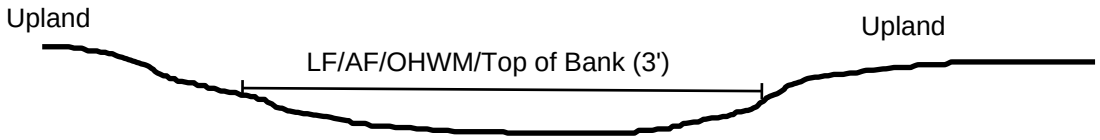
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** BNSF Big Barstow **Cross section ID:** ODP 8 **Date:** 04/13/2022 **Time:** 1326

**Cross section drawing:**




## OHWM

**GPS point:** 34.86171543, -117.14261952

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide OHWM defined by a very shallow and gradual break in slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 8 **Date:** 04/13/2022 **Time:** 1326

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide AF with very shallow and gradual break in slope. Drift/debris present as dead plant. Very coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Ambrosia dumosa and Larrea tridentata. Coarse sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 9
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1331
**Town:** Barstow **State:** CA
**Photo begin file#:** 12 **Photo end file#:** 12

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.86304344,-117.140500865

**Potential anthropogenic influences on the channel system:**
Area received runoff from adjacent residential homes and dirt roads.

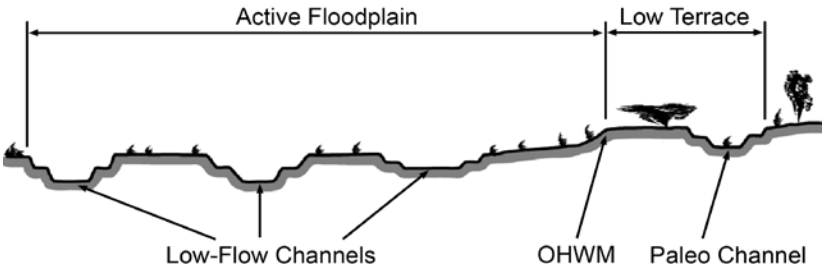
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

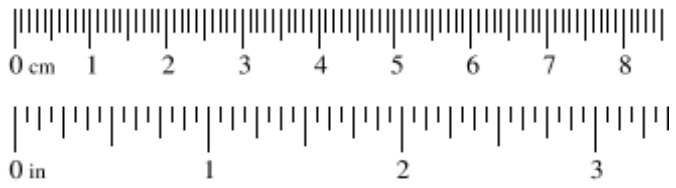



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

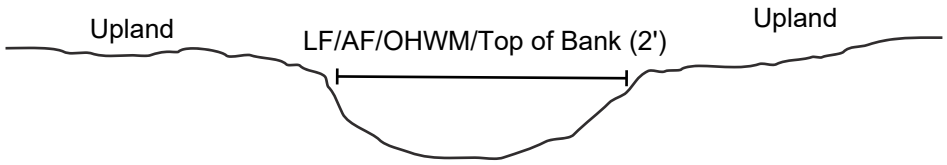
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 9 **Date:** 04/13/2022 **Time:** 1331

**Cross section drawing:**




## OHWM

**GPS point:** 34.86304344,-117.140500865

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 2-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 9 **Date:** 04/13/2022 **Time:** 1331

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 2-foot wide AF. Drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Fine sand

Total veg cover: 10 % Tree: 0 % Shrub: 10 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Ambrosia dumosa and Larrea tridentata. Find sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 10
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1315
**Town:** Barstow **State:** CA
**Photo begin file#:** 13 **Photo end file#:** 13

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.85849318,-117.148919321

**Potential anthropogenic influences on the channel system:**
Area shows evidence of heavy off-road vehicle use and yard trash dumped in wash and throughout area.

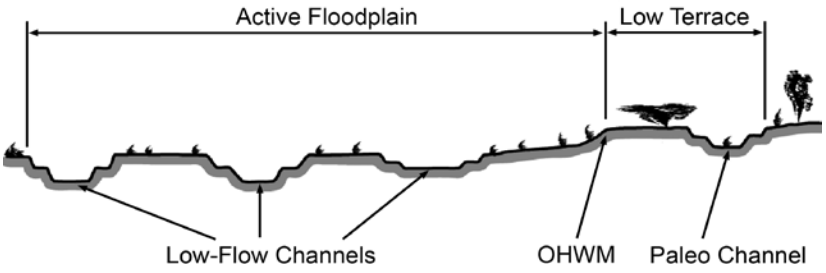
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

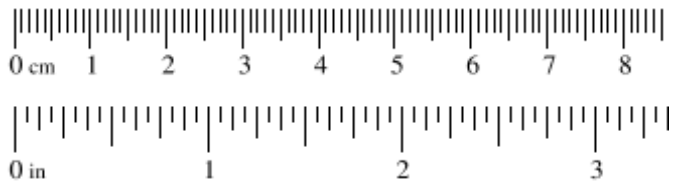



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

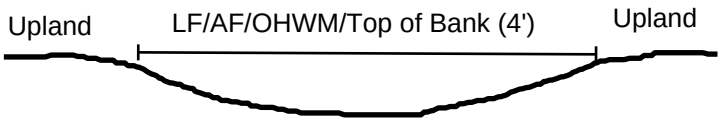
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 10 **Date:** 04/13/2022 **Time:** 1315

**Cross section drawing:**




## OHWM

**GPS point:** 34.85849318,-117.148919321

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide OHWM defined by a shallow/gradual break in slope, change in vegetation cover, and change in average sediment texture. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 10 **Date:** 04/13/2022 **Time:** 1315

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide AF with slight break in slope. Drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 10 % Tree: 0 % Shrub: 10 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Ambrosia dumosa and Larrea tridentata scrub. Fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** BNSF Big Barstow
**Project Number:** N/A
**Stream:** ODP 11
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/22 **Time:** 1309
**Town:** Barstow **State:** CA
**Photo begin file#:** 14 **Photo end file#:** 14

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.857778251,-117.15123949

**Potential anthropogenic influences on the channel system:**
Heavy off-road vehicle use, dirt roads, and trash/debris throughout the entire area.

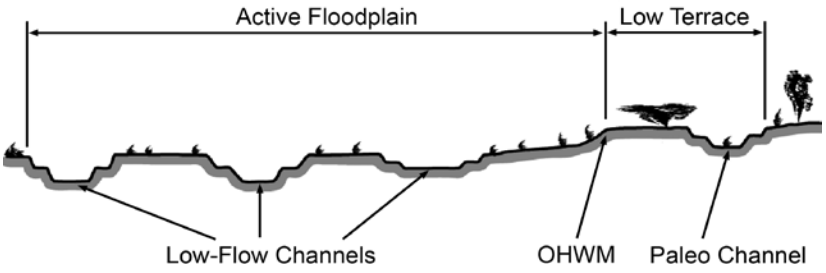
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

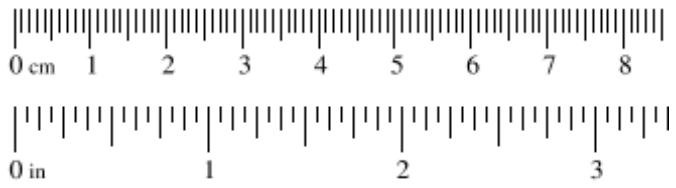



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

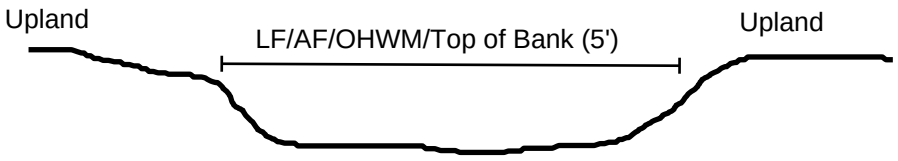
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 11 **Date:** 04/13/2022 **Time:** 1309

## Cross section drawing:




## OHWM

**GPS point:** 34.857778251,-117.15123949

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 5-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Feature has decreased definition in upstream and downstream portions and remains defined in the mid section. Feature appears erosional adjacent to road. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 11 **Date:** 04/13/22 **Time:** 1309

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 5-foot wide AF. Drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: fine sand

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Ambrosia dumosa and Larrea tridentata scrub. Fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 12
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/12/2022 **Time:** 1452
**Town:** Barstow **State:** CA
**Photo begin file#:** 16 **Photo end file#:** 16

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.857778251,-117.15123949

**Potential anthropogenic influences on the channel system:**
Area receives runoff from adjacent dirt road and railroad tracks.

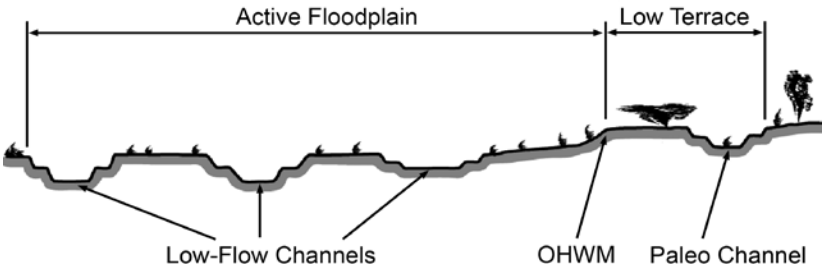
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

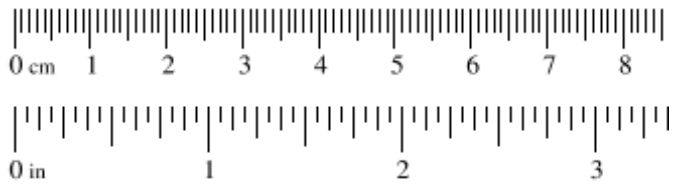



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

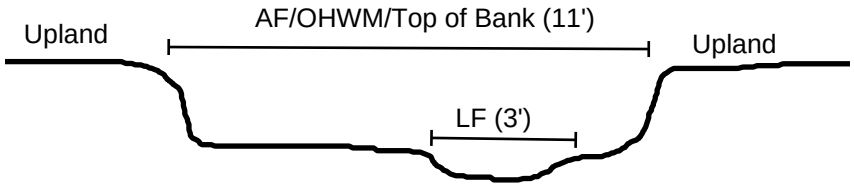
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 12 **Date:** 04/12/2022 **Time:** 1452

**Cross section drawing:**




## OHWM

**GPS point:** 34.85631287,-117.15451914

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 11-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Just below AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide low-flow channel (LF); very shallow and faint in some portions of the feature. Visible bed and bank. Granule sediment texture throughout.

**Project ID:** Big Barstow **Cross section ID:** ODP 12 **Date:** 04/12/2022 **Time:** 1452

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 2 % Tree: 0 % Shrub: 0 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☐ Mid (herbaceous, shrubs, saplings)
- ☑ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 11-foot wide AF, incised with an abrupt shift from upland to AF. Drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Early (herbaceous & seedlings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Atriplex canescens/Atriplex polycarpa scrub. Coarse sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 13
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/12/2022 **Time:** 1440
**Town:** Barstow **State:** CA
**Photo begin file#:** 17 **Photo end file#:** 17

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.853941018,-117.15730066

**Potential anthropogenic influences on the channel system:**
Area subject to heavy upstream off-road vehicle use and receives runoff from adjacent residential neighborhood.

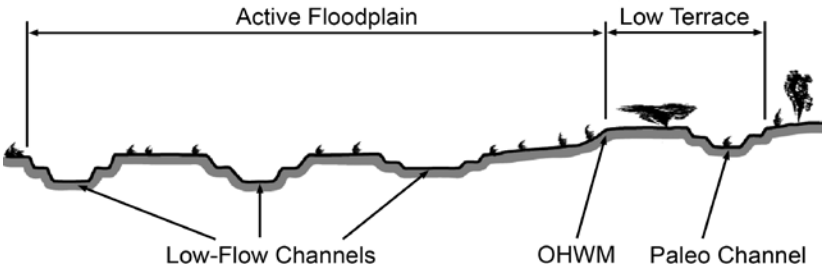
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

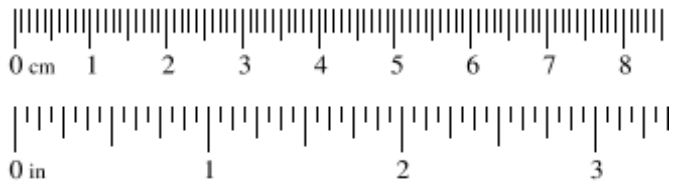



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

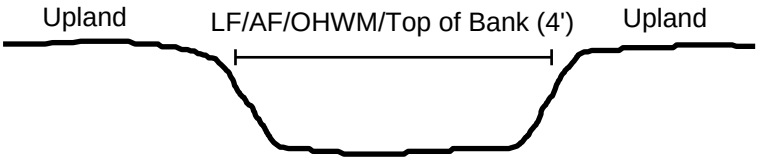
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 13 **Date:** 04/12/2022 **Time:** 1440

**Cross section drawing:**




## OHWM

**GPS point:** 34.853941018,-117.15730066

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide OHWM defined by a break in bank slope, change in vegetation cover, and change in average sediment texture. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 13 **Date:** 4/12/2022 **Time:** 1440

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide AF. Shallow channel with drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very fine sand

Total veg cover: 10 % Tree: 0 % Shrub: 10 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Atriplex polycarpa and Ambrosia dumosa scrub. Very fine sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 14
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/12/2022 **Time:** 1418
**Town:** Barstow **State:** CA
**Photo begin file#:** 18 **Photo end file#:** 18

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.84826389,-117.165801470

**Potential anthropogenic influences on the channel system:**
Area receives runoff from upstream residential neighborhood and associated dirt roads.

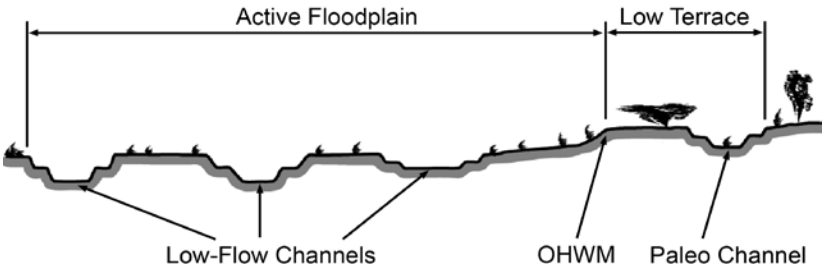
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

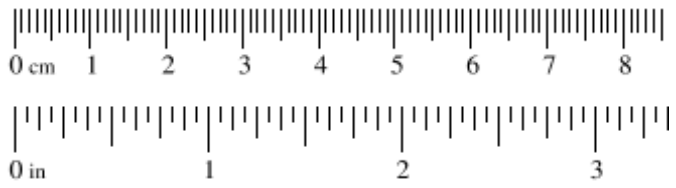



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

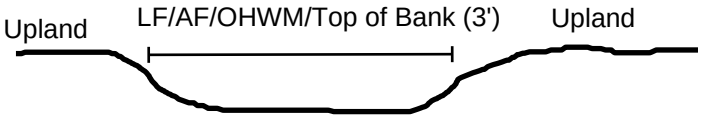
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | Gravel |
| 2.56 | 64 | Cobble | Gravel |
| 0.157 | 4 | Pebble | Gravel |
| 0.079 | 2.00 | Granule | Gravel |
| 0.039 | 1.00 | Very coarse sand | Sand |
| 0.020 | 0.50 | Coarse sand | Sand |
| 1/2 0.0098 | 0.25 | Medium sand | Sand |
| 1/4 0.005 | 0.125 | Fine sand | Sand |
| 1/8 0.0025 | 0.0625 | Very fine sand | Sand |
| 1/16 0.0012 | 0.031 | Coarse silt | Silt |
| 1/32 0.00061 | 0.0156 | Medium silt | Silt |
| 1/64 0.00031 | 0.0078 | Fine silt | Silt |
| 1/128 0.00015 | 0.0039 | Very fine silt | Silt |
| | | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 14 **Date:** 04/12/2022 **Time:** 1418

**Cross section drawing:**




## OHWM

**GPS point:** 34.84826389,-117.165801470

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide OHWM defined by a break in bank slope, change in vegetation cover, and change in average sediment texture. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 14 **Date:** 04/12/2022 **Time:** 1418

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 3-foot wide AF. Shallow channel with drift/debris present as dead plant material. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very fine sand

Total veg cover: 5 % Tree: 0 % Shrub: 5 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Larrea tridentata and Ambrosia dumosa scrub. Very fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 15
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/12/2022 **Time:** 1304
**Town:** Barstow **State:** CA
**Photo begin file#:** 19 **Photo end file#:** 19

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.84366014,-117.167787774

**Potential anthropogenic influences on the channel system:**
Area receives runoff from upstream residential neighborhood and associated dirt roads.

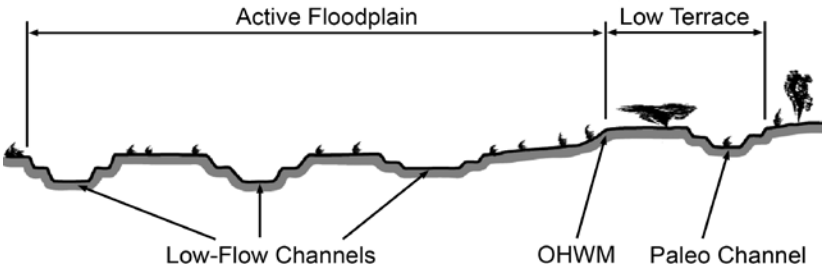
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

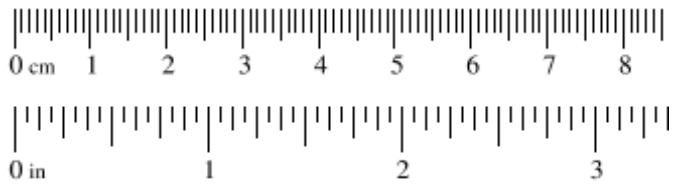



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

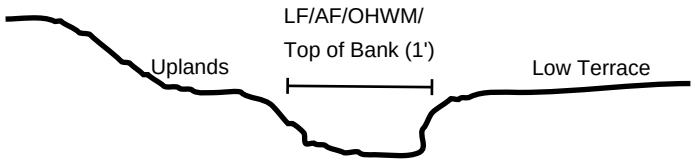
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 15 **Date:** 04/12/2022 **Time:** 1304

**Cross section drawing:**




## OHWM

**GPS point:** 34.84366014,-117.167787774

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 15 **Date:** 04/12/2022 **Time:** 1304

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☑ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide AF exhibiting ripples. Coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 10 % Tree: 0 % Shrub: 10 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Uplands present at west bank; low terrace present at east bank. Vegetation dominated by Larrea tridentata scrub. Multiple, vegetated low terrace areas exist between the seven OHWMs within the low topographic area. Granule sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 16
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/12/2022 **Time:** 1021
**Town:** Barstow **State:** CA
**Photo begin file#:** 20 **Photo end file#:** 20

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.83413979,-117.182567893

**Potential anthropogenic influences on the channel system:**
Residential irrigation appears to be contributing to flow. Additionally, trash and debris is present within and along banks of the feature.

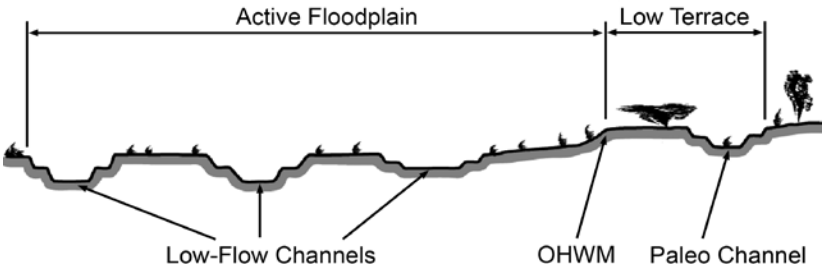
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

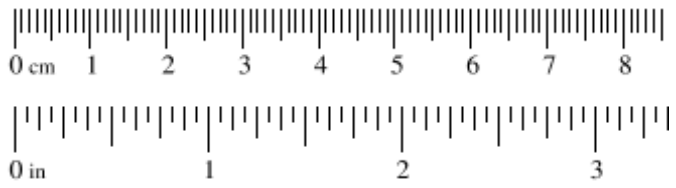



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

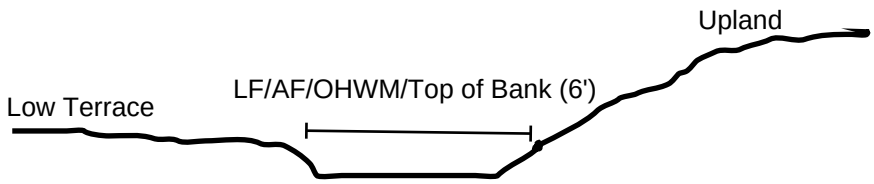
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 16 **Date:** 04/12/2022 **Time:** 1021

**Cross section drawing:**




## OHWM

**GPS point:** 34.83413979,-117.182567893

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 16 **Date:** 04/12/2022 **Time:** 1021

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide AF. Drift/debris present as dead plant material. Coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 10 % Tree: 0 % Shrub: 10 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Uplands present at west bank; low terrace present at east bank. Vegetation dominated by Larrea tridentata, Atriplex polycarpa, and Ambrosia dumosa. Granule sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 17
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1138
**Town:** Barstow **State:** CA
**Photo begin file#:** 21 **Photo end file#:** 21

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.82964338,-117.183496811

**Potential anthropogenic influences on the channel system:**
Wash appears to be utilized as a road for off-road vehicles. Flows are diverted into large culvert under railroad tracks.

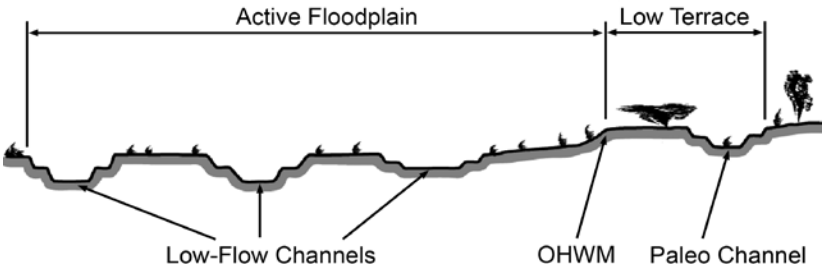
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

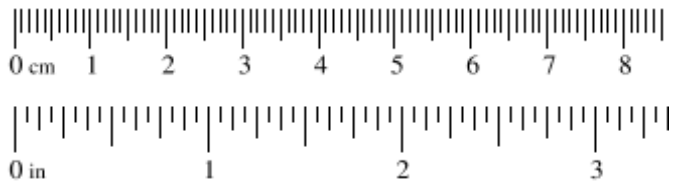



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

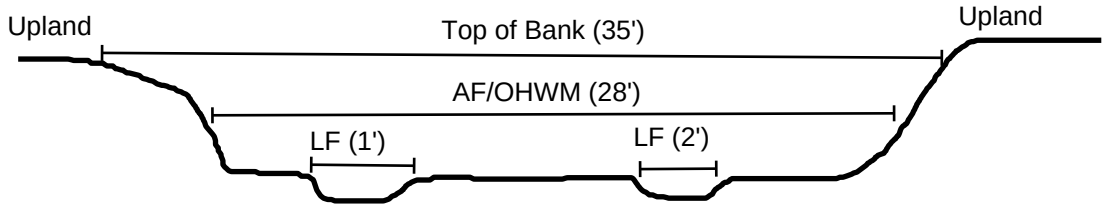
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 17 **Date:** 04/13/2022 **Time:** 1138

**Cross section drawing:**




## OHWM

**GPS point:** 34.82964338,-117.183496811

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Large wash/road with approximately 28-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Just below AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☑ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☑ Other: finer sediment texture
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Two low-flow channels (LF) measuring approximately 1 foot and 2 feet wide; exhibiting ripples. Coarse sand sediment texture throughout.

**Project ID:** Big Barstow **Cross section ID:** ODP 17 **Date:** 04/13/2022 **Time:** 1138

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 4 % Tree: 0 % Shrub: 0 % Herb: 4 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☑ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 28-foot wide active floodplain (AF) that appears to function as a road. Drift/debris present as dead plant material. Vegetation dominated by Schismus sp. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: pebble

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Larrea tridentata, Atriplex polycarpa, and Senna armata. Pebble sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 18
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1057
**Town:** Barstow **State:** CA
**Photo begin file#:** 23 **Photo end file#:** 23

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.808776842,-117.201606214

**Potential anthropogenic influences on the channel system:**
Dirt road and small dirt berm are severing potential downstream connection.

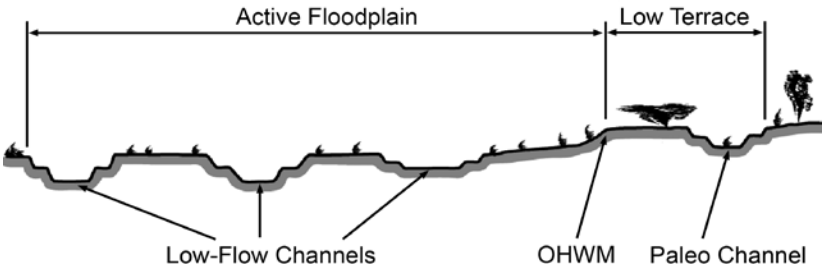
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Area receives flows from higher desert ground. Originally delineated on 12/12/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

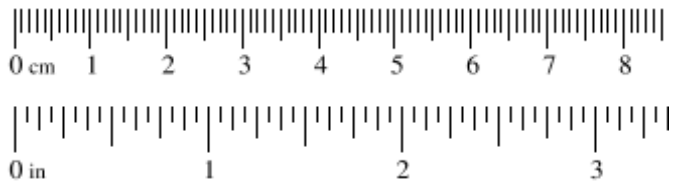



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

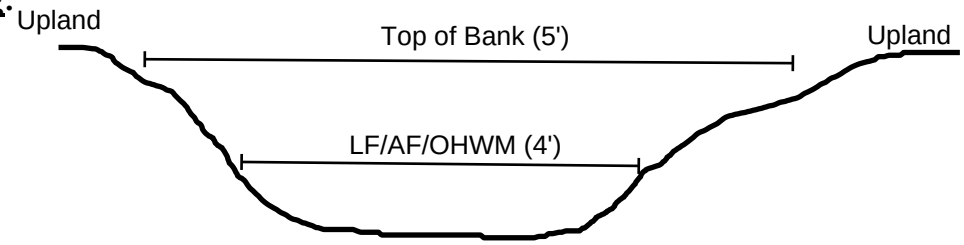
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 18 **Date:** 04/13/2022 **Time:** 1057

**Cross section drawing:**




## OHWM

**GPS point:** 34.808776842,-117.201606214

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 18 **Date:** 04/13/2022 **Time:** 1057

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☑ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 4-foot wide OHWM. Granule sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: pebble

Total veg cover: 20 % Tree: 0 % Shrub: 20 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by Atriplex polycarpa scrub. Pebble sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 19
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/12/2022 **Time:** 1257
**Town:** Barstow **State:** CA
**Photo begin file#:** 24 **Photo end file#:** 24

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.84361111, -117.16861111

**Potential anthropogenic influences on the channel system:**
Area receives runoff from upstream residential neighborhood and associated dirt roads.

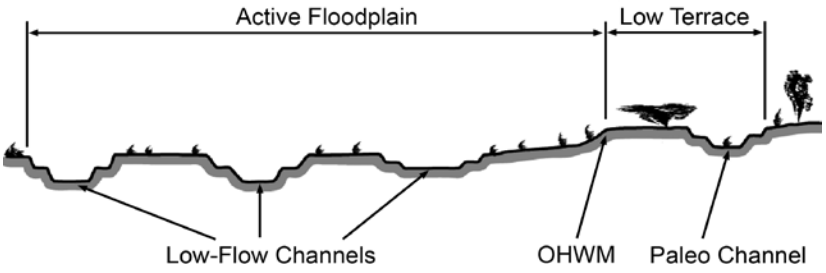
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 12/11/2018, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

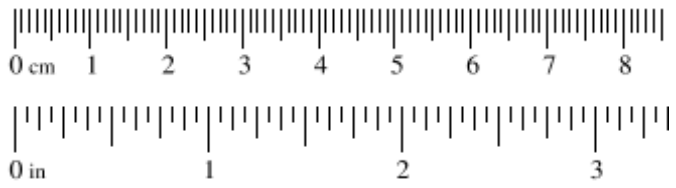



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

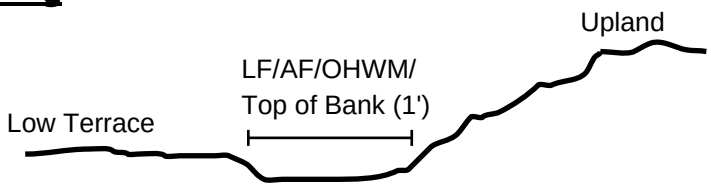
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 19 **Date:** 04/12/2022 **Time:** 1257

**Cross section drawing:**




## OHWM

**GPS point:** 34.84361111, -117.16861111

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide OHWM defined by a change in average sediment texture, change in vegetation cover, and a break in bank slope. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 19 **Date:** 04/12/2022 **Time:** 1257

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☑ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide AF exhibiting sandy wash characteristics and ripples. Coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: pebble

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Uplands present at south bank; low terrace present at southeast bank. Vegetation dominated by Larrea tridentata scrub. Multiple, vegetated low terrace areas exist between the seven OHWMs within the low topographic area. Pebble sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 20
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 04/13/2022 **Time:** 1123
**Town:** Barstow **State:** CA
**Photo begin file#:** 25 **Photo end file#:** 25

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.81944638, -117.18971987

**Potential anthropogenic influences on the channel system:**
Area receives runoff from dirt road and railroad; trash/debris present.

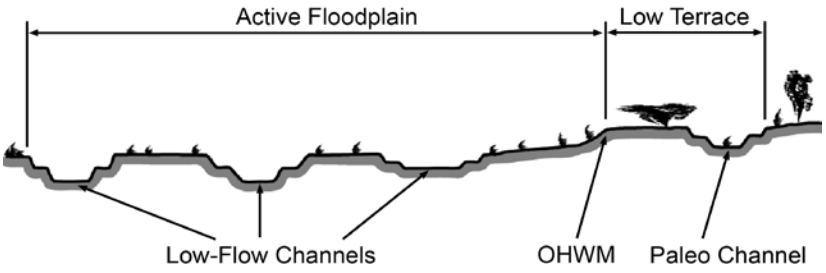
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Swale-like feature between dirt road and railroad. Originally delineated on 12/12/2018, conditions reassessed on 04/13/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

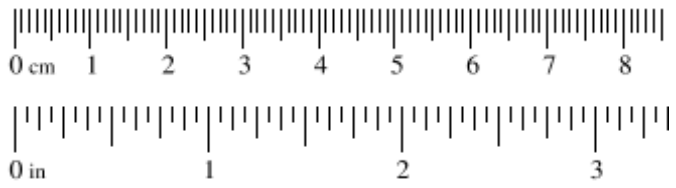



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

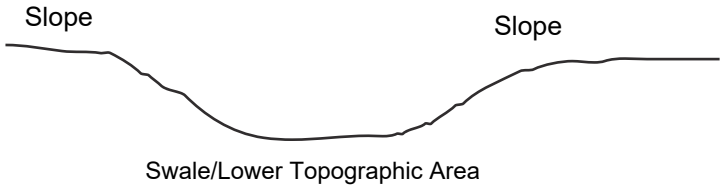
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 20 **Date:** 04/13/2022 **Time:** 1123

**Cross section drawing:**




## OHWM

**GPS point:** 34.81944638, -117.18971987

**Indicators:**

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☐ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Lower topographic area (i.e., swale-like feature) that does not appear to sustain sufficient drainage flows to create the presence of a bed and bank and/or break in bank slope. Average sediment texture and vegetation species did not appear to differ from lower topographic area to adjacent slopes. A change in vegetation cover was observed between the lower topographic area and adjacent slopes (lower topographic area is generally unvegetated); however, no other OHWM indicators were present.

## Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

**Project ID:** Big Barstow **Cross section ID:** ODP 20 **Date:** 04/13/2022 **Time:** 1123

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 21
**Investigator(s):** Emily Trevino, Kelsey Woldt, Ryan Layden

**Date:** 4/12/2022
**Town:** Barstow
**Photo begin file#:** 27

**Time:** 1335
**State:** CA
**Photo end file#:** 27

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.840211, -117.169904

**Potential anthropogenic influences on the channel system:**
Area receives runoff form adjacent dirt road and National Trails Highway.

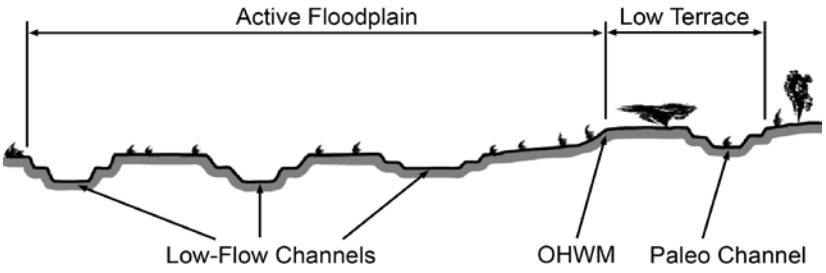
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Originally delineated on 8/20/2019, conditions reassessed on 04/12/2022.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

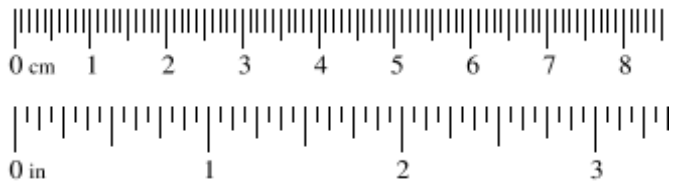



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

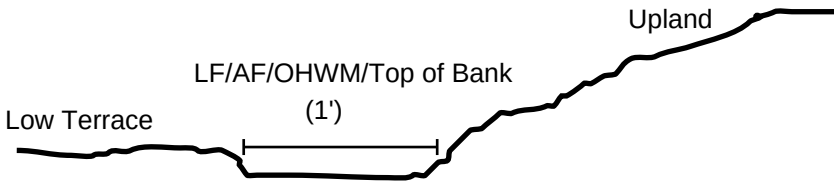
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 21 **Date:** 04/12/2022 **Time:** 1335

**Cross section drawing:**




## OHWM

**GPS point:** 34.840211, -117.169904

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide OHWM adjacent to two similar features in an area of low topography. OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 21 **Date:** 04/12/2022 **Time:** 1335

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide AF with a 1-inch break in slope. Coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: granule

Total veg cover: 15 % Tree: 0 % Shrub: 8 % Herb: 7 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Upland present at west bank; low terrace present at east bank. Upland vegetation dominated by Ambrosia dumosa, Larrea tridenta, Ephedra sp., Schismus barbatus, and Atriplex canescens. Low terrace vegetation consists of the above species as well as Erodium sp. Granule sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 22
**Investigator(s):** Sarah Krejca, Natasha Foti

**Date:** 12/01/2021 **Time:** 1115
**Town:** Barstow **State:** CA
**Photo begin file#:** 28 **Photo end file#:** 28

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.847611, -117.152992

**Potential anthropogenic influences on the channel system:**
Wash appears to be utilized as a road for off-road vehicles. Area also receives runoff from National Trails Highway to the south/southeast.

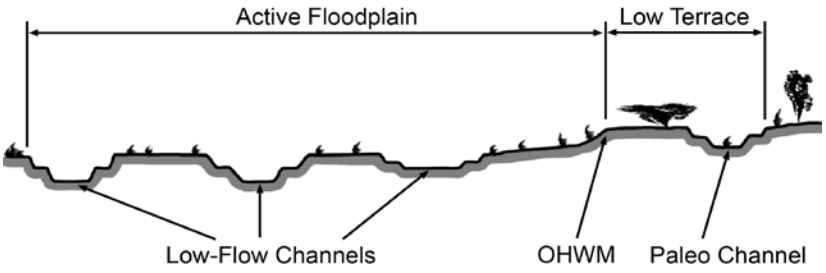
**Brief site description:**
Immediate surrounding area generally undeveloped except for National Trails Highway directly southeast.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

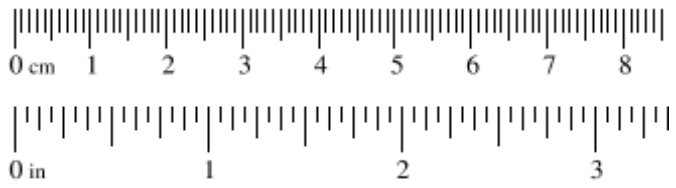



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

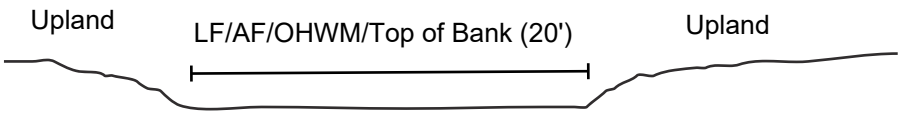
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 22 **Date:** 12/01/2021 **Time:** 1115

**Cross section drawing:**




## OHWM

**GPS point:** 34.847611, -117.152992

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 20-foot wide OHWM defined by an approximately 1-inch break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 22 **Date:** 12/01/2021 **Time:** 1115

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 20-foot wide AF with an approximately 1-inch break in bank slope. Very coarse sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 20 % Tree: 0 % Shrub: 17 % Herb: 3 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by creosote bush (Larrea tridentata), ephedra (Ephedra sp.), and unknown dried/dead grass. Granule sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 23
**Investigator(s):** Sarah Krejca, Natasha Foti

**Date:** 12/01/2021
**Town:** Barstow
**Photo begin file#:** 29

**Time:** 1215
**State:** CA
**Photo end file#:** 29

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.858029, -117.140586

**Potential anthropogenic influences on the channel system:**
Wash receives runoff from dirt road at upstream extent.

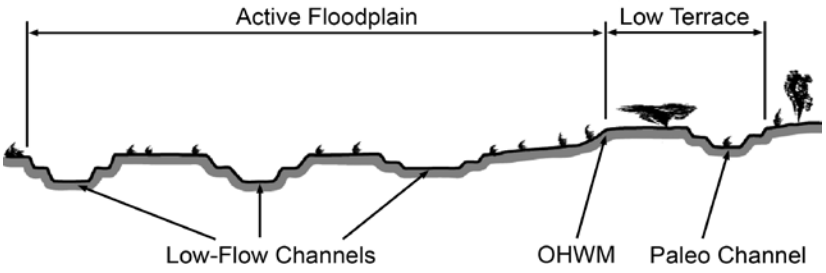
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Immediate surrounding area generally flat and undeveloped except for dirt roads at upstream extent and just downstream.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

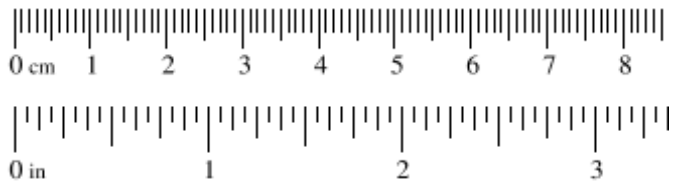



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

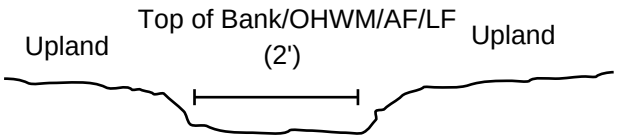
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 23 **Date:** 12/01/2021 **Time:** 1215

**Cross section drawing:**




## OHWM

**GPS point:** 34.858029, -117.140586

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 2-foot wide OHWM defined by an approximately 2-inch break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 23 **Date:** 12/01/2021 **Time:** 1215

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Medium sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1-foot wide AF with an approximately 2-inch break in bank slope. Medium sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very fine sand

Total veg cover: 15 % Tree: 0 % Shrub: 10 % Herb: 5 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by creosote bush (Larrea tridentata), allscale (Atriplex sp.), and unknown dried/dead grass. Very fine sand sediment texture with pebbles throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 24
**Investigator(s):** Sarah Krejca, Kelsey Woldt, Alec Goodman

**Date:** 03/16/2022
**Town:** Barstow
**Photo begin file#:** 30

**Time:** 1210
**State:** CA
**Photo end file#:** 30

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.852444, -117.182596

**Potential anthropogenic influences on the channel system:**
Area receives upstream road runoff from dirt roads and National Trails Highway.

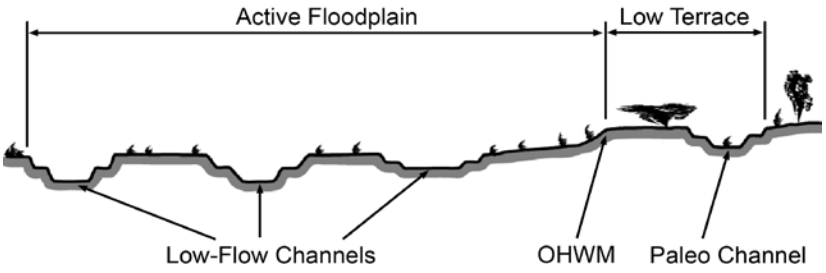
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Immediate surrounding area generally undeveloped except for dirt roads

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

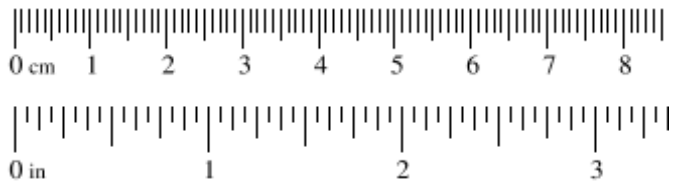



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

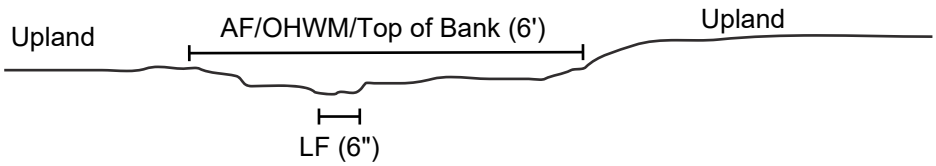
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 24 **Date:** 03/16/2022 **Time:** 1210

## Cross section drawing:




## OHWM

**GPS point:** 34.852444, -117.182596

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide OHWM defined by an approximate 1-inch break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Just below AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☑ Other: finer sediment
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-inch wide low-flow channel (LF) defined by a slight break in bank slope and change in average sediment texture from LF to active floodplain (AF). LF is more pronounced/visible in certain areas. Coarse sand sediment texture throughout.

**Project ID:** Big Barstow **Cross section ID:** ODP 24 **Date:** 03/16/2022 **Time:** 1210

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: very coarse sand

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 6-foot wide AF with an approximately 1-inch break in bank slope. Drift deposits present as dead plant material. Very coarse sand sediment texture with some granules.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Fine sand

Total veg cover: 15 % Tree: 0 % Shrub: 13 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation dominated by creosote bush (Larrea tridentata), ephedra (Ephedra sp.), desert senna (Senna armata), and white bursage (Ambrosia dumosa). Fine sand sediment texture with some pebbles and granules.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 25
**Investigator(s):** Ryan Layden

**Date:** 03/16/2022
**Town:** Barstow
**Photo begin file#:** 32

**Time:** 1250
**State:** CA
**Photo end file#:** 32

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.862508, -117.131741

**Potential anthropogenic influences on the channel system:**
Area receives road runoff from dirt roads; off-road vehicle use is apparent in the surrounding area.

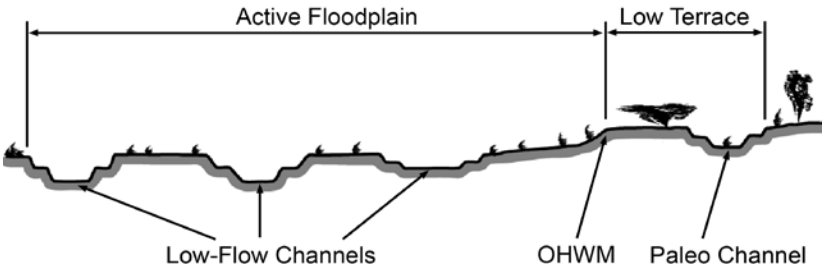
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Immediate surrounding area is generally undeveloped.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

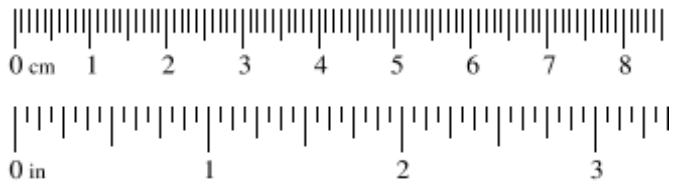



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

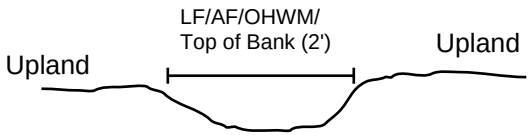
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 25 **Date:** 03/16/2022 **Time:** 1250

**Cross section drawing:**




## OHWM

**GPS point:** 34.862508, -117.131741

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 2-foot wide OHWM defined by a visible break in slope, change in sediment texture, and change in vegetation cover. Narrow channel that receives road runoff upstream and supplies a larger feature downstream. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF).

**Project ID:** Big Barstow **Cross section ID:** ODP 25 **Date:** 03/16/2022 **Time:** 1250

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Medium sand

Total veg cover: 2 % Tree: 0 % Shrub: 0 % Herb: 2 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 2-foot wide AF with a clear break in bank slope. Vegetation composed of allscale scrub. Medium sand sediment texture throughout.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: 17 % Tree: 0 % Shrub: 15 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☑ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Vegetation composed of allscale scrub. Coarse sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 26
**Investigator(s):** Kelsey Woldt, Ryan Layden

**Date:** 03/24/2022 **Time:** 0800
**Town:** Barstow **State:** CA
**Photo begin file#:** 33 **Photo end file#:** 33

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.874111, -117.153853

**Potential anthropogenic influences on the channel system:**
Area receives possible upstream runoff/flows from surrounding development. Bermed area/road occurs along portions of northern extent of the river. Evidence of off-road vehicular use (tire tracks).

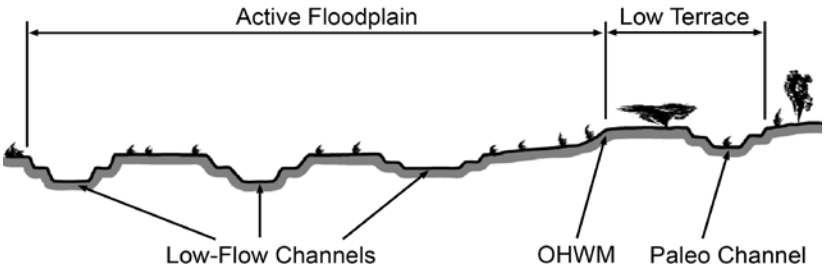
**Brief site description:**
Within Mojave River adjacent to active desert dune habitat; immediate surrounding area generally undeveloped.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

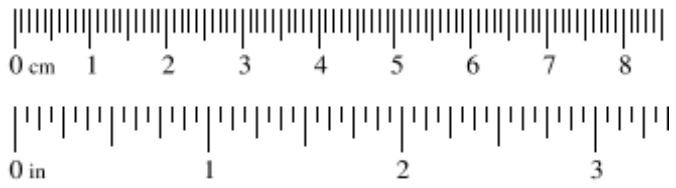



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

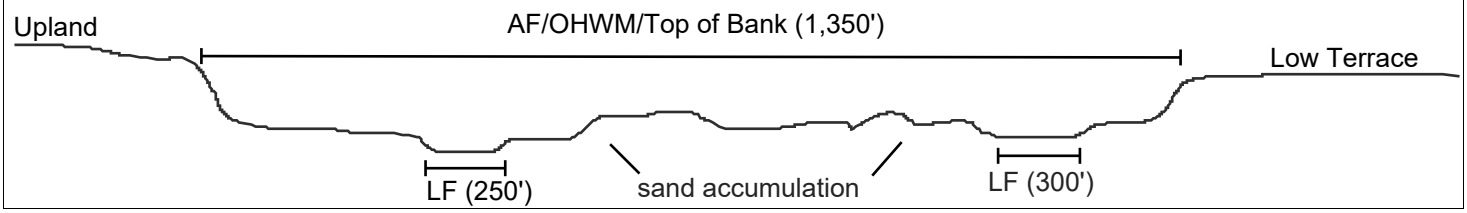
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 26 **Date:** 03/24/2022 **Time:** 0800

## Cross section drawing:




## OHWM

**GPS point:** 34.874111, -117.153853

**Indicators:**

- ☐ Change in average sediment texture
- ☑ Change in vegetation species
- ☐ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1,350-foot wide OHWM defined by a gradual break in slope and change in vegetation species. OHWM indicators along this extent of the Mojave River were sporadic/irregular, as such, the OHWM was determined using field data, a review of historic aerial imagery, and 10-year floodplain mapping. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography. Note that the entire delineated extent of the OHWM does not occur within the review area.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** 34.875578, -117.157011

**Characteristics of the floodplain unit:**

Average sediment texture: Very coarse sand

Total veg cover: 10 % Tree: 0 % Shrub: 8 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Two low-flow channels (LF) measuring approximately 250 feet and 300 feet wide. Vegetation dominated by California broomsage (Lepidospartum squamatum). Rock patterns indicative of flow and drift/debris present as woody tree fragments. Very coarse sand sediment texture with pebbles and granules, some finer sand at 1-inch deep.

**Project ID:** Big Barstow **Cross section ID:** ODP 26 **Date:** 03/24/2022 **Time:** 0800

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: 12 % Tree: 0 % Shrub: 2 % Herb: 10 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1,350-foot wide active floodplain (AF). Vegetation dominated by California broomsage (Lepidospartum squamatum) and desert panicgrass (Panicum urvilleanum). Drift/debris present as large tree branches and trunks not located at the base of and/or associated with California broomsage. Coarse sand sediment texture throughout with multiple areas of higher elevation throughout AF with changes in sediment (finer sand in higher topographic zones) caused by accumulation of wind-blown sands. Indicators along this extent of the Mojave River were sporadic/irregular, as such, the extent of the AF was determined using field data, a review of historic aerial imagery, and 10-year floodplain mapping.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** 34.874042, -117.153691

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: 12 % Tree: 0 % Shrub: 2 % Herb: 10 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low terrace present at eastern bank (within review area); no true low terrace (i.e., uplands) present at western bank (outside of review area). Vegetation dominated by tumbleweed (Salsola australis), honey mesquite (Prosopis glandulosa), and desert panicgrass (Panicum urvilleanum). Coarse sand sediment texture with few pebbles throughout low terrace. Slight change in elevation from AF to low terrace; bank defined by large linear dunes.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 27
**Investigator(s):** Kelsey Woldt, Ryan Layden

**Date:** 03/24/2022 **Time:** 1207
**Town:** Barstow **State:** CA
**Photo begin file#:** 35 **Photo end file#:** 35

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.840347, -117.179832

**Potential anthropogenic influences on the channel system:**
Area receives runoff/sheet flow from adjacent dirt road and large 12-foot cement culvert approximately 100-feet to the south that directs flows under the railroad tracks.

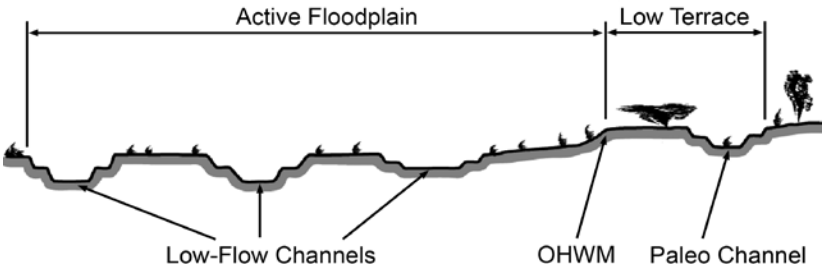
**Brief site description:**
Site occurs along existing railroad line; disturbed conditions prevalent. Immediate surrounding area includes railroad tracks, dirt road, undeveloped land, and residential.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

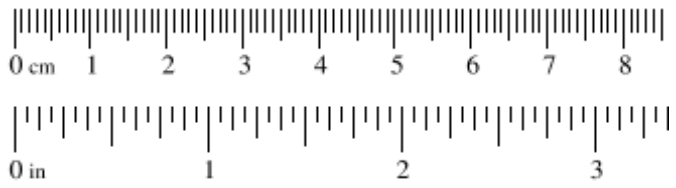



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

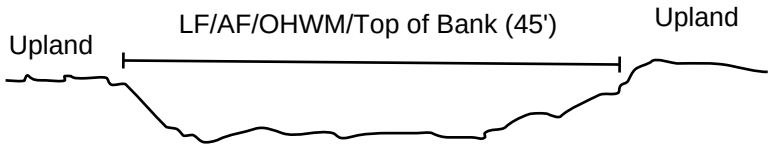
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 27 **Date:** 03/24/2022 **Time:** 1207

**Cross section drawing:**




## OHWM

**GPS point:** 34.840347, -117.179832

**Indicators:**

- ☐ Change in average sediment texture
- ☑ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 45-foot wide OHWM defined by a break in bank slope, change in vegetation species, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

**Floodplain unit:** ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF)

**Project ID:** Big Barstow **Cross section ID:** ODP 27 **Date:** 03/24/2022 **Time:** 1207

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very fine sand

Total veg cover: 8 % Tree: 0 % Shrub: 6 % Herb: 2 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☑ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 45-foot wide AF supplied by upstream sheet flow from railroad culvert. Drift/debris present as detritus. Mudcracks and drift patterns (i.e., grasses lying northwest in direction of flow) present. Vegetation dominated by Atriplex polycarpa and Schismus barbatus. Very fine sand sediment texture with few granules.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Very fine sand

Total veg cover: 35 % Tree: 0 % Shrub: 20 % Herb: 15 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

No true low terrace present; continues from AF to upland. Drift/debris present as dead plant material. Vegetation dominated by Suaeda nigra, Atriplex polycarpa, and Schismus barbatus. Very fine sand sediment texture with few granules.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 28
**Investigator(s):** Sarah Krejca, Shanti Santulli

**Date:** 10/20/2021 **Time:** 1325
**Town:** Barstow **State:** CA
**Photo begin file#:** 37 **Photo end file#:** 38

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review Area

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.852444, -117.182596

**Potential anthropogenic influences on the channel system:**
Area receives possible upstream runoff/flows from surrounding development. Bermed area/road occurs along northern extent of the river.

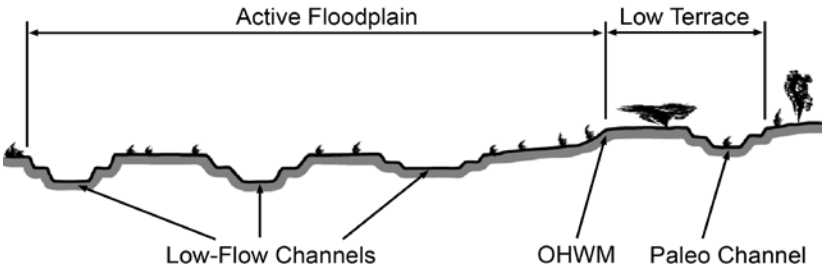
**Brief site description:**
Within Mojave River adjacent to active desert dune habitat; immediate surrounding area generally undeveloped.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

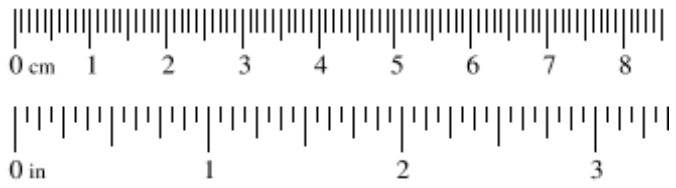



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

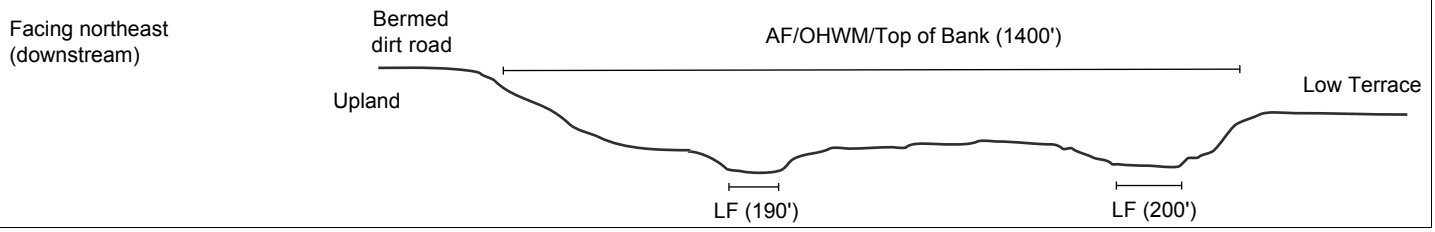
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 28 **Date:** 10/20/2021 **Time:** 1325

## Cross section drawing:




## OHWM

**GPS point:** 34.852444, -117.182596

**Indicators:**

- ☑ Change in average sediment texture
- ☑ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1,400-foot wide OHWM defined by a break in bank slope, change in average sediment texture, change in vegetation species, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography. Note that the entire delineated extent of the OHWM does not occur within the review area.

## Floodplain unit: ☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** 34.852637, -117.182880

**Characteristics of the floodplain unit:**

Average sediment texture: Medium sand

Total veg cover: 5 % Tree: 0 % Shrub: 5 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☑ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☑ Other: Finer sediment
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Two low-flow (LF) channels measuring approximately 190 feet and 200 feet wide. Vegetation dominated by cheesebush (Ambrosia salsola). Some areas of ripples likely attributed to past flows rather than wind. Medium sand sediment texture throughout.

**Project ID:** Big Barstow **Cross section ID:** ODP 28 **Date:** 10/20/2021 **Time:** 1325

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Coarse sand

Total veg cover: 15 % Tree: 0 % Shrub: 15 % Herb: 0 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☑ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 1,400-foot wide active floodplain (AF). Vegetation dominated by cheesebush (Ambrosia salsola) and honey mesquite (Prosopis glandulosa). Drift/debris present as dead branches not located at the base of and/or not associated with cheesebush or honey mesquite. Coarse sand sediment texture with pebbles.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** 34.852257, -117.182333

**Characteristics of the floodplain unit:**

Average sediment texture: Fine sand

Total veg cover: 40 % Tree: 0 % Shrub: 10 % Herb: 30 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low terrace present at southeast bank (within review area); no true low terrace (i.e., uplands) present at northwest bank (outside of review area). More uniform sediment texture throughout layers within low terrace. Vegetation dominated by desert panicgrass (Panicum urvilleanum), cheesebush (Ambrosia salsola), and honey mesquite (Prosopis glandulosa). Surface relief defines uplands/low terrace. Fine sand sediment texture throughout.

# Arid West Ephemeral and Intermittent Streams OHWM Datasheet

**Project:** Big Barstow
**Project Number:** N/A
**Stream:** ODP 29
**Investigator(s):** Kelsey Woldt, Ryan Layden

**Date:** 06/20/2022 **Time:** 1200
**Town:** Barstow **State:** CA
**Photo begin file#:** 39 **Photo end file#:** 39

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☑ / N ☐ Is the site significantly disturbed?

**Location Details:**
Big Barstow Aquatic Resources Delineation Report Review

**Projection:** NAD 83 **Datum:** WGS 84
**Coordinates:** 34.791535, -117.240448

**Potential anthropogenic influences on the channel system:**
Cement bank on northwest side of feature; channel used as road based on presence of tire tracks.

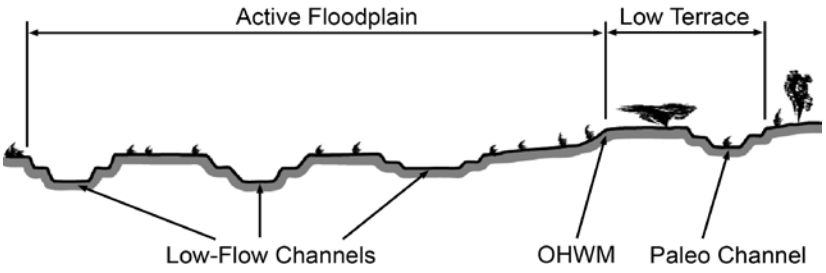
**Brief site description:**
Within Wild Wash, which also serves as a road.S ite occurs along existing railroad line; disturbed conditions prevalent.

**Checklist of resources (if available):**

- ☑ Aerial photography
  Dates:
- ☑ Topographic maps
- ☐ Geologic maps
- ☑ Vegetation maps
- ☑ Soils maps
- ☑ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☑ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

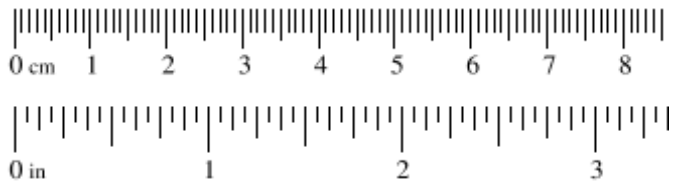



**Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:**

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☑ Mapping on aerial photograph
   - ☑ Digitized on computer
   - ☑ GPS
   - ☐ Other:

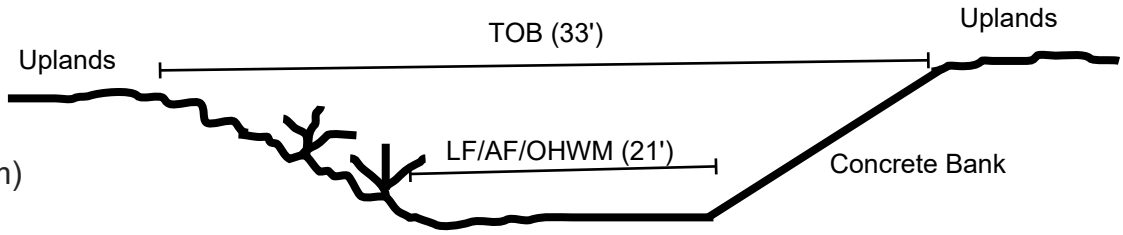
## Wentworth Size Classes

| Inches (in) | Millimeters (mm) | Wentworth size class | |
|---|---|---|---|
| 10.08 | 256 | Boulder | |
| | | Cobble | Gravel |
| 2.56 | 64 | Pebble | |
| 0.157 | 4 | Granule | |
| 0.079 | 2.00 | Very coarse sand | |
| 0.039 | 1.00 | Coarse sand | |
| 0.020 | 0.50 | Medium sand | Sand |
| 1/2 0.0098 | 0.25 | Fine sand | |
| 1/4 0.005 | 0.125 | Very fine sand | |
| 1/8 0.0025 | 0.0625 | Coarse silt | |
| 1/16 0.0012 | 0.031 | Medium silt | |
| 1/32 0.00061 | 0.0156 | Fine silt | Silt |
| 1/64 0.00031 | 0.0078 | Very fine silt | |
| 1/128 0.00015 | 0.0039 | Clay | Mud |



**Project ID:** Big Barstow **Cross section ID:** ODP 29 **Date:** 06/20/2022 **Time:** 1200

**Cross section drawing:**




## OHWM

**GPS point:** 34.791535, -117.240448

**Indicators:**

- ☑ Change in average sediment texture
- ☐ Change in vegetation species
- ☑ Change in vegetation cover
- ☑ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 21-foot wide OHWM defined by a break in bank slope, change in average sediment texture, and change in vegetation cover. Data was collected during a drought year; however, indicators still observed and consistent with anticipated extent of OHWM based on site conditions/topography.

## Floodplain unit:

☑ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** N/A

**Characteristics of the floodplain unit:**

Average sediment texture: _____

Total veg cover: _____ % Tree: _____% Shrub: _____% Herb: _____%

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Low-flow channel (LF) is indistinguishable/cannot be determined from active floodplain (AF)

**Project ID:** Big Barstow **Cross section ID:** ODP 29 **Date:** 06/20/2022 **Time:** 1200

**Floodplain unit:** ☐ Low-Flow Channel ☑ Active Floodplain ☐ Low Terrace/Upland

**GPS point:** Same as OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Granule

Total veg cover: 0 % Tree: 0 % Shrub: 0 % Herb: 0 %

Community successional stage:

- ☑ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☑ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

**Comments:**

Approximately 21-foot wide AF with a defined break in bank slope. Granule sediment texture with some pebbles.

**Floodplain unit:** ☐ Low-Flow Channel ☐ Active Floodplain ☑ Low Terrace/Upland

**GPS point:** Just above AF/OHWM

**Characteristics of the floodplain unit:**

Average sediment texture: Fine silt

Total veg cover: 34 % Tree: 0 % Shrub: 30 % Herb: 4 %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☑ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

**Indicators:**

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☑ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

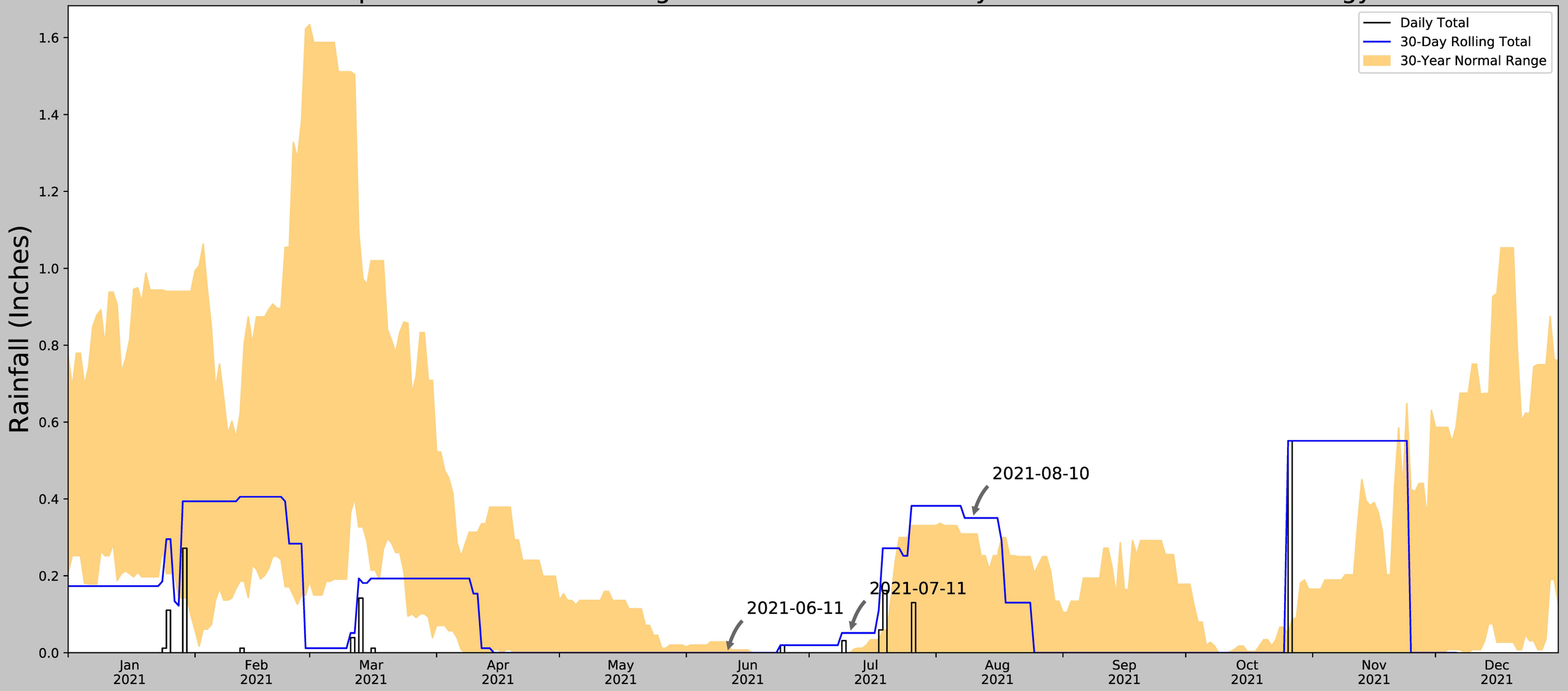
**Comments:**

No true low terrace present; continues from AF to upland. Northern bank/upland is composed of concrete; southern bank/upland is vegetated and dominated by Atriplex polycarpa and Larrea tridentata. Surface relief defines uplands on southern bank. Fine silt sediment texture with some granules.

# APPENDIX F

# ANTECEDENT PRECIPITATION TOOL OUTPUT

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.845561, -117.162790 |
| Observation Date | 2021-08-10 |
| Elevation (ft) | 2297.43 |
| Drought Index (PDSI) | Extreme drought |
| WebWIMP $H_2O$ Balance | Dry Season |

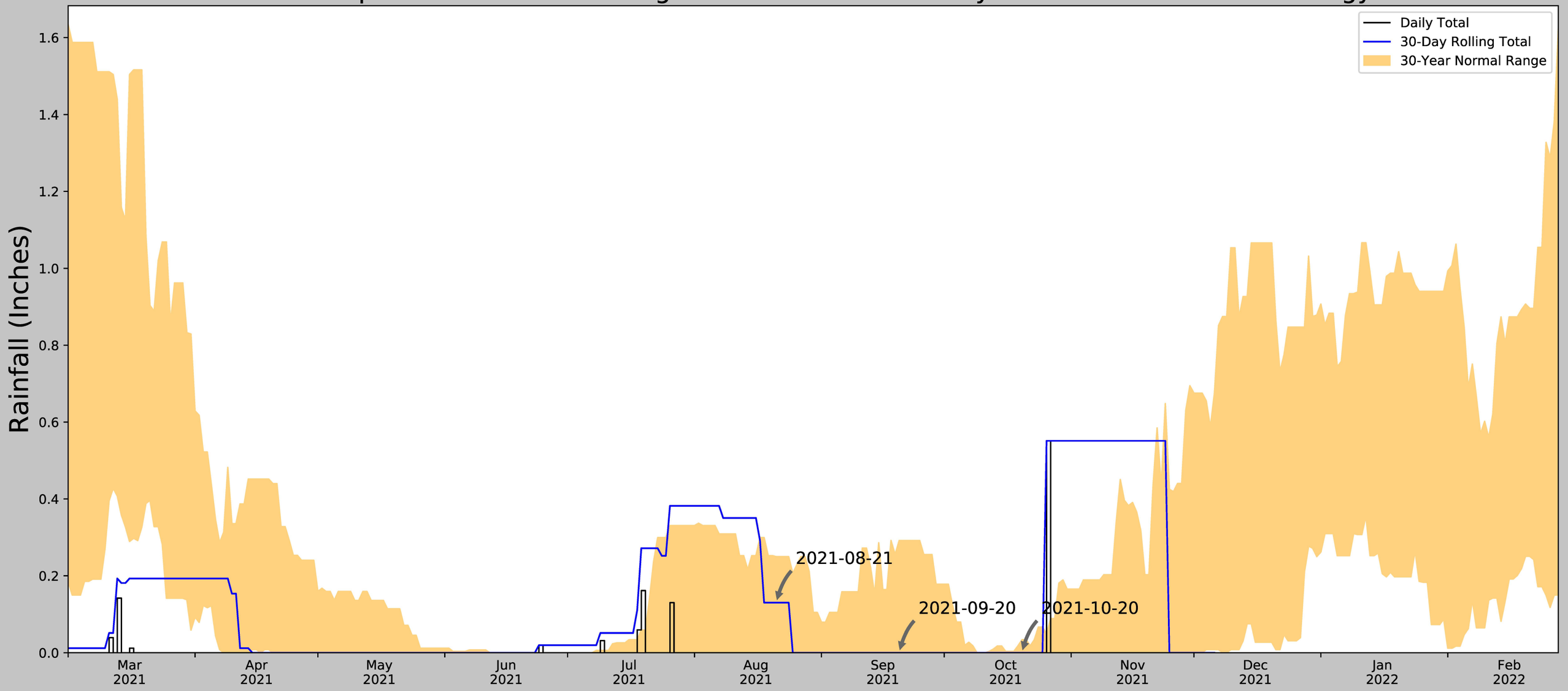
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2021-08-10 | 0.0 | 0.308661 | 0.350394 | Wet | 3 | 3 | 9 |
| 2021-07-11 | 0.0 | 0.0 | 0.051181 | Wet | 3 | 2 | 6 |
| 2021-06-11 | 0.0 | 0.028346 | 0.0 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Wetter than Normal - 17 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 8.628 | 77.286 | 4.549 | 11044 | 90 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 2.148 | 50.196 | 1.074 | 2 | 0 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 5.518 | 8.859 | 2.532 | 1 | 0 |
| BARSTOW DAGGETT AP | 34.8536, -116.7858 | 1916.995 | 13.655 | 303.149 | 10.284 | 306 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.845561, -117.162790 |
| Observation Date | 2021-10-20 |
| Elevation (ft) | 2297.43 |
| Drought Index (PDSI) | Severe drought |
| WebWIMP $H_2O$ Balance | Dry Season |

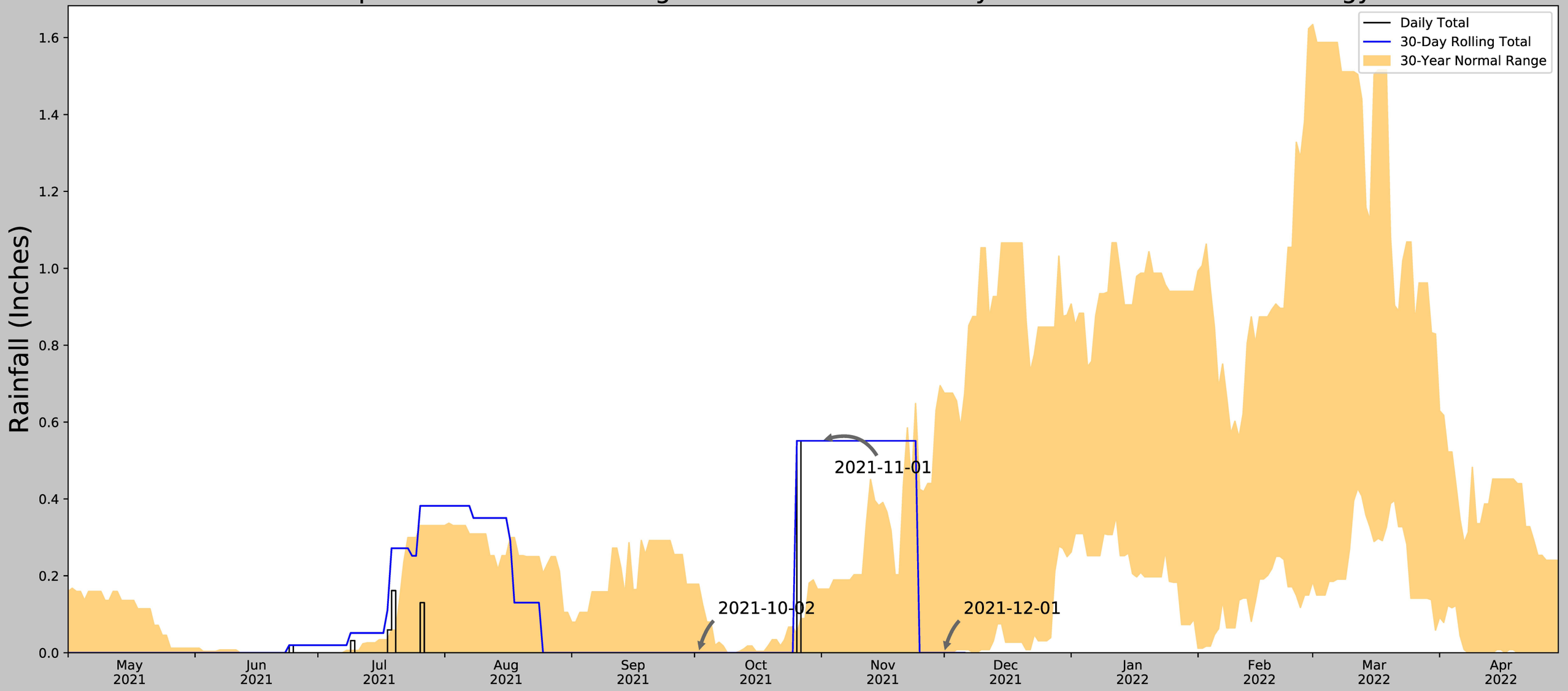
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2021-10-20 | 0.0 | 0.033858 | 0.0 | Normal | 2 | 3 | 6 |
| 2021-09-20 | 0.0 | 0.291732 | 0.0 | Normal | 2 | 2 | 4 |
| 2021-08-21 | 0.0 | 0.249606 | 0.129921 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Normal Conditions - 12 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 8.628 | 77.286 | 4.549 | 11098 | 90 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 2.148 | 50.196 | 1.074 | 7 | 0 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 5.518 | 8.859 | 2.532 | 1 | 0 |
| BARSTOW DAGGETT AP | 34.8536, -116.7858 | 1916.995 | 13.655 | 303.149 | 10.284 | 247 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.845561, -117.162790 |
| Observation Date | 2021-12-01 |
| Elevation (ft) | 2297.43 |
| Drought Index (PDSI) | Severe drought (2021-11) |
| WebWIMP $H_2O$ Balance | Wet Season |

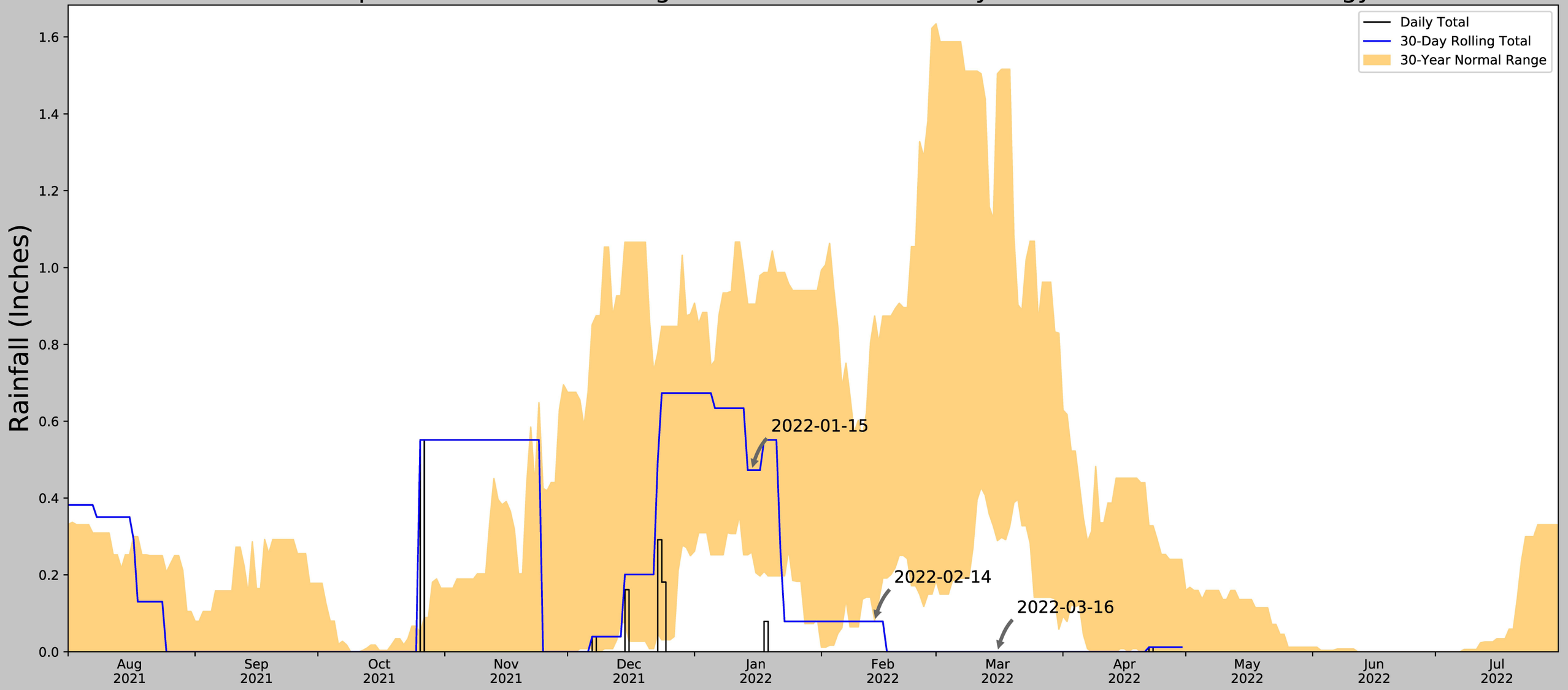
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2021-12-01 | 0.0 | 0.675197 | 0.0 | Normal | 2 | 3 | 6 |
| 2021-11-01 | 0.0 | 0.165354 | 0.551181 | Wet | 3 | 2 | 6 |
| 2021-10-02 | 0.0 | 0.177953 | 0.0 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Normal Conditions - 14 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 8.628 | 77.286 | 4.549 | 11098 | 90 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 2.148 | 50.196 | 1.074 | 7 | 0 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 5.518 | 8.859 | 2.532 | 1 | 0 |
| BARSTOW DAGGETT AP | 34.8536, -116.7858 | 1916.995 | 13.655 | 303.149 | 10.284 | 247 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-03-16 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought |
| WebWIMP $H_2O$ Balance | Dry Season |

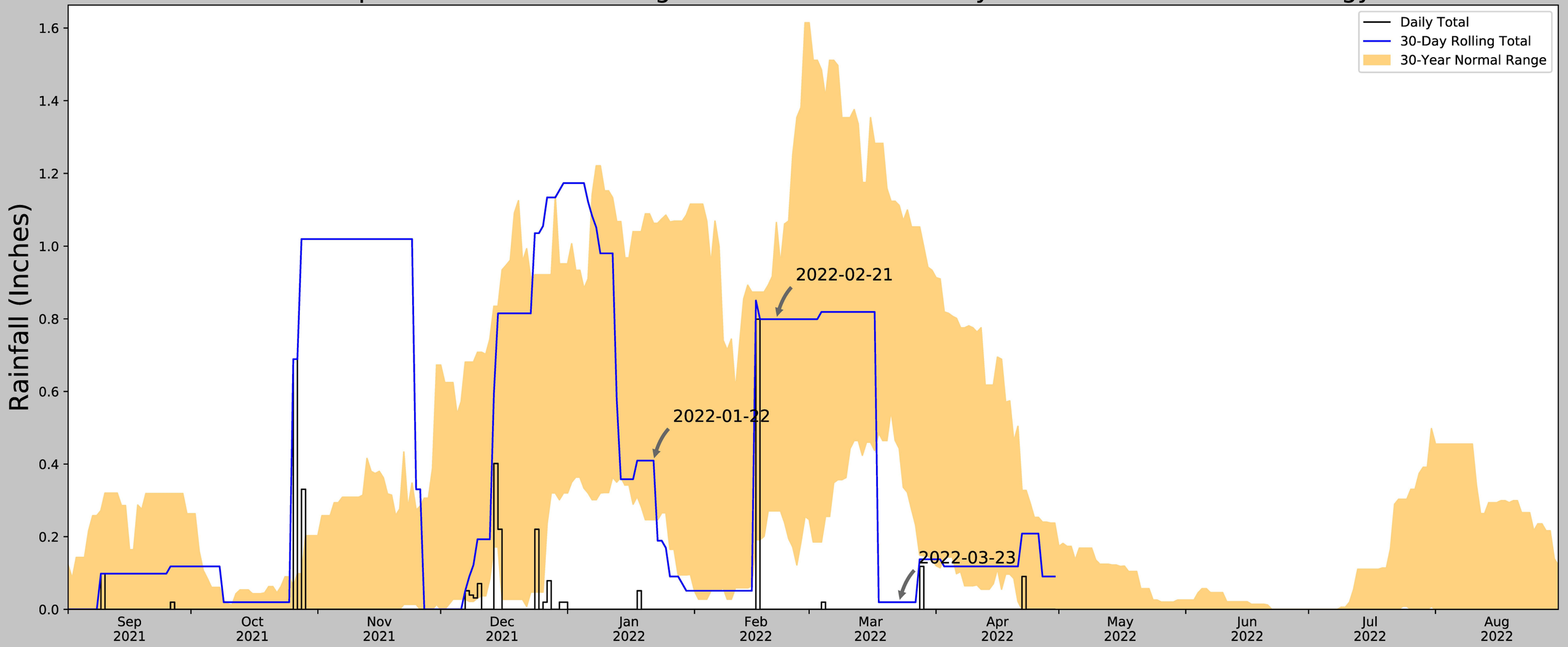
Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-03-16 | 0.28937 | 1.503937 | 0.0 | Dry | 1 | 3 | 3 |
| 2022-02-14 | 0.081496 | 0.873622 | 0.07874 | Dry | 1 | 2 | 2 |
| 2022-01-15 | 0.259449 | 0.905118 | 0.472441 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Drier than Normal - 7 |

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 11098 | 89 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 2.148 | 50.196 | 1.074 | 7 | 0 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 5.518 | 8.859 | 2.532 | 1 | 0 |
| BARSTOW DAGGETT AP | 34.8536, -116.7858 | 1916.995 | 13.655 | 303.149 | 10.284 | 247 | 1 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-03-23 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought |
| WebWIMP $H_2O$ Balance | Dry Season |

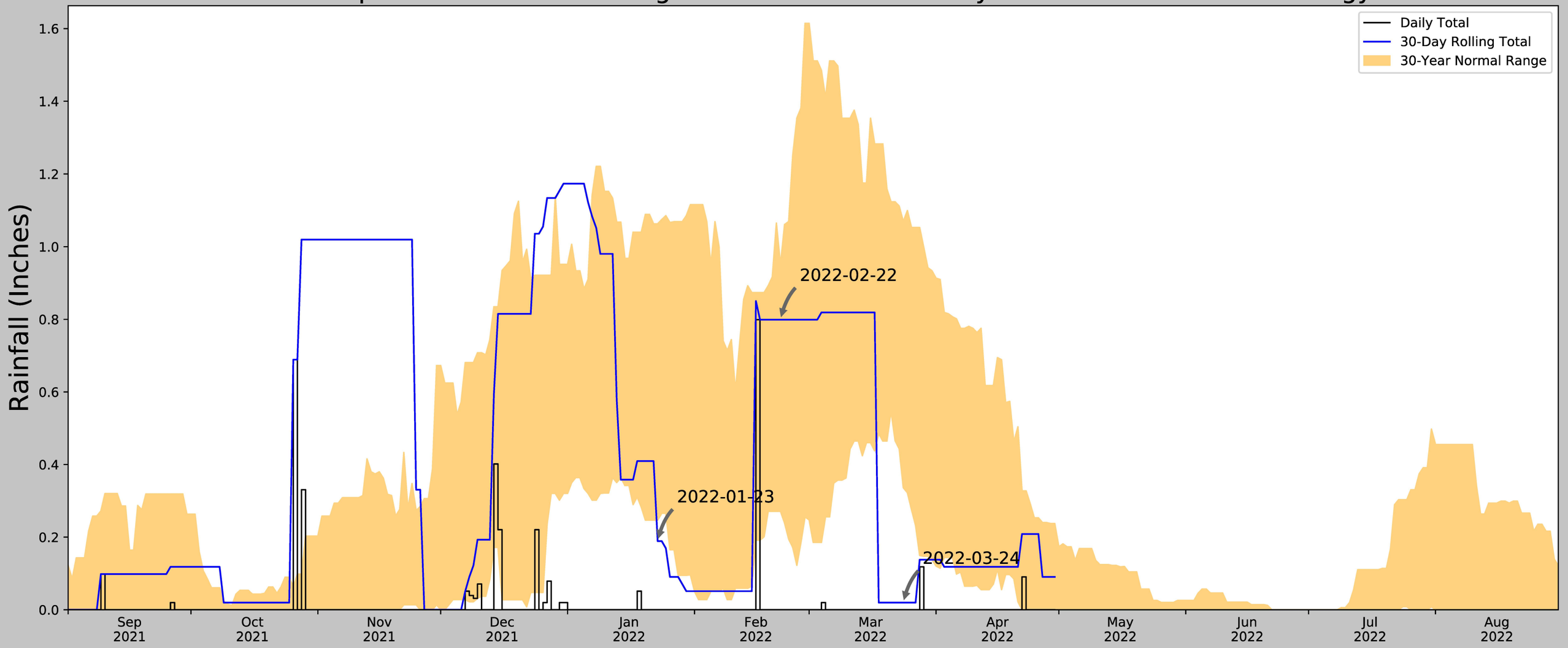
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-03-23 | 0.443307 | 1.111417 | 0.019685 | Dry | 1 | 3 | 3 |
| 2022-02-21 | 0.27126 | 1.064567 | 0.799213 | Normal | 2 | 2 | 4 |
| 2022-01-22 | 0.24685 | 1.062598 | 0.409449 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Drier than Normal - 9 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| APPLE VALLEY 2.6 SSW | 34.4957, -117.2353 | 2880.906 | 25.685 | 649.916 | 28.251 | 1447 | 0 |
| BARSTOW 0.8 SSE | 34.8667, -117.0592 | 2608.924 | 5.124 | 377.934 | 4.242 | 155 | 4 |
| ADELANTO 3.1 S | 34.5253, -117.4331 | 3084.974 | 28.229 | 853.984 | 36.81 | 79 | 1 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 2.22 | 1.987 | 1.003 | 2 | 0 |
| APPLE VALLEY 2.6 SE | 34.5043, -117.1808 | 2940.945 | 24.687 | 709.955 | 28.636 | 1301 | 3 |
| APPLE VALLEY 1.9 N | 34.556, -117.2111 | 2935.039 | 21.341 | 704.049 | 24.629 | 34 | 0 |
| VICTORVILLE 2.6 SSW | 34.4901, -117.3518 | 3110.892 | 28.07 | 879.902 | 37.33 | 401 | 0 |
| APPLE VALLEY 4.1 ENE | 34.5588, -117.1516 | 3119.095 | 20.857 | 888.105 | 27.909 | 273 | 50 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 8.636 | 61.042 | 4.413 | 90 | 9 |
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 7333 | 23 |
| VICTORVILLE | 34.5292, -117.2928 | 2879.921 | 24.31 | 648.931 | 26.715 | 238 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-03-24 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought |
| WebWIMP $H_2O$ Balance | Dry Season |

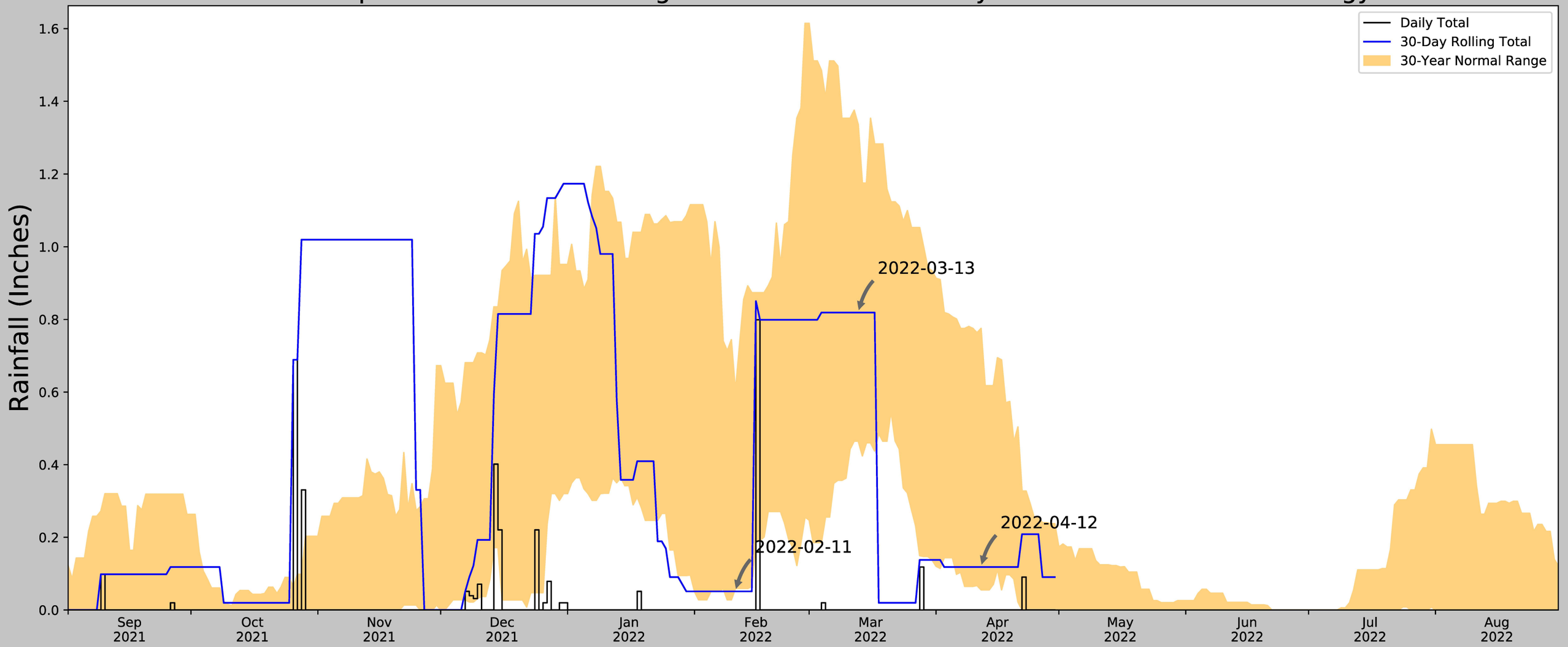
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-03-24 | 0.33622 | 1.068898 | 0.019685 | Dry | 1 | 3 | 3 |
| 2022-02-22 | 0.27126 | 0.950394 | 0.799213 | Normal | 2 | 2 | 4 |
| 2022-01-23 | 0.24685 | 1.062598 | 0.188976 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Drier than Normal - 8 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| APPLE VALLEY 2.6 SSW | 34.4957, -117.2353 | 2880.906 | 25.685 | 649.916 | 28.251 | 1447 | 0 |
| BARSTOW 0.8 SSE | 34.8667, -117.0592 | 2608.924 | 5.124 | 377.934 | 4.242 | 155 | 3 |
| ADELANTO 3.1 S | 34.5253, -117.4331 | 3084.974 | 28.229 | 853.984 | 36.81 | 79 | 1 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 2.22 | 1.987 | 1.003 | 2 | 0 |
| APPLE VALLEY 2.6 SE | 34.5043, -117.1808 | 2940.945 | 24.687 | 709.955 | 28.636 | 1301 | 3 |
| APPLE VALLEY 1.9 N | 34.556, -117.2111 | 2935.039 | 21.341 | 704.049 | 24.629 | 34 | 0 |
| VICTORVILLE 2.6 SSW | 34.4901, -117.3518 | 3110.892 | 28.07 | 879.902 | 37.33 | 401 | 0 |
| APPLE VALLEY 4.1 ENE | 34.5588, -117.1516 | 3119.095 | 20.857 | 888.105 | 27.909 | 273 | 51 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 8.636 | 61.042 | 4.413 | 90 | 9 |
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 7333 | 23 |
| VICTORVILLE | 34.5292, -117.2928 | 2879.921 | 24.31 | 648.931 | 26.715 | 238 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-04-12 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought (2022-03) |
| WebWIMP $H_2O$ Balance | Dry Season |

| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-04-12 | 0.055512 | 0.775197 | 0.11811 | Normal | 2 | 3 | 6 |
| 2022-03-13 | 0.464961 | 1.335827 | 0.818898 | Normal | 2 | 2 | 4 |
| 2022-02-11 | 0.059055 | 0.601969 | 0.051181 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 11 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

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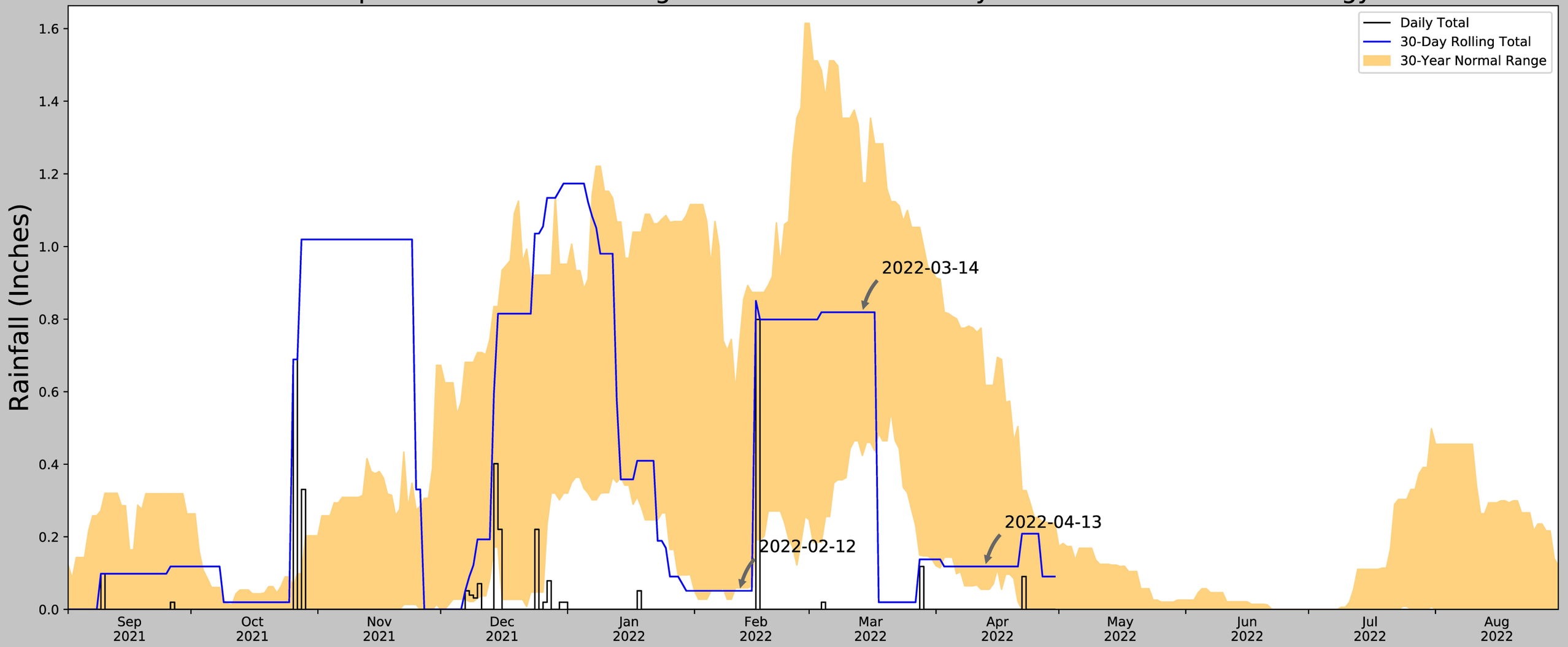
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| APPLE VALLEY 2.6 SSW | 34.4957, -117.2353 | 2880.906 | 25.685 | 649.916 | 28.251 | 1447 | 0 |
| BARSTOW 0.8 SSE | 34.8667, -117.0592 | 2608.924 | 5.124 | 377.934 | 4.242 | 155 | 1 |
| ADELANTO 3.1 S | 34.5253, -117.4331 | 3084.974 | 28.229 | 853.984 | 36.81 | 79 | 1 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 2.22 | 1.987 | 1.003 | 2 | 0 |
| APPLE VALLEY 2.6 SE | 34.5043, -117.1808 | 2940.945 | 24.687 | 709.955 | 28.636 | 1301 | 3 |
| APPLE VALLEY 1.9 N | 34.556, -117.2111 | 2935.039 | 21.341 | 704.049 | 24.629 | 34 | 0 |
| VICTORVILLE 2.6 SSW | 34.4901, -117.3518 | 3110.892 | 28.07 | 879.902 | 37.33 | 401 | 0 |
| APPLE VALLEY 4.1 ENE | 34.5588, -117.1516 | 3119.095 | 20.857 | 888.105 | 27.909 | 273 | 58 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 8.636 | 61.042 | 4.413 | 90 | 7 |
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 7333 | 20 |
| VICTORVILLE | 34.5292, -117.2928 | 2879.921 | 24.31 | 648.931 | 26.715 | 238 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-04-13 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought (2022-03) |
| WebWIMP $H_2O$ Balance | Dry Season |

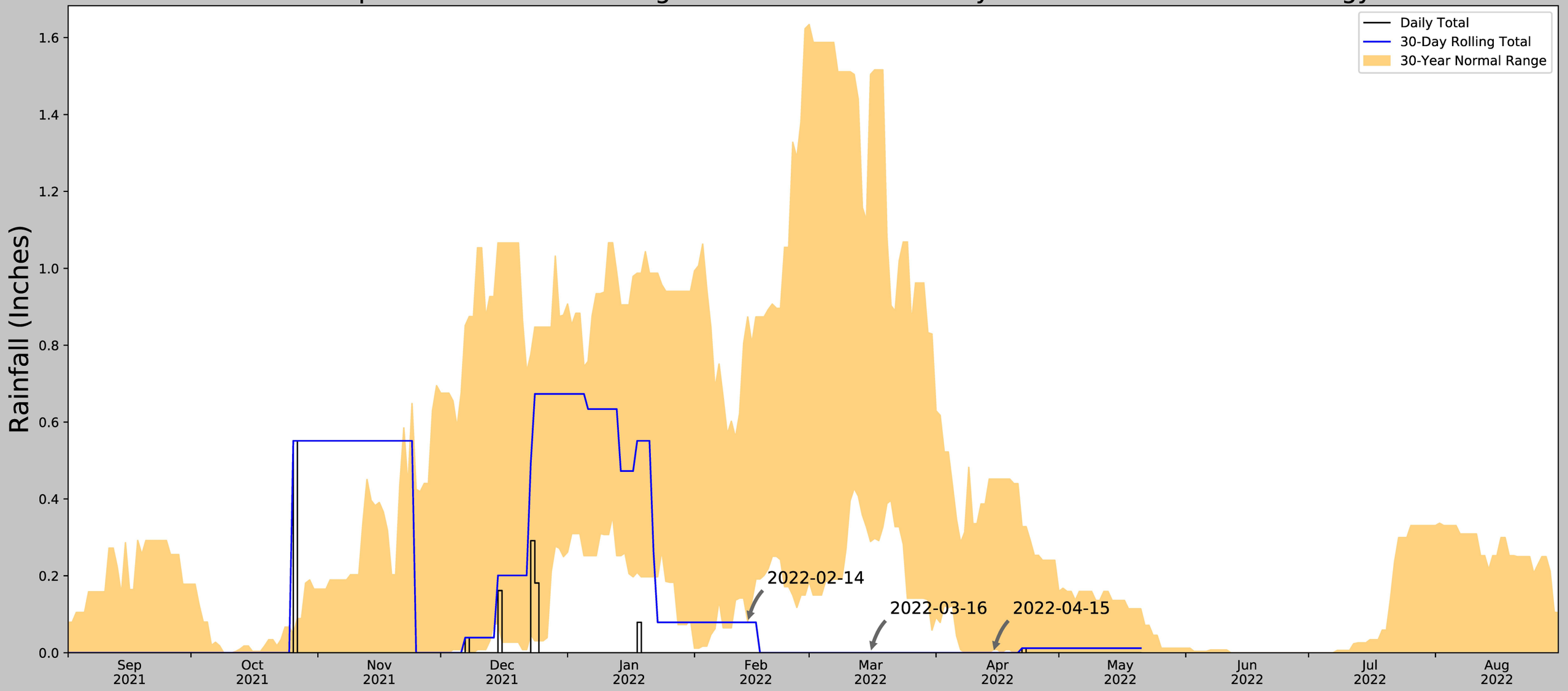
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-04-13 | 0.055512 | 0.617323 | 0.11811 | Normal | 2 | 3 | 6 |
| 2022-03-14 | 0.424409 | 1.175197 | 0.818898 | Normal | 2 | 2 | 4 |
| 2022-02-12 | 0.059055 | 0.729921 | 0.051181 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 11 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| APPLE VALLEY 2.6 SSW | 34.4957, -117.2353 | 2880.906 | 25.685 | 649.916 | 28.251 | 1447 | 0 |
| BARSTOW 0.8 SSE | 34.8667, -117.0592 | 2608.924 | 5.124 | 377.934 | 4.242 | 155 | 1 |
| ADELANTO 3.1 S | 34.5253, -117.4331 | 3084.974 | 28.229 | 853.984 | 36.81 | 79 | 1 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 2.22 | 1.987 | 1.003 | 2 | 0 |
| APPLE VALLEY 2.6 SE | 34.5043, -117.1808 | 2940.945 | 24.687 | 709.955 | 28.636 | 1301 | 3 |
| APPLE VALLEY 1.9 N | 34.556, -117.2111 | 2935.039 | 21.341 | 704.049 | 24.629 | 34 | 0 |
| VICTORVILLE 2.6 SSW | 34.4901, -117.3518 | 3110.892 | 28.07 | 879.902 | 37.33 | 401 | 0 |
| APPLE VALLEY 4.1 ENE | 34.5588, -117.1516 | 3119.095 | 20.857 | 888.105 | 27.909 | 273 | 59 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 8.636 | 61.042 | 4.413 | 90 | 7 |
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 7333 | 19 |
| VICTORVILLE | 34.5292, -117.2928 | 2879.921 | 24.31 | 648.931 | 26.715 | 238 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-04-15 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought |
| WebWIMP $H_2O$ Balance | Dry Season |

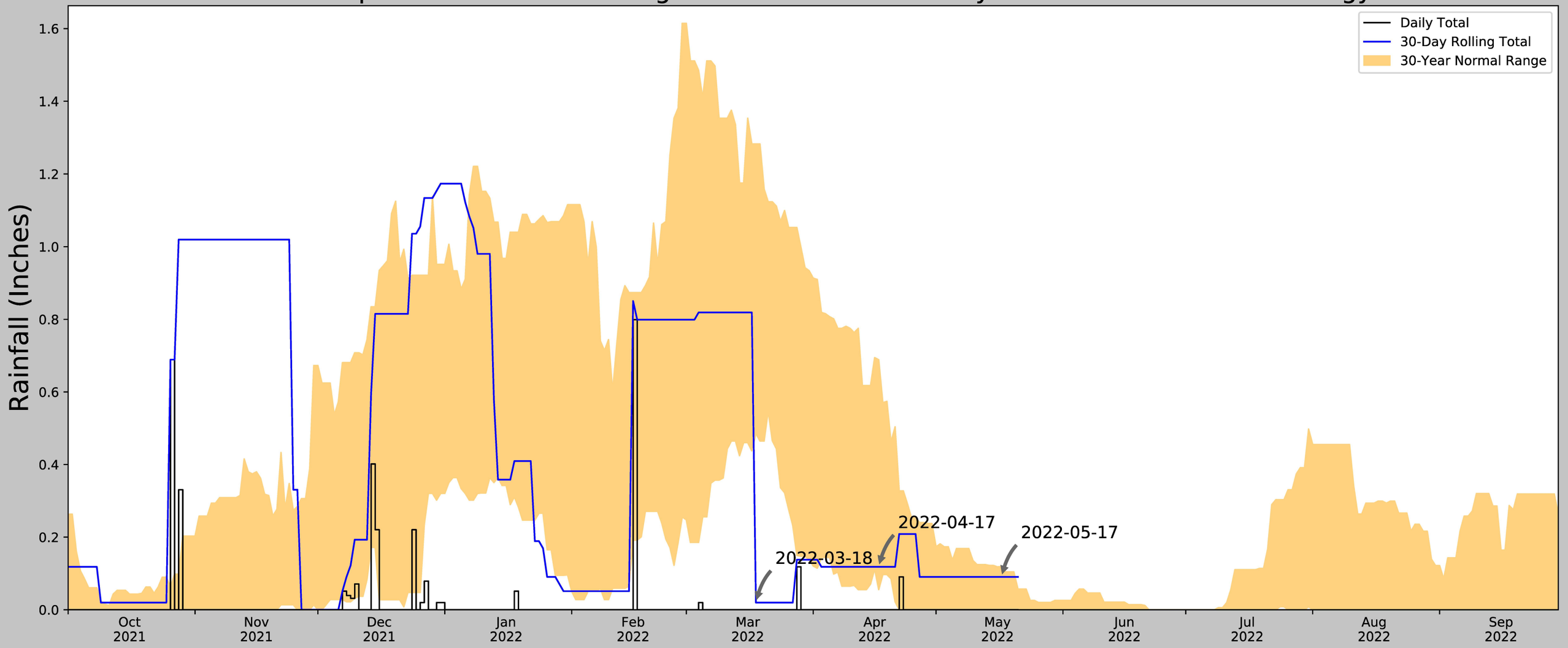
| 30 Days Ending | $30^{th}$ %ile (in) | $70^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-04-15 | 0.008268 | 0.451575 | 0.0 | Dry | 1 | 3 | 3 |
| 2022-03-16 | 0.28937 | 1.503937 | 0.0 | Dry | 1 | 2 | 2 |
| 2022-02-14 | 0.081496 | 0.873622 | 0.07874 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Drier than Normal - 6 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 11098 | 89 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 2.148 | 50.196 | 1.074 | 7 | 0 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 5.518 | 8.859 | 2.532 | 1 | 0 |
| BARSTOW DAGGETT AP | 34.8536, -116.7858 | 1916.995 | 13.655 | 303.149 | 10.284 | 247 | 1 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-05-17 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought (2022-04) |
| WebWIMP $H_2O$ Balance | Dry Season |

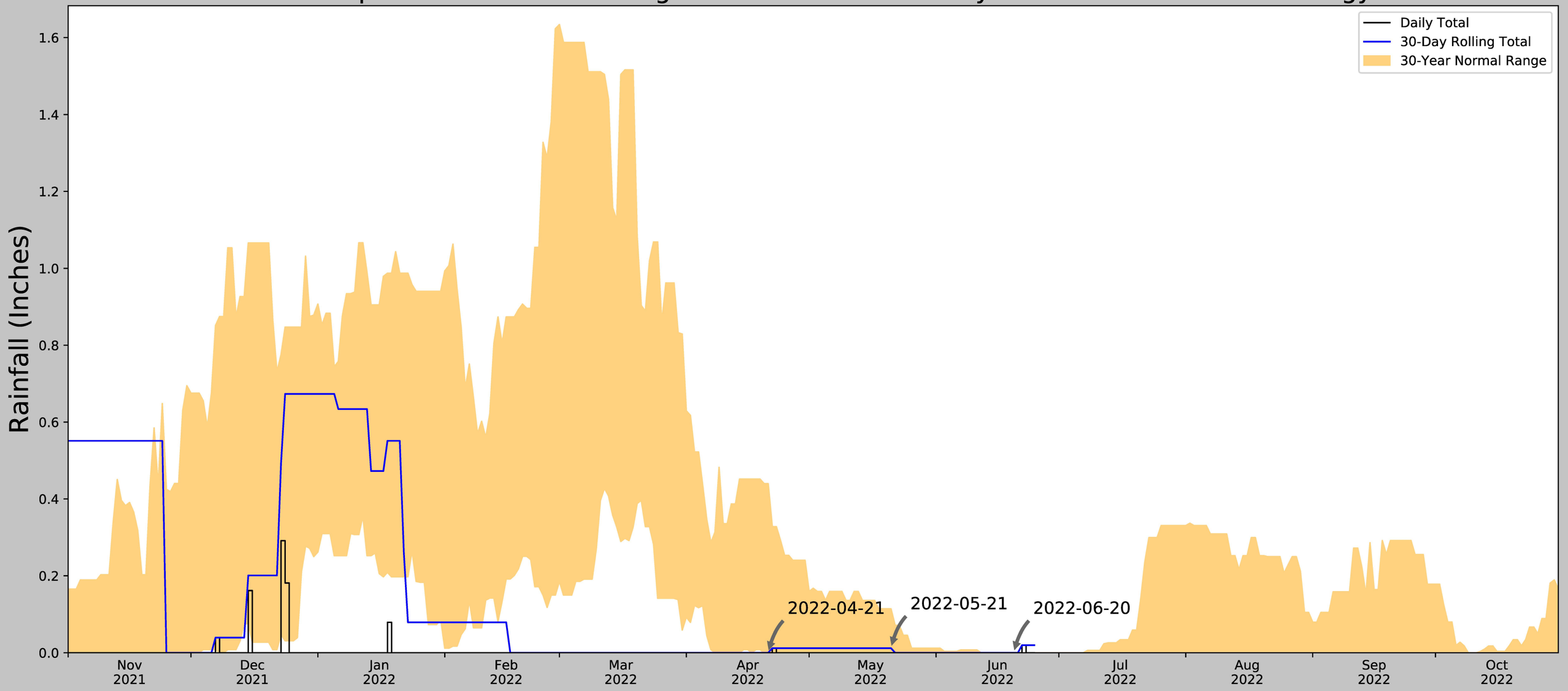
| 30 Days Ending | 30$^{th}$ %ile (in) | 70$^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-05-17 | 0.0 | 0.119291 | 0.090551 | Normal | 2 | 3 | 6 |
| 2022-04-17 | 0.055512 | 0.688583 | 0.11811 | Normal | 2 | 2 | 4 |
| 2022-03-18 | 0.485827 | 1.282677 | 0.019685 | Dry | 1 | 1 | 1 |
| Result | | | | | | | Normal Conditions - 11 |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| APPLE VALLEY 2.6 SSW | 34.4957, -117.2353 | 2880.906 | 25.685 | 649.916 | 28.251 | 1447 | 0 |
| BARSTOW 0.8 SSE | 34.8667, -117.0592 | 2608.924 | 5.124 | 377.934 | 4.242 | 155 | 1 |
| ADELANTO 3.1 S | 34.5253, -117.4331 | 3084.974 | 28.229 | 853.984 | 36.81 | 79 | 1 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 2.22 | 1.987 | 1.003 | 2 | 0 |
| APPLE VALLEY 2.6 SE | 34.5043, -117.1808 | 2940.945 | 24.687 | 709.955 | 28.636 | 1301 | 2 |
| VICTORVILLE 2.6 SSW | 34.4901, -117.3518 | 3110.892 | 28.07 | 879.902 | 37.33 | 401 | 0 |
| APPLE VALLEY 1.9 N | 34.556, -117.2111 | 2935.039 | 21.341 | 704.049 | 24.629 | 34 | 0 |
| APPLE VALLEY 4.1 ENE | 34.5588, -117.1516 | 3119.095 | 20.857 | 888.105 | 27.909 | 273 | 55 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 8.636 | 61.042 | 4.413 | 90 | 6 |
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 7333 | 25 |
| VICTORVILLE | 34.5292, -117.2928 | 2879.921 | 24.31 | 648.931 | 26.715 | 238 | 0 |

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network




| | |
|---|---|
| Coordinates | 34.860658, -117.149281 |
| Observation Date | 2022-06-20 |
| Elevation (ft) | 2230.99 |
| Drought Index (PDSI) | Extreme drought (2022-05) |
| WebWIMP $H_2O$ Balance | Dry Season |

Figure and tables made by the
**Antecedent Precipitation Tool**
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

| 30 Days Ending | 30$^{th}$ %ile (in) | 70$^{th}$ %ile (in) | Observed (in) | Wetness Condition | Condition Value | Month Weight | Product |
|---|---|---|---|---|---|---|---|
| 2022-06-20 | 0.0 | 0.0 | 0.0 | Normal | 2 | 3 | 6 |
| 2022-05-21 | 0.0 | 0.11378 | 0.011811 | Normal | 2 | 2 | 4 |
| 2022-04-21 | 0.0 | 0.439764 | 0.0 | Normal | 2 | 1 | 2 |
| Result | | | | | | | Normal Conditions - 12 |

| Weather Station Name | Coordinates | Elevation (ft) | Distance (mi) | Elevation Δ | Weighted Δ | Days Normal | Days Antecedent |
|---|---|---|---|---|---|---|---|
| BARSTOW | 34.8928, -117.0219 | 2220.144 | 7.554 | 10.846 | 3.481 | 11098 | 90 |
| BARSTOW 4.2 NE | 34.9237, -117.0177 | 2169.948 | 2.148 | 50.196 | 1.074 | 7 | 0 |
| BARSTOW 3.0 W | 34.88, -117.118 | 2229.003 | 5.518 | 8.859 | 2.532 | 1 | 0 |
| BARSTOW DAGGETT AP | 34.8536, -116.7858 | 1916.995 | 13.655 | 303.149 | 10.284 | 247 | 0 |

# APPENDIX G

# SITE PHOTOGRAPHS

# Appendix G

## Site Photographs[1]

Big Barstow Aquatic Resources Delineation – August 10, 2021; October 20, 2021; December 1, 2021; March 16, 23, 24, 2022; April 12, 13, 15, 2022; May 17, 2022; June 20, 2022



Photo 1. Downstream view of Ordinary High Water Mark (OHWM) Datasheet Point (ODP) 1 within Non-Wetland Waters (NWW-) 97, facing north, within disturbed habitat. ODP 1 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.879568, -117.105532). April 13, 2022.



Photo 2. View of Wetland Data Form Point (WDP) 1 (white arrow) within NWW-96, facing south, within tamarisk thickets. WDP 1 did not meet any of the three wetland parameters (34.878453, -117.108756). April 13, 2022.



Photo 3. Upstream view of ODP 2 within NWW-95, facing south, within disturbed habitat. ODP 2 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.877416, -117.111049). April 13, 2022.



Photo 4. Downstream view of ODP 3 within NWW-94, facing north, within disturbed habitat. ODP 3 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.873981, -117.117320). April 13, 2022.

[1] See corresponding Figure 5 series for photo point locations. See Aquatic Resources Delineation Report Sections 6 through 8 for a discussion of each feature. Photos of culvert crossings within the review area are available upon request.



Photo 5. View of WDP 2 (white arrow) within NWW-94, facing south, within disturbed habitat. WDP 2 met the wetland hydrology parameter; however, WDP 2 did not meet the hydrophytic vegetation or hydric soil parameters (34.873798, -117.117380). April 13, 2022.



Photo 6. Downstream view of ODP 4 within NWW-92, facing northwest, within unvegetated channel. ODP 4 exhibited a break in bank slope and change in average sediment texture (34.868920, -117.128573). April 13, 2022.



Photo 7. View of WDP 3 (white arrow) within NWW-89, facing north, within allscale scrub. WDP 3 did not meet any of the three wetland parameters (34.863976, -117.131649). April 13, 2022.



Photo 8. View of ODP 5 within NWW-89, facing south, within allscale scrub. ODP 5 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.864056, -117.131616). April 13, 2022.



Photo 9. Upstream view of ODP 6 within NWW-89, facing east, within allscale scrub. ODP 6 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.865275, -117.133289). April 13, 2022.



Photo 10. Upstream view of ODP 7 within NWW-89, facing south, within allscale scrub. ODP 7 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.864610, -117.135505). April 13, 2022.



Photo 11. Upstream view of ODP 8 within NWW-90, facing east, within allscale scrub. ODP 8 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.861717, -117.142712). April 13, 2022.



Photo 12. Downstream view of ODP 9 within NWW-91, facing northwest, within allscale scrub. ODP 9 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.862985, -117.140461). April 13, 2022.



Photo 13. Downstream view of ODP 10 within NWW-87, facing west, within allscale scrub. ODP 10 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.858535, -117.148911). April 13, 2022.



Photo 14. Downstream view of ODP 11 within NWW-85, facing west, within allscale scrub. ODP 11 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.85783, -117.151636). April 13, 2022.



Photo 15. View of WDP 5 (white arrow), facing west, within tamarisk thickets. WDP 5 did not meet any of the three wetland parameters (34.858121, -117.152981). April 13, 2022.



Photo 16. Downstream view of ODP 12 within NWW-82, facing northeast, within disturbed allscale scrub. ODP 12 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.856230, -117.154700). April 12, 2022.



Photo 17. Downstream view of ODP 13 within NWW-80, facing north, within allscale scrub. ODP 13 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.853895, -117.157272). April 12, 2022.



Photo 18. Downstream view of ODP 14 within NWW-73, facing north, within allscale scrub. ODP 14 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.848316, -117.165825). April 12, 2022.



Photo 19. Upstream view of ODP 15 within NWW-70, facing south, within allscale scrub. ODP 15 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.843796, -117.167803). April 12, 2022.



Photo 20. Upstream view of ODP 16 near WDP 4 within NWW-45, facing east, within allscale scrub. ODP 16 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover. WDP 4 met the wetland hydrology parameter; however, WDP 4 did not meet the hydrophytic vegetation or hydric soil parameters (34.834131, -117.182665). April 12, 2022.



Photo 21. Downstream view of ODP 17 within NWW-44, facing northwest, within unvegetated channel. ODP 17 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.829592, -117.183445). April 13, 2022.




Photo 22. View of WDP 6 (white arrow), facing west, within disturbed allscale scrub. WDP 6 did not meet any of the three wetland parameters (34.823361, -117.187915). April 13, 2022.



Photo 23. Upstream view of ODP 18 within NWW-36, facing southeast, within allscale scrub. ODP 18 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.808714, -117.201562). April 13, 2022.



Photo 24. Upstream view of ODP 19 within NWW-69, facing south, within allscale scrub. ODP 19 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.843462, -117.168631). April 12, 2022.



Photo 25. View of ODP 20 within Swale (S-) 1, facing south, within disturbed habitat. ODP 20 exhibited a change in vegetation cover; however, no other OHWM indicators were observed (34.819464, -117.189726). April 13, 2022.



Photo 26. View of WDP 7 (white arrow), facing east, within tamarisk thickets. WDP 7 met the wetland hydrology parameter; however, WDP 7 did not meet the hydrophytic vegetation or hydric soil parameters (34.814805, -117.195132). April 13, 2022.



Photo 27. Downstream view of ODP 21 within NWW-68, facing west, within creosote bush scrub. ODP 21 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.840159, -117.169936). April 12, 2022.



Photo 28. Upstream view of ODP 22 within NWW-80, facing east, within creosote bush scrub. ODP 22 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.847573, -117.153050). December 1, 2021.



Photo 29. Upstream view of ODP 23 within NWW-89, facing west, within creosote bush scrub. ODP 23 exhibited a break in slope, change in average sediment texture, and change in vegetation cover (34.858002, -117.140602). December 1, 2021.



Photo 30. Upstream view of ODP 24 within NWW-76, facing south, within creosote bush scrub. ODP 24 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.848365, -117.159487). March 16, 2022.



Photo 31. View of WDP 8 (white arrow), facing south, within tamarisk thickets. WDP 8 met the hydrophytic vegetation parameter; however, WDP 8 did not meet the wetland hydrology or hydric soil parameters (34.802127, -117.215285). April 13, 2022.



Photo 32. Downstream view of ODP 25 within NWW-89, facing north, within allscale scrub. ODP 25 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.862511, -117.131726). March 16, 2022.



Photo 33. Downstream view of ODP 26 within NWW-109 (Mojave River), facing north, within active desert dunes. ODP 26 exhibited a break in bank slope and change in vegetation species (34.875604, -117.156870). March 24, 2022.



Photo 34. View of WDP 9, facing north, within tamarisk thickets. WDP 9 met the hydrophytic vegetation parameter; however, it did not meet the wetland hydrology or hydric soil parameters (34.837722, -117.184100). April 12, 2022.



Photo 35. Upstream view of ODP 27 within NWW-60, facing west, within creosote bush scrub. ODP 27 exhibited a break in bank slope and change in vegetation species and cover (34.840443, -117.179781). March 24, 2022.



Photo 36. View of WDP 10 within NWW-60, facing north, within creosote bush scrub. WDP 10 met the wetland hydrology parameter; however, WDP 10 did not meet the hydrophytic vegetation or hydric soil parameters (34.840073, -117.179764). March 24, 2022.



Photo 37. Upstream view of ODP 28 within NWW-109 (Mojave River), facing southwest, within active desert dunes. ODP 28 exhibited a break in bank slope, change in average sediment texture, and change in vegetation species and cover (34.852795, -117.183066). October 20, 2021.



Photo 38. Downstream view of ODP 28, facing northeast, within NWW-109 (Mojave River) (34.852790, -117.183067). October 20, 2021.



Photo 39. Upstream view of ODP 29 within NWW-20, facing east, within disturbed habitat. ODP 29 exhibited a break in bank slope, change in average sediment texture, and change in vegetation cover (34.791510, -117.240752). June 20, 2022.



Photo 40. View of WDP 11, facing north, within allscale scrub. WDP 11 met the wetland hydrology parameter; however, WDP 11 did not meet the hydrophytic vegetation or hydric soil parameters (34.883779, -117.094422). June 20, 2022.



Photo 41. View of watercouse associated with NWW-49, facing north, within allscale scrub (34.837243, -117.181167). April 12, 2022



Photo 42. View of watercouse associated with NWW-59, facing west, within allscale scrub (34.839333, -117.178218). April 13, 2022



Photo 43. View of secondary channel (white dashed line), facing west, within active desert dunes habitat. Based on the lack of OHWM indicators, this area did not qualify as jurisdictional per the Corps/RWQCB; however, this area qualified as CDFW streambed associated with the Mojave River (34.870457, -117.152712). March 24, 2022



Photo 44. View of evidence of ponding (mud cracks), facing north, within active desert dunes habitat. Based on the lack of OHWM indicators, this area did not qualify as jurisdictional per the Corps/RWQCB; however, this area qualified as CDFW streambed associated with the Mojave River (34.860885, -117.158040). October 20, 2021



Photo 45. View of active desert dunes habitat north of the agriculture fields, facing west. Based on the lack of OHWM indicators, this area did not qualify as jurisdictional per the Corps/RWQCB; however, this area qualified as CDFW streambed associated with the Mojave River (34.858790, -117.171585). October 20, 2021



Photo 46. View of active desert dunes habitat, facing north. Based on the lack of OHWM indicators, this area did not qualify as jurisdictional per the Corps/RWQCB; this area also did not qualify as CDFW streambed associated with the Mojave River (34.858790, -117.171585). October 20, 2021



Photo 47. View of active desert dunes habitat, facing north. Based on the lack of OHWM indicators, this area did not qualify as jurisdictional per the Corps/RWQCB; this area also did not qualify as CDFW streambed associated with the Mojave River (34.878000, -117.130945). August 10, 2021



Photo 48. View of active desert dunes habitat, facing north. Based on the lack of OHWM indicators, this area did not qualify as jurisdictional per the Corps/RWQCB; this area also did not qualify as CDFW streambed associated with the Mojave River (34.878558, -117.133787). August 10, 2021

# APPENDIX H

# AQUATIC RESOURCE SUMMARY TABLES

Table H-1. Aquatic Resource Summary: Corps/RWQCB

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-1 | R6 | 4 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.772787, -117.284653 | 0.02 | 123 |
| NWW-2 | R6 | 4 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.772847, -117.284610 | 0.01 | 121 |
| NWW-3 | R6 | 6 – 6 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.773221, -117.283817 | 0.02 | 132 |
| NWW-4 | R6 | 3 – 6 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.773653, -117.283036 | 0.01 | 113 |
| NWW-5 | R6 | 3 – 6 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.773734, -117.282869 | 0.01 | 109 |
| NWW-6 | R6 | 3 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.774652, -117.281701 | 0.01 | 126 |
| NWW-7 | R6 | 3 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.776674, -117.278786 | 0.01 | 119 |
| NWW-8 | R6 | 3 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.776786, -117.278705 | 0.01 | 96 |
| NWW-9 | R6 | 10 – 10 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as road runoff from dirt road north of and parallel to railroad tracks. | 34.778794, -117.277384 | 0.03 | 107 |
| NWW-10 | R6 | 1 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.778399, -117.276743 | <0.01 | 52 |
| NWW-11 | R6 | 3 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub; originates south of review area. | 34.778377, -117.276478 | 0.02 | 223 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-12 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.778670, -117.276121 | 0.01 | 127 |
| NWW-13 | R6 | 2 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.778712, -117.276024 | 0.01 | 113 |
| NWW-14 | R6 | 3 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.778886, -117.275827 | 0.01 | 133 |
| NWW-15 | R6 | 3 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub; originates south of review area. | 34.778978, -117.275585 | 0.01 | 184 |
| NWW-16 | R6 | 14 – 24 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.784276, -117.262668 | 0.07 | 214 |
| NWW-17 | R6 | 24 – 24 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Disturbed Habitat[6] | Primarily unvegetated, single-thread feature within allscale scrub. | 34.784361, -117.262104 | 0.05 | 81 |
| NWW-18 | R6 | 3 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.786948, -117.252605 | 0.01 | 104 |
| NWW-19 | R6 | 3 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.787318, -117.251761 | 0.01 | 114 |
| NWW-20 | R6 | 21 – 48 | CAST, CVC, BBS; See ODP 29 | WH[5] | Yes/No | Disturbed Habitat[6] | Primarily unvegetated, single-thread feature within disturbed habitat; originates south of review area. (See Photo 39 on Figures 5A – 5B and Appendix G.) | 34.791189, -117.241868 | 0.65 | 852 |
| NWW-21 | R6 | 3 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub that originates as runoff from National Trails Hwy/Main St. | 34.795810, -117.228450 | 0.03 | 428 |
| NWW-22 | R6 | 2 – 7 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates downstream of NWW-21. | 34.796559, -117.227801 | 0.02 | 176 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-23 | R6 | 3 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.795776, -117.228162 | 0.02 | 221 |
| NWW-24 | R6 | 3 – 12 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.797160, -117.227759 | 0.11 | 801 |
| NWW-25 | R6 | 3 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, double-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.796981, -117.225815 | 0.07 | 727 |
| NWW-26 | R6 | 3 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.797595, -117.225008 | 0.07 | 522 |
| NWW-27 | R6 | 2 – 13 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, partially braided feature within allscale scrub; originates as runoff from National Trails Hwy/Main St and/or features south of National Trails Hwy (NWW-103 and NWW-104). | 34.798258, -117.223204 | 0.18 | 1,155 |
| NWW-28 | R6 | 3 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub south of National Trails Hwy. | 34.797819, -117.222127 | 0.01 | 109 |
| NWW-29 | R6 | 1 – 1 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub. | 34.798766, -117.222983 | <0.01 | 96 |
| NWW-30 | R6 | 2 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.798508, -117.221906 | 0.03 | 311 |
| NWW-31 | R6 | 2 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, small, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.798583, -117.221247 | 0.01 | 145 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-32 | R6 | 3 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub south of National Trails Hwy. | 34.798456, -117.220065 | <0.01 | 32 |
| NWW-33 | R6 | 3 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.799322, -117.219846 | 0.02 | 171 |
| NWW-34 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.800955, -117.215818 | 0.03 | 572 |
| NWW-35 | R6 | 4 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.807290, -117.203290 | 0.01 | 66 |
| NWW-36 | R6 | 4 – 4 | CAST, CVC, BBS; See ODP 18 | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. (See Photo 23 on Figures 5A– 5B and Appendix G.) | 34.808738, -117.201555 | 0.01 | 183 |
| NWW-37 | R6 | 6 – 6 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.809189, -117.201054 | 0.01 | 150 |
| NWW-38 | R6 | 5 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.809316, -117.200892 | 0.01 | 141 |
| NWW-39 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.809671, -117.200471 | <0.01 | 182 |
| NWW-40 | R6 | 6 – 6 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.810099, -117.199975 | 0.01 | 155 |
| NWW-41 | R6 | 3 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.810323, -117.199718 | 0.01 | 172 |
| NWW-42 | R6 | 8 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.811425, -117.198424 | 0.02 | 175 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-43 | R6 | 12 – 12 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated, single-thread feature within creosote bush scrub; indicators of flow not present before dirt road. | 34.826693, -117.188511 | 0.13 | 475 |
| NWW-44 | R6 | 2 – 80 | CAST, CVC, BBS; See ODP 17 | WH[5] | Yes/No | Unvegetated Channel | Large, primarily unvegetated feature fed by culvert along Hinkley Road and road runoff from National Trails Hwy and/or features south of National Trails Hwy (NWW-105 and NWW-106).; located within unvegetated channel and allscale scrub; feature runs along berm (earthen-lined and partially concrete); feature enlarges near railroad crossing. (See Photo 21 on Figures 5A– 5B and Appendix G.) | 34.829248, -117.186429 | 3.13 | 5,956 |
| NWW-45 | R6 | 2 – 6 | CAST, CVC, BBS; See ODP 16 | WH; see WDP 4 | Yes/No | Allscale Scrub[6]; See WDP 4 | Primarily unvegetated braided feature within allscale scrub; feature initiates at and is sourced by a residential lot. (See Photo 20 on Figures 5A– 5B and Appendix G.) | 34.834684, -117.182237 | 0.21 | 2,468 |
| NWW-46 | R6 | 2 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated braided feature within allscale scrub between hillslopes. | 34.835168, -117.181479 | 0.06 | 1,172 |
| NWW-47 | R6 | 2 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub; originates as runoff from two dirt roads leading from National Trails Hwy. | 34.833706, -117.176283 | 0.04 | 580 |
| NWW-48 | R6 | 2 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.836991, -117.181122 | 0.03 | 481 |
| NWW-49 | R6 | 2 – 10 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, large braided and interwoven feature with multiple tributaries within allscale scrub between hillslopes. | 34.836110, -117.179064 | 0.73 | 7,138 |
| NWW-50 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.837239, -117.179203 | 0.02 | 461 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-51 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub between hillslopes. | 34.837464, -117.178078 | 0.04 | 842 |
| NWW-52 | R6 | 3 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub between hillslopes. | 34.837867, -117.177679 | 0.04 | 562 |
| NWW-53 | R6 | 2 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, double-thread feature within allscale scrub between hillslopes. | 34.837648, -117.177101 | 0.07 | 1,131 |
| NWW-54 | R6 | 2 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.835210, -117.172619 | 0.02 | 354 |
| NWW-55 | R6 | 2 – 10 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.835454, -117.171863 | 0.02 | 170 |
| NWW-56 | R6 | 2 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.835773, -117.172617 | 0.02 | 252 |
| NWW-57 | R6 | 2 – 7 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.836014, -117.172631 | 0.02 | 264 |
| NWW-58 | R6 | 2 – 14 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub. | 34.838348, -117.176084 | 0.50 | 4,358 |
| NWW-59 | R6 | 1- 13 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Large, primarily unvegetated, fan feature with multiple braids and heavily interwoven throughout; upstream portion of the feature runs through various hillslopes and fans downstream; within allscale scrub and creosote bush scrub; portions originate as runoff from National Trails Hwy and/or feature south of National Trails Hwy (NWW-107). | 34.838248, -117.174160 | 0.75 | 8,262 |
| NWW-60 | R6 | 6 – 51 | CVS, CVC, BBS; See ODP 27 | WH; See WDP 10 | Yes/No | Creosote Bush Scrub | Vegetated feature north of railroad tracks within creosote bush scrub; receives sheet flows from dirt road north of and parallel to railroad tracks. (See Photos 35 and 36 on Figures 5A– 5B and Appendix G.) | 34.840401, -117.179750 | 0.17 | 188 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-61 | R6 | 1 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated, single-thread feature within creosote bush scrub; originates as runoff from National Trails Hwy/Main St. | 34.837031, -117.169791 | 0.05 | 910 |
| NWW-62 | R6 | 2 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated feature within allscale scrub between hillslopes; multiple tributaries. | 34.840397, -117.175307 | 0.14 | 1,696 |
| NWW-63 | R6 | 2 – 6 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated feature within allscale scrub between hillslopes; multiple tributaries. | 34.840934, -117.174275 | 0.20 | 2,174 |
| NWW-64 | R6 | 2 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub between hillslopes. | 34.841711, -117.174418 | 0.04 | 538 |
| NWW-65 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub within hillslopes. | 34.842293, -117.173643 | 0.02 | 482 |
| NWW-66 | R6 | 2 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, double-thread feature within allscale scrub within hillslopes. | 34.843147, -117.172457 | 0.08 | 1,260 |
| NWW-67 | R6 | 1 – 12 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated feature with multiple tributaries upstream within creosote bush scrub. | 34.841131, -117.171984 | 0.22 | 2,373 |
| NWW-68 | R6 | 1 – 12 | CAST, CVC, BBS; See ODP 21 | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated, braided feature within creosote bush scrub; originates as runoff from National Trails Hwy/Main St. (See Photo 27 on Figures 5A– 5B and Appendix G.) | 34.839992, -117.170094 | 0.34 | 5,708 |
| NWW-69 | R6 | 2 – 8 | CAST, CVC, BBS; See ODP 19 | WH[5] | Yes/No | Allscale Scrub[6] | Large, primarily unvegetated, braided and interwoven feature within allscale scrub and creosote bush scrub between hillslopes. (See Photo 24 on Figures 5A– 5B and Appendix G.) | 34.842933, -117.168625 | 0.68 | 6,858 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-70 | R6 | 1 – 20 | CAST, CVC, BBS; See ODP 15 | WH[5] | Yes/No | Creosote Bush Scrub[6] | Large, primarily unvegetated, braided and interwoven feature with multiple mainstems fed by various tributaries; located within allscale scrub and creosote bush scrub between hillslopes; originates as runoff from unnamed dirt roads leading from National Trails Hwy. (See Photo 19 on Figures 5A– 5B and Appendix G.) | 34.842209, -117.166408 | 2.09 | 18,554 |
| NWW-71 | R6 | 4 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub between hillslopes. | 34.844554, -117.165718 | 0.10 | 1,128 |
| NWW-72 | R6 | 4 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub between hillslopes. | 34.845370, -117.166236 | 0.04 | 427 |
| NWW-73 | R6 | 2 – 12 | CAST, CVC, BBS; See ODP 14 | WH[5] | Yes/No | Allscale Scrub[6] | Large, primarily unvegetated, interwoven feature with multiple mainstems fed by various tributaries within allscale scrub and creosote bush scrub; originates as runoff from unnamed dirt roads leading from National Trails Hwy. (See Photo 18 on Figures 5A– 5B and Appendix G.) | 34.844453, -117.163545 | 1.24 | 13,348 |
| NWW-74 | R6 | 2 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, double-thread feature within allscale scrub; originates as runoff from unnamed dirt road. | 34.846950, -117.162756 | 0.17 | 1,582 |
| NWW-75 | R6 | 2 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, double-thread feature within allscale scrub. | 34.845550, -117.159978 | 0.04 | 487 |
| NWW-76 | R6 | 2 – 13 | CAST, CVC, BBS; See ODP 24 | WH[5] | Yes/No | Allscale Scrub[6] | Large, primarily unvegetated, braided feature with multiple tributaries within allscale scrub; originates as runoff from unnamed dirt road leading from National Trails Hwy. (See Photo 30 on Figures 5A– 5B and Appendix G.) | 34.848019, -117.159133 | 0.86 | 8,649 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-77 | R6 | 2 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated feature with one tributary within allscale scrub in between hillslopes; originates as runoff from unnamed dirt road leading from National Trails Hwy. | 34.847129, -117.156396 | 0.16 | 1,677 |
| NWW-78 | R6 | 2 – 2 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.848845, -117.157242 | 0.01 | 278 |
| NWW-79 | R6 | 2 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, braided feature within allscale scrub; originates as runoff from unnamed dirt road. | 34.850248, -117.158057 | 0.13 | 1,874 |
| NWW-80 | R6 | 1 – 20 | CAST, CVC, BBS; See ODP 13 and 22 | WH[5] | Yes/No | Creosote Bush Scrub[6] | Large, primarily unvegetated, braided and interwoven feature with multiple mainstems fed by various tributaries within creosote bush scrub; originates as runoff from National Trails Hwy/Main St and/or feature south of National Trails Hwy (NWW-108); portions of feature display disturbance by off-road vehicle usage. (See Photos 17 and 28 on Figures 5A– 5B and Appendix G.) | 34.850680, -117.154564 | 2.02 | 15,877 |
| NWW-81 | R6 | 2 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub. | 34.853340, -117.156269 | 0.12 | 1,229 |
| NWW-82 | R6 | 1 – 15 | CAST, CVC, BBS; See ODP 12 | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated, braided feature within allscale scrub and creosote bush scrub; heavily eroded where feature runs parallel to railroad tracks. (See Photo 16 on Figures 5A– 5B and Appendix G.) | 34.854433, -117.152784 | 0.64 | 8,328 |
| NWW-83 | R6 | 2 – 3 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.856239, -117.153167 | 0.01 | 250 |
| NWW-84 | R6 | 1 – 1 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated, single-thread feature within creosote bush scrub. | 34.854958, -117.146066 | 0.02 | 909 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-85 | R6 | 1 – 5 | CAST, CVC, BBS; See ODP 11 | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated feature with multiple tributaries within allscale scrub; originates as runoff from unnamed dirt road. (See Photo 11 on Figures 5A– 5B and Appendix G.) | 34.857281, -117.149898 | 0.31 | 3,921 |
| NWW-86 | R6 | 3 – 3 | CAST, CVC, BBS[5] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Small, primarily unvegetated, single-thread feature within creosote bush scrub; originates as runoff from unnamed dirt road. | 34.856698, -117.147965 | 0.02 | 218 |
| NWW-87 | R6 | 2 – 4 | CAST, CVC, BBS; See ODP 10 | WH[5] | Yes/No | Creosote Bush Scrub[6] | Primarily unvegetated, double-thread feature within creosote bush scrub; originates as runoff from unnamed dirt road. (See Photo 13 on Figures 5A– 5B and Appendix G.) | 34.857936, -117.147949 | 0.13 | 2,162 |
| NWW-88 | R6 | 4 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from unnamed dirt road. | 34.858906, -117.148308 | 0.04 | 403 |
| NWW-89 | R6 | 1 – 18 | CAST, CVC, BBS; see ODP 5, 6, 7, 23, 25 | None; See WDP 3 | Yes/No | Allscale Scrub[6] | Large, primarily unvegetated feature within allscale scrub, creosote bush scrub, and disturbed habitat that consists of two large mainstems with several tributaries; eastern main stem originates south of National Trails Hwy/Main St before traveling through a culvert, western main stem originates as runoff from Mockingbird Rd (dirt road); disturbed by off-road vehicle use and obstructions (tree logs) likely placed by adjacent residential lot residents; heavily eroded downstream near manipulated and heavily used dirt roads adjacent to the railroad tracks. (See Photos 7 – 10, 29, and 32 on Figures 5A– 5B and Appendix G.) | 34.863711, -117.134655 | 1.39 | 12,490 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-90 | R6 | 2 – 6 | CAST, CVC, BBS; See ODP 8 | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from unnamed dirt road. (See Photo 11 on Figures 5A– 5B and Appendix G.) | 34.860552, -117.142795 | 0.08 | 995 |
| NWW-91 | R6 | 2 – 2 | CAST, CVC, BBS; See ODP 9 | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, small, single-thread feature within allscale scrub near residential lots; originates as runoff from upstream residential lot and Dundee St. (See Photo 12 on Figures 5A– 5B and Appendix G.) | 34.863147, -117.140564 | 0.01 | 150 |
| NWW-92 | R6 | 8 – 40 | CAST, BBS; See ODP 4 | WH[5] | Yes/No | Unvegetated Channel | Primarily unvegetated, large, trapezoidal feature (San Bernardino County Flood Control District Channel) within heavily manipulated, unvegetated channel; evidence of off-road vehicle use; originates south of Main St/National Trails Hwy. (See Photo 6 on Figures 5A– 5B and Appendix G.) | 34.874455, -117.131291 | 1.32 | 4,629 |
| NWW-93 | R6 | 3 – 20 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Disturbed Habitat[6] | Rip-rap feature within developed and fenced area; originates at culvert outlet near intersection of National Trails Hwy and Lenwood Rd; downstream extent is large, rip-rap, circular, unvegetated drainage area containing a culvert inlet. | 34.873485, -117.118709 | 0.06 | 409 |
| NWW-94 | R6 | 6 – 6 | CAST, CVC, BBS; See ODP 3 | WH; See WDP 2 | Yes/No | Disturbed Habitat[6] | Primarily unvegetated feature within disturbed habitat; feature initiates from large stormwater concrete channelized structure. (See Photos 4 and 5 on Figures 5A– 5B and Appendix G.) | 34.874055, -117.117372 | 0.06 | 401 |
| NWW-95 | R6 | 2 – 5 | CAST, CVC, BBS; See ODP 2 | WH[5] | Yes/No | Disturbed Habitat[6] | Primarily unvegetated, single-thread feature within disturbed habitat that outlets from culvert along National Trails Hwy; manipulation on the eastern slopes. (See Photo 3 on Figures 5A– 5B and Appendix G.) | 34.877087, -117.110926 | 0.03 | 307 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-96 | R6 | 5 – 5 | CAST, CVC, BBS[4] | None; See WDP 1 | Yes/No; See WDP 1 | Disturbed Habitat | Primarily heavily vegetated, disturbed, single-thread feature within disturbed habitat and tamarisk thickets; originates as road runoff from National Trails Hwy. (See Photo 2 on Figures 5A– 5B and Appendix G.) | 34.878268, -117.108708 | 0.05 | 439 |
| NWW-97 | R6 | 3 – 3 | CAST, CVC, BBS; See ODP 1 | WH[5] | Yes/No | Disturbed Habitat[6] | Primarily unvegetated, single-thread feature generally within disturbed habitat; feature drains through private commercial lots and outputs across a culvert crossing. (See Photo 1 on Figures 5A– 5B and Appendix G.) | 34.879422, -117.105552 | 0.03 | 506 |
| NWW-98 | R6 | 4 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub – Disturbed[6] | Small, unvegetated single-thread feature within allscale scrub – disturbed habitat that originates as runoff from dirt road parallel to the north side of railroad tracks. | 34.880017, -117.105950 | 0.01 | 124 |
| NWW-99 | R6 | 2 – 4 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Disturbed Habitat | Vegetated, single-thread feature within disturbed habitat that originates at culvert north of Main St/National Trails Hwy. | 34.880936, -117.101226 | 0.03 | 353 |
| NWW-100 | R6 | 2 – 13 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated feature within allscale scrub with several tributaries that travels through several culverts; originates as runoff from and at a culvert north of Main St/National Trails Hwy. | 34.882602, -117.095407 | 0.34 | 2,524 |
| NWW-101 | R6 | 3 – 28 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated feature within allscale scrub with multiple tributaries that travels through several culverts; originates as runoff from and at a culvert north of Main St/National Trails Hwy. | 34.883416, -117.092671 | 0.29 | 1,003 |
| NWW-102 | R6 | 2 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated feature within allscale scrub that originates as runoff from Main St/National Trails Hwy. | 34.883038, -117.091930 | 0.01 | 99 |

| Aquatic Resource Name (Corps/ RWQCB) | Cowardin Code | Active Channel Width Range (Feet) | Observed OHWM Indicators[1] | Observed Wetland Parameters[2] | Presence of OHWM/ Wetland | Dominant Vegetation[3] | General Characteristics | Location (Latitude, Longitude) | Acre(s) | Linear Feet |
|---|---|---|---|---|---|---|---|---|---|---|
| NWW-103 | R6 | 4 – 15 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy and converge with NWW-27. | 34.797426, -117.223080 | 0.01 | 43 |
| NWW-104 | R6 | 4 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy and converge with NWW-27. | 34.797510, -117.222886 | 0.01 | 70 |
| NWW-105 | R6 | 8 – 8 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Small, primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy and converge with NWW-44. | 34.828712, -117.182373 | 0.01 | 29 |
| NWW-106 | R6 | 12 – 12 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Allscale Scrub[6] | Primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy and converge with NWW-44. | 34.828907, -117.182084 | 0.01 | 36 |
| NWW-107 | R6 | 3 – 5 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub[6] | Small, primarily unvegetated, single-thread feature within creosote bush scrub that may continue over Main St/National Trails Hwy converge with NWW-59. | 34.835555, -117.169501 | <0.01 | 51 |
| NWW-108 | R6 | 16 – 16 | CAST, CVC, BBS[4] | WH[5] | Yes/No | Creosote Bush Scrub – Disturbed[6] | Primarily unvegetated, single-thread feature within creosote bush scrub – disturbed that may continue over Main St/National Trails Hwy and converge with NWW-80. | 34.847053, -117.151904 | 0.01 | 36 |
| NWW-109 (Mojave River) | R4 | 500 – 1400 | CAST, CVS, CVC, BBS; See ODP 26 and 28 | WH[5] | Yes/No | Active Desert Dunes | Sparsely vegetated, dry, sandy wash that comprises the on-site extent of the Mojave River; generally flows southwest to northeast before continuing off site. (See Photos 33, 37, and 38 on Figures 5A – 5B and Appendix G.) | 34.863277, -117.170128 | 104.30 | 4,818 |
| | | | | | | | | Total | 125.58 | 177,864 |

[1] OHWM Indicators: CAST = Change in average sediment texture; CVS = Change in vegetation species; CVC = Change in vegetation cover; BBS = Break in bank slope

[2] Wetland Indicators: WH = Wetland Hydrology
[3] See Figure 6 for all vegetation communities present within/around each aquatic resource.
[4] Based on a representative ODP taken within an aquatic resource with similar conditions.
[5] Based on a representative WDP taken within an aquatic resource with similar conditions.
[6] Unvegetated within mapped vegetation community; however, no vegetation technically present within the OHWM.
[7] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.

Table H-2. Aquatic Resource Summary: CDFW

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-1 | Unvegetated Streambed[3] | Allscale Scrub[4] | 6 – 12 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.772787, -117.284653 | 0.02 | 123 |
| NWW-2 | Unvegetated Streambed[3] | Allscale Scrub[4] | 6 – 6 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.772847, -117.284610 | 0.02 | 121 |
| NWW-3 | Unvegetated Streambed[3] | Allscale Scrub[4] | 6 – 6 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.773221, -117.283817 | 0.02 | 132 |
| NWW-4 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 8 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.773653, -117.283036 | 0.02 | 113 |
| NWW-5 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 8 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.773734, -117.282869 | 0.01 | 109 |
| NWW-6 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 8 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.774652, -117.281701 | 0.02 | 126 |
| NWW-7 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 5 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.776674, -117.278786 | 0.01 | 119 |
| NWW-8 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.776786, -117.278705 | 0.01 | 96 |
| NWW-9 | Unvegetated Streambed[3] | Allscale Scrub[4] | 35 – 35 | Primarily unvegetated, single-thread feature within allscale scrub; originates as road runoff from dirt road north of and parallel to railroad tracks. | 34.778794, -117.277384 | 0.10 | 107 |
| NWW-10 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 3 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.778399, -117.276743 | <0.01 | 52 |
| NWW-11 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 4 | Small, primarily unvegetated, double-thread feature within allscale scrub; originates south of review area. | 34.778377, -117.276478 | 0.02 | 223 |
| NWW-12 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.778670, -117.276121 | 0.01 | 127 |
| NWW-13 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 6 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.778712, -117.276024 | 0.01 | 113 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-14 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.778886, -117.275827 | 0.01 | 133 |
| NWW-15 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 4 | Small, primarily unvegetated, double-thread feature within allscale scrub; originates south of review area. | 34.778978, -117.275585 | 0.01 | 184 |
| NWW-16 | Unvegetated Streambed[3] | Allscale Scrub[4] | 16 – 24 | Primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.784276, -117.262668 | 0.08 | 214 |
| NWW-17 | Unvegetated Streambed[3] | Allscale Scrub[4] | 27 – 27 | Primarily unvegetated, single-thread feature within allscale scrub. | 34.784361, -117.262104 | 0.06 | 81 |
| NWW-18 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 3 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.786948, -117.252605 | 0.01 | 104 |
| NWW-19 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 5 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.787318, -117.251761 | 0.01 | 114 |
| NWW-20 | Unvegetated Streambed[3] | Disturbed Habitat[4] | 33 – 96 | Primarily unvegetated, single-thread feature within disturbed habitat; originates south of review area. (See Photo 39 on Figure 5C and Appendix G.) | 34.791189, -117.241868 | 1.32 | 852 |
| NWW-21 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 15 | Primarily unvegetated, single-thread feature within allscale scrub that originates as runoff from National Trails Hwy/Main St. | 34.795810, -117.228450 | 0.09 | 428 |
| NWW-22 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 7 | Primarily unvegetated, single-thread feature within allscale scrub; originates downstream of NWW-21. | 34.796559, -117.227801 | 0.02 | 176 |
| NWW-23 | Unvegetated Streambed[3] | Allscale Scrub[4] | 8 – 16 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.795776, -117.228162 | 0.07 | 221 |
| NWW-24 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 20 | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.797160, -117.227759 | 0.22 | 801 |
| NWW-25 | Unvegetated Streambed[3] | Allscale Scrub[4] | 5 – 15 | Primarily unvegetated, double-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.796981, -117.225815 | 0.16 | 727 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-26 | Unvegetated Streambed[3] | Allscale Scrub[4] | 5 – 15 | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.797595, -117.225008 | 0.16 | 522 |
| NWW-27 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 20 | Primarily unvegetated, partially braided feature within allscale scrub; originates as runoff from National Trails Hwy/Main St and/or features south of National Trails Hwy (NWW-103 and NWW-104); watercourse mapped throughout. | 34.798258, -117.223204 | 0.26 | 1,155 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 2.58 | – |
| NWW-28 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 5 | Small, primarily unvegetated, double-thread feature within allscale scrub south of National Trails Hwy; watercourse mapped throughout | 34.797819, -117.222127 | 0.01 | 109 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.16 | – |
| NWW-29 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Primarily unvegetated, single-thread feature within allscale scrub; occurs within watercourse mapped as associated with NWW-27. | 34.798766, -117.222983 | <0.01 | 96 |
| NWW-30 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 12 | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.798508, -117.221906 | 0.05 | 311 |
| NWW-31 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 10 | Primarily unvegetated, small, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.798583, -117.221247 | 0.03 | 145 |
| NWW-32 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub south of National Trails Hwy; watercourse mapped throughout. | 34.798456, -117.220065 | <0.01 | 32 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.16 | – |
| NWW-33 | Unvegetated Streambed[3] | Allscale Scrub[4] | 5 – 18 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.799322, -117.219846 | 0.05 | 171 |
| NWW-34 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.800955, -117.215818 | 0.03 | 572 |
| NWW-35 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.807290, -117.203290 | 0.01 | 66 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-36 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area; watercourse mapped throughout. (See Photo 23 on Figure 5C and Appendix G.) | 34.808738, -117.201555 | 0.01 | 183 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.11 | – |
| NWW-37 | Unvegetated Streambed[3] | Allscale Scrub[4] | 6 – 6 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area; watercourse mapped throughout. | 34.809189, -117.201054 | 0.01 | 150 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.21 | – |
| NWW-38 | Unvegetated Streambed[3] | Allscale Scrub[4] | 5 – 5 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area; occurs within watercourse mapped as associated with NWW-37. | 34.809316, -117.200892 | 0.01 | 141 |
| NWW-39 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.809671, -117.200471 | <0.01 | 182 |
| NWW-40 | Unvegetated Streambed[3] | Allscale Scrub[4] | 6 – 6 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area; watercourse mapped throughout. | 34.810099, -117.199975 | 0.01 | 155 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.29 | – |
| NWW-41 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 3 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area; occurs within watercourse mapped as associated with NWW-40. | 34.810323, -117.199718 | 0.01 | 172 |
| NWW-42 | Unvegetated Streambed[3] | Allscale Scrub[4] | 8 – 8 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates south of review area. | 34.811425, -117.198424 | 0.02 | 175 |
| NWW-43 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 20 – 20 | Primarily unvegetated, single-thread feature within creosote bush scrub; indicators of flow not present before dirt road. | 34.826693, -117.188511 | 0.34 | 475 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-44 | Unvegetated Streambed[3] | Unvegetated Channel | 2 - 150 | Large, primarily unvegetated feature fed by culvert along Hinkley Road and road runoff from National Trails Hwy and/or features south of National Trails Hwy (NWW-105 and NWW-106).; located within unvegetated channel and allscale scrub; feature runs along berm (earthen-lined and partially concrete); feature enlarges near railroad crossing. (See Photo 21 on Figure 5C and Appendix G.) | 34.829248, -117.186429 | 3.72 | 5,956 |
| NWW-45 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 6 | Primarily unvegetated braided feature within allscale scrub; feature initiates at and is sourced by a residential lot; watercourse present throughout some portions of feature. (See Photo 20 on Figure 5C and Appendix G.) | 34.834684, -117.182237 | 0.21 | 2,468 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.66 | – |
| NWW-46 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 4 | Primarily unvegetated braided feature within allscale scrub between hillslopes. | 34.835168, -117.181479 | 0.06 | 1,172 |
| NWW-47 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 4 | Small, primarily unvegetated, double-thread feature within allscale scrub; originates as runoff from two dirt roads leading from National Trails Hwy. | 34.833706, -117.176283 | 0.04 | 580 |
| NWW-48 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub; portion occurs within watercourse mapped as associated with NWW-49. | 34.836991, -117.181122 | 0.03 | 481 |
| NWW-49 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 10 | Primarily unvegetated, large braided and interwoven feature with multiple tributaries within allscale scrub between hillslopes; watercourse present throughout some portions of feature. (See Photo 41 on Figure 5C and Appendix G.) | 34.836110, -117.179064 | 0.73 | 7,138 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 1.62 | – |
| NWW-50 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.837239, -117.179203 | 0.02 | 461 |
| NWW-51 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Small, primarily unvegetated, double-thread feature within allscale scrub between hillslopes. | 34.837464, -117.178078 | 0.04 | 842 |
| NWW-52 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 3 | Small, primarily unvegetated, single-thread feature within allscale scrub between hillslopes. | 34.837867, -117.177679 | 0.04 | 562 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-53 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 3 | Primarily unvegetated, double-thread feature within allscale scrub between hillslopes. | 34.837648, -117.177101 | 0.07 | 1,131 |
| NWW-54 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 3 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from National Trails Hwy/Main St. | 34.835210, -117.172619 | 0.02 | 354 |
| NWW-55 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 10 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.835454, -117.171863 | 0.02 | 170 |
| NWW-56 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 5 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.835773, -117.172617 | 0.02 | 252 |
| NWW-57 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 7 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.836014, -117.172631 | 0.02 | 264 |
| NWW-58 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 14 | Primarily unvegetated, single-thread feature within allscale scrub. | 34.838348, -117.176084 | 0.50 | 4,358 |
| NWW-59 | Unvegetated Streambed[3] | Allscale Scrub[4] | 1 – 16 | Large, primarily unvegetated, fan feature with multiple braids and heavily interwoven throughout; upstream portion of the feature runs through various hillslopes and fans downstream; within allscale scrub and creosote bush scrub; portions originate as runoff from National Trails Hwy and/or feature south of National Trails Hwy (NWW-107); watercourse present throughout some portions of feature. (See Photo 42 on Figure 5C and Appendix G.) | 34.838248, -117.174160 | 0.82 | 8,262 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 9.45 | – |
| NWW-60 | Vegetated Streambed[3] | Creosote Bush Scrub | 6 – 51 | Vegetated feature north of railroad tracks within creosote bush scrub; receives sheet flows from dirt road north of and parallel to railroad tracks. (See Photos 35 and 36 on Figure 5C and Appendix G.) | 34.840401, -117.179750 | 0.17 | 188 |
| NWW-61 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 12 | Primarily unvegetated, single-thread feature within creosote bush scrub; originates as runoff from National Trails Hwy/Main St. | 34.837031, -117.169791 | 0.08 | 910 |
| NWW-62 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 8 | Primarily unvegetated feature within allscale scrub between hillslopes; multiple tributaries. | 34.840397, -117.175307 | 0.14 | 1,696 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-63 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 6 | Primarily unvegetated feature within allscale scrub between hillslopes; multiple tributaries. | 34.840934, -117.174275 | 0.20 | 2,174 |
| NWW-64 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 4 | Small, primarily unvegetated, double-thread feature within allscale scrub between hillslopes. | 34.841711, -117.174418 | 0.04 | 538 |
| NWW-65 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Small, primarily unvegetated, single-thread feature within allscale scrub within hillslopes. | 34.842293, -117.173643 | 0.02 | 482 |
| NWW-66 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 3 | Primarily unvegetated, double-thread feature within allscale scrub within hillslopes. | 34.843147, -117.172457 | 0.08 | 1,260 |
| NWW-67 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 12 | Primarily unvegetated feature with multiple tributaries upstream within creosote bush scrub. | 34.841131, -117.171984 | 0.22 | 2,373 |
| NWW-68 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 12 | Primarily unvegetated, braided feature within creosote bush scrub; originates as runoff from National Trails Hwy/Main St; watercourse present throughout some portions of feature. (See Photo 27 on Figure 5C and Appendix G.) | 34.839992, -117.170094 | 0.36 | 5,708 |
| | Watercourse[5] | Creosote Bush Scrub | N/A | | | 0.51 | – |
| NWW-69 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 8 | Large, primarily unvegetated, braided and interwoven feature within allscale scrub and creosote bush scrub between hillslopes; watercourse present throughout some portions of feature. (See Photo 24 on Figure 5C and Appendix G.) | 34.842933, -117.168625 | 0.68 | 6,858 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.83 | – |
| NWW-70 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 20 | Large, primarily unvegetated, braided and interwoven feature with multiple mainstems fed by various tributaries; located within allscale scrub and creosote bush scrub between hillslopes; originates as runoff from unnamed dirt roads leading from National Trails Hwy; watercourse present throughout some portions of feature. (See Photo 19 on Figure 5C and Appendix G.) | 34.842209, -117.166408 | 2.10 | 18,554 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 6.25 | – |
| NWW-71 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Primarily unvegetated, single-thread feature within allscale scrub between hillslopes. | 34.844554, -117.165718 | 0.10 | 1,128 |
| NWW-72 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub between hillslopes. | 34.845370, -117.166236 | 0.04 | 427 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-73 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 12 | Large, primarily unvegetated, interwoven feature with multiple mainstems fed by various tributaries within allscale scrub and creosote bush scrub; originates as runoff from unnamed dirt roads leading from National Trails Hwy. (See Photo 18 on Figure 5C and Appendix G.) | 34.844453, -117.163545 | 1.24 | 13,348 |
| NWW-74 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 8 | Primarily unvegetated, double-thread feature within allscale scrub; originates as runoff from unnamed dirt road. | 34.846950, -117.162756 | 0.17 | 1,582 |
| NWW-75 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 4 | Small, primarily unvegetated, double-thread feature within allscale scrub. | 34.845550, -117.159978 | 0.04 | 487 |
| NWW-76 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 13 | Large, primarily unvegetated, braided feature with multiple tributaries within allscale scrub; originates as runoff from unnamed dirt road leading from National Trails Hwy; watercourse present throughout some portions of feature. (See Photo 30 on Figure 5C and Appendix G.) | 34.848019, -117.159133 | 0.86 | 8,649 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 15.45 | – |
| NWW-77 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 2 – 8 | Primarily unvegetated feature with one tributary within allscale scrub in between hillslopes; originates as runoff from unnamed dirt road leading from National Trails Hwy; downstream extent continues into watercourse associated with NWW-76. | 34.847129, -117.156396 | 0.17 | 1,677 |
| NWW-78 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.848845, -117.157242 | 0.01 | 278 |
| NWW-79 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 5 | Primarily unvegetated, braided feature with island within allscale scrub; originates as runoff from unnamed dirt road. | 34.850248, -117.158057 | 0.13 | 1,874 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-80 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 20 | Large, primarily unvegetated, braided and interwoven feature with multiple mainstems fed by various tributaries within creosote bush scrub; originates from National Trails Hwy/Main St and/or feature south of National Trails Hwy (NWW-108); portions of feature display disturbance by off-road vehicle usage; watercourse present throughout some portions of feature. (See Photos 17 and 18 on Figure 5C and Appendix G.) | 34.850680, -117.154564 | 2.02 | 15,877 |
| | Watercourse[5] | Creosote Bush Scrub | N/A | | | 13.99 | – |
| NWW-81 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 8 | Primarily unvegetated, single-thread feature within allscale scrub. | 34.853340, -117.156269 | 0.12 | 1,229 |
| NWW-82 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 15 | Primarily unvegetated, braided feature within allscale scrub and creosote bush scrub; heavily eroded where feature runs parallel to railroad tracks. (See Photo 16 on Figure 5C and Appendix G.) | 34.854433, -117.152784 | 0.64 | 8,328 |
| NWW-83 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 3 | Small, primarily unvegetated, single-thread feature within allscale scrub. | 34.856239, -117.153167 | 0.01 | 250 |
| NWW-84 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 1 – 1 | Primarily unvegetated, single-thread feature within creosote bush scrub. | 34.854958, -117.146066 | 0.02 | 909 |
| NWW-85 | Unvegetated Streambed[3] | Allscale Scrub[4] | 1 – 5 | Primarily unvegetated feature with multiple tributaries within allscale scrub; originates as runoff from unnamed dirt road. (See Photo 11 on Figure 5C and Appendix G.) | 34.857281, -117.149898 | 0.31 | 3,921 |
| NWW-86 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 3 – 3 | Small, primarily unvegetated, single-thread feature within creosote bush scrub; originates as runoff from unnamed dirt road. | 34.856698, -117.147965 | 0.02 | 218 |
| NWW-87 | Unvegetated Streambed[3] | Creosote Bush Scrub[4] | 2 – 4 | Primarily unvegetated, double-thread feature within creosote bush scrub; originates as runoff from unnamed dirt road. (See Photo 13 on Figure 5C and Appendix G.) | 34.857936, -117.147949 | 0.13 | 2,162 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-88 | Unvegetated Streambed[3] | Allscale Scrub[4] | 4 – 4 | Small, primarily unvegetated, single-thread feature within allscale scrub; originates as runoff from unnamed dirt road. | 34.858906, -117.148308 | 0.04 | 403 |
| NWW-89 | Unvegetated Streambed[3] | Allscale Scrub[4] | 1 – 22 | Large, primarily unvegetated feature within allscale scrub, creosote bush scrub, and disturbed habitat that consists of two large mainstems with several tributaries; eastern main stem originates south of National Trails Hwy/Main St before traveling through a culvert, western main stem originates as runoff from Mockingbird Rd (dirt road); disturbed by off-road vehicle use and obstructions (tree logs) likely placed by adjacent residential lot residents; heavily eroded downstream near manipulated and heavily used dirt roads adjacent to the railroad tracks; watercourse present throughout some portions of feature. (See Photos 7 – 10, 29, and 32 on Figure 5C and Appendix G.) | 34.863711, -117.134655 | 1.57 | 12,490 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 1.84 | – |
| NWW-90 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 6 | Primarily unvegetated, single-thread feature within allscale scrub between residential lots; originates as runoff from unnamed dirt road. (See Photo 11 on Figure 5C and Appendix G.) | 34.860552, -117.142795 | 0.08 | 995 |
| NWW-91 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 2 | Primarily unvegetated, small, single-thread feature within allscale scrub near residential lots; originates as runoff from upstream residential lot and Dundee Street. (See Photo 12 on Figure 5C and Appendix G.) | 34.863147, -117.140564 | 0.01 | 150 |
| NWW-92 | Unvegetated Streambed[3] | Unvegetated Channel | 8 – 45 | Primarily unvegetated, large, trapezoidal feature (San Bernardino County Flood Control District Channel) within heavily manipulated, unvegetated channel; evidence of off-road vehicle use; originates south of Main St/National Trails Hwy. (See Photo 6 on Figure 5C and Appendix G.) | 34.874455, -117.131291 | 1.77 | 4,629 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-93 | Unvegetated Streambed[3] | Disturbed Habitat[4] | 3 – 20 | Rip-rap feature within developed and fenced area; originates at culvert outlet near intersection of National Trails Hwy and Lenwood Rd; downstream extent is large, rip-rap, circular, unvegetated drainage area containing a culvert inlet. | 34.873485, -117.118709 | 0.06 | 409 |
| NWW-94 | Unvegetated Streambed[3] | Disturbed Habitat[4] | 10 – 10 | Primarily unvegetated feature within disturbed habitat; feature initiates from large stormwater concrete channelized structure. (See Photos 4 and 5 on Figure 5C and Appendix G.) | 34.874055, -117.117372 | 0.09 | 401 |
| NWW-95 | Unvegetated Streambed[3] | Disturbed Habitat[4] | 2 – 10 | Primarily unvegetated, single-thread feature within disturbed habitat that outlets from culvert along National Trails Hwy; manipulation on the eastern slopes. (See Photo 3 on Figure 5C and Appendix G.) | 34.877087, -117.110926 | 0.06 | 307 |
| NWW-96 | Unvegetated Streambed[3] | Disturbed Habitat[4] | 5 – 5 | Primarily heavily vegetated, disturbed, single-thread feature within disturbed habitat and tamarisk thickets; originates as road runoff from National Trails Hwy. (See Photo 2 on Figure 5C and Appendix G.) | 34.878268, -117.108708 | 0.01 | 439 |
| | Vegetated Streambed[3] | Disturbed Habitat | 5 – 5 | | | 0.04 | |
| NWW-97 | Unvegetated Streambed[3] | Disturbed Habitat[4] | 3 – 3 | Primarily unvegetated, single-thread feature generally within disturbed habitat; feature drains through private commercial lots and outputs across a culvert crossing. (See Photo 1 on Figure 5C and Appendix G.) | 34.879422, -117.105552 | 0.03 | 506 |
| NWW-98 | Unvegetated Streambed[3] | Allscale Scrub – Disturbed[4] | 5 – 5 | Small, unvegetated single-thread feature within allscale scrub – disturbed habitat that originates as runoff from dirt road parallel to the north side of railroad tracks. | 34.880017, -117.105950 | 0.01 | 124 |
| NWW-99 | Vegetated Streambed[3] | Disturbed Habitat | 5 – 12 | Vegetated, single-thread feature within disturbed habitat that originates at culvert north of Main St/National Trails Hwy. | 34.880936, -117.101226 | 0.07 | 353 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-100 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 13 | Primarily unvegetated feature within allscale scrub with several tributaries that travels through several culverts; originates as runoff from and at a culvert north of Main St/National Trails Hwy. | 34.882602, -117.095407 | 0.34 | 2,524 |
| NWW-101 | Unvegetated Streambed[3] | Allscale Scrub[4] | 3 – 36 | Primarily unvegetated feature within allscale scrub with multiple tributaries that travels through several culverts; originates as runoff from and at a culvert north of Main St/National Trails Hwy. | 34.883416, -117.092671 | 0.35 | 1,003 |
| NWW-102 | Unvegetated Streambed[3] | Allscale Scrub[4] | 2 – 5 | Small, primarily unvegetated feature within allscale scrub that originates as runoff from Main St/National Trails Hwy. | 34.883038, -117.091930 | 0.01 | 99 |
| NWW-103 | Unvegetated Streambed[3] | Allscale Scrub[4] | 13 – 17 | Primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy during storm events and converge with NWW-27. | 34.797426, -117.223080 | 0.02 | 43 |
| NWW-104 | Unvegetated Streambed[3] | Allscale Scrub[4] | 6 - 12 | Small, primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy and converge with NWW-27. | 34.797510, -117.222886 | 0.02 | 70 |
| NWW-105 | Unvegetated Streambed[3] | Allscale Scrub[4] | 8 – 8 | Small, primarily unvegetated, single-thread feature within allscale scrub that may continue over Main St/National Trails Hwy and converge with NWW-44; occurs within watercourse mapped as associated with NWW-106. | 34.828712, -117.182373 | 0.01 | 29 |
| NWW-106 | Unvegetated Streambed[3] | Allscale Scrub[4] | 12 – 12 | Primarily unvegetated, single-thread feature generally within disturbed habitat; feature drains through private commercial lots and outputs across a culvert crossing. | 34.828907, -117.182084 | 0.01 | 36 |
| | Watercourse[5] | Allscale Scrub | N/A | | | 0.15 | – |
| NWW-107 | Unvegetated Streambed[3] | Creosote Bush Scrub[6] | 3 – 5 | Small, primarily unvegetated, single-thread feature within creosote bush scrub that may continue over Main St/National Trails Hwy and converge with NWW-59. | 34.835555, -117.169501 | <0.01 | 51 |

| Aquatic Resource Name (CDFW) | Aquatic Resource Type | Dominant Vegetation Community | Width Range[1] (Min to Max) (Linear Feet) | General Characteristics | Location (Latitude, Longitude) | Acres | Linear Feet[2] |
|---|---|---|---|---|---|---|---|
| NWW-108 | Unvegetated Streambed[3] | Creosote Bush Scrub – Disturbed[6] | 16 – 16 | Primarily unvegetated, single-thread feature within creosote bush scrub – disturbed that may continue over Main St/National Trails Hwy and converge with NWW-80. | 34.847053, -117.151904 | 0.01 | 36 |
| NWW-109 (Mojave River) | Unvegetated Streambed[3] | Unvegetated Channel | 50 – 3,100 | Sparsely vegetated, dry, sandy wash that comprises the on-site extent of the Mojave River; extends into active desert dune habitat; generally flows southwest to northeast before continuing off site. (See Photos 33, 37, 38, and 43 – 45 on Figure 5C and Appendix G.) | 34.863277, -117.170128 | 10.33 | 22,078 |
| | Vegetated Streambed[3] | Active Desert Dunes | | | | 580.02 | |
| Watercourse A | Watercourse[5] | Allscale Scrub | N/A | Watercourse associated with a streambed that occurs off site and upstream. | 34.789811, -117.245502 | 0.94 | – |
| | | | | | **Total[6]** | **669.96** | **195,124** |

[1] Corresponds with the approximate stream bank widths observed during delineation. Width range accounts for entirety of streambed delineated, not individual vegetation communities.
[2] Linear feet not calculated for watercourse to avoid redundant linear foot calculation where such areas overlap with streambed.
[3] A "streambed" under CFGC Section 1602 includes the channel of a watercourse that is generally defined to include the depression between the banks worn by the regular and usual flow of water.
[4] Unvegetated streambed within mapped vegetation community; however, no vegetation technically present within the streambed.
[5] A "watercourse" extends beyond the streambed and can consist of associated features such as low-flow, active, and braided channels and banks associated with islands, and secondary channels within the bounds of a larger channel complex (Vyverberg & Brady 2013)
[6] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.

# APPENDIX I

# ORM BULK UPLOAD AQUATIC RESOURCES OR CONSOLIDATED EXCEL SPREADSHEET (PROVIDED AS AN EXCEL FILE TO THE CORPS)

# APPENDIX J

# LITERATURE CITATIONS AND REFERENCES

## APPENDIX J. LITERATURE CITATIONS AND REFERENCES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# APPENDIX K

# GIS DATA (PROVIDED ELECTRONICALLY TO AGENCIES)

# ATTACHMENT B

## *BIG BARSTOW AQUATIC RESOURCES DELINEATION REPORT 2023 ADDENDUM*, PREPARED BY RBC AND DATED AUGUST 16, 2023

ROCKS
BIOLOGICAL CONSULTING

August 16, 2023

Ms. Deanna Cummings
U.S. Army Corps of Engineers
Los Angeles District, Regulatory Division
North Coast Branch, Los Angeles and San Bernardino Counties Section
915 Wilshire Boulevard, Suite 930
Los Angeles, CA 90017

**Subject: Request for a Preliminary Jurisdictional Determination, Big Barstow (Barstow International Gateway Project), San Bernardino County, California**

Ms. Cummings:

On behalf of Burlington Northern Santa Fe (BNSF) Railway Company, Rocks Biological Consulting (RBC) submits the attached *Big Barstow (Barstow International Gateway Project) Aquatic Resources Delineation Report Addendum* (2023 ARDR Addendum), prepared by RBC and dated August 9, 2023. The *Big Barstow Aquatic Resources Delineation Report* (2022 ARDR), prepared by RBC and dated September 2022, which RBC previously submitted to you on September 26, 2022, is included as Attachment A to the 2023 ARDR Addendum. The *Request for Corps Jurisdictional Determination (JD)* and the *Preliminary Jurisdictional Determination (PJD) Form* (PJD form), prepared by RBC, are included as Attachment B to the 2023 ARDR Addendum, for your review and consideration with submittal of the 2023 ARDR Addendum and 2022 ARDR.

The 2023 ARDR Addendum includes the following components:

- Figures
    - Figure 1. Project Location
    - Figure 2. USGS Topo and NHD
    - Figure 3. Watershed
    - Figure 4. NRCS Soils Survey Data and NWI
    - Figure 5A. Corps Aquatic Resources
    - Figure 5B. RWQCB Aquatic Resources
    - Figure 5C. CDFW Streambed and Watercourse
    - Figure 6. Vegetation

- Attachment A. *Big Barstow Aquatic Resources Delineation Report*, prepared by RBC and dated September 23, 2022
    - Figures:
        - Figure 1. Project Location
        - Figure 2. USGS Topo and NHD
        - Figure 3. Watershed
        - Figure 4. NRCS Soils Survey Data and NWI
        - Figure 5A. Corps Aquatic Resources
        - Figure 5B. RWQCB Aquatic Resources
        - Figure 5C. CDFW Streambed and Watercourse
        - Figure 6. Vegetation
    - Appendix A. Checklist: Minimum Standards for Acceptance of Aquatic Resource
    - Appendix B. Jurisdictional Determination Request Forms
    - Appendix C. Applicable Aquatic Resource Protection Regulations
    - Appendix D. Recent and Historic Aerials Analysis
    - Appendix E. Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets
    - Appendix F. Antecedent Precipitation Tool Output
    - Appendix G. Site Photographs
    - Appendix H. Aquatic Resource Summary Tables
    - Appendix I. ORM Bulk Upload Aquatic Resources or Consolidated Excel Spreadsheet
    - Appendix J. Literature Citations and References
    - Appendix K. GIS Data (provided electronically to agencies)
- Attachment B. Jurisdictional Determination Request Forms (*supersedes Appendix B of the 2022 ARDR*)
- Attachment C. Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets
- Attachment D. Site Photographs
- Attachment E. Aquatic Resource Summary Tables for 2023 ARDR Addendum Review Area
- Attachment F. Connectivity to Mojave River
- Attachment G. ORM Bulk Upload Aquatic Resources or Consolidated Excel Spreadsheet (*supersedes Appendix I of the 2022 ARDR*)

  Attachment H. GIS Data (provided electronically to agencies)

Assuming concurrence with the findings of the 2023 ARDR Addendum, 2022 ARDR, and draft PJD form, per RGL 16-01, **RBC respectfully requests the Corps provide the Applicant with a final PJD.**

Thank you for your consideration of our request. Please do not hesitate to contact me with any questions or clarifications needed to assist your evaluation of this project and associated 2023 ARDR Addendum, 2022 ARDR, and PJD form. I can be reached directly at 619-813-8790 or via email at sarah@rocksbio.com.

Respectfully,

Sarah Krejca

Sarah Krejca
Senior Regulatory Specialist/Biologist

To: Deanna Cummings, U.S. Army Corps of Engineers

From: Sarah Krejca, Rocks Biological Consulting

Date: August 9, 2023

Subject: Big Barstow (Barstow International Gateway Project) Aquatic Resources Delineation Report Addendum

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This memorandum serves as an addendum to the September 23, 2022 *Big Barstow Aquatic Resources Delineation Report* (2022 ARDR; Attachment A) to address the updated project footprint for the Barstow International Gateway Project (project; formerly 'Big Barstow') per files received on May 2 and May 23, 2023. Specifically, the overall project footprint was expanded to include project limits that occur outside of the review area used in the 2022 ARDR (2022 ARDR review area), including additional off-site improvement areas along Hinkley Road, along the County of San Bernardino Flood Control District Channel/Lenwood Channel, and within the Tortilla Substation work limits plus a 100-foot survey buffer. As such, the review area discussed in this addendum (2023 ARDR addendum review area) only encompasses the project areas (plus a 100-foot survey buffer) that occur beyond the limits of the 2022 ARDR review area (i.e., the original project footprint plus a 100-foot survey buffer) (Figure 1).

This addendum serves as a request for the U.S. Army Corps of Engineers (Corps) to complete a Preliminary Jurisdictional Determination (PJD) based on the information provided in this addendum and the 2022 ARDR (Attachment A). Attachment B provides the required forms associated with the PJD request and supersedes Appendix B of the 2022 ARDR.

## 1.1 SITE DESCRIPTIONS, LANDSCAPE SETTING

The 223.70-acre 2023 ARDR addendum review area is generally flat with elevations ranging from approximately 2,210 to 2,745 feet above mean sea level (amsl) (Figure 2). The 2023 ARDR addendum review area is within the Mojave Hydrologic Unit Code [HUC] 8 (18090208), Daggett Wash-Mojave River HUC 10 (1809020811), Stoddard Valley HUC 10 (1809020810), Wild Wash HUC 10 (1809020808), Town of Lenwood-Mojave River HUC 12 (180902081102), Town of Johnstons Corner HUC 12 (180902081101), Stoddard Valley HUC 12 (180902081004), and City of Barstow-Mojave River HUC 12 (180902081105) (Figure 3).

## 1.2 METHODS

Rocks Biological Consulting (RBC) conducted aquatic resources delineation field visits for the 2023 ARDR addendum review area on April 18, 2023, June 14, 2023, and June 27 – 28, 2023. Field conditions during these field visits are provided below in Table 1. Complete methods are provided in Section 3 of the 2022 ARDR (Attachment A).

Table 1. Field Conditions

| Date | Survey Time Start – End | Temperature (°F) Start – End | Wind Speed Range (miles per hour) Start – End | Cloud Cover (%) Start – End | Personnel[1] |
|---|---|---|---|---|---|
| 4/18/2023 | 0645 – 1015 | 49 – 60 | 13 to 15 – 18 to 22 | 0 – 10 | AG, KW |
| | 1545 – 1715 | 68 – 67 | 22 to 25 – 25 to 28 | 50 – 80 | |
| 6/14/2023 | 1400 – 1530 | 84 – 86 | 3 to 5 – 3 to 5 | 15 – 15 | SK |
| 6/27/2023 | 0900 – 1530 | 73 – 93 | 10 to 15 – 1 to 3 | 0 – 0 | AG, KW, SK |
| 6/28/2023 | 0600 – 0700 | 62 – 65 | 5 to 8 – 3 to 5 | 0 – 0 | AG, KW, SK |

[1] *AG = Alec Goodman, KW = Kelsey Woldt, SK = Sarah Krejca*

Figure 1 and Figures 5A to 5C depict the 223.70-acre 2023 ARDR addendum review area.

## 1.3 SITE ALTERATIONS, CURRENT AND PAST LAND USE

### 1.3.1 SOILS

Based on the Natural Resources Conservation Service (NRCS) soils map (Figure 4), 14 soil map units occur within the 2023 ARDR addendum review area (Table 2).

Table 2. Soils Mapped within 2023 ARDR Addendum Review Area

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Cajon gravelly sand, 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon loamy sand, 5 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon sand, 0 to 2 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| Cajon sand, 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon-Wasco, cool complex[2], 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| | Wasco | Coarse-loamy, mixed, superactive, nonacid, thermic Typic Torriorthents | |
| Dune land | Dune land | – | Yes |
| Helendale loamy sand, 2 to 5 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Nebona-Cuddeback complex[2], 2 to 9 percent slopes | Nebona | Loamy, mixed, superactive, thermic, shallow Typic Haplodurids | Yes |
| | Cuddeback | Fine-loamy, mixed, superactive, thermic Typic Argidurids | |
| | Norob | Fine-loamy, mixed, superactive, thermic Typic Natrargids | Yes |

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Norob-Halloran complex[2], 0 to 5 percent slopes | Halloran | Coarse-loamy, mixed, superactive, thermic Typic Natrargids | |
| Riverwash | Riverwash | – | Yes |
| Rock Outcrop-Lithic Torriorthents complex, 15 to 50 percent slopes | Rock Outcrop | – | No |
| | Torriorthents | Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Torriorthents | |
| Victorville sandy loam | Victorville | Coarse-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |
| Villa loamy sand | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |
| Villa loamy sand, hummocky | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |

Source: NRCS Official Soil Series Description and Series Classification database (NRCS n.d.a); *Soil Survey of San Bernardino County California, Mojave River Area* (USDA 1986); NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.b).
[1] Based on the NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.b). As stated in the Arid West Supplement (Corps 2008), RBC used the hydric soils list as a tool and made final hydric soils determinations based on field-collected data at representative wetland delineation sample points deemed appropriate on site as recorded on the attached Arid West Wetland Determination Data Forms (Attachment C) discussed further in Section 1.5.1.
[2] A complex consists of two or more soils or miscellaneous areas that either contain such small areas or are so complexly mapped that they are unable to be displayed separately (Ditzler 2015).

The National Technical Committee for Hydric Soils defines hydric soils; *Changes in Hydric Soils Database Selection Criteria* (77 FR 12234) outlines the current four hydric soil criteria. As shown above in Table 2, the NRCS Soil Data Access (SDA) Hydric Soils List specifies nine soil map units within the review area as hydric (NRCS n.d.b).

### 1.3.2 VEGETATION

Table 3 provides vegetation community acreages within the 2023 ARDR addendum review area based on vegetation mapping conducted by RBC on June 27 and July 20, 2023. Vegetation communities within the 2023 ARDR addendum review area are shown on Figure 6. The vegetation community classifications generally follow *A Manual of California Vegetation* (Sawyer et al. 2009) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

Table 3. Vegetation Communities within 2023 ARDR Addendum Review Area

| Vegetation Community/Land Cover Type | Acre(s)[1] |
|---|---|
| Active Desert Dunes | 10.44 |
| Active Desert Dunes – Disturbed | 4.96 |
| Allscale Scrub | 30.61 |
| Allscale Scrub – Disturbed | 17.70 |
| Creosote Bush Scrub | 85.21 |

| Vegetation Community/Land Cover Type | Acre(s)[1] |
|---|---|
| Creosote Bush Scrub – Disturbed | 0.28 |
| Developed | 19.97 |
| Disturbed Habitat | 26.66 |
| Tamarisk Thickets | 14.98 |
| Unvegetated Channel | 12.91 |
| Total | 223.70 |

[1] Acreages summed using raw numbers provided during GIS analysis (available upon request) and thus the sum of the total rounded numbers may not directly add up in this table.

## 1.4 PRECIPITATION DATA AND ANALYSIS

### 1.4.1 PRECIPITATION SUMMARY

Table 4 describes the estimated monthly total precipitation for the 2023 ARDR addendum review area from September 2022 to May 2023 to provide pertinent pre-site visit precipitation data from the NRCS database for the Barstow station (NRCS 2023).

Table 4. Precipitation Data for September 2022 – May 2023

| | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|
| Monthly Total Precipitation (inch[es]) | T[1] | T[1] | 0.66 | 1.03 | 1.15 | 0.43 | 1.40 | 0.00 | 0.46 |

Source: NRCS Agricultural Applied Climate Information System (AgACIS) database (NRCS 2023)
[1] Per AgACIS database: Value of 'T' indicates a trace.

### 1.4.2 ANTECEDENT PRECIPITATION TOOL DATA

Table 5 summarizes the key data extrapolated from the Corps' Antecedent Precipitation Tool (APT) output to compare the current year 30-day rolling total to the averaged 30-year normal for the weather stations with comprehensive historical data within 30 miles of the review area: estimated drought conditions, wet or dry season determination, antecedent runoff condition (ARC) score, and antecedent precipitation condition. The APT output summarized in Table 5 noted a PDSI class of "moderate wetness" during the April 2023 and June 2023 field surveys (Corps 2023). The precipitation and climatic conditions were classified as "wetter than normal" for the review area during the April 18 and June 14, 2023 field surveys and "normal conditions" for the review area during the June 27 and 28, 2023 field surveys based on the 30-day rolling totals for the three months preceding the field survey dates (Corps 2023).

Table 5. Antecedent Precipitation Tool Data for 2023 ARDR Addendum Review Area

| Field Survey Date | PDSI Value | PDSI Class | Season | ARC Score | Antecedent Precipitation Condition |
|---|---|---|---|---|---|
| 4/18/2023 | 2.24 | Moderate wetness | Dry season | 16 | Wetter than normal |
| 6/14/2023 | 2.46 | Moderate wetness | Dry season | 16 | Wetter than normal |
| 6/27/2023 | 2.46 | Moderate wetness | Dry season | 14 | Normal conditions |
| 6/28/2023 | 2.46 | Moderate wetness | Dry season | 14 | Normal conditions |

Source: Antecedent Precipitation Tool (Corps 2023)

## 1.5 DESCRIPTION OF OBSERVED POTENTIAL AQUATIC RESOURCES

The following descriptions of observed potential aquatic resources within the review area document the presence or absence of aquatic resource indicators per the methods discussed in Section 3 of the 2022 ARDR. The subsections below are intended to be reviewed independently under each agency's purview unless otherwise directed in the text (i.e., the aquatic resource description is the same between two or more agencies) given the various regulatory definitions and standards per each agency and in conjunction with Section 6 of the 2022 ARDR.

Note that the nomenclature used in this report for the Wetland Data Form Points (WDPs), Ordinary High Water Mark (OHWM) Datasheet Points (ODPs), and aquatic resources is sequential with that used in the 2022 ARDR; therefore, within this addendum the WDP numbering begins at WDP 12 and the ODP numbering begins at ODP 30 (Attachment C).

Attachment D provides representative site photographs of the aquatic resources within the review area; all figures in the Figure 5 series display representative photo points.

### 1.5.1 CORPS/RWQCB WETLAND WATERS OF THE U.S./STATE

RBC collected data at two representative WDPs within the 2023 ARDR addendum review area to determine the presence or absence of jurisdictional wetland waters of the U.S./State (WDP 12 and 13; Figures 5A and 5B; Attachment C). The delineated aquatic features on site did not meet the appropriate wetland parameters to qualify as wetland waters of the U.S./State based on the data collected during the field delineation (Attachment C).

### 1.5.2 CORPS/RWQCB NON-WETLAND WATERS OF THE U.S./STATE

RBC collected data at seven representative ODPs within the 2023 ARDR addendum review area to determine the presence of potential waters of the U.S./State (ODP 30 through 36; Figures 5A and 5B; Attachment C). RBC selected representative ODP locations as there were multiple dry washes (i.e., features) with similar hydrology or OHWM characteristics. Overall, the 2023 ARDR addendum review area supports 78 features (portions of Non-Wetland Water [NWW-] 24, portions of NWW-89, portions of NWW-92, portions of NWW-109 [Mojave River], and NWW-110 through NWW-184), which vary from single-thread, small, unvegetated dry washes to the larger Mojave River. The OHWMs within the 2023 ARDR addendum review area for NWW-24, NWW-89, NWW-92, and NWW-110 through NWW-

184 varied in width from an average minimum of 3 feet and an average maximum of 5 feet. With the exception of NWW-113, which is primarily concrete-lined, these features were primarily unvegetated and generally surrounded by creosote bush (*Larrea tridentata*; Not Listed/Upland [NL/UPL]) and allscale (*Atriplex polycarpa*; Facultative Upland [FACU]). The OHWM for the portions of NWW-109 (Mojave River) within the 2023 ARDR addendum review area ranged from approximately 110 feet to 375 feet; this feature was sparsely vegetated and composed of unvegetated channel. See Attachment E, Table E-1 for the estimated OHWM and representative OHWM and wetland data for the portions of NWW-24, NWW-89, NWW-92, NWW-109 (Mojave River), and NWW-110 through NWW-184 within the 2023 ARDR addendum review area.

NWW-24, NWW-89, NWW-92, NWW-183, and NWW-184 generally drain southeast to northwest; NWW-110 through NWW-182 generally drain south to north (Figures 5A and 5B). Additionally, NWW-113 directs flows around the Tortilla substation and into earthen features (NWW-114 through NWW-119). The portion of NWW-109 (Mojave River) within the 2023 ARDR addendum review area is a sparsely vegetated, sandy wash that flows south to north before continuing off site (Figure 5A and 5B). Figures 5A and 5B display the limits of where OHWM indicators were observed within the review area. Attachment F provides a brief overview of the anticipated connectivity of NWW-110 through NWW-182 to NWW-109 (Mojave River).

Staff concluded based on field observations that NWW-24, NWW-89, NWW-92, and NWW-110 through NWW-184 were ephemeral features that only receive flows from runoff in direct response to precipitation; NWW-109 (Mojave River) is an intermittent feature based on field observations and the USGS NHD database (USGS 2021). The general characteristics of each of the observed features within the review area are provided in Attachment E, Table E-1. Staff observed flowing water within NWW-109 (Mojave River) during 2023 field surveys; however, staff did not observe standing water at any other features during the 2023 field surveys.

Staff determined the presence of an OHWM at one location within each of the following features within the 2023 ARDR addendum review area: NWW-113, NWW-114, NWW-146, and NWW-172 (Attachment C, ODP 33 – 36). Indicators of an OHWM for NWW-114, NWW-146, and NWW-172 generally included a change in average sediment texture and vegetation cover between the active floodplain and upland areas as well as a typically small break in bank slope along the active channel (Attachment C, ODP 33, 35, 36). The OHWMs present at these locations were representative of the OHWMs within NWW-24, NWW-89, NWW-110 through NWW-112, NWW-115 through NWW-145, NWW-147 through NWW-171, and NWW-173 through NWW-184. Indicators of an OHWM within the concrete-lined portion of NWW-113 included water staining and sediment deposits (Attachment C, ODP 34).

Staff determined the presence of an OHWM at two locations within NWW-92 (Attachment C, ODP 30 and 31). Indicators of an OHWM for NWW-92 generally included a change in average sediment texture, change in vegetation species or cover between the active floodplain and upland areas as well as a well-defined break in bank slope along the active channel (Attachment C, ODP 30 and 31). Staff also determined the presence of an OHWM at one location within NWW-109 (Mojave River) (Attachment C, ODP 32). Indicators of an

OHWM for NWW-109 (Mojave River) included a break in bank slope, change in vegetation cover, and change in average sediment texture between the active floodplain and upland/low terrace (Attachment C, ODP 32).

### 1.5.3 CDFW STREAMBED AND ASSOCIATED RIPARIAN AND WETLAND HABITATS

Figure 5C displays the estimated extent of streambed within the 2023 ARDR addendum review area. Overall, the 2023 ARDR addendum review area supports 78 features (portions of NWW-24, portions of NWW-89, portions of NWW-92, portions of the Mojave River [NWW-109], and NWW-110 through NWW-184), which vary from single-thread, small, unvegetated, dry streambeds with a well-defined bed and bank to the larger Mojave River (NWW-109). No associated riparian or wetland habitat occurs within the review area. NWW-24, NWW-89, NWW-92, and NWW-110 through NWW-184 vary in width from an average minimum of 3 feet and an average maximum of 16 feet and were primarily unvegetated and surrounded by creosote bush (NL/UPL) and allscale (FACU). The portion of the Mojave River (NWW-109) within the 2023 ARDR addendum review area varied in width from approximately 1,450 feet to 2,115 feet; the vegetated portion of this feature was generally composed of tamarisk thickets. See Attachment E, Table E-2 for the estimated extent of CDFW jurisdiction for NWW-24, NWW-89, NWW-92, the Mojave River (NWW-109), and NWW-110 through NWW-184 within the 2023 ARDR addendum review area.

NWW-24, NWW-89, NWW-92, NWW-183, and NWW-184 generally drain southeast to northwest; NWW-110 through NWW-182 generally drain south to north (Figure 5C). NWW-113 directs flows around the Tortilla substation and into earthen features (NWW-114 through NWW-119). The portion of the Mojave River (NWW-109) within the 2023 ARDR addendum review area is a sparsely vegetated, sandy wash that flows south to north before continuing off site (Figure 5C). No watercourse or riparian habitat was mapped within the 2023 ARDR addendum review area. As further detailed in Section 3.2.3 of the 2022 ARDR, the extent of the Mojave River (NWW-109) was delineated based on the presence of field indicators, including evidence of ponding (e.g., mud cracks and moist soils) and secondary channels, as well as topography and 50- and 100-year floodplain modeling for the Mojave River (NWW-109).

The general characteristics of each of the observed features within the 2023 ARDR addendum review area are provided in Attachment E, Table E-2.

## 1.6 RESULTS AND CONCLUSIONS

The results provided in this section include the extent of delineated aquatic resources within the 2023 ARDR addendum review area based on observed field indicators of potential waters of the U.S., waters of the State, and CDFW streambed and watercourse per the methodologies presented in Section 3 of the 2022 ARDR (Attachment A). Table 6 provides a summary of the aquatic resources delineated within the 2023 ARDR addendum review area and 2022 ARDR review area per agency. Further details for each aquatic resource mapped within the 2023 ARDR addendum review area (NWW-24, NWW-89, NWW-92, and NWW-109 [Mojave River] through NWW-184) are provided in Attachment E.

This section, however, does not analyze the Corps' jurisdictional status of the delineated features per the current regulations, guidance, and standard operating procedures. A request for the Corps to complete a PJD based on the information provided in this addendum and the 2022 ARDR (Attachment A) is included as Attachment B.

Table 6. Total Delineated Aquatic Resources within 2023 ARDR Addendum Review Area and 2022 ARDR Review Area

| Agency | Aquatic Resource Type | 2023 ARDR Addendum Review Area | | 2022 ARDR Review Area | | TOTAL[1] | |
|---|---|---|---|---|---|---|---|
| | | Acres | Linear Feet | Acres | Linear Feet | Acres | Linear Feet |
| Corps | Non-Wetland Waters of the U.S. | 11.10 | 26,855 | 125.58 | 177,864 | 136.69 | 204,719 |
| | ***Total Corps Aquatic Resources*** | ***11.10*** | ***26,855*** | ***125.58*** | ***177,864*** | ***136.69*** | ***204,719*** |
| RWQCB | Non-Wetland Waters of the U.S./State | 11.10 | 26,855 | 125.58 | 177,864 | 136.69 | 204,719 |
| | ***Total RWQCB Aquatic Resources*** | ***11.10*** | ***26,855*** | ***125.58*** | ***177,864*** | ***136.69*** | ***204,719*** |
| CDFW | Unvegetated Streambed | 14.69 | 26,855 | 34.49 | 195,124 | 49.18 | 203,997 |
| | Vegetated Streambed | 14.13 | | 580.30 | | 594.43 | 17,982 |
| | Watercourse | N/A | N/A | 55.18 | N/A[2] | 55.18 | N/A[2] |
| | ***Total CDFW Aquatic Resources[1]*** | ***28.82*** | ***26,855*** | ***669.96*** | ***195,124*** | ***698.79*** | ***221,979*** |

[1] Acreages and linear feet totals were summed using raw numbers provided during GIS analysis (available upon request) and thus, the sum of the total rounded numbers may not directly add up in this table.
[2] Linear feet not calculated for watercourse to avoid redundant linear foot calculation where such areas overlap with streambed.

### 1.6.1 CORPS

NWW-24, NWW-89, NWW-92, and NWW-109 (Mojave River) through NWW-184 displayed clear indicators of an OHWM, such as a break in bank slope, change in average sediment texture, and change in vegetation cover and/or species between the drainage and adjacent uplands (Attachment C); however, these features did not meet the three wetland parameters.

As such, NWW-24, NWW-89, NWW-92, and NWW-109 (Mojave River) through NWW-184 may be considered non-wetland waters of the U.S. Approximately 11.10 acres (26,855 linear feet) of potential non-wetland waters of the U.S. associated with NWW-24, NWW-89, NWW-92, and NWW-109 (Mojave River) through NWW-184 occur within the 2023 ARDR addendum review area, as further detailed in Attachment E, Table E-1 and as shown on Figure 5A.

In sum, based on the results of this addendum and the 2022 ARDR, approximately 136.69 acres (204,719 linear feet) of potential non-wetland waters of the U.S. associated with NWW-1 through NWW-184 occur within the 2023 ARDR addendum review area and the 2022 ARDR review area. The ORM Bulk Upload Aquatic Resources or Consolidated Excel spreadsheet is included as Attachment G and supersedes Appendix I of the 2022 ARDR.

### 1.6.2 RWQCB

NWW-24, NWW-89, NWW-92, and NWW-109 (Mojave River) through NWW-184 displayed clear indicators of an OHWM, such as a break in bank slope, change in average sediment texture, and change in vegetation cover and/or species between the drainage and adjacent uplands (Attachment C); however, these features did not meet the three wetland parameters.

As such, NWW-24, NWW-89, NWW-92, and NWW-109 (Mojave River) through NWW-184 may be considered non-wetland waters of the U.S./State. Approximately 11.10 acres (26,855 linear feet) of potential non-wetland waters of the U.S./State associated with NWW-24, NWW-89, NWW-92, and NWW-109 (Mojave River) through NWW-184 occur within the 2023 ARDR addendum review area, as further detailed in Attachment E, Table E-1 and as shown on Figure 5B.

In sum, based on the results of this addendum and the 2022 ARDR, approximately 136.69 acres (204,719 linear feet) of potential non-wetland waters of the U.S./State associated with NWW-1 through NWW-184 occur within the 2023 ARDR addendum review area and the 2022 ARDR review area.

### 1.6.3 CDFW

NWW-24, NWW-89, NWW-92, the Mojave River (NWW-109), and NWW-110 through NWW-184 qualify as CDFW streambed (Figure 5C).

Approximately 14.13 acres (437 linear feet) of vegetated streambed and 14.69 acres (26,418 linear feet) of unvegetated streambed associated with NWW-24, NWW-89, NWW-92, the Mojave River (NWW-109), and NWW-110 through NWW-184 occur within the 2023 ARDR addendum review area, as further detailed in Attachment E, Table E-2 and as shown on Figure 5C. No additional watercourse was mapped within the 2023 ARDR addendum review area.

In sum, based on the results of this addendum and the 2022 ARDR, approximately 594.43 acres (17,982 linear feet) of vegetated streambed, 49.18 acres (203,997 linear feet) of unvegetated streambed, and 55.18 acres of watercourse associated with NWW-1 through NWW-184 occur within the 2023 ARDR addendum review area and the 2022 ARDR review area.

## 2 REFERENCES

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## FIGURES

Figure 1. Project Location

Figure 2. USGS Topo and NHD

Figure 3. Watershed

Figure 4. NRCS Soils Survey Data and NWI

Figure 5A. Corps Aquatic Resources

Figure 5B. RWQCB Aquatic Resources

Figure 5C. CDFW Streambed and Watercourse

Figure 6. Vegetation

## ATTACHMENTS

Attachment A. *Big Barstow Aquatic Resources Delineation Report*, prepared by RBC and dated September 23, 2022

Attachment B. Jurisdictional Determination Request Forms (*supersedes Appendix B of the 2022 ARDR*)

Attachment C. Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets

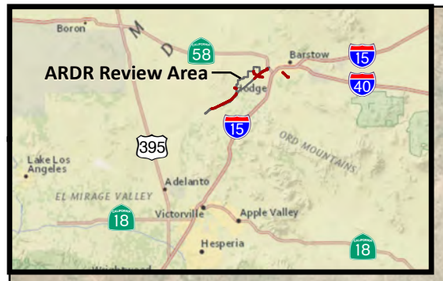
Attachment D. Site Photographs

Attachment E. Aquatic Resource Summary Tables for 2023 ARDR Addendum Review Area

Attachment F. Connectivity to Mojave River

Attachment G. ORM Bulk Upload Aquatic Resources or Consolidated Excel Spreadsheet (*supersedes Appendix I of the 2022 ARDR*)

Attachment H. GIS Data (provided electronically to agencies)




Hillview Truck Trl

Wheeler Rd

Indian Trl

Mojave River

Main St

Hodge Rd

Wild Rd

Lords Rd

National Trails Hwy

34.772232,
-117.285959

2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

Key Map

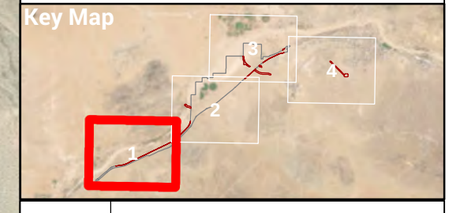



FIGURE 1
PAGE 1 OF 4

**Project Location**

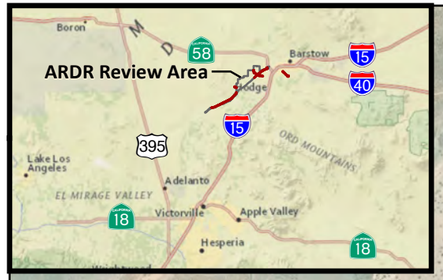
BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

N

Date: 7/30/2023
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012




Mojave River

Oak Grove Rd

Gazana St

Burlington Northern Santa Fe RR

National Trails Hwy

Delaney Rd

Hinkley Rd

2023 ARDR Addendum Review Area (223.7 Ac)

2022 ARDR Review Area (5104.5 Ac)

Key Map

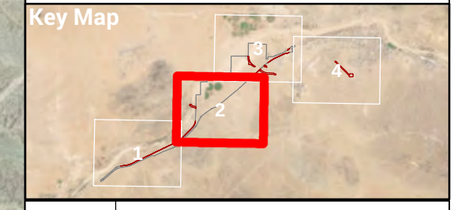



FIGURE 1

PAGE 2 OF 4

## Project Location

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET

1 INCH = 2,000 FEET

N

Date: 7/30/2023

Aerial Photo: Maxar, Esri 2020

Regional Map: National Geographic, Esri 2012

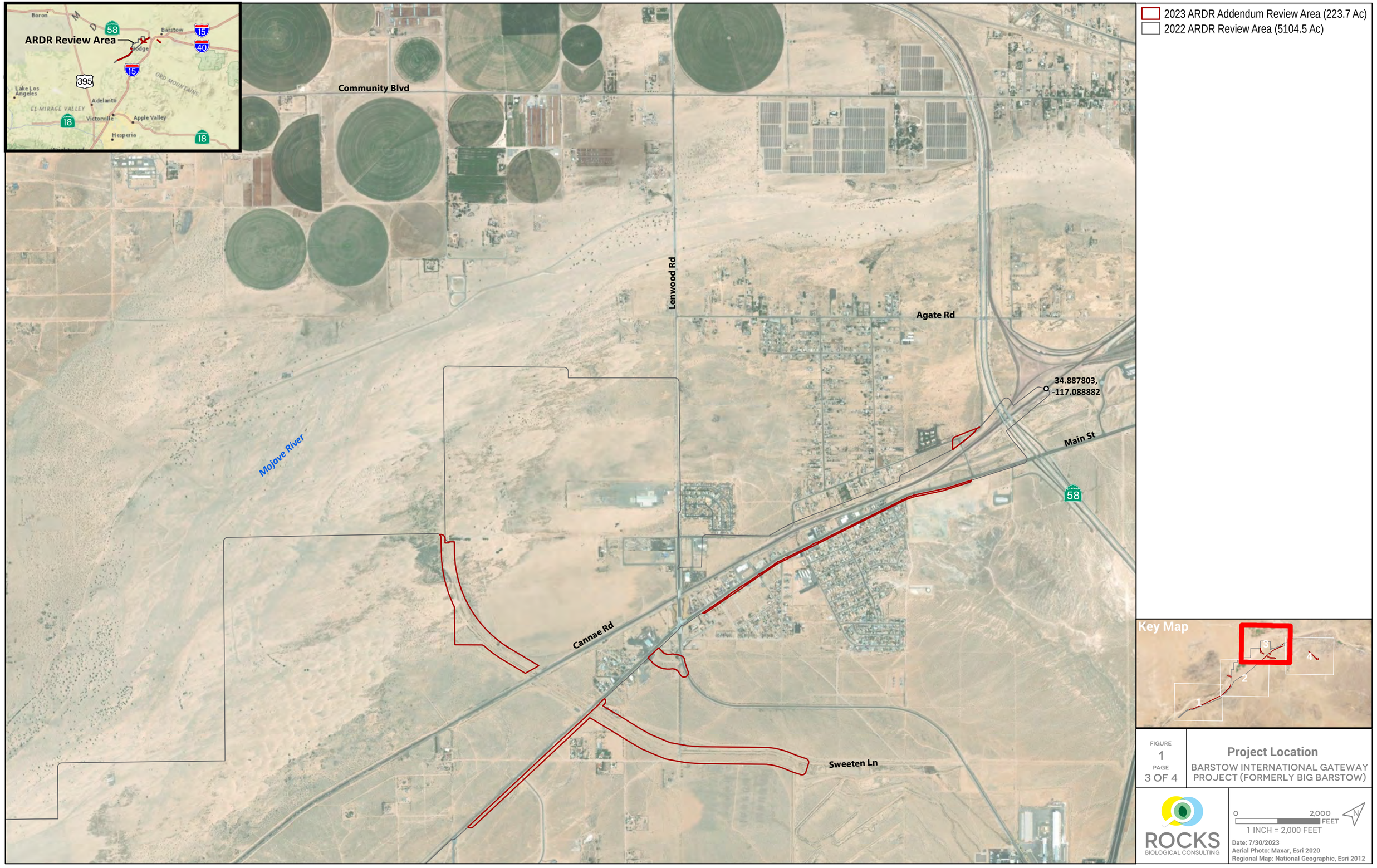



FIGURE 1
PAGE 3 OF 4

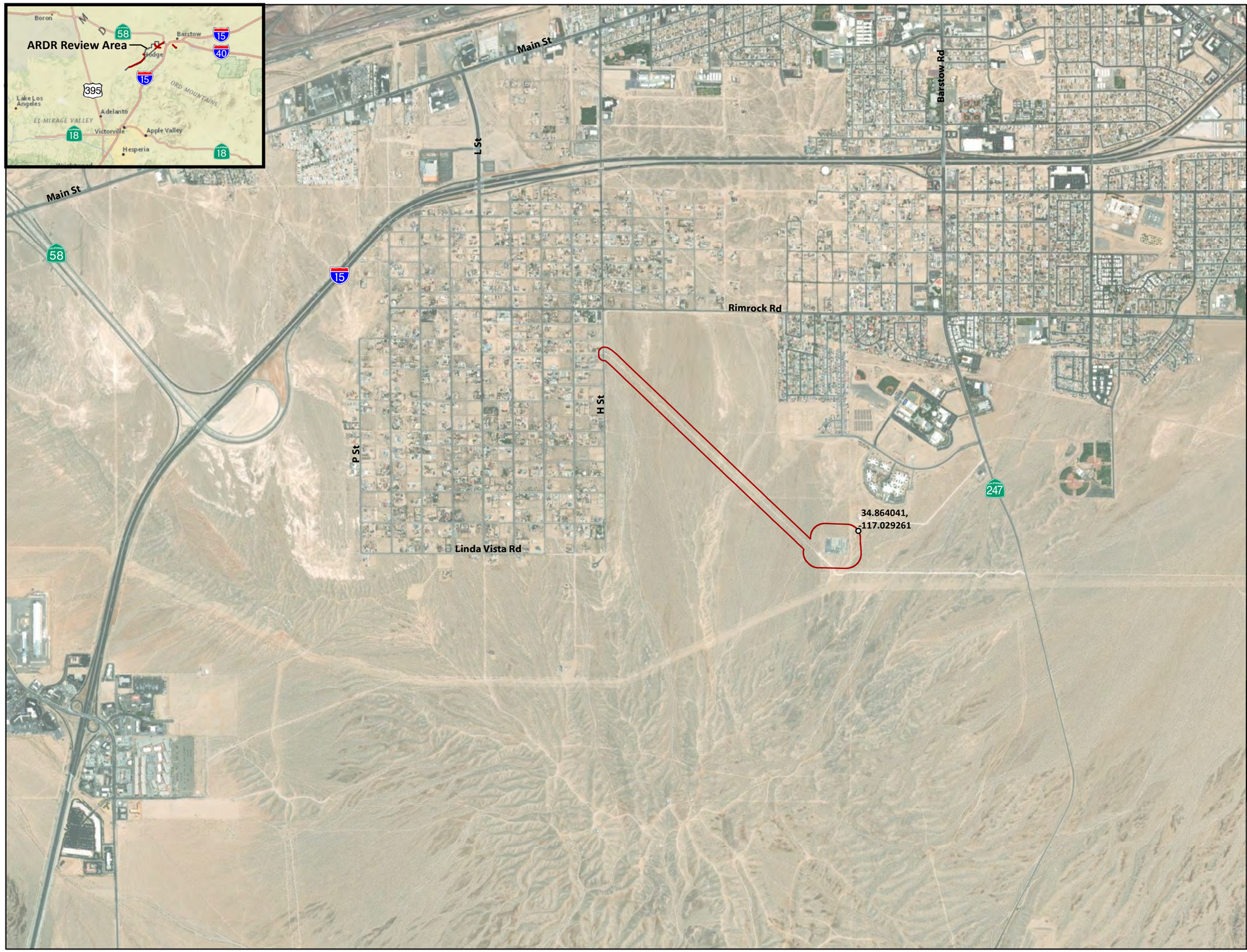
**Project Location**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 7/30/2023
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

Key Map

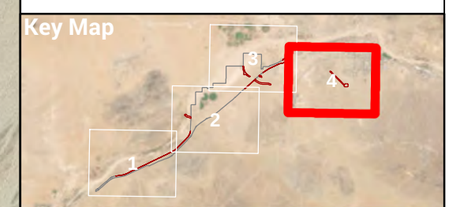



FIGURE 1
PAGE 4 OF 4

**Project Location**
BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 2,000 FEET
1 INCH = 2,000 FEET

Date: 7/30/2023
Aerial Photo: Maxar, Esri 2020
Regional Map: National Geographic, Esri 2012

2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)
Township, Range and Section

**USGS National Hydrography Dataset (NHD)**

Wash
Lake/Pond
Reservoir
Stream/River

09N 02W 9
34.887803, -117.088882
09N 02W 7
09N 02W 8
09N 03W 12
09N 02W 18
09N 02W 17
09N 03W 14
09N 03W 13
09N 02W 19
09N 03W 22
09N 03W 23
09N 03W 24
09N 03W 25
09N 03W 28
09N 03W 27
09N 03W 26
09N 03W 35
09N 03W 33
09N 03W 34
08N 03W 3
08N 03W 4
08N 03W 5
08N 03W 9
08N 03W 7
08N 03W 8
08N 04W 12
08N 04W 14
08N 04W 13
08N 04W 15
34.772232, -117.285959
08N 04W 22

Mojave River
Oak Grove Rd
Burlington Northern Santa Fe RR
National Trails Hwy
Grandview
Lenwood
15

FIGURE 2A

# USGS Topo and NHD

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 4,500 FEET
1 INCH = 4,500 FEET

Date: 6/27/2023
Source: USGS NHD 2020
USGS 7.5' Quadrangles (Hodge; Hinkley; Barstow SE; Barstow)

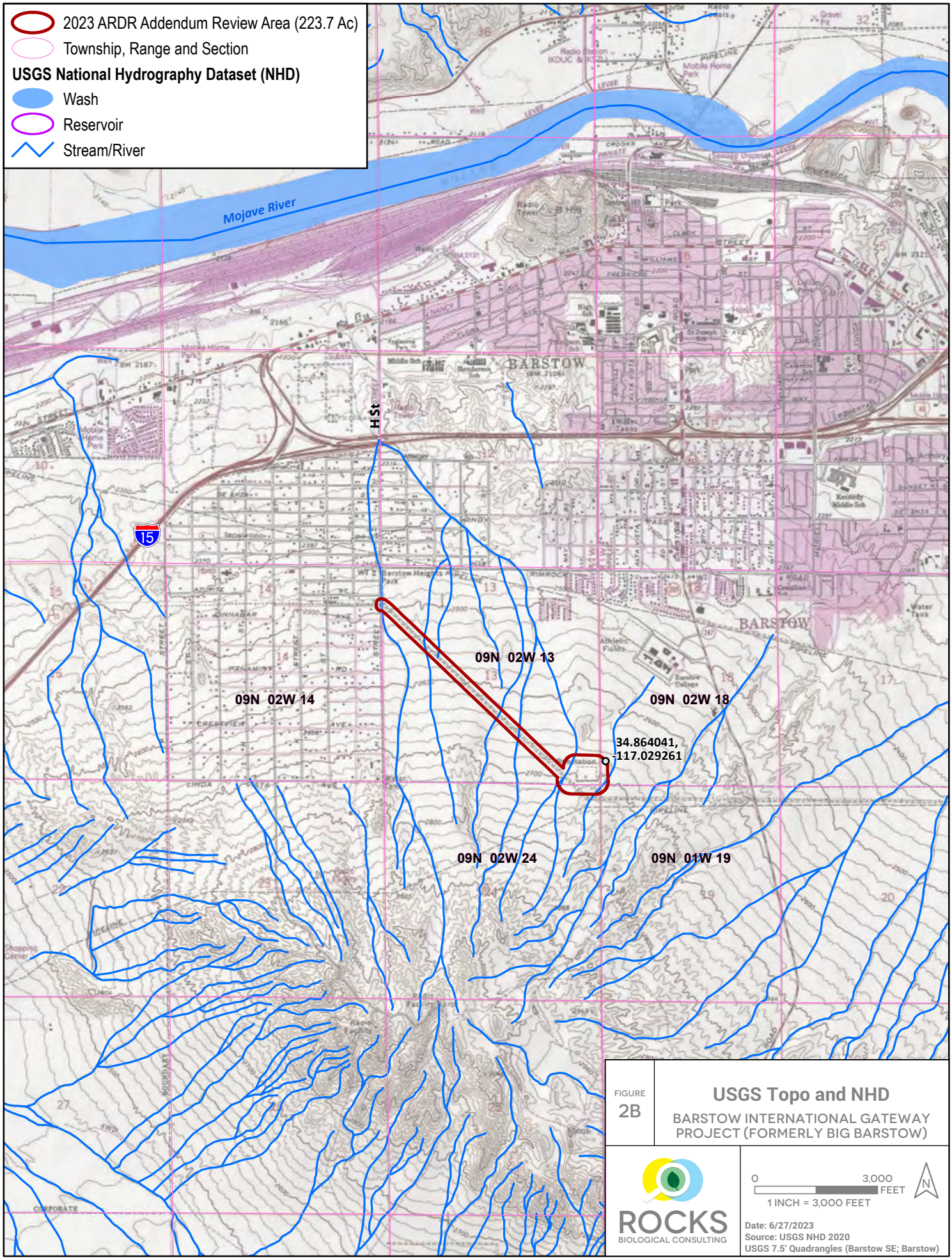



FIGURE 2B

## USGS Topo and NHD

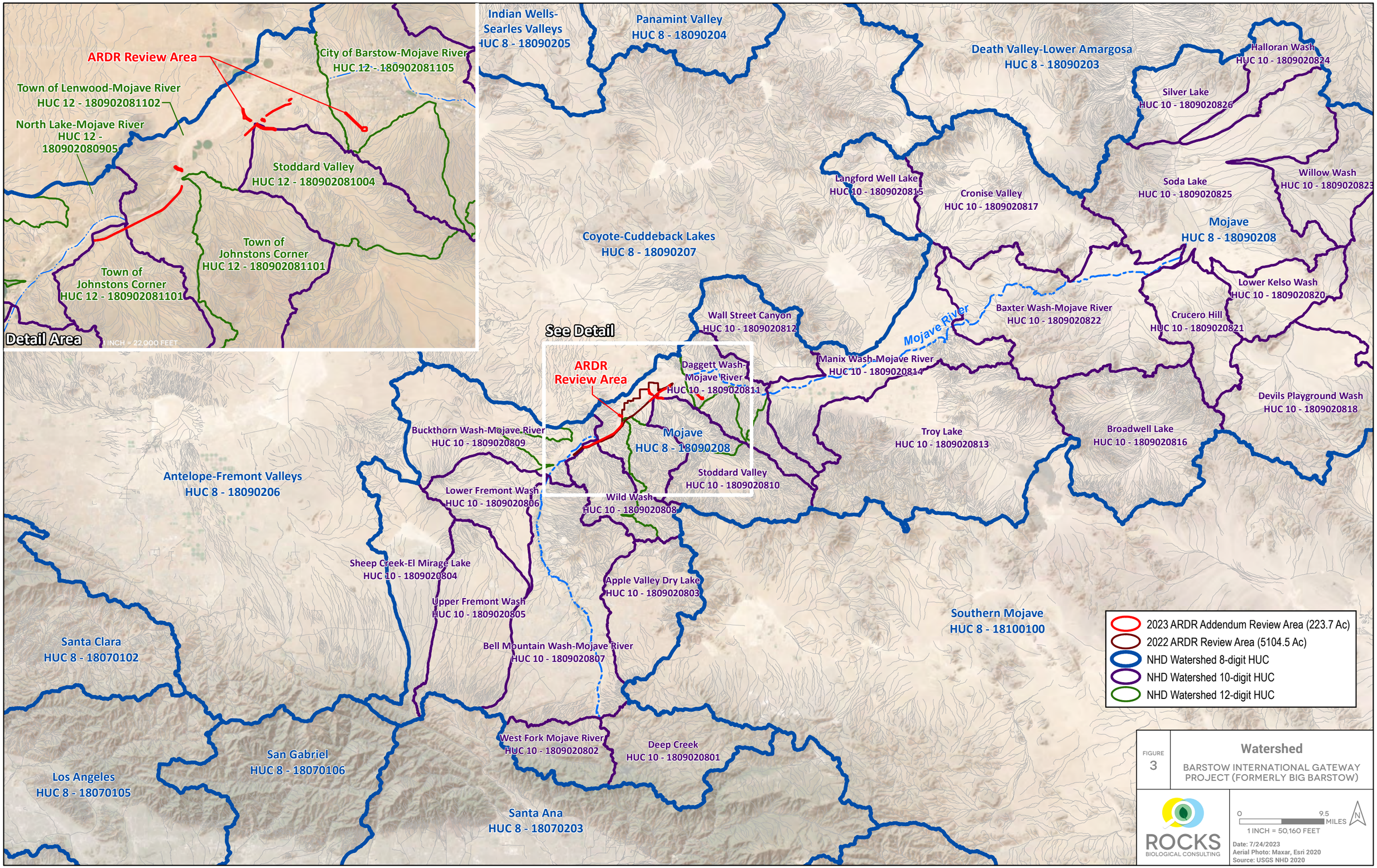
BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 3,000 FEET

1 INCH = 3,000 FEET

Date: 6/27/2023
Source: USGS NHD 2020
USGS 7.5' Quadrangles (Barstow SE; Barstow)


ARDR Review Area
City of Barstow-Mojave River
HUC 12 - 180902081105
Town of Lenwood-Mojave River
HUC 12 - 180902081102
North Lake-Mojave River
HUC 12 -
180902080905
Stoddard Valley
HUC 12 - 180902081004
Town of
Johnstons Corner
HUC 12 - 180902081101
Town of
Johnstons Corner
HUC 12 - 180902081101
Detail Area
1 INCH = 22,000 FEET
Indian Wells-
Searles Valleys
HUC 8 - 18090205
Panamint Valley
HUC 8 - 18090204
Death Valley-Lower Amargosa
HUC 8 - 18090203
Halloran Wash
HUC 10 - 1809020824
Silver Lake
HUC 10 - 1809020826
Langford Well Lake
HUC 10 - 1809020815
Cronise Valley
HUC 10 - 1809020817
Soda Lake
HUC 10 - 1809020825
Willow Wash
HUC 10 - 1809020823
Coyote-Cuddeback Lakes
HUC 8 - 18090207
Mojave
HUC 8 - 18090208
Lower Kelso Wash
HUC 10 - 1809020820
Wall Street Canyon
HUC 10 - 1809020812
Baxter Wash-Mojave River
HUC 10 - 1809020822
Mojave River
Crucero Hill
HUC 10 - 1809020821
See Detail
ARDR
Review Area
Daggett Wash-
Mojave River
HUC 10 - 1809020811
Manix Wash-Mojave River
HUC 10 - 1809020814
Devils Playground Wash
HUC 10 - 1809020818
Buckthorn Wash-Mojave River
HUC 10 - 1809020809
Mojave
HUC 8 - 18090208
Troy Lake
HUC 10 - 1809020813
Broadwell Lake
HUC 10 - 1809020816
Antelope-Fremont Valleys
HUC 8 - 18090206
Stoddard Valley
HUC 10 - 1809020810
Lower Fremont Wash
HUC 10 - 1809020806
Wild Wash
HUC 10 - 1809020808
Sheep Creek-El Mirage Lake
HUC 10 - 1809020804
Apple Valley Dry Lake
HUC 10 - 1809020803
Upper Fremont Wash
HUC 10 - 1809020805
Southern Mojave
HUC 8 - 18100100
Santa Clara
HUC 8 - 18070102
Bell Mountain Wash-Mojave River
HUC 10 - 1809020807
West Fork Mojave River
HUC 10 - 1809020802
Deep Creek
HUC 10 - 1809020801
San Gabriel
HUC 8 - 18070106
Los Angeles
HUC 8 - 18070105
Santa Ana
HUC 8 - 18070203
2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)
NHD Watershed 8-digit HUC
NHD Watershed 10-digit HUC
NHD Watershed 12-digit HUC
FIGURE
3
Watershed
BARSTOW INTERNATIONAL GATEWAY
PROJECT (FORMERLY BIG BARSTOW)
ROCKS
BIOLOGICAL CONSULTING
0
9.5
MILES
N
1 INCH = 50,160 FEET
Date: 7/24/2023
Aerial Photo: Maxar, Esri 2020
Source: USGS NHD 2020

2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)
Wetland Data Form Point (WDP)

**National Wetlands Inventory (NWI)**

Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Riverine
Freshwater Pond

**NRCS Soils**

Bryman Loamy Fine Sand, 2 to 5 Percent Slopes
Cajon Gravelly Sand, 2 to 15 Percent Slopes
Cajon Loamy Sand, 5 to 9 Percent Slopes
Cajon Sand, 0 to 2 Percent Slopes*
Cajon Sand, 2 to 9 Percent Slopes
Cajon-Arizo Complex, 2 to 15 Percent Slopes
Cajon-Wasco, Cool Complex, 2 to 9 Percent Slopes*
Cave Loam, Dry, 0 to 2 Percent Slopes*
Dune Land*
Helendale Loamy Sand, 0 to 2 Percent Slopes
Helendale Loamy Sand, 2 to 5 Percent Slopes
Joshua Loam, 2 to 5 Percent Slopes
Nebona-Cuddeback Complex, 2 to 9 Percent Slopes*
Norob-Halloran Complex, 0 to 5 Percent Slopes*
Riverwash*
Rock Outcrop-Lithic Torriorthents Complex, 15 to 50 Percent Slopes
Rosamond Loam, Saline-Alkali*
Victorville Sandy Loam*
Villa Loamy Sand*
Villa Loamy Sand, Hummocky*

*Soils rated as hydric per the NRCS.

34.887803, -117.088882
34.772232, -117.285959
WDP 1
WDP 2
WDP 3
WDP 4
WDP 5
WDP 6
WDP 7
WDP 8
WDP 9
WDP 10
WDP 11
WDP 12
Mojave River
Oak Grove Rd
Burlington Northern Santa Fe RR
National Trails Hwy
Lenwood Rd
58
15

FIGURE 4A

# NRCS Soils Survey Data and NWI

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 4,500 FEET
1 INCH = 4,500 FEET

Date: 7/24/2023
Aerial Photo: San Bernardino County 2020, Esri
Source: USFWS NWI 2019; USDA NRCS 2018

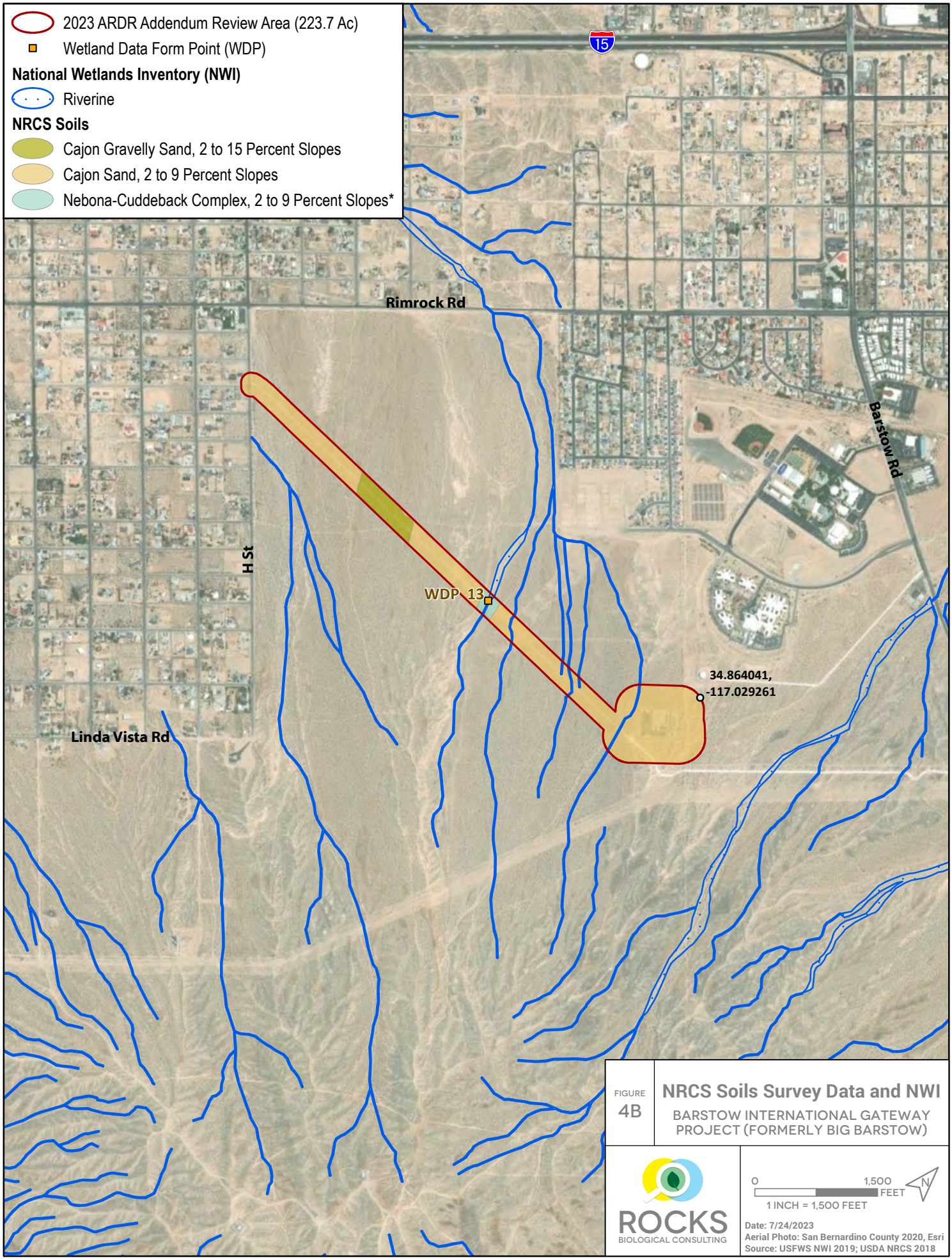



FIGURE 4B

# NRCS Soils Survey Data and NWI

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 1,500 FEET

1 INCH = 1,500 FEET

N

Date: 7/24/2023

Aerial Photo: San Bernardino County 2020, Esri

Source: USFWS NWI 2019; USDA NRCS 2018




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Railroad Crossing
Flow Direction

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
11'-15'
24'-30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

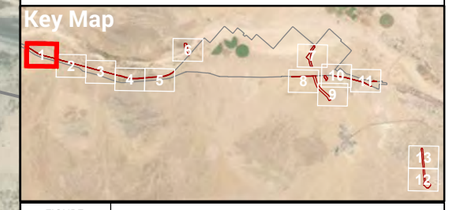



FIGURE 5A

PAGE 1 OF 13

Corps Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

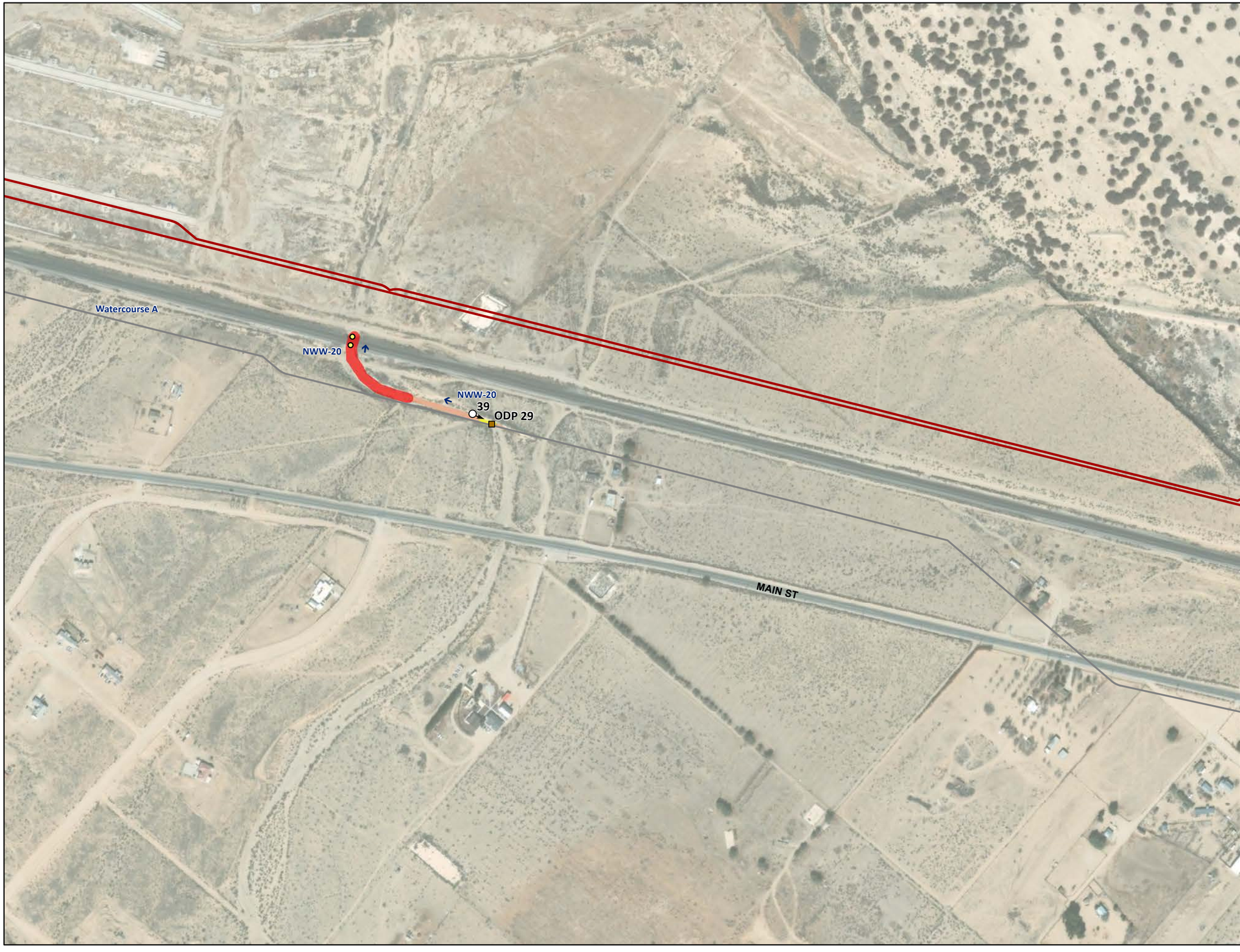
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

16'-21'
24'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

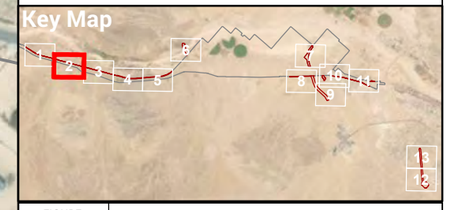


FIGURE 5A

PAGE 2 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

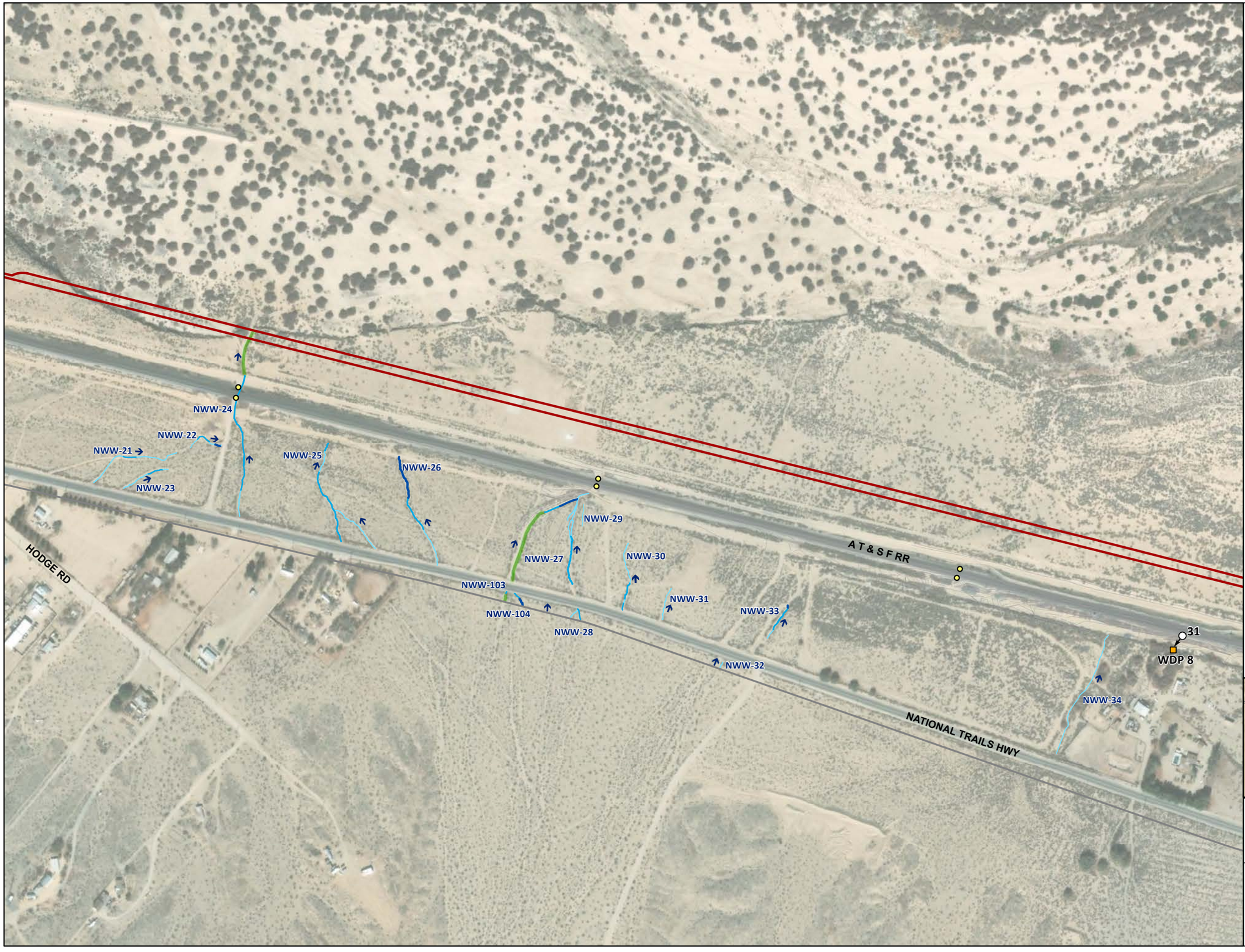
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Wetland Data Form Point (WDP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

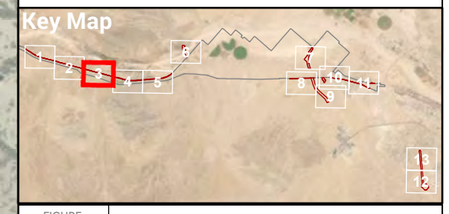


FIGURE 5A

PAGE 3 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

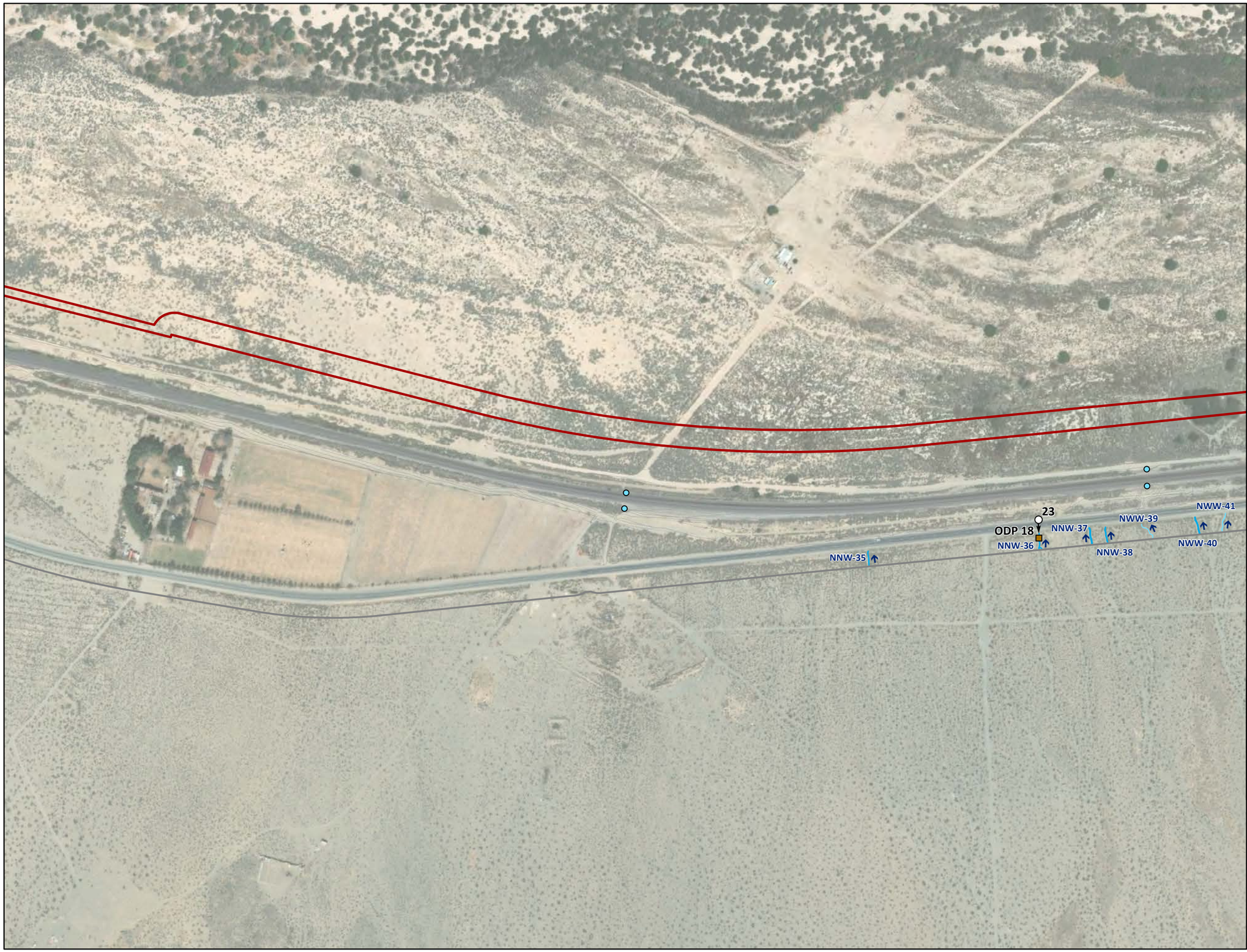
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5A

PAGE 4 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

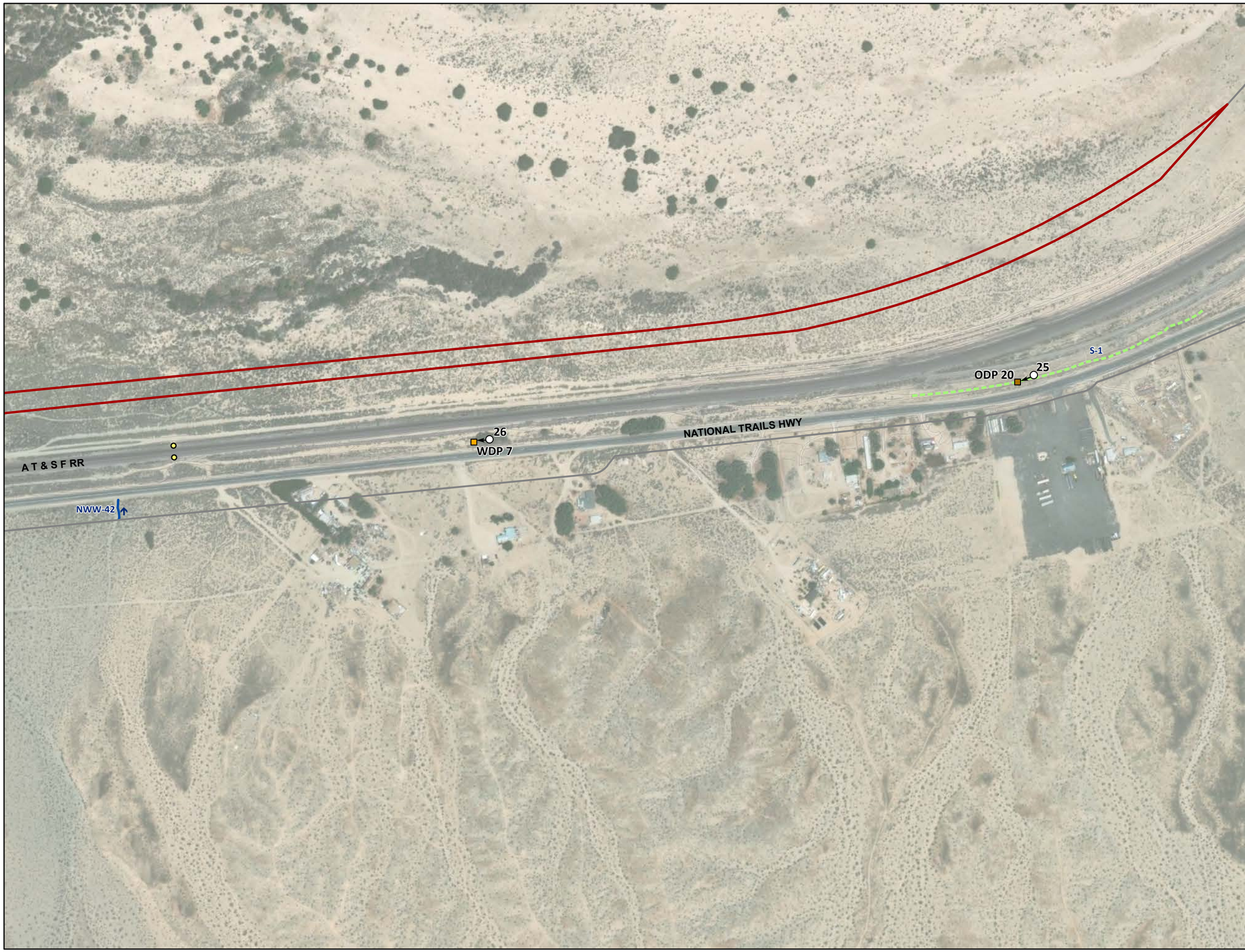
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

7'-10'

## Other Features[3]

Swale

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined OHWM, and thus anticipated to be non-jurisdictional.

Key Map

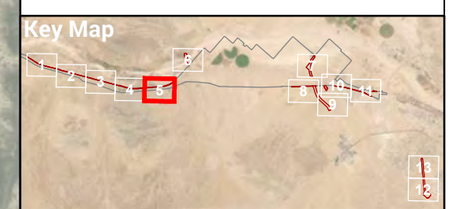


FIGURE 5A

PAGE 5 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
Mojave River Extent

## Other Features[3]

Basin

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined OHWM, and thus anticipated to be non-jurisdictional.

Key Map

FIGURE 5A

PAGE 6 OF 13

# Corps Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5A

PAGE 7 OF 13

Corps Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/3/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

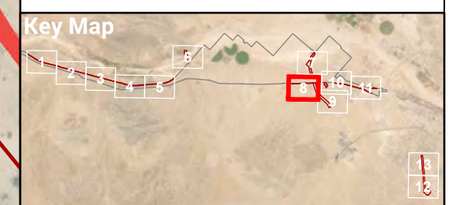


FIGURE 5A

PAGE 8 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

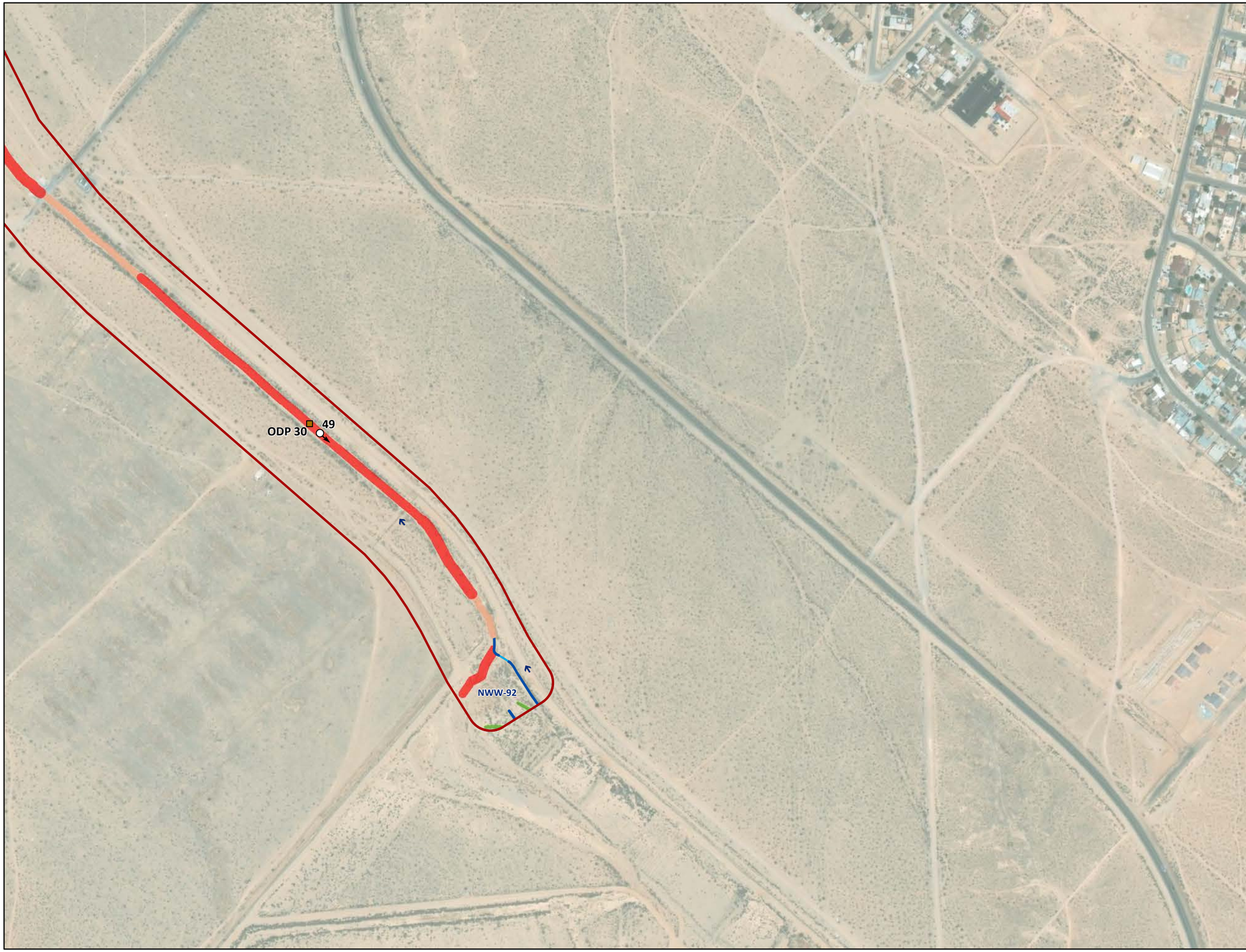
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

4'-6'
7'-10'
11'-15'
24'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

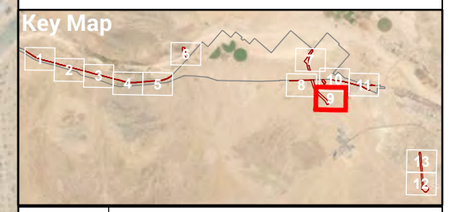


FIGURE 5A

PAGE 9 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**
1'-3'
4'-6'

**Non-Wetland Waters - Rip-rap (0.06 ac)[1] (widths[2])**
3'
20'

**Non-Wetland Waters - Concrete (0.12 ac)[1] (widths[2])**
6'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

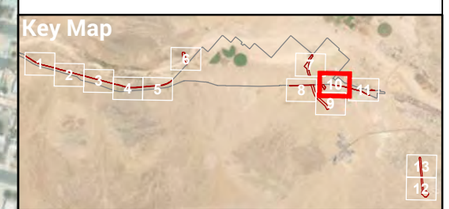



FIGURE 5A

PAGE 10 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/3/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

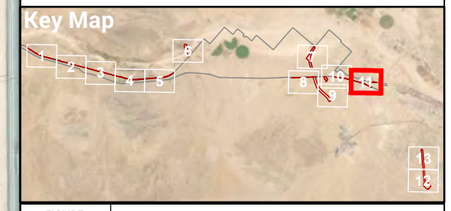


FIGURE 5A

PAGE 11 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

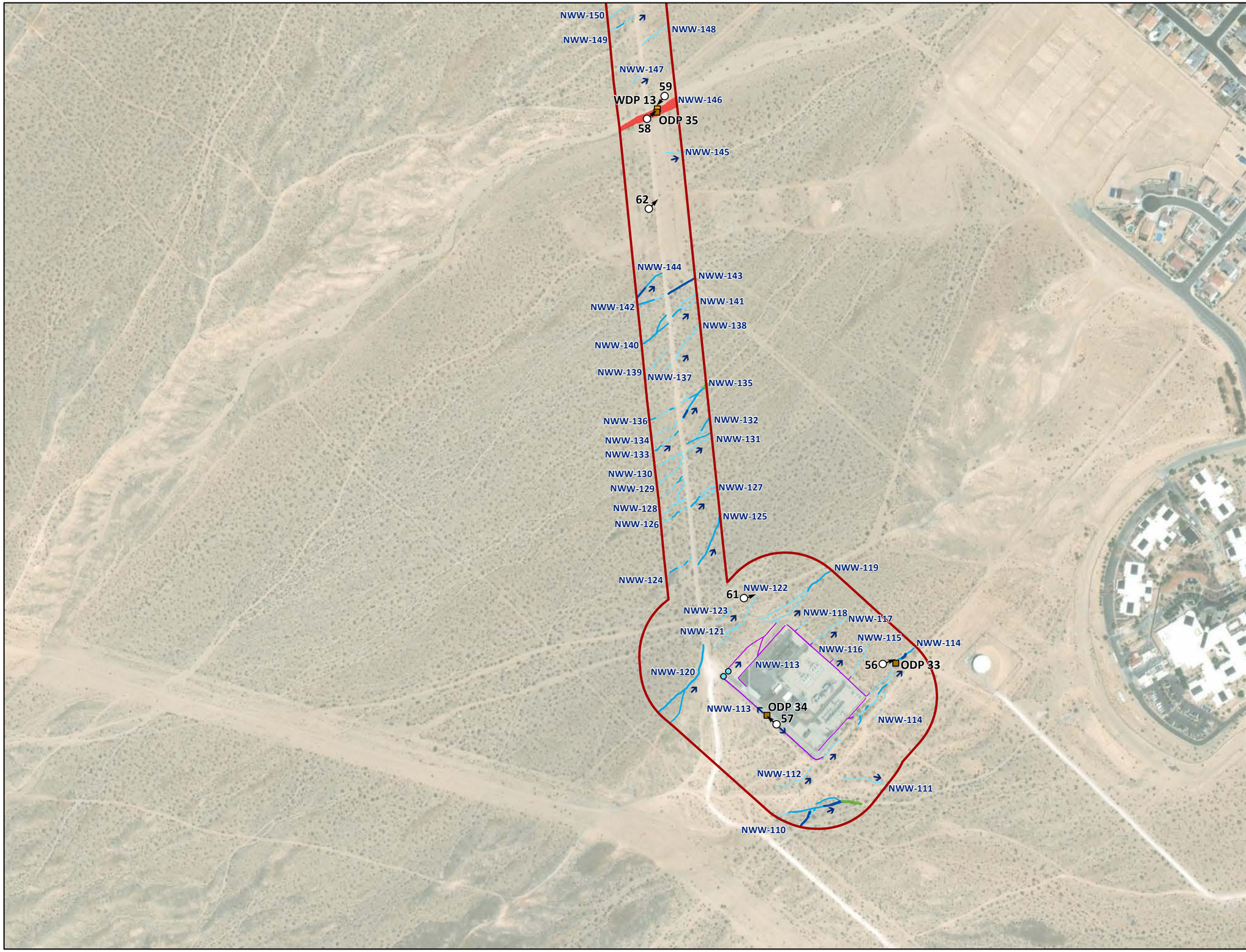
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
>30'

**Non-Wetland Waters - Concrete (0.12 ac)[1] (widths[2])**

1'-3'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

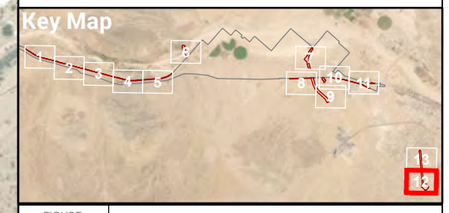



FIGURE 5A

PAGE 12 OF 13

**Corps Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

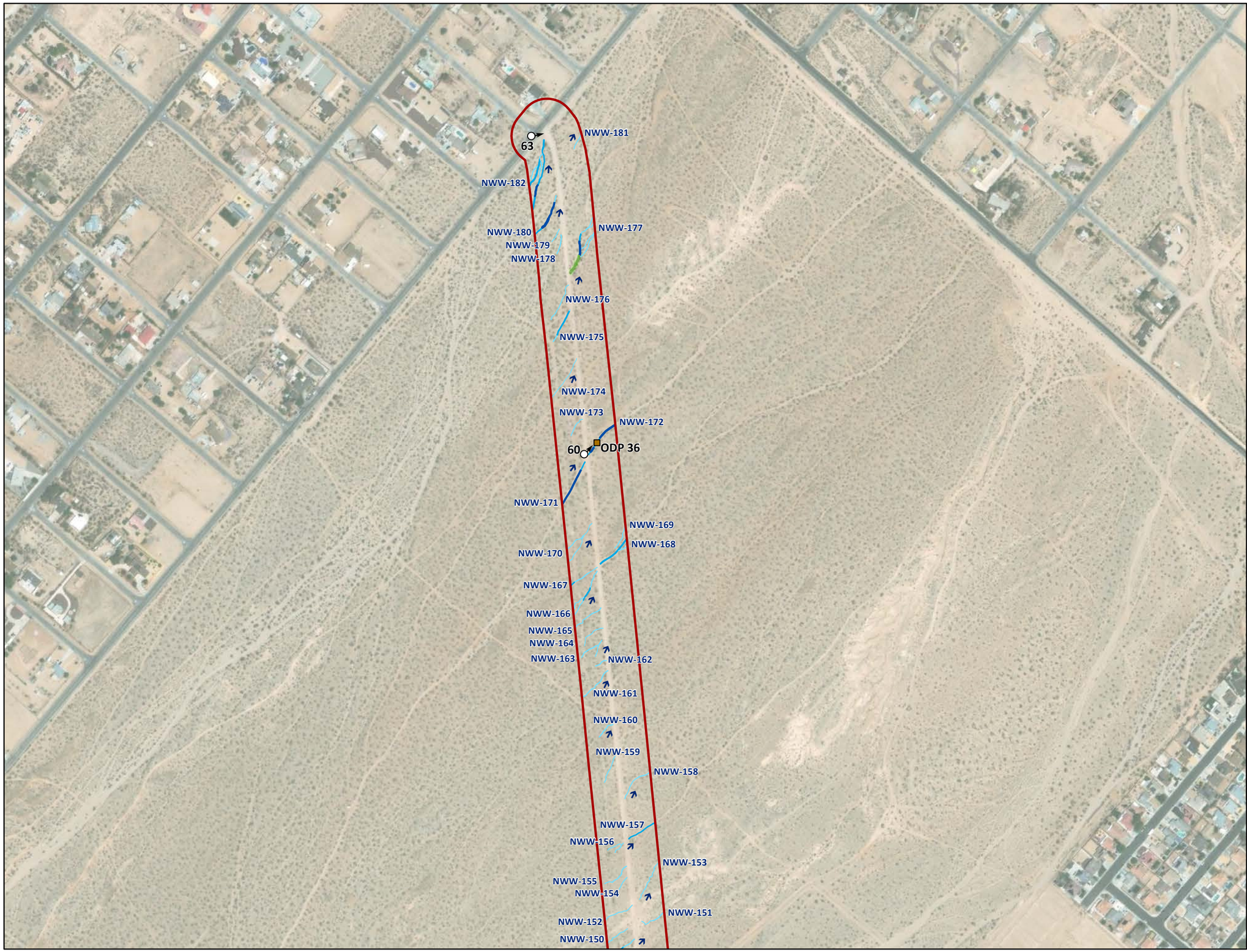
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## Corps Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

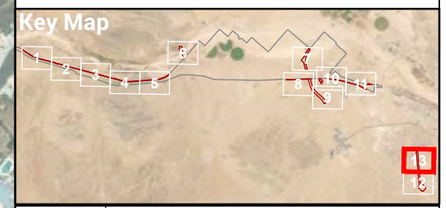


FIGURE 5A

PAGE 13 OF 13

Corps Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Railroad Crossing
Flow Direction

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
11'-15'
24'-30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

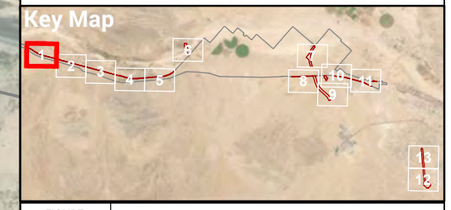



FIGURE 5B

PAGE 1 OF 13

RWQCB Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

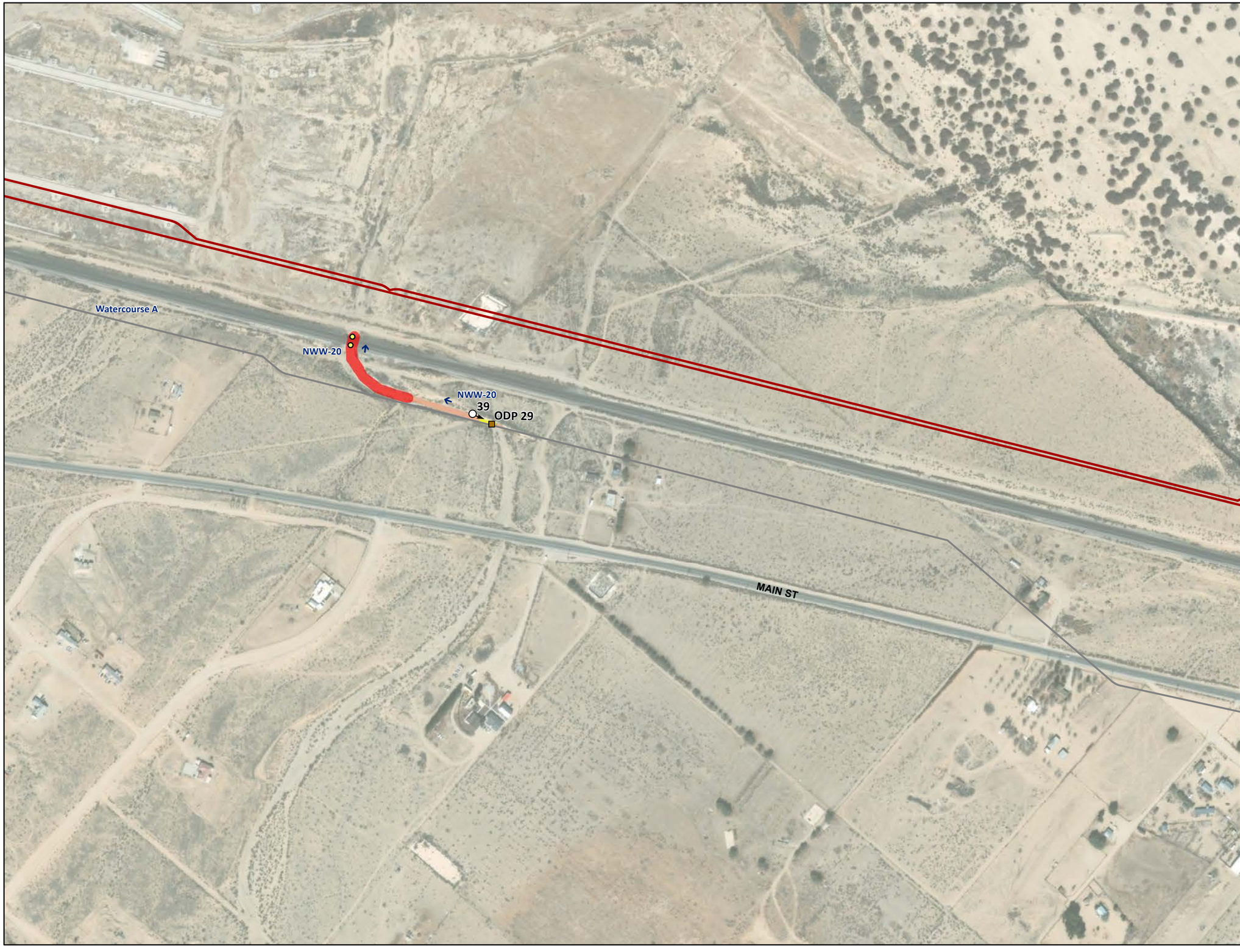
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

16'-21'
24'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

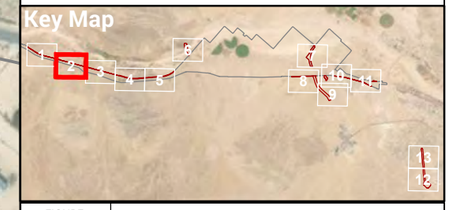


FIGURE 5B

PAGE 2 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

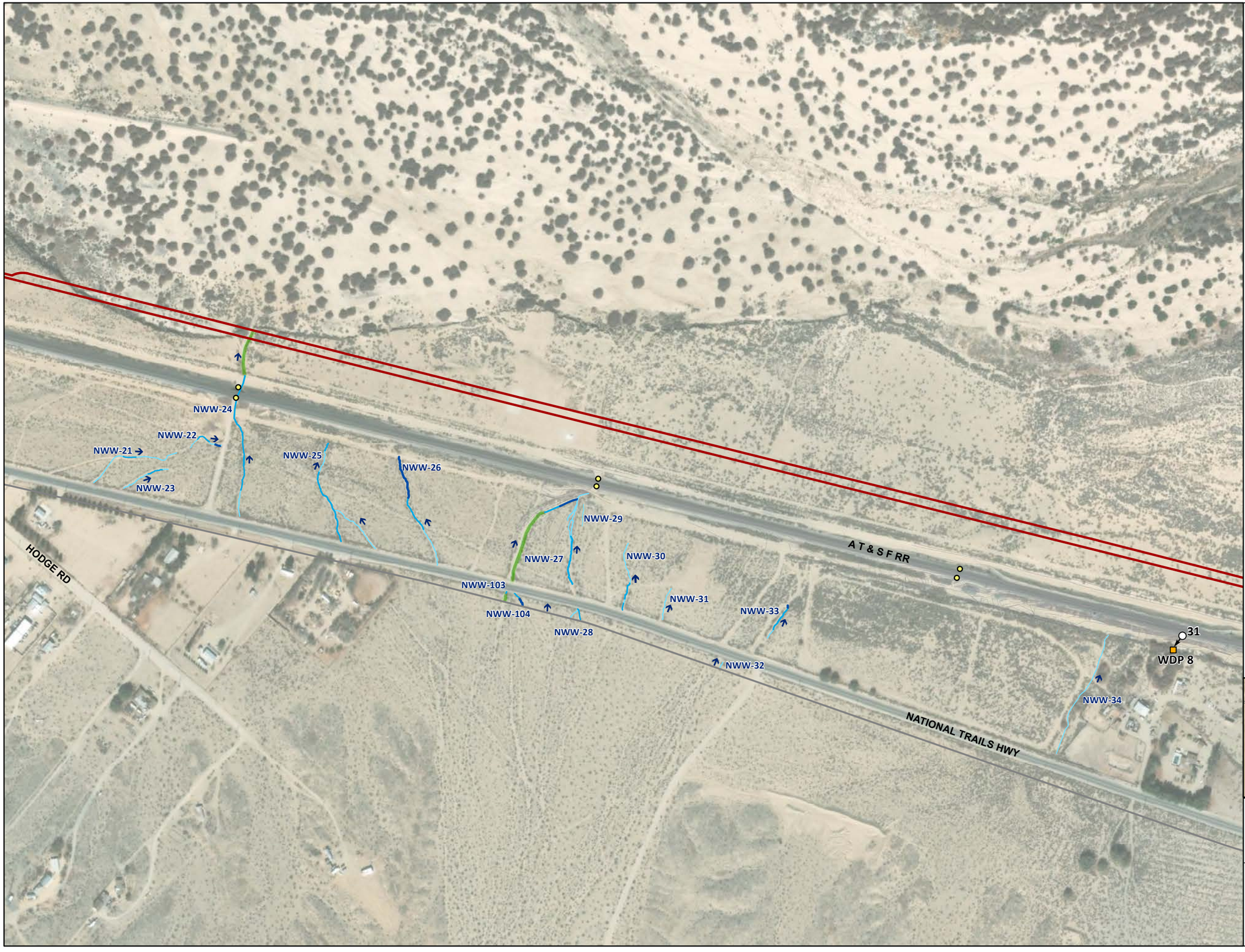
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Wetland Data Form Point (WDP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

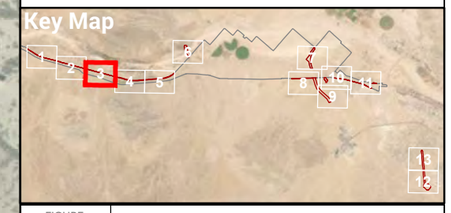


FIGURE 5B

PAGE 3 OF 13

# RWQCB Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

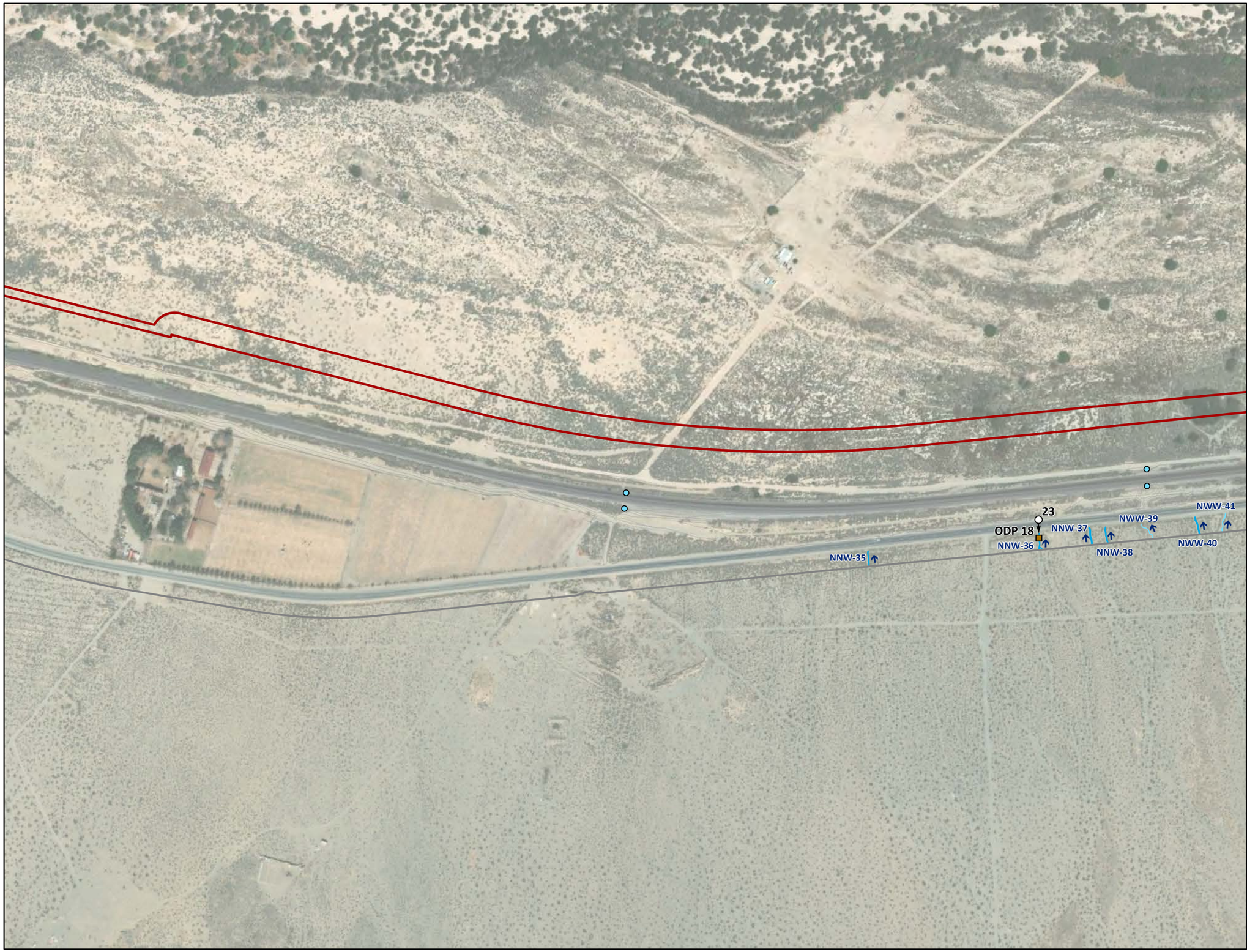
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 4 OF 13

# RWQCB Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

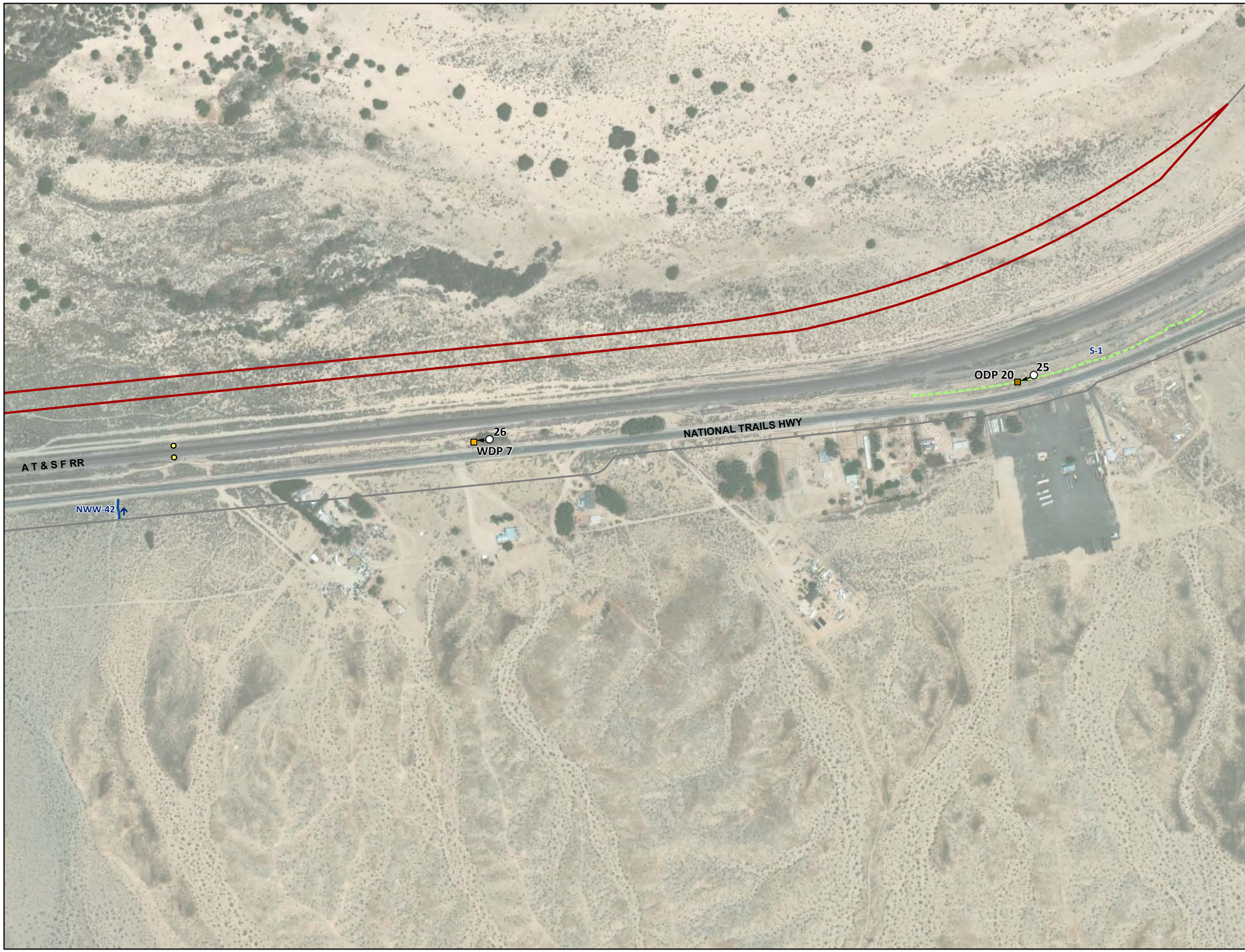
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

7'-10'

## Other Features[3]

Swale

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined OHWM, and thus anticipated to be non-jurisdictional.

Key Map

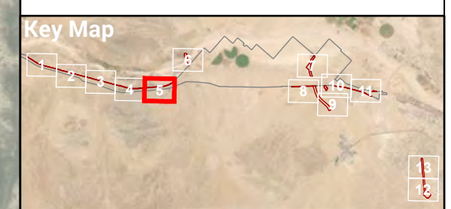


FIGURE 5B

PAGE 5 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
Mojave River Extent

## Other Features[3]

Basin

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined OHWM, and thus anticipated to be non-jurisdictional.

Key Map

FIGURE 5B

PAGE 6 OF 13

# RWQCB Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Flow Direction
Photo Location

**RWQCB Aquatic Resources**

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 7 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/3/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

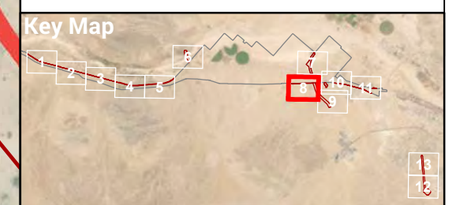


FIGURE 5B

PAGE 8 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

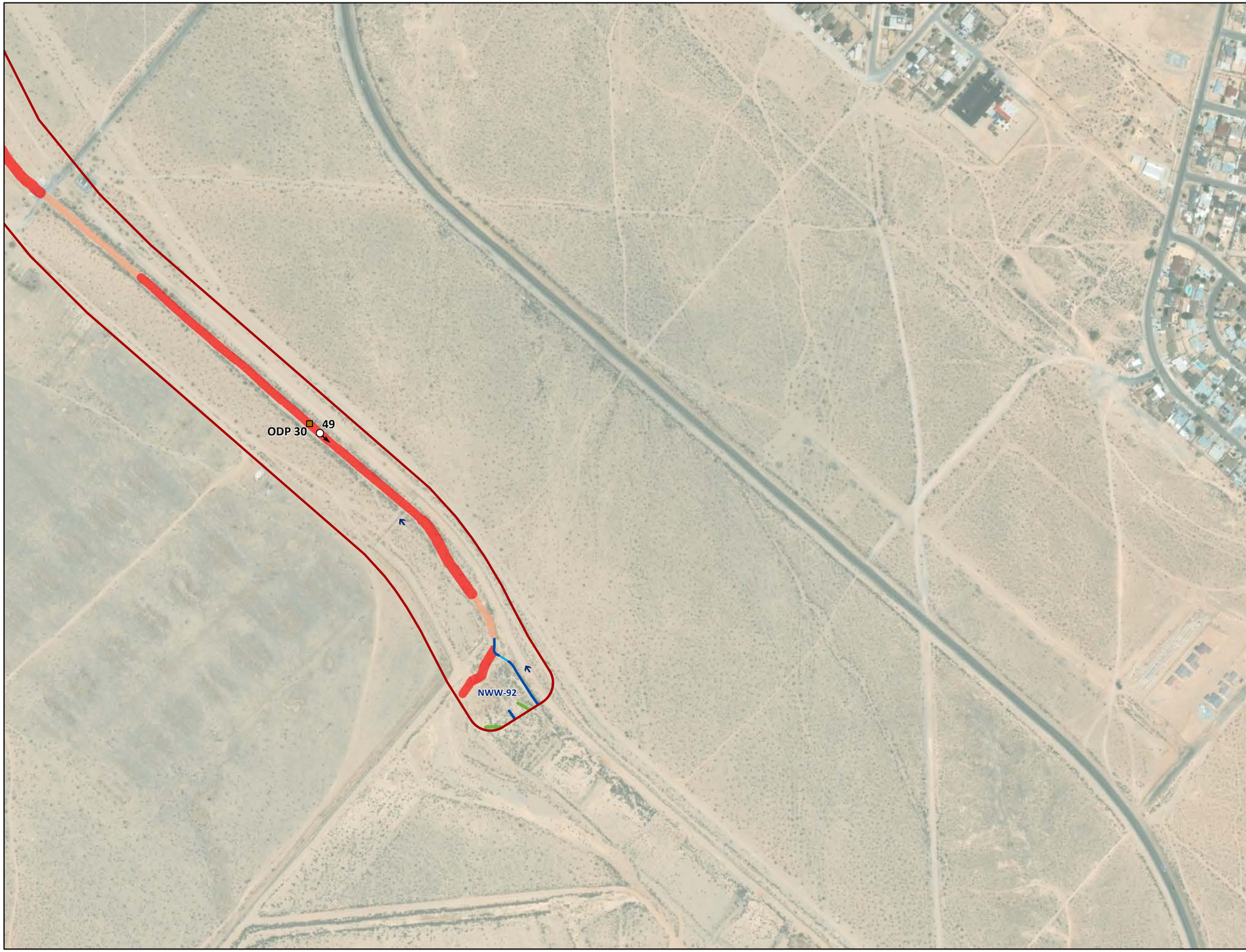
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

4'-6'
7'-10'
11'-15'
24'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

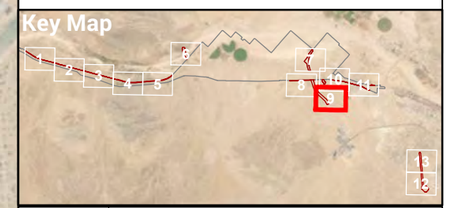


FIGURE 5B

PAGE 9 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**
1'-3'
4'-6'

**Non-Wetland Waters - Rip-rap (0.06 ac)[1] (widths[2])**
3'
20'

**Non-Wetland Waters - Concrete (0.12 ac)[1] (widths[2])**
6'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5B

PAGE 10 OF 13

RWQCB Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/3/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
24'-30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

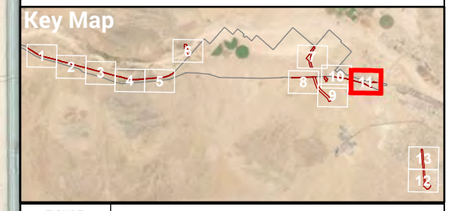



FIGURE 5B

PAGE 11 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

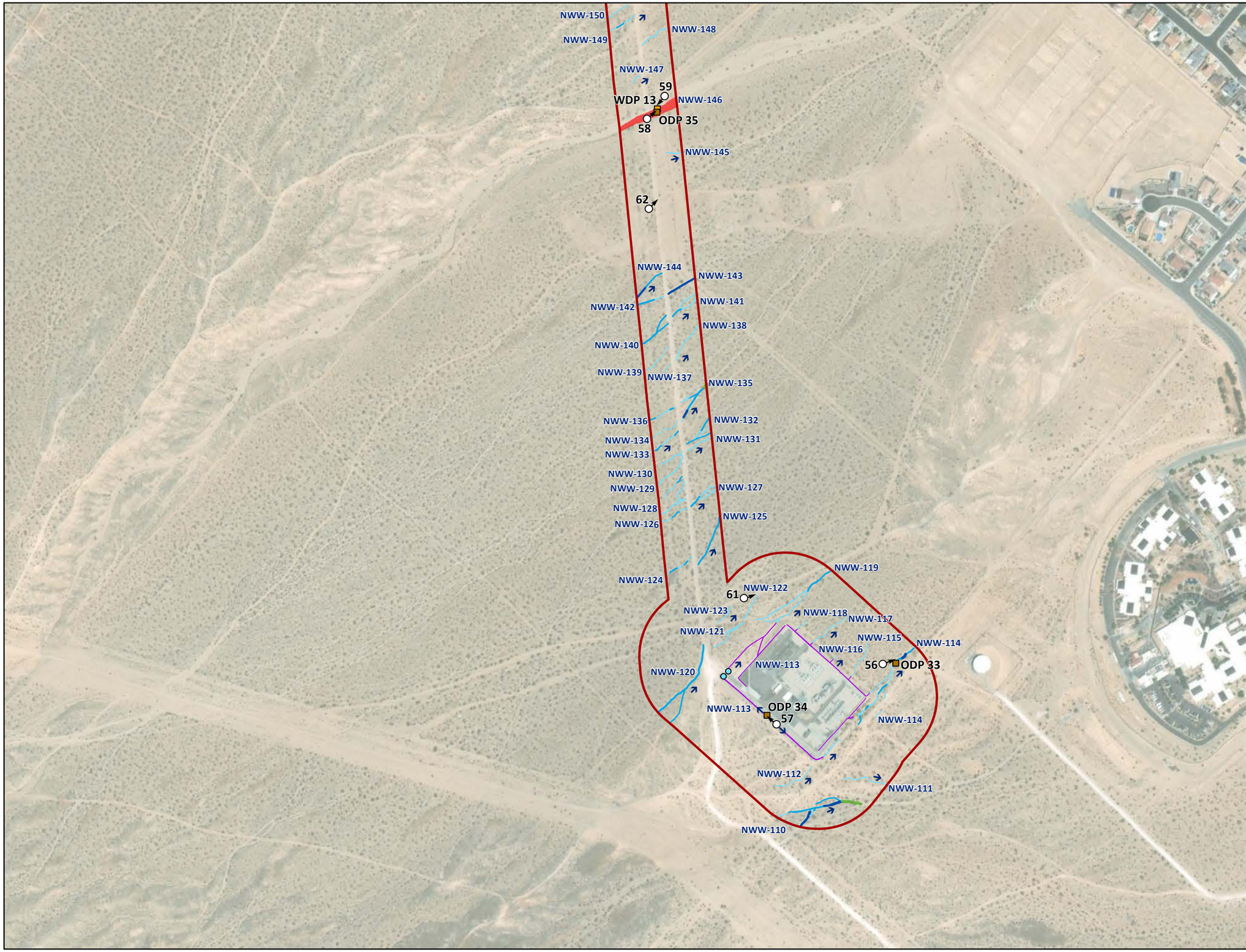
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
>30'

**Non-Wetland Waters - Concrete (0.12 ac)[1] (widths[2])**

1'-3'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

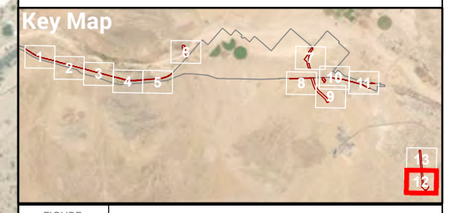



FIGURE 5B

PAGE 12 OF 13

**RWQCB Aquatic Resources**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

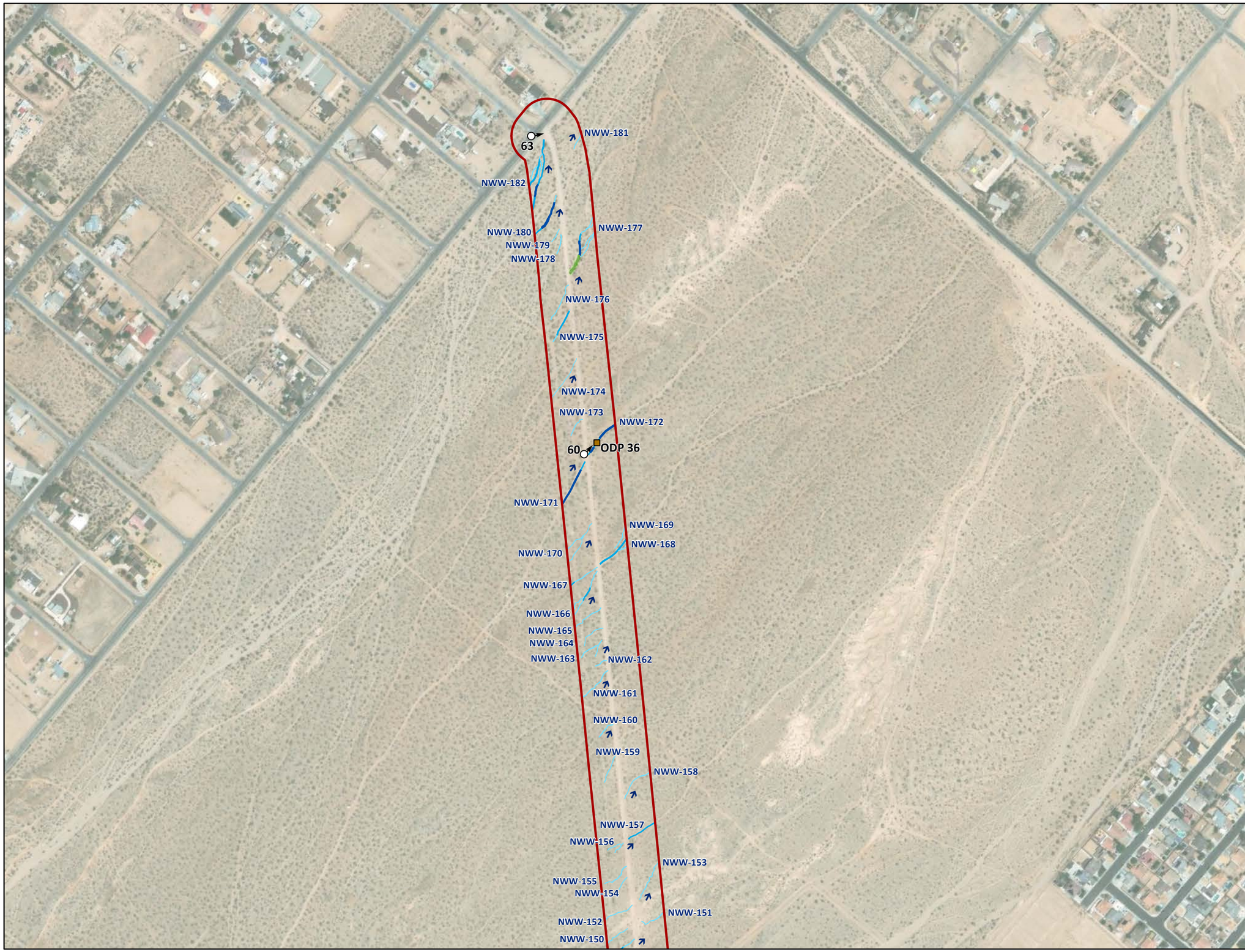
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## RWQCB Aquatic Resources

**Non-Wetland Waters (136.50 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

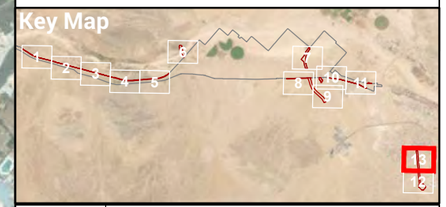


FIGURE 5B

PAGE 13 OF 13

RWQCB Aquatic Resources

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Railroad Crossing
Flow Direction

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

1'-3'
4'-6'
16'-21'
22'-30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map




FIGURE 5C

PAGE 1 OF 13

**CDFW Streambed and Watercourse**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

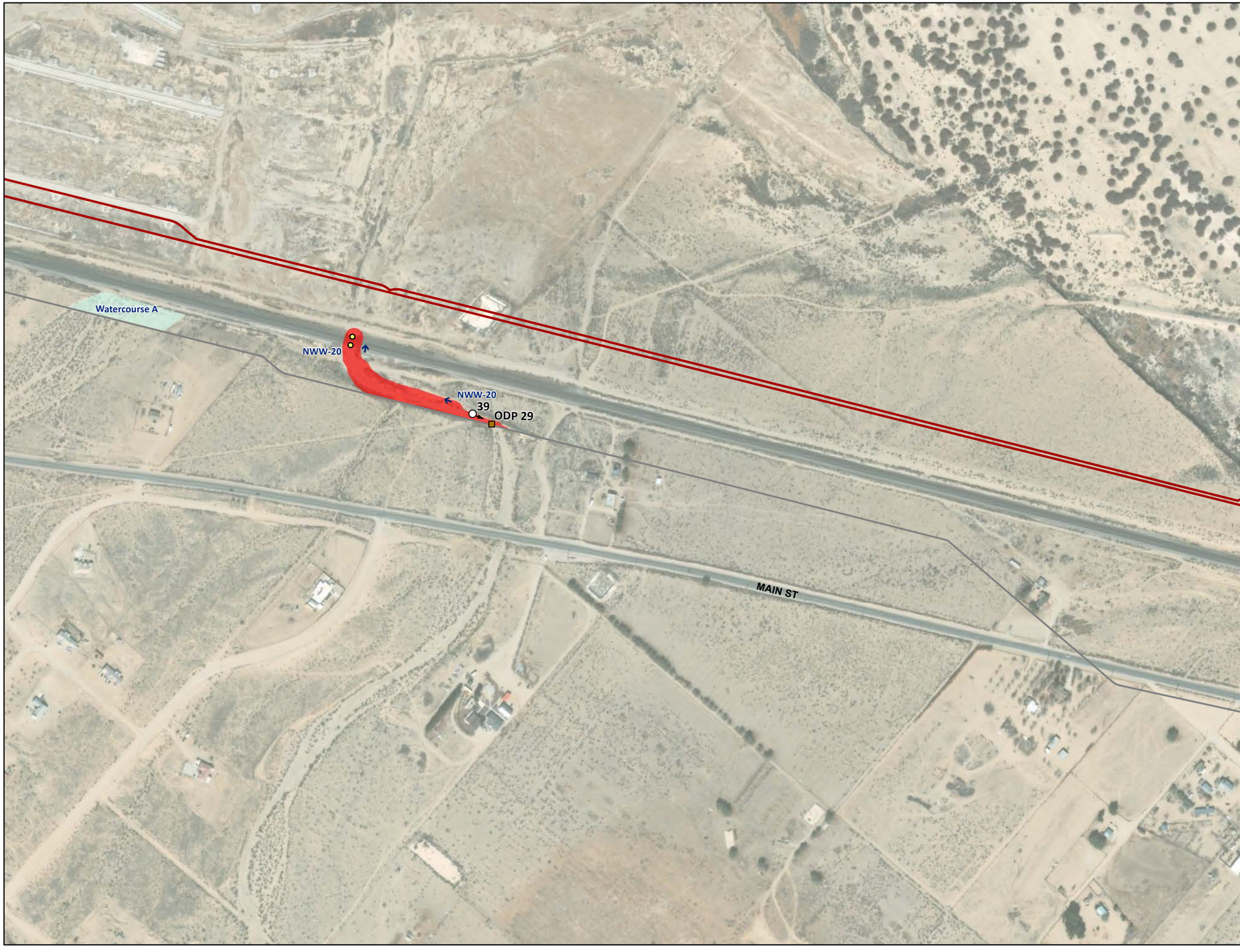
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

>30'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map



FIGURE 5C

PAGE 2 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

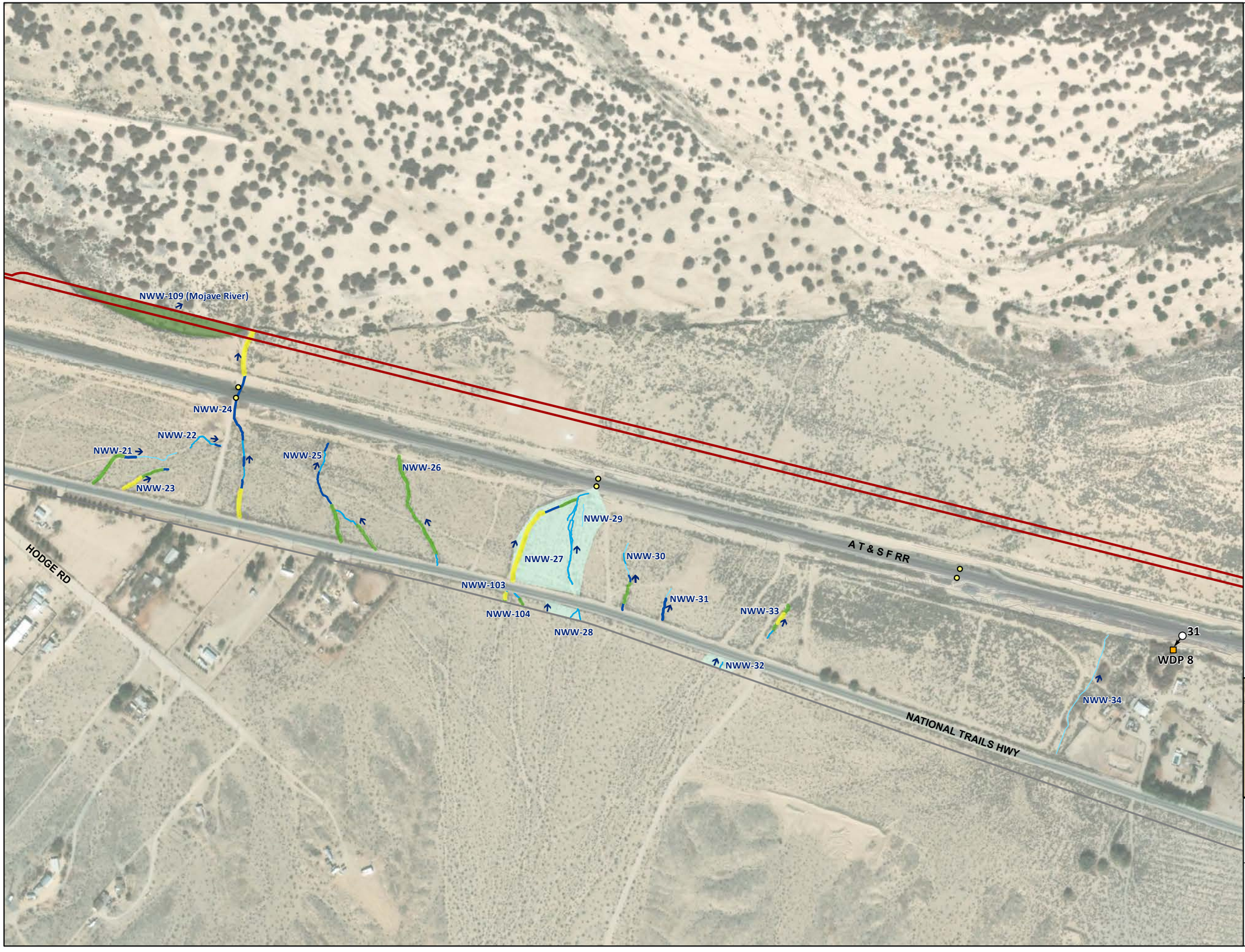
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Wetland Data Form Point (WDP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'
11'-15'
16'-21'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed

**Watercourse (55.18 ac)[1]**
Watercourse

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

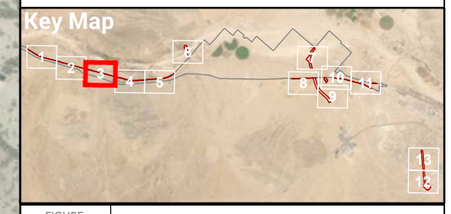


FIGURE 5C
PAGE 3 OF 13

# CDFW Streambed and Watercourse

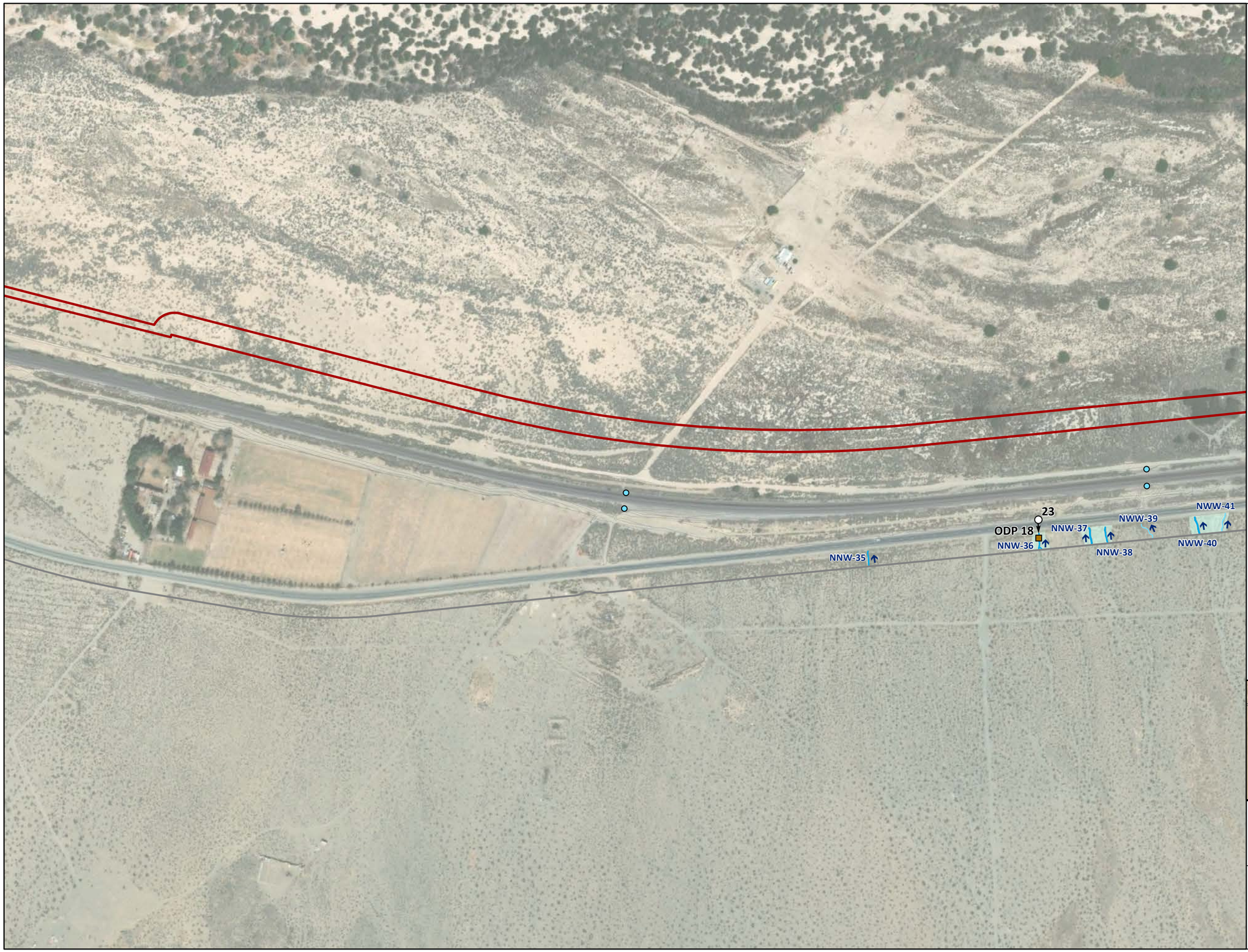
BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

N

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

1'-3'
4'-6'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C

PAGE 4 OF 13

**CDFW Streambed and Watercourse**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

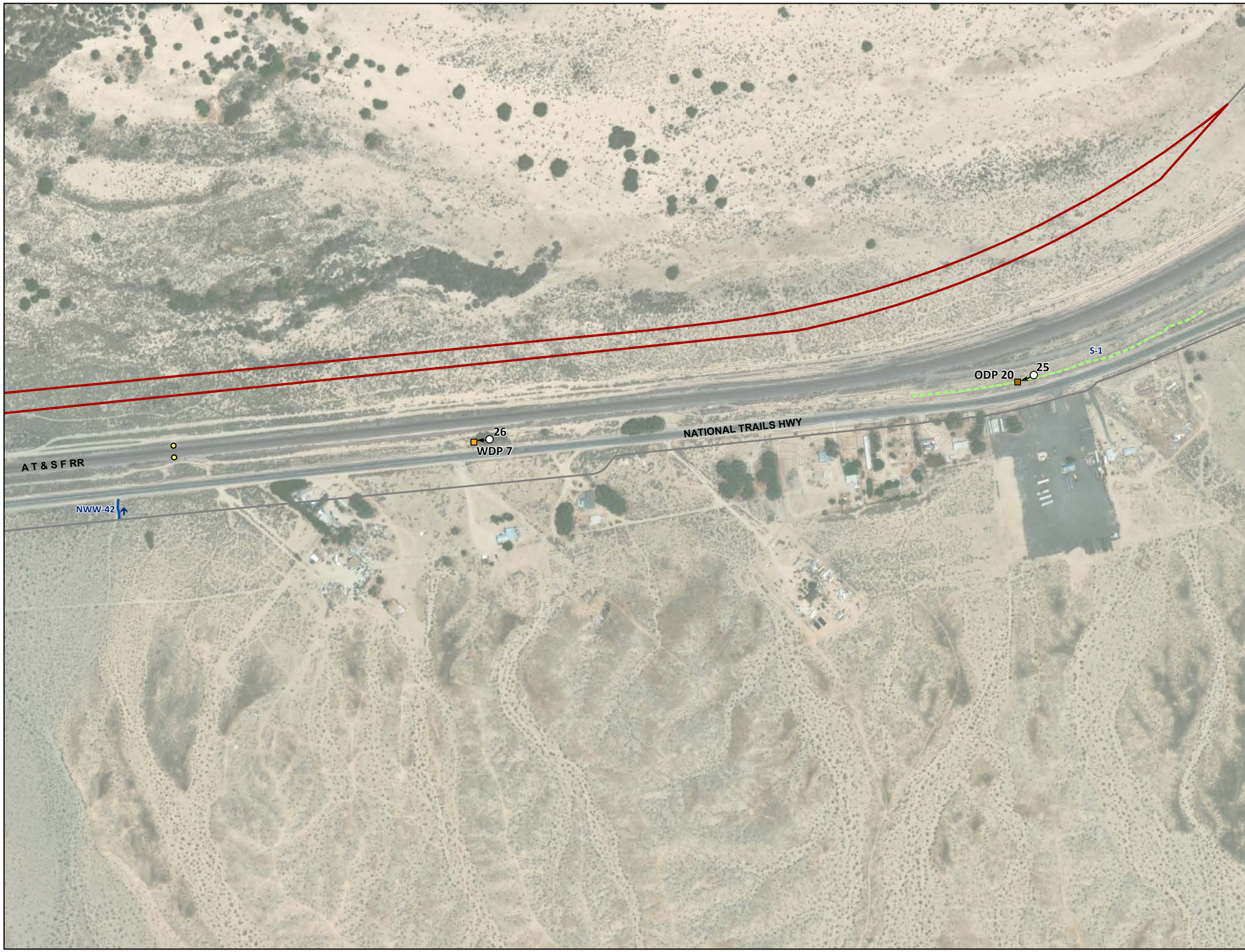
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

7'-10'

## Other Features[3]

Swale

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.

Key Map

FIGURE 5C

PAGE 5 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**
1'-3'
4'-6'

**Mojave River Extent (607.04 ac)[1]**
Vegetated Streambed
Unvegetated Streambed

**Watercourse (55.18 ac)[1]**
Watercourse

## Other Features[3]

Basin

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

[3] Features lacking a defined lake or streambed, and thus anticipated to be non-jurisdictional.

Key Map

FIGURE 5C
PAGE 6 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Railroad Crossing
Flow Direction
Photo Location

**CDFW Streambed and Watercourse**

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

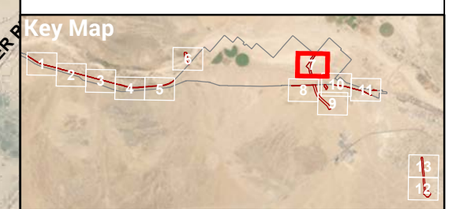


FIGURE 5C

PAGE 7 OF 13

**CDFW Streambed and Watercourse**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

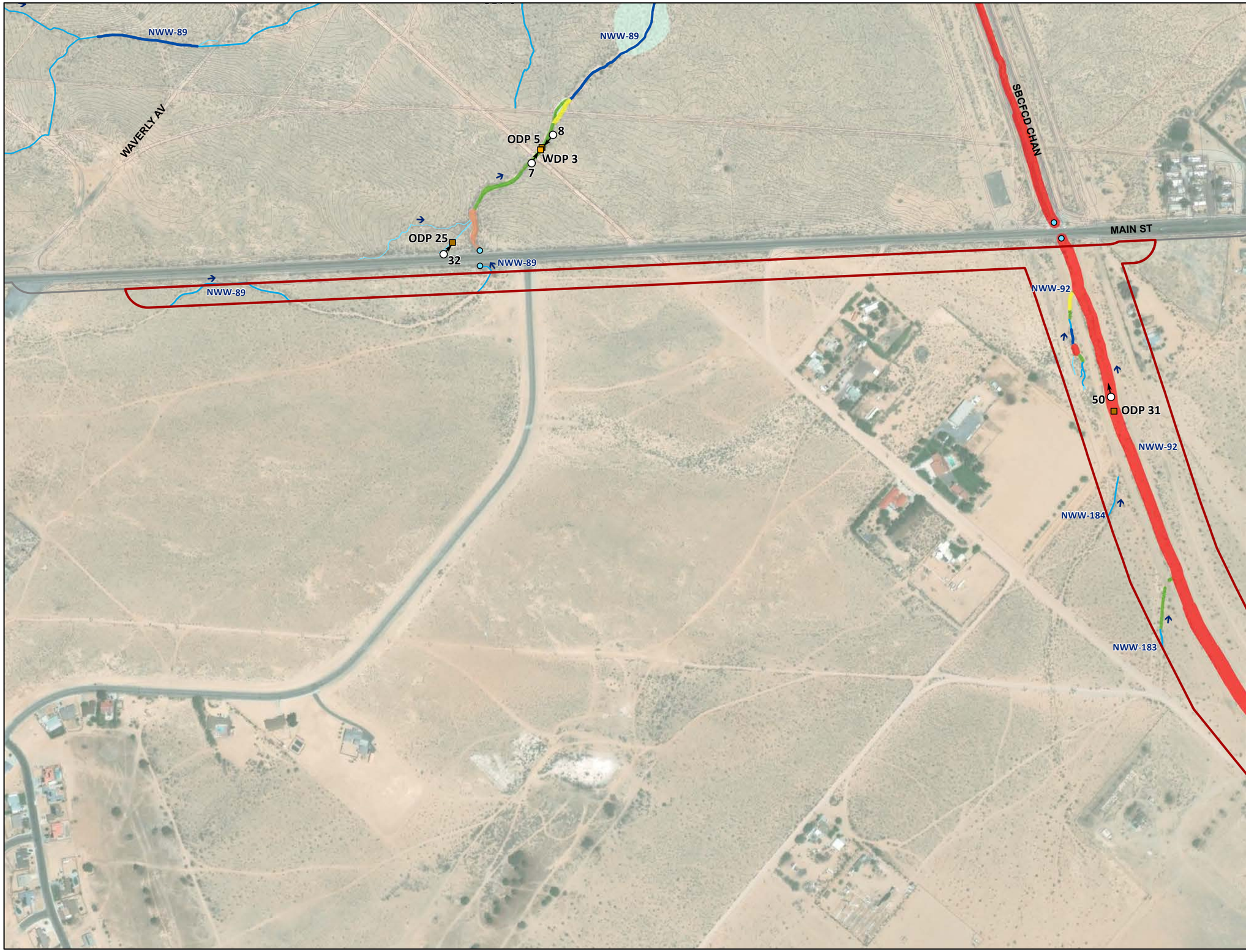
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

1'-3'
4'-6'
7'-10'
11'-15'
16'-21'
22'-30'
>30'

**Watercourse (55.18 ac)[1]**

Watercourse

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

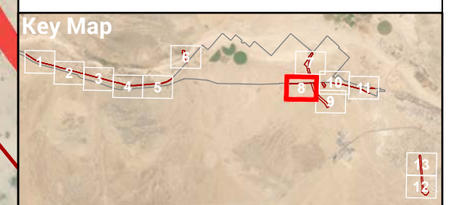


FIGURE 5C

PAGE 8 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

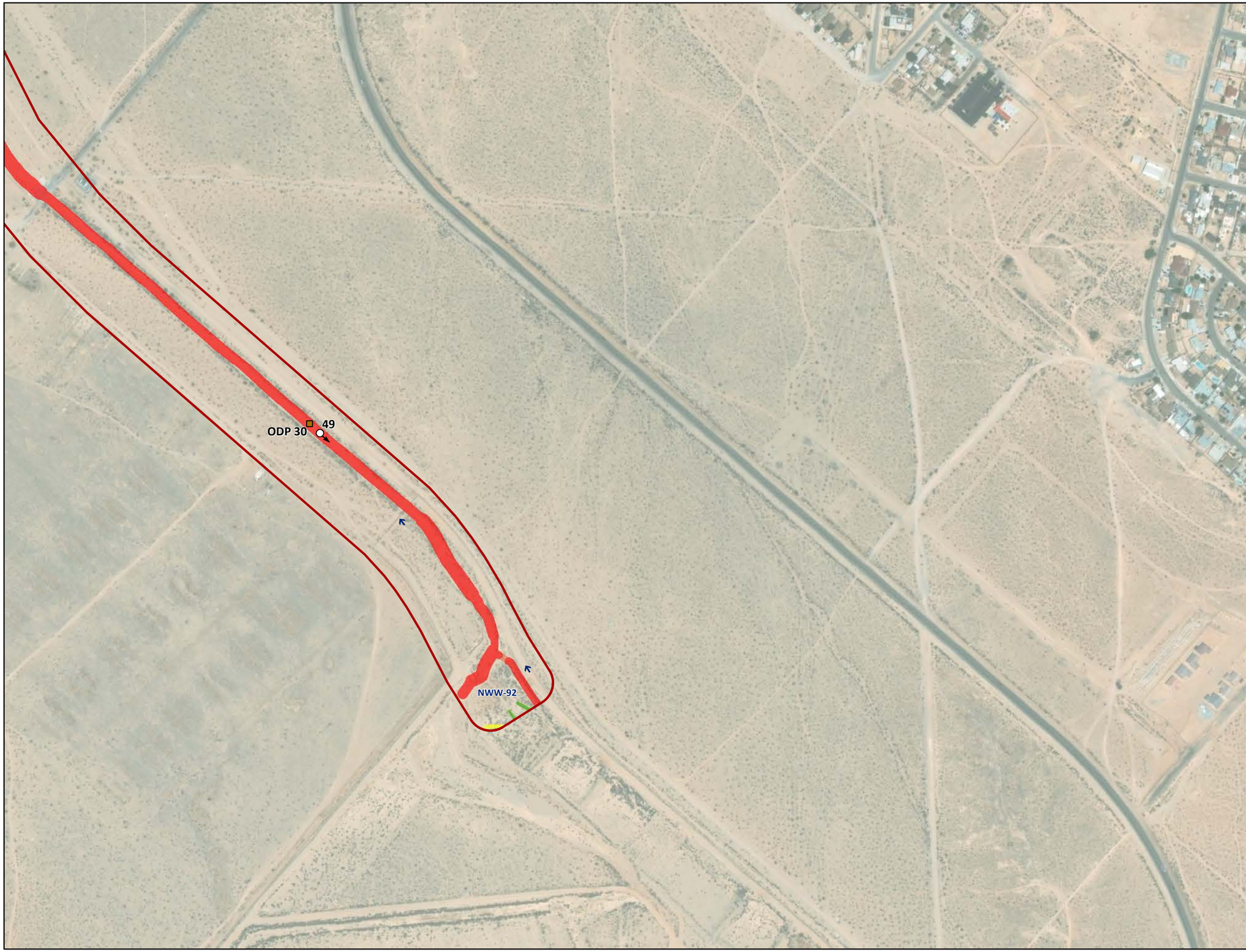
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

11'-15'
16'-21'
22'-30'
>30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

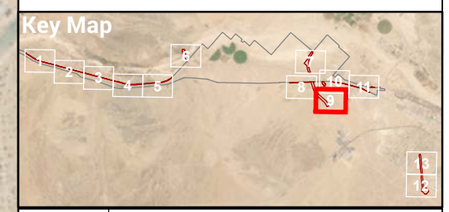


FIGURE 5C

PAGE 9 OF 13

**CDFW Streambed and Watercourse**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Vegetated Streambed (0.28 ac)[1] (widths[2])**
4'-6'

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'

**Unvegetated Streambed - Rip-Rap (0.06 ac)[1] (widths[2])**
3'
20'

**Unvegetated Streambed - Concrete (0.31 ac)[1] (widths[2])**
10'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 10 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri

BIRCH RD
JASPER RD
CEDAR RD
AT & SF RR
US 66 HWY
MAIN ST
PETTIT RD
NWW-98
NWW-97
ODP 1
1
NWW-99
NWW-100
NWW-100
NWW-101
NWW-101
NWW-102
WDP 11
40

2023 ARDR Addendum Review Area (223.7 ac)
2022 ARDR Review Area (5,104.5 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Vegetated Streambed (0.28 ac)[1] (widths[2])**
- 4'-6'
- 7'-10'
- 11'-15'

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**
- 1'-3'
- 4'-6'
- 7'-10'
- 11'-15'
- 16'-21'
- 22'-30'
- >30'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C

PAGE 11 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

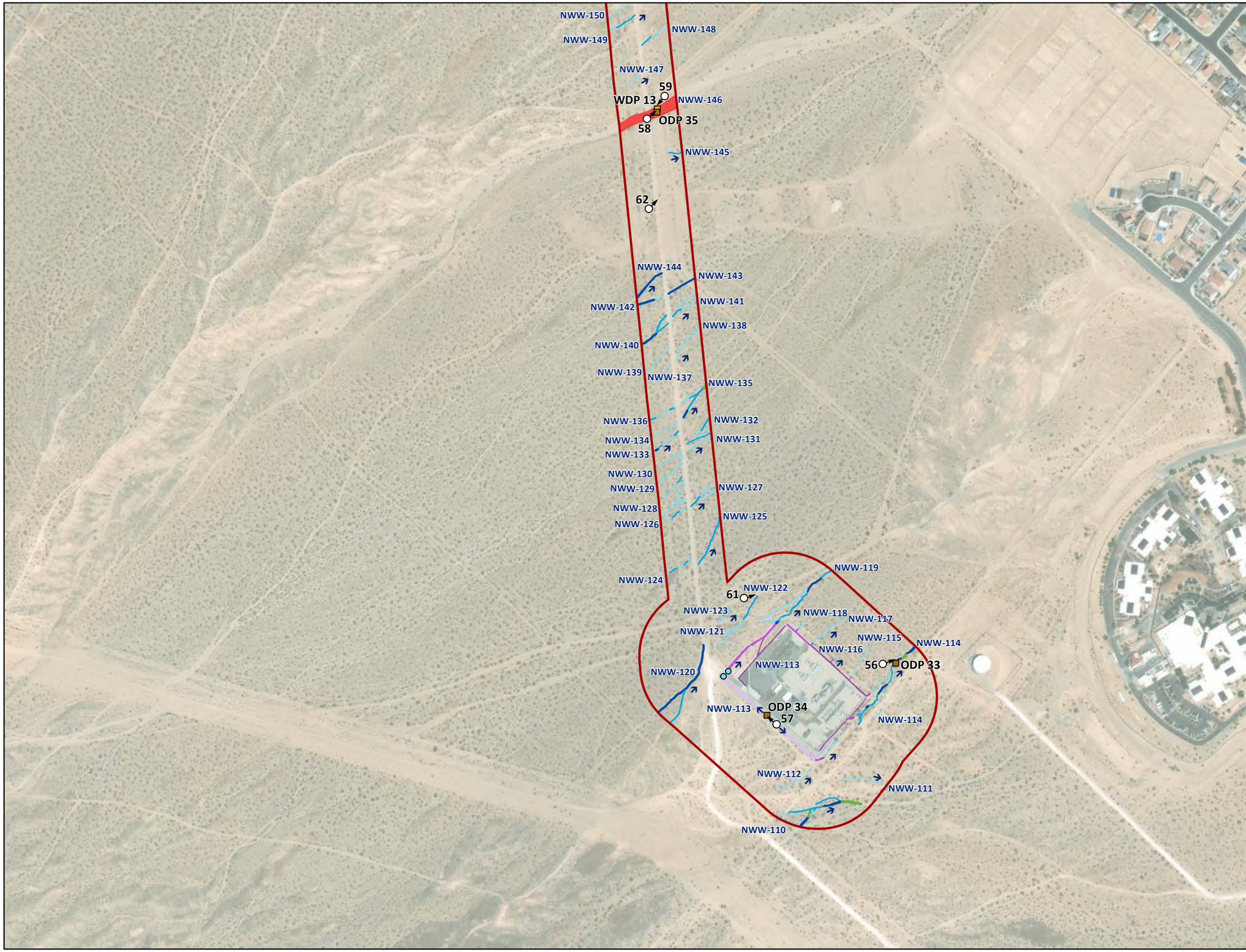
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)
Culvert
Wetland Data Form Point (WDP)
OHWM Datasheet Point (ODP)
Flow Direction
Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**
1'-3'
4'-6'
7'-10'
11'-15'
>30'

**Unvegetated Streambed - Concrete (0.31 ac)[1] (widths[2])**
1'-3'
4'-6'
11'-15'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map

FIGURE 5C
PAGE 12 OF 13

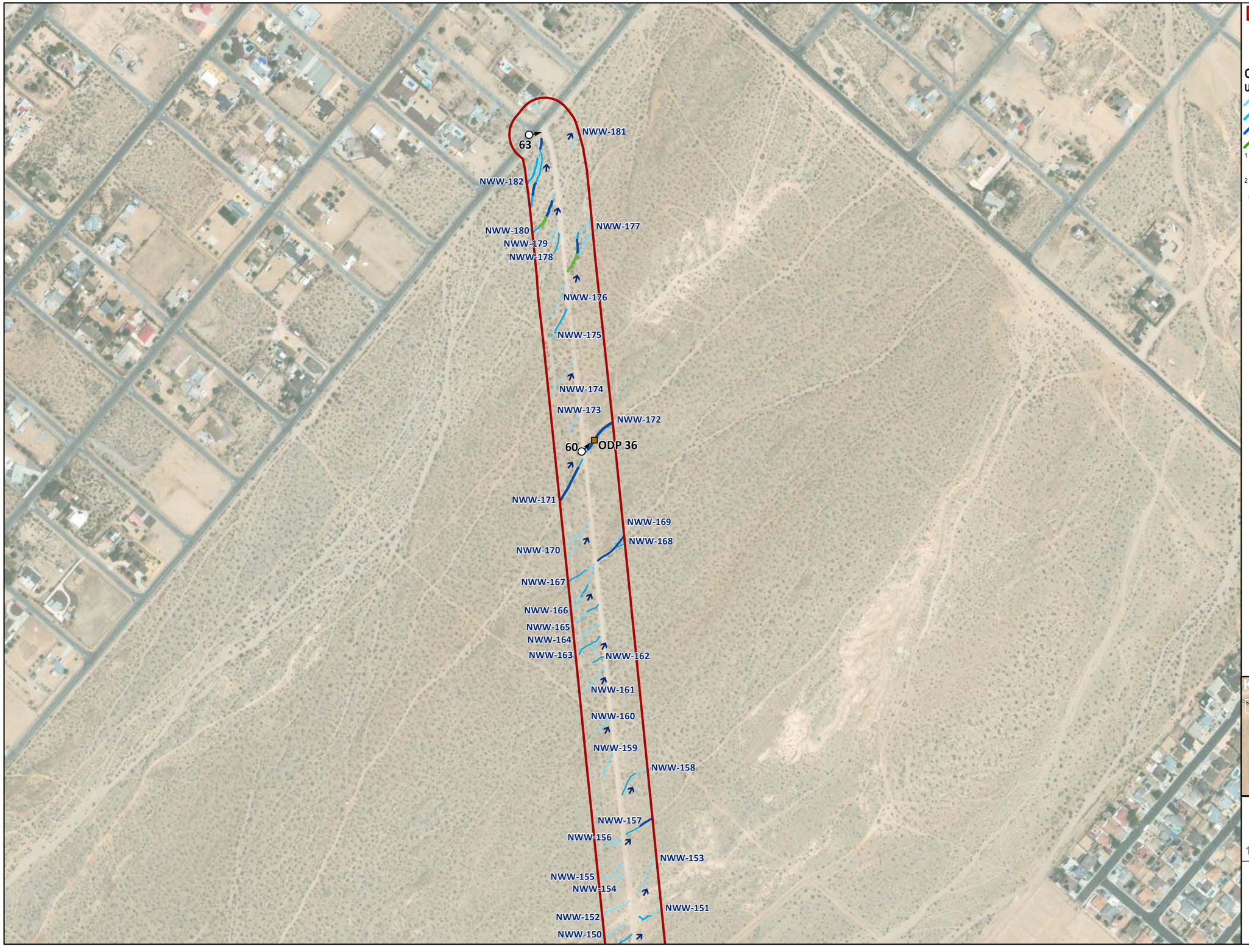
# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET
1 INCH = 400 FEET

Date: 8/2/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 ac)

OHWM Datasheet Point (ODP)

Flow Direction

Photo Location

## CDFW Streambed and Watercourse

**Unvegetated Streambed (35.91 ac)[1] (widths[2])**

1'-3'

4'-6'

7'-10'

11'-15'

[1] Represents total acreage for 2022 ARDR Review Area and 2023 ARDR Addendum Review Area

[2] Width ranges used for display purposes only. Acreage calculations use varied widths of each feature.

Key Map



FIGURE 5C

PAGE 13 OF 13

# CDFW Streambed and Watercourse

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

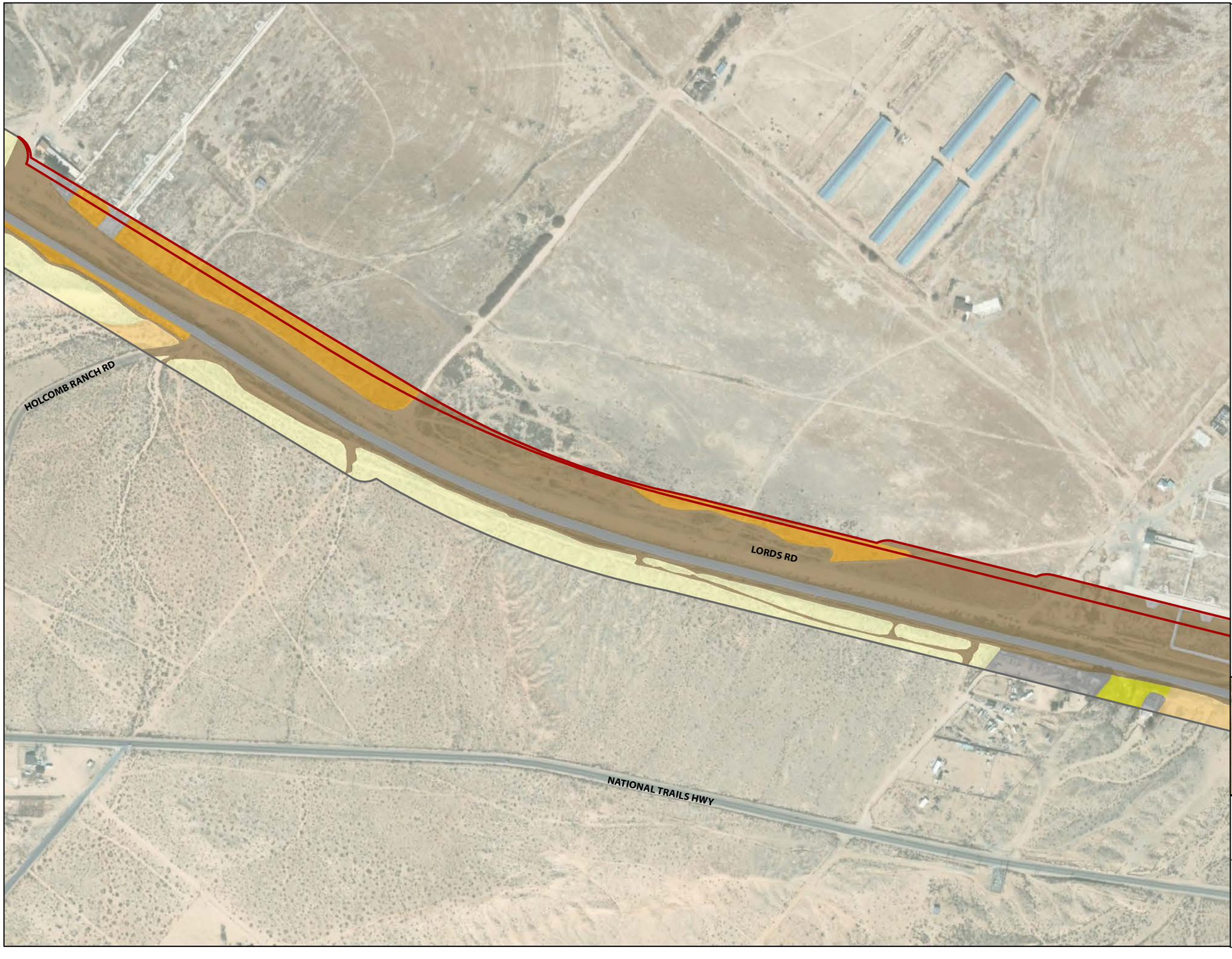
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/2/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat

Key Map

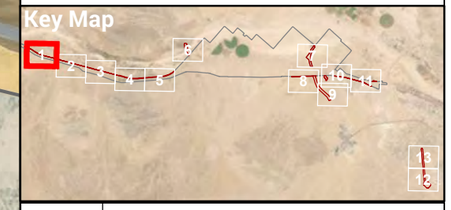


FIGURE 6

PAGE 1 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

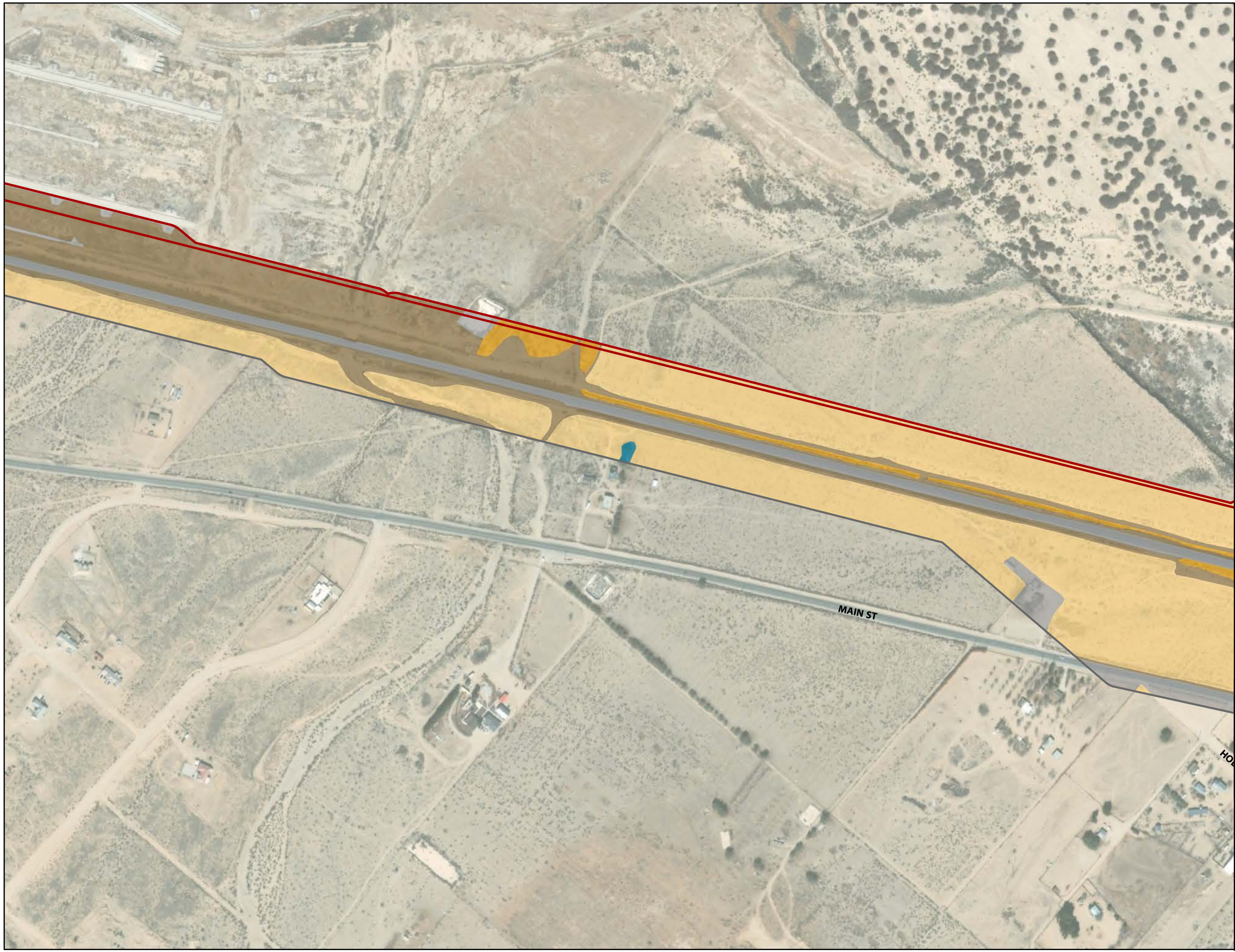
ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

Key Map

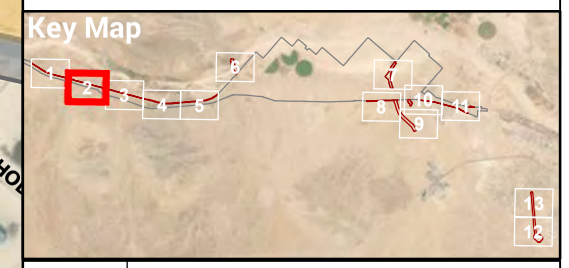


FIGURE 6

PAGE 2 OF 13

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

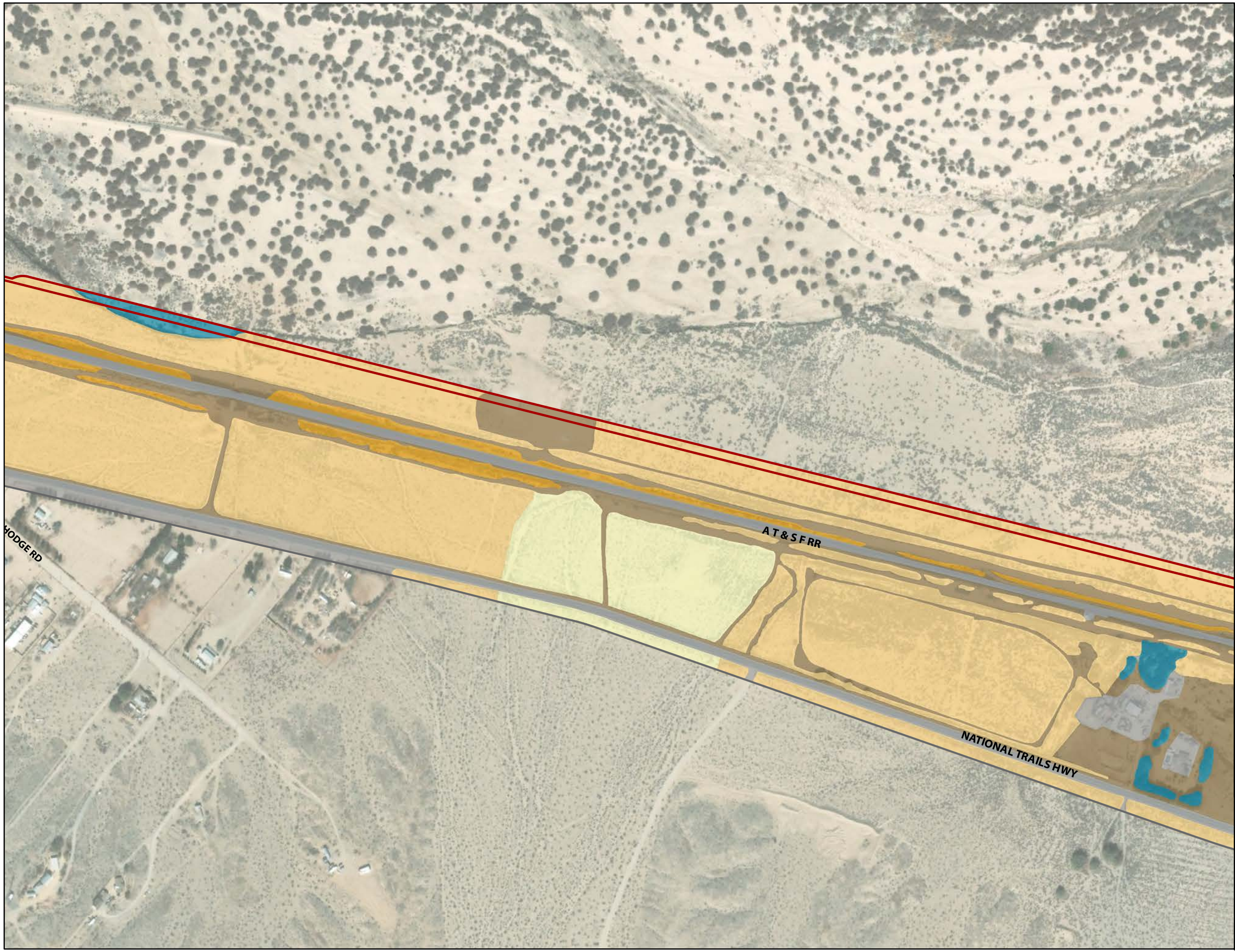
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Developed
- Disturbed Habitat
- Tamarisk Thickets

Key Map

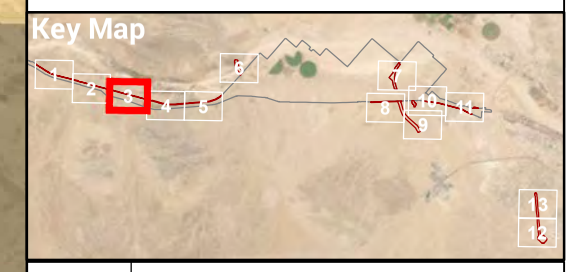


FIGURE 6

PAGE 3 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

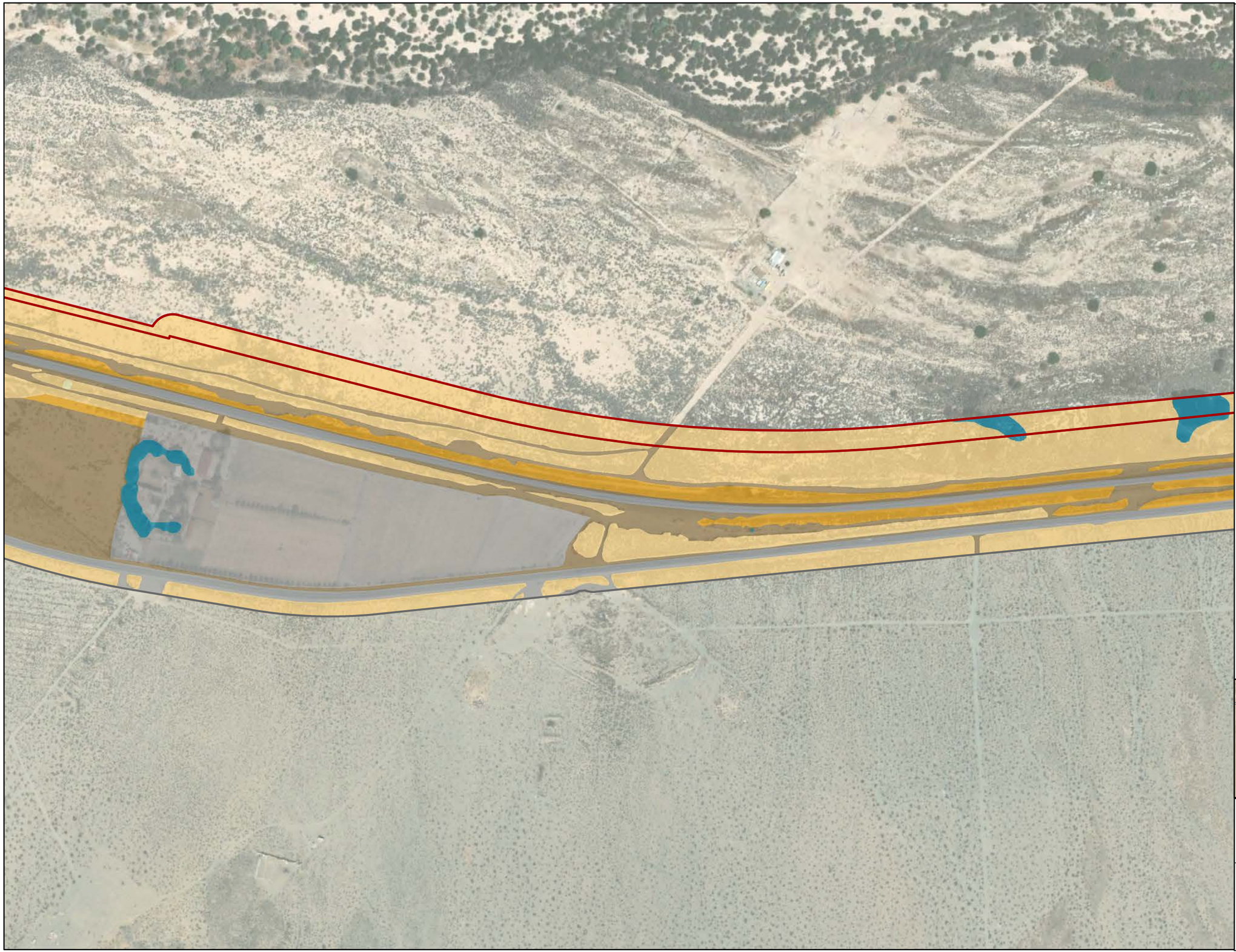
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri



2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Developed
- Disturbed Habitat
- Tamarisk Thickets

**Key Map**

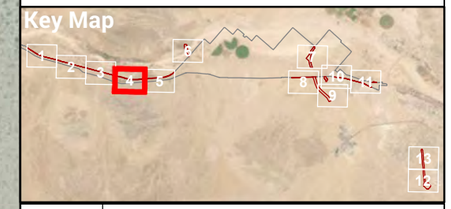



FIGURE 6

PAGE 4 OF 13

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023
Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets

**Key Map**

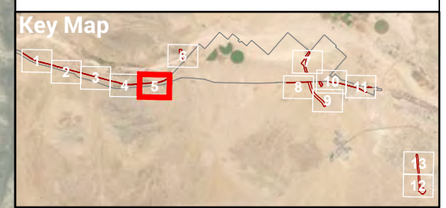



FIGURE 6

PAGE 5 OF 13

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

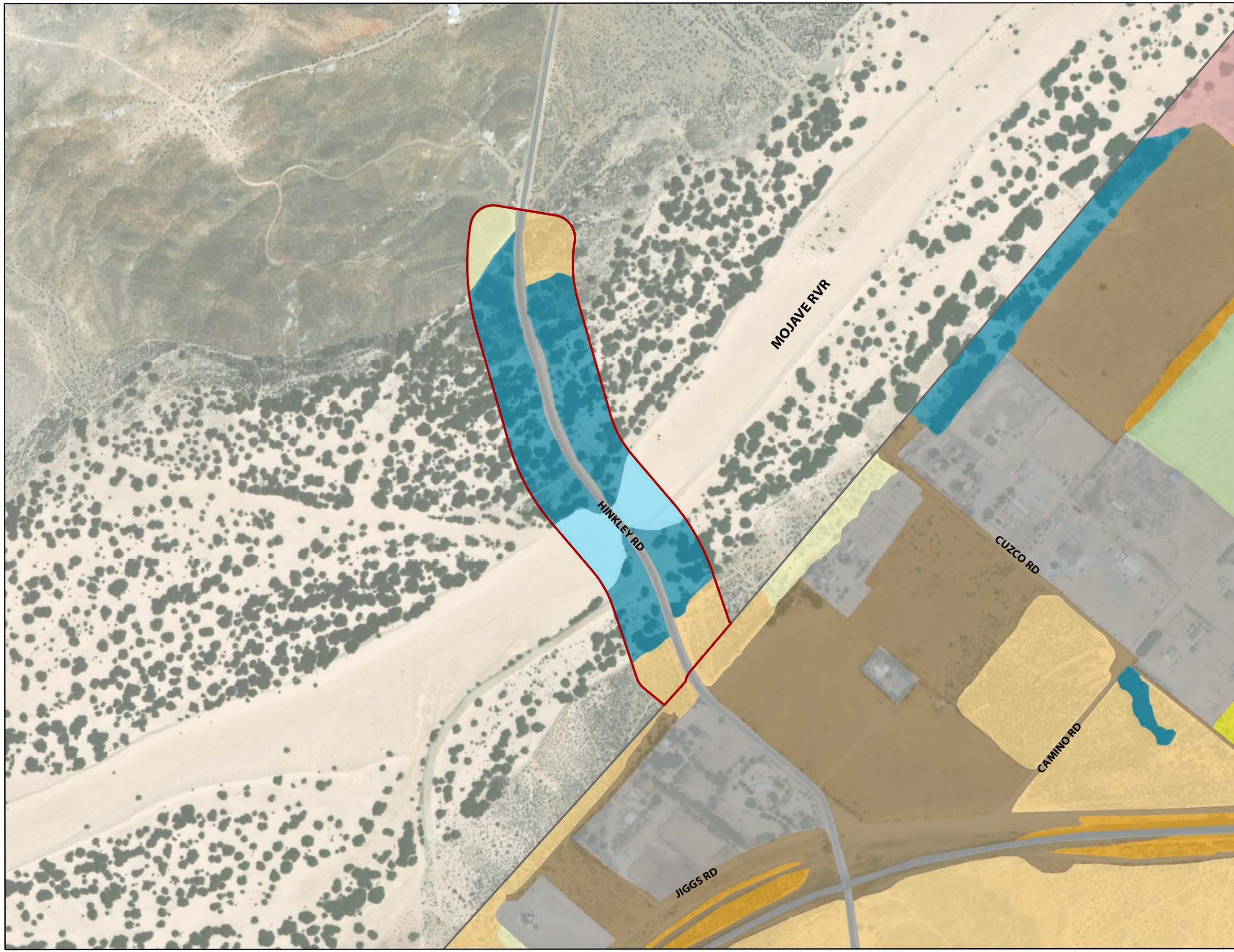
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Agriculture
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets
- Unvegetated Channel

Key Map

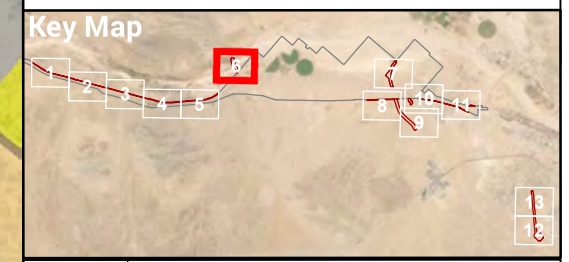


FIGURE 6

PAGE 6 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

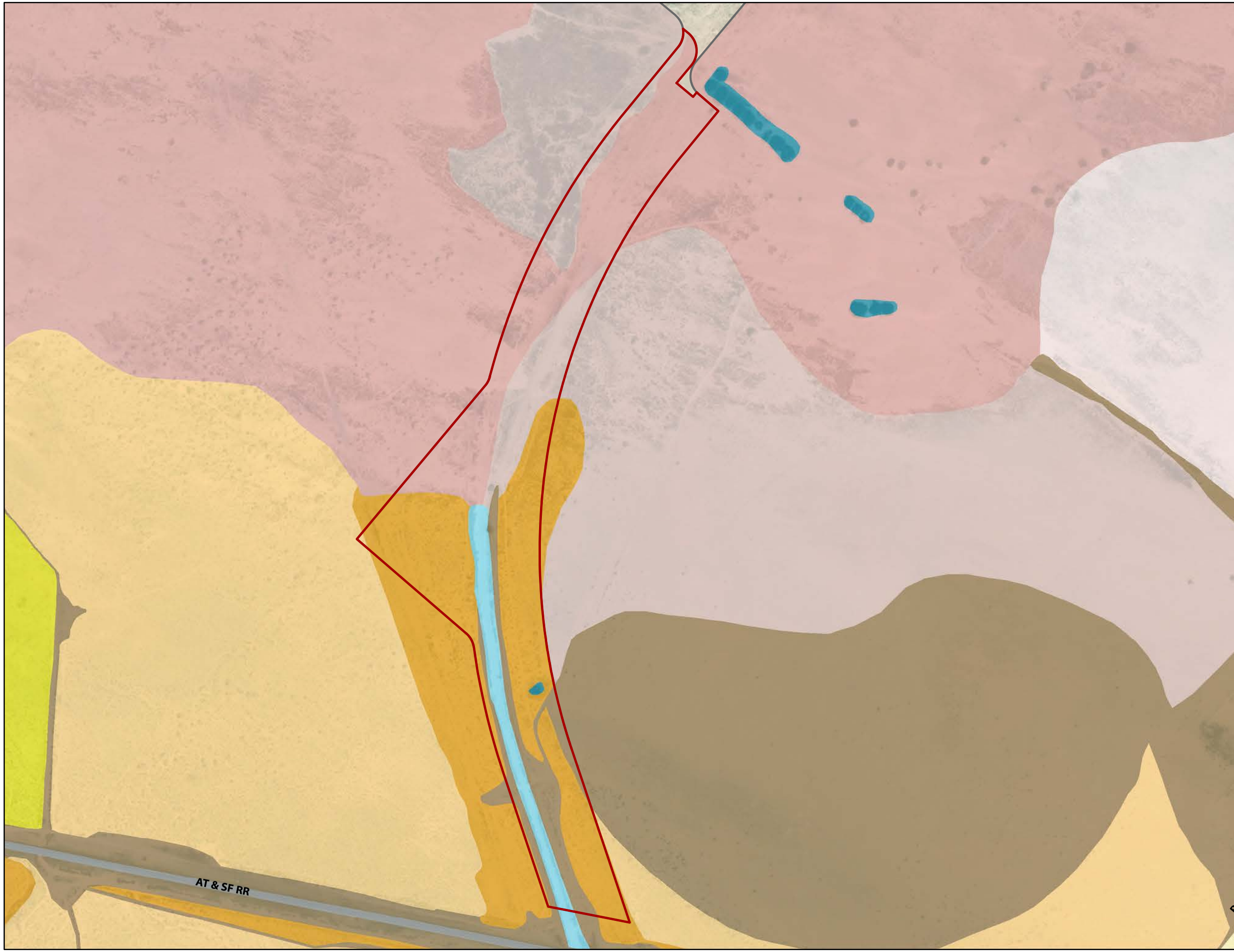
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Active Desert Dunes
- Active Desert Dunes - Disturbed
- Stabilized/Partially Stabilized Desert Dunes
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Tamarisk Thickets
- Unvegetated Channel

Key Map

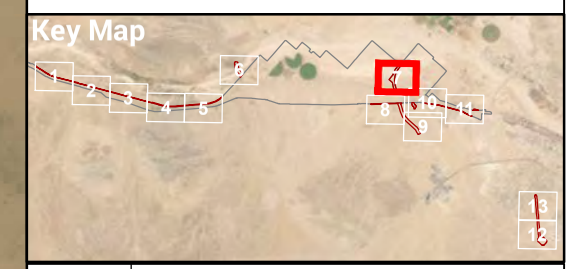


FIGURE 6

PAGE 7 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Creosote Bush Scrub - Disturbed
- Developed
- Disturbed Habitat
- Unvegetated Channel

Key Map

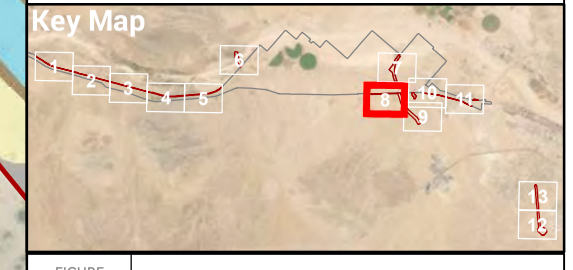


FIGURE 6

PAGE 8 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

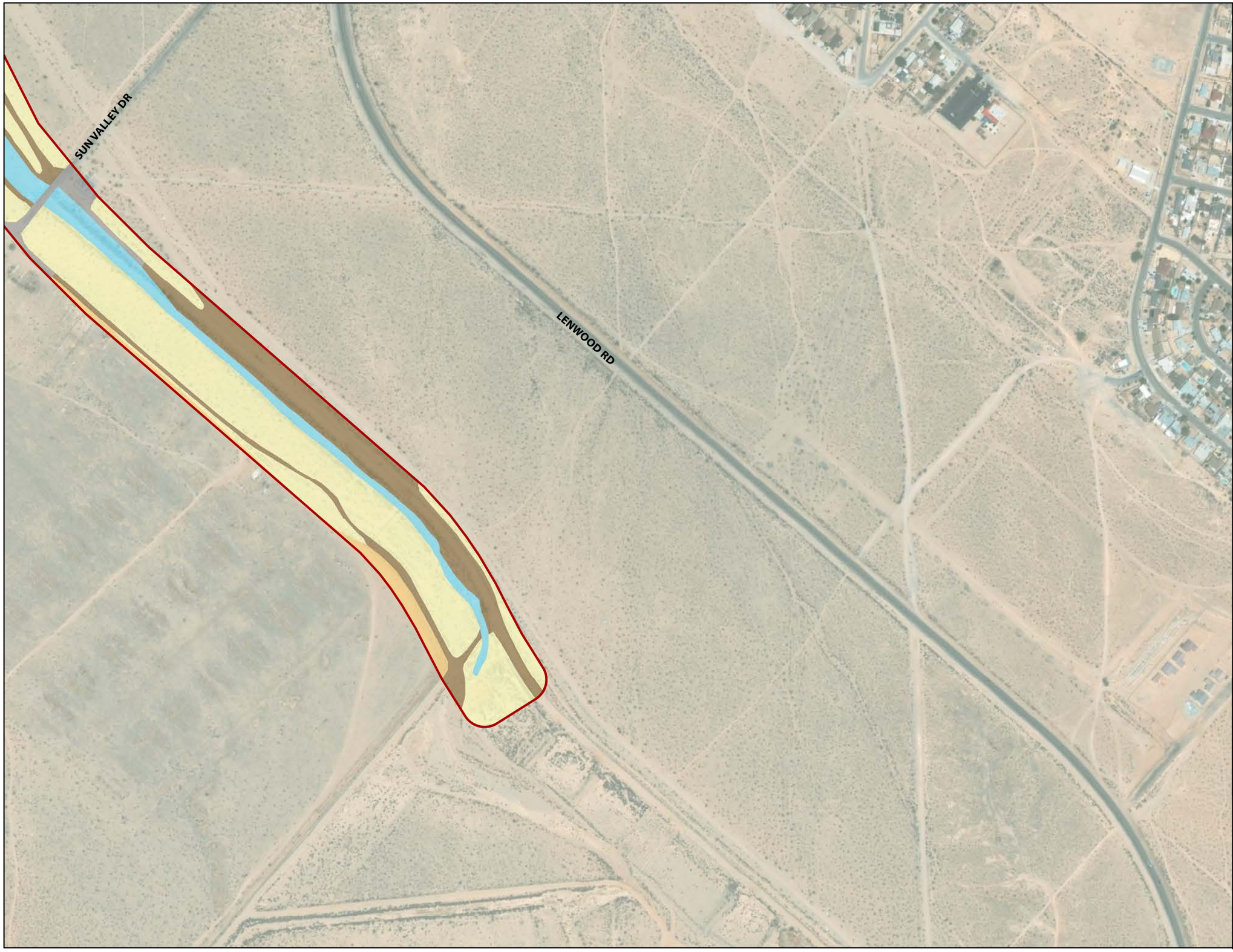
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)

**Vegetation**

- Allscale Scrub
- Creosote Bush Scrub
- Developed
- Disturbed Habitat
- Unvegetated Channel

Key Map

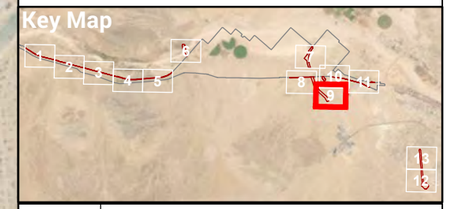


FIGURE 6

PAGE 9 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri

2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Stabilized/Partially Stabilized Desert Dunes
- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Developed
- Disturbed Habitat
- Tamarisk Thickets

ROADRUNNER RD
HILLSIDE LN
LENWOOD RD
CAMINO DEL SOL
JASPER RD
LENWOOD AV
WOODS AV
LENWOOD RD
MAIN ST
ANDERSON AV
HANNAN ST
TOWNSEND ST
BLEITZ RD
JOHNSON ST
SECOND ST
ASH RD

Key Map

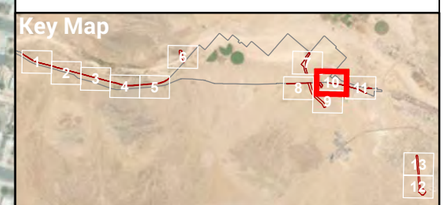


FIGURE 6

PAGE 10 OF 13

# Vegetation

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)
2022 ARDR Review Area (5104.5 Ac)

**Vegetation**

- Allscale Scrub
- Allscale Scrub - Disturbed
- Creosote Bush Scrub
- Developed
- Disturbed Habitat

Key Map

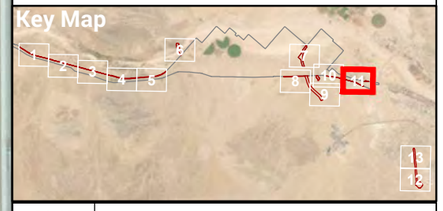



FIGURE 6

PAGE 11 OF 13

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

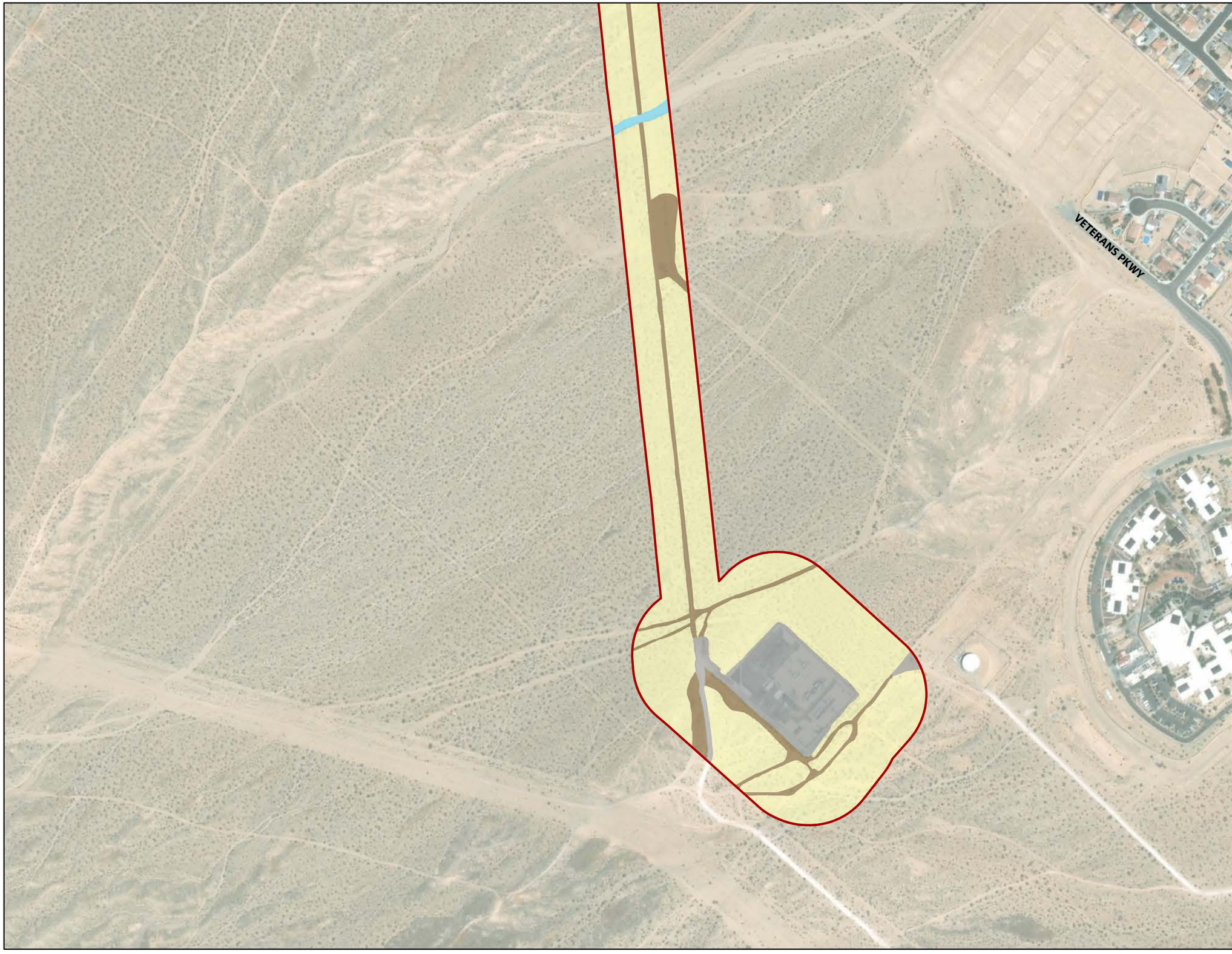
0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)

**Vegetation**

- Creosote Bush Scrub
- Developed
- Disturbed Habitat
- Unvegetated Channel

**Key Map**

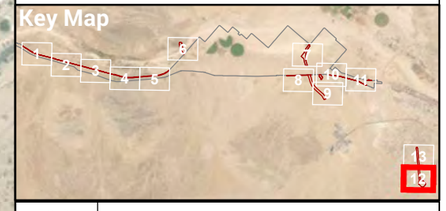



FIGURE 6

PAGE 12 OF 13

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri




2023 ARDR Addendum Review Area (223.7 Ac)

**Vegetation**

- Creosote Bush Scrub
- Developed
- Disturbed Habitat

**Key Map**

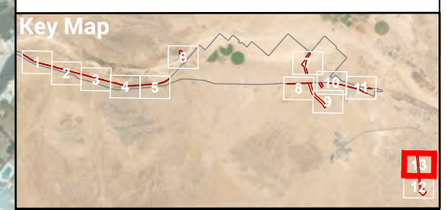



FIGURE 6

PAGE 13 OF 13

**Vegetation**

BARSTOW INTERNATIONAL GATEWAY PROJECT (FORMERLY BIG BARSTOW)

ROCKS BIOLOGICAL CONSULTING

0 400 FEET

1 INCH = 400 FEET

N

Date: 8/3/2023

Aerial Photo: San Bernardino County 2020, Esri

# ATTACHMENT A

## *BIG BARSTOW AQUATIC RESOURCES DELINEATION REPORT*, PREPARED BY RBC AND DATED SEPTEMBER 23, 2022

ROCKS
BIOLOGICAL CONSULTING





# BIG BARSTOW
# AQUATIC RESOURCES DELINEATION REPORT

San Bernardino County, California

September 23, 2022

Prepared for:
BNSF Railway Company
2500 Lou Menk Drive, AOB-3
Fort Worth, TX 76131
(817) 352-2383

Prepared by:
Rocks Biological Consulting
4312 Rialto Street
San Diego, CA 92107
(619) 701-6798

# TABLE OF CONTENTS

1 Introduction ....3
2 Site Description, Landscape Setting ....3
2.1 Location ....3
2.2 Topography ....3
2.3 Watershed ....4
3 Methods ....4
3.1 Pre-Field Review ....4
3.2 On-Site Delineation and Mapping ....4
3.2.1 Corps ....5
3.2.2 RWQCB ....6
3.2.3 CDFW ....7
4 Site Alterations, Current and Past Land Use ....8
4.1 Soils ....9
4.2 Hydrology ....13
4.3 Vegetation ....14
5 Precipitation Data and Analysis ....16
5.1 Precipitation Summary ....16
5.2 Antecedent Precipitation Tool Data ....16
6 Description of Observed Potential Aquatic Resources ....17
6.1 Corps/RWQCB Wetland Waters of the U.S./State ....18
6.2 Corps/RWQCB Non-Wetland Waters of the U.S./State ....18
6.3 CDFW Streambed and Watercourse ....19
6.4 Other Features ....20
7 Deviation from NWI and NHD ....22
8 Results and Conclusions ....22
8.1 Corps ....23
8.2 RWQCB ....23
8.3 CDFW ....23
8.4 Disclaimer Statement ....23
9 Contact Information ....24

## TABLES

Table 1. Field Conditions ....5
Table 2. Soils Mapped within Review Area ....9
Table 3. Vegetation Communities within Review Area ....14

Table 4. Precipitation Data for October 2020 – August 2021 .....16
Table 5. Precipitation Data for October 2021 – May 2022.....16
Table 6. Antecedent Precipitation Tool Data for Review Area.....17
Table 7. Total Acreages of Delineated Aquatic Resources within Review Area .....22

## FIGURES

Figure 1. Project Location
Figure 2. USGS Topo and NHD
Figure 3. Watershed
Figure 4. NRCS Soils Survey Data and NWI
Figure 5A. Corps Aquatic Resources
Figure 5B. RWQCB Aquatic Resources
Figure 5C. CDFW Streambed and Watercourse
Figure 6. Vegetation

## APPENDICES

Appendix A. Checklist: Minimum Standards for Acceptance of Aquatic Resource Delineation Reports
Appendix B. Jurisdictional Determination Request Forms
Appendix C. Applicable Aquatic Resource Protection Regulations
Appendix D. Recent and Historic Aerials Analysis
Appendix E. Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets
Appendix F. Antecedent Precipitation Tool Output
Appendix G. Site Photographs
Appendix H. Aquatic Resource Summary Tables
Appendix I. ORM Bulk Upload Aquatic Resources or Consolidated Excel Spreadsheet
Appendix J. Literature Citations and References
Appendix K. GIS Data (provided electronically to agencies)

# 1 INTRODUCTION

On behalf of Burlington Northern Santa Fe (BNSF) Railway Company, Rocks Biological Consulting (RBC) conducted a formal aquatic resources delineation for the Big Barstow review area, composed of approximately 5,105 acres (Figure 1), to identify areas that may be considered jurisdictional under the U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act; the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act; and the California Department of Fish and Wildlife (CDFW) pursuant to Section 1602 of the California Fish and Game Code (CFGC). The information provided in this aquatic resources delineation report (ARDR) is necessary to define the presence or absence of aquatic resources within the review area. This ARDR can also be used by the agencies to inform the jurisidictional status of delineated aquatic resources and by the applicant and agencies to assess conformance with state and federal regulations and to estimate potential impacts and associated permitting requirements. Furthermore, the information contained in this report is in compliance with the Corps Los Angeles District's *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (Minimum Standards; Corps 2017). Appendix A provides a checklist to ensure compliance with the Minimum Standards.

This ARDR also serves as a request for the Corps to complete a Preliminary Jurisdictional Determination (PJD) based on the information provided in this report. Appendix B provides the requried forms associated with the PJD request.

# 2 SITE DESCRIPTION, LANDSCAPE SETTING

## 2.1 LOCATION

The review area is generally located south of and partially within the Mojave River, south and west of California State Route (CA)-58, northwest of National Trails Highway, and extends west-southwest from the City of Barstow for approximately 14.1 miles along the existing BNSF railroad tracks, within the City of Barstow and unincorporated San Bernardino County, California (Figure 1). The review area is generally bounded by the Mojave River to the north/northwest; National Trails Highway, undeveloped land, and/or low-density residential to the south/southeast; BNSF railroad tracks and undeveloped land to the west; and BNSF railroad tracks, undeveloped land, and/or low-density residential to the east. The latitude and longitude of the approximate center of the review area is 34.853903, -117.159799. The review area sits on Township 8 North, Range 4 West, including Sections 12 to 15 and 22; Township 8 North, Range 3 West, including Sections 3 to 5 and 7 to 9; Township 9 North, Range 3 West, including Sections 12 to 14, 22 to 28, and 33 to 35; and Township 9 North, Range 2 West, including Sections 7 to 9, and 17 to 19 within the Hodge, Barstow SE, Barstow, and Hinkley 7.5-minute quadrangles, as mapped by the U.S. Geological Survey (USGS; Figure 2).

## 2.2 TOPOGRAPHY

The review area consists of elevations ranging from approximately 2,189 to 2,413 feet above mean sea level (amsl; Figure 2). The review area is relatively flat except for the presence of dunes within portions of the review area north of the railroad tracks and several hillslopes within the central portion of the review area south of the railroad tracks. Overall, the review area gradually decreases

in elevation moving northwest towards the Mojave River. Drainage patterns within the Mojave River trend southwest to northeast. Drainage patterns within the remainder of the review area generally trend southeast to north/northwest towards the Mojave River.

### 2.3 WATERSHED

The review area is within the Mojave Hydrologic Unit Code (HUC) 8 (18090208), Daggett Wash-Mojave River HUC 10 (1809020811), Stoddard Valley HUC 10 (1809020810), Buckthorn Wash-Mojave River HUC 10 (1809020809), Town of Lenwood-Mojave River HUC 12 (180902081102), Town of Johnstons Corner HUC 12 (180902081101), North Lake-Mojave River HUC 12 (180902080905), and Stoddard Valley HUC 12 (180902081004) (Figure 3). The Mojave River headwaters in the San Bernadino Mountains, continues for approximately 120 miles via surface and subsurface flows through the Mojave Desert, then drains into Soda Dry Lake (Lahontan Regional Water Quality Control Board [LRWQCB] 2002). The Mojave River typically only conveys surface flows during large storm events or in areas where geologic structures force groundwater to the surface (LRWQCB 2002).

In addition to the watersheds defined by the USGS and commonly used by the Corps, the RWQCB also defines watershed boundaries by Hydrologic Units (HUs). The review area is within the South Lahontan Hydrologic Basin, the Mojave HU, and the Middle Mojave Hydrologic Area (LRWQCB 2021).

## 3 METHODS

### 3.1 PRE-FIELD REVIEW

Prior to the on-site delineations, field maps were created using a Geographic Information System (GIS) and a color aerial photograph at a 1:450 scale. RBC staff also reviewed USGS National Hydrography Dataset (NHD) and topography data (Figure 2), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) data (Figure 4), and Natural Resources Conservation Service (NRCS) soils data (Figure 4) to further determine the potential locations of aquatic resources within the review area. RBC also utilized Google Earth to assess current and historic presence or absence of flows and/or ponding in the review area (Google Earth Pro 2022).

### 3.2 ON-SITE DELINEATION AND MAPPING

RBC conducted a constraints-level wetland/non-wetland waters jurisdictional assessment for the review area on August 10, 2021. RBC conducted formal aquatic resources delineation field visits for the review area on October 20, 2021; December 1, 2021; March 16, 23, and 24, 2022; April 12, 13, and 15, 2022; May 17, 2022; and June 20, 2022. Field visits were conducted over portions of the review area based on when access was granted to each parcel/portion of the review area. Areas where access was prohibited were visually assessed with binoculars and/or the use of aerial imagery. Field conditions during these field visits are provided below in Table 1.

Table 1. Field Conditions

| Date | Survey Time Start – End | Temperature (°F) Start – End | Wind Speed Range (miles per hour) Start – End | Cloud Cover (%) Start – End | Personnel[1] |
|---|---|---|---|---|---|
| 8/10/2021 | 0800 – 1550 | 87 – 103 | 0 to 1 – 0 to 1 | 0 – 0 (hazy from fires) | SK, IH |
| 10/20/2021 | 0930 – 1545 | 54 – 75 | 0 to 2 – 0 to 1 | 5 – 10 | NF, SK, SS |
| 12/01/2021 | 0940 – 1300 | 55 – 73 | 0 to 2 – 0 to 2 | 0 – 0 | NF, SK |
| 3/16/2022 | 0820 – 1450 | 56 – 77 | 8 to 10 – 7 to 12 | 0 – 5 | AG, KW, RL, SK |
| 3/23/2022 | 0815 – 1530 | 56 – 80 | 1 to 3 – 7 to 12 | 0 – 0 | KW, RL |
| 3/24/2022 | 0700 – 1315 | 52 – 82 | 4 to 8 – 4 to 6 | 0 – 1 | KW, RL |
| 4/12/2022 | 0730 – 1500 | 43 – 61 | 2 to 5 – 0 to 3 | 0 – 0 | ET, KW, RL, SK |
| 4/13/2022 | 0730 – 1430 | 43 – 64 | 0 to 1 – 0 to 1 | 0 – 0 | ET, KW, RL |
| 4/15/2022 | 1045 – 1200 | 66 – 70 | 5 to 8 – 2 to 5 | 2 – 2 | ET |
| 5/17/2022 | 0830 – 1130 | 72 – 81 | 12 to 14 – 12 to 14 | 0 – 0 | KW, RL |
| 6/20/2022 | 0715 – 1640 | 59 – 91 | 3 to 5 – 3 to 6 | 0 – 0 | KW, RL |

[1] AG = Alec Goodman, ET = Emily Trevino, IH = Ian Hirschler, KW = Kelsey Woldt, NF = Natasha Foti, RL = Ryan Layden, SK = Sarah Krejca, SS = Shanti Santulli

Figure 1 and Figures 5A – 5C depict the approximately 5,105-acre review area.

Areas with depressions, drainage patterns, and/or wetland vegetation within the review area were evaluated, with focus on the presence of defined channels and/or wetland vegetation, soils, and hydrology. While in the field, potential aquatic resources were recorded using a hand-held Global Positioning System (GPS) unit with a level of accuracy ranging from 4 to 30 feet. RBC staff refined the data using aerial photographs and topographic maps with one-foot contours to ensure accuracy.

All figures generated for this ARDR follow the Corps' Updated Map and Drawing Standards for the South Pacific Division Regulatory Program (Corps 2016).

The below subsections provide the aquatic resources delineation methods used per agency; Appendix C provides additional details regarding the agencies' applicable regulations and guidance associated with this ARDR.

### 3.2.1 CORPS

#### *Ordinary High Water Mark Delineation*

Aquatic resources with a defined ordinary high water mark (OHWM) would be considered potential non-wetland waters of the U.S. Corps regulations at 33 Code of Federal Regulations (CFR) 329.11 define an OHWM as "the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas" (51 Federal Register

[FR] 41251, November 13, 1986). RBC staff used guidance provided in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (OHWM Field Guide; Lichvar & McColley 2008) and Regulatory Guidance Letter (RGL) 05-05 to estimate the extent of an OHWM in the field. For each feature exhibiting the potential presence of an OHWM, RBC completed a 2010 Arid West Ephemeral and Intermittent Streams OHWM Datasheet following the guidance provided in the *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (OHWM Datasheet; Curtis & Lichvar 2010). Per the 2010 OHWM Datasheet, common indicators of an OHWM include a break in slope (i.e., abrupt cut in bank slope created by hydrogeomorphic processes across the landscape), changes in average sediment texture between floodplain units (i.e., low-flow, active floodplain, low terrace), and changes in vegetation species and/or cover between floodplain units.

#### *Wetland Delineation*

Field staff examined potential wetland waters of the U.S. using the routine determination methods set forth in Part IV, Section D, Subsection 2 of the Corps 1987 *Wetland Delineation Manual* (Wetland Manual; Environmental Laboratory 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region Version 2.0* (Arid West Supplement; Corps 2008). Areas that met the three parameters per the Arid West Supplement (i.e., hydrophytic vegetation, hydric soils, and wetland hydrology, following methods set forth in the Wetland Manual and Arid West Supplement) were considered wetland waters of the U.S. RBC staff based wetland plant indicator status (i.e., Obligate [OBL], occurs 99+% in wetlands; Facultative Wetland [FACW], occurs 67-99% in wetlands; Facultative [FAC], occurs 34-66% in wetlands; Facultative Upland [FACU], occurs 1-33% in wetlands; Upland [UPL], occurs 99+% in uplands; and Not Listed [NL], considered UPL for wetland delineation purposes) on the *National Wetland Plant List* (NWPL; Corps 2020a) and hydric soils indicators on *Field Indicators of Hydric Soils in the United States, Version 8.2* (NRCS 2018). Soil chromas were identified in the field according to *Munsell Soil-Color Charts with Genuine Munsell Color Chips* (Munsell Color 2015) and per the Wetland Manual and Arid West Supplement. Plants were identified according to *The Jepson Manual: Vascular Plants of California, 2nd edition* (Baldwin et al. 2012) and nomenclature follows Jepson eFlora (Jepson Flora Project 2022).

### 3.2.2 RWQCB

#### *Ordinary High Water Mark Delineation*

The State Water Resources Control Board (SWRCB) and RWQCBs do not have regulations or guidance on defining the extent of non-wetland waters of the State. As such, field staff identified the lateral limits of potential non-wetland waters of the State using the same methodology for determining an OHWM per the Corps as described in Section 3.2.1. as they have generally been considered coincident.

#### *Wetland Delineation*

The State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (the Procedures; SWRCB 2021) defines wetland waters of the State. The Procedures were adopted on April 2, 2019, went into effect on May 28,

2020, and were revised on April 6, 2021. As detailed in the Procedures, the SWRCB and RWQCBs define a wetland as follows: “An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area’s vegetation is dominated by hydrophytes or the area lacks vegetation” (SWRCB 2021).

The Procedures provide that RWQCBs shall rely on a wetland delineation from a final ARDR verified by the Corps to determine the extent of wetland waters of the State. If any potential wetland areas have not been delineated in a final ARDR verified by the Corps, the limits of such potential wetland waters of the State shall be identified using the same wetland delineation methods per the Corps as described in Section 3.2.1, except that a lack of vegetation (i.e., less than 5 percent areal coverage of plants during the peak of the growing season) does not preclude an area from meeting the definition of a wetland waters of the State (SWRCB 2021).

### 3.2.3 CDFW

***River, Lake, Stream, Watercourse, and Associated Riparian and Wetland Habitat Delineation***

CDFW jurisdiction relies on the presence of a river, lake, and/or stream and associated riparian or wetland habitat (CFGC § 1600 et seq). Lakes include “natural lakes or man-made reservoirs” (14 California Code of Regulations [CCR] § 1.56). CDFW regulations define a stream as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supporting fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports riparian vegetation" (14 CCR § 1.72). The 1987 *Rutherford v. State of California* (188 Cal. App. 3d 1268) decision further provided that a streambed is the “channel of a water course; the depression between the banks worn by the regular and usual flow of the water.” A streambed includes the “[a]rea extending between the opposing banks measured from the foot of the banks from the top of the water at its ordinary stage, including sand bars which may exist between the foot of said banks…” (188 Cal. App. 3d 1268). The bank is defined as “the slope or elevation of land that bounds the bed of the stream in a permanent or long-standing way, and that confines the stream water up to its highest level” (*The People v. Phillip Wright Osborn*, 116 Cal. App. 4$^{th}$ 764 (2004)).

RBC staff utilized a combination of field indicators (e.g., evidence of ponding such as moist and/or cracked soils and secondary channels), 50- and 100-year floodplain modeling, and local topography to delineate the extent of streambed associated with the Mojave River in areas where the active desert dunes continually erase signs of hydrology and bed and bank; RBC confirmed the use of this approach with Brandy Wood, CDFW Senior Environmental Scientist (Supervisor) with the Inland Deserts Region. Floodplain mapping throughout the extent of the Mojave River within the review area was not available through the Federal Emergency Management Agency’s (FEMA’s) National Flood Hazard Layer (NFHL) Viewer (FEMA n.d.) or the County of San Bernardino Department of Public Works’ ArcGIS web maps (County of San Bernardino Department of Public Works 2022). As such, the project engineer, TranSystems, performed hydraulic modeling of the Mojave River using Sedimentation and River Hydraulics – Two-Dimension (SRH-2D) software developed by the U.S. Bureau of Reclamation, in collaboration with the Federal Highway Administration in the U.S. and the Water Resources Agency in Taiwan (Bureau of Reclamation

2020). SRH-2D is hydraulic modeling software capable of analyzing 2-dimensional (2D) flow simulations for riverine systems. Further details regarding TranSystems' hydraulic modeling methods and results are available upon request.

Riparian habitat refers to vegetation and habitat associated with a stream. CDFW-jurisdictional habitat includes all riparian shrub or tree canopy that may extend beyond the banks of a stream. Isolated riparian habitat (i.e., where riparian vegetation does not appear associated with an ephemeral wash) is not considered CDFW-jurisdictional.

To assist in assessing CDFW-jurisdictional limits in desert areas, RBC staff utilized the methods outlined in the *MESA – Mapping Episodic Stream Activity Field Guide* (MESA Field Guide; Vyverberg & Brady 2013). The MESA Field Guide was developed to describe the methodology for delineating episodic streams and the active watercourse within the arid and semi-arid California desert regions. The MESA guidelines indicate the active watercourse extends beyond the streambed and can consist of associated features such as low-flow, active, and braided channels and banks associated with islands, and secondary channels within the bounds of a larger channel complex (Vyverberg & Brady 2013).

CDFW follows the USFWS wetland definition and classification system, which defines a wetland as transitional land between terrestrial and aquatic systems having one or more of the following attributes: "(1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year" (Cowardin et al. 1979). A wetland is presumed when all three attributes are present; if less than three attributes are present the presumption of a wetland must be supported by "the demonstrable use of wetland areas by wetland associated fish or wildlife resources, related biological activity, and wetland habitat values" (California Fish and Game Commission [CFGC] 1994).

Potential CDFW-jurisdictional wetland boundaries were determined based on the presence of wetland areas supported by a river, lake, or stream. Wetland delineation methods to determine the presence of one or more wetland attributes included the same methods per the Corps as described in Section 3.2.1.

Based on the above, potential CDFW-jurisdictional aquatic resources delineated included rivers, lakes, and/or streams and their associated riparian and wetland habitats, and active watercourse. Field staff delineated the lateral extent of potential CDFW jurisdiction to be "bank to bank" for a streambed or to the "dripline" of riparian habitat and/or wetland boundary, if present.

# 4 SITE ALTERATIONS, CURRENT AND PAST LAND USE

RBC staff reviewed Google Earth Pro (Google Earth Pro 2022), NetrOnline Historic Aerials (NetrOnline 2022), and the University of California – Santa Barbara (UCSB; UCSB n.d.) database to assess historic and ongoing land uses within the review area. The railroad tracks and National Trails Highway occurred within their current locations within the review area at least as far back as October 1929 (i.e., the earliest aerial image available; UCSB n.d.; Appendix D). Development of ranchland and/or residential uses increased somewhat between 1929 and 1952, with minor changes in development/land use continuing through at least 1984, particularly in the far northwestern portion of the review area (UCSB n.d.; NetrOnline 2022; Appendix D). Between July

1973 and December 1984, a large agricultural (row crop) operation was established within/around the northwestern portion of the review area (UCSB n.d; NetrOnline 2022; Appendix D). Additionally, portions of the Mojave River appear to have been bermed sometime between May 1952 and January 1953, redirecting and constricting the Mojave River's natural flow path (UCSB n.d.; Appendix D). Additional berming of the Mojave River appears to have occurred between January 1953 and June 1959, between June 1959 and November 1963, and again, between November 1963 and July 1973 (UCSB n.d.). The bermed areas appeared to remain relatively consistent from July 1973 through June 2022 (the last survey date) (UCSB n.d.; NetrOnline 2022; Google Earth Pro 2022; Appendix D). Basin (B-) 2 was constructed between July 1973 and December 1984 and is currently used for irrigation purposes (UCSB n.d.; NetrOnline 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). Construction of B-1 began around May 2009 along with installation of the nearby basketball court, fishing docks, and playground; B-1 is currently used for recreational purposes (Google Earth Pro 2022; Appendix D; C. Stevens, personal communication, May 26, 2022). Since May 2009, minor changes in development and land use have occurred within the review area; much of the review area remains undeveloped to this day (Google Earth Pro 2022; Appendix D). Normal circumstances, as defined in the Corps 1987 Wetland Manual (Environmental Laboratory 1987), were assumed to be present within the review area; no evidence of recent natural events or human activities that would affect the results of the delineation were observed within the review area during the 2021 and 2022 field delineations.

The following sections provide additional details regarding site alterations and land use specific to on-site soils, hydrology, and vegetation based on available data and the site visit.

## 4.1 SOILS

Based on the NRCS soils data map (Figure 4), 20 soil map units, outlined below in Table 2, occur within the review area:

Table 2. Soils Mapped within Review Area

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Bryman loamy fine sand, 2 to 5 percent slopes | Bryman | Fine-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Cajon gravelly sand, 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon loamy sand, 5 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon sand, 0 to 2 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| Cajon sand, 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| Cajon-Arizo complex[1], 2 to 15 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | No |
| | Arizo | Sandy-skeletal, mixed, thermic Typic Torriorthents | |

| Soil Map Unit | Soil Series/Unit | Taxonomic Class | NRCS Hydric Status[1] |
|---|---|---|---|
| Cajon-Wasco, cool complex[1], 2 to 9 percent slopes | Cajon | Mixed, thermic Typic Torripsamments | Yes |
| | Wasco | Coarse-loamy, mixed, superactive, nonacid, thermic Typic Torriorthents | |
| Cave loam, dry, 0 to 2 percent slopes | Cave | Loamy, mixed, superactive, thermic, shallow Typic Petrocalcids | Yes |
| Dune land | Dune land | – | Yes |
| Helendale loamy sand, 0 to 2 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Helendale loamy sand, 2 to 5 percent slopes | Helendale | Coarse-loamy, mixed, superactive, thermic Typic Haplargids | No |
| Joshua loam, 2 to 5 percent slopes | Joshua | Fine-loamy, mixed, superactive, thermic Argidic Argidurids | No |
| Nebona-Cuddeback complex[1], 2 to 9 percent slopes | Nebona | Loamy, mixed, superactive, thermic, shallow Typic Haplodurids | Yes |
| | Cuddeback | Fine-loamy, mixed, superactive, thermic Typic Argidurids | |
| Norob-Halloran complex[1], 0 to 5 percent slopes | Norob | Fine-loamy, mixed, superactive, thermic Typic Natrargids | Yes |
| | Halloran | Coarse-loamy, mixed, superactive, thermic Typic Natrargids | |
| Riverwash | Riverwash | – | Yes |
| Rock Outcrop-Lithic Torriorthents complex, 15 to 50 percent slopes | Rock Outcrop | – | No |
| | Torriorthents | Loamy-skeletal, mixed, superactive, calcareous, mesic Lithic Torriorthents | |
| Rosamond loam, saline-alkali | Rosamond | Fine-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |
| Victorville sandy loam | Victorville | Coarse-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents | Yes |
| Villa loamy sand | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |
| Villa loamy sand, hummocky | Villa | Sandy, mixed, thermic Typic Torrifluvents | Yes |

Source: NRCS Official Soil Series Description and Series Classification database (NRCS n.d.b); *Soil Survey of San Bernardino County California, Mojave River Area* (USDA 1986); NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.).a).

[1] Based on the NRCS Soil Data Access (SDA) Hydric Soils List (NRCS n.d.)..a). As stated in the Arid West Supplement (Corps 2008), RBC used the hydric soils list as a tool and made final hydric soils determinations based on field-collected data at representative wetland delineation sample points deemed appropriate on site as recorded on the attached Arid West Wetland Determination Data Forms (Appendix E) discussed further in Section 6.1.

[2] A complex consists of two or more soils or miscellaneous areas that either contain such small areas or are so complexly mapped that they are unable to be displayed separately (Ditzler 2015).

The National Technical Committee for Hydric Soils defines hydric soils; *Changes in Hydric Soils Database Selection Criteria* (77 FR 12234) outlines the current four hydric soil criteria. The NRCS Soil Data Access (SDA) Hydric Soils List specifies 11 soil map units within the review area as hydric per Critiera 2, 3, and/or 4 (NRCS n.d.a). The soil series/units outlined above in Table 2 are further described below per the USDA's NRCS Official Soil Series Description and Series Classification database (NRCS n.d.b) and the USDA's *Soil Survey of San Bernardino County California, Mojave River Area* (USDA 1986).

*Arizo* – The Arizo series consists of very deep, excessively drained soils that have negligible to medium runoff. These soils formed in mixed alluvium on recent alluvial fans, inset fans, fan apron, fan skirts, stream terraces, and floodplains of intermittent streams and channels with slopes ranging from 0 to 15 percent at elevations of 750 to 4,600 feet amsl. Arizo soil is used primarily for rangeland and wildlife habitat. Native vegetation consists primarily of creosote bush (*Larrea tridentata*) and burrobush (*Hymenoclea* sp.).

*Bryman* – The Bryman series consists of deep, well-drained soils that have slow runoff and moderately slow permeability. These soils formed in mixed alluvium derived primarily from granitic rock and occur on terraces and older alluvial fans with slopes ranging from 0 to 15 percent at elevations of 2,800 to 3,800 feet amsl. Bryman soil is used primarily for irrigated crops, homesites, and recreation. Native vegetation consists of creosote bush, bursage (*Ambrosia* sp.), green ephedra (*Ephedra viridis*), Joshua tree (*Yucca brevifolia*), and annual forbs and grasses.

*Cajon* – The Cajon series consists of very deep, somewhat excessively drained soils that have slight to low runoff and rapid permeability. These soils formed in sandy alluvium and occur on alluvial fans, fan aprons, fan skirts, inset fans, and river terraces with slopes ranging from 0 to 15 percent at elevations of 200 to 4,300 feet amsl. Cajon soil is used primarily for range, watershed, and recreation, and irrigated areas are used for growing alfalfa and other crops. Uncultivated areas consist of desert shrubs.

*Cave* – The Cave series consists of very shallow, well-drained soils that have medium to very high runoff and moderate or moderately rapid permeability. These soils formed in mixed alluvium and occur on fan remnants, fan piedmonts, and stream terraces with slopes ranging from 0 to 35 percent at elevations of 1,500 to 5,060 feet amsl. Cave soil is used primarily for livestock grazing, wildlife habitat, and urban development. Native vegetation consists of creosote bush, blackbrush (*Coleogyne ramosissima)*, bursage, Joshua tree, mesquite (*Prosopis* sp.), cactus, and annual grasses and weeds.

*Cuddeback* – The Cuddeback series consists of moderately deep, well-drained soils that have medium to rapid runoff and moderately slow permeability above the duripan but very slow in the duripan. These soils formed in mixed alluvium on terraces and alluvial fans with slopes ranging from 2 to 9 percent at elevations of 2,200 to 3,000 feet amsl. Cuddeback soil is used mainly for wildlife habitat and recreation. Native vegetation consists of very sparse stands of creosote bush yucca species, and annual grasses and forbs.

*Dune Land* – The Dune Land miscellaneous areas consists of excessively drained soils with slow runoff and very rapid permeability. These soils formed from wind-deposited sand and occur on unstable hills and ridges of loose, wind-deposited sand with slopes ranging from 5 to 15 percent. Dunes are generally less than 15 feet high but can sometimes reach 25 feet high. Dune Land soil is

used primarily for wildlife habitat and recreation and is essentially barren of vegetation.

*Halloran* – The Halloran series consists of deep, moderately well-drained soils that have slow runoff and moderately slow permeability. These soils formed in mixed alluvium dominantly from granitic sources and occur on old alluvial derraces and depressional areas with slopes ranging from 0 to 2 percent at elevations of 1,800 to 1,850 feet amsl. Halloran soil is used primarily for wildlife habitat and recreation. Native vegetation consists of creosote bush, saltbush (*Atriplex* sp.), and alkali-tolerant vegetation.

*Helendale* – The Helendale series consists of very deep, well-drained soils that have negligible to low runoff and moderately high to high saturated hydraulic conductivity. These soils formed in alluvium from granitic sources and occur on fan piedmonts, fan remnants, alluvial fans, and terraces with slopes ranging from 0 to 15 percent at elevations of 2,500 to 3,800 feet amsl. Helendale soil is used primarily for irrigated agriculture and pasture, residential development, military operations, recreation, and wildlife habitat. Native vegetation consists of creosote bush, cheesebush (*Ambrosia salsola*), Nevada jointfir (*Ephedra nevadensis*), Joshua tree (*Yucca brevifolia*), and annural forbs and grasses.

*Joshua* – The Joshua series consists of moderately deep, well-drained soils that have medium to rapid runoff and moderately slow to slow permeability. These soils formed in material derived from mixed sources and occur on old terraces with a well-developed erosion pavement with slopes ranging from 2 to 15 percent at elevations of 2,600 to 3,000 feet amsl. Joshua soil is used primarily for wildlife habitat and recreation. Native vegetation consists of very sparse strands of creosote bush, white bursage (*Ambrosia dumosa*), yucca species, saltbush, and annual grasses and forbs.

*Lithic Torriorthents* – Lithic Torriorthents consists of very shallow and shallow, well-drained soils that have medium to rapid runoff and rapid to very rapid permeability. These soils formed from weathering of granitic rock and occur between areas of Rock outcrop (i.e., exposed granitic rock), in small depressional areas, and on relatively stable hillslopes ranging from 15 to 50 percent at elevations of 3,000 to 4,950 feet amsl. Lithic Torriorthents soil is used primarily for wildlife habitat.

*Nebona* – The Nebona series consists of shallow, well-drained soils that have medium to rapid runoff and moderately rapid permeability in the upper part but very slow in the duripan. These soils formed in mixed alluviam and occur on terraces with slopes ranging from 2 to 9 percent at elevations of 2,200 to 3,000 feet amsl. Nebona soil is used mainly for wildlife habitat and recreation. Native vegetation consists of very sparse stands of creosote bush, white bursage, yucca species, some saltbush, and annual grasses and forbs.

*Norob* – The Norob series consists of very deep, moderately well-drained soils that have negligible to medium runoff with slow permeability. These soils formed in mixed alluvium and occur on alluvial plains and alluvial flats in the Mojave Desert with slopes ranging from 0 to 5 percent at elevations of 2,300 to 3,200 feet amsl. Norob soil is used primarily for livestock grazing, military operations, and recreation. Native vegetation consists of saltbush, creosote bush, and scattered annual grasses and forbs.

*Riverwash* – The Riverwash miscellaneous areas consists of excessively drained soils in the Mojave River riverbed and in beds of intermittent streams subject to flooding during prolonged storms of high intensity. These soils formed in areas of alluvium derived primarily from granitic rocks and occur on unstable sandy and gravelly alluvium that is frequently removed, resorted, and

redeposited with slopes ranging from 0 to 2 percent at elevations of 1,700 to 3,100 feet amsl. Riverwash soil is used mainly for wildlife habitat and areas of Riverwash are essentially barren of vegetation. Small areas of Villa loamy sand and Victorville sandy loam soils are also included in this unit on low stream terraces along the Mojave River.

*Rock Outcrop* – The Rock Outcrop miscellaneous areas consists of exposed granitic bedrock on mountainsides, ridges, and rugged hills at elevations of 3,000 to 4,950 feet amsl. Rock outcrop is used primarily for wildlife habitat.

*Rosamond* – The Rosamond series consists of deep, well-drained soils that have medium runoff and moderate to moderately slow permeability. These soils formed in alluvium derived primarily from granitic rock and occur on slopes ranging from 0 to 2 percent at elevations from 2,200 to 2,900 feet amsl. Rosamond series is used primarily for desert range in larger areas, and irrigated areas are used for growing alfalfa and row crops. Native vegetation consists primarily of rabbitbrush, big sagebrush (*Artemisia tridentata*), saltbush, and annual and perennial grass and weeds.

*Victorville* – The Victorville series consists of deep, moderately well-drained soils that have medium runoff and moderately rapid permeability. These soils formed in mixed alluvium, dominantly from granitic sources and occur on low river terraces and flood plains with slopes ranging from 0 to 2 percent at elevations of 2,200 to 2,800 amsl. Victorville soil is used mainly for irrigated crops such as alfalfa, pasture, and small grains. Native vegetation consists of rabbitbrush , salt grass (*Distichlis spicata*), annual weeds and grasses, and some cottonwood (*Populus* sp.) trees.

*Villa* – The Villa series consists of deep, moderately well-drained soils that have slow runoff and moderately rapid permeability. These soils formed in alluvium derived primarily from granitic rock and occur on river flood plains with slopes of 0 to 2 percent at elevations of 2,100 to 2,800 feet amsl. Villa soil is used mainly for irrigated crops such as alfalfa. Native vegetation consists of saltbush, mesquite, creosote bush, and annual grasses and forbs.

*Wasco* – The Wasco series consists of very deep, well-drained soils that have negligible or very low runoff and moderately rapid permeability. These soils formed in mixed alluvium derived mainly from igneous and/or sedimentary rock sources with slopes ranging from 0 to 5 percent at elevations of 225 to 1,000 feet amsl in the southern San Joaquin Valley and as high as 3,700 feet amsl in the Mojave Desert. Wasco soil is used primarily for growing field, forage, and row crops, and some areas are used for livestock grazing, wildlife habitat, recreation, and homesites. Native vegetation consists of *Atriplex* species and annual grasses and forbs.

As stated in the Arid West Supplement, RBC used the hydric soils list as a tool and made final hydric soils determinations based on field-collected data at representative wetland delineation sample points deemed appropriate on site as recorded on the attached Arid West Wetland Determination Data Forms (Appendix E) discussed further in Section 6.1.

## 4.2 HYDROLOGY

Per the review of on-line data sources, USGS NHD maps “Stream/River” (ephemeral), “Stream/River” (intermittent) (for the extent of the Mojave River), “Lake/Pond”, “Reservoir,” and “Wash” features in the review area as shown in Figure 2 (USGS 2021). USFWS NWI maps features with a designation of “Riverine,” “Freshwater Emergent Wetland,” “Freshwater Pond,” and

"Freshwater Forested/Shrub Wetland" in the review area as shown in Figure 4 (USFWS 2021).

Known hydrologic sources for the observed on-site drainages, discussed further below, are direct precipitation, upstream Mojave River flows, and runoff from surrounding roads and development. Based on field observations, features within the review area south of the railroad tracks generally drain southeast to northwest, following a slight change in topography towards the railroad tracks. The USGS NHD web map indicates flows from the Mojave River continue northeast and ultimately drain into Soda Dry Lake (USGS 2021).

## 4.3 VEGETATION

Table 3 provides vegetation community acreages within the review area based on vegetation mapping conducted by RBC biologists for the BNSF Lenwood Staging Track Component (BNSF Lenwood Component) during December 2018, August 2019, and June 2020 field visits, as well as constraints-level vegetation mapping conducted by RBC biologists on August 10, 2021 for portions of the review area that were not mapped as part of the BNSF Lenwood Component. Vegetation communities within the review area are shown on Figure 6. The review area primarily consists of active desert dunes and allscale scrub habitat. The vegetation community classifications generally follow *A Manual of California Vegetation* (Sawyer et al. 2009) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986).

Table 3. Vegetation Communities within Review Area

| Vegetation Community/Land Cover Type | Acre(s)[1] |
|---|---|
| Active Desert Dunes | 1,172.91 |
| Active Desert Dunes – Disturbed | 333.79 |
| Agriculture | 319.85 |
| Allscale Scrub | 1,065.88 |
| Allscale Scrub – Disturbed | 218.23 |
| Creosote Bush Scrub | 550.97 |
| Creosote Bush Scrub – Disturbed | 420.91 |
| Developed | 379.50 |
| Disturbed Habitat | 582.68 |
| Ornamental | 1.86 |
| Pasture | 16.07 |
| Tamarisk Thickets | 16.47 |
| Unvegetated Channel | 25.38 |
| Total | 5,104.49 |

[1] Acreages summed using raw numbers provided during GIS analysis (available upon request) and thus the sum of the total rounded numbers may not directly add up in this table.

*Active Desert Dunes* – Active desert dunes within the review area consist of generally barren expanses of actively moving sand with sparse to intermittent cover of seasonal annuals and scattered perennials, such as desert panicgrass (*Panicum urvilleanum*).

*Active Desert Dunes – Disturbed* – Active desert dunes – disturbed within the review area is similar to active desert dunes, though it has been substantially altered by human disturbance.

*Agriculture* – Agriculture within the review area supports large areas of monotypic crop plantings or disturbed, bare soils.

*Allscale Scrub* – Allscale scrub within the review area supports widely spaced stands of allscale (*Atriplex polycarpa*) with bare ground or weedy, non-native species including Bermuda grass (*Cynodon dactylon*) and tumbleweed (*Salsola australis*).

*Allscale Scrub – Disturbed* – Allscale scrub – disturbed within the review area is similar to allscale scrub, though it has been substantially altered by human disturbance.

*Creosote Bush Scrub* – Creosote bush scrub occurs on alluvial fans, bajadas, and upland slopes, and is dominated by widely spaced stands of creosote bush containing patches of open soil in between shrubs. Annual plant species and other various shrub species such as white bursage are also present.

*Creosote Bush Scrub – Disturbed* – Creosote bush scrub – disturbed within the review area is similar to creosote bush scrub, though it has been substantially altered by human disturbance.

*Developed* – Developed areas within the review area include the railroad tracks, roads, commercial buildings, residences, and storage yards. The high level of soil disturbance in these areas precludes native vegetation resulting in barren areas or sparse weedy vegetation.

*Disturbed Habitat* – Disturbed habitat within the review area has been graded, cleared, or used to the point where the land cannot support native vegetation. These areas consist of bare soils and non-native species.

*Ornamental* – Ornamental areas within the review area consist of non-native tree and grass species including Siberian elm (*Ulmus pumila*) and Bermuda grass.

*Pasture* – Pasture within the review area consists of a dense cover of grass species or row crops.

*Tamarisk Thickets* – Tamarisk thickets within the review area primarily consist of salt cedar (*Tamarix ramosissima*) with a few weedy species. Tamarisk thickets typically occur on sandy or gravelly soils within, or in close proximity to washes or streams and often become established in these areas following major disturbance. Tamarisk thickets observed within the review area appeared associated with road runoff rather than potentially jurisdictional aquatic resource areas/watercourses.

*Unvegetated Channel* – Unvegetated channel within the review area includes relatively large, well-defined waterways (including portions of the Mojave River) that are sandy, gravelly, and largely unvegetated. Vegetation within unvegetated channels is typically non-permanent and accounts for less than 10 percent total cover.

# 5 PRECIPITATION DATA AND ANALYSIS

RBC utilized the NRCS Agricultural Applied Climate Information System (AgACIS) database for the Barstow station (approximately 5 miles northeast from the review area's northeastern-most reach) to access pre-site visit precipitation data (NRCS 2022), as shown in Tables 4 and 5.

RBC also utilized the Corps' Antecedent Precipitation Tool (APT) to assess whether or not the delineation date occurred in a drier, average, or wetter than normal period for the review area (Corps 2020b). The Corps created the APT to assist with determining the normal periodic range of precipitation and other climate variables for the waterbody or waterbodies within a review area. Additionally, the APT can generally inform the regulatory agencies whether or not normal hydrologic/climatic conditions were on site at the time of the site visit and assist with completion of the Wetland Determination Data Forms (Appendix E).

## 5.1 PRECIPITATION SUMMARY

Tables 4 and 5 describe the estimated monthly total precipitation for the review area from October 2020 to July 2021 and August 2021 to May 2022 to provide the pertinent pre-site visit precipitation data from the NRCS database for the Barstow station (NRCS 2022).

Table 4. Precipitation Data for October 2020 – July 2021

| | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul |
|---|---|---|---|---|---|---|---|---|---|---|
| Monthly Total Precipitation (inch[es]) | 0.00 | T[1] | 0.17 | 0.39 | 0.01 | M[1] | 0.00 | 0.00 | 0.02 | 0.38 |

[1] Per AgACIS database: "Values of 'M' indicate missing data and 'T' indicates a trace."

Table 5. Precipitation Data for August 2021 – May 2022

| | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May |
|---|---|---|---|---|---|---|---|---|---|---|
| Monthly Total Precipitation (inch[es]) | 0.00 | 0.00 | 0.55 | 0.00 | 0.67 | 0.08 | T[1] | T[1] | 0.01 | 0.00 |

[1] Per AgACIS database: "Values of 'T' indicates a trace."

## 5.2 ANTECEDENT PRECIPITATION TOOL DATA

The APT provides three climatological parameters: Palmer Drought Severity Index (PDSI), season, and antecedent precipitation condition. The PDSI is a standardized index calculated on a monthly basis with PDSI value outputs ranging from -10 (extremely dry) to +10 (extremely wet) (National Oceanic and Atmospheric Administration [NOAA] 2020) to assess drought conditions (i.e., PDSI Class). The APT determines wet versus dry season based on related procedures provided in the applicable regional supplement for the review area (i.e., Arid West Supplement). The antecedent precipitation condition is classified as drier than normal with an antecedent runoff condition (ARC) score less than 10; normal with an ARC score between 10 to 14; or wetter than normal with an ARC score greater than 14 (Sprecher & Warne 2000).

Table 6 summarizes the key data extrapolated from the APT output to compare the current year 30-day rolling total to the averaged 30-year normal for the weather stations with comprehensive historical data within 30 miles of the review area: estimated drought conditions, wet or dry season determination, ARC score, and antecedent precipitation condition. The APT output provided in Appendix F and summarized in Table 6 noted a PDSI class of "severe drought" during the October 2021 and December 2021 field surveys and a PDI class of "extreme drought" during the August 2021, March 2022, April 2022, May 2022, and June 2022 field surveys. The precipitation and climatic conditions were classified as "normal conditions" for the review area during the October 2021, December 2021, April 12 and 13, 2022, May 2022, and June 2022 field surveys; "wetter than normal" for the review area during the August 2021 field survey; and "drier than normal" for the review area during the March 2022 and April 15, 2022 field surveys based on the 30-day rolling totals for the three months preceding the field survey dates. Field staff considered the "severe drought" and "extreme drought" conditions during the field delineation; evaluated how the drought conditions could affect the data collected on the Arid West Wetland Determination Data Forms and Ephemeral and Intermittent Streams OHWM Datasheets (Appendix E); and used recent and historic aerials to ensure appropriate representation of the extent of the on-site aquatic features for this ARDR considering the 2021 and 2022 drought conditions.

Table 6. Antecedent Precipitation Tool Data for Review Area

| Field Survey Date | PDSI Value | PDSI Class | Season | ARC Score | Antecedent Precipitation Condition |
|---|---|---|---|---|---|
| 8/10/2021 | -4.11 | Extreme drought | Dry season | 17 | Wetter than normal |
| 10/20/2021 | -3.54 | Severe drought | Dry season | 12 | Normal conditions |
| 12/01/2021 | -3.95 | Severe drought | Wet season | 14 | Normal conditions |
| 3/16/2022 | -4.45 | Extreme drought | Dry season | 7 | Drier than normal |
| 3/23/2022 | -4.45 | Extreme drought | Dry season | 9 | Drier than normal |
| 3/24/2022 | -4.45 | Extreme drought | Dry season | 8 | Drier than normal |
| 4/12/2022 | -4.45 | Extreme drought | Dry season | 11 | Normal conditions |
| 4/13/2022 | -4.45 | Extreme drought | Dry season | 11 | Normal conditions |
| 4/15/2022 | -4.85 | Extreme drought | Dry season | 6 | Drier than normal |
| 5/17/2022 | -4.85 | Extreme drought | Dry season | 11 | Normal conditions |
| 6/20/2022 | -5.17 | Extreme drought | Dry season | 12 | Normal conditions |

# 6 DESCRIPTION OF OBSERVED POTENTIAL AQUATIC RESOURCES

The following descriptions of observed potential aquatic resources within the review area document the presence or absence of aquatic resource indicators per the methods discussed in Section 3. The subsections below are intended to be reviewed independently under each agency's purview unless otherwise directed in the text (i.e., the aquatic resource description is the same between two or more agencies) given the various regulatory definitions and standards per each

agency. Areas that were investigated but determined to not qualify as a potential aquatic resource are discussed briefly in Section 6.4.

Appendix G provides site photographs of the features within the review area; all figures in the Figure 5 series display representative photo points.

## 6.1 CORPS/RWQCB WETLAND WATERS OF THE U.S./STATE

RBC collected data at 11 representative Wetland Data Form Points (WDP) within the review area to determine the presence or absence of jurisdictional wetland waters of the U.S./State (WDP 1 through 11; Figures 5A and 5B; Appendix E). Note that data at WDP 1 through WDP 8 was originally collected by RBC regulatory specialists for the BNSF Lenwood Component during December 2018 and August 2019 field visits. RBC regulatory specialists verified the conditions at WDP 1 through WDP 8 and updated the associated datasheets accordingly during the April 2022 field visits. Overall, conditions at WDP 1 through WDP 8 remained consistent from 2018/2019 to 2022. The delineated aquatic features on site did not meet the appropriate wetland parameters to qualify as wetland waters of the U.S./State based on the data collected during the field delineation, as discussed further in Section 6.2.

## 6.2 CORPS/RWQCB NON-WETLAND WATERS OF THE U.S./STATE

RBC collected data at 29 representative OHWM Datasheet Points (ODPs) within the review area to determine the presence of potential waters of the U.S. (ODP 1 through 29; Figures 5A and 5B; Appendix E). RBC selected representative ODP locations as there were multiple dry washes (i.e., features) with similar hydrology or OHWM characteristics (Appendix E). Note that data at ODP 1 through ODP 22 was originally collected by RBC regulatory specialists for the BNSF Lenwood Component during December 2018 and August 2019 field visits. RBC regulatory specialists reverified the conditions at ODP 1 through ODP 22 and updated the associated datasheets accordingly during the April 2022 field visits. Overall, conditions at ODP 1 through ODP 22 remained consistent from 2018/2019 and 2022. Overall, the review area supports 109 features (Non-Wetland Water [NWW-] 1 through NWW-109 [Mojave River]) which vary from single-thread, small, unvegetated dry washes to large, braided, unvegetated dry wash systems to the larger Mojave River. The OHWMs for NWW-1 through NWW-108 varied in width from an average minimum of 4 feet and an average maximum of 9 feet; these features were primarily unvegetated and surrounded by allscale (FACU), four-wing saltbush/shadscale (*Atriplex canescens*; NL/UPL), creosote bush (NL/UPL), and white bursage (NL/UPL). The OHWM for the portions of the NWW-109 (Mojave River) within the review area ranged from approximately 500 feet to 1,400 feet; this feature was sparsely vegetated and generally composed of active desert dune habitat. See Appendix H, Table H-1 for the estimated OHWM and representative OHWM and wetland data for NWW-1 through NWW-109 (Mojave River).

All of the delineated features, except NWW-9, NWW-43, NWW-60, NWW-98, and NWW-109 (Mojave River), generally drain southeast to northwest (Figures 5A and 5B). Figures 5A and 5B display the limits of where OHWM indicators were observed within the review area. There are 19 sets of culvert/railroad crossings located along the railroad tracks within the review, which could allow for flows to continue north. NWW-9, NWW-43, and NWW-98 commence at the dirt road north of the railroad tracks before continuing northwest and off site. NWW-60 is a small, localized

feature north of the railroad tracks that receives flows off the dirt road north of the railroad tracks. NWW-109 (Mojave River) is a sparsely vegetated, dry, sandy wash that generally flows southwest to northeast before continuing off site.

Staff concluded based on field observations that NWW-1 through NWW-108 were ephemeral features that only receive flows from runoff in direct response to precipitation; NWW-109 (Mojave River) is an intermittent feature based on field observations and the USGS NHD database (USGS 2021). The general characteristics of each of the observed features within the review area are provided in Appendix H, Table H-1. Staff did not observe standing water at any of the features during the 2021 and 2022 field surveys.

Staff determined the presence of an OHWM at one location within each of the following features: NWW-20, NWW-36, NWW-44, NWW-45, NWW-60, NWW-68, NWW-69, NWW-70, NWW-73, NWW-76, NWW-82, NWW-85, NWW-87, NWW-90, NWW-91, NWW-92, NWW-94, NWW-95, and NWW-97 (Appendix E, ODP 1 – 4, 8 – 12, 14 – 19, 21, 24, 27, and 29). Staff determined the presence of an OHWM at two locations within NWW-80 (Appendix E, ODP 13 and 22) and five locations within NWW-89 (Appendix E, ODP 5 – 7, 23, and 25). Indicators of an OHWM for NWW-1 through NWW-108 generally included a change in average sediment texture and vegetation cover between the active floodplain and upland areas as well as a typically small break in slope along the active channel (Appendix E). The OHWMs present at these locations were representative of the OHWM within NWW-1 through NWW-19, NWW-21 through NWW-35, NWW-37 through NWW-43, NWW-46 through NWW-59, NWW-61 through NWW-67, NWW-71 through NWW-72, NWW-74, NWW-75, NWW-77 through NWW-79, NWW-81, NWW-83, NWW-84, NWW-86, NWW-88, NWW-93, NWW-93, and NWW-98 through NWW-108. Staff also determined the presence of an OHWM at two locations within NWW-109 (Mojave River) (Appendix E, ODP 26 and 28). Indicators of an OHWM for NWW-109 (Mojave River) included a break in bank slope, change in vegetation cover and species, and a change in average sediment texture between the active floodplain and upland/low terrace areas (Appendix E, ODP 26 and 28).

## 6.3 CDFW STREAMBED AND WATERCOURSE

Figure 5C displays the estimated extent of streambed and associated watercourse within the review area. The extent of streambed was delineated based on the top of the channel banks and the extent of the associated watercourse was delineated beyond the streambed, consisting of associated features such as low-flow, active, and braided channels and banks associated with islands, and secondary channels within the bounds of the larger channel complex (Vyverberg & Brady 2013).

Overall, the features observed within the review area (NWW-1 through NWW-109 [Mojave River]) vary from single-thread, small, unvegetated dry streambeds with a well-defined bed and bank to large watercourses with multiple tributaries and vegetated islands to the larger Mojave River. No associated riparian or wetland habitat occurs within the review area. NWW-1 through NWW-108 vary in width from an average minimum of 4 feet and an average maximum of 12 feet and were primarily unvegetated and surrounded by allscale (FACU), four-wing saltbush/shadscale (*Atriplex canescens*; NL/UPL), creosote bush (NL/UPL), and white bursage (NL/UPL). Portions of NWW-109 (Mojave River) within the review area varied in width from approximately 50 feet to 3,100 feet; this feature was sparsely vegetated and generally composed of active desert dune habitat. See