# The Metropolitan Water District of Southern California

# Copper Basin Discharge Valve Replacement and Access Road Improvements Project

# Proposed Draft Mitigated Negative Declaration

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

Report No. 1663
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# 1. Project Description

## 1.1 Background

The Metropolitan Water District of Southern California (Metropolitan) is a regional water wholesaler that provides water for 26 public agency members that provide drinking water to approximately 19 million people in parts of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. The mission of Metropolitan is to provide its service area with an adequate and reliable supply of high-quality water to meet present and future needs in an environmentally and economically responsible way.

Metropolitan owns, operates, and manages the Colorado River Aqueduct (CRA), which is a regional water conveyance system that consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four reservoirs, and 242 miles of aqueducts, siphons, canals, conduits, and pipelines terminating at Lake Mathews in Riverside County, California. In 1932, Congress provided Metropolitan with authority to acquire fee ownership of the CRA right-of-way (fee property) as well as additional land needed to support the operations and maintenance of the CRA. Metropolitan acquired ownership of the fee property roughly between 1932 and 1941. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA and its various components. The Copper Basin Reservoir, one of Metropolitan's four reservoirs along the CRA, is a critical hydraulic component of the CRA that enables Metropolitan to balance and control aqueduct flows. Copper Basin Reservoir was constructed in 1938 and holds approximately 24,200 acre-feet of water with a surface area of approximately 427 acres. Water from the Gene Pumping Plant is pumped to the Copper Basin Reservoir, and then flows by gravity to the Iron Mountain Pumping Plant, approximately 70 miles from Copper Basin Reservoir. Copper Basin Reservoir has a concrete arch dam with a discharge structure at the base that contains a debris rack, a 60-inch diameter outlet pipe, a 54-inch by 54-inch slide gate valve, and a 54-inch fixed cone (Howell-Bunger) discharge valve. The slide gate valve and discharge valve are used to drain the reservoir in the event of an emergency and are not used for maintaining reservoir levels.

## 1.2 Purpose and Need

The purpose of the Copper Basin Discharge Valve Replacement and Access Road Improvements Project (proposed Project) is to replace the discharge valve, rehabilitate the slide gate valve, replace or rehabilitate appurtenant structures, and improve the existing access road to facilitate construction and operation of the proposed Project. The valves have been in operation for over 80 years and have passed their expected service life. Additionally, segments of the approximately 1.66-mile-long dirt access road between the outlet structure at Copper Basin Reservoir and the canyon floor that leads to the base of Copper Basin Dam are too steep, are subject to frequent erosion, and would not support the types of construction equipment required to complete the proposed Project.

## 1.3 Project Location and Land Use

The proposed Project is located at Copper Basin Reservoir in the Colorado Desert, approximately 5 miles west of Parker Dam and the border between California and Arizona within unincorporated San Bernardino County. Land use surrounding the proposed Project site is undeveloped open space. Figure 1-1 provides an overview of the Project's regional location.

**Figure 1-1. Project Regional Location**

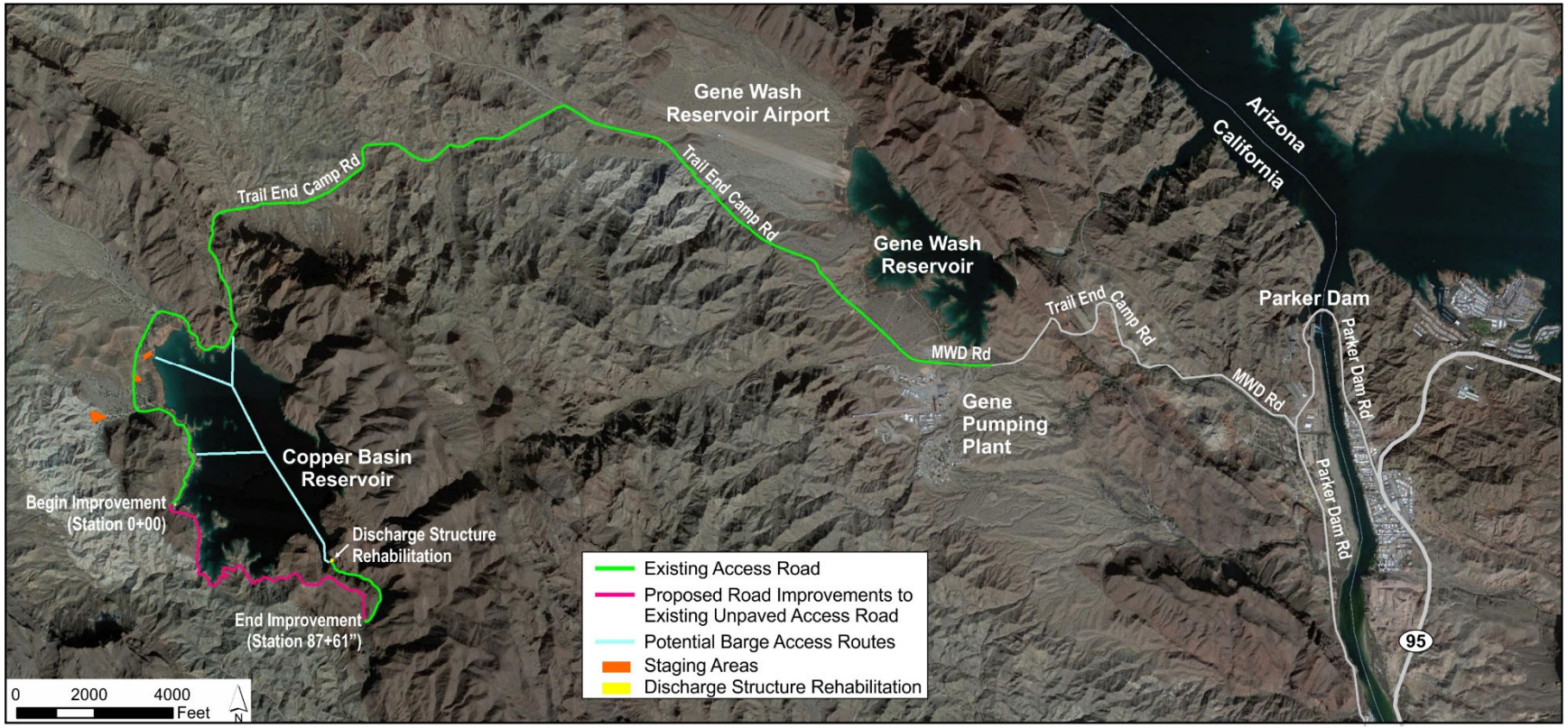
## 1.4 Proposed Project

The proposed Project would rehabilitate the slide gate valve and replace the discharge valve within the Copper Basin Dam valve house; install new conduit and electrical components within the valve house; install three new concrete pads and electrical components 250 feet southwest of the Copper Basin Dam; install and anchor-in-place approximately 250 feet of above-ground electrical conduit from the new concrete pads to Copper Basin Dam; replace the ladder on the dam face; install a new catwalk and stairs immediately downstream of and adjacent to the valve house; remove and reconstruct two existing concrete weirs approximately 125 feet downstream of Copper Basin Dam; and install electrical conduit and instrumentation from the two weirs along the catwalk to the valve house. Project staging is proposed at three existing staging/operations areas along the west side of the reservoir as noted in Figure 1-2. An existing road provides access below the dam.

The proposed Project would improve approximately 1.66 miles of the existing dirt access road around the perimeter of Copper Basin Reservoir to facilitate safe access to the base of Copper Basin Dam. Improvements to this existing dirt access road include re-grading the road; paving steep segments of road and installing metal beam guard railing for safety; constructing Arizona crossings at drainage crossing locations; installing v-ditches and riprap outlet structures along the access road to control runoff; and installing vehicle turn out areas and safety signs.

The proposed Project is discussed in greater detail in the following sections.

## Figure 1-2. Project Overview



### 1.4.1 Slide Gate Valve and Discharge Valve Rehabilitation

*Photo 1. Existing valve house. The discharge valve is located in the lower floor of the valve house.*

The slide gate valve, discharge valve, and associated control equipment are located in a concrete structure with a low-pitched concrete roof, referred to as the valve house. The lower floor of the valve house is approximately 8 feet above the canyon floor and contains the slide gate valve and discharge valve. The 54-inch by 54-inch slide gate valve would be rehabilitated with new parts and the 54-inch discharge valve and actuator would be replaced in-kind with new structures. Portions of the concrete just below the discharge valve have also deteriorated and would be rehabilitated with reinforced steel and concrete. Photo 1 shows a photograph of the existing valve house.

Before the discharge valve can be replaced, an isolation device would be temporarily installed on the water-side inlet of the dam to prevent water from entering the discharge pipe. The discharge inlet is located approximately 165 feet below water level. Installation of the isolation device would require divers to remove the debris rack in order to install the plug. The divers would remove the plug after the discharge valve replacement work is complete. The discharge valve would be tested following completion of construction, which requires opening and closing the discharge valve.

### 1.4.2 Appurtenant Structures

**Electrical Components**

New conduits, wiring, and electrical components would be installed in the valve house to replace and upgrade the power dam monitoring systems, controls, and transmit signals to the supervisory control and data acquisition system. These components would also measure flows downstream of Copper Basin Dam and would connect to existing instrumentation at the two weirs approximately 125 feet downstream.

*Photo 2. Electrical concrete pad area with electrical and telecommunication equipment.*

The existing transformer located approximately 250 feet southwest of Copper Basin Dam will be replaced with a new transformer and other associated electrical and telecommunication equipment. The equipment would be used to provide power, control of the discharge valve, slide gate valve, bypass valve, and telecommunication systems, and would be installed on three new concrete pads in

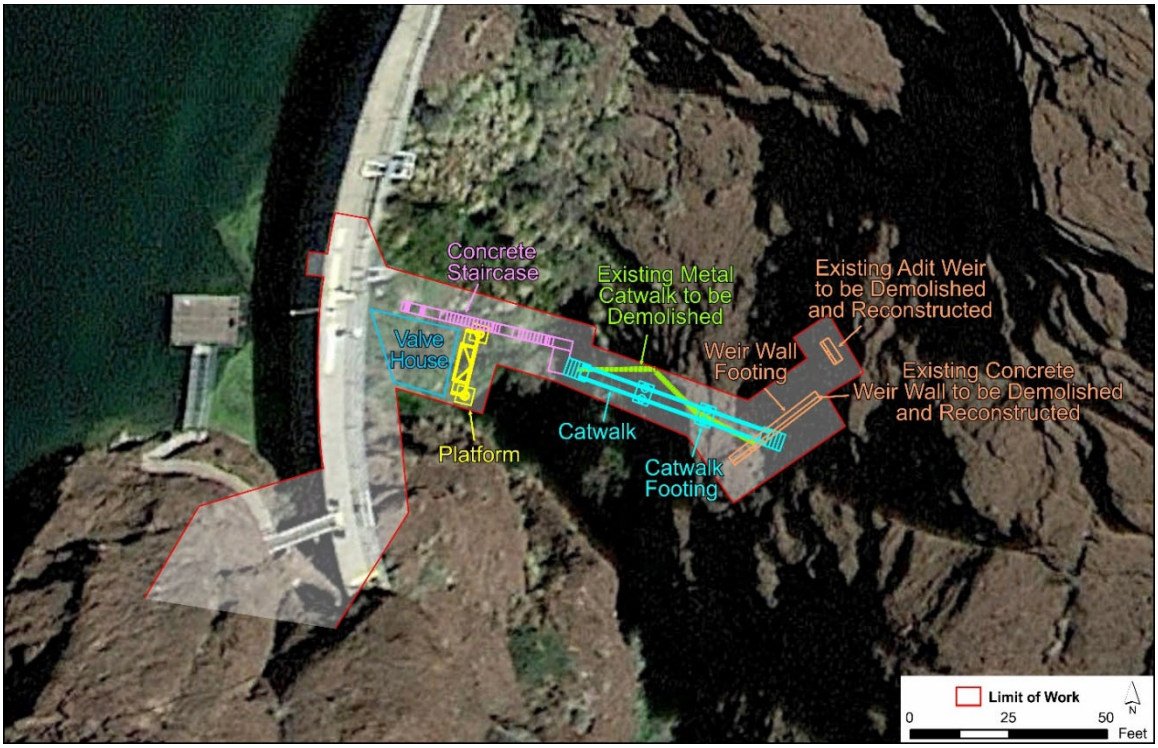
the same vicinity (see Photo 2). The six-inch thick concrete pads would measure approximately 90 inches by 128 inches, 86 inches by 132 inches, and 72 inches by 96 inches. Two 36-inch by 36-inch handhole boxes would also be installed adjacent to the concrete pads to provide access to subsurface equipment.

Approximately 250 feet of above-ground electrical conduit would be replaced to connect the equipment between the new concrete pads and the valve house. This equipment would be accessed via a 135-foot-long side road that would be constructed as part of the Project. The side road would traverse from the access road to the concrete pad containing the transformer and electrical equipment and would connect with the access road in two locations.

### Weirs

An existing weir (Weir 1) located approximately 125 feet downstream of Copper Basin Dam collects and measures water that leaks through the valves and the dam at the downstream end of the valve house foundation, which allows Metropolitan to obtain credit for water that leaks back into the Colorado River system. An additional weir (Weir 2) performs a similar function from an adjacent adit (i.e., a horizontal tunnel) that discharges seepage water, as noted in Figure 1-3. The two existing weirs would be demolished and reconstructed with concrete in the same location, followed by the installation of wiring, conduit, and instrumentation from the discharge valve structure along the catwalk to the two reconstructed weirs. Weir 1 would be approximately 26 feet wide by 2 feet tall by 1 foot thick and would contain a v-notch to allow water to pass through. Weir 2 would be approximately 56 inches wide by 30 inches tall by 12 inches thick. An existing road provides access below the dam.

**Figure 1-3. Dam Valve Structure Improvements**



### Ladder

The existing ladder would be replaced with a new galvanized steel ladderway system consisting of ladders, rest platforms, and a fence fall guard surrounding the entire ladderway heights, conforming to the Division of Occupational Safety and Health of California and Federal Occupational Safety and Health Administration standards. The new ladderways would follow the dam face contour and utilize the existing discharge valve house platforms as the termination point. Photo 3 shows the location of the existing ladder.

*Photo 3. Existing valve house with ladder to the upper right and catwalk to the bottom center. A new galvanized steel walkway would replace the catwalk, and a steel grate platform would be constructed in front of the valve house. The walkway would connect to the platform by a new concrete staircase.*

### Catwalk, Platform, and Concrete Staircase

The existing catwalk would be removed and replaced with an approximately 48-inch-wide galvanized steel walkway with steel guardrails that provides foot access from Weir 1 to the valve house (refer to Photo 3 and Figure 1-3). The new catwalk would be anchored in place using 24-inch diameter concrete piers or pilings, elevated approximately two feet above the surface water level and would include concrete steps at the entrance and exit points. Two boulders measuring approximately 7 feet in diameter within the stream channel would be relocated prior to the installation of the catwalk.

The upstream end of the catwalk would connect to a new 54-inch-wide concrete staircase with steel guard-rails and would extend from the end of the catwalk to the north side of the valve house (see Figure 1-3). A new galvanized steel grate platform would be constructed in front of the valve house to provide access to the discharge valve. The platform would be anchored in place using 24-inch diameter concrete piers or pilings.

### 1.4.3 Access Road Improvements

The proposed Project would improve approximately 1.66 miles of a 10-foot-wide existing, unpaved access road, which is currently subject to frequent erosion and is too steep to support the types of construction equipment required to complete the proposed Project. Table 1-1 and Figure

1-2 provide the locations of access road improvements, including slope stability improvements, Arizona crossings, v-ditches, and outlet structures.

### Grading

In order to facilitate the improvements, the access road would first need to be graded. The grading would result in approximately 1,955 cubic yards of material that will not be used to construct the proposed Project. In order to accommodate the installation of the new v-ditch system, the limits of grading may extend outside of the existing roadway in some areas in order to keep a safe slope of 1.5:1 per geotechnical specifications.

### Concrete Paving

The 10-foot-wide access road would be graded and segments would be improved with a nine-inch-thick layer of gunite (a dry mixed form of sprayed concrete typically containing fine particles) along all areas of the access road where slopes are 20 percent or greater to create a roughened surface safe for vehicle access. The concrete segments would be reinforced with welded wire fabric and include 24-inch-deep rebar-reinforced concrete footings spaced at a maximum of every 12 feet.

### Arizona Crossings

Arizona crossings would be installed where natural drainage features cross the access road. The Arizona crossings consist of nine-inch-thick concrete crossings reinforced with welded wire fabric and 36-inch-thick riprap energy dissipation structures lined with geotextile fabric on the downstream side of the crossing. The crossings would match the upstream and downstream grade of the drainage feature.

### V-ditches and Outlet Structures

Concrete v-ditches would be constructed along the extent of the access road in order to capture and convey runoff to newly constructed outlet structures. The v-ditches would be 12-to-30 inches wide and 6-to-18 inches deep, depending on the size of the drainage area. The outlet structures would consist of a geotextile fabric liner and a 36-inch-thick layer of riprap to dissipate flows received from the v-ditch system.

**Table 1-1. Access Road Improvement Locations**

| Improvement Type | Station | Map Sheet |
|---|---|---|
| Concrete Paving | 0+27.00 to 1+76.00 | Figure 1-4; Sheet 4 of 15 |
| | 3+75.00 to 4+60.00 | Figure 1-4; Sheet 4 of 15 |
| | 7+45.00 to 7+81.00 | Figure 1-4; Sheet 4 of 15 |
| | 42+58.00 to 43+04.00 | Figure 1-4; Sheet 9 and 10 of 15 |
| | 45+52.80 to 45+95.00 | Figure 1-4; Sheet 10 of 15 |
| | 52+24.00 to 52+54.00 | Figure 1-4; Sheet 10 and 11 of 15 |
| | 54+73.00 to 55+16.00 | Figure 1-4; Sheet 11 of 15 |
| | 55+75.00 to 56+59.00 | Figure 1-4; Sheet 11 of 15 |
| | 60+07.00 to 60+54.00 | Figure 1-4; Sheets 12 of 15 |

**Table 1-1. Access Road Improvement Locations**

| Improvement Type | Station | Map Sheet |
|---|---|---|
| | 61+07.00 to 62+80.00 | Figure 1-4; Sheet 12 of 15 |
| | 72+30.00 to 72+93.00 | Figure 1-4; Sheet 13 of 15 |
| | 74+23.00 to 75+71.00 | Figure 1-4; Sheet 14 of 15 |
| | 77+10.00 to 78+33.00 | Figure 1-4; Sheet 14 and 15 of 15 |
| | 79+60.00 to 87+30.00 | Figure 1-4; Sheet 15 of 15 |
| Arizona Crossing | 19+55.14 to 20+15.14 | Figure 1-4; Sheet 7 of 15 |
| | 22+38.00 to 23+78.00 | Figure 1-4; Sheet 7 and 8 of 15 |
| | 25+00.00 to 25+90.00 | Figure 1-4; Sheet 7 and 8 of 15 |
| | 27+85.00 to 29+20.00 | Figure 1-4; Sheet 8 and 9 of 15 |
| | 29+85.00 to 30+40.00 | Figure 1-4; Sheet 8 and 9 of 15 |
| | 32+87.00 to 33+95.00 | Figure 1-4; Sheet 8 and 9 of 15 |
| | 39+67.00 to 40+12.00 | Figure 1-4; Sheet 9 of 15 |
| | 46+48.22 to 47+08.22 | Figure 1-4; Sheet 10 of 15 |
| | 49+01.57 to 49+71.57 | Figure 1-4; Sheet 10 of 15 |
| | 53+32.00 to 54+12.00 | Figure 1-4; Sheet 11 of 15 |
| | 58+12.00 to 58+92.00 | Figure 1-4; Sheet 11 of 15 |
| Riprap Outlet/Drop Inlet Structure | 2+82.00 | Figure 1-4; Sheet 4 of 15 |
| | 6+24.00 | Figure 1-4; Sheet 4 of 15 |
| | 12+34.00 | Figure 1-4; Sheet 5 of 15 |
| | 14+48.50 | Figure 1-4; Sheet 6 of 15 |
| | 18+28.00 | Figure 1-4; Sheet 7 of 15 |
| | 32+12.00 | Figure 1-4; Sheet 8 and 9 of 15 |
| | 36+93.00 | Figure 1-4; Sheet 9 of 15 |
| | 38+53.00 | Figure 1-4; Sheet 9 of 15 |
| | 42+10.00 | Figure 1-4; Sheet 9 and 10 of 15 |
| | 48+03.00 | Figure 1-4; Sheet 10 of 15 |
| | 63+63.90 | Figure 1-4; Sheet 12 of 15 |

**Figure 1-4**

**Project Components**

*Sheet 1 of 15*

N

0 4,000 8,000 Feet

Laydown Yard

**Figure 1-4**

**Project Components**

*Sheet 2 of 15*

N

0 4,000 8,000 Feet

Laydown Yard

**Figure 1-4**

**Project Components**

*Sheet 3 of 15*

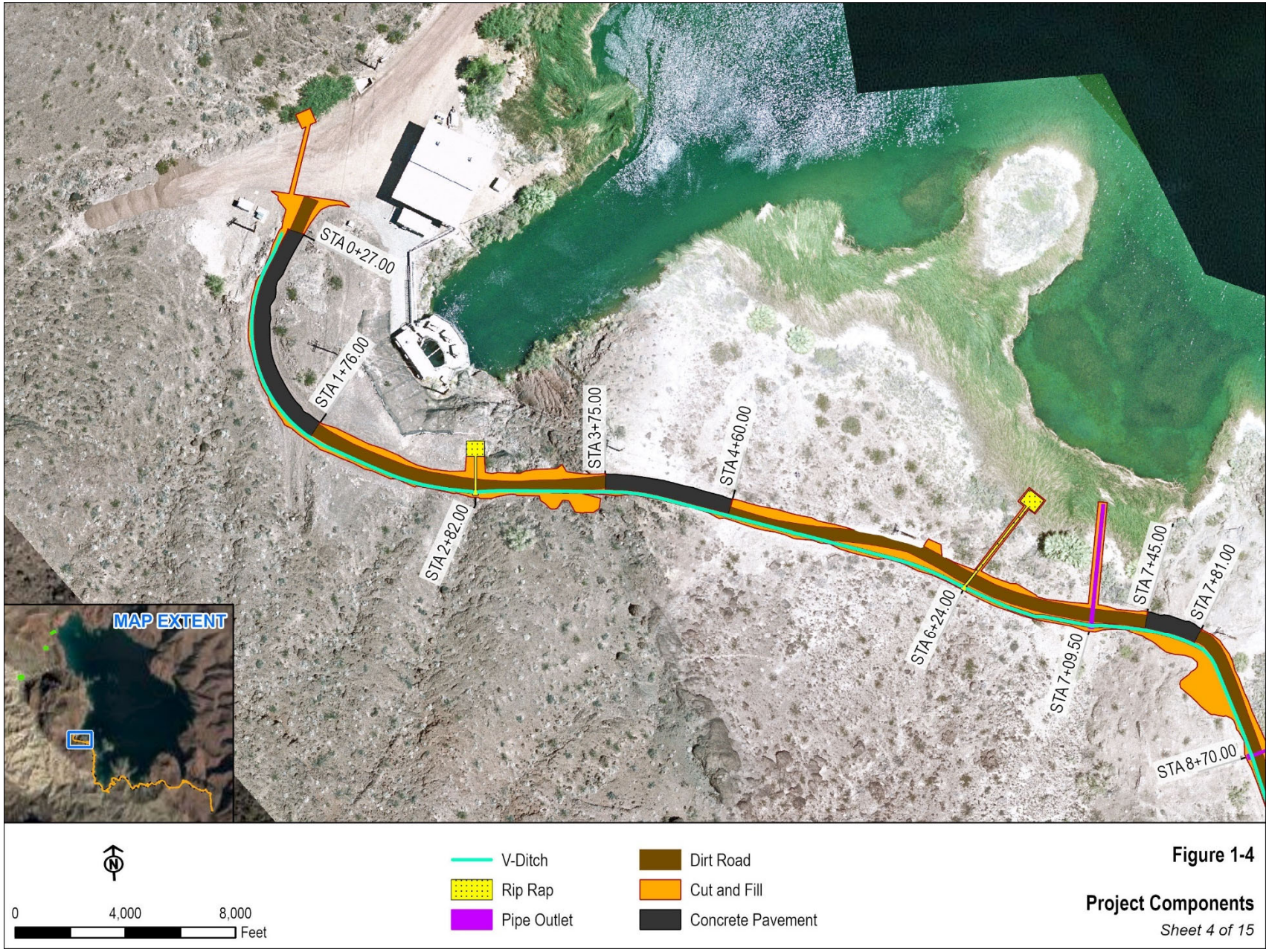



**Figure 1-4**

**Project Components**

*Sheet 4 of 15*

N

0 4,000 8,000 Feet

V-Ditch
Rip Rap
Pipe Outlet
Dirt Road
Cut and Fill

**Figure 1-4**

**Project Components**

*Sheet 5 of 15*

N

0 4,000 8,000 Feet

V-Ditch
Rip Rap
Dirt Road
Cut and Fill

**Figure 1-4**

**Project Components**

*Sheet 6 of 15*

**Figure 1-4**

**Project Components**

*Sheet 7 of 15*

**Figure 1-4**

**Project Components**

*Sheet 8 of 15*

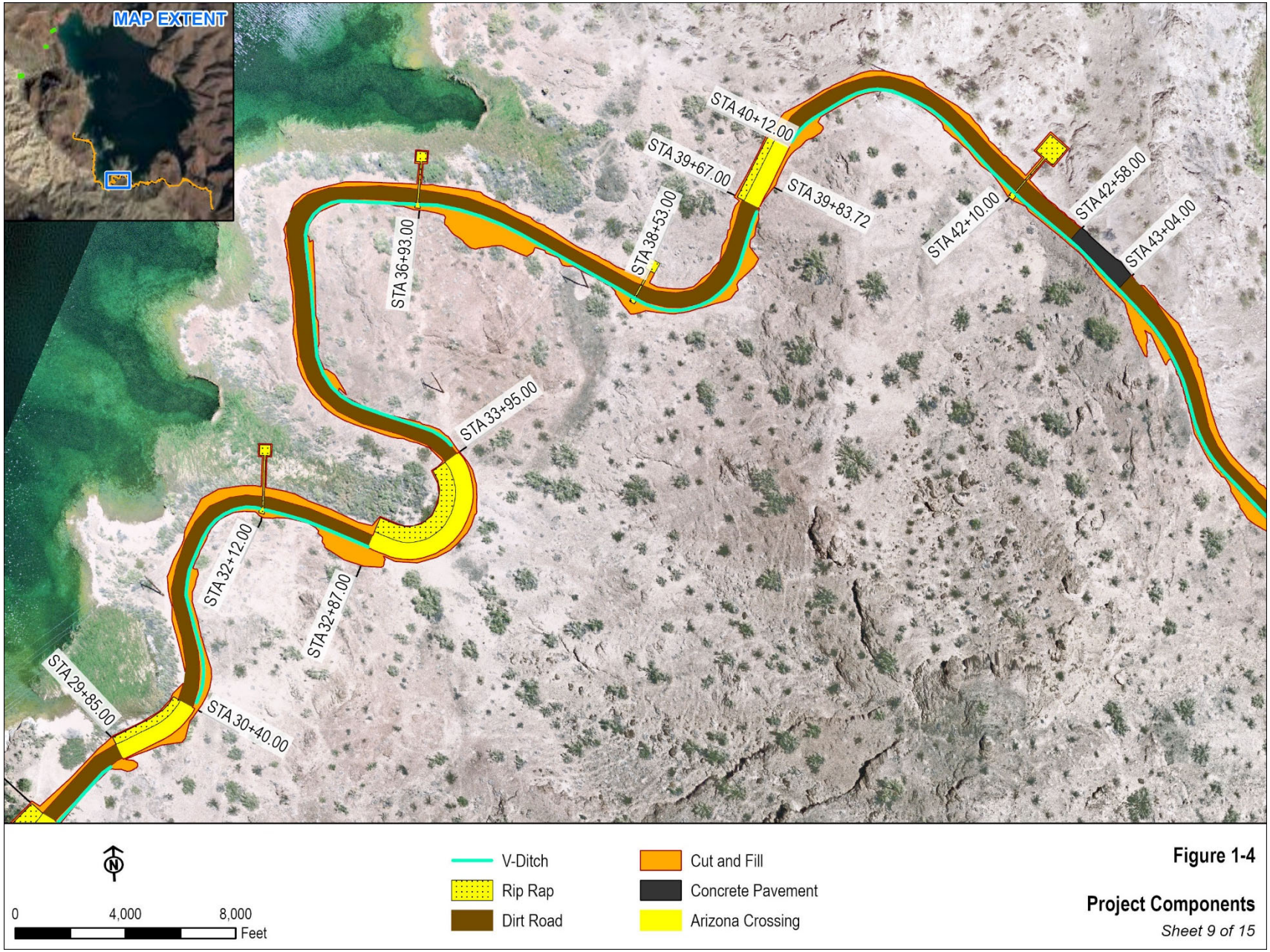



**Figure 1-4**

**Project Components**

*Sheet 9 of 15*

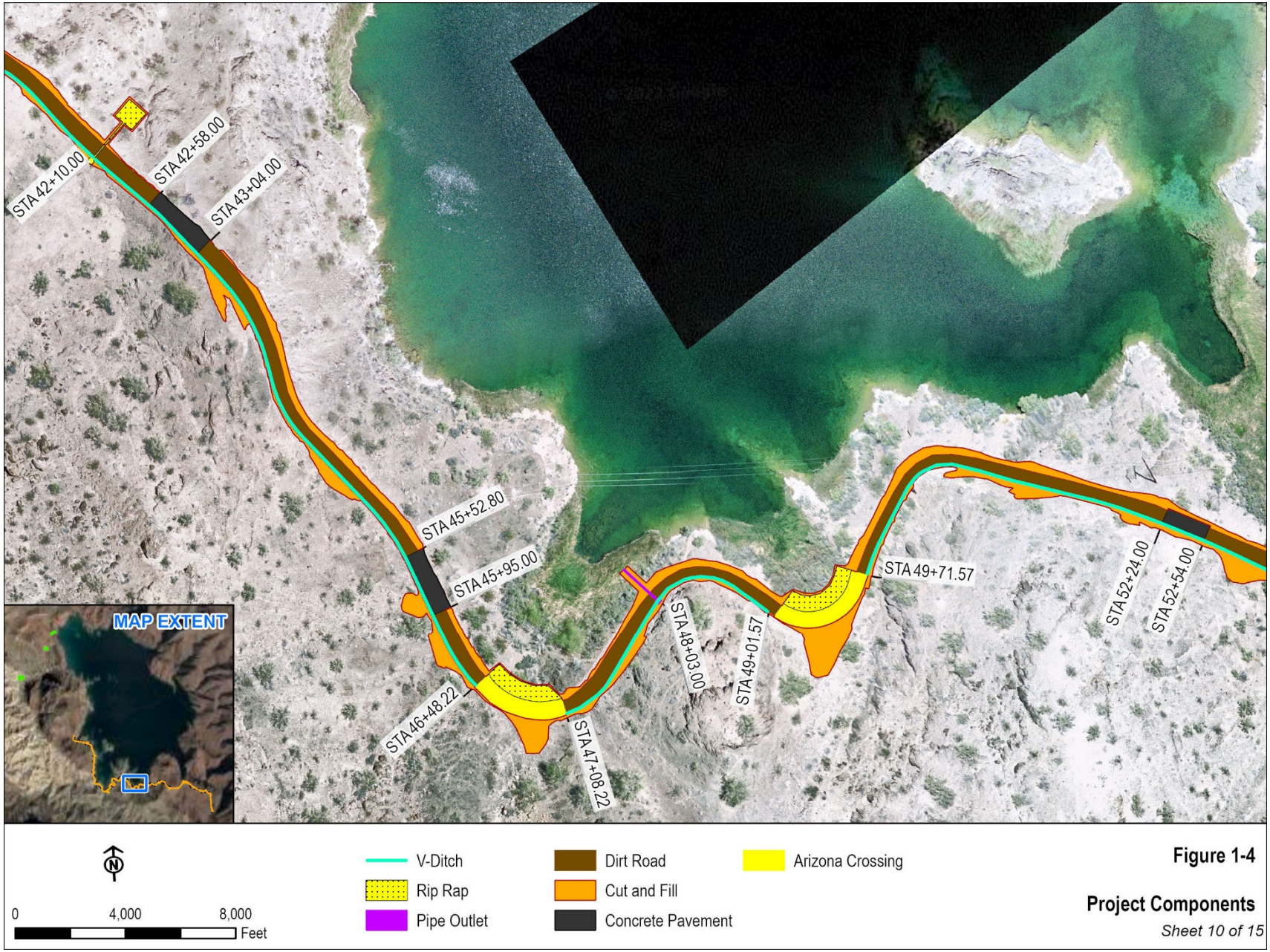



**Figure 1-4**

**Project Components**

*Sheet 10 of 15*

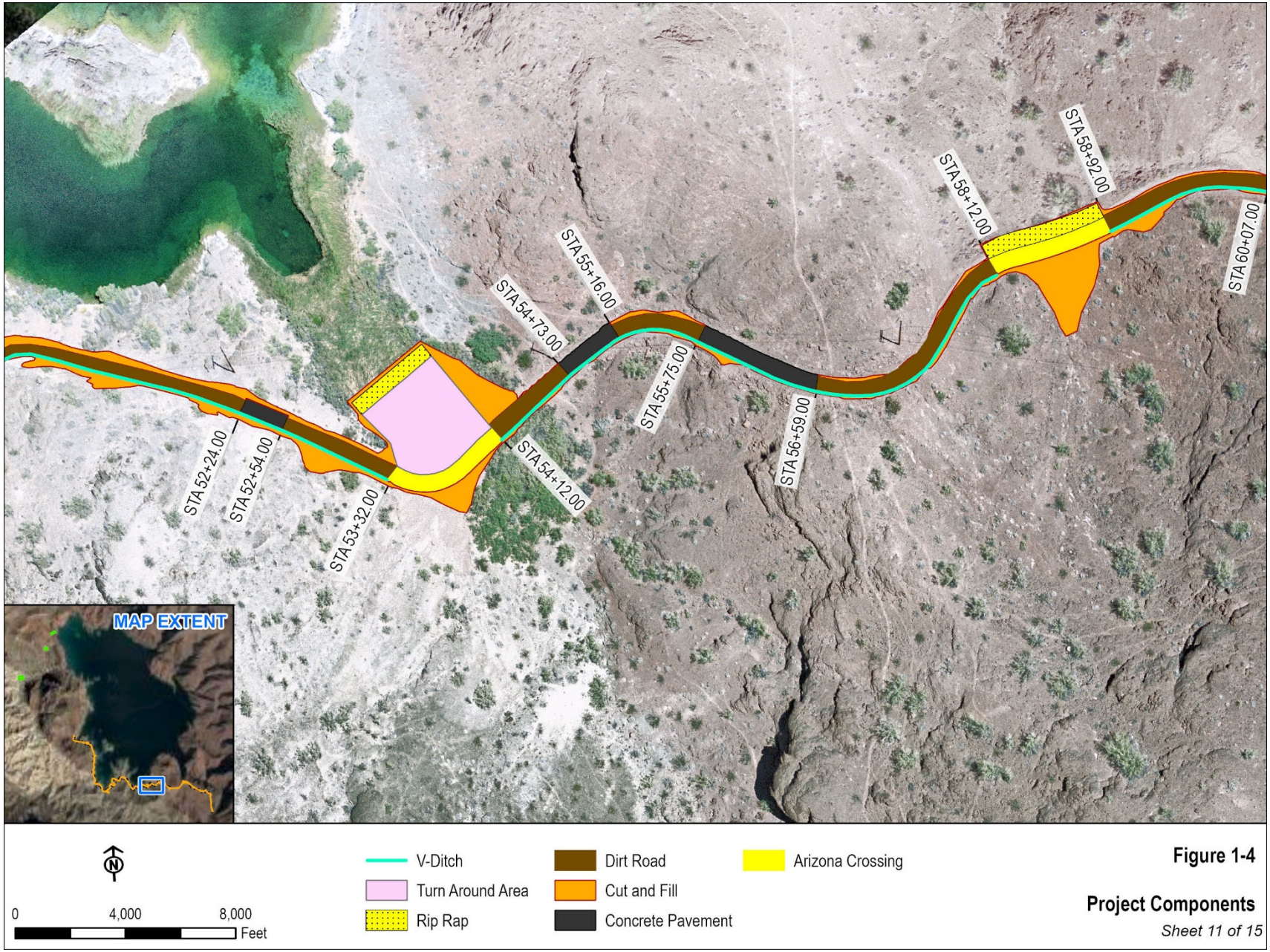



**Figure 1-4**

**Project Components**

*Sheet 11 of 15*

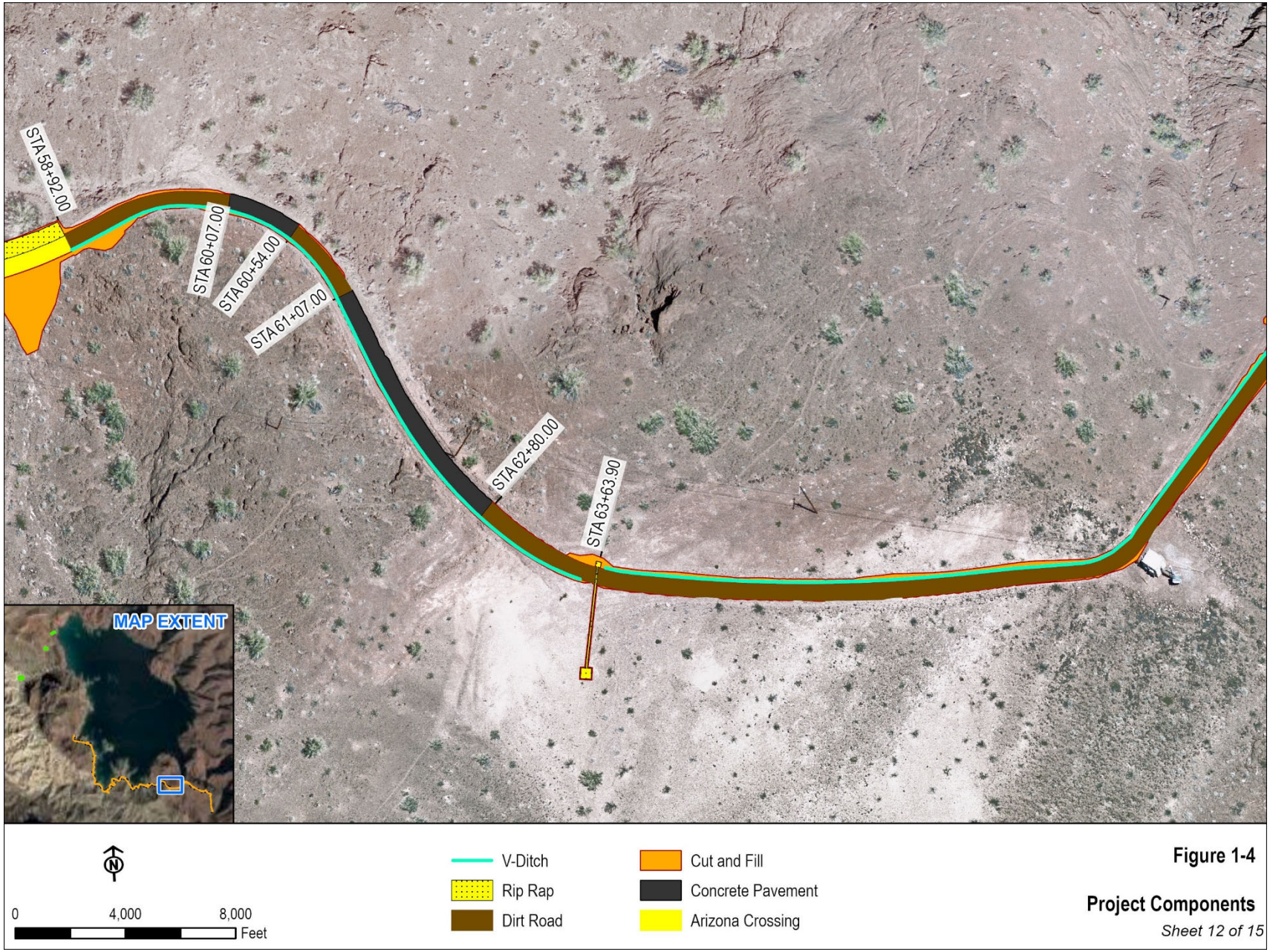
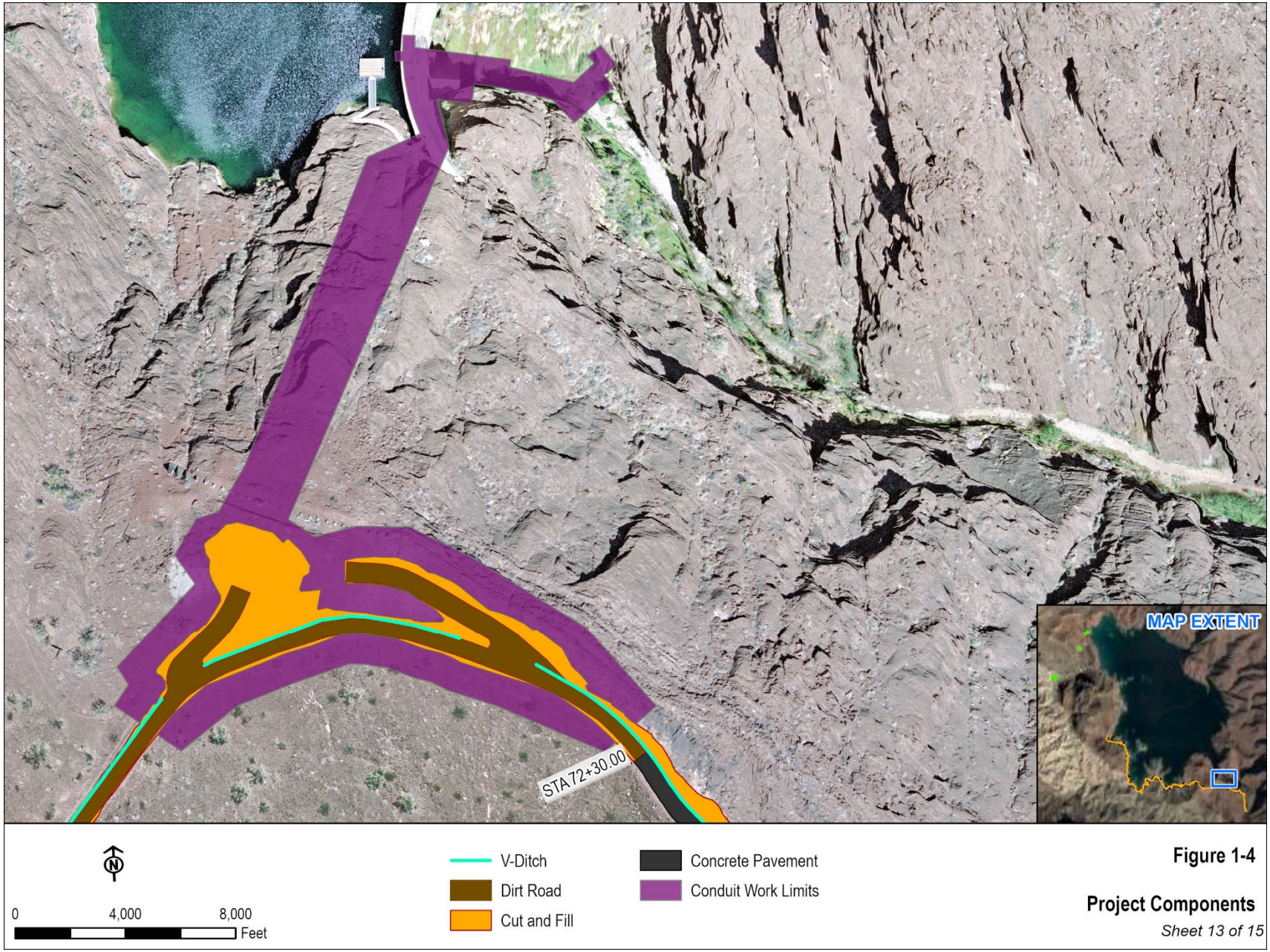



**Figure 1-4**

**Project Components**

*Sheet 12 of 15*


STA72+30.00
MAP EXTENT
N
0
4,000
8,000
Feet
V-Ditch
Dirt Road
Cut and Fill
Concrete Pavement
Conduit Work Limits
Figure 1-4
Project Components
Sheet 13 of 15

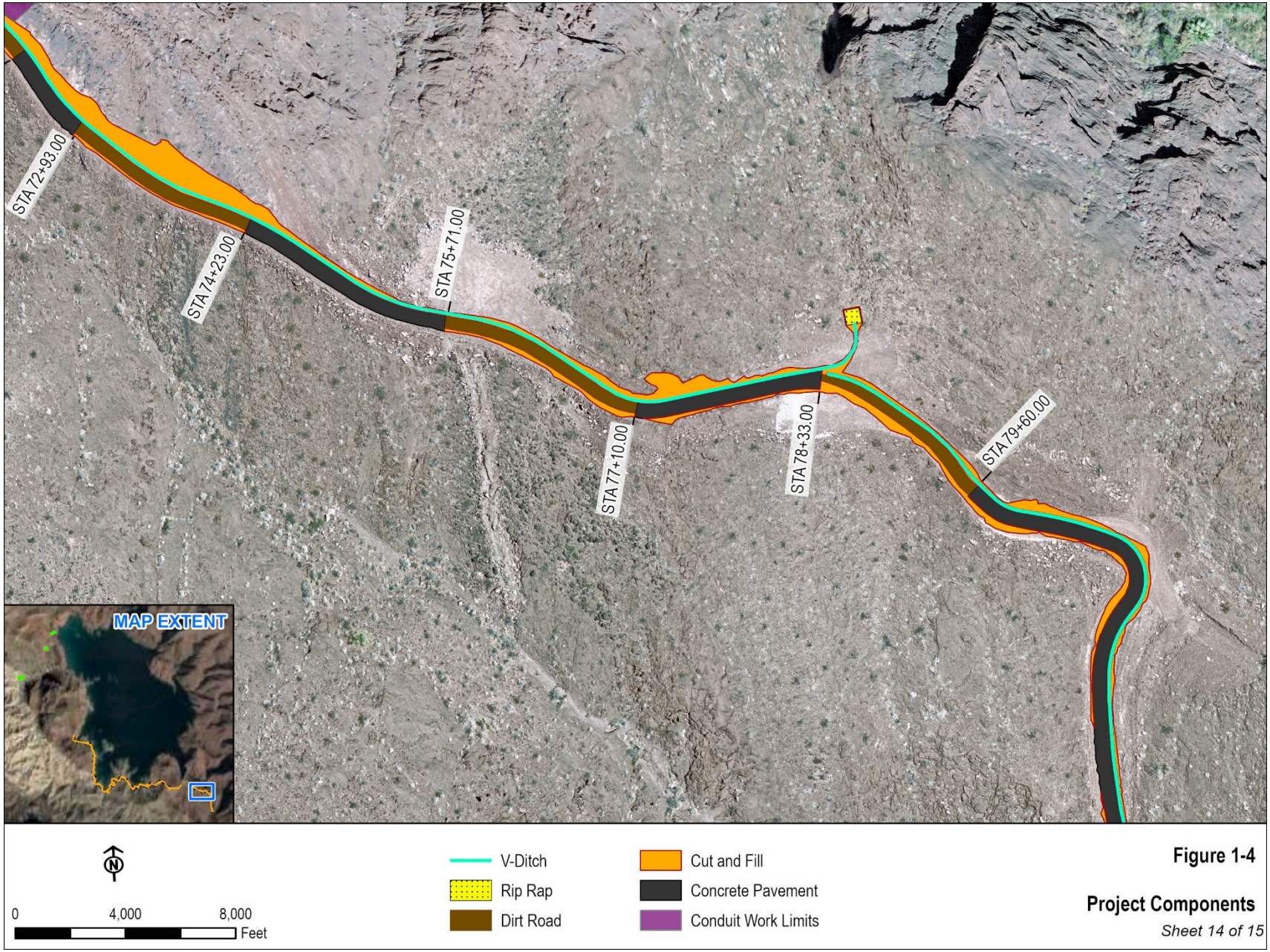
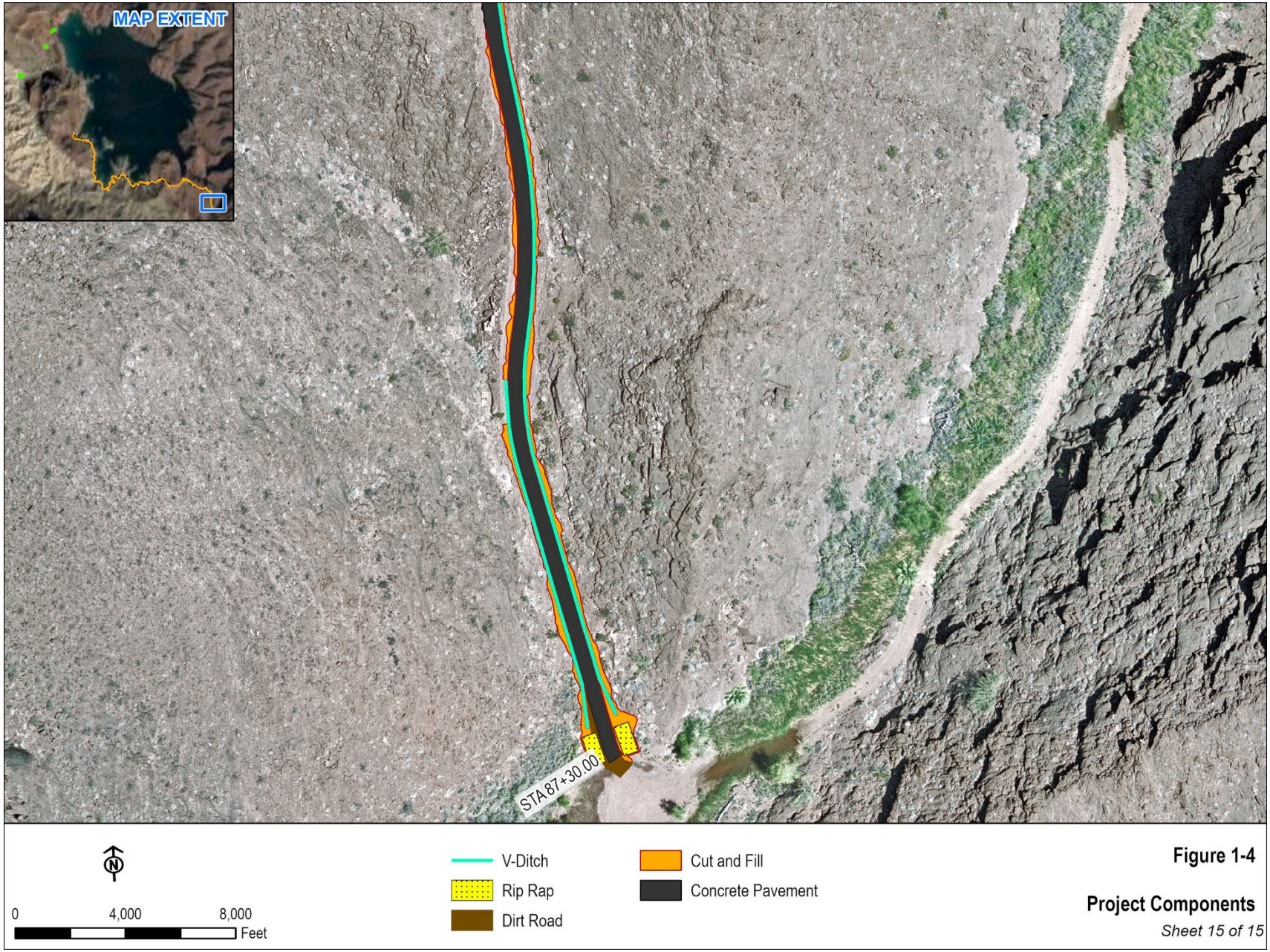



**Figure 1-4**

**Project Components**

*Sheet 14 of 15*


MAP EXTENT
STA 87+30.00
N
0
4,000
8,000
Feet
V-Ditch
Rip Rap
Dirt Road
Cut and Fill
Concrete Pavement
Figure 1-4
Project Components
Sheet 15 of 15

### 1.4.4 Construction Details

Construction is expected to take approximately two years. Construction activities would occur Monday through Thursday between 6:00 a.m. and 8:00 p.m. Construction equipment and materials would be transported to three staging locations (see Figure 1-2 and Figure 1-4; Sheet 1 through 3 of 15). Access to the overall Project area would occur via State Route 62 and U.S. Route 95 (US 95). From US 95, access to the Project site would be via Parker Dam Road, MWD Road, and Trail End Camp Road.

Construction would include a crew of approximately 18 people. One temporary construction trailer would be located within one of the staging areas. A generator may be used to provide temporary power for the construction trailer. Typical construction equipment required for Project construction would include backhoes, loaders, excavators, concrete pumps, dump trucks, and water trucks. Table 1-2 provides the Project construction details including location, Project components, construction duration, equipment, imports, exports, construction workers, and total disturbance area.

Due to the difficult terrain of the existing access road, the construction contractor would have the option of using a barge on Copper Basin Reservoir to transport materials, equipment, and personnel to the Project site. Potential barge access routes are identified in Figure 1-2. Off-site refueling may not be feasible due to the remote location of the Project. As such, fuel may be stored at the staging areas, and refueling may be done on site.

The construction contractor would likely mix concrete on site at one of the staging areas to produce gunite, as it is infeasible to regularly travel to the nearest concrete plant, which is approximately two to three hours away from Copper Basin Reservoir.

**Standard Construction Practices**

As part of standard construction practice, Metropolitan would incorporate a variety of standard measures as part of the proposed Project. These measures, which are defined in the contractor specifications, are included in and implemented as part of all Metropolitan construction projects. These practices are relatively standardized and/or compulsory (i.e., regulatory requirement); they represent sound and proven methods to reduce potential effects of construction activities. Specific standard construction practices identified for the proposed Project are discussed throughout the document.

## Table 1-2. Project Construction Details

| | Project Components | Construction Duration | Onsite Construction Equipment List | Imports | Exports | Construction Workers | Total Disturbance Area (Acres) |
|---|---|---|---|---|---|---|---|
| Access Road Improvements/ Laydown Areas | Vegetation Removal, Road Grading, Gunite Paving, Arizona Crossings, V-ditches and Outlet Structures | 6-12 months | 1-Rubber Tire Front Loader<br>1-Skip Loader<br>1-Backhoe<br>1-Excavator<br>1-Skid Steer<br>1-Dump Truck<br>1-Water Truck<br>1-Truck-Mounted Concrete Pump<br>2-Compressors<br>1-Water Truck | ▪ 750 CY concrete<br>▪ 9706 CY riprap | ▪ 0 | 10 | 4.66 |
| Electrical Upgrades | Transformer, Concrete Pads, Conduit, and Electrical Equipment | 4-6 months | 1-Backhoe<br>1-Excavator<br>1-Skid Steer<br>1-Water Truck<br>1-Small Concrete Pump<br>1-Compressor<br>1-Generator | ▪ 60 CY concrete | ▪ 145 CY earthen material | 6 | 0.63 |
| Valve House | Discharge Structure Rehabilitation, Weirs, Catwalk, Staircase | 6-12 months | 1-Backhoe<br>1-Skid Steer<br>1-Extendable Boom Forklift<br>1-Barge Mounted Crane<br>1-Compressor<br>1-Generator | 0 | 0 | 10 | 0.13 |
| Field Office | Staging | 1.5-2 years | 1-Generator | 0 | 0 | N/A | N/A |

### 1.4.5 Operation and Maintenance

Once the proposed Project is completed, California Division of Safety of Dams (DSOD) and Metropolitan would continue to conduct operations and maintenance (O&M) activities, including valve tests, at the Copper Basin Reservoir. Personnel required to support O&M activities would typically include approximately six to eight employees from Metropolitan and DSOD. Metropolitan would exercise the valve a maximum of twice per year. Valve testing is required by DSOD once every three years and consists of closing the slide gate valve and opening the discharge valve to exercise and discharge a small amount of water in the chamber between the two valves. These activities would require up to three vehicles utilizing the improved access road to reach Copper Basin Dam.

Weir measurements, which require one to two employees and one vehicle, would be taken at least one a month. Maintenance of the access road would be reduced after it is improved, as compared to the existing condition, because the proposed Project would minimize potential erosion issues. If the improved access road is damaged after a storm, loaders would be used to transport fill materials, and graders and scrapers would be used to smooth the roads.

## 1.5 Other Public Agency Approvals Required

Table 1-3 lists the anticipated permits and approvals which may be required for proposed Project-related activities.

**Table 1-3. Permits and Approvals Which May Be Required**

| Agency / Department | Permit / Approval | Description |
|---|---|---|
| **Federal** | | |
| U.S. Army Corps of Engineers (USACE) | Clean Water Act Section 404 Permit | Requires USACE to review impacts to "waters of the US" (bed, banks, channel, or associated riparian areas of a river, stream, or lake), including impacts to wildlife and vegetation from sediments, diversions, and other disturbances. |
| **State of California** | | |
| California Department of Fish and Wildlife (CDFW) | Streambed Alteration Agreement | Requires CDFW to review impacts to "waters of the state" (bed, banks, channel, or associated riparian areas of a river, stream, or lake), including impacts to wildlife and vegetation from sediments, diversions, and other disturbances. |
| Regional Water Quality Control Board (RWQCB) | General Construction Permit, Waste Discharge Requirements, and Clean Water Act Section 401 Permit | Project proponents are required to submit a Notice of Intent to the RWQCB for coverage under the General Construction Permit for activities with disturbance over 1 acre. Waste Discharge Requirements are necessary when non-federal "waters of the state" are present. Section 401 permits are necessary when Section 404 permits are required. |
| **Regional** | | |
| Mojave Desert Air Quality Management District (MDAQMD) | Fugitive Dust Control Plan | MDAQMD approval of Dust Control Plan consistent with requirements of MDAQMD Rule 403, which is applicable to construction activity or operations on disturbed surface areas. |

**Table 1-3. Permits and Approvals Which May Be Required**

| Agency / Department | Permit / Approval | Description |
|---|---|---|
| | Portable Equipment Registration or Air Quality Permit to Operate | Portable equipment subject to local air quality permitting requirements, such as generators or air compressors, must either be registered under the California Air Resources Board (CARB) Portable Equipment Registration Program (PERP) or obtain a local air quality permit to operate. |

# 2. Initial Study

This document is a proposed Initial Study and Mitigated Negative Declaration (IS/MND), which addresses the potential environmental effects resulting from the proposed Project.

## 2.1 Legal Authority and Findings

This Initial Study was prepared in accordance with the California Environmental Quality Act (CEQA) Guidelines and relevant provisions of CEQA of 1970, as amended.

**Initial Study**. Section 15063 of the CEQA Guidelines describes an Initial Study as a preliminary method for analyzing the potential environmental consequences of a project. The purposes of an Initial Study include:

(1) Providing the Lead Agency with the necessary information to decide whether to prepare an Environmental Impact Report (EIR) or a Negative Declaration;

(2) Enabling the Lead Agency to modify a project during the planning stage by mitigating adverse impacts prior to preparation of CEQA documentation, thus avoiding the need to prepare an EIR; and

(3) Providing documentation of the factual basis for the finding in a Mitigated Negative Declaration that the significant environmental impacts of a project have been mitigated to a less-than significant level.

**Negative Declaration or Mitigated Negative Declaration**. Section 15070 of the CEQA Guidelines states that a public agency shall prepare a Negative Declaration or Mitigated Negative Declaration for a project subject to CEQA when:

(a) The Initial Study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment; or

(b) The Initial Study identifies potentially significant effects but:

1. Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed Mitigated Negative Declaration and Initial Study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and

2. There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment.

An IS/MND may be used to satisfy the requirements of CEQA when a proposed project would have no significant unmitigable effects on the environment. As discussed further in subsequent sections of this document, implementation of the proposed Project would not result in any significant effects on the environment that cannot be reduced to below a level of significance with the mitigation measures included herein.

## 2.2 Impact Analysis and Significance Classification

The following sections of this IS/MND provide discussions of the possible environmental effects of the proposed Project for specific issue areas as identified on the CEQA Environmental Checklist

Form in Appendix G of the CEQA Guidelines (as updated in December 2018). For each issue area, potential effects are discussed and evaluated.

A "significant effect on the environment" is defined by Section 15382 of the CEQA Guidelines as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by a project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance." According to the CEQA Guidelines, "an economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant."

Following the evaluation of each environmental effect determined to be potentially significant is a discussion of mitigation measures and the residual effects or level of significance remaining after the implementation of the measures.

## 2.3 Initial Study and Environmental Checklist Form

| | | |
|---|---|---|
| a) | Project Title: | Copper Basin Discharge Valve Replacement and Access Road Improvements Project (proposed Project) |
| b) | Lead Agency Name and Address: | The Metropolitan Water District of Southern California<br>700 North Alameda Street<br>Los Angeles, CA 90012 |
| c) | Contact Person and Phone Number: | Daniel Cardoza<br>Environmental Specialist<br>The Metropolitan Water District of Southern California<br>(213) 217-5602 |
| d) | Project Location: | The proposed Project is located at Copper Basin Dam in the Colorado Desert, approximately 5 miles west of Parker Dam along the Colorado River and the border of between California and Arizona. The proposed Project is located within Metropolitan's fee property in unincorporated San Bernardino County. Figure 1-1 provides an overview of the Project location and components. |
| e) | Project Sponsor's Name and Address: | The Metropolitan Water District of Southern California<br>700 North Alameda Street<br>Los Angeles, CA 90012 |

| | | |
|---|---|---|
| f) | General Plan Designation: | The Project is in the eastern portion of unincorporated San Bernardino County's North Desert Region. The General Plan Designation is RLM (Resource/Land Management) (San Bernardino County, 2020a). |
| g) | Zoning: | The Project site is within the Resource Conservation Land Use Zoning District (San Bernardino County, 2022a). |
| h) | Description of Project: | Refer to Section 1 (Project Description). |
| i) | Surrounding Land Uses and Setting: | The proposed Project is in a remote area of the Colorado Desert predominantly surrounded by undeveloped open space. Public water supply infrastructure, including the Gene Pumping Plant and Gene Wash Reservoir, are approximately 3.3 miles northeast of Copper Basin Dam. |
| j) | Other Agencies Whose Approval May be Required: | Refer to Table 1-3. |
| k) | Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun? | Metropolitan has conducted consultation pursuant to Public Resources Code Section 21080.3.1 and has made an impact determination. See Section 3.18. |

## 2.4 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project, requiring implementation of mitigation. These environmental factors are indicated by "Less Than Significant With Mitigation Incorporated" in the checklists throughout Section 3.

| | | |
|---|---|---|
| ☐ Aesthetics | ☐ Agriculture & Forestry Resources | ☐ Air Quality |
| ☒ Biological Resources | ☐ Cultural Resources | ☐ Energy |
| ☐ Geology/Soils | ☐ Greenhouse Gas Emissions | ☐ Hazards & Hazardous Materials |
| ☐ Hydrology/Water Quality | ☐ Land Use/Planning | ☐ Mineral Resources |
| ☐ Noise | ☐ Population/Housing | ☐ Public Services |
| ☐ Recreation | ☐ Transportation | ☐ Tribal Cultural Resources |
| ☐ Utilities/Service Systems | ☐ Wildfire | ☒ Mandatory Findings of Significance |

## 2.5 Determination

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project may have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Jennifer Harriger

Jennifer Harriger
Manager, Environmental Planning Section

12-08-2022
Date

# 3. Evaluation of Environmental Impacts

The following discussion addresses impacts to various environmental resources, per the Environmental Checklist Form contained in Appendix G of the State CEQA Guidelines.

## 3.1 Aesthetics

| AESTHETICS<br>Except as provided in Public Resources Code Section 21099, would the project: | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway? | ☐ | ☐ | ☐ | ☒ |
| c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☐ | ☐ | ☒ |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Have a substantial adverse effect on a scenic vista?*

**No Impact**. The proposed Project would not have a substantial adverse effect on a scenic vista. A scenic vista is defined as a viewpoint that provides panoramic or focused views of a highly valued landscape or scenic resource for the benefit of the general public. The proposed Project is located in undeveloped desert lands adjacent to Copper Basin Dam. A portion of Trail End Camp Road (approximately 2.7 miles northeast of the Project) and Parker Dam Road (approximately 3.3 miles southeast of the Project) are the closest public roads to the Project site. These roads include views of open desert landscapes and parts of the Colorado River. No other public vantagepoints such as residential areas are located within or near the Project site. Additionally, Copper Basin Dam is not accessible to the public for recreational uses.

During construction of the proposed Project, construction equipment and workers would temporarily be present along the approximately 1.66-mile-long portion of the access road and dam; however, they would not be visible to the public due to the Project's distance from these public roads. Once construction is complete, the overall visual appearance of the Project site would be similar to existing conditions. The Project includes surface-level improvements such as vegetation removal, grading work, concrete installation, drainage improvements, and riprap installation along the access road, as well as replacement and rehabilitation of existing structures at the dam's discharge valve. Due to the Project's remote location and distance from public roads, these activities would have no effect on views of the desert landscape.

Therefore, the proposed Project would not result in adverse effects on a scenic vista or degrade the existing visual character or quality of the site or its surroundings. No impact would occur.

*b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?*

**No Impact**. The nearest eligible State scenic highway to the proposed Project is State Route 62 from Interstate 10 to San Bernardino County line (Caltrans, 2022). This freeway segment is located approximately 8.7 miles southwest of the proposed Project.

Given the access road's remote location and distance from State Route 62, Project activities would not be visible from the eligible State scenic highway. Construction activities at the dam would also not be visible due to the varying terrain and distance from State Route 62. All Project components such as the paved access road, riprap, V-ditches, and discharge rehabilitation activities would result in similar visual conditions when construction is complete. The Project would not damage or alter existing views within a State scenic highway and no impacts would occur.

*c. In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

**No Impact**. The proposed Project is located in a non-urbanized area and would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. The nearest public roads to the Project site include a portion of Trail End Camp Road (approximately 2.7 miles northeast of the Project) and Parker Dam Road (approximately 3.3 miles southeast of the Project). These roads include views of open desert landscapes and parts of the Colorado River. Immediate views of the Project site are not accessible to the general public, as Copper Basin Reservoir is not open to the public for recreational uses. The proposed Project would temporarily introduce construction equipment to portions of the access road and at the dam. New components such as riprap, V-ditches, and gunite concrete paving would not substantially change or degrade the existing visual character of the access road, as these components would be at-grade, of natural colors, and unobtrusive. Dam valve replacement components would be similar to existing dam infrastructure. Given the distances of the Project to public viewsheds, the Project would not be visible when viewed from public roads. Therefore, the proposed Project would not degrade the visual character or quality of the site or its surroundings, and no impact would occur.

*d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*

**Less than Significant Impact**. The proposed Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. The proposed Project would not add or alter any permanent light sources. The Project may require temporary nighttime lighting for construction activities that may occur in the evening. However, the use of such lighting would be temporary, likely limited to the temporary construction trailer and work sites, and only required until 8:00 p.m., as needed. Once the Project is completed, no impacts from light sources would occur. No new structures with reflective surfaces would be constructed, and the Project would not generate new sources of daytime glare. As a result, impacts would be less than significant.

## 3.2 Agricultural Resources

### AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

| | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? | ☐ | ☐ | ☐ | ☒ |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*

**No Impact**. According to the California Department of Conservation (DOC), no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance exist within the Project area (DOC, 2022). As such, no impacts to Prime Farmland, Unique Farmland, or Farmland of Statewide Importance would occur as a result of the proposed Project.

*b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

**No Impact.** The proposed Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. The proposed Project is within the County of San Bernardino's Resource Conservation Land Use Zoning District (San Bernardino County, 2022a). This zoning designation provides for open space and recreational activities, single-family homes on large parcels, and similar compatible uses (San Bernardino County, 2009); there is no zoning for agricultural use. Furthermore, the proposed Project does not contain any Williamson Act contract

lands. Therefore, the proposed Project would not conflict with existing zoning designations for agricultural lands or Williamson Act contract lands, and no impacts would occur.

*c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*

**No Impact**. The proposed Project would not conflict with existing zoning for, or cause rezoning of forest land, timberland or timberland zoned Timberland Production. The proposed Project site is within the County of San Bernardino's Resource Conservation Land Use Zoning District (San Bernardino County, 2022a). The proposed Project does not contain a General Plan or zoning designation for forest land or timberland and is not located within a designated Timberland Production zone. Therefore, the proposed Project would not result in the loss of forest land, timberland, or timberland production areas since none exist within the site or in the surrounding areas. No impacts pertaining to zoning for forest land or timberland would occur.

*d. Result in the loss of forest land or conversion of forest land to non-forest use?*

**No Impact**. As discussed in Section 3.2.c, the Project site does not contain forest land; therefore, the proposed Project would not result in the conversion or loss of forest land. No impacts related to the loss of forest land or conversion of forest land to non-forest use would occur.

*e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*

**No Impact**. As discussed in Sections 3.2.a through 3.2.c, the Project site does not contain farmland or forest land; therefore, the proposed Project would not result in the conversion or loss of agriculture or forest land. No impacts related to the conversion of farmland would occur.

## 3.3 Air Quality

| **AIR QUALITY**<br>Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☒ | ☐ |
| b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard? | ☐ | ☐ | ☒ | ☐ |
| c) Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☐ | ☒ |
| d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion. Would the project:***

*a. Conflict with or obstruct implementation of the applicable air quality plan?*

**Less than Significant Impact**. The proposed Project would not conflict with or obstruct implementation of the applicable air quality plan. The proposed Project is located within the Mojave Desert Air Basin (MDAB), which includes desert portions of San Bernardino County within the jurisdictional boundaries of the Mojave Desert Air Quality Management District (MDAQMD). The MDAQMD has developed federal attainment plans under the Federal Clean Air Act for ozone and PM10 (particulate matter 10 micrometers or less in diameter). The most recent attainment plans were adopted in 2004 and 2017 for nitrogen oxides (NOx) and volatile organic compound (VOC) emissions to meet federal eight- and one-hour ozone targets, respectively (MDAQMD, 2020).

The proposed Project does not include permanent stationary emissions sources regulated by MDAQMD, and therefore, regulations pertaining to permanent emission sources do not apply to the Project. The proposed Project would comply with all applicable MDAQMD rules and regulations pertaining to temporary construction emission sources, including Rule 403, which reduces fugitive dust emissions.

The proposed Project would not create new facilities and, therefore, would not directly or indirectly cause growth beyond the regional growth projections. Therefore, the proposed Project would not conflict with or obstruct the applicable air quality plan. The proposed Project would have less than significant impacts related to air quality plan compliance.

*b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?*

**Less than Significant Impact.** The proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or State ambient air quality standard. The proposed Project is located in the MDAB, which is in non-attainment for federal and state ozone and PM10 ambient air quality standards, as well as state annual PM2.5 (particulate matter 2.5 micrometers or less in diameter) standards. MDAQMD's CEQA Guidelines specifies emissions significance thresholds (MDAQMD, 2020).

The proposed Project would generate short-term air pollutant emissions during construction activities, which were calculated using the California Emissions Estimator Model (CalEEMod), which is recommended by the MDAQMD. The analysis was conducted in April 2022 and revised in July 2022. Table 1-2 in Section 1.4, Proposed Project, provides additional details and construction assumptions used in the Project's emission calculations.

Construction activities were grouped by activity for the air quality analysis and mass rates of emissions were reported for each year of activity with the maximum daily emissions. A breakdown of activities leading to maximum daily emissions is shown in Appendix A. Table 3.3-1 presents the estimated maximum daily air pollutant emissions for the year with the highest emissions, as calculated with CalEEMod prior to considering the dust control requirements of MDAQMD Rule 403.

**Table 3.3-1. Construction Emissions, Uncontrolled (lbs/day)**

| Construction Emissions | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 |
|---|---|---|---|---|---|---|
| Maximum Daily Construction Emissions | 4.9 | 39.8 | 54.7 | 0.1 | 115.5 | 13.5 |
| MDAQMD Significance Thresholds | 137 | 137 | 548 | 137 | 82 | 65 |
| *Significant (Exceeds Thresholds)?* | *NO* | *NO* | *NO* | *NO* | *YES* | *NO* |

Notes: ROG (reactive organic gases), $NO_X$ (nitrogen oxides), CO (carbon monoxide), $SO_X$ (sulfur oxides), PM10 (particulate matter 10 micrometers or less in diameter), PM2.5 (particulate matter 2.5 micrometers or less in diameter).

Source: Appendix A; MDAQMD, 2020.

Worst-case, uncontrolled maximum-daily construction emissions shown in Table 3.3-1 would exceed the MDAQMD significance thresholds for PM10. However, separate emission calculations show the results of applying the mandatory dust controls in compliance with Rule 403. Table 3.3-2 shows the maximum-daily construction emissions after considering the dust control requirements of Rule 403, such as the use of dust suppressants or watering unpaved disturbed surface areas.

**Table 3.3-2. Construction Emissions, Controlled (lbs/day)**

| Construction Emissions | ROG | $NO_X$ | CO | $SO_X$ | PM10 | PM2.5 |
|---|---|---|---|---|---|---|
| Maximum Daily Construction Emissions | 4.9 | 39.8 | 54.7 | 0.1 | 54.5 | 7.5 |
| MDAQMD Significance Thresholds | 137 | 137 | 548 | 137 | 82 | 65 |
| *Significant (Exceeds Thresholds)?* | *NO* | *NO* | *NO* | *NO* | *NO* | *NO* |

Notes: ROG (reactive organic gases), $NO_X$ (nitrogen oxides), CO (carbon monoxide), $SO_X$ (sulfur oxides), PM10 (particulate matter 10 micrometers or less in diameter), PM2.5 (particulate matter 2.5 micrometers or less in diameter).

Source: Appendix A; MDAQMD, 2020.

The standard construction measures for the proposed Project would include compliance with MDAQMD Rule 403 to avoid and minimize visible fugitive dust emissions. The mandatory dust control measures for compliance with MDAQMD Rule 403 could include but would not be limited to:

- Use periodic watering for short-term stabilization of disturbed surface area to minimize visible fugitive dust emissions. Use of a water truck to maintain moist disturbed surfaces and actively spread water during visible dusting episodes shall be considered sufficient to maintain compliance;
- Take actions sufficient to prevent Project-related track-out onto paved surfaces;
- Cover loaded haul vehicles while operating on publicly maintained paved surfaces;
- Stabilize graded site surfaces upon completion of grading when subsequent development is delayed or expected to be delayed more than thirty days, except when such delay is due to precipitation that dampens the disturbed surface sufficiently to eliminate visible fugitive dust emissions;
- Cleanup Project-related track-out or spills on publicly maintained paved surfaces within twenty-four hours;
- Maintain the natural topography to the extent possible during grading and other earth movement;
- Cover or otherwise contain bulk material carried on haul trucks operating on paved roads; and
- Remove bulk material tracked onto paved road surfaces.

The construction contractor would have the option of using a barge on the Copper Basin Reservoir for material and equipment transport to avoid travel on the difficult terrain of the access road. If a barge is used, the contractor would likely avoid some diesel truck usage and other vehicle travel on the existing access road. As a result, barging would likely reduce overall on-road travel and related vehicular emissions. Barging would reduce NOx emissions and other combustion-related emissions and would avoid fugitive dust emissions from on-road truck travel. The emission calculations presented here include the use of a barge without quantifying the potential reductions in truck and vehicle travel. As a result, the emissions specified in Table 3.3-1 and Table 3.3-2 would be a conservative overestimate.

The proposed Project would not change existing operation and maintenance activities, so operational emissions have not been calculated. Therefore, the emissions associated with the proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant with implementation of mandatory dust control measures in compliance with MDAQMD Rule 403, and impacts would be less than significant.

*c. Expose sensitive receptors to substantial pollutant concentrations?*

**No Impact**. The proposed Project would not expose sensitive receptors to substantial pollutant concentrations. The MDAQMD defines sensitive receptors as schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent homes, hospitals, retirement homes, and residences. Specified distances to a planned land used must be evaluated if it falls under any of the following categories: industrial project, distribution center, major transportation project, dry cleaner, or gasoline dispensing facility. The proposed Project does not fit into these categories and the nearest sensitive receptors are residences are located approximately 3.3 miles southeast of the Project site in the unincorporated community of Earp. In addition, as presented in Table 3.3-1, the proposed Project's daily emissions would be less than the MDAQMD's significance thresholds.

The proposed Project would produce toxic air contaminants (TAC) emissions, primarily in the form of diesel particulate matter, during the short-term construction period. However, the quantity of TAC emissions during construction would be minimal and limited only to the duration of construction and the nearest sensitive receptor is approximately 3.3 miles from the Project site. TACs would not be produced during operations and maintenance. Therefore, the proposed Project would not expose sensitive receptors to substantial pollutant concentrations and no impacts would occur.

*d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*

**No Impact**. The proposed Project would not result in other emissions adversely affecting a substantial number of people. The proposed Project is located in a remote desert landscape within Metropolitan's fee property. The proposed Project would generate oil and diesel fuel odors from operating heavy equipment during construction activities. However, these odors would be localized, limited to the duration of the construction activities and would dissipate within a short distance. In addition, the nearest concentration of people are residences approximately 3.3 miles away. There would be no other emissions as a result of operations and maintenance. Accordingly, the proposed Project would not result in other emissions, such as those leading to odors, adversely affecting a substantial number of people, and no impact would occur.

## 3.4 Biological Resources

| BIOLOGICAL RESOURCES<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| a) 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 Game or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |
| c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | ☐ | ☒ | ☐ | ☐ |
| d) 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? | ☐ | ☐ | ☒ | ☐ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☒ | ☐ |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

### Overview of Biological Resources

The biological resources information presented below is summarized from the Biological Resources Technical Report and the Aquatic Resources Delineation Report (see Appendix B.1 and B.2). These reports document existing conditions and evaluate the potential for impacts to biological resources to occur during implementation of the proposed Project. Regulated or sensitive resources studied and analyzed herein include special-status plant and wildlife species, nesting birds and raptors, sensitive vegetation communities, jurisdictional waters and wetlands, wildlife movement, and locally protected resources, such as native and mature trees.

### Regulatory Framework

The following is a summary of the regulatory context under which biological resources are managed at the federal, state, and local levels. Many federal and state statutes provide a regulatory structure that guides the protection of biological resources. Agencies with the responsibility for protection of biological resources within the Project area include:

- United States Army Corps of Engineers (USACE) (wetlands and other waters of the United States as defined under Section 404 of the Clean Water Act [CWA]);
- Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) (waters of the State as defined under Section 401 of the CWA);

- United States Fish and Wildlife Service (USFWS) (federally listed as threatened [FT] or endangered [FE] species, species afforded protection under the Bald and Golden Eagle Protection Act [BGEPA], and migratory birds receiving protection under the Migratory Bird Treaty Act [MBTA]); and
- California Department of Fish and Wildlife (CDFW) (riparian areas and other waters of the State as regulated under Sections 1600-1617 of the California Fish and Game Code; sensitive vegetation communities; state listed as threatened [ST], endangered [SE], or candidate [SC] species; species designated as Fully Protected [FP] under Sections 3511, 4700, 5050, or 5515 of the California Fish and Game Code; animals designated as Species of Special Concern [SSC]; and other Special Animals [SA] tracked by the California Natural Diversity Database [CNDDB]).
- California Native Plant Society (CNPS) (plants designated as California Rare Plant Rank [CRPR] 1B or 2B).

Sensitive vegetation communities are vegetation types, associations, or sub-associations that support concentrations of special-status plant or wildlife species, are of relatively limited distribution, or are of particular value to wildlife.

Listed species are those taxa that are formally designated as federally endangered or threatened by USFWS, pursuant to the Federal Endangered Species Act (FESA) or as state endangered, threatened, or rare (for plants only) by CDFW pursuant to the California Endangered Species Act (CESA) or the California Native Plant Protection Act. CDFW Fully Protected species are considered rare or facing possible extinction and receive additional protection under Sections 3511, 4700, 5050, or 5515 of the California Fish and Game Code while Species of Special Concern are those species, subspecies, or distinct populations of an animal native to California that are considered for protection by CDFW for a variety of reasons, such as population declines or range restrictions. “Special Animals” is a broad term used to refer to all the animal taxa tracked by the CNDDB, regardless of their legal or protection status. The Special Animals list includes taxa that are biologically rare, very restricted in distribution, or declining throughout their range, but not currently threatened with extirpation. Some species are considered rare (but not formally listed) by resource agencies, organizations with biological interests/expertise (e.g., Audubon Society, The Wildlife Society, etc.), and the scientific community.

**Methodology**

Biological conditions were evaluated by confirming applicable regulations, policies, and standards; reviewing biological literature and querying available databases relevant to the Project area and vicinity (within five miles for CDFW’s CNDDB and within the four topographic quadrangles that encompass the Project area or are located immediately adjacent for CNPS); and conducting reconnaissance-level and focused surveys at the three staging areas northwest of the reservoir and within a 50-foot to 300-foot survey area along the access road (width varied based on proposed activities and level of anticipated disturbance).

Prior to conducting field surveys, a review of existing literature sources, including a search of the CNPS Inventory of Rare and Endangered Plants of California, California Consortium of Herbariums, and the CNDDB for the Cross Roads, Parker, Whipple Wash, and Gene Wash United

States Geological Survey (USGS) 7.5-minute topographic quadrangle maps, was performed (CNPS, 2021; CCH, 2021; CDFW, 2022a).

Reconnaissance-level biological surveys were conducted on March 29 and 30, 2021. These surveys focused on assessing the potential for the Project area to support special-status species, searching for any special-status plants and wildlife, and identifying any potential jurisdictional wetlands or other waters. Floristic surveys for special-status plants were performed on March 15 and 16, 2022. A delineation of federal and state waters was also conducted during this time. Protocol-level surveys for southwestern willow flycatcher (*Empidonax traillii extimus*) and Arizona Bell's vireo (*Vireo bellii arizonae*) were conducted between May and July and April and July 2022, respectively. Visual and acoustic surveys for special-status bats were completed between March and August 2022.

**Existing Conditions**

The Project area is located within the Colorado Desert region, which is a subdivision of the larger Sonoran Desert. The Colorado Desert region covers approximately 7 million acres, which is a small portion of the Colorado River drainage that spans Arizona, Nevada, Utah, Wyoming, Colorado, New Mexico, and portions of northwestern Mexico. The region consists of rolling hills, steep ridges, mountain peaks, and numerous ephemeral drainages that convey flow towards the Colorado River. On a more local scale, the Project would be constructed at the Copper Basin Reservoir, a large manmade reservoir located on lands owned and managed by Metropolitan. Copper Basin is in the Whipple Mountains, a small mountain range located west of the Colorado River. The elevation of the Project area varies from 970 feet above mean sea level (amsl) below the reservoir in Copper Basin Wash, to approximately 1230 feet amsl along the access road.

The topography of the area is complex and includes alluvial plains, steep mountainous slopes, and rocky terrain. Below the reservoir is the Copper Basin Wash, a narrow canyon with nearly vertical walls. Access to the Project would occur along existing paved and unpaved roads including the Trail End Camp Road and a dirt road which runs from the west end of the reservoir to Copper Basin Wash. Trail End Camp Road is subject to daily vehicle and truck traffic to support operation of the Metropolitan facility.

Four native vegetation alliances and two additional land cover types were identified within the proposed Project area (see Figures 2a through 2e in Appendix B.1). The majority of the proposed Project area is characterized as saguaro – foothill palo verde-velvet mesquite desert scrub (*Carnegiea gigantea-Parkinsonia microphylla-Prosopis velutina* Provisional Shrubland Alliance). This habitat typically supports xeric desert vegetation dominated by yellow paloverde (*Parkinsonia microphylla*), creosote bush (*Larrea tridentata*), and various species of cactus. This community occurs along the access road or is growing on the steep rocky slopes surrounding the Project area. Vegetation in the Copper Basin Wash, located downstream of the dam, consists of Fremont cottonwood forest and woodland (*Populus fremontii-Fraxinus velutina-Salix gooddingii* Forest and Woodland Alliance) which is a mesic riparian community dominated by Fremont cottonwood (*Populus fremontii*), willows (*Salix* spp.), multiple species of palms (including *Phoenix canariensis* [Canary Island palm] and *Washingtonia filifera* [California fan palm]), and tamarisk (*Tamarix ramosissima*). A low-flow channel is dominated by arrow weed thickets (*Pluchea sericea* Shrubland Alliance) and cattail marshes (*Typha [angustifolia, domingensis, latifolia]* Herbaceous Alliance) and other species of hydrophytic vegetation. Additional land cover

types that were mapped in the proposed Project area include open water and developed/disturbed lands.

Drainage features are present throughout the Project area. Ephemeral desert dry washes occur along the access road along the western portion of the Project area. Below the dam is Copper Basin Wash, a narrow perennial feature that supports wetlands and riparian habitat (see Appendix B.2). This drainage is fed from seepage at the dam which is conveyed parallel to the road in a manmade channel. In addition, a small pool is present at the base of the dam that is crossed by a series of wooden catwalks. The ephemeral drainage features that typically occur in the Project area support surface flows only during or immediately after large rain events, whereas Copper Basin Wash, the only perennial drainage feature in the Project area, supports surface flows year-round due to seepage from the dam. An existing road provides access below the dam which may cross portions of the drainage.

No state or federally listed plants were observed during surveys and none are expected to occur in the proposed Project area. Focused surveys identified the presence of four non-listed special-status plants, including rough-stemmed forget-me-not (*Cryptantha [Johnstonella] holoptera*) (CRPR 4.3), Darlington's blazing star (*Mentzelia puberula*) (CRPR 2B.2), yellow paloverde (*Parkinsonia microphylla*) (CRPR 4.3), and desert beardtongue (*Penstemon pseudospectabilis* ssp. *pseudospectabilis*) (CRPR 2B.2) (see Figures 3-2a through 3-2i in Appendix B.1). Saguaro (*Carnegiea gigantea*) (CRPR 2B.2) was observed in adjacent upland habitat during the 2021 and 2022 field surveys, but not within the proposed Project area. The literature review identified an additional 23 special-status plant species that have been recorded within the four USGS 7.5-minute quads associated with the proposed Project area. Of these, 11 were determined to have the potential to occur (see Appendix B.1).

Common wildlife observed during the surveys primarily consisted of common invertebrate, fish, reptile, bird, and mammal species, including side-blotched lizard (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), mourning dove (*Zenaida macroura*), greater roadrunner (*Geococcyx californianus*), common raven (*Corvus corax*), desert cottontail (*Sylvilagus audubonii*), gray fox (*Urocyon cinereoargenteus*), and bobcat (*Lynx rufus*), among several others (see Appendix B.1).

Based on the literature review, 39 special-status wildlife species have been documented within the four USGS 7.5-minute quads associated with the proposed Project area. A total of ten of these were observed or detected during the 2021 and 2022 reconnaissance and protocol level surveys. These include Costa's hummingbird (*Calypte costae*) (SA), willow flycatcher (*Empidonax traillii*) (SE), Lucy's warbler (*Leiothlypis lucae*) (SSC), loggerhead shrike (*Lanius ludovicianus*) (SSC), burrowing owl (*Athene cunicularia*) (SSC), American peregrine falcon (*Falco peregrinus anatum*) (FP), bald eagle (*Haliaeetus leucocephalus*) (BGEPA, SE, FP), double-crested cormorant (*Nannopterum auritum*) (SA), desert bighorn sheep (*Ovis canadensis*) (FP), and Yuma myotis (*Myotis yumanensis*) (SA) (see Figures 3a through 3i in Appendix B.1).

An additional 17 of these species were determined to have a moderate to high potential to occur (see Appendix B.1). These include federally and/or state listed species, such as Mojave desert tortoise (*Gopherus agassizii*) (FT, ST), Gila woodpecker (*Melanerpes uropygialis*) (SE), Yuma Ridgway's rail (*Rallus obsoletus yumanensis*) (FE, ST, FP), Arizona Bell's vireo (SE), and mountain lion (*Puma concolor*) (SC).

Special-status wildlife with a moderate to high potential to occur also include CDFW Fully Protected species, such as golden eagle (*Aquila chrysaetos*) (BGEPA, FP), ringtail (*Bassariscus astutus*) (FP), and desert kit fox (*Vulpes macrotis arsipus*) (FP).

Species of Special Concern and CDFW Special Animals that were not observed during surveys but have the potential to occur include banded Gila monster (*Heloderma suspectum cinctum*) (SSC), yellow-breasted chat (*Icteria virens*) (SSC), vermilion flycatcher (*Pyrocephalus rubinus*) (SSC), and American badger (*Taxidea taxus*) (SSC). In addition to Yuma myotis, discussed above, five other special-status bat species also could potentially occur in the proposed Project area, including pallid bat (*Antrozous pallidus*) (SSC), Townsend's big-eared bat (*Corynorhinus townsendii*) (SSC), western mastiff bat (*Eumops perotis californicus*) (SSC), California leaf-nosed bat (*Macrotus californicus*) (SSC), and cave myotis (*Myotis velifer*) (SSC).

Special-status plant and wildlife species and an analysis of their potential to occur within the proposed Project area are discussed in further detail below.

**Metropolitan Standard Practices**

**Environmental Assessment.** As an internal practice, Metropolitan conducts Environmental Assessments or similar studies prior to Project commencement to determine if any resources have the potential to be present at each Project site. The Environmental Assessment evaluates the potential for impacts to all biological resources including, but not limited to special-status species, nesting birds, wildlife movement, sensitive plant communities/critical habitat, potentially jurisdictional features, and other resources, policies, plans, or ordinances, determined to be sensitive by local, state, and/or federal agencies. The Environmental Assessment also includes habitat assessments for special-status plants and wildlife and identifies avoidance measures or further technical studies, surveys, or consultations with state, federal, or local agencies that may be needed to reduce impacts to biological resources.

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

**Desert Tortoise Awareness Training.** Metropolitan conducts Desert Tortoise Awareness Training for all Metropolitan staff and contractors working at Metropolitan's desert facilities. Desert Tortoise Awareness Training consists of a presentation and handout discussing the protected status of the desert tortoise and its habitat, predators, and avoidance measures. Avoidance measures include, but are not limited to the following:

- Work areas shall be delineated with flagging if determined necessary by the qualified staff person.
- Access to project sites shall be restricted to designated existing routes of travel.

- Workers shall inspect for tortoises under vehicles and equipment prior to use. If a tortoise is present, workers would only move the vehicle when the tortoise would not be injured by the vehicle or would wait for the tortoise to move out from under the vehicle.

**Nesting Bird Surveys.** To achieve compliance with the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503, 3503.5, and 3513, Metropolitan routinely performs surveys for nesting birds on projects that occur during the bird breeding season. Nesting bird surveys will include burrowing owl, which shall follow the protocols set forth in the Staff Report on Burrowing Owl Mitigation (CDFW, 2012). Survey timeframes vary depending on a project's geographic location. For Project activities occurring during the nesting season in the Mojave Desert (from January 15 through August 31 for raptors and hummingbirds and from March 15 through August 31 for other bird species), surveys for nesting birds would be conducted by a monitoring biologist no more than 72 hours prior to vegetation removal or earth-moving activities.

The survey area for all nesting bird surveys includes the applicable Project site and an appropriate buffer, as determined by the monitoring biologist. If active nests (i.e., nests with eggs or chicks) are located, the monitoring biologist would establish an appropriate avoidance buffer based on the species' biology and the current and anticipated disturbance levels occurring in the vicinity of the nest. The size of the buffer may be influenced by the existing conditions and disturbance regime, relevant landscape characteristics, and the nature, timing and duration of the expected disturbance. All buffers would be marked with high-visibility flagging or fencing, and, unless approved by the monitoring biologist, no Project activities would be allowed within the buffers until the young have fledged from the nest or the nest fails. Documentation of nesting bird surveys and nest monitoring (if applicable) would be prepared prior to the start of Project activities.

**Temporary Work Area.** As a standard internal practice, Metropolitan staff implements measures to ensure that all construction-related temporary work areas associated with both capital projects and operations and maintenance activities are returned to pre-Project conditions following the completion of construction activities. These measures include, but are not limited to:

- The temporary work area shall be the minimum amount necessary to complete the Project.
- Vegetation within the temporary work area shall be avoided, when feasible.
- The temporary work area shall be returned to pre-construction contours.
- The temporary work area shall include appropriate BMPs and/or be revegetated following the completion of construction activities, if deemed necessary.

***Discussion*. Would the project:**

a. *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 Game or U.S. Fish and Wildlife Service?*

**Less than Significant Impact with Mitigation Incorporated.** The proposed Project would not 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 CDFW or USFWS with incorporation of mitigation measures.

### Special-Status Plant Species

No federal or state listed plant species were observed in the proposed Project area during the 2021 reconnaissance-level surveys and 2022 focused plant surveys and none are expected to occur. The literature search did not indicate that federal or state listed plants have been reported within the proposed Project area or surrounding vicinity (CNPS, 2021; CCH, 2021; CDFW, 2022a, CDFW, 2022a; CNPS, 2022; USFWS, 2022). There is no designated critical habitat for any federally-listed plants within the proposed Project area or the immediate vicinity. Therefore, impacts to federal or state listed plants would not occur.

Five non-listed special-status plant species were observed in or near the proposed Project area during the surveys. These include saguaro, Darlington's blazing star, and desert beardtongue, which are designated as CRPR 2B species. CRPR 2B species are plants that are considered rare, threatened, or endangered in California but more common elsewhere. Rough-stemmed forget-me-not and yellow paloverde were also observed during surveys; however, these species are designated as CRPR 4.3 and are not afforded protection under CEQA.

The field surveys were performed during the appropriate season in 2021 and 2022, but the area received lower than average annual precipitation for the rainfall year of 2022 (July 1 through June 30). Approximately 14 percent of normal rainfall was recorded within the vicinity of the proposed Project in 2021, and approximately 20 percent of normal rainfall has currently been recorded in 2022 (NOAA, 2022). In addition to the species observed during surveys, an additional six special-status plants were determined to have a moderate to high potential to occur based on the presence of suitable habitat and documented occurrences in the region. Of these, five are defined as CRPR 2B species. These include bare-stem larkspur (*Delphinium scaposum*), Graham fishhook cactus (*Mammillaria grahamii* var. *grahamii*), narrow-leafed psorothamnus (*Psorothamnus fremontii* var. *attenuatus*), Cove's cassia (*Senna covesii*), and desert germander (*Teucrium glandulosum*). Table 3.4-1 lists the special-status plant species, which are discussed further below, that were observed or have a moderate to high potential to occur within the proposed Project area.

**Table 3.4-1 – Special-Status Plants with Potential to Occur in the Proposed Project Area**

| Common Name | Scientific Name | Status |
|---|---|---|
| Saguaro | *Carnegiea gigantea* | CRPR 2B.2 |
| Bare-stem larkspur | *Delphinium scaposum* | CRPR 2B.3 |
| Graham fishhook cactus | *Mammillaria grahamii* var. *grahamii* | CRPR 2B.2 |
| Darlington's blazing star | *Mentzelia puberula* | CRPR 2B.2 |
| Desert beardtongue | *Penstemon pseudospectabilis* ssp. *pseudospectabilis* | CRPR 2B.2 |
| Narrow-leaved psorothamnus | *Psorothamnus fremontii* var. *attenuatus* | CRPR 2B.3 |
| Cove's cassia | *Senna covesii* | CRPR 2B.2 |
| Desert germander | *Teucrium glandulosum* | CRPR 2B.3 |

Notes: Ranks at each CRPR level also include a threat rank (e.g., 2B.2 or 2B.3) an are determined as follows: 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 (less than 20% of occurrences threatened/low degree of immediacy of threat or no current threats known).

Saguaro and Graham fishhook cactus are highly conspicuous, perennial species that are identifiable year-round. Each of these are typically associated with Sonoran desert scrub habitat with rocky substrates. Numerous saguaro individuals were observed in adjacent uplands during the 2021 and 2022 surveys, but none were identified within the proposed Project area. Suitable habitat for Graham fishhook cactus is present within and adjacent to the proposed Project area and the species has been documented along the Metropolitan Road between Gene Wash Reservoir and Copper Basin Reservoir (CDFW, 2022a; iNaturalist, 2021). Narrow-leaved psorothamnus is a perennial bush associated with granitic and volcanic soils and Cove's cassia is a perennial herb associated with dry, sandy desert washes and slopes. Each of these species are typically associated with Sonoran desert scrub habitats and there are several occurrence records for narrow-leaved psorothamnus and Cove's cassia from the Whipple Mountains within five miles east of Copper Basin Reservoir (CDFW, 2022a; iNaturalist, 2021). Although each of these conspicuous species are known from the area, none were observed within the proposed Project area during 2022 focused plant surveys. Consequently, direct impacts to these species are not anticipated to occur.

Approximately five Darlington's blazing star and ten desert beardtongue individual plants were observed along the access road downstream of the Copper Basin Dam (see Figures 3a through 3i in Appendix B.1). These plants were detected in adjacent uplands and except for one Darlington's blazing star that was found in the existing road, are not expected to be subject to direct impacts from vegetation clearing, road grading, or working in the riparian corridor below the Copper Basin Dam. These species were not detected in any other work areas. It is expected that individual annual plants in the roadbed would likely persist in the seedbank in areas not subject to ground-disturbance or would colonize the area following construction from adjacent occurrences.

As previously mentioned, annual precipitation levels were below average during the focused plant surveys conducted in 2022. Although bare-stem larkspur and desert germander were not observed during these surveys, they would be more likely to germinate or flower during years with higher levels of rainfall. Bare-stem larkspur is an underground perennial bulb that occurs in rocky substrates and desert washes within Sonoran desert scrub habitat. This species is known from the Whipple Mountains and has been documented along the Metropolitan Road between Gene Wash Reservoir and Copper Basin Reservoir. Desert germander is an annual herb that also occurs in rocky substrates within Sonoran desert scrub habitat. There are historic records located along the western edge of Copper Basin Reservoir and more recent records in the foothills of the Whipple Mountains less than two miles east of the reservoir (CDFW, 2022a). Based on the presence of suitable habitat in and near the proposed Project area and nearby occurrences, there is a moderate potential for these species to occur.

Special-status plants that are known to occur, including Darlington's blazing star and desert beardtongue, may be encountered if current populations expand into proposed Project work areas or if new occurrences of species, such as bare-stem larkspur and desert germander, are identified in proposed Project work areas following a year of adequate rainfall. However, it is not possible to determine if these species would be present.

If present, direct impacts to special-status plants could include trampling or crushing from heavy equipment, vehicles, or foot traffic, alterations to the native seed bank due to soil compaction, and

modifications to existing hydrological conditions. Indirect impacts could include the disruption of native seed banks through soil alterations, the accumulation of fugitive dust, increased erosion and sediment transport, and the colonization of non-native, invasive plant species. Excessive dust can decrease or limit plant survivorship by decreasing photosynthetic output, reducing transpiration, and adversely affecting reproductive success. Because noxious weeds can permanently degrade rare plant and animal habitats, their proliferation could adversely affect sensitive plant species if they are present. Direct impacts may also occur during the initial valve testing when water is released below the reservoir into Copper Basin Wash.

The direct loss of single plants or small occurrences of these species would not be considered a significant impact and no mitigation is required. However, to ensure that potential impacts to new or expanded occurrences of special-status plant species are avoided or minimized, Metropolitan would implement its Standard Practices of Environmental Assessment and WEAP training to identify current site conditions at the time of proposed Project implementation and to educate workers on environmental sensitivities in the proposed Project area. Additionally, Mitigation Measures BIO-1 (Special-Status Plant Species Surveys), BIO-2 (Special-Status Plant Species Avoidance and Minimization), and BIO-3 (Special-Status Plant Species Revegetation) would be implemented to avoid potentially significant impacts should special-status plant species be identified in the proposed Project area. These measures would require identification of special-status plants that may be present and application of appropriate avoidance and/or minimization measures prior to construction activities. With implementation of these measures, impacts to special-status plants would be reduced to less-than-significant levels.

Operational activities are not expected to result in impacts to special-status plants. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and impacts to special-status plants would be considered less than significant. Periodic testing of the valve is not expected to result in adverse impacts to special-status plants and would mimic natural rain events. Periodic scour of stream channels is a natural event and many species of plants and wildlife benefit from these events. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

### Special-Status Wildlife Species

Twenty-seven special-status wildlife species were either observed during 2021 and 2022 surveys or have a moderate to high potential to occur in or near the proposed Project area (see Table 3.4-2). The potential to occur and possible impacts to each of these species is discussed below.

**Table 3.4-2 – Special-Status Wildlife with Potential to Occur in the Proposed Project Area**

| Common Name | Scientific Name | Status |
|---|---|---|
| Mojave desert tortoise | *Gopherus agassizii* | FT, ST |
| Banded Gila monster | *Heloderma suspectum cinctum* | SSC |
| Golden eagle | *Aquila chrysaetos* | BGEPA, FP |
| Burrowing owl | *Athene cunicularia* | SSC |
| Costa's hummingbird | *Calypte costae* | SA |

| Table 3.4-2 – Special-Status Wildlife with Potential to Occur in the Proposed Project Area | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Status** |
| Willow flycatcher | *Empidonax traillii extimus* | SE |
| American peregrine falcon | *Falco peregrinus anatum* | FP |
| Bald eagle | *Haliaeetus leucocephalus* | BGEPA, SE, FP |
| Yellow-breasted chat | *Icteria virens* | SSC |
| Loggerhead shrike | *Lanius ludovicianus* | SSC |
| Lucy's warbler | *Leiothlypis lucae* | SSC |
| Gila woodpecker | *Melanerpes uropygialis* | SE |
| Double-crested cormorant | *Nannopterum auritum* | SA |
| Vermilion flycatcher | *Pyrocephalus rubinus* | SSC |
| Yuma Ridgway's rail | *Rallus obsoletus yumanensis* | FE, ST, FP |
| Arizona Bell's vireo | *Vireo bellii arizonae* | SE |
| Pallid bat | *Antrozous pallidus* | SSC |
| Ringtail | *Bassariscus astutus* | FP |
| Townsend's big-eared bat | *Corynorhinus townsendii* | SSC |
| Western mastiff bat | *Eumops perotis californicus* | SSC |
| California leaf-nosed bat | *Macrotus californicus* | SSC |
| Cave myotis | *Myotis velifer* | SSC |
| Yuma myotis | *Myotis yumanensis* | SA |
| Desert bighorn sheep | *Ovis canadensis nelson* | FP |
| Mountain lion | *Puma concolor* | SC |
| American badger | *Taxidea taxus* | SSC |
| Desert kit fox | *Vulpes macrotis arsipus* | FP |

Notes: FT – Federally Threatened; ST- State Threatened; SE – State Endangered; BGEPA – Species protected under the federal Bald and Golden Eagle Protection Act; FP - CDFW Fully Protected; SSC – CDFW Species of Special Concern; SA – CNDDB Special Animal

### *Mojave Desert Tortoise and Banded Gila Monster*

The Mojave Desert tortoise is listed as threatened under FESA and CESA and banded Gila monster is designated as a CDFW SSC. Although no individual tortoises or suitable burrows were identified during surveys for the proposed Project or during biological monitoring at a nearby Metropolitan facility in 2019, this species has a low to moderate potential to occur in low densities due to the presence of suitable habitat in and adjacent to the proposed Project area. The closest recorded observations of desert tortoise are located approximately five miles south of the proposed Project area. Banded Gila monster was not observed during surveys; however, there is a historical record

from the Whipple Mountains and the proposed Project area is within the known range of the species (CDFW, 2022a). Therefore, there is a moderate potential for banded Gila monster to occur.

Construction of the Project has a very low potential to directly affect desert tortoise, banded Gila monster, or their habitat. Most work would occur along the existing access road, on the dam, along the riparian area below the dam, and along the margins of the reservoir. Impacts to these species are not expected to occur. However, if present, direct impacts could result from mortality due to collisions with vehicles or heavy equipment, harassment, fugitive dust, release of hazardous materials, and noise. Indirect impacts could include the introduction and spread of invasive weeds, providing predator subsidies, and increased human presence.

If present, direct and indirect impacts to desert tortoise would be significant. However, as part of the proposed Project, Metropolitan would implement its Standard Practices including an Environmental Assessment to determine site conditions at the time of proposed Project implementation and WEAP training to educate workers on environmental sensitivities in the proposed Project area. Furthermore, Metropolitan's Standard Practices regarding Desert Tortoise Avoidance Training, which include clearly delineating Project work limits, restricting access to designated existing travel routes, having a qualified biologist(s) onsite during construction activities, inspecting under vehicles and equipment prior to moving, and avoiding impacts to any known or identified tortoise or tortoise burrow, would be implemented. In addition to the above listed Standard Practices, implementation of Mitigation Measures BIO-4 (Special-Status Wildlife Species Surveys) and BIO-5 (Special-Status Wildlife Species Avoidance and Minimization) would further reduce potential impacts to desert tortoise and banded Gila monster should they occur. These measures would require identification of desert tortoise or banded Gila monster individuals that may be present within the proposed Project area and application of appropriate avoidance and/or minimization measures prior to construction activities. With the implementation of these measures, impacts to desert tortoise and banded Gila monster, if present, would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts would be limited and not likely to impact the species' ability to persist once the proposed Project is complete.

Operational activities are not expected to result in impacts to desert tortoise and banded Gila monster, if present. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. Periodic testing of the valve is not expected to result in adverse impacts to desert tortoise, if present, as this species is not expected to occur within the dense riparian habitat at this location. Banded Gila monster, if present, can utilize desert riparian areas for foraging; however, periodic testing of the valve is not expected to result in adverse impacts to this species as these activities would mimic natural rain events. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

### *Golden Eagle, Bald Eagle, and American Peregrine Falcon*

Golden and bald eagles are protected by the federal BGEPA and designated as a CDFW FP species. Bald eagle is listed as endangered under the CESA. The American peregrine falcon is a CDFW FP species.

Although suitable nesting habitat occurs along the steep mountainous cliffs in the proposed Project area, golden eagles have a low potential to nest as these sites have been recently occupied by bald eagles. As recently as 2019, bald eagles had been documented nesting in a tree within the basin; however, this tree fell over during a windstorm in the fall of 2020. The bald eagle pair were subsequently observed nesting on a cliff approximately one-half mile southeast of the dam, but the nest was determined to be inactive during the most recent surveys for the proposed Project. American peregrine falcons require cliffs between 50 and 200 meters (164 to 656 feet) or suitable surrogates that are close to preferred foraging areas for breeding. Although no falcon nests were observed during surveys, suitable habitat is present and there is a moderate potential that falcons could nest in or near the proposed Project area.

Each of these species is a wide-ranging predator and the proposed Project area provides suitable foraging habitat. Bald eagle and peregrine falcon were observed in flight over the proposed Project area during surveys. Although no golden eagles were observed, there is a high potential for the species to occur and it is expected to forage throughout the proposed Project area and broader region throughout the year.

Direct impacts to eagles and peregrine falcon could include disruption of foraging activity or loss or degradation of foraging habitat due to increased dust, noise and disturbance, and the release of hazardous materials. Work conducted in proximity to active nests can also result in nest failure or added vigilance which may limit the foraging time of these species. Indirect impacts include the degradation of habitat due to the introduction and spread of invasive weeds and increased human presence.

During construction, vehicles and equipment would use the existing dirt road to gain access below the dam. If the bald eagle nests at or near the historic nest located above Copper Basin Wash, use of the road within Copper Basin Wash would come within 550 feet of the nest. In addition, one steep section of the road that would be graded and paved with concrete is approximately 990 feet from the nest. Other work areas, including the valve replacement area, would be located approximately 1,800 feet from the nest and are in a narrow slot canyon which shields the work from the nest. Metropolitan would attempt to perform work in these areas outside the breeding season. However, the duration of the Project is approximately two years, and it is possible eagles would nest at or near the old nest site.

Any disturbance to nesting eagles or peregrine falcons would be considered a significant impact without mitigation. Impacts from the disruption of foraging habitat is not anticipated to be significant as large areas of the reservoir would remain open to foraging and work would not preclude access to foraging habitat. Barge use, if utilized to support construction, is expected to be used only for moving large pieces of equipment to the face of the dam.

As part of the proposed Project, Metropolitan would implement its Standard Practice of Environmental Assessment to determine site conditions at the time of construction along with WEAP training to educate workers on the environmental sensitivities in the proposed Project area. Furthermore, Metropolitan's Standard Practices regarding nesting bird surveys would be implemented. In addition to the above listed Standard Practices, implementation of Mitigation Measures BIO-4 (Special-Status Wildlife Species Surveys) and BIO-5 (Special-Status Wildlife Avoidance and Minimization) would be required. These measures would require identification of golden and bald eagle and peregrine falcon individuals that may be present within the proposed Project area and application of appropriate avoidance and/or minimization measures prior to

proposed Project activities. With the implementation of these measures, impacts to eagles and peregrine falcon would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts within suitable habitat would be limited and not likely to substantially reduce local populations or these species' ability to persist once the proposed Project.

Operational activities are not expected to result in impacts to eagles and peregrine falcons. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and always remain on designated roads. Periodic testing of the valve would occur outside the breeding season and is not expected to result in adverse impacts to these species. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Burrowing Owl***

Burrowing owl is a CDFW SSC and has a high potential to occur in or adjacent to the proposed Project area due to the detection of owl sign during 2021 reconnaissance surveys. The sign was observed in a naturally occurring rock cavity at a small canyon located approximately 200 feet from the existing access road. The cavity/burrow was inactive but the sign at the burrow indicates that it was likely occupied by a wintering or transient burrowing owl in the recent past. However, no burrowing owl or their sign were detected during the 2022 reconnaissance surveys or in any other areas along the access roads, laydown areas, or in Copper Basin Wash.

Road construction could affect burrowing owl should any individuals or active burrows occur on or near the Project site during construction. This could include the loss and degradation of habitat, mortality due to collisions with vehicles or heavy equipment, destruction of burrows, fugitive dust, release of hazardous materials, and increased noise and disturbance. Adult burrowing owls would generally shelter in their burrow rather than flee from disturbance, and construction, and could result in injury and mortality to adults, damage or destruction of burrows, and injury or mortality to eggs and nestlings. Indirect impacts include the introduction and spread of invasive weeds, providing predator subsidies, and increased human presence.

If burrowing owls occur in the Project area during construction, impacts would be considered significant without mitigation. As part of the proposed Project, Metropolitan would implement its Standard Practices of Environmental Assessment to determine site conditions prior to proposed Project activities and WEAP training to educate workers on environmental sensitivities in the proposed Project area. Additionally, Metropolitan's Standard Practices regarding nesting birds would be implemented. Furthermore, to avoid potentially significant impacts, implementation of Mitigation Measures BIO-4 (Special-Status Wildlife Species Surveys) and BIO-5 (Special-Status Wildlife Species Avoidance and Minimization) would be required. These measures would require identification of burrowing owl individuals or active burrows that may be present within the proposed Project area and application of appropriate avoidance or minimization measures prior to construction activities. With the implementation of these measures, impacts to burrowing owl, if present, would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts within suitable habitat would be limited and not likely to substantially reduce local populations or their ability to persist once the proposed Project is complete.

Operational activities are not expected to result in impacts to burrowing owl, if present. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that

currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and always remain on designated roads. Periodic testing of the valve would occur outside the breeding season and is not expected to result in adverse impacts to this species. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Costa's Hummingbird, Willow Flycatcher, Yellow-Breasted Chat, Loggerhead Shrike, Lucy's Warbler, Gila Woodpecker, Vermilion Flycatcher, Double-Crested Cormorant, Yuma Ridgway's Rail, Arizona Bell's Vireo, and Other Birds***

Willow flycatcher, Gila woodpecker, and Arizona Bell's vireo are listed as endangered under CESA. Yuma Ridgway's rail is listed as endangered under FESA, threatened under CESA, and is considered a CDFW FP species. Yellow-breasted chat, loggerhead shrike, Lucy's warbler, and vermilion flycatcher are considered CDFW SSC. Costa's hummingbird and double-crested cormorant are designated as CNDDB Special Animals.

Willow flycatcher typically occurs in riparian woodland habitat that is characterized by a dense growth of willow (*Salix* spp.), cottonwood (*Populus* spp.), and sycamore (*Platanus* spp.) trees and mulefat (*Baccharis salicifolia*) with a herbaceous understory. Although two willow flycatcher (*E. traillii*) individuals were observed within the riparian habitat around the Copper Basin Reservoir during 2022 protocol-level surveys, they were detected prior to the nesting season. Since no nesting activity was identified during subsequent surveys, these individuals were determined to be migrants and not the federally listed southwestern willow flycatcher subspecies (*E. t. extimus*). Therefore, willow flycatcher and southwestern willow flycatcher are not expected to nest in or near the proposed Project area. Yuma Ridgway's rail inhabits freshwater marshes along the lower Colorado River. There are several occurrence records for this species along the river to the north and south of the proposed Project area (CDFW, 2022a). However, it was not observed during 2021 and 2022 focused bird surveys and marsh habitat around the Copper Basin Reservoir is limited. Therefore, there is a low potential for Yuma Ridgway's rail to nest in or near the proposed Project area. However, the proposed Project area supports suitable foraging habitat around Copper Basin Reservoir and the species may occasionally occur in or near the proposed Project area while foraging.

Gila woodpecker excavates cavity nests in large trees (mainly restricted to riparian habitats), saguaro cacti, and manmade structures (e.g., wooden power poles). There are several occurrence records along the Colorado River within five miles of the proposed Project area (CDFW, 2022a). Vermilion flycatcher typically nests in native riparian trees, such as willows, cottonwoods, and sycamores, especially in parks or near human habitation. This species has been recently documented south of Parker Dam and around Buckskin Mountain State Park approximately five miles southeast and south, respectively, from the proposed Project area (iNaturalist, 2021). Arizona Bell's vireo nests in riparian vegetation and mesquite thickets along the lower Colorado River and suitable habitat occurs in the canyon downstream from Copper Basin Dam. This species has been recently documented at numerous locations along the Colorado River within 20 miles southwest of the proposed Project area (CDFW, 2022a). Although the proposed Project area supports suitable breeding and foraging habitat for Gila woodpecker, vermilion flycatcher, and Arizona Bell's vireo, neither species were observed or detected during the 2021 and 2022 protocol-level surveys. Yellow-breasted chat is a migratory species that occurs in California only during the breeding season, which is typically between April and August. In California, it primarily breeds

in the northern portion of the state and is scarce in the central and southern portions. It typically utilizes dense riparian thickets and brushy tangles near watercourses for breeding. Although not detected during the 2021 and 2022 focused bird surveys, they are known from upstream and downstream records within twenty miles of the proposed Project area and suitable foraging and breeding habitat is present (CDFW, 2022a).

One individual Costa's hummingbird was identified along the access road within the southern portion of the proposed Project area and there are numerous recent records in the vicinity of Parker Dam less than ten miles away (iNaturalist, 2021). There are several occurrence records for loggerhead shrike associated with lower elevations surrounding the Whipple Mountains (iNaturalist, 2021). One individual shrike was observed along the access road and may have been nesting within the vicinity of the proposed Project area. Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands. Its breeding range extends through much of Arizona and parts of the eastern California deserts, throughout much of the lower Colorado Valley. This species typically nests in unoccupied woodpecker nests or other cavities in trees. Lucy's warbler was identified during the 2022 focused bird surveys in the canyon just below the dam and at the laydown area. It is a likely nester in the area. Double-crested cormorant was observed flying over the basin during surveys; however, the proposed Project area does not support suitable breeding habitat for this species.

Implementation of the proposed Project is not expected to result in impacts to willow flycatcher, Gila woodpecker, Yuma's Ridgway rail, Arizona Bell's vireo, or double-crested cormorant since these species were not identified nesting in the proposed Project area during the 2021 and 2022 focused bird surveys or the proposed Project area provides limited to no suitable nesting habitat. The proposed Project could impact Costa's hummingbird, yellow-breasted chat, loggerhead shrike, Lucy's warbler, vermilion flycatcher, and other nesting migratory birds, if present, should construction activities be conducted during the breeding season.

Implementation of the proposed Project would remove up to 0.62 acres of vegetation along the existing access road and along the margins of the reservoir where rock energy dissipators would be placed below the Arizona crossings. Vegetation is not expected to be removed from the riparian corridor below the dam as vehicles would use an existing access road. The removal of vegetation in other areas could result in the loss of nesting habitat for a variety of songbirds and shorebirds, particularly species that nest in dense stands of cattails. Nesting trees used by songbirds or eagles would not be removed. If work is conducted during the breeding season, construction activities could directly impact special-status and other nesting migratory bird species if nests or eggs are destroyed or if breeding behavior is disturbed resulting in nest abandonment or failure. Indirect impacts include the introduction and spread of invasive weeds, providing predator subsidies, and increased human presence.

Except for a few non-native birds such as European starling (*Sturnus vulgaris*) and house sparrow (*Passer domesticus*), the loss of any active bird nests or young is regulated by the MBTA and Fish and Game Code Section 3503 and would be considered a significant impact without mitigation. As part of the proposed Project, Metropolitan would implement its Standard Practices of Environmental Assessment to determine site conditions prior to proposed Project activities and WEAP training to educate workers on environmental sensitivities in the proposed Project area. Additionally, Metropolitan's Standard Practices regarding nesting birds would be implemented. Furthermore, to avoid potentially significant impacts should nesting birds be identified within the

proposed Project area, implementation of Mitigation Measures BIO-4 (Special-Status Wildlife Species Surveys) and BIO-5 (Special-Status Wildlife Species Avoidance and Minimization) would be required. These measures would require identification of nesting birds that may be present within the proposed Project area and application of appropriate avoidance or minimization measures prior to construction activities. With the implementation of these measures, impacts to special-status and other nesting migratory bird species, if present, would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts within suitable habitat would be limited and not likely to substantially reduce local populations or their ability to persist once the proposed Project is complete.

Operational activities are not expected to result in impacts to these nesting birds. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. Periodic testing of the valve would occur outside the breeding season and is not expected to result in adverse impacts to nesting birds. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Ringtail, American Badger, and Desert Kit Fox***

Ringtail and desert kit fox are CDFW FP species and American badger is a CDFW SSC. Although none of these species were observed or detected in the proposed Project area during 2021 and 2022 surveys, there is a high potential for occurrence.

The nocturnal and highly secretive ringtail inhabit a variety of rocky habitats throughout the southwestern United States. This species has been reported by Metropolitan employees in and around the proposed Project area. American badgers utilize open, arid habitats, but are mostly found in grasslands, savannas, mountain meadows, and desert scrub (Stephenson and Calcarone, 1999). Basic requirements that have been identified for this species include sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground (Williams, 1986). American badgers are most often solitary animals that are primarily nocturnal but have been reported occasionally foraging and dispersing during the daytime (Lindzey, 1978). Desert kit fox habitat includes open, arid scrublands, grasslands, and agricultural lands. Creosote bush scrub is the most common habitat association for desert kit fox in California (McGrew, 1979). Desert kit fox require friable soils for digging dens. Dens are used for cover, protection from predators and heat, and pup rearing. Suitable soil for dens may be a limited resource for kit fox distribution. These wide-ranging species could enter the Project area or occur in adjacent buffer areas that were not subject to extensive surveys, although American badger and desert kit fox are not likely to occur below the dam in the dense riparian area.

Direct impacts to these species could include injury or mortality to individual animals, disturbance or destruction of natal dens during the pup-rearing season, the loss of habitat, and exposure to hazardous materials. Indirect impacts would include degradation of habitat due to the introduction and proliferation of invasive or noxious weeds. If present, these impacts would be significant without mitigation.

Ringtail, American badger, and desert kit fox could occur almost anywhere in and around the proposed Project area. Should these species be present, injury or mortality of individuals during road improvements and access road use could occur. Animals could also become entrapped if they enter

the slot canyon below the dam prior to construction crews commencing work. Given the mobility and elusive nature of each of these species, it is likely that they would disperse into nearby habitat, avoiding human interactions during proposed Project activities. However, the proposed Project area and surrounding areas support suitable denning habitat and construction activities could result in disturbance to natal dens if performed during the pup-rearing season.

If any of these species occur in or near the proposed Project area during construction, impacts would be considered significant without mitigation. As part of the proposed Project, Metropolitan would implement its Standard Practice of Environmental Assessment to determine site conditions prior to proposed Project activities and WEAP training to educate workers on environmental sensitivities in the proposed Project area. In addition to the above listed Standard Practices, implementation of Mitigation Measure BIO-6 (Conduct Surveys and Avoidance for Ringtail, American Badger, and Desert Kit Fox) would further reduce potential impacts to ringtail, American badger, and desert kit fox should they occur. These measures would require identification of individuals or active dens that may be present within or near the proposed Project area and application of appropriate avoidance and/or minimization measures prior to construction activities. With the implementation of these measures, impacts to these species, if present, would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts would be limited and not likely to impact the species' ability to persist once the proposed Project is complete.

Operational activities are not expected to result in adverse impacts to ringtail, American badger, and desert kit fox, if present. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. These species are highly mobile and would likely move into adjacent habitat when vehicles or Project personnel are using the access road or inspecting the valve below the dam. Periodic testing of the valve is not expected to result in adverse impacts to these species. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

### *Desert Bighorn Sheep*

Desert bighorn sheep is a CDFW FP species. This species was observed and/or identified by sign, including tracks and scat, throughout the proposed Project area during surveys. Habitat for bighorn sheep is present in the general Project region; however, the proposed work sites do not provide suitable habitat for lambing which is the most critical time of year for bighorn sheep survival (February 1 through March 31).

Direct impacts to desert bighorn sheep are not anticipated because the species is large and highly visible and therefore can be easily avoided by equipment and personnel during proposed Project activities. Furthermore, bighorn sheep are likely to avoid entering the slot canyon as this area supports limited escape routes, a critical habitat component for the species, and ample access to water is available from other areas of the reservoir. Potential indirect impacts could include increased noise and vibrations and exposure to dust during construction activities. However, these impacts would be temporary in nature and bighorn sheep would likely move away from active work sites and into the abundant natural lands surrounding the Project area.

Nevertheless, impacts to desert bighorn sheep would be considered significant. As part of the proposed Project, Metropolitan would implement its Standard Practice of Environmental Assessment to determine site conditions at the time of construction and WEAP training to educate workers on environmental sensitivities in the proposed Project area. In addition to the above listed Standard Practices, implementation of Mitigation Measure BIO-7 (Construction Monitoring for Bighorn Sheep) would be required to avoid potential impacts to desert bighorn sheep. This measure would require ceasing construction activities if sheep enter work areas, implementing appropriate avoidance buffers if sheep are present within the vicinity of construction activities, and maintaining a reasonable speed limit on access roads to avoid collisions with sheep if they are present in the area. With the implementation of these Standard Practices and measures, impacts to desert bighorn sheep would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts within suitable habitat would be limited and not likely to substantially reduce local populations or their ability to persist once the proposed Project is complete.

Operational activities are not expected to result in adverse impacts to desert bighorn sheep. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. This species is highly mobile and would likely move into adjacent habitat when vehicles or Project personnel are using the access road or inspecting the valve below the dam. Periodic testing of the valve is not expected to result in adverse impacts to this species. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Mountain Lion***

Mountain lion is a candidate for threatened or endangered status under CESA. Mountain lion has a moderate potential to occur within the proposed Project area because it is located within open desert habitat within the species' range. While the proposed Project site is too small to support long-term use by mountain lions, the entire Project area is likely used for foraging and denning.

Direct impacts to mountain lion are not anticipated because the species is large and highly visible and therefore can be easily avoided by equipment and personnel during proposed Project activities. Potential indirect impacts could include the disturbance to individual lions and/or denning sites, if present, from increased sound and vibration and exposure to dust. However, disturbance associated with proposed Project activities would be temporary in nature and individual lions would likely move away from active work sites and into the abundant natural lands surrounding the Project area.

Nevertheless, impacts to mountain lion individuals and/or denning sites, if present, would be considered significant. As part of the proposed Project, Metropolitan would implement its Standard Practice of Environmental Assessment to determine site conditions at the time of construction and WEAP training to educate workers on environmental sensitivities in the proposed Project area. In addition to the above listed Standard Practices, implementation of Mitigation Measure BIO-8 (Conduct Focused Surveys for Mountain Lion and Avoid Denning Areas) would be required to avoid potential impacts to desert bighorn sheep. This measure would require focused surveys prior to construction activities that could potentially disturb active dens and the implementation of appropriate avoidance buffers if active dens are identified in or near the proposed Project area. With the implementation of these Standard Practices and measures, impacts to mountain lion

would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts within suitable habitat would be limited and not likely to substantially reduce local populations or their ability to persist once the proposed Project is complete.

Operational activities are not expected to result in adverse impacts to mountain lion, if present. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. This species is highly mobile and would likely move into adjacent habitat when vehicles or Project personnel are using the access road or inspecting the valve below the dam. Periodic testing of the valve is not expected to result in adverse impacts to this species. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Special-Status Bats***

Pallid bat, Townsend's big-eared bat, western mastiff bat, California leaf-nosed bat, and cave myotis are all designated as CDFW SSC while Yuma myotis is considered a CNDDB Special Animal.

Emergent and acoustic surveys for special-status bats were conducted to assess which species are roosting or foraging in the proposed Project area. Canyon bat (*Parastrellus hesperus*) was the most abundant species detected during the surveys. This species, along with other common bat species detected during the surveys, appear to move into the area to forage while roosting at other sites away from the proposed Project area. With the exception of Yuma myotis, no other special-status bat species were detected. Small numbers of Yuma myotis were identified day roosting in the valve house at the base of the dam. Common bats were detected foraging over the Project area but appear to move into the area from other areas.

Bat life histories vary widely. Some species hibernate during winter or migrate to warmer areas. During the breeding season, bats generally roost during the day, either alone or in communal roost sites, depending on species. Most special-status bats roost in rock crevices, caves, abandoned mine shafts, or old buildings. Others may roost in tree cavities, bark crevices, or foliage. Roost sites may be used seasonally (e.g., hibernacula) or daily (day roosts, used during inactive daylight hours). Maternity roosts (where female bats congregate to give birth and raise young) are particularly important. Each of the species listed above is insectivorous, catching their prey either on the wind or on the ground. Some forage over open shrublands or over open water, both of which can be found within the proposed Project area. The decline of bat populations is often due to loss of roost sites, roost site disturbance, and loss of foraging habitat.

California leaf-nosed bat, cave myotis, and Townsend's big-eared bat prefer to roost in caves and tunnels where thermal conditions are more stable, but they have been observed roosting under ledges and other structures. Pallid bat can roost in rock outcrops along with other bats and could occur near the dam. Bats can also use manmade structures such as valve boxes, adits (i.e., access tunnels both concrete and natural), and pipes.

Direct impacts to bats could include mortality or displacement of bats during ground-disturbing activities associated with work below the dam, road repair activities, increased noise levels from heavy equipment, human presence, and exposure to fugitive dust. Noise, vibration, and human activity could disrupt maternity roosts during the breeding season. Indirect effects could include

increased traffic, dust, and human presence in the proposed Project area that could result in bats abandoning their roosts or maternal colonies. For example, Townsend's big-eared bat is known to abandon young when disturbed. Based on emergent and acoustic studies completed for the proposed Project, the site does not support important nursery or rooting sites for large numbers of bats. However, it is possible that special-status bats could move into the area at some point to forage or roost.

Impacts to special-status bats, should they occur in the proposed Project area, would be considered significant without mitigation. As part of the proposed Project, Metropolitan would implement its Standard Practices of Environmental Assessment to determine site conditions at the time of construction and WEAP training to educate workers on environmental sensitivities in the proposed Project area. In addition to the above listed Standard Practices, implementation of Mitigation Measure BIO-9 (Survey for Maternity Colonies or Hibernaculum for Roosting Bats) would be required to avoid potential impacts to special-status bats. This measure would require preconstruction surveys for roosting bats prior to construction activities and the avoidance of maternity colonies or hibernaculum. It would also require the safe eviction of known day roosting sites for Yuma myotis and exclusion from the site during construction activities. With the implementation of these Standard Practices and measures, impacts to special-status bats would be reduced to less-than-significant levels because direct impacts would be avoided and indirect impacts within suitable habitat would be limited and not likely to substantially reduce local populations or their ability to persist once the proposed Project is complete.

Operational activities are not expected to result in adverse impacts to these species. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. These species are primarily nocturnal or active during crepuscular periods when typical operational activities are not conducted. Roosting habitat below the dam would not be disturbed and bats would be prevented from entering the new valve structure. Periodic testing of the valve is not expected to result in adverse impacts to bats. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Mitigation Measures***

**BIO-1** **Special-Status Plant Species Surveys.** Prior to any ground disturbing activities that are initiated after the spring 2023 blooming season, Metropolitan shall conduct surveys for special-status plants in areas of suitable habitat. Surveys shall be conducted by a qualified botanist during the flowering season in suitable habitat located within proposed Project disturbance areas and a 50-foot buffer. All special-status plant species identified in the proposed Project area shall be mapped onto a site-specific aerial photograph and/or topographic map. Surveys shall be conducted in accordance with the most current protocols established by the CDFW and USFWS. If federally listed, state listed, or California Rare Plant Ranking 1B or 2B species are found, avoidance and minimization measures shall be implemented in accordance with Mitigation Measure BIO-2.

**BIO-2** **Special-Status Plant Species Avoidance and Minimization.** If federally listed, state listed, or California Rare Plant Ranking 1B or 2B species are found during

special-status plant surveys conducted pursuant to Mitigation Measure BIO-1, then avoidance measures shall be implemented to avoid impacting these plant species. Rare plant occurrences that are not within the immediate disturbance footprint but are located within 50 feet of disturbance limits shall be protected at least 30 feet beyond their extent, or other distance as approved by a monitoring biologist, to protect them from harm. If avoidance of federally listed or state listed plant species is not feasible, impacts shall be fully offset through implementation of a restoration plan that results in no net loss in accordance with Mitigation Measure BIO-3.

**BIO-3** **Special-Status Plant Species Revegetation.** If avoidance of federally listed, state listed, and/or California Rare Plant Rank 1B or 2B species is not feasible, the individuals shall be transplanted, and surrounding topsoil shall be salvaged to be incorporated into the revegetation process for the site. A special-status plant restoration plan shall be prepared and implemented that includes the following criteria at a minimum:

- The number of specimens affected for each species.
- Identification of onsite or offsite preservation location(s).
- Methods for restoration, enhancement, and/or transplanting, including topsoil salvage and planting seeds of the affected species.
- A replacement ratio of 1:1 per impacted specimen.

**BIO-4** **Special-Status Wildlife Species Surveys.** For all proposed Project work areas, Metropolitan shall implement preconstruction wildlife surveys for special-status wildlife species with a moderate to high potential to occur. Surveys shall be conducted in areas of suitable habitat no more than 72 hours prior to the start of proposed Project activities. The survey area shall include the proposed Project area and all ingress/egress routes, plus a 100-foot buffer (unless otherwise defined by Mitigation Measures BIO-6, BIO-8, and BIO-9).

**BIO-5** **Special-Status Wildlife Species Avoidance and Minimization.** Metropolitan shall develop and implement appropriate avoidance measures for special-status wildlife species occurring within or near the proposed Project area. Avoidance measures may include but are not limited to:

- Flagging or fencing of any special-status species burrows or nests by a monitoring biologist and establishing an appropriate buffer to ensure avoidance during proposed Project activities.
- Monitoring by a monitoring biologist during initial ground-disturbing activities. Once initial ground-disturbing activities have been completed, the biologist shall conduct preconstruction clearance surveys, as necessary.
- If at any time during proposed Project activities a special-status species enters work areas or otherwise may be impacted by construction, activities at the site where the find occurred shall cease until the individual has moved out of the work area and/or buffer on its own accord.

**BIO-6** **Conduct Surveys and Avoidance for Ringtail, American Badger, and Desert Kit Fox.** Metropolitan shall conduct pre-construction surveys for ringtail, American badger, and desert kit fox no more than 15 days prior to initiation of construction activities. Surveys shall be conducted in areas that contain habitat for these species and shall include Project disturbance areas and access roads plus a 200-foot buffer surrounding these areas. If dens are detected, each den shall be classified as inactive, potentially active, active non-natal, or active natal.

Inactive dens that would be directly impacted by road grading shall be excavated either by hand or mechanized equipment under the direct supervision of the biologist and backfilled to prevent reuse by ringtails, badgers, or kit fox. Potentially and known active dens shall not be disturbed during the whelping/pupping season (February 1 – September 30). A den may be declared "inactive" after three days of monitoring via camera(s) or a tracking medium have shown no ringtail, badger, or kit fox activity.

Active dens shall be flagged and Project activities within 200 feet shall be avoided. Buffers may be modified by a qualified biologist. If active dens are found within Project disturbance areas and avoidance is not possible, Metropolitan shall take action as specified below.

**Active and potentially active non-natal dens.** Outside the breeding season, any potentially active dens that would be directly impacted by construction activities shall be monitored by a qualified biologist for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den may be excavated and backfilled by hand. If tracks are observed, the den may be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage continued use. After verification that the den is no longer active, the den may be excavated and backfilled by hand.

**Active natal dens.** Active natal dens or any den active during the breeding season will not be excavated or passively relocated. The pup-rearing season is generally from February 1 through September 30. A 300-foot no-disturbance buffer shall be maintained around all active natal dens. A qualified biologist shall monitor the natal den until they determine that the pups have dispersed. Any disturbance to animals or activities that might disturb denning activities shall be prohibited within the buffer zone. Once the pups have dispersed, methods listed above for non-natal dens may be used to discourage den reuse. After verification that the den is unoccupied, it shall then be excavated by hand and backfilled to ensure that no animals are trapped in the den.

**BIO-7** **Construction Monitoring for Bighorn Sheep.** If bighorn sheep are detected within 300 feet of project activities, construction shall cease until the bighorn sheep have moved a safe distance away from Project activities. If bighorn sheep become acclimated to any activity and the biologist determines that Project activities are unlikely to adversely affect the animals, then Project activities can proceed. If the

animals appear agitated, the biologist may increase the buffer distance and suspend Project construction.

**BIO-8** **Conduct Surveys for Mountain Lion and Avoid Denning Areas**. If construction activities that could disturb potential denning sites (i.e., large trees, cavities, rock piles, pipes, or overhangs) will occur during the breeding season for mountain lions (April through September), a qualified biologist will conduct surveys for potential dens within 200 feet of all areas proposed for disturbance. Any active dens will be avoided and an appropriate disturbance-free buffer will be established. Once the young have left the den or the den is no longer active, construction activities can resume.

**BIO-9** **Survey for Maternity Colonies or Hibernaculum for Roosting Bats.** Prior to the initiation of Project activities within suitable bat roosting habitat, Metropolitan shall retain a qualified biologist to conduct surveys for sensitive bats. Surveys shall be conducted no more than 15 days prior to the initiation of work near the base of the dam or near other structures that could support bats. Surveys shall also be conducted during the maternity season (March 1 to July 31) within 300 feet of Project activities, where safe access is possible. If active maternity roosts or hibernacula are found, the structure, tree, or feature occupied by the roost shall be avoided (i.e., not removed), if feasible. If avoidance of the maternity roost is not feasible the biologist will implement the following actions.

**Maternity Roosts.** If a maternity roost will be impacted/removed by the Project, and no alternative maternity roost exists in proximity, substitute roosting habitat for the maternity colony shall be provided in an adjacent area free from Project impacts. Alternative roost sites will be designed to meet the needs of the specific species. Alternative roost sites must be of comparable size and proximal in location to the impacted colony.

**Exclusion of bats prior to eviction from roosts.** If non-breeding bat hibernacula are found in trees or structures in the Project area, the individuals shall be safely evicted, under the direction of a qualified biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the biologist (e.g., installation of one-way doors). In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost. Roosts that need to be removed in situations where the use of one-way doors is not necessary shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours.

*b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

**Less Than Significant Impact with Mitigation Incorporated.** The proposed Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS.

Natural communities with ranks of S1 (Critically Imperiled), S2 (Imperiled), or S3 (Vulnerable) are considered Sensitive Natural Communities by CDFW. Based on these rankings, three CDFW Sensitive Natural Communities were documented in the proposed Project area. These include Saguaro – foothill palo verde – velvet mesquite desert scrub (*Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina* Provisional Shrubland Alliance) (S2), Fremont cottonwood forest and woodland (*Populus fremontii - Fraxinus velutina - Salix gooddingii* Forest & Woodland Alliance) (S3), and arrow weed thickets (*Pluchea sericea* Alliance) (S3) (see Figures 2a through 2e in Appendix B.1).

A summary of the permanent and temporary impacts to all vegetation communities, including CDFW Sensitive Natural Communities, and other land cover types is presented in Table 3.4-3.

**Table 3.4-3 – Summary of Impacts to Vegetation Communities and Other Land Cover Types**

| Vegetation Community or Other Land Cover Type | Total Acres in Survey Area | Total Acres in Project Area | Permanent Impacts (acres) | Temporary Impacts (acres) |
|---|---|---|---|---|
| Saguaro – foothill palo verde – velvet mesquite desert scrub* | 15.75 | 1.66 | 0.23 | 1.43 |
| Fremont cottonwood forest and woodland* | 0.18 | 0.00 | 0.00 | 0.00 |
| Arrow weed thickets* | 3.14 | 0.20 | 0.10 | 0.10 |
| Cattail marshes | 1.06 | 0.24 | 0.13 | 0.11 |
| Disturbed or developed | 7.76 | 3.32 | 0.87 | 2.45 |
| Open water | 0.21 | 0.002 | 0.001 | 0.002 |
| **Total** | **28.10** | **5.42** | **1.33** | **4.09** |

Notes: Total acres in survey area includes the proposed Project area and a 50-to-300-foot buffer.
* CDFW Sensitive Natural Community

The proposed Project would result in permanent and temporary impacts to the riparian habitats and other CDFW Sensitive Natural Communities listed in Table 3.4-3. Direct impacts from implementation of the proposed Project would include removal of vegetation, altered soil conditions, and disturbance to native seed banks. In addition, use of the access road could result in impacts from exposure to fugitive dust. Indirect impacts could occur from the introduction or spread of non-native weeds. Most of the vegetation disturbance would occur in sparsely vegetated areas along the existing access road or along the margins of the reservoir within discontinuous habitat segments.

The proposed Project would result in temporary impacts of 1.43 acres to Saguaro – foothill palo verde – velvet mesquite desert scrub. Metropolitan would implement its Standard Practice of returning temporary work areas to similar conditions that existed prior to ground-disturbing activities. The proposed Project would also result in permanent impacts of 0.23 acre of Saguaro – foothill palo verde – velvet mesquite desert scrub. This habitat is abundant in the region and most impacts would occur along the margins of the previously disturbed access road. Therefore, the

impacts would not be expected to result in substantial adverse effects to the ecological function of the community and these impacts would be less than significant.

The proposed Project would result in temporary impacts of 0.10 acre to arrow weed thickets and 0.11 acre to cattail marsh. These communities are broadly distributed along the margin of the reservoir and based on the location of the habitat, they are expected to recover and naturally become re-established along the margin of the reservoir. Additionally, Metropolitan would implement its Standard Practice of returning temporary work areas to similar conditions that existed prior to ground-disturbing activities. Accordingly, temporary impacts would be considered less than significant. The proposed Project would also result in permanent impacts of 0.10 acre of arrow weed thickets and 0.13 acre of cattail marsh. Permanent impacts to riparian communities would be less than significant with the implementation of Mitigation Measure BIO-10 (Jurisdictional Waters Avoidance and Compensatory Mitigation).

Implementation of the proposed Project is not expected to result in the degradation or loss of riparian habitat or other CDFW Sensitive Natural Communities in downstream areas during initial valve testing. The impacts of controlled flows on seedling establishment and survival have been documented in many riparian systems. In some circumstances, the regulation of flow regimes can result in a loss of riparian vegetation along rivers and streams. However, potential scour from initial valve testing below the dam would more than likely enhance riparian habitat by providing substrate for the germination of new seedlings.

Operational activities are not expected to result in adverse impacts to native vegetation. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and remain on designated roads. Impacts to vegetation would be limited to herbaceous plants and saplings or to vegetation that has recruited into the access roads. Periodic testing of the valve is not expected to result in adverse impacts to native riparian vegetation as these activities would mimic natural rain events. Additionally, Metropolitan would continue to implement its Standard Practice of WEAP training during operational activities to educate all workers of sensitive biological resources in the proposed Project area.

***Mitigation Measure***

**BIO-10 Jurisdictional Waters Avoidance and Compensatory Mitigation.** Where feasible, jurisdictional areas shall be flagged or fenced for avoidance. Vegetation removal or trimming in jurisdictional areas shall be minimized. Temporary impact areas will be returned to similar conditions that existed prior to ground-disturbing activities. Compensatory mitigation at a 1:1 ratio for permanent impacts will occur through purchase of mitigation credits from an agency-approved mitigation bank, or through permittee-responsible mitigation, subject to applicable regulatory agency approval. Mitigation for temporary impacts to jurisdictional waters will occur through on-site restoration at a 1:1 ratio.

c. *Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

**Less than Significant Impact with Mitigation Incorporated**. The proposed Project would not have a substantial adverse effect on state or federally protected wetlands through direct removal, filling, hydrological interruption, or other means with incorporation of mitigation measures.

A preliminary delineation of potential federal and state jurisdictional waters and wetlands was conducted in March 2022 (see Figures 4a through 4o in Appendix B.2). The delineation identified approximately 0.15 acre of non-wetland waters and 0.09 acre of wetlands under the jurisdiction of the USACE and the CRBRWQCB and approximately 5.55 acres of streambeds and riparian habitat under the jurisdiction of CDFW within the proposed Project area.

Manmade wetlands occur along the margins of the Copper Basin Reservoir and within portions of Copper Basin Wash below the dam. Implementation of the proposed Project would result in approximately 0.04 acre of permanent impacts and 0.11 acre of temporary impacts to non-wetland waters under USACE and CRBRWQCB jurisdiction. Permanent impacts of approximately 0.06 acre and temporary impacts of 0.02 acre of wetlands under the jurisdiction of the USACE and CRBRWQCB would also occur. In addition, the proposed Project would result in approximately 0.25 acre of permanent impacts and 0.29 acre of temporary impacts to streambeds and riparian habitat under the jurisdiction of CDFW. Table 3.4-4 provides a summary of permanent and temporary impacts to federal and state jurisdictional features.

**Table 3.4-4 – Summary of Impacts to Federal and State Waters and Wetlands**

| | USACE Waters and Wetlands (acres)[a] | | CRBRWQCB Waters and Wetlands (acres)[a] | | CDFW Streambeds and Riparian Habitat (acres) |
|---|---|---|---|---|---|
| | Non-wetland Waters of the U.S. | Wetlands[b] | Non-wetland Waters of the U.S. | Wetlands[b] | |
| Total in Survey Area | 1.30 | 0.94 | 1.30 | 0.94 | 5.55 |
| Total in Project Area | 0.15 | 0.09 | 0.15 | 0.09 | 0.53 |
| Permanent Impact Area | 0.04 | 0.06 | 0.04 | 0.06 | 0.25 |
| Temporary Impact Area | 0.11 | 0.02 | 0.11 | 0.02 | 0.29 |

(a) Non-wetland waters of the U.S. and non-wetland waters of the state overlap; as such, jurisdictional acreages are not additive.
(b) Wetlands fall under the jurisdiction of the USACE, CRBRWQCB, and CDFW, each with separate extents that overlap; as such, wetland acreages are not additive.

Permanent impacts would occur from the construction of the Arizona crossings, rock riprap energy dissipaters, the replacement of two weirs, construction of the staircase and platform, and upgrading the existing catwalk. Wetland and riparian habitat have developed along the margin of the man-made reservoir. These areas are dominated by cattails and other riparian vegetation. It is likely that vegetation would become re-established in some of these areas following construction. Placement of the Arizona crossings and the energy dissipaters would not substantially alter the function and services of these areas or result in the loss of important nesting or foraging habitat. Most of the reservoir is ringed by wetland vegetation and numerous small bays have formed where the

ephemeral drainages flow into the reservoir. The drainages crossed by the access road are primarily characterized as ephemeral drainages that only flow during periods of heavy rainstorms. Riparian and wetland vegetation present in Copper Basin Wash is supported from seepage from the dam.

Temporary impacts to jurisdictional features would occur through the creation of temporary work areas to facilitate construction of the Arizona crossings, riprap energy dissipaters, weirs, catwalk, platform, and to accommodate the valve house activities. A small pool lacking riparian vegetation has formed from leakage below the dam. The pool in this area would be drained upon removal of Weir 1 and rock or other matting would be placed in this area during construction. Water located in this area would flow downstream through the existing channel that is located parallel to the existing access road. Rock may need to be placed on portions of the access road to accommodate heavy vehicle access. Some of the arrow weed and other riparian vegetation growing in this area may need to be trimmed. At the conclusion of construction, all temporary fills, diversions, and other construction related material would be removed.

Direct impacts to State and federal waters would include the removal of native riparian vegetation, the discharge of fill, placement of concrete structures including the two weirs and the footings required to support the catwalk, stairs, and platform. Indirect impacts could include alterations to the existing topographical and hydrological conditions and the introduction of non-native, invasive plant species. As required by law, Metropolitan would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the regulatory agencies and would obtain permits pursuant to Section 401 and 404 of the CWA, the Porter-Cologne Water Quality Control Act, and sections 1600-1617 of the California Fish and Game Code.

Because jurisdictional waters are considered sensitive by the regulatory agencies, these impacts would be considered significant. As part of the proposed Project, Metropolitan would implement its Standard Practice of WEAP training to educate workers of environmental sensitivities in the proposed Project area. In addition, implementation of Mitigation Measure BIO-10 (Jurisdictional Waters Avoidance and Compensatory Mitigation) would be required. This measure would be implemented to reduce impacts through flagging or fencing jurisdictional waters or wetland areas for avoidance and establishing a compensatory mitigation ratio. With the implementation of this measure, impacts to federal and state waters and wetlands and state streambed and riparian habitat would be reduced to less-than-significant levels.

Operational activities are not expected to result in adverse impacts to jurisdictional features. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to maintain low vehicle speeds and always remain on designated roads. Use of the road below the dam would continue and periodic road maintenance would continue to occur. Periodic testing of the valve is not expected to result in adverse impacts to jurisdictional features.

***Mitigation Measure***

**BIO-10 Jurisdictional Waters Avoidance and Compensatory Mitigation.**

*d. 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?*

**Less than Significant Impact**. The proposed Project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or disrupt native nursery sites. Construction of the proposed Project would not result in permanent barriers to wildlife movement or disrupt native nursery sites.

Access for the proposed Project would occur on existing roads and improvements and repair work would primarily occur in previously developed areas (i.e., dam, existing weirs, and access roads). Bighorn sheep, mountain lion, ringtail, bats, and other wildlife species that occur in the proposed Project area would still be able to forage and move without disruption after the proposed Project is completed. There are no special linkages or essential connectivity areas that cross the proposed Project area or immediate vicinity (CDFW 2022b; Spencer et al. 2010). The CDFW has identified Areas of Conservation Emphasis based on the Terrestrial Connectivity dataset for the region (CDFW, 2022c). This dataset summarizes information on terrestrial connectivity through the presence of mapped corridors or linkages and the juxtaposition to large, contiguous natural areas (CDFW, 2022c). A Rank 2 area (e.g., a large natural habitat area where connectivity is generally intact) is located on the western half of the reservoir and a Rank 3 area (e.g., the area has not been identified as having connectivity importance but may be later identified to have crucial habitat linkages, species corridors, or channelized areas) occurs on the eastern half of the region.

The closest designated habitat connectivity/wildlife corridor to the proposed Project area is a portion of the California Desert Linkage Network, an area identified by the California Desert Connectivity Project to be of essential value to conserve the biological diversity of multiple desert species (Penrod et al. 2012). It is located approximately 4.3 miles east of the proposed Project area, and generally follows the Colorado River and the California-Arizona border. Approximately one mile north and 2.5 miles west of the proposed Project area are Landscape Blocks for the California Desert Linkage Network. As part of the California Essential Habitat Connectivity Project, Natural Landscape Blocks (natural habitat blocks that support native biodiversity) and Interstate Connections (habitat that supports crossing between two states, such as California and Arizona) are located just outside of the Project vicinity within the Whipple Mountains and greater Whipple Mountains Wilderness area (CDFW 2022c). However, none of these corridors or habitat blocks overlap or pass through the proposed Project area. Therefore, impacts related to interfering substantially with wildlife movement or designated movement corridors would be considered less than significant.

*e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

**Less Than Significant Impact.** The proposed Project would not conflict with any local policies or ordinances protecting biological resources with mitigation incorporated.

The County of San Bernardino Desert Native Plant Protection ordinance protects certain desert native plants and does not allow the removal of the following plants with stems two inches or greater in diameter or six feet greater in height: smoketree (*Dalea spinosa*), Joshua tree (*Yucca brevifolia*), all species of the genus *Prosopis*, all species of the family Agavaceae, and creosote rings 10 feet or greater in diameter (San Bernardino County, 2007). In addition, any part of any of the following species, whether living or dead, may not be removed: desert ironwood (*Olneya tesota*), all species of the genus *Prosopis*, and all species of the genus *Cercidium*. During the 2021 and 2022 reconnaissance field surveys, multiple trees of the *Prosopis* and *Cercidium* (*Parkinsonia*)

genera and smoketree were identified within and adjacent to the proposed Project area. Although mapping of these resources was not included in the 2021 and 2022 surveys, numerous *Cercidium* and *Prosopis* trees were observed within temporary and permanent impact areas. Trees of the genera *Prosopis* and *Cercidium* along with smoketrees were also observed downstream of the dam; however, not within any temporary and permanent impact areas.

As part of the proposed Project, Metropolitan would implement its Standard Practices of Environmental Assessment to determine site conditions at the time of construction, WEAP training to educate workers on environmental sensitivities in the proposed Project area and returning temporary work areas to similar conditions that existed prior to ground-disturbing activities. Should any protected plant species need to be removed, Metropolitan would coordinate with the appropriate officials to apply for a Tree or Plant Removal Permit pursuant to § 88.01.050 (Native Tree or Plant Removal Permits) of the San Bernardino County Desert Native Plant Protection ordinance (San Bernardino County, 2007).

Operational activities are not expected to result in conflicts to any tree preservation policies or ordinances, including the County of San Bernardino Desert Native Plant Protection ordinance. Vehicle use of the upgraded road would be consistent with the types and magnitude of activities that currently occur at the reservoir and vehicles are required to always remain on designated roads. Use of the road below the dam would continue and periodic road maintenance would continue to occur. Periodic testing of the valve is not expected to result in adverse impacts to resources covered under the San Bernardino Desert Native Plant Protection ordinance.

*f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?*

**No Impact.** The proposed Project would not conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or State HCP.

The proposed Project area is not located within any existing or proposed Habitat Conservation Plan or Natural Community Conservation Plan area. The nearest plan area to the proposed Project area is Reach 3 of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) (LCR MSCP, 2004). Reach 3 includes the segment of the Lower Colorado River from Davis Dam to Parker Dam, including Lake Havasu up to full-pool elevation of 450 feet. The proposed Project area is located approximately 4 miles southwest of the margins of Reach 3 before it enters Lake Havasu. Parker Dam Camp, a 200-acre Colorado River historic floodplain area, is the closest designated conservation area being considered for inclusion into the LCR MSCP and is located approximately 4.3 miles east of the proposed Project area. The Parker Dam Camp property is managed to support honey mesquite type III habitat for species covered in the LCR MSCP. The LCR MSCP does not intersect within the proposed Project area or immediate vicinity, and there is no honey mesquite III habitat within the proposed Project area or immediate vicinity. Therefore, the proposed Project would not conflict with a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan and no impact would occur.

## 3.5 Cultural Resources

| CULTURAL RESOURCES<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? | ☐ | ☐ | ☒ | ☐ |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | ☐ | ☐ | ☐ | ☒ |
| c) Disturb any human remains, including those interred outside of dedicated cemeteries? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

The cultural resources information presented below is summarized from the Phase I Cultural Resources Assessment Report for the Copper Basin Dam and Access Road Project, San Bernardino County, California, (Appendix C) and the Historic Resources Evaluation Report for Copper Basin Dam (Appendix D).

**Metropolitan Standard Practice**

**Unanticipated Discovery**

In the event unanticipated archaeological resources are discovered during Project reclamation, all work would cease within 50 feet of the discovery to protect the area until a qualified archaeologist can evaluate the discovery and recommend additional measures for the proper handling and treatment.

***Discussion. Would the project:***

*a. Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?*

**Less than Significant Impact.** The proposed Project would not cause a substantial adverse change in the significance of a historical resource. As part of cultural resource studies, a cultural resource record search was conducted at the South Central Coastal Information Center in March 2022. The record search results did not identify any previously recorded cultural resources or studies within the Project Area or within the 0.25-mile records search radius except for the Colorado River Aqueduct (historical resource CA-SBR-10521; CRA Historic District). The CRA was determined eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources in 2010. The Copper Basin Dam and Reservoir are contributors to the CRA Historic District and as such qualify as historical resources pursuant to CEQA.

As described in Section 1.4, the Project would repair aging components of Copper Basin Dam to allow for its continued use and overall function of the CRA. The Project would replace and rehabilitate the gate valve and Howell-Bunger discharge valve within the dam; install new conduit and electrical components; replace the main access ladderway on the dam face; install a new catwalk and stairs adjacent to the discharge valve structure and weir structures; remove and reconstruct two existing concrete weirs downstream of the dam; and install surface conduit and instrumentation from the discharge valve structure to the weirs. The Project would also improve

approximately 1.66 miles of the existing dirt access road around the perimeter of the reservoir, with approximately 13 segments of concrete paving and associated improvements.

The historic integrity and character-defining features of the dam would be retained, including the scale, setting, and location of the dam, its prominent concrete thin arch design, and board-form concrete fabric, as well as its feeling and association as an individually significant structure and within the CRA Historic District. Upgrades to safety proposed with the improved ladderway, addition of stairs and replaced catwalk to the valve house, as well as the upgrades to the electrical, communication, and mechanical systems, would allow for the continuous use of the dam and the overall CRA, and would not adversely impact character-defining features. The use of the dam would not change and would continue to function as a dam within the Copper Basin Reservoir, serving its originally intended function as part of the CRA system. Lastly, the valves would be replaced in-kind to match the existing valves in materials, dimensions, and use; care would be taken to avoid the destruction, obscuring, or removal of adjacent character-defining features. No new features or significantly different detailing would be added to the valves or dam that would change the overall character. Although the Howell-Bunger valve is large in scale, it is a comparatively small feature in relation to the scale of the dam itself. Additionally, Metropolitan regularly maintains access roads along the CRA to allow for maintenance of the CRA and associated infrastructure. The Project does not propose to change the use of the Copper Basin access roads and the grading of or modifying a small segment of the road to continue the function of the CRA does not change the significance of the road as a contributing feature to the larger historic district.

The Project complies with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Secretary's Standards). Implementation of the proposed Project would not result in a significant adverse impact or material impairment. The historical resource would retain its historic integrity following Project implementation, and its status as a contributor to the CRA Historic District and as an individual historic resource. In addition, no indirect impacts would be expected to result to the larger CRA Historic District as a result of Project implementation. Therefore, impacts will be less than significant.

*b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*

**No Impact.** The proposed Project would not cause a substantial adverse change in the significance of an archaeological resource. As part of cultural resource studies, a cultural resources record search was conducted at the South Central Coastal Information Center in March 2022. The record search results did not identify any previously recorded cultural resources or studies within the Project Area or within the 0.25-mile records search radius. A Sacred Lands File search was completed by the Native American Heritage Commission (NAHC) with negative results for the Project Area. As the CEQA Lead Agency, Metropolitan conducted outreach to all persons on the NAHC-provided contact list and detailed letters were sent describing the Project with maps and requested a reply with any questions or concerns. No comments were received. A pedestrian survey of the Project Area was conducted on March 8 and 30, 2022. Archaeologists surveyed 100 percent of the Project Area with 15-meter transects, or less. Ground visibility during the pedestrian survey was 90-100 percent. No archaeological resources were identified during the pedestrian survey.

The possibility that previously undiscovered buried archaeological resources could be encountered during ground-disturbing activities associated with the Project is considered low. Furthermore, Metropolitan standard construction practices require that in the event unanticipated archaeological resources are discovered during Project construction, all work would cease within 50 feet of the discovery to protect the area until a qualified archaeologist can evaluate the discovery and recommend additional measures for proper handling and treatment. Therefore, there would be no impacts to archaeological resources.

*c. Disturb any human remains, including those interred outside of dedicated cemeteries?*

**Less than Significant Impact.** The proposed Project would not disturb any human remains, including those interred outside of dedicated cemeteries. The cultural resource record search and the intensive pedestrian field survey failed to find any potential for, or evidence of human remains. However, there is the possibility that previously undiscovered, buried remains could be encountered during ground-disturbing activities. Should human remains be encountered, Metropolitan would comply with the State of California's Health and Safety Code Section 7050.5, which states that no further disturbance will occur until the county coroner has made a determination of origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. Adherence to State of California's Health and Safety Code Section 7050.5 would ensure that any unexpected buried human remains that are exposed during construction activities are properly handled and treated. Therefore, impacts will be less than significant.

## 3.6 Energy

| **Energy**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

**Less than Significant Impact**. The proposed Project would not result in potentially significant environmental impact due to wasteful, unnecessary consumption of energy resources, during Project construction or operation. Energy use associated with the proposed Project would be primarily in the form of diesel and gasoline consumption from on- and off-road vehicles and equipment used during construction. The Project's construction activities are necessary to ensure safe access and ongoing maintenance and inspection activities for Copper Basin Dam and Reservoir, a crucial component of the CRA. Construction would use standard methods and equipment to meet the Project goals and would not create a wasteful, inefficient, or unnecessary consumption of energy resources. The proposed Project would not add new energy requirements for continued maintenance of Copper Basin Dam.

As shown in Appendix A, the proposed Project would emit approximately 1,418 metric tons of carbon dioxide equivalent (CO2e) per year. The volume of diesel consumed during the proposed Project can be estimated by using a general emission factor to gallons for diesel of 10.2 kilograms of CO2 per gallon. Based on the mass of CO2e emissions, approximately 139,020 gallons or 3,310 barrels of diesel fuel would need to be used per year. Impacts would be less than significant.

*b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

**Less than Significant Impact**. The Project does not conflict with energy efficiency plans, restrict the development of renewable energy projects, or restrict the use of renewable energy. The proposed Project would rehabilitate and replace the discharge valve as a means of improving Colorado River Aqueduct conveyance reliability. Metropolitan's strategies for promoting renewable energy and energy efficiency are in the Metropolitan Water District Climate Action Plan (2022), which includes strategies to achieve carbon neutrality while providing co-benefits such as improved infrastructure reliability, increased energy resiliency, and decreased costs associated with energy procurement and maintenance. The Project does not include energy consumption sources that are directly subject to state or local energy efficiency plans. During operations, maintenance activities would be identical to existing conditions with no increase in energy use. Therefore, the Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Impacts would be less than significant.

## 3.7 Geology and Soils

| **GEOLOGY AND SOILS**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☐ | ☒ |
| ii) Strong seismic groundshaking? | ☐ | ☐ | ☐ | ☒ |
| iii) Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☐ | ☒ |
| iv) Landslides? | ☐ | ☐ | ☐ | ☒ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☒ | ☐ |
| c) Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial direct or indirect risks to life or property? | ☐ | ☐ | ☐ | ☒ |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? | ☐ | ☐ | ☐ | ☒ |

| **GEOLOGY AND SOILS**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion. Would the project:***

*a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:*

*i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*

**No Impact**. The proposed Project would not cause a substantial adverse impact, either directly or indirectly, involving the rupture of an earthquake fault mapped as part of an Alquist-Priolo Earthquake Fault Zoning map. According to the California Department of Conservation (DOC) Earthquake Zones of Required Investigation, the Project is within an unevaluated area, and no fault zones are known exist within the Project site. Pinto Mountain Fault Zone is the closest fault zone, located approximately 100 miles west of the Project site in Twentynine Palms (DOC, 2022). Although there are no known fault zones within or near the Project site, Southern California is a seismically active region, and the Project may experience damage from a strong seismic event. Lurching or cracking of the access road and dam components is possible. However, the proposed Project would not exacerbate existing seismic risks or expose people to the risk of loss, injury, or death, as maintenance of the access road and valve structures would continue as it does under existing conditions. Additionally, no habitable structures would be constructed that would house occupants and expose them to the risk of loss, injury, or death during an earthquake. Therefore, the probability of damage and injury from distant surface fault rupture is considered low. There are no nearby structures that could be damaged, and the Project does not propose any manned facilities. O&M activities would remain the same as existing conditions. Therefore, the proposed Project would not expose people or structures to potential substantial adverse effects caused by the rupture of a known fault. No impact would occur.

*ii) Strong seismic groundshaking?*

**No Impact**. The proposed Project would not cause a substantial adverse impact, either directly or indirectly, from strong seismic ground shaking. Refer to Section 3.7.a(i) above. The Project site is not within or near any known fault zones, and the closest known fault zone is approximately 100 miles west of the Project (DOC, 2022). Therefore, the probability of damage to the proposed Project components from strong seismic ground shaking is considered low. Design of the proposed Project components would be in accordance with California Building Code standards for seismic stability. Conforming to these recommendations and all required building standards would minimize the risk of damage, injury, or death due to strong seismic ground shaking. There are no nearby structures that could be damaged, and the Project does not propose any manned facilities. Therefore, the proposed Project would not expose people or structures to potential substantial

adverse effects caused by strong seismic ground shaking. The proposed Project would result in no impact.

*iii) Seismic-related ground failure, including liquefaction?*

**No Impact**. The proposed Project would not cause a substantial adverse impact, directly or indirectly, from seismic-related ground failure, including liquefaction. Liquefaction typically occurs where the ground water is less than 30 feet from the surface and the soils are predominately of poorly compacted sand. The Project site is not within a known liquefaction zone (DOC, 2022). Therefore, the probability of damage to the proposed Project components from seismic-related ground failure or liquefaction is considered low. The proposed Project would be designed in accordance with California Building Code standards for seismic stability. Conforming to these recommendations and all required building standards would minimize the risk of damage, injury, or death due to strong seismic-related ground failure and liquefaction. The proposed Project would improve the existing access road to provide safe access for maintenance activities and rehabilitate the discharge valve and other dam components. There are no nearby structures that could be damaged, and the Project does not propose any manned facilities. Therefore, the proposed Project would not expose people or structures to potential substantial adverse effects caused by the rupture of a nearby fault that results in ground failure or liquefaction at the Project site. The proposed Project would result in no impact.

*iv) Landslides?*

**No Impact**. The proposed Project would not directly or indirectly cause a potential substantial adverse impact involving landslides The Project site is not within a known landslide zone (DOC, 2022). Although the electrical components would be located on top of the hill adjacent to the dam, and steep rock walls are located on both sides of the bottom of the dam, no new large structures would be constructed on top of these steep areas. There are no nearby structures that could be damaged from new Project components, and the Project does not propose any manned facilities. The proposed Project is intended to facilitate safe maintenance of Copper Basin Dam. Therefore, the proposed Project would not expose people or structures to potential substantial adverse effects caused by landslides at the Project site. The proposed Project would result in no impact.

*b. Result in substantial soil erosion or the loss of topsoil?*

**Less than Significant Impact**. The proposed Project would not result in substantial soil erosion or the loss of topsoil. Access road improvements would require grading and the removal of some vegetation, which may result in disturbance of topsoil. However, the impact would be temporary because once operational, access road improvements would reduce erosion with the installation of paved gunite concrete sections, riprap, and V-ditches. These components would protect unpaved road sections from erosion and loss of topsoil. Because the Project components would all occur at grade, they would not result in significant changes to levels of topsoil and would not result in significant erosion from either wind or storm events. Furthermore, according to the County of San Bernardino General Plan Hazards Element, the Project site is not within a mapped wind erosion hazard zone (San Bernardino County, 2020b). The closest mapped wind erosion hazard zone is located approximately 1 mile west of the Project site and has a wind erosion potential of "Low" (San Bernardino County, 2020b). Therefore, the Project site is not expected to be affected by wind driven soil erosion. Therefore, the proposed Project would not result in substantial soil erosion or loss of topsoil. The proposed Project would result in a less-than-significant impact.

c. *Be located on geologic units or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?*

**No Impact**. The proposed Project would not be located on or result in unstable geologic deposits or soils such that on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse would potentially occur. Refer to Sections 3.7.a.(iii) and 3.7.a.(iv), above, regarding liquefaction and landslide, respectively. The Project site is not within a known liquefaction zone or known landslide zone (DOC, 2022). The proposed Project entails replacement of existing valves, upgrades to appurtenant structures and access road rehabilitation activities, and no adverse ground conditions would be created that would contribute to these types of ground failures. There are no nearby structures that could be damaged, and the Project does not propose any manned facilities. Therefore, the proposed Project would not expose people or structures to potential substantial adverse effects caused by a seismic event or other phenomena that create unstable ground. Given that the Project would not be situated in areas known to have unstable ground conditions and would not otherwise create such conditions, impacts related to unstable geologic units and soil would not occur, and the proposed Project would result in no impact.

d. *Be located on expansive soil, as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial direct or indirect risks to life or property?*

**No Impact**. The proposed Project would not be located on expansive soil as defined in Section 1803.5.3 of the California Building Code (2010), creating substantial direct or indirect risks to life or property. According to Section 1803.5.3 of the California Building Code, soils are considered expansive if exhibiting the following characteristics:

1. Plasticity index (PI) of 15 or greater;
2. More than 10 percent of the soil particles pass a No. 200 sieve (75 micrometers);
3. More than 10 percent of the soil particles are less than 5 micrometers in size; and
4. Expansion index greater than 20.

According to the Swelling Clays Map of the Coterminous United States (Olive, et al. 1989), soils in San Bernardino and Riverside counties contain little to no swelling clay. In addition, the Project sites are not currently occupied by people, and no permanent or temporary structures that would be occupied by people would be constructed and/or operated as part of the proposed Project. Therefore, impacts related to expansive soils would not occur.

e. *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*

**No Impact**. The proposed Project does not include the use of septic tanks, nor does it include any features that require wastewater disposal or connection to the existing wastewater treatment system. Therefore, soil suitability for septic tanks or alternative wastewater disposal systems is not applicable in this case, and the proposed Project would have no impacts associated with septic systems. No impact would occur.

*f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

**Less than Significant Impact**. The Project will not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. The Society for Vertebrate Paleontology (SVP 2010) defines significant paleontologic resources as "fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years)." Therefore, Metropolitan recognizes that any identifiable vertebrate fossil remains would be considered unique under CEQA, and direct or indirect impacts on such remains would be considered significant. Identifiable invertebrate and plant fossils would be considered unique if they meet the criteria presented above. Determinations would take into account the abundance and densities of fossil specimens or newly and previously recorded fossil localities in exposures of the rock units present at a Project site.

The Project Area is underlain by Holocene alluvium and stream gravels, Miocene nonmarine sedimentary (primarily sandstone with some conglomeritic sandstone) and mixed nonmarine sedimentary and volcanic rocks, and Precambrian gneisses and granitic rocks (NGMD, 2022; USGS, 1988). The San Bernardino Countywide Plan Draft EIR notes that while many Miocene nonmarine sedimentary units are well known for preserving significant vertebrate fossils, the deposits are likely to vary locally in their paleontological sensitivity; finer grained deposits are more likely to have high sensitivity, and coarse-grained deposits such as conglomerate or breccia, have low sensitivity. Therefore, the Miocene sedimentary deposits consisting primarily of sandstone would be classified as having moderate to high paleontological sensitivity. Precambrian gneisses and granitic rocks have low to no paleontologic sensitivity, and the Holocene alluvium and stream deposits have low sensitivity due to their young age.

The proposed Project Area is located primarily within previously disturbed areas at Copper Basin Reservoir and associated access roads and do not contain any surficial unique geologic features. Miocene sandstone with moderate to high paleontological sensitivity underlies portions of the existing access road, sections of the unpaved access road improvements, and the discharge structure rehabilitation area and associated structures. Proposed Project-related ground disturbance would occur primarily on previously disturbed areas and likelihood of encountering unique paleontological resources from Project construction is considered low. Should any unique paleontological resources be encountered, Metropolitan's standard construction practices ensure that work would be stopped in the immediate area until a paleontologist could validate the discovery. Implementation Metropolitan standard construction practices would ensure that any previously unidentified unique paleontological resources encountered would be protected, therefore impacts are less than significant.

## 3.8 Greenhouse Gas Emissions

| GREENHOUSE GAS EMISSIONS<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

## OVERVIEW OF CLIMATE CHANGE AND GREENHOUSE GASES

Climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. Climate change is the result of numerous, cumulative sources of GHG emissions contributing to the "greenhouse effect," a natural occurrence that takes place in Earth's atmosphere and helps regulate the temperature of the planet. GHG emissions occur both naturally and as a result of human activities, such as fossil fuel burning, decomposition of landfill wastes, raising livestock, deforestation, and some agricultural practices. GHGs produced by human activities include carbon dioxide ($CO_2$), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Different types of GHGs have varying global warming potentials. The global warming potential of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas ($CO_2$) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as "carbon dioxide equivalent" ($CO_2e$), which is the amount of GHG emitted multiplied by its global warming potential. Carbon dioxide has a 100-year global warming potential of one. By contrast, methane has a global warming potential of 28, meaning its global warming effect is 28 times greater than $CO_2$ on a molecule per molecule basis (Intergovernmental Panel on Climate Change [IPCC] 2014).[1]

Anthropogenic activities since the beginning of the industrial revolution (approximately 250 years ago) are adding to the natural greenhouse effect by increasing the concentration of GHGs in the atmosphere that trap heat. Since the late 1700s, estimated concentrations of $CO_2$, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (USEPA 2021h). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature. Potential climate change impacts in California may include loss of snowpack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (State of California 2018).

## REGULATORY FRAMEWORK

In response to climate change, California implemented assembly bill (AB) 32, the "California Global Warming Solutions Act of 2006." AB 32 required the reduction of statewide GHG emissions to 1990 emissions levels (essentially a 15 percent reduction below 2005 emission levels) by 2020 and the adoption of rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. On September 8, 2016, the Governor signed senate bill (SB) 32 into law, extending AB 32 by requiring the State to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, CARB

[1] The IPCC's (2014) *Fifth Assessment Report* determined that methane has a GWP of 28. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the IPCC's (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.

adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program and the Low Carbon Fuel Standard, and implementation of recently adopted policies and legislation, such as SB 1383 (aimed at reducing short-lived climate pollutants including methane, hydrofluorocarbon gases, and anthropogenic black carbon) and SB 100 (accelerated the Renewables Portfolio Standard to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045). As with the 2013 Scoping Plan Update, the 2017 Scoping Plan does not provide Project-level thresholds for land use development. Instead, it recommends local governments adopt policies and locally-appropriate quantitative thresholds consistent with a statewide per capita goal of six metric tons (MT) of $CO_2e$ by 2030 and two MT of $CO_2e$ by 2050 (CARB 2017).

The County of San Bernardino Regional Greenhouse Gas Emissions Reduction Plan (San Bernardino County, 2011; San Bernardino County 2015)_has specific goals including reduce emissions to 15 percent below 2007 levels by 2020, provide estimated GHG reductions associated with the County's existing efforts, and approve a GHG reduction plan that satisfies the CEQA Guidelines requirements. In 2015 an update to the plan was prepared. This update set a review standard of 3,000 MTCO2e per year to identify projects large enough to utilize screening tables for quantifying and mitigating GHG emissions.

In May 2022, Metropolitan adopted a CAP and certified the associated Program EIR to analyze and mitigate GHG emissions associated with its activities. This plan meets the requirements of CEQA Guidelines Section 15183.5(b)(1) for a qualified GHG emissions reduction plan (Metropolitan 2022a). However, the CAP was not yet completed at the time this Project's GHG emissions analysis was conducted. Therefore, this Project continues the practice of referring to guidance from the San Bernardino County Regional Greenhouse Gas Reduction Plan when evaluating the significance of GHG emissions. Actual Project-related emissions associated with this activity would be quantified and reported in the CAP annual progress report.

***Discussion. Would the project:***

a. *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*

**Less than Significant Impact.** The proposed Project would not directly or indirectly generate GHG emissions that may have a significant impact on the environment. The proposed Project would generate greenhouse gas (GHG) emissions temporarily during construction activities. The GHG emissions were estimated using the MDAQMD approved CalEEMod program. As described in Section 3.3, Air Quality, the possible use of a barge was not included in the GHG emissions calculations, and this provides a conservatively high estimate of GHG emissions because using a barge for transport would avoid some diesel truck and other vehicle usage that is also included in the calculations. A summary of the proposed Project's construction carbon dioxide equivalent (CO2e) emissions estimates is shown in Table 3.8-1.

**Table 3.8-1. Greenhouse Gas Emissions**

| | GHG Emissions (MT of CO2e) |
|---|---|
| Construction GHG Emissions | 1,418 |
| **GHG Emissions Significance Threshold (metric tons per year)** | **3,000** |
| *Significant (Exceeds Thresholds)?* | *NO* |

Source: Appendix A; San Bernardino County, 2015.
Note: MT of CO2e: Metric ton of carbon dioxide equivalent

As shown in Table 3.8-1, the GHG emissions estimate for the proposed Project is substantially below the San Bernardino County GHG emissions review standard of 3,000 metric tons (MT) of CO2e per year (San Bernardino County, 2015). The total one-time emissions during the construction period would be even lower, on a per-year basis, if amortized over the life of the Project. The proposed Project would not affect existing O&M activities; therefore, no emissions estimate has been completed for continuing operations. As a result, the quantity of GHG emissions caused by the Project would have a less than significant impact.

b. *Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?*

**Less than Significant Impact.** The proposed Project would not conflict with an applicable plan, policy or regulation of an agency adopted for the purposes of reducing GHG emissions. As stated in the Regulatory Framework section above, Metropolitan adopted a CAP in May 2022, however it was not yet completed at the time this Project's GHG emissions analysis was conducted. Therefore, this discussion addresses whether these emissions would conflict with the GHG emissions reduction measures listed in the CARB (2017) Climate Change Scoping Plan or the County of San Bernardino Regional Greenhouse Gas Emissions Reduction Plan.

The AB32 Climate Change Scoping Plan includes emission reduction strategies to reach the state's GHG reduction target of 40 percent below 1990 levels by 2030 (CARB, 2017). Emissions reduction strategies include increasing renewable energy and fuels, increasing building efficiency, moving towards zero or near zero emission vehicles, and community design strategies such a walkable/bikeable communities with public transit. Most emission reduction strategies in the plan do not directly impact construction emissions, however, strategies involving vehicle standards and idling time, as well as waste reduction would apply to the Project's construction. Vehicles that access the Project site would be required to comply with the Vehicle Climate Change Standards and would be required to limit idling time for commercial vehicles. Solid Waste Reduction is another strategy of the plan that would apply to construction of the proposed Project. This State strategy was codified in 2012 under SB 1374 as the Construction and Demolition Waste Ordinance that requires jurisdictions to divert a minimum of 50 percent of their non-hazardous construction and demolition waste from landfills. Waste from the proposed Project would be minimal, and material excavated on site would be reused for infill on site. Additional GHG emissions reductions from construction would occur indirectly from other state-wide actions such as the low carbon fuel standard that is currently being implemented. The Project would not conflict with the state's GHG reduction target of 40 percent below 1990 levels by 2030 or conflict with the GHG emissions reduction measures listed in the CARB Climate Change Scoping Plan.

The proposed Project would be consistent with the County of San Bernardino's GHG Reduction Plan. The proposed Project would temporarily generate a small amount of construction related GHG emissions (Table 3.8-1) and would not otherwise change current operational GHG emissions. The proposed Project would implement the County's required waste reduction measures to ensure compliance with applicable state and local GHG reduction measures. Therefore, the proposed Project would not conflict with applicable plans, policies, or regulations adopted for the purpose of reducing the emissions of GHGs, and this impact would be less than significant.

## 3.9 Hazards and Hazardous Materials

| **HAZARDS AND HAZARDOUS MATERIALS**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☐ | ☒ | ☐ |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☐ | ☒ | ☐ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☐ | ☒ |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | ☐ | ☐ | ☐ | ☒ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |
| f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☒ | ☐ |
| g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion. Would the project:***

*a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*

**Less than Significant Impact**. The proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. There would be no permanent storage of hazardous materials (e.g., fuel, lubricants, etc.) on the Project sites. Construction of the proposed Project would include the temporary use and transport of hazardous materials in the form of fuels and lubricants required to operate construction vehicles and equipment as well as coal tar enamel coating at the dam valve structure. Minor spills or releases of hazardous materials could occur due to accidental handling and/or storage during construction

activities at the sites. The existing pipe and concrete valve house contain coal tar enamel coating that is assumed to contain polychlorinated biphenyls (PCBs) above the regulatory limit.

Metropolitan implements a Hazardous Materials/Waste Management Program (HM/WMP) as part of its standard construction practices that sets forth policies, requirements, and responsibilities for evaluation, handling, storage, disposal, transport, and source reduction of hazardous materials/wastes. The HM/WMP includes procedures for containment and cleanup of hazardous materials/waste spills and establishes hazardous waste contingency plans. These procedures would be included in Metropolitan's contractor specifications for the proposed Project. To avoid accidental leaks or spills, use and storage of hazardous materials in limited quantities, which is common for construction projects, would occur in compliance with all federal, state, and local laws and regulations, as well as in compliance with standard Metropolitan construction practices, which ensure that hazardous materials are stored safely. Potential impacts related to minor spills would be largely avoided by compliance with Metropolitan's standard construction practices, training construction personnel in the handling and storage of hazardous materials in compliance with California Occupational Safety and Health Administration standards, and compliance with Stormwater Pollution and Prevention Program (SWPPP) requirements (the Project would be required to obtain SWPPP approval from the Regional Water Quality Control Board). The proposed Project does not involve any changes to long-term use or storage of hazardous substances required for CRA operation and maintenance. Therefore, the Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and impacts would be less than significant.

b. *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*

**Less than Significant Impact.** The proposed Project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Refer to Section 3.9.a. Only minimal amounts of hazardous materials would be used such as petroleum-based fuels or hydraulic fluid used for construction equipment; therefore, the potential for an accidental release of significant quantities of hazardous materials that could affect the surrounding environment is low. Metropolitan's standard construction practices would ensure that all hazardous materials are stored safely within the Project footprint and within covered, leak-proof containers. Additionally, Metropolitan's standard contractor specifications for the Project would include provisions to address spills of fuel, hydraulic fluid, and other materials. Metropolitan's contractor specifications for the proposed Project would address the proper removal and disposal of concrete with coal tar coating. Finally, development and implementation of a SWPPP would be required during construction of the proposed Project and would comply with local, state, and federal regulations. There would be no operational impacts related to the creation of a significant hazard. For these reasons, accident conditions leading to the release of hazardous materials that could cause a significant hazard to the public or surrounding environment is unlikely. Therefore, impacts would be less than significant.

*c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

**No Impact**. The proposed Project would not emit hazardous emissions, materials, substances, or waste within 0.25 mile of an existing or proposed school. The nearest school, Parker Dam Elementary School, is located approximately 4.3 miles east of the Project site. Therefore, no impact related to emitting or handling hazardous materials within 0.25 mile of an existing or proposed school would occur.

*d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*

**No Impact**. The proposed Project site is not within any of the hazardous materials sites on lists compiled pursuant to Government Code Section 65962.5 (Cortese List). According to the California Department of Toxic Substances Control EnviroStor Database, the nearest site is the Gene Pumping Plant, located approximately 3.3 miles northeast of the site, which was cleaned in 2009. According to the State Water Resources Control Board GeoTracker database, the nearest leaking underground storage tank site is the U.S. Fish and Wildlife Parker Dam site, located approximately 3.3 miles southeast of the Project site. The site was cleaned, and the status is Case Closed as of November 14, 1989 (SWRCB, 2022). The Project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, the Project would not create a significant hazard to the public or the environment related to hazardous materials sites, and no impact would occur.

*e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?*

**No Impact**. The proposed Project would not result in a safety hazard or excessive noise for people residing or working in the Project area due to proximity to a public airport or public use airport. No Project sites are located within two miles of a public airport or public use airport. The proposed Project is approximately 2.85 miles southwest of the Gene Wash Reservoir Airport, which is privately owned, and not within an airport land use plan (San Bernardino County, 2022b). Therefore, no impact would occur.

*f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

**Less than Significant Impact**. The proposed Project would not impair implementation of or physically interfere with an adopted emergency plan or evacuation plan. The Project sites are all located on Metropolitan fee property. According to the County of San Bernardino's Personal and Property Protection Element, PP-2 Evacuation Routes map, the nearest evacuation route is State Route 62, located approximately 9 miles southwest of the Project site (San Bernardino County, 2020c). Local roads providing direct access to the Project site are not included in the County of San Bernardino's Evacuation Routes map. During construction, vehicles and large construction equipment would utilize the local roads to access the site. These trips may cause brief temporary delays on local roads providing direct access to the site. However, no public roadway or lane closures are expected during construction. Additionally, Metropolitan's contractor specifications identify traffic control measures for construction to reduce impacts to traffic and safety for motorists. In the

event deliveries require any disruption to public roadways, flagmen would be present to ensure traffic flow, including emergency vehicle flow through the area. Once operational, the proposed Project would have no impact on access or movement to emergency service providers. Therefore, the Project would not impair implementation of or physically interfere with an adopted emergency response or evacuation plan, and no impact would occur.

g. *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*

**Less than Significant Impact**. The proposed Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. The Project site surrounding Copper Basin Reservoir and Dam is rural and largely undeveloped, with adjacent lands being desert landscape. According to the CAL FIRE Fire Hazard Severity Zone (FHSZ) Viewer, the Project site is not within a FHSZ, meaning the site has no potential for high fire hazard at either the State, Local, or Federal Responsibility Area level (CAL FIRE, 2022). As the Project site is not located in or near lands classified as High or Very High FHSZ, there is low risk of wildfire or uncontrolled spread of a wildfire.

To reduce fire risk during construction, the construction contractor would adhere to standard Metropolitan construction practices, which require fire containment and extinguishing equipment located onsite and include practices to avoid accidental ignition and leaking of fuels and other combustible materials. All gasoline-powered or diesel-powered machinery used during construction would be equipped with standard exhaust controls and muffling devices that will also act as spark arrestors. Once completed, the proposed Project would have no new potential for fire as maintenance activities at the Project site would be identical as those occurring under existing conditions. Additionally, the removal of vegetation along the improved access road would further reduce the risk of vehicles accidentally igniting dry vegetation along the road. Therefore, the Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires, and impacts would be less than significant.

## 3.10 Hydrology and Water Quality

| **HYDROLOGY AND WATER QUALITY**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Violate Regional Water Quality Control Board water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? | ☐ | ☐ | ☒ | ☐ |
| b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | ☐ | ☐ | ☒ | ☐ |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: | | | | |
| i. Result in substantial erosion or siltation on or off site? | ☐ | ☐ | ☒ | ☐ |
| ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite? | ☐ | ☐ | ☒ | ☐ |

| **HYDROLOGY AND WATER QUALITY**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | ☐ | ☐ | ☒ | ☐ |
| iv. Impede or redirect flood flows? | ☐ | ☐ | ☒ | ☐ |
| d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | ☐ | ☐ | ☒ | ☐ |
| e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Violate Regional Water Quality Control Board water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?*

**Less than Significant Impact**. The proposed Project would not violate RWQCB water quality standards or waste discharge requirements (WDRs) or otherwise substantially degrade surface or ground water quality. Section 303 of the federal CWA requires states to develop water quality standards to protect the beneficial uses of receiving waters. In accordance with California's Porter-Cologne Act, the RWQCBs of the State Water Resources Control Board are required to develop water quality objectives that ensure their region meets the requirements of Section 303 of the CWA. Metropolitan shall comply with the requirement to prepare a SWPPP specific to this Project for review and approval by the RWQCB. The requirements of the SWPPP would be implemented during construction to ensure any accidental release of chemicals and watering for dust control do not violate RWQCB water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. The SWPPP would include BMPs for erosion and sediment control including, but not limited to, check dams, fiber rolls, sandbags, and siltation fences. Soil disturbance activities would be limited to the dry season, whenever possible. If construction occurs during the rainy season, erosion and sediment transport control measures would be implemented prior to disturbance of soil and vegetation (Metropolitan, 2021b).

Implementation of the proposed Project would require Metropolitan to obtain a CWA Section 401 Water Quality Certification and/or WDR from the RWQCB prior to construction. Adherence to the requirements of the 401 Water Quality Certification and/or WDR would ensure any accidental release of chemicals, watering for dust control, and alterations to existing jurisdictional drainages do not violate water quality standards, waste discharge requirements, or otherwise substantially degrade surface or ground water quality. Therefore, proposed Project impacts related to RWQCB water quality standards, waste discharge requirements, or surface or ground water quality would be less than significant.

*b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*

**Less than Significant Impact**. The proposed Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project

may impede sustainable groundwater management of the basin. A project can result in a significant impact on groundwater supplies if it reduces groundwater recharge capacity, reduces groundwater yield, adversely changes the rate or direction of groundwater flow, or reduces a water utility's ability to use the groundwater basin for public water supplies.

The small amount of water that would be required during construction of the proposed Project (mainly for dust suppression and concrete preparation) would be obtained from the CRA or provided via local supplies trucked to the site through an agreement with a local municipality. The use of water for dust suppression would be limited to the construction contractor's staging yards. In addition, the Project would not install any groundwater wells. The Project would result in a nominal change to the amount of impermeable surface along the access road. Although portions of the access road would be paved with impermeable gunite concrete, the surrounding area consists of undeveloped desert land and would continue to allow water to naturally infiltrate the soil. Access road improvements would have a negligible impact on groundwater recharge. Stormwater would flow over the paved gunite concrete surfaces and continue to be absorbed by surrounding desert lands. Therefore, the access road improvements would not impede groundwater recharge.

Replacement of the dam valve and rehabilitation of appurtenant structures would not require groundwater pumping and would not create new impermeable surfaces that may interfere with groundwater recharge. Stormwater flowing over these small areas of concrete would continue to be absorbed by surrounding desert land. Therefore, the proposed Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge and impacts would be less than significant.

c. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*

   i) *Result in substantial erosion or siltation on or off site?*

**Less than Significant Impact**. The proposed Project would not substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion on or off site. The Project site consists of an access road and dam infrastructure. Copper Basin Dam outlets to Copper Basin Wash. Although there are no rivers or streams located adjacent to the access road, the existing access road is unpaved and has portions of varying steepness that are vulnerable to erosion and siltation during storm events and maintenance activities. The proposed Project would temporarily disturb the unpaved access road during construction and grading activities and transport of materials and equipment. However, during operations, erosion and siltation would be reduced with the addition of gunite concrete pavement along slopes 20 percent or greater and installation of riprap and V-ditches that would convey stormwater runoff away from unpaved portions of the road. Project activities would not substantially alter the drainage pattern along the access road or surrounding area and would not substantially alter surface absorption of water or drainage flows.

As discussed in Section 1.4, *Proposed Project*, Arizona crossings would be installed where the access road crosses drainage features. The low water crossings are designed to ensure adequate water flow and sediment transport during storm events. Additionally, as discussed under Section 3.10.(a), the Project would require preparation of a SWPPP for review by the RWQCB and require obtaining CWA Sections 401 and 404 permits/authorizations from the RWQCB and USACE,

respectively. Compliance with the requirements of the construction SWPPP and implementation of standard Metropolitan construction practices would reduce water quality impacts, including erosion and siltation, to the maximum extent practicable during construction. The proposed Project would not result in significant erosion or siltation impacts due to changes to drainage patterns. Therefore, the Project would result in a less-than-significant impact related to substantial erosion or siltation.

*ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?*

**Less than Significant Impact**. The proposed Project would not substantially alter the existing drainage pattern of the site or area in a manner that would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site. As discussed in Section 3.10.c.(i), the Project would involve relatively minor changes to the site's existing drainage patterns along the access road. As discussed in Section 1.4, *Proposed Project*, gunite concrete pavement would be installed along portions of the access road where slopes are 20 percent or greater. Although the concrete would be impervious, it would not substantially increase the rate or amount of surface runoff, as the remaining portions of the access road and surrounding areas would remain unpaved and pervious. The proposed Project would not substantially alter drainage courses, and existing conditions would remain nearly identical. Therefore, the Project would not result in, or contribute to, on- or off-site flooding and would have less-than-significant impacts related to increasing the rate or amount of surface runoff.

*iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*

**Less than Significant Impact**. The proposed Project would not substantially alter the existing drainage pattern of the site or area in a manner that would create or contribute runoff water exceeding the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff water. The Project site is in a remote desert location and is not served by municipal stormwater drainage systems. As discussed in Section 3.10.c.(i), the Project would involve relatively minor changes to the site's existing drainage patterns along the access road and would not significantly increase runoff. As discussed under Section 3.10.(a), the Project would require preparation of a SWPPP and obtaining CWA Sections 401 and 404 permits/authorizations from the RWQCB and USACE, respectively. Compliance with these requirements would further reduce additional sources of polluted runoff during construction to the maximum extent practicable. During operation of the proposed Project, the improved access road would not contribute a substantial increase in runoff water, and stormwater would continue to flow to the surrounding unpaved or impervious areas. Therefore, the proposed Project would not create or contribute substantial amounts of runoff or provide substantial additional sources of polluted runoff. Impacts would be less than significant.

*iv) Impede or redirect flood flows?*

**Less than Significant Impact**. The proposed Project would not substantially alter the existing drainage pattern of the site or area in a manner that would impede or redirect flood flows. As discussed in Section 3.10.c.(i) and 3.10.c.(ii), the proposed Project would involve minor changes to the existing drainage patterns along the access road. It is expected that the drainage patterns

along the access road following construction would be similar to existing conditions. The V-ditches and riprap would cause minor changes in drainage patterns along the site but would improve the conveyance of flows to avoid erosion along the unpaved access road. No large structures would be constructed that would impede or redirect flood flows in the Project site. Therefore, the proposed Project would not result in, or contribute to, impeding or redirecting flood flows. Because the Project involves minor alterations that would improve the site's drainage patterns to maintain safe access along the road, it would not impede or redirect flood flows. Therefore, the proposed Project would have a less-than-significant impact related to impeding or redirecting flood flows.

*d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?*

**Less than Significant Impact**. The Project site is located in the Colorado Desert and thus, is not subject to tsunami risks. It is, however, adjacent to Copper Basin Reservoir and may be affected by seiches or floods. According to the Federal Emergency Management Agency (FEMA) Flood Map, the Project is located in Zone D (Area with Flood Risk due to Levee) (FEMA, 2008). Negligible amounts of oil or lubricants from maintenance vehicles will be required during construction, and PCBs from rehabilitation of the concrete at the dam valve house, which contains coal tar enamel will be removed and disposed of in accordance with applicable laws and regulations. The SWPPP and construction contract would require measures such as preventing the storage of excess materials such as oil, petroleum products, and fuel from being deposited near surface water bodies or drainages. Once constructed, the Project would not contain any pollutants that could be released in the event of site flooding. Therefore, the proposed Project would have a less than significant impact from exposing people or structures to release of pollutants from a flood hazard, tsunami, or seiche zone.

*e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?*

**Less than Significant Impact**. The proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. As discussed under Section 3.10.a, the Project would require preparation of a SWPPP and obtaining CWA Sections 401 and 404 permits/authorizations issued by the RWQCB and USACE, respectively. Compliance with these requirements would ensure that the proposed Project would comply with all water quality control plan requirements. As discussed under Section 3.10.b, the proposed Project would not affect groundwater recharge or management. Less-than-significant impacts would occur related to conflicting with or obstructing implementation of a water quality control plan or sustainable groundwater management plan.

## 3.11 Land Use and Planning

| **LAND USE PLANNING**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Physically divide an established community?*

**No Impact**. The proposed Project would not physically divide an established community. The proposed Project is located in the Colorado Desert within Metropolitan fee property. The Project site and access road are not located within or in the immediate vicinity of an established community and do not serve as a means of moving through or connecting a community or neighborhood. No residential development is located within or near the proposed Project. Access road improvements and refurbishment of the dam valve components would not physically divide a community. Therefore, the proposed Project would not physically divide an existing community, and no impact would occur.

*b. Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?*

**No Impact**. The Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The proposed Project is located within Metropolitan's fee property along the CRA. The primary land use planning document that governs the Project site and adjacent areas is the San Bernardino Countywide Plan Land Use Element. The Project area is within the Resource Conservation Zoning District, which is zoned for open space and recreational activities, single-family homes on large parcels, and similar compatible uses (San Bernardino County, 2009). The proposed Project would improve the existing access road to Copper Basin Dam and replace existing discharge components. It would not introduce a new incompatible use to the area or require changes to the existing zoning or General Plan designation. Furthermore, the Project is located within Metropolitan-controlled fee property. Therefore, the proposed Project would not conflict with a land use plan, policy, or regulation, and no impact would occur.

## 3.12 Mineral Resources

| **MINERAL RESOURCES**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State? | ☐ | ☐ | ☒ | ☐ |
| b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?*

**Less than Significant Impact**. There would be no loss of availability of a known mineral resource that would be of value to the region and the residents of the State. Based on the County of San Bernardino General Plan Natural Resources Element, the Project site is located within Mineral

Resource Zone (MRZ) 3 (moderate potential or possible location) for hydrothermal deposits (San Bernardino County, 2020e). According to the County's Natural Resources Element Goal NR-6 (Mineral Resources), Policy NR-6.1 (Mineral resource areas), the County prohibits or discourages development of land that would substantially preclude the future development of mining facilities in areas classified as MRZ 2a, 2b, or 3a (San Bernardino County, 2020f). Although the Project would be located within MRZ 3, no active mining operations exist at the proposed Project site, and all Project activities would occur within the limits of Metropolitan fee property. Impacts related to the loss of a known mineral resource of value to the region or residents of the State would be less than significant.

*b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*

**No Impact**. The Project would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan. As discussed in Section 13.12.(a), although the Project is located within MRZ 3, the Project site is not used or zoned for mineral resource recovery, and Project activities would have no impact related to the loss of a known mineral resource of local importance.

## 3.13 Noise

| **NOISE**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☐ | ☒ |
| b) Generation of excessive groundborne vibration or groundborne noise levels? | ☐ | ☐ | ☒ | ☐ |
| c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion. Would the project:***

*a. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

**No Impact**. The proposed Project would not generate a substantial temporary or permanent increase in ambient noise levels in excess of applicable standards.

County of San Bernardino General Plan Hazards Element. The Riverside County General Plan Hazards Element (San Bernardino County, 2020e) Policy HZ-2.8, *Proximity to noise generating uses*, limits or restricts new noise sensitive land uses near existing noise generating uses. Noise sensitive land uses (i.e., sensitive receptors) are typically residences, hospitals, schools, daycares, and religious institutions. Other policies address noise in the context of being located near other

development that could disturb people. The proposed Project is located in a remote desert setting with no nearby residential uses or other sensitive receptors. The nearest residences are located approximately 3.3 miles southeast of the Project site in the unincorporated community of Earp. As such, the Project would be consistent with the General Plan Hazards Element. No impact would occur.

San Bernardino County Code of Ordinances. San Bernardino County Code of Ordinances Section 83.01.080 establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-generating land uses in the County. Pursuant to San Bernardino County noise and vibration regulations under San Bernardino County Code Sections 83.01.080(g)(3) and 83.01.090(c)(2), noise and vibrations generated from temporary construction between the hours of 7:00 am and 7:00 pm, Monday through Saturday are exempt. Nevertheless, noise impacts are further analyzed herein for the purposes of CEQA.

The proposed Project is a capital improvement project funded by a government agency for the purposes of maintenance and repair of critical infrastructure to ensure the safe and reliable delivery of water. The proposed Project would generate temporary noise from construction activities. Construction equipment would include heavy equipment such as loaders, backhoes, excavators, and dump trucks. Periodic temporary noise from maintenance activities of the CRA occurs under existing conditions at each site, and the proposed Project would not generate new sources of permanent noise. There are no noise-sensitive land uses located within or near the proposed Project. The nearest residences are located approximately 3.3 miles southeast of the Project site. Temporary construction noise would dissipate over this distance, and sensitive receptors would not be exposed to changes in ambient noise levels. No impact would occur from the proposed Project generating substantial temporary or permanent noise levels in the vicinity of the Project in excess of established standards.

*b. Generation of excessive groundborne vibration or groundborne noise levels?*

**Less than Significant Impact**. The proposed Project would not generate excessive groundborne vibration or noise levels. Pursuant to San Bernardino County noise and vibration regulations under San Bernardino County Code Sections 83.01.080(g)(3) and 83.01.090(c)(2), noise and vibrations generated from temporary construction between the hours of 7:00 am and 7:00 pm, Monday through Saturday are exempt. Nevertheless, groundborne vibration or groundborne noise are further analyzed herein for the purposes of CEQA.

Heavy equipment used during construction of the proposed Project has the potential to generate groundborne vibration and noise. Additionally, heavy truck haul trips may produce short-term groundborne vibration. Typically, groundborne vibrations generated by construction activities attenuate rapidly with distance from the source. The nearest sensitive receptors to the Project site are approximately 3.3 miles southeast of the Project site. Temporary construction vibration would attenuate over this distance and would not affect sensitive receptors. Temporary construction vibration at the sites would have less-than-significant impacts.

Heavy truck haul trips during the temporary construction period would utilize existing roads such as Parker Dam Road and US 95, which are designated for allowable weight and use to access the construction site. Vibration on paved surfaces is typically minimal, and residential and other structures located near these roads are already subject to any momentary vibration from normally occurring trips not associated with Project construction. No residences are located near the

unpaved road segment that requires improvements. Therefore, heavy truck trips on unpaved roads would not generate vibration to any sensitive receptors or buildings. Once constructed, the proposed Project would not generate vibration outside of routine maintenance and repairs that occur during existing conditions. Therefore, groundborne vibration or noise impacts during construction activities would be less than significant.

c. *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*

**No Impact**. The proposed Project is not within the vicinity of an airport land use plan. The proposed Project is approximately 2.85 miles southwest of the Gene Wash Reservoir Airport, which is not within an airport land use plan (San Bernardino County, 2022b). The Gene Wash Reservoir Airport is owned by Metropolitan and not used by the public. Furthermore, the nearest residential area is over 3 miles southwest of the Project site. As such, the proposed Project would not expose people residing or working in the Project area to excessive noise levels. No impacts would occur.

## 3.14 Population and Housing

| **POPULATION AND HOUSING**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | ☐ | ☐ | ☐ | ☒ |
| b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

a. *Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?*

**No Impact**. The proposed Project would not induce substantial unplanned growth in an area. The proposed Project involves improvements to an existing access road and dam infrastructure to ensure safe access and maintenance of Copper Basin Dam within Metropolitan's fee property. The proposed Project would not include residences and would only require temporary construction workers to complete the Project. Thus, construction and operation of the proposed Project would not require extending or improving infrastructure in a manner that would facilitate new population growth. Accordingly, the proposed Project would not induce substantial unplanned population growth in an area, either directly or indirectly, and no impact would occur.

*b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*

**No Impact**. The proposed Project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing. The proposed Project involves improvements to an existing access road and dam infrastructure to ensure safe access and maintenance of Copper Basin Dam within Metropolitan's fee property. The proposed Project does not contain any existing residential uses and would not displace any persons or housing. The nearest residence is approximately 3.3 miles from the Project site. Therefore, no additional construction of replacement housing elsewhere is required. The proposed Project would have no impact related to displacement of persons or housing.

## 3.15 Public Services

| PUBLIC SERVICES<br>Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Fire protection? | ☐ | ☐ | ☐ | ☒ |
| b) Police protection? | ☐ | ☐ | ☐ | ☒ |
| c) Schools? | ☐ | ☐ | ☐ | ☒ |
| d) Parks? | ☐ | ☐ | ☐ | ☒ |
| e) Other public facilities? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:**

*a. Fire protection?*

**No Impact**. The proposed Project would not result in substantial adverse physical impacts to any fire protection services.

The need for new or expanded fire protection facilities is typically associated with a permanent population increase that is large enough to cause new or expanded fire protection facilities to be constructed. As discussed in Section 3.14 (Population and Housing), the Project would not induce population growth or develop structures that may require additional public services. The proposed temporary construction activities and ongoing maintenance of Copper Basin Dam would not affect or result in a need for new or altered fire protection services. Therefore, the construction and operation of the proposed Project would not result in the need for additional new or altered fire

protection services and would not alter acceptable service ratios or response times. No impact to fire protection service levels would occur from the proposed Project.

*b. Police protection?*

**No Impact**. The proposed Project would not result in substantial adverse physical impacts to any police protection services. The need for new or expanded police protection facilities is typically associated with a permanent population increase that is large enough to cause new or expanded police protection facilities to be constructed. The proposed Project involves improvements to an existing access road and dam infrastructure to ensure safe access and maintenance of Copper Basin Dam within Metropolitan's fee property. As discussed in Section 3.14 (Population and Housing), the Project would not induce population growth or develop structures that may require public service response.

Therefore, the construction and operation of the proposed Project would not result in the need for additional new or altered police protection services and would not alter acceptable service ratios or response times. No impact to police protection service levels would occur from the proposed Project.

*c. Schools?*

**No Impact**. The proposed Project would not result in substantial adverse physical impacts to any schools. The need for new or expanded school facilities is typically associated with a permanent population increase that generates an increase in enrollment large enough to cause new schools to be constructed. The nearest school, Parker Dam Elementary School, is located approximately 4.3 miles east of the Project site. The proposed PAs discussed in Section 3.14 (Population and Housing), the proposed Project would not induce population growth or develop structures that may impact school capacities, and operation of the project would not require new or permanent employees. Therefore, no impacts related to the need for new or expanded school facilities would occur.

*d. Parks?*

**No Impact**. The proposed Project would not result in substantial adverse physical impacts to any parks. The need for new or expanded park facilities is typically associated with a permanent population increase that generates the need for new or expanded park facilities. The nearest park is Buckskin Mountain State Park, located approximately 4 miles southeast of the Project site. The proposed Project involves improvements to an existing access road and dam infrastructure to ensure safe access and maintenance of Copper Basin Dam within Metropolitan's fee property. As discussed in Section 3.14 (Population and Housing), the proposed Project would not induce population growth or develop structures that may impact park service ratios, and operation of the project would not require new or permanent employment. Therefore, no impacts related to the need for new or expanded park facilities would occur.

*e. Other public facilities?*

**No Impact**. The need for new or expanded public facilities (libraries, etc.) is typically associated with a permanent population increase that generates the need for new or expanded public facilities to be constructed. Other public facilities, such as libraries and hospitals, are located over 10 miles away from the Project site. Parker Public Library is located approximately 10 miles southeast, and

Parker Indian Hospital is approximately 10.2 miles southeast. The proposed Project involves improvements to an existing access road and dam infrastructure to ensure safe access and maintenance of Copper Basin Dam within Metropolitan's fee property. As discussed in Section 3.14 (Population and Housing), the proposed Project would not induce population growth or develop structures that may affect public facility use, and operation of the Project would not require new or permanent employment. Therefore, no impacts related to the need for any other new or expanded public facilities would occur.

## 3.16 Recreation

| **RECREATION**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☒ |
| b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*

**No Impact.** The proposed Project would not increase the use of existing neighborhood and regional parks or other recreational facilities. The nearest park is Buckskin Mountain State Park, located approximately 4 miles southeast of the Project site. An increased use of an existing neighborhood, park, or recreational facility is typically associated with a permanent population increase. As discussed in Section 3.14 (Population and Housing), the proposed Project involves improvements to an existing access road and dam infrastructure within Metropolitan's fee property and would not induce population growth. Operation and maintenance of the Project would not require new or permanent employment. Therefore, the proposed Project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated, and no impact would occur.

*b. Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?*

**No Impact**. The proposed Project does not include recreational facilities or require the construction or expansion of recreational facilities. As discussed in Section 3.14 (Population and Housing), the proposed Project involves improvements to an existing access road and dam infrastructure within Metropolitan's fee property and does not include recreational facilities or require the construction or expansion of recreational facilities. Operation and maintenance of the Project would not require new or permanent employment Therefore, the proposed Project does not involve the development of recreational facilities that would have an adverse effect on the environment. No impacts would occur.

## 3.17 Transportation

| TRANSPORTATION<br>Would the project: | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities? | ☐ | ☐ | ☒ | ☐ |
| b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)? | ☐ | ☐ | ☒ | ☐ |
| c) Substantially increase hazards due to a geometric design feature (5.g., sharp curves or dangerous intersections) or incompatible uses (5.g., farm equipment)? | ☐ | ☐ | ☒ | ☐ |
| d) Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

### OVERVIEW OF TRANSPORTATION

#### *San Bernardino County*

The County of San Bernardino (2020b) County Policy Plan Transportation and Mobility Element identifies goals and policies related to the transportation system, including roadway capacity, road design standards, and vehicle miles traveled (VMT). Goal TM-1 identifies minimum levels of service (LOS) standards for various regions within the county. The LOS standard for the North and East Desert Regions, in which the San Bernardino County Project sites are located, is LOS C (County of San Bernardino 2020b). The San Bernardino County Transportation Authority is the designated Congestion Management Agency responsible for the development and implementation of the Congestion Management Plan (CMP) in San Bernardino County. According to the current CMP, none of the roadways in the vicinity of the Project sites in San Bernardino County operate below the County's LOS standard of LOS C for the North and East Desert Regions (San Bernardino Associated Governments 2016).

***Discussion*. Would the project:**

a. *Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?*

**Less than Significant Impact**. The Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The proposed Project is located in a remote area within Metropolitan's fee property and would require temporary vehicle trips during construction. Construction worker trips would occur between 6:00 a.m. and 8:00 a.m. Truck trips associated with materials and equipment deliveries to the project site would likely be distributed throughout the workday. Temporary construction trips are assumed to come from the local area or from the greater San Bernardino County area. Appendix A provides details on the predicted number of trips for the proposed Project, with the maximum number of trips being approximately 20 per day. While vehicle trips would occur on local roads that connect to the unpaved access road at the Project site, these trips would be temporary, and the Project would not impact any county program, plan, ordinance, or policy related to transit, bicycle, or pedestrian facilities in the vicinity of the site or along local roadways.

Once constructed, the Project would not generate any permanent vehicle trips. Operation and maintenance of the Project would be identical to that occurring under existing conditions. As a result, the Project would not impact any County program, plan, ordinance, or policy related to transit, roadway, bicycle, or pedestrian facilities in the vicinity of the Project area, and no impact would occur.

b. *Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?*

**Less than Significant Impact.** The proposed Project would not conflict with or be inconsistent with CEQA Guidelines Section 15064.3(b). As discussed in CEQA Guidelines Section 15064.3(b)(3), a qualitative analysis of construction traffic vehicle miles travelled (VMT) may be appropriate. Temporary construction worker commute trips are assumed to be generated from the local area or from the greater San Bernardino County area. As presented in Appendix A, it is assumed a worst-case average that Project trips may be up to 35 miles each direction. This distance is primarily due to the remote location of the Project site. Some truck trips associated with delivery of specialized materials and equipment may require longer distances. Although construction requires somewhat high VMT to access the Project site (35 miles or greater in each direction), these trips would be temporary and only in volumes necessary for the construction workforce and to deliver specialized equipment and materials to the site (a maximum of 20 trips per day). Such construction-related trips are not considered to be transit-friendly trips, meaning workers and equipment cannot utilize public transportation in efforts to reduce overall VMT of the Project.

According to the County of San Bernardino Transportation Impact Study Guidelines, projects generating less than 110 daily vehicle trips are not required to complete a VMT assessment (San Bernardino County, 2019). The proposed Project would generate with a daily maximum of 20 employee vehicle trips (see Appendix A). Although the proposed Project would include temporary construction trips, some with high VMT due to the remote location of the Project site, to deliver specialized materials and equipment, they would be temporary and cease upon completion of construction. Once constructed, the Project would not generate any new permanent vehicle trips. Operation and maintenance of Copper Basin Dam would be identical to that occurring under existing conditions. The Project would not generate any new long-term trips and would have no effect on existing VMT in the area. Therefore, the proposed Project would not affect existing transit uses or corridors and would result in a less-than-significant impact with respect to CEQA Guidelines Section 15064.3(b)(3).

c. *Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*

**Less than Significant Impact**. The proposed Project would not substantially increase hazards due to a geometric design feature or incompatible uses. All construction disturbance would be limited to the Project site and within the existing Metropolitan fee property. The access road would be graded and paved and would not be realigned. The Project would not modify any public roadways or driveways outside of the Project limits. During construction, oversize truck trips may be required to deliver large pieces of construction equipment and materials to the site. Any necessary oversized truck trips would require obtaining permits from Caltrans and local jurisdictions, as needed. The construction contractor would follow all rules and requirements of such permits,

which would ensure no hazards to motorists or others utilizing the public roadway system occur. Impacts would be less than significant.

*d. Result in inadequate emergency access?*

**No Impact.** The proposed Project would not result in inadequate emergency access. All construction vehicles and equipment would be staged away from public roads and would not block emergency access routes, and no road closures are proposed. The proposed Project would not impede existing emergency response plans for residential, commercial, industrial, or other land uses in the vicinity of the Project site. No impact would occur.

## 3.18 Tribal Cultural Resources

| **TRIBAL CULTURAL RESOURCES**<br>Would the project: | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: | | | | |
| i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)? | ☐ | ☐ | ☐ | ☒ |
| ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe? | ☐ | ☐ | ☐ | ☒ |

***Discussion*. Would the project:**

*a. Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*

*i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?*

*ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?*

**No Impact**. The proposed Project would not cause a substantial adverse change in the significance of Tribal Cultural Resources listed or eligible for listing in the California Register of Historical Resources (CRHR), nor were any resources determined by Metropolitan as Lead Agency.

On June 30, 2022, Metropolitan sent a consultation request letter via certified mail to tribes that had previously requested to be informed through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with those tribes. The only tribe whose geographic area is traditionally and culturally affiliated with the Project area and previously informed Metropolitan to be notified to consult is the Twenty-Nine Palms Band of Mission Indians. Metropolitan did not receive any formal request for tribal cultural resource consultation from the Twenty-Nine Palms Band of Mission Indians. Additionally, Metropolitan's cultural resource and archaeological resource identification efforts did not identify the presence of any prehistoric archaeological resources or resources eligible for or listed on the CRHR or local register within the Project Area, except for the CRA itself. Because no tribal cultural resources have been identified on or near the Project Area, the Project would not cause a substantial adverse change in the significance of a tribal cultural resource as defined, and no impact would occur.

## 3.19 Utilities and Service Systems

| **UTILITIES AND SERVICE SYSTEMS**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction of which could cause significant environmental effects? | ☐ | ☐ | ☒ | ☐ |
| b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years? | ☐ | ☐ | ☒ | ☐ |
| c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | ☐ | ☐ | ☐ | ☒ |
| d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | ☐ | ☐ | ☒ | ☐ |
| e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☒ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion*. Would the project:**

*a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction of which could cause significant environmental effects?*

**Less than Significant Impact**. The proposed Project would not require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities. The proposed Project consists of improvements to an existing access road and dam valve infrastructure upgrades to ensure safe

access to and proper maintenance of an existing reservoir. A new transformer, electrical equipment, wiring, cables, and conduits would be installed at the dam valve house. Although these electrical components would be new, they would not require expanded facilities, as these components would replace existing electrical infrastructure and would not increase demand for electricity. The proposed Project would not result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities. Impacts would be less than significant.

b. *Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?*

**Less than Significant Impact**. There would be sufficient water supplies available to serve the Project. The small amount of water that would be required during construction of the proposed Project (mainly for dust suppression and concrete preparation) would be obtained from local supplies (e.g., the CRA) or trucked to the site through an agreement with a local municipality or provider. This use of water would be temporary and would not impact long-term water supplies. Once completed, the proposed Project would not utilize or require water. Impacts to water supplies would be less than significant.

c. *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*

**No Impact**. There are no wastewater treatment facilities in the Project area. The proposed Project consists of improvements to ensure safe access to and maintenance of Copper Basin Dam. The project would not result in population growth or require the construction of sewer systems requiring connection to a wastewater treatment plant. No new demand on an existing wastewater treatment provider would occur as a result of the proposed Project. No impact would occur.

d. *Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?*

**Less than Significant Impact**. The proposed Project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. The Project is anticipated to generate approximately 1,955 cubic yards of cut soil, and construction activities may generate small amounts of inert and domestic wastes. Upon completion of the proposed Project, no permanent increase in solid waste generation would occur, as operation and maintenance of the dam and valves would occur in the same capacity as existing conditions. The limited amount of waste generated during construction is expected to be adequately served by nearby landfills with sufficient permitted capacity. The closest municipal landfill to the Project site is Lake Havasu City Landfill (3251 East Chenoweth Drive, Lake Havasu, Arizona 86404), located approximately 19 miles northwest. Lake Havasu City Landfill has a permitted capacity of approximately 6.7 million cubic yards (ADEQ, 2022). The amount of solid waste generated by the proposed Project would be nominal compared to the permitted capacity of this landfill. Therefore, less-than-significant impacts would occur related to generating substantial amounts of solid waste or meeting solid waste reduction goals.

*e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*

**No Impact**. The proposed Project would comply with all federal, state, and local laws and regulations for reduction of solid waste. As discussed in Section 3.8.b, SB 1374 (Construction and Demolition Waste Ordinance) requires jurisdictions to divert a minimum of 50 percent of their non-hazardous construction and demolition waste from landfills. Waste from the proposed Project would be minimal, and material excavated on site would be reused for infill on site. No impacts from the proposed Project would occur related to compliance with federal, state, and local management and reduction statutes and regulations related to solid waste.

## 3.20 Wildfire

| **Wildfire**<br>If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Substantially impair an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☒ | ☐ |
| b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | ☐ | ☐ | ☒ | ☐ |
| c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | ☐ | ☐ | ☒ | ☐ |
| d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | ☐ | ☐ | ☒ | ☐ |

***Discussion*. If located in or near State Responsibility Areas or lands classified as Very High Fire Hazard Severity Zones, would the Project:**

a. *Substantially impair an adopted emergency response plan or emergency evacuation plan?*

b. *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*

c. *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*

d. *Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*

**Less than Significant Impact**. The proposed Project would not substantially impair an adopted response plan or emergency evacuation plan; exacerbate wildfire risks and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire; require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. The Project site is in a remote, relatively undeveloped area surrounded by desert landscape. According to the CAL FIRE FHSZ Viewer, the Project site is not within a Fire Hazard Severity Zone (FHSZ), meaning the site has no potential for high fire hazard at either the State, Local, or Federal Responsibility Area level (CAL FIRE, 2022). As the Project site is not located in or near lands classified as High or Very High FHSZ,

there is low risk of wildfire or uncontrolled spread of a wildfire. All proposed Project construction disturbance would occur within existing Metropolitan fee property. Improvement of the unpaved access road leading to Copper Basin Dam would facilitate on-site circulation of maintenance vehicles only. The Project does not include the modifications to any public roadways or driveways. During construction, oversize truck trips may be required to deliver large pieces of construction equipment and materials to the site. Any necessary oversized truck trips would require obtaining permits from Caltrans and local jurisdictions, as needed. The construction contractor would follow all rules and requirements of such permits, which would ensure motorists access and use to the public roadway system. Therefore, the Project would not impact roadways or access routes that could be utilized for emergency response or emergency evacuation. Impacts would be less than significant related to substantial impairment of an adopted emergency response plan or emergency evacuation plan from the proposed Project.

As discussed above, the Project site is in a remote, relatively undeveloped area surrounded by desert landscape and is not within a FHSZ, meaning the site has no potential for high fire hazard at either the State, Local, or Federal Responsibility Area level (CAL FIRE, 2022). As the Project site is not located in or near lands classified as High or Very High FHSZ, there is low risk of wildfire or uncontrolled spread of a wildfire. Construction vehicles and other equipment would use fuels that could temporarily increase the risk of localized fire during construction. To reduce fire risk during construction, the construction contractor would adhere to standard Metropolitan construction practices, which require fire containment and extinguishing equipment located onsite and include practices to avoid accidental ignition and leaking of fuels and other combustible materials. All gasoline-powered or diesel-powered machinery used during construction would be equipped with standard exhaust controls and muffling devices that will also act as spark arrestors.

Once completed, the proposed Project would have no associated potential for fire as maintenance activities at the Project site would be identical to existing conditions. Additionally, the removal of vegetation along the improved access road would further reduce the risk of vehicles accidentally igniting dry vegetation along the road. Impacts related to exposing persons or structures to wildland fires would be less than significant. Once constructed, the Project would have no new potential for fire as maintenance activities at the Project site would be identical as those occurring under existing conditions. Impacts related to exposing Project occupants to pollutant concentrations from a wildfire or uncontrolled spread of a wildfire would be less than significant.

The Project does not include the modifications to any public roadways or driveways. The project would require installation of a new 75kVA, 2400V-480V transformer and new electrical equipment and wiring at the dam valve house. However, these would not exacerbate fire risk, as they would replace existing electrical equipment. Furthermore, the Project site is not located within a High or Very High FHSZ and does not require fire breaks. Impacts related to installing new infrastructure that could exacerbate fire risks would be less than significant.

As discussed above, the Project site is not located within a High or Very High FHSZ. Therefore, the Project and adjacent areas are not susceptible to post-wildfire conditions. The Project would involve minor changes to the site's drainage patterns by installing concrete pavement, riprap, and V-ditches that would convey stormwater runoff away from the road. Although the topography of the access road varies and includes steep sections where the slopes are 20 percent or greater, there are no structures or development nearby that would be exposed to downslope flooding, landslides, or post-fire slope instability or drainage changes. The addition of impervious gunite concrete

surface would not substantially contribute to flooding. The stormwater drainage features would improve stormwater conveyance, and gunite concrete pavement would stabilize steep portions of the access road. The Project would not increase the potential for landslide or ground instability impacts. Lastly, the Project site is unmanned, and the nearest residential area is over 3 miles southwest of the Project site. Since the Project would not substantially alter the existing on-site drainage patterns, and post-development runoff discharge rates would not exceed existing rates, the proposed Project does not have the potential to expose people or structures to significant risks due to post-wildfire flooding or ground instability. The proposed Project would result in a less-than-significant impact related to exposing persons or structures to significant post-fire risks.

## 3.21 Mandatory Findings of Significance

| **MANDATORY FINDINGS OF SIGNIFICANCE**<br>Would the project: | Potentially Significant Impact | Less than Significant With Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☒ | ☐ | ☐ |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? (*Cumulatively considerable* means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.) | ☐ | ☐ | ☒ | ☐ |
| c) Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☒ | ☐ |

Significance criteria established by CEQA Guidelines, Appendix G.

***Discussion:***

a. *Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?*

**Less Than Significant Impact with Mitigation.** The proposed Project would not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory. Based on the analysis provided in Section 3.4 (Biological Resources) and Appendix B.1 (Biological Resources Technical Report) and Appendix B.2 (Aquatic Resources Delineation Report), potential impacts to threatened, endangered, candidate,

or special status species would be mitigated to a less-than-significant level with implementation of Mitigation Measures BIO-1 through BIO-10. Therefore, with mitigation incorporated, the proposed Project would not have the potential to substantially reduce the habitat of fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal. In addition, as discussed in Section 3.5 (Cultural Resources), the Project would not have the potential to substantially adversely affect previously unidentified archaeological resources or eliminate important examples of the major periods of California history or prehistory.

b. *Does the project have impacts that are individually limited, but cumulatively considerable? (Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)*

**Less than Significant Impact.** The proposed Project does not have impacts that are individually limited, but cumulatively considerable. Based on the analysis contained in this Initial Study, the proposed Project would not result in any significant and unmitigable impacts in any environmental category. In all cases, impacts associated with the Project would be limited to the Project area or are of such a negligible degree that they would not result in a significant contribution to any cumulative impacts. This is largely due to the fact that Project construction activities would be temporary, and after construction is completed, Project operations would be identical to those occurring under existing baseline conditions.

Cumulative impacts could occur if construction of other projects occurs at the same time as the proposed Project and in the same geographic scope, such that the effects of similar impacts of multiple projects combine to create greater levels of impact than would occur at the Project level. For example, if the construction of other projects in the area occurs at the same time as construction activities associated with the proposed Project, combined noise and transportation impacts may be treater than at the project level. However, the Project area is in a remote, isolated area surrounded by desert landscape within Metropolitan fee property with no cumulative projects expected in the vicinity, other than ongoing minor Metropolitan operations and maintenance activities pertaining to the CRA. Given that the Project site is located more than 1,000 feet from the nearest residences and communities, the Project's impacts during construction and operation activities would not combine with the impacts of other Metropolitan projects to create cumulative activity-related impacts in areas such as air quality, noise, and transportation. Furthermore, upon completion, Project operations would be identical to those occurring under existing baseline conditions. Therefore, the incremental effects of the proposed Project would not be considerable when viewed in connection with the effects of past, current, and probably future projects, and cumulative impacts would be less than significant.

c. *Does the project have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?*

**Less than Significant Impact.** Based on the analysis contained in this Initial Study, the proposed Project does not exceed any significance thresholds or result in significant impact in the environmental categories typically associated with indirect or direct effects to human beings, such as aesthetics, air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, public services, or transportation. As discussed in Sections 3.1 (Aesthetics), 3.3 (Air

Quality), 3.7 (Geology and Soils), 3.9 (Hazards and Hazardous Materials), 3.10 (Hydrology and Water Quality), 3.13 (Noise), 3.15 (Public Services), and 3.17 (Transportation) of this document, the proposed Project would not expose persons to the hazards of toxic air emissions, chemical or explosive materials, ground shaking, flooding, noise, or transportation. Therefore, the proposed Project does not have a Mandatory Finding of Significance due to environmental effects that could cause substantial adverse effects on humans.

# 4. List of Mitigation Measures

**BIO-1** **Special-Status Plant Species Surveys.** Prior to any ground disturbing activities that are initiated after the spring 2023 blooming season, Metropolitan shall conduct surveys for special-status plants in areas of suitable habitat. Surveys shall be conducted by a qualified botanist during the flowering season in suitable habitat located within proposed Project disturbance areas and a 50-foot buffer. All special-status plant species identified in the proposed Project area shall be mapped onto a site-specific aerial photograph and/or topographic map. Surveys shall be conducted in accordance with the most current protocols established by the CDFW and USFWS. If federally listed, state listed, or California Rare Plant Ranking 1B or 2B species are found, avoidance and minimization measures shall be implemented in accordance with Mitigation Measure BIO-2.

**BIO-2** **Special-Status Plant Species Avoidance and Minimization.** If federally listed, state listed, or California Rare Plant Ranking 1B or 2B species are found during special-status plant surveys conducted pursuant to Mitigation Measure BIO-1, then avoidance measures shall be implemented to avoid impacting these plant species. Rare plant occurrences that are not within the immediate disturbance footprint but are located within 50 feet of disturbance limits shall be protected at least 30 feet beyond their extent, or other distance as approved by a monitoring biologist, to protect them from harm. If avoidance of federally listed or state listed plant species is not feasible, impacts shall be fully offset through implementation of a restoration plan that results in no net loss in accordance with Mitigation Measure BIO-3.

**BIO-3** **Special-Status Plant Species Revegetation.** If avoidance of federally listed, state listed, and/or California Rare Plant Rank 1B or 2B species is not feasible, the individuals shall be transplanted, and surrounding topsoil shall be salvaged to be incorporated into the revegetation process for the site. A special-status plant restoration plan shall be prepared and implemented that includes the following criteria at a minimum:

- The number of specimens affected for each species.
- Identification of onsite or offsite preservation location(s).
- Methods for restoration, enhancement, and/or transplanting, including topsoil salvage and planting seeds of the affected species.
- A replacement ratio of 1:1 per impacted specimen.

**BIO-4** **Special-Status Wildlife Species Surveys.** For all proposed Project work areas, Metropolitan shall implement preconstruction wildlife surveys for special-status wildlife species with a moderate to high potential to occur. Surveys shall be conducted in areas of suitable habitat no more than 72 hours prior to the start of proposed Project activities. The survey area shall include the proposed Project area and all ingress/egress routes, plus a 100-foot buffer (unless otherwise defined by Mitigation Measures BIO-6, BIO-8, and BIO-9).

**BIO-5** **Special-Status Wildlife Species Avoidance and Minimization.** Metropolitan shall develop and implement appropriate avoidance measures for special-status wildlife species occurring within or near the proposed Project area. Avoidance measures may include but are not limited to:

- Flagging or fencing of any special-status species burrows or nests by a monitoring biologist and establishing an appropriate buffer to ensure avoidance during proposed Project activities.
- Monitoring by a monitoring biologist during initial ground-disturbing activities. Once initial ground-disturbing activities have been completed, the biologist shall conduct preconstruction clearance surveys, as necessary.
- If at any time during proposed Project activities a special-status species enters work areas or otherwise may be impacted by construction, activities at the site where the find occurred shall cease until the individual has moved out of the work area and/or buffer on its own accord.

**BIO-6** **Conduct Surveys and Avoidance for Ringtail, American Badger, and Desert Kit Fox.** Metropolitan shall conduct pre-construction surveys for ringtail, American badger, and desert kit fox no more than 15 days prior to initiation of construction activities. Surveys shall be conducted in areas that contain habitat for these species and shall include Project disturbance areas and access roads plus a 200-foot buffer surrounding these areas. If dens are detected, each den shall be classified as inactive, potentially active, active non-natal, or active natal.

Inactive dens that would be directly impacted by road grading shall be excavated either by hand or mechanized equipment under the direct supervision of the biologist and backfilled to prevent reuse by ringtails, badgers, or kit fox. Potentially and known active dens shall not be disturbed during the whelping/pupping season (February 1 – September 30). A den may be declared "inactive" after three days of monitoring via camera(s) or a tracking medium have shown no ringtail, badger, or kit fox activity.

Active dens shall be flagged and Project activities within 200 feet shall be avoided. Buffers may be modified by a qualified biologist. If active dens are found within Project disturbance areas and avoidance is not possible, Metropolitan shall take action as specified below.

**Active and potentially active non-natal dens.** Outside the breeding season, any potentially active dens that would be directly impacted by construction activities shall be monitored by a qualified biologist for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den may be excavated and backfilled by hand. If tracks are observed, the den may be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage continued use. After verification that the den is no longer active, the den may be excavated and backfilled by hand.

**Active natal dens.** Active natal dens or any den active during the breeding season will not be excavated or passively relocated. The pup-rearing season is generally from February 1 through September 30. A 300-foot no-disturbance buffer shall be maintained around all active natal dens. A qualified biologist shall monitor the natal den until they determine that the pups have dispersed. Any disturbance to animals or activities that might disturb denning activities shall be prohibited within the buffer zone. Once the pups have dispersed, methods listed above for non-natal dens may be used to discourage den reuse. After verification that the den is unoccupied, it shall then be excavated by hand and backfilled to ensure that no animals are trapped in the den.

**BIO-7** **Construction Monitoring for Bighorn Sheep.** If bighorn sheep are detected within 300 feet of Project activities, construction shall cease until the bighorn sheep have moved a safe distance away from project activities. If bighorn sheep become acclimated to any activity and the biologist determines that Project activities are unlikely to adversely affect the animals, then Project activities can proceed. If the animals appear agitated, the biologist may increase the buffer distance and suspend Project construction.

**BIO-8** **Conduct Surveys for Mountain Lion and Avoid Denning Areas**. If construction activities that could disturb potential denning sites (i.e., large trees, cavities, rock piles, pipes, or overhangs) will occur during the breeding season for mountain lions (April through September), a qualified biologist will conduct surveys for potential dens within 200 feet of all areas proposed for disturbance. Any active dens will be avoided and an appropriate disturbance-free buffer will be established. Once the young have left the den or the den is no longer active, construction activities can resume.

**BIO-9** **Survey for Maternity Colonies or Hibernaculum for Roosting Bats.** Prior to the initiation of Project activities within suitable bat roosting habitat, Metropolitan shall retain a qualified biologist to conduct surveys for sensitive bats. Surveys shall be conducted no more than 15 days prior to the initiation of work near the base of the dam or near other structures that could support bats. Surveys shall also be conducted during the maternity season (March 1 to July 31) within 300 feet of project activities, where safe access is possible. If active maternity roosts or hibernacula are found, the structure, tree, or feature occupied by the roost shall be avoided (i.e., not removed), if feasible. If avoidance of the maternity roost is not feasible the biologist will implement the following actions.

**Maternity Roosts.** If a maternity roost will be impacted/removed by the Project, and no alternative maternity roost exists in proximity, substitute roosting habitat for the maternity colony shall be provided in an adjacent area free from project impacts. Alternative roost sites will be designed to meet the needs of the specific species. Alternative roost sites must be of comparable size and proximal in location to the impacted colony.

**Exclusion of bats prior to eviction from roosts.** If non-breeding bat hibernacula are found in trees or structures in the Project area, the individuals shall be safely evicted, under the direction of a qualified biologist, by opening the roosting area

to allow airflow through the cavity or other means determined appropriate by the biologist (e.g., installation of one-way doors). In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost. Roosts that need to be removed in situations where the use of one-way doors is not necessary shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours.

**BIO-10** **Jurisdictional Waters Avoidance and Compensatory Mitigation.** Where feasible, jurisdictional areas shall be flagged or fenced for avoidance. Vegetation removal or trimming in jurisdictional areas shall be minimized. Temporary impact areas will be returned to similar conditions that existed prior to ground-disturbing activities. Compensatory mitigation at a 1:1 ratio for permanent impacts will occur through purchase of mitigation credits from an agency-approved mitigation bank, or through permittee-responsible mitigation, subject to applicable regulatory agency approval. Mitigation for temporary impacts to jurisdictional waters will occur through on-site restoration at a 1:1 ratio.

# 5. List of Acronyms and Abbreviations

| | |
|---|---|
| AB | Assembly bill |
| BGEPA | Bald and Golden Eagle Protection Act |
| CalEEMod | California Emissions Estimator Model |
| CAP | Climate Action Plan |
| CARB | California Air Resources Board |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CMP | Congestion Management Plan |
| CNDDB | California Natural Diversity Database |
| CNPS | California Native Plant Society |
| CO | Carbon monoxide |
| CO2 | Carbon dioxide |
| CO2e | Carbon dioxide equivalent |
| CRA | Colorado River Aqueduct |
| CRBRWQCB | Colorado River Basin Regional Water Quality Control Board |
| CRHR | California Register of Historical Resources |
| CRPR | California Rare Plant Rank |
| CWA | Clean Water Act |
| DOC | Department of Conservation |
| DSOD | California Division of Safety of Dams |
| EIR | Environmental Impact Report |
| FEMA | Federal Emergency Management Agency |
| FESA | Federal Endangered Species Act |
| FHSZ | Fire Hazard Severity Zone |
| GHG | Greenhouse gas |
| HCP | Habitat Conservation Plan |
| HM/WMP | Hazardous Materials/Waste Management Program |
| HRA | Health Risk Assessment |
| IS/MND | Initial Study/Mitigated Negative Declaration |
| kVA | Kilovolt amp |
| LOS | Level of service |
| MBTA | Migratory Bird Treaty Act |
| MDAB | Mojave Desert Air Basin |
| MDAQMD | Mojave Desert Air Quality Management District |
| MRZ | Mineral Resource Zone |
| MT | Metric tons |

| | |
|---|---|
| NAHC | Native American Heritage Commission |
| NCCP | Natural Communities Conservation Plan |
| NOx | Nitrogen oxides |
| O&M | Operations and maintenance |
| PCB | Polychlorinated biphenyls |
| PERP | Portable Equipment Registration Program |
| PM | Particulate Matter |
| PM10 | Particulate matter less than or equal to 10 microns in diameter |
| PM2.5 | Particulate matter less than or equal to 2.5 microns in diameter |
| ROG | Reactive organic gas |
| RWQCB | Regional Water Quality Control Board |
| SB | Senate bill |
| SOx | Sulfur oxide |
| SWPPP | Stormwater Pollution and Prevention Program |
| TAC | Toxic air contaminants |
| USACE | U.S. Army Corps of Engineers |
| USEPA | United States Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| VOC | Volatile organic compound |
| VMT | Vehicle miles traveled |
| WDR | Waste discharge requirement |
| WEAP | Worker Environmental Awareness Program |
| WSO | Water System Operations |

# 6. List of Preparers

**Table 6-1. CEQA Lead Agency: The Metropolitan Water District of Southern California**

| | |
|---|---|
| Diane Doesserich | Team Manager, Environmental Planning Section |
| Michelle Morrison | Senior Environmental Specialist |
| Daniel Cardoza | Environmental Specialist |

**Table 6-2. Consultant Team; Aspen Environmental Group**

| Name | Project Role |
|---|---|
| Stanley Yeh | Project Manager |
| Stephanie Tang | Deputy Project Manager, Aesthetics, Agricultural Resources, Energy, Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation, Utilities and Services Systems, Wildfire |
| Brewster Birdsall, PE, QEP | Air Quality, Greenhouse Gas Emissions, Noise |
| Rachael Dal Porto | Air Quality, Greenhouse Gas Emissions, Noise |
| Chris Huntley | Biological Resources |
| Justin Wood | Biological Resources |
| Jamison Miner | Biological Resources |
| Brigit Harvey | Biological Resources |
| Lauren DeOliveira, RPA | Cultural Resources |
| Elliot D'Antin | Cultural Resources |
| Jose Reyes | GIS |
| Kati Simpson | Graphics, Document/Production Coordinator |

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# Appendix A

Construction Details and Air Quality Emission Estimate Calculations

# Attachment 1

AQ/GHG Emissions Summary

## Air Quality Maximum Daily Emissions

### Unmitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | |
| 2022 | 3.0486 | 25.1144 | 28.8346 | 0.0666 | 78.5393 | 1.1444 | 79.6836 | 8.1694 | 1.0793 | 9.2487 |
| 2023 | 4.9128 | 39.8454 | 54.7385 | 0.1125 | 113.6665 | 1.8188 | 115.4854 | 11.8205 | 1.7275 | 13.5480 |
| 2024 | 2.9449 | 23.0350 | 34.2398 | 0.0643 | 60.5680 | 1.0442 | 61.6122 | 6.2941 | 0.9954 | 7.2895 |
| **Maximum** | **4.9128** | **39.8454** | **54.7385** | **0.1125** | **113.6665** | **1.8188** | **115.4854** | **11.8205** | **1.7275** | **13.5480** |
| **MDAQMD Threshold** | **137** | **137** | **548** | **137** | | | **82** | | | **65** |

### Mitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | |
| 2022 | 3.0486 | 25.1144 | 28.8346 | 0.0666 | 36.4347 | 1.1444 | 37.5790 | 3.9679 | 1.0793 | 5.0472 |
| 2023 | 4.9128 | 39.8454 | 54.7385 | 0.1125 | 52.7235 | 1.8188 | 54.5423 | 5.7392 | 1.7275 | 7.4666 |
| 2024 | 2.9449 | 23.0350 | 34.2398 | 0.0643 | 28.0836 | 1.0442 | 29.1278 | 3.0526 | 0.9954 | 4.0480 |
| **Maximum** | **4.9128** | **39.8454** | **54.7385** | **0.1125** | **52.7235** | **1.8188** | **54.5423** | **5.7392** | **1.7275** | **7.4666** |
| **MDAQMD Threshold** | **137** | **137** | **548** | **137** | | | **82** | | | **65** |

## GHG Yearly Emissions

### Unmitigated Construction

| | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|
| Year | MT/yr | | | | | |
| 2022 | 0.0000 | 460.6095 | 460.6095 | 0.0741 | 0.0148 | 466.8787 |
| 2023 | 0.0000 | 758.1940 | 758.1940 | 0.1206 | 0.0134 | 765.2113 |
| 2024 | 0.0000 | 184.8701 | 184.8701 | 0.0243 | 1.5500e-003 | 185.9408 |
| **Total** | **0.0000** | **1403.6736** | **1403.6736** | **0.2190** | **0.0282** | **1418.0308** |
| **County of San Bernardino Threshold** | | | | | | **3000** |

### Mitigated Construction

| | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|
| Year | MT/yr | | | | | |
| 2022 | 0.0000 | 460.6091 | 460.6091 | 0.0741 | 0.0148 | 466.8784 |
| 2023 | 0.0000 | 758.1934 | 758.1934 | 0.1206 | 0.0134 | 765.2107 |
| 2024 | 0.0000 | 184.8699 | 184.8699 | 0.0243 | 1.5500e-003 | 185.9407 |
| **Total** | **0.0000** | **1403.6724** | **1403.6724** | **0.2190** | **0.0282** | **1418.0298** |
| **County of San Bernardino Threshold** | | | | | | **3000** |

# Attachment 2

AQ/GHG Input Summary

| Phases | Start Date | End Date | Days | Equipment Quantity | Quantity | Hours of Use/Day | Employee Vehicles (one way per day) | Water Truck Trips (one way per day) | Heavy Haul (total one way trips) | Cement Truck Trips (total one way trips) |
|---|---|---|---|---|---|---|---|---|---|---|
| Road Grading | 2022/06/01 | 2023/06/01 | 262 | rubber tire front loader | 1 | 7 | 20 | 2 | 2220 | 200.6 |
| | | | 262 | skip loader | 1 | 7 | 20 | 2 | | |
| | | | 262 | backhoe | 1 | 7 | 20 | 2 | | |
| | | | 262 | excavator | 1 | 7 | 20 | 2 | | |
| | | | 262 | skid steer | 1 | 7 | 20 | 2 | | |
| | | | 262 | dump truck | 1 | 7 | 20 | 2 | | |
| | | | 262 | water truck | 1 | 7 | 20 | 2 | | |
| Gunnite Paving | 2022/06/01 | 2023/06/01 | 262 | truck mounted concrete pump | 1 | 7 | 20 | 2 | 40 | 0 |
| | | | 262 | compressors | 2 | 7 | 20 | 2 | | |
| | | | 262 | water truck | 1 | 7 | 20 | 2 | | |
| Electrical Pad and Equipment | 2023/06/01 | 2024/01/01 | 153 | backhoe | 1 | 7 | 12 | 2 | 40 | 0 |
| | | | 153 | excavator | 1 | 7 | 12 | 2 | | |
| | | | 153 | skid steer | 1 | 7 | 12 | 2 | | |
| | | | 153 | water truck | 1 | 7 | 12 | 2 | | |
| | | | 153 | small concrete pump | 1 | 7 | 12 | 2 | | |
| | | | 153 | compressor | 1 | 7 | 12 | 2 | | |
| | | | 153 | generator | 1 | 7 | 12 | 2 | | |
| DV Activites | 2023/06/02 | 2024/06/01 | 261 | backhoe | 1 | 7 | 20 | 2 | 40 | 0 |
| | | | 261 | skid steer | 1 | 7 | 20 | 2 | | |
| | | | 261 | extendable boom fork lift | 1 | 7 | 20 | 2 | | |
| | | | 261 | barge mounted crane | 1 | 7 | 20 | 2 | | |
| | | | 261 | compressor | 1 | 7 | 20 | 2 | | |
| | | | 261 | generator | 1 | 7 | 20 | 2 | | |
| Field Office | 2022/06/01 | 2024/06/01 | 523 | generator | 1 | 7 | 20 | 2 | 40 | 0 |

2421 cement and haul
2581 total trips

Concrete Pavement

| * | Station | + Station | Feet at STA start | Station | + Station | Feed at STA end | Total Feet of Paved Segment Length |
|---|---|---|---|---|---|---|---|
| | 0 | 27 | 27 | 1 | 76 | 176 | 149 |
| | 3 | 75 | 375 | 4 | 60 | 460 | 85 |
| | 7 | 45 | 745 | 7 | 81 | 781 | 36 |
| | 42 | 58 | 4258 | 43 | 4 | 4304 | 46 |
| | 52 | 24 | 5224 | 52 | 54 | 5254 | 30 |
| | 54 | 73 | 5473 | 55 | 16 | 5516 | 43 |
| | 55 | 75 | 5575 | 56 | 59 | 5659 | 84 |
| | 60 | 7 | 6007 | 60 | 54 | 6054 | 47 |
| | 61 | 7 | 6107 | 62 | 80 | 6280 | 173 |
| | 72 | 30 | 7230 | 72 | 93 | 7293 | 63 |
| | 74 | 23 | 7423 | 75 | 71 | 7571 | 148 |
| | 77 | 10 | 7710 | 78 | 33 | 7833 | 123 |
| | 79 | 60 | 7960 | 87 | 30 | 8730 | 770 |

| | Total Length of Paved Segment (ft) | Width of Paved Segment (ft) | Depth of Paved Segment (ft) |
|---|---|---|---|
| 9' Paved C | 1797 | 10 | 0.75 |
| Arizona | 760 | 11 | 0.75 |

| CF to CY | Road | Arizona Crossing | V ditches |
|---|---|---|---|
| | Paved Segment (cf) | Paved Segment (cf) | |
| 0.037 | 13477.5 | 6270 | |
| | Paved Segment (CY) | Paved Segment (CY) | Concrete (CY) |
| | 499 | 231.99 | 172 |
| | Total Concrete Trucks at 9 CY per truck | Total Concrete Trucks at 9 CY per truck | Total Concrete Trucks at 9 CY per truck |
| | 55 | 25.77666667 | 19 |
| | Total one way concrete trips | Total one way concrete trips | Total one way concrete trips |
| | 111 | 51.55333333 | 38 |

| | |
|---|---|
| Total One-Way Concrete Trips for Entire Project | 201 |

| | | |
|---|---|---|
| Total Rip Rap | 9700 | CY |
| | 1940 | One way rip rap trips |

** Heavy Haul Trips
1392 CY Net Material
10 CY per truck
140 round trips
280 total trips

References
* Access Road Plan and Profile - Phase 2 Final Design
** Grading Limits for Access Road Exhibit February 2022

# Attachment 3

CalEEMod Outputs

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# MWD Copper Basin

**San Bernardino-Mojave Desert County, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Heavy Industry | 1,000.00 | 1000sqft | 22.96 | 1,000,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.6 | **Precipitation Freq (Days)** | 32 |
| **Climate Zone** | 10 | | | **Operational Year** | 2024 |
| **Utility Company** | | | | | |
| **CO2 Intensity (lb/MWhr)** | 0 | **CH4 Intensity (lb/MWhr)** | 0 | **N2O Intensity (lb/MWhr)** | 0 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction Schedule

Off-road Equipment - 50hp barge

Off-road Equipment - summary input sheet

Off-road Equipment - small concrete pump

Off-road Equipment - input summary

Off-road Equipment - concrete pump

Off-road Equipment - summary input sheet

Trips and VMT - lake havasu city

On-road Fugitive Dust - 2 percent unpaved

Grading -

MWD Copper Basin - San Bernardino-Mojave Desert County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

Vehicle Trips - no operational

Road Dust -

Consumer Products - no operational changes

Area Coating - no operational changes

Energy Use - no operational changes

Water And Wastewater - no operational changes

Solid Waste - no operational changes

Construction Off-road Equipment Mitigation - soil stabilizer or watering reqd by Rule 403

Area Mitigation - no paint

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaCoating | Area_EF_Nonresidential_Exterior | 250 | 0 |
| tblAreaCoating | Area_EF_Nonresidential_Interior | 250 | 0 |
| tblAreaCoating | Area_EF_Parking | 250 | 0 |
| tblAreaCoating | Area_EF_Residential_Exterior | 250 | 0 |
| tblAreaCoating | Area_EF_Residential_Interior | 250 | 0 |
| tblAreaCoating | Area_Nonresidential_Exterior | 500000 | 0 |
| tblAreaCoating | Area_Nonresidential_Interior | 1500000 | 0 |
| tblAreaCoating | ReapplicationRatePercent | 10 | 0 |
| tblConstDustMitigation | WaterUnpavedRoadMoistureContent | 0 | 0.5 |
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 40 |
| tblConstructionPhase | NumDays | 10.00 | 262.00 |
| tblConstructionPhase | NumDays | 10.00 | 523.00 |
| tblConstructionPhase | NumDays | 10.00 | 523.00 |
| tblConstructionPhase | NumDays | 35.00 | 262.00 |
| tblConstructionPhase | NumDays | 10.00 | 262.00 |
| tblConstructionPhase | NumDays | 35.00 | 153.00 |
| tblConsumerProducts | ROG_EF | 2.14E-05 | 0 |
| tblConsumerProducts | ROG_EF_Degreaser | 3.542E-07 | 0 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | |
|---|---|---|---|
| tblConsumerProducts | ROG_EF_PesticidesFertilizers | 5.152E-08 | 0 |
| tblEnergyUse | LightingElect | 2.93 | 0.00 |
| tblEnergyUse | NT24E | 5.02 | 0.00 |
| tblEnergyUse | NT24NG | 17.13 | 0.00 |
| tblEnergyUse | T24E | 1.97 | 0.00 |
| tblEnergyUse | T24NG | 15.20 | 0.00 |
| tblOffRoadEquipment | HorsePower | 172.00 | 50.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 1.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | |
|---|---|---|---|
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblSolidWaste | SolidWasteGenerationRate | 1,240.00 | 0.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 2,421.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | |
|---|---|---|---|
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 3.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 5.00 | 4.00 |
| tblTripsAndVMT | WorkerTripNumber | 13.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 13.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 12.00 |
| tblVehicleTrips | CC_TL | 7.30 | 0.00 |
| tblVehicleTrips | CNW_TL | 7.30 | 0.00 |
| tblVehicleTrips | CW_TL | 9.50 | 0.00 |
| tblVehicleTrips | ST_TR | 6.42 | 0.00 |
| tblVehicleTrips | SU_TR | 5.09 | 0.00 |
| tblVehicleTrips | WD_TR | 3.93 | 0.00 |
| tblWater | ElectricityIntensityFactorForWastewaterTreatment | 1,911.00 | 0.00 |
| tblWater | ElectricityIntensityFactorToDistribute | 1,272.00 | 0.00 |
| tblWater | ElectricityIntensityFactorToSupply | 9,727.00 | 0.00 |
| tblWater | ElectricityIntensityFactorToTreat | 111.00 | 0.00 |
| tblWater | IndoorWaterUseRate | 231,250,000.00 | 0.00 |

## 2.0 Emissions Summary

MWD Copper Basin - San Bernardino-Mojave Desert County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 2.1 Overall Construction (Maximum Daily Emission)

**Unmitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2022 | 3.0486 | 25.1144 | 28.8346 | 0.0666 | 78.5393 | 1.1444 | 79.6836 | 8.1694 | 1.0793 | 9.2487 | 0.0000 | 6,608.6596 | 6,608.6596 | 1.0675 | 0.2122 | 6,698.5935 |
| 2023 | 4.9128 | 39.8454 | 54.7385 | 0.1125 | 113.6665 | 1.8188 | 115.4854 | 11.8205 | 1.7275 | 13.5480 | 0.0000 | 11,072.9301 | 11,072.9301 | 1.8018 | 0.2365 | 11,188.4513 |
| 2024 | 2.9449 | 23.0350 | 34.2398 | 0.0643 | 60.5680 | 1.0442 | 61.6122 | 6.2941 | 0.9954 | 7.2895 | 0.0000 | 6,259.6683 | 6,259.6683 | 0.9823 | 0.0460 | 6,297.9292 |
| **Maximum** | **4.9128** | **39.8454** | **54.7385** | **0.1125** | **113.6665** | **1.8188** | **115.4854** | **11.8205** | **1.7275** | **13.5480** | **0.0000** | **11,072.9301** | **11,072.9301** | **1.8018** | **0.2365** | **11,188.4513** |

**Mitigated Construction**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | lb/day | | | | | | | | | | lb/day | | | | | |
| 2022 | 3.0486 | 25.1144 | 28.8346 | 0.0666 | 36.4347 | 1.1444 | 37.5790 | 3.9679 | 1.0793 | 5.0472 | 0.0000 | 6,608.6596 | 6,608.6596 | 1.0675 | 0.2122 | 6,698.5935 |
| 2023 | 4.9128 | 39.8454 | 54.7385 | 0.1125 | 52.7235 | 1.8188 | 54.5423 | 5.7392 | 1.7275 | 7.4666 | 0.0000 | 11,072.9301 | 11,072.9301 | 1.8018 | 0.2365 | 11,188.4513 |
| 2024 | 2.9449 | 23.0350 | 34.2398 | 0.0643 | 28.0836 | 1.0442 | 29.1278 | 3.0526 | 0.9954 | 4.0480 | 0.0000 | 6,259.6683 | 6,259.6683 | 0.9823 | 0.0460 | 6,297.9292 |
| **Maximum** | **4.9128** | **39.8454** | **54.7385** | **0.1125** | **52.7235** | **1.8188** | **54.5423** | **5.7392** | **1.7275** | **7.4666** | **0.0000** | **11,072.9301** | **11,072.9301** | **1.8018** | **0.2365** | **11,188.4513** |

MWD Copper Basin - San Bernardino-Mojave Desert County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **53.62** | **0.00** | **52.78** | **51.45** | **0.00** | **44.95** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 2.2 Overall Operational

### Unmitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 9.4100e-003 | 9.3000e-004 | 0.1019 | 1.0000e-005 | | 3.6000e-004 | 3.6000e-004 | | 3.6000e-004 | 3.6000e-004 | | 0.2189 | 0.2189 | 5.7000e-004 | | 0.2331 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **9.4100e-003** | **9.3000e-004** | **0.1019** | **1.0000e-005** | **0.0000** | **3.6000e-004** | **3.6000e-004** | **0.0000** | **3.6000e-004** | **3.6000e-004** | | **0.2189** | **0.2189** | **5.7000e-004** | **0.0000** | **0.2331** |

### Mitigated Operational

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Area | 9.4100e-003 | 9.3000e-004 | 0.1019 | 1.0000e-005 | | 3.6000e-004 | 3.6000e-004 | | 3.6000e-004 | 3.6000e-004 | | 0.2189 | 0.2189 | 5.7000e-004 | | 0.2331 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **9.4100e-003** | **9.3000e-004** | **0.1019** | **1.0000e-005** | **0.0000** | **3.6000e-004** | **3.6000e-004** | **0.0000** | **3.6000e-004** | **3.6000e-004** | | **0.2189** | **0.2189** | **5.7000e-004** | **0.0000** | **0.2331** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Gunnite | Site Preparation | 6/1/2022 | 6/1/2023 | 5 | 262 | |
| 2 | Field Office | Site Preparation | 6/1/2022 | 6/1/2024 | 5 | 523 | |
| 3 | Barge Use | Site Preparation | 6/1/2022 | 6/1/2024 | 5 | 523 | |
| 4 | Road Grading | Grading | 6/1/2022 | 6/1/2023 | 5 | 262 | |
| 5 | Dam Valve Activites | Site Preparation | 6/1/2023 | 6/1/2024 | 5 | 262 | |
| 6 | Electrical Pad and Quipment | Grading | 6/1/2023 | 1/1/2024 | 5 | 153 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Gunnite | Air Compressors | 2 | 7.00 | 78 | 0.48 |
| Gunnite | Other Construction Equipment | 1 | 7.00 | 172 | 0.42 |
| Field Office | Generator Sets | 1 | 7.00 | 84 | 0.74 |
| Barge Use | Cranes | 1 | 7.00 | 231 | 0.29 |
| Barge Use | Other Construction Equipment | 1 | 7.00 | 50 | 0.42 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | | | |
|---|---|---|---|---|---|
| Road Grading | Excavators | 1 | 7.00 | 158 | 0.38 |
| Road Grading | Rubber Tired Loaders | 1 | 7.00 | 203 | 0.36 |
| Road Grading | Skid Steer Loaders | 1 | 7.00 | 65 | 0.37 |
| Road Grading | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Road Grading | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Dam Valve Activites | Aerial Lifts | 1 | 7.00 | 63 | 0.31 |
| Dam Valve Activites | Air Compressors | 1 | 7.00 | 78 | 0.48 |
| Dam Valve Activites | Generator Sets | 1 | 7.00 | 84 | 0.74 |
| Dam Valve Activites | Skid Steer Loaders | 1 | 7.00 | 65 | 0.37 |
| Dam Valve Activites | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Electrical Pad and Quipment | Air Compressors | 1 | 7.00 | 78 | 0.48 |
| Electrical Pad and Quipment | Excavators | 1 | 7.00 | 158 | 0.38 |
| Electrical Pad and Quipment | Generator Sets | 1 | 7.00 | 84 | 0.74 |
| Electrical Pad and Quipment | Other Construction Equipment | 1 | 7.00 | 172 | 0.42 |
| Electrical Pad and Quipment | Skid Steer Loaders | 1 | 7.00 | 65 | 0.37 |
| Electrical Pad and Quipment | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Gunnite | 3 | 20.00 | 2.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Field Office | 1 | 20.00 | 0.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Barge Use | 2 | 4.00 | 0.00 | 4.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Road Grading | 5 | 20.00 | 2.00 | 2,421.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Dam Valve Activites | 5 | 20.00 | 2.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Electrical Pad and Quipment | 6 | 12.00 | 2.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

MWD Copper Basin - San Bernardino-Mojave Desert County, Winter

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

Use Soil Stabilizer

Water Exposed Area

## 3.2 Gunnite - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.8062 | 6.6247 | 7.7495 | 0.0123 | | 0.3649 | 0.3649 | | 0.3509 | 0.3509 | | 1,180.2520 | 1,180.2520 | 0.2121 | | 1,185.5540 |
| **Total** | **0.8062** | **6.6247** | **7.7495** | **0.0123** | **0.0000** | **0.3649** | **0.3649** | **0.0000** | **0.3509** | **0.3509** | | **1,180.2520** | **1,180.2520** | **0.2121** | | **1,185.5540** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2022

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 8.3000e-004 | 0.0356 | 7.5700e-003 | 1.5000e-004 | 0.1619 | 3.8000e-004 | 0.1623 | 0.0170 | 3.6000e-004 | 0.0173 | | 16.7134 | 16.7134 | 7.2000e-004 | 2.6500e-003 | 17.5209 |
| Vendor | 3.4600e-003 | 0.0957 | 0.0339 | 3.9000e-004 | 0.4431 | 1.1000e-003 | 0.4442 | 0.0467 | 1.0600e-003 | 0.0478 | | 42.1495 | 42.1495 | 1.1300e-003 | 6.2400e-003 | 44.0370 |
| Worker | 0.1530 | 0.1192 | 1.4631 | 4.4000e-003 | 21.1262 | 2.6500e-003 | 21.1289 | 2.1948 | 2.4400e-003 | 2.1972 | | 447.1859 | 447.1859 | 8.9900e-003 | 0.0110 | 450.7003 |
| **Total** | **0.1573** | **0.2505** | **1.5046** | **4.9400e-003** | **21.7312** | **4.1300e-003** | **21.7354** | **2.2585** | **3.8600e-003** | **2.2623** | | **506.0488** | **506.0488** | **0.0108** | **0.0199** | **512.2582** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.8062 | 6.6247 | 7.7495 | 0.0123 | | 0.3649 | 0.3649 | | 0.3509 | 0.3509 | 0.0000 | 1,180.2520 | 1,180.2520 | 0.2121 | | 1,185.5540 |
| **Total** | **0.8062** | **6.6247** | **7.7495** | **0.0123** | **0.0000** | **0.3649** | **0.3649** | **0.0000** | **0.3509** | **0.3509** | **0.0000** | **1,180.2520** | **1,180.2520** | **0.2121** | | **1,185.5540** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 8.3000e-004 | 0.0356 | 7.5700e-003 | 1.5000e-004 | 0.0754 | 3.8000e-004 | 0.0758 | 8.3300e-003 | 3.6000e-004 | 8.6900e-003 | | 16.7134 | 16.7134 | 7.2000e-004 | 2.6500e-003 | 17.5209 |
| Vendor | 3.4600e-003 | 0.0957 | 0.0339 | 3.9000e-004 | 0.2067 | 1.1000e-003 | 0.2078 | 0.0232 | 1.0600e-003 | 0.0242 | | 42.1495 | 42.1495 | 1.1300e-003 | 6.2400e-003 | 44.0370 |
| Worker | 0.1530 | 0.1192 | 1.4631 | 4.4000e-003 | 9.7943 | 2.6500e-003 | 9.7970 | 1.0640 | 2.4400e-003 | 1.0664 | | 447.1859 | 447.1859 | 8.9900e-003 | 0.0110 | 450.7003 |
| **Total** | **0.1573** | **0.2505** | **1.5046** | **4.9400e-003** | **10.0764** | **4.1300e-003** | **10.0806** | **1.0955** | **3.8600e-003** | **1.0993** | | **506.0488** | **506.0488** | **0.0108** | **0.0199** | **512.2582** |

## 3.2 Gunnite - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7521 | 6.0484 | 7.7282 | 0.0123 | | 0.3218 | 0.3218 | | 0.3093 | 0.3093 | | 1,180.1911 | 1,180.1911 | 0.2086 | | 1,185.4059 |
| **Total** | **0.7521** | **6.0484** | **7.7282** | **0.0123** | **0.0000** | **0.3218** | **0.3218** | **0.0000** | **0.3093** | **0.3093** | | **1,180.1911** | **1,180.1911** | **0.2086** | | **1,185.4059** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2023

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.6000e-004 | 0.0284 | 6.8700e-003 | 1.5000e-004 | 0.1619 | 3.1000e-004 | 0.1622 | 0.0170 | 2.9000e-004 | 0.0173 | | 15.9816 | 15.9816 | 6.9000e-004 | 2.5300e-003 | 16.7537 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.4431 | 5.6000e-004 | 0.4437 | 0.0467 | 5.3000e-004 | 0.0473 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 21.1262 | 2.5000e-003 | 21.1287 | 2.1948 | 2.3000e-003 | 2.1971 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1446** | **0.2094** | **1.3727** | **4.7800e-003** | **21.7312** | **3.3700e-003** | **21.7346** | **2.2585** | **3.1200e-003** | **2.2616** | | **491.8975** | **491.8975** | **9.7200e-003** | **0.0186** | **497.6848** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7521 | 6.0484 | 7.7282 | 0.0123 | | 0.3218 | 0.3218 | | 0.3093 | 0.3093 | 0.0000 | 1,180.1911 | 1,180.1911 | 0.2086 | | 1,185.4059 |
| **Total** | **0.7521** | **6.0484** | **7.7282** | **0.0123** | **0.0000** | **0.3218** | **0.3218** | **0.0000** | **0.3093** | **0.3093** | **0.0000** | **1,180.1911** | **1,180.1911** | **0.2086** | | **1,185.4059** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.6000e-004 | 0.0284 | 6.8700e-003 | 1.5000e-004 | 0.0754 | 3.1000e-004 | 0.0757 | 8.3300e-003 | 2.9000e-004 | 8.6200e-003 | | 15.9816 | 15.9816 | 6.9000e-004 | 2.5300e-003 | 16.7537 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.2067 | 5.6000e-004 | 0.2073 | 0.0232 | 5.3000e-004 | 0.0237 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 9.7943 | 2.5000e-003 | 9.7968 | 1.0640 | 2.3000e-003 | 1.0663 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1446** | **0.2094** | **1.3727** | **4.7800e-003** | **10.0764** | **3.3700e-003** | **10.0798** | **1.0955** | **3.1200e-003** | **1.0986** | | **491.8975** | **491.8975** | **9.7200e-003** | **0.0186** | **497.6848** |

## 3.3 Field Office - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2887 | 2.5622 | 3.2165 | 5.7600e-003 | | 0.1285 | 0.1285 | | 0.1285 | 0.1285 | | 545.1553 | 545.1553 | 0.0259 | | 545.8028 |
| **Total** | **0.2887** | **2.5622** | **3.2165** | **5.7600e-003** | **0.0000** | **0.1285** | **0.1285** | **0.0000** | **0.1285** | **0.1285** | | **545.1553** | **545.1553** | **0.0259** | | **545.8028** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2022

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.2000e-004 | 0.0178 | 3.7900e-003 | 8.0000e-005 | 0.0811 | 1.9000e-004 | 0.0813 | 8.5000e-003 | 1.8000e-004 | 8.6800e-003 | | 8.3727 | 8.3727 | 3.6000e-004 | 1.3300e-003 | 8.7772 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.1530 | 0.1192 | 1.4631 | 4.4000e-003 | 21.1262 | 2.6500e-003 | 21.1289 | 2.1948 | 2.4400e-003 | 2.1972 | | 447.1859 | 447.1859 | 8.9900e-003 | 0.0110 | 450.7003 |
| **Total** | **0.1534** | **0.1370** | **1.4669** | **4.4800e-003** | **21.2073** | **2.8400e-003** | **21.2102** | **2.2033** | **2.6200e-003** | **2.2059** | | **455.5586** | **455.5586** | **9.3500e-003** | **0.0124** | **459.4775** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2887 | 2.5622 | 3.2165 | 5.7600e-003 | | 0.1285 | 0.1285 | | 0.1285 | 0.1285 | 0.0000 | 545.1553 | 545.1553 | 0.0259 | | 545.8028 |
| **Total** | **0.2887** | **2.5622** | **3.2165** | **5.7600e-003** | **0.0000** | **0.1285** | **0.1285** | **0.0000** | **0.1285** | **0.1285** | **0.0000** | **545.1553** | **545.1553** | **0.0259** | | **545.8028** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.2000e-004 | 0.0178 | 3.7900e-003 | 8.0000e-005 | 0.0378 | 1.9000e-004 | 0.0380 | 4.1700e-003 | 1.8000e-004 | 4.3500e-003 | | 8.3727 | 8.3727 | 3.6000e-004 | 1.3300e-003 | 8.7772 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.1530 | 0.1192 | 1.4631 | 4.4000e-003 | 9.7943 | 2.6500e-003 | 9.7970 | 1.0640 | 2.4400e-003 | 1.0664 | | 447.1859 | 447.1859 | 8.9900e-003 | 0.0110 | 450.7003 |
| **Total** | **0.1534** | **0.1370** | **1.4669** | **4.4800e-003** | **9.8321** | **2.8400e-003** | **9.8349** | **1.0681** | **2.6200e-003** | **1.0708** | | **455.5586** | **455.5586** | **9.3500e-003** | **0.0124** | **459.4775** |

## 3.3 Field Office - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2676 | 2.3761 | 3.2107 | 5.7600e-003 | | 0.1122 | 0.1122 | | 0.1122 | 0.1122 | | 545.1553 | 545.1553 | 0.0240 | | 545.7548 |
| **Total** | **0.2676** | **2.3761** | **3.2107** | **5.7600e-003** | **0.0000** | **0.1122** | **0.1122** | **0.0000** | **0.1122** | **0.1122** | | **545.1553** | **545.1553** | **0.0240** | | **545.7548** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2023

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.3000e-004 | 0.0142 | 3.4400e-003 | 7.0000e-005 | 0.0811 | 1.5000e-004 | 0.0813 | 8.5000e-003 | 1.5000e-004 | 8.6400e-003 | | 8.0061 | 8.0061 | 3.4000e-004 | 1.2700e-003 | 8.3929 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 21.1262 | 2.5000e-003 | 21.1287 | 2.1948 | 2.3000e-003 | 2.1971 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1422** | **0.1184** | **1.3385** | **4.3200e-003** | **21.2073** | **2.6500e-003** | **21.2100** | **2.2033** | **2.4500e-003** | **2.2057** | | **443.4385** | **443.4385** | **8.3200e-003** | **0.0114** | **447.0322** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2676 | 2.3761 | 3.2107 | 5.7600e-003 | | 0.1122 | 0.1122 | | 0.1122 | 0.1122 | 0.0000 | 545.1553 | 545.1553 | 0.0240 | | 545.7548 |
| **Total** | **0.2676** | **2.3761** | **3.2107** | **5.7600e-003** | **0.0000** | **0.1122** | **0.1122** | **0.0000** | **0.1122** | **0.1122** | **0.0000** | **545.1553** | **545.1553** | **0.0240** | | **545.7548** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.3000e-004 | 0.0142 | 3.4400e-003 | 7.0000e-005 | 0.0378 | 1.5000e-004 | 0.0379 | 4.1700e-003 | 1.5000e-004 | 4.3200e-003 | | 8.0061 | 8.0061 | 3.4000e-004 | 1.2700e-003 | 8.3929 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 9.7943 | 2.5000e-003 | 9.7968 | 1.0640 | 2.3000e-003 | 1.0663 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1422** | **0.1184** | **1.3385** | **4.3200e-003** | **9.8321** | **2.6500e-003** | **9.8347** | **1.0681** | **2.4500e-003** | **1.0706** | | **443.4385** | **443.4385** | **8.3200e-003** | **0.0114** | **447.0322** |

## 3.3 Field Office - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2494 | 2.2265 | 3.2059 | 5.7600e-003 | | 0.0969 | 0.0969 | | 0.0969 | 0.0969 | | 545.1553 | 545.1553 | 0.0221 | | 545.7068 |
| **Total** | **0.2494** | **2.2265** | **3.2059** | **5.7600e-003** | **0.0000** | **0.0969** | **0.0969** | **0.0000** | **0.0969** | **0.0969** | | **545.1553** | **545.1553** | **0.0221** | | **545.7068** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2024

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.3000e-004 | 0.0143 | 3.4600e-003 | 7.0000e-005 | 0.0811 | 1.5000e-004 | 0.0813 | 8.5000e-003 | 1.5000e-004 | 8.6400e-003 | | 7.8668 | 7.8668 | 3.3000e-004 | 1.2500e-003 | 8.2467 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.1326 | 0.0919 | 1.2401 | 4.1300e-003 | 21.1262 | 2.4000e-003 | 21.1286 | 2.1948 | 2.2100e-003 | 2.1970 | | 426.1976 | 426.1976 | 7.1800e-003 | 9.3100e-003 | 429.1516 |
| **Total** | **0.1328** | **0.1062** | **1.2436** | **4.2000e-003** | **21.2073** | **2.5500e-003** | **21.2099** | **2.2033** | **2.3600e-003** | **2.2056** | | **434.0644** | **434.0644** | **7.5100e-003** | **0.0106** | **437.3983** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2494 | 2.2265 | 3.2059 | 5.7600e-003 | | 0.0969 | 0.0969 | | 0.0969 | 0.0969 | 0.0000 | 545.1553 | 545.1553 | 0.0221 | | 545.7068 |
| **Total** | **0.2494** | **2.2265** | **3.2059** | **5.7600e-003** | **0.0000** | **0.0969** | **0.0969** | **0.0000** | **0.0969** | **0.0969** | **0.0000** | **545.1553** | **545.1553** | **0.0221** | | **545.7068** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.3000e-004 | 0.0143 | 3.4600e-003 | 7.0000e-005 | 0.0378 | 1.5000e-004 | 0.0379 | 4.1700e-003 | 1.5000e-004 | 4.3200e-003 | | 7.8668 | 7.8668 | 3.3000e-004 | 1.2500e-003 | 8.2467 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.1326 | 0.0919 | 1.2401 | 4.1300e-003 | 9.7943 | 2.4000e-003 | 9.7967 | 1.0640 | 2.2100e-003 | 1.0662 | | 426.1976 | 426.1976 | 7.1800e-003 | 9.3100e-003 | 429.1516 |
| **Total** | **0.1328** | **0.1062** | **1.2436** | **4.2000e-003** | **9.8321** | **2.5500e-003** | **9.8346** | **1.0681** | **2.3600e-003** | **1.0705** | | **434.0644** | **434.0644** | **7.5100e-003** | **0.0106** | **437.3983** |

## 3.4 Barge Use - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.6244 | 5.1978 | 3.3304 | 6.8100e-003 | | 0.2647 | 0.2647 | | 0.2436 | 0.2436 | | 660.4738 | 660.4738 | 0.2136 | | 665.8140 |
| **Total** | **0.6244** | **5.1978** | **3.3304** | **6.8100e-003** | **0.0000** | **0.2647** | **0.2647** | **0.0000** | **0.2436** | **0.2436** | | **660.4738** | **660.4738** | **0.2136** | | **665.8140** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2022

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.0000e-005 | 1.7800e-003 | 3.8000e-004 | 1.0000e-005 | 8.1100e-003 | 2.0000e-005 | 8.1300e-003 | 8.5000e-004 | 2.0000e-005 | 8.7000e-004 | | 0.8373 | 0.8373 | 4.0000e-005 | 1.3000e-004 | 0.8777 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0306 | 0.0238 | 0.2926 | 8.8000e-004 | 4.2253 | 5.3000e-004 | 4.2258 | 0.4390 | 4.9000e-004 | 0.4394 | | 89.4372 | 89.4372 | 1.8000e-003 | 2.2100e-003 | 90.1401 |
| **Total** | **0.0306** | **0.0256** | **0.2930** | **8.9000e-004** | **4.2334** | **5.5000e-004** | **4.2339** | **0.4398** | **5.1000e-004** | **0.4403** | | **90.2745** | **90.2745** | **1.8400e-003** | **2.3400e-003** | **91.0178** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.6244 | 5.1978 | 3.3304 | 6.8100e-003 | | 0.2647 | 0.2647 | | 0.2436 | 0.2436 | 0.0000 | 660.4738 | 660.4738 | 0.2136 | | 665.8140 |
| **Total** | **0.6244** | **5.1978** | **3.3304** | **6.8100e-003** | **0.0000** | **0.2647** | **0.2647** | **0.0000** | **0.2436** | **0.2436** | **0.0000** | **660.4738** | **660.4738** | **0.2136** | | **665.8140** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.0000e-005 | 1.7800e-003 | 3.8000e-004 | 1.0000e-005 | 3.7800e-003 | 2.0000e-005 | 3.8000e-003 | 4.2000e-004 | 2.0000e-005 | 4.4000e-004 | | 0.8373 | 0.8373 | 4.0000e-005 | 1.3000e-004 | 0.8777 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0306 | 0.0238 | 0.2926 | 8.8000e-004 | 1.9589 | 5.3000e-004 | 1.9594 | 0.2128 | 4.9000e-004 | 0.2133 | | 89.4372 | 89.4372 | 1.8000e-003 | 2.2100e-003 | 90.1401 |
| **Total** | **0.0306** | **0.0256** | **0.2930** | **8.9000e-004** | **1.9626** | **5.5000e-004** | **1.9632** | **0.2132** | **5.1000e-004** | **0.2137** | | **90.2745** | **90.2745** | **1.8400e-003** | **2.3400e-003** | **91.0178** |

## 3.4 Barge Use - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.5881 | 4.8276 | 3.2494 | 6.8200e-003 | | 0.2436 | 0.2436 | | 0.2241 | 0.2241 | | 660.5147 | 660.5147 | 0.2136 | | 665.8553 |
| **Total** | **0.5881** | **4.8276** | **3.2494** | **6.8200e-003** | **0.0000** | **0.2436** | **0.2436** | **0.0000** | **0.2241** | **0.2241** | | **660.5147** | **660.5147** | **0.2136** | | **665.8553** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2023

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.0000e-005 | 1.4200e-003 | 3.4000e-004 | 1.0000e-005 | 8.1100e-003 | 2.0000e-005 | 8.1300e-003 | 8.5000e-004 | 1.0000e-005 | 8.6000e-004 | | 0.8006 | 0.8006 | 3.0000e-005 | 1.3000e-004 | 0.8393 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0284 | 0.0208 | 0.2670 | 8.5000e-004 | 4.2253 | 5.0000e-004 | 4.2258 | 0.4390 | 4.6000e-004 | 0.4394 | | 87.0865 | 87.0865 | 1.6000e-003 | 2.0200e-003 | 87.7279 |
| **Total** | **0.0284** | **0.0223** | **0.2674** | **8.6000e-004** | **4.2334** | **5.2000e-004** | **4.2339** | **0.4398** | **4.7000e-004** | **0.4403** | | **87.8871** | **87.8871** | **1.6300e-003** | **2.1500e-003** | **88.5672** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.5881 | 4.8276 | 3.2494 | 6.8200e-003 | | 0.2436 | 0.2436 | | 0.2241 | 0.2241 | 0.0000 | 660.5147 | 660.5147 | 0.2136 | | 665.8553 |
| **Total** | **0.5881** | **4.8276** | **3.2494** | **6.8200e-003** | **0.0000** | **0.2436** | **0.2436** | **0.0000** | **0.2241** | **0.2241** | **0.0000** | **660.5147** | **660.5147** | **0.2136** | | **665.8553** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.0000e-005 | 1.4200e-003 | 3.4000e-004 | 1.0000e-005 | 3.7800e-003 | 2.0000e-005 | 3.7900e-003 | 4.2000e-004 | 1.0000e-005 | 4.3000e-004 | | 0.8006 | 0.8006 | 3.0000e-005 | 1.3000e-004 | 0.8393 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0284 | 0.0208 | 0.2670 | 8.5000e-004 | 1.9589 | 5.0000e-004 | 1.9594 | 0.2128 | 4.6000e-004 | 0.2133 | | 87.0865 | 87.0865 | 1.6000e-003 | 2.0200e-003 | 87.7279 |
| **Total** | **0.0284** | **0.0223** | **0.2674** | **8.6000e-004** | **1.9626** | **5.2000e-004** | **1.9632** | **0.2132** | **4.7000e-004** | **0.2137** | | **87.8871** | **87.8871** | **1.6300e-003** | **2.1500e-003** | **88.5672** |

## 3.4 Barge Use - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.5585 | 4.5279 | 3.1836 | 6.8200e-003 | | 0.2264 | 0.2264 | | 0.2083 | 0.2083 | | 660.4623 | 660.4623 | 0.2136 | | 665.8025 |
| **Total** | **0.5585** | **4.5279** | **3.1836** | **6.8200e-003** | **0.0000** | **0.2264** | **0.2264** | **0.0000** | **0.2083** | **0.2083** | | **660.4623** | **660.4623** | **0.2136** | | **665.8025** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2024

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.0000e-005 | 1.4300e-003 | 3.5000e-004 | 1.0000e-005 | 8.1100e-003 | 2.0000e-005 | 8.1200e-003 | 8.5000e-004 | 1.0000e-005 | 8.6000e-004 | | 0.7867 | 0.7867 | 3.0000e-005 | 1.2000e-004 | 0.8247 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0265 | 0.0184 | 0.2480 | 8.3000e-004 | 4.2253 | 4.8000e-004 | 4.2257 | 0.4390 | 4.4000e-004 | 0.4394 | | 85.2395 | 85.2395 | 1.4400e-003 | 1.8600e-003 | 85.8303 |
| **Total** | **0.0265** | **0.0198** | **0.2484** | **8.4000e-004** | **4.2334** | **5.0000e-004** | **4.2339** | **0.4398** | **4.5000e-004** | **0.4403** | | **86.0262** | **86.0262** | **1.4700e-003** | **1.9800e-003** | **86.6550** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.5585 | 4.5279 | 3.1836 | 6.8200e-003 | | 0.2264 | 0.2264 | | 0.2083 | 0.2083 | 0.0000 | 660.4623 | 660.4623 | 0.2136 | | 665.8025 |
| **Total** | **0.5585** | **4.5279** | **3.1836** | **6.8200e-003** | **0.0000** | **0.2264** | **0.2264** | **0.0000** | **0.2083** | **0.2083** | **0.0000** | **660.4623** | **660.4623** | **0.2136** | | **665.8025** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 2.0000e-005 | 1.4300e-003 | 3.5000e-004 | 1.0000e-005 | 3.7800e-003 | 2.0000e-005 | 3.7900e-003 | 4.2000e-004 | 1.0000e-005 | 4.3000e-004 | | 0.7867 | 0.7867 | 3.0000e-005 | 1.2000e-004 | 0.8247 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0265 | 0.0184 | 0.2480 | 8.3000e-004 | 1.9589 | 4.8000e-004 | 1.9593 | 0.2128 | 4.4000e-004 | 0.2132 | | 85.2395 | 85.2395 | 1.4400e-003 | 1.8600e-003 | 85.8303 |
| **Total** | **0.0265** | **0.0198** | **0.2484** | **8.4000e-004** | **1.9626** | **5.0000e-004** | **1.9631** | **0.2132** | **4.5000e-004** | **0.2137** | | **86.0262** | **86.0262** | **1.4700e-003** | **1.9800e-003** | **86.6550** |

## 3.5 Road Grading - 2022

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7812 | 7.9466 | 9.3183 | 0.0173 | | 0.3519 | 0.3519 | | 0.3237 | 0.3237 | | 1,669.9801 | 1,669.9801 | 0.5401 | | 1,683.4828 |
| **Total** | **0.7812** | **7.9466** | **9.3183** | **0.0173** | **0.0000** | **0.3519** | **0.3519** | **0.0000** | **0.3237** | **0.3237** | | **1,669.9801** | **1,669.9801** | **0.5401** | | **1,683.4828** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2022

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0502 | 2.1552 | 0.4585 | 9.2900e-003 | 9.7981 | 0.0231 | 9.8211 | 1.0265 | 0.0221 | 1.0485 | | 1,011.5812 | 1,011.5812 | 0.0437 | 0.1603 | 1,060.4493 |
| Vendor | 3.4600e-003 | 0.0957 | 0.0339 | 3.9000e-004 | 0.4431 | 1.1000e-003 | 0.4442 | 0.0467 | 1.0600e-003 | 0.0478 | | 42.1495 | 42.1495 | 1.1300e-003 | 6.2400e-003 | 44.0370 |
| Worker | 0.1530 | 0.1192 | 1.4631 | 4.4000e-003 | 21.1262 | 2.6500e-003 | 21.1289 | 2.1948 | 2.4400e-003 | 2.1972 | | 447.1859 | 447.1859 | 8.9900e-003 | 0.0110 | 450.7003 |
| **Total** | **0.2067** | **2.3700** | **1.9555** | **0.0141** | **31.3674** | **0.0268** | **31.3942** | **3.2679** | **0.0256** | **3.2935** | | **1,500.9166** | **1,500.9166** | **0.0538** | **0.1776** | **1,555.1866** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7812 | 7.9466 | 9.3183 | 0.0173 | | 0.3519 | 0.3519 | | 0.3237 | 0.3237 | 0.0000 | 1,669.9801 | 1,669.9801 | 0.5401 | | 1,683.4828 |
| **Total** | **0.7812** | **7.9466** | **9.3183** | **0.0173** | **0.0000** | **0.3519** | **0.3519** | **0.0000** | **0.3237** | **0.3237** | **0.0000** | **1,669.9801** | **1,669.9801** | **0.5401** | | **1,683.4828** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2022

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0502 | 2.1552 | 0.4585 | 9.2900e-003 | 4.5625 | 0.0231 | 4.5855 | 0.5040 | 0.0221 | 0.5261 | | 1,011.5812 | 1,011.5812 | 0.0437 | 0.1603 | 1,060.4493 |
| Vendor | 3.4600e-003 | 0.0957 | 0.0339 | 3.9000e-004 | 0.2067 | 1.1000e-003 | 0.2078 | 0.0232 | 1.0600e-003 | 0.0242 | | 42.1495 | 42.1495 | 1.1300e-003 | 6.2400e-003 | 44.0370 |
| Worker | 0.1530 | 0.1192 | 1.4631 | 4.4000e-003 | 9.7943 | 2.6500e-003 | 9.7970 | 1.0640 | 2.4400e-003 | 1.0664 | | 447.1859 | 447.1859 | 8.9900e-003 | 0.0110 | 450.7003 |
| **Total** | **0.2067** | **2.3700** | **1.9555** | **0.0141** | **14.5635** | **0.0268** | **14.5903** | **1.5911** | **0.0256** | **1.6167** | | **1,500.9166** | **1,500.9166** | **0.0538** | **0.1776** | **1,555.1866** |

## 3.5 Road Grading - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7236 | 7.1219 | 9.2886 | 0.0173 | | 0.3024 | 0.3024 | | 0.2782 | 0.2782 | | 1,670.6427 | 1,670.6427 | 0.5403 | | 1,684.1507 |
| **Total** | **0.7236** | **7.1219** | **9.2886** | **0.0173** | **0.0000** | **0.3024** | **0.3024** | **0.0000** | **0.2782** | **0.2782** | | **1,670.6427** | **1,670.6427** | **0.5403** | | **1,684.1507** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2023

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0278 | 1.7201 | 0.4160 | 8.8700e-003 | 9.7981 | 0.0186 | 9.8167 | 1.0265 | 0.0178 | 1.0443 | | 967.2834 | 967.2834 | 0.0416 | 0.1533 | 1,014.0172 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.4431 | 5.6000e-004 | 0.4437 | 0.0467 | 5.3000e-004 | 0.0473 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 21.1262 | 2.5000e-003 | 21.1287 | 2.1948 | 2.3000e-003 | 2.1971 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1719** | **1.9011** | **1.7819** | **0.0135** | **31.3674** | **0.0217** | **31.3891** | **3.2679** | **0.0207** | **3.2886** | | **1,443.1994** | **1,443.1994** | **0.0506** | **0.1694** | **1,494.9483** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7236 | 7.1219 | 9.2886 | 0.0173 | | 0.3024 | 0.3024 | | 0.2782 | 0.2782 | 0.0000 | 1,670.6427 | 1,670.6427 | 0.5403 | | 1,684.1507 |
| **Total** | **0.7236** | **7.1219** | **9.2886** | **0.0173** | **0.0000** | **0.3024** | **0.3024** | **0.0000** | **0.2782** | **0.2782** | **0.0000** | **1,670.6427** | **1,670.6427** | **0.5403** | | **1,684.1507** |

## 3.5 Road Grading - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 0.0278 | 1.7201 | 0.4160 | 8.8700e-003 | 4.5624 | 0.0186 | 4.5811 | 0.5040 | 0.0178 | 0.5218 | | 967.2834 | 967.2834 | 0.0416 | 0.1533 | 1,014.0172 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.2067 | 5.6000e-004 | 0.2073 | 0.0232 | 5.3000e-004 | 0.0237 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 9.7943 | 2.5000e-003 | 9.7968 | 1.0640 | 2.3000e-003 | 1.0663 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1719** | **1.9011** | **1.7819** | **0.0135** | **14.5635** | **0.0217** | **14.5852** | **1.5911** | **0.0207** | **1.6118** | | **1,443.1994** | **1,443.1994** | **0.0506** | **0.1694** | **1,494.9483** |

## 3.6 Dam Valve Activites - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7109 | 6.4632 | 9.4438 | 0.0152 | | 0.2949 | 0.2949 | | 0.2869 | 0.2869 | | 1,455.1086 | 1,455.1086 | 0.2317 | | 1,460.9017 |
| **Total** | **0.7109** | **6.4632** | **9.4438** | **0.0152** | **0.0000** | **0.2949** | **0.2949** | **0.0000** | **0.2869** | **0.2869** | | **1,455.1086** | **1,455.1086** | **0.2317** | | **1,460.9017** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2023

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.6000e-004 | 0.0284 | 6.8700e-003 | 1.5000e-004 | 0.1619 | 3.1000e-004 | 0.1622 | 0.0170 | 2.9000e-004 | 0.0173 | | 15.9816 | 15.9816 | 6.9000e-004 | 2.5300e-003 | 16.7537 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.4431 | 5.6000e-004 | 0.4437 | 0.0467 | 5.3000e-004 | 0.0473 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 21.1262 | 2.5000e-003 | 21.1287 | 2.1948 | 2.3000e-003 | 2.1971 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1446** | **0.2094** | **1.3727** | **4.7800e-003** | **21.7312** | **3.3700e-003** | **21.7346** | **2.2585** | **3.1200e-003** | **2.2616** | | **491.8975** | **491.8975** | **9.7200e-003** | **0.0186** | **497.6848** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.7109 | 6.4632 | 9.4438 | 0.0152 | | 0.2949 | 0.2949 | | 0.2869 | 0.2869 | 0.0000 | 1,455.1086 | 1,455.1086 | 0.2317 | | 1,460.9017 |
| **Total** | **0.7109** | **6.4632** | **9.4438** | **0.0152** | **0.0000** | **0.2949** | **0.2949** | **0.0000** | **0.2869** | **0.2869** | **0.0000** | **1,455.1086** | **1,455.1086** | **0.2317** | | **1,460.9017** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.6000e-004 | 0.0284 | 6.8700e-003 | 1.5000e-004 | 0.0754 | 3.1000e-004 | 0.0757 | 8.3300e-003 | 2.9000e-004 | 8.6200e-003 | | 15.9816 | 15.9816 | 6.9000e-004 | 2.5300e-003 | 16.7537 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.2067 | 5.6000e-004 | 0.2073 | 0.0232 | 5.3000e-004 | 0.0237 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.1419 | 0.1042 | 1.3350 | 4.2500e-003 | 9.7943 | 2.5000e-003 | 9.7968 | 1.0640 | 2.3000e-003 | 1.0663 | | 435.4325 | 435.4325 | 7.9800e-003 | 0.0101 | 438.6394 |
| **Total** | **0.1446** | **0.2094** | **1.3727** | **4.7800e-003** | **10.0764** | **3.3700e-003** | **10.0798** | **1.0955** | **3.1200e-003** | **1.0986** | | **491.8975** | **491.8975** | **9.7200e-003** | **0.0186** | **497.6848** |

## 3.6 Dam Valve Activites - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.6711 | 6.0993 | 9.4415 | 0.0152 | | 0.2573 | 0.2573 | | 0.2502 | 0.2502 | | 1,455.3459 | 1,455.3459 | 0.2287 | | 1,461.0641 |
| **Total** | **0.6711** | **6.0993** | **9.4415** | **0.0152** | **0.0000** | **0.2573** | **0.2573** | **0.0000** | **0.2502** | **0.2502** | | **1,455.3459** | **1,455.3459** | **0.2287** | | **1,461.0641** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2024

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.5000e-004 | 0.0285 | 6.9000e-003 | 1.4000e-004 | 0.1619 | 3.0000e-004 | 0.1622 | 0.0170 | 2.9000e-004 | 0.0173 | | 15.7035 | 15.7035 | 6.7000e-004 | 2.4900e-003 | 16.4619 |
| Vendor | 2.1700e-003 | 0.0775 | 0.0303 | 3.7000e-004 | 0.4431 | 5.5000e-004 | 0.4436 | 0.0467 | 5.3000e-004 | 0.0473 | | 39.9270 | 39.9270 | 1.0100e-003 | 5.9000e-003 | 41.7096 |
| Worker | 0.1326 | 0.0919 | 1.2401 | 4.1300e-003 | 21.1262 | 2.4000e-003 | 21.1286 | 2.1948 | 2.2100e-003 | 2.1970 | | 426.1976 | 426.1976 | 7.1800e-003 | 9.3100e-003 | 429.1516 |
| **Total** | **0.1352** | **0.1979** | **1.2773** | **4.6400e-003** | **21.7312** | **3.2500e-003** | **21.7345** | **2.2585** | **3.0300e-003** | **2.2615** | | **481.8281** | **481.8281** | **8.8600e-003** | **0.0177** | **487.3231** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.6711 | 6.0993 | 9.4415 | 0.0152 | | 0.2573 | 0.2573 | | 0.2502 | 0.2502 | 0.0000 | 1,455.3459 | 1,455.3459 | 0.2287 | | 1,461.0641 |
| **Total** | **0.6711** | **6.0993** | **9.4415** | **0.0152** | **0.0000** | **0.2573** | **0.2573** | **0.0000** | **0.2502** | **0.2502** | **0.0000** | **1,455.3459** | **1,455.3459** | **0.2287** | | **1,461.0641** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 4.5000e-004 | 0.0285 | 6.9000e-003 | 1.4000e-004 | 0.0754 | 3.0000e-004 | 0.0757 | 8.3300e-003 | 2.9000e-004 | 8.6200e-003 | | 15.7035 | 15.7035 | 6.7000e-004 | 2.4900e-003 | 16.4619 |
| Vendor | 2.1700e-003 | 0.0775 | 0.0303 | 3.7000e-004 | 0.2067 | 5.5000e-004 | 0.2073 | 0.0232 | 5.3000e-004 | 0.0237 | | 39.9270 | 39.9270 | 1.0100e-003 | 5.9000e-003 | 41.7096 |
| Worker | 0.1326 | 0.0919 | 1.2401 | 4.1300e-003 | 9.7943 | 2.4000e-003 | 9.7967 | 1.0640 | 2.2100e-003 | 1.0662 | | 426.1976 | 426.1976 | 7.1800e-003 | 9.3100e-003 | 429.1516 |
| **Total** | **0.1352** | **0.1979** | **1.2773** | **4.6400e-003** | **10.0764** | **3.2500e-003** | **10.0797** | **1.0955** | **3.0300e-003** | **1.0985** | | **481.8281** | **481.8281** | **8.8600e-003** | **0.0177** | **487.3231** |

## 3.7 Electrical Pad and Quipment - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.1506 | 10.3597 | 14.8411 | 0.0237 | | 0.5097 | 0.5097 | | 0.4845 | 0.4845 | | 2,273.8876 | 2,273.8876 | 0.4965 | | 2,286.3010 |
| **Total** | **1.1506** | **10.3597** | **14.8411** | **0.0237** | **0.0000** | **0.5097** | **0.5097** | **0.0000** | **0.4845** | **0.4845** | | **2,273.8876** | **2,273.8876** | **0.4965** | | **2,286.3010** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2023

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 7.9000e-004 | 0.0487 | 0.0118 | 2.5000e-004 | 0.2772 | 5.3000e-004 | 0.2777 | 0.0290 | 5.0000e-004 | 0.0296 | | 27.3671 | 27.3671 | 1.1800e-003 | 4.3400e-003 | 28.6893 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.4431 | 5.6000e-004 | 0.4437 | 0.0467 | 5.3000e-004 | 0.0473 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.0852 | 0.0625 | 0.8010 | 2.5500e-003 | 12.6757 | 1.5000e-003 | 12.6772 | 1.3169 | 1.3800e-003 | 1.3182 | | 261.2595 | 261.2595 | 4.7900e-003 | 6.0600e-003 | 263.1836 |
| **Total** | **0.0882** | **0.1880** | **0.8436** | **3.1800e-003** | **13.3960** | **2.5900e-003** | **13.3986** | **1.3926** | **2.4100e-003** | **1.3951** | | **329.1101** | **329.1101** | **7.0200e-003** | **0.0164** | **334.1647** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.1506 | 10.3597 | 14.8411 | 0.0237 | | 0.5097 | 0.5097 | | 0.4845 | 0.4845 | 0.0000 | 2,273.8876 | 2,273.8876 | 0.4965 | | 2,286.3010 |
| **Total** | **1.1506** | **10.3597** | **14.8411** | **0.0237** | **0.0000** | **0.5097** | **0.5097** | **0.0000** | **0.4845** | **0.4845** | **0.0000** | **2,273.8876** | **2,273.8876** | **0.4965** | | **2,286.3010** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2023

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 7.9000e-004 | 0.0487 | 0.0118 | 2.5000e-004 | 0.1291 | 5.3000e-004 | 0.1296 | 0.0143 | 5.0000e-004 | 0.0148 | | 27.3671 | 27.3671 | 1.1800e-003 | 4.3400e-003 | 28.6893 |
| Vendor | 2.2200e-003 | 0.0768 | 0.0308 | 3.8000e-004 | 0.2067 | 5.6000e-004 | 0.2073 | 0.0232 | 5.3000e-004 | 0.0237 | | 40.4835 | 40.4835 | 1.0500e-003 | 5.9800e-003 | 42.2917 |
| Worker | 0.0852 | 0.0625 | 0.8010 | 2.5500e-003 | 5.8766 | 1.5000e-003 | 5.8781 | 0.6384 | 1.3800e-003 | 0.6398 | | 261.2595 | 261.2595 | 4.7900e-003 | 6.0600e-003 | 263.1836 |
| **Total** | **0.0882** | **0.1880** | **0.8436** | **3.1800e-003** | **6.2124** | **2.5900e-003** | **6.2150** | **0.6758** | **2.4100e-003** | **0.6782** | | **329.1101** | **329.1101** | **7.0200e-003** | **0.0164** | **334.1647** |

## 3.7 Electrical Pad and Quipment - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.0889 | 9.6759 | 14.8534 | 0.0237 | | 0.4548 | 0.4548 | | 0.4318 | 0.4318 | | 2,274.2497 | 2,274.2497 | 0.4936 | | 2,286.5892 |
| **Total** | **1.0889** | **9.6759** | **14.8534** | **0.0237** | **0.0000** | **0.4548** | **0.4548** | **0.0000** | **0.4318** | **0.4318** | | **2,274.2497** | **2,274.2497** | **0.4936** | | **2,286.5892** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2024

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 7.8000e-004 | 0.0489 | 0.0118 | 2.5000e-004 | 0.2772 | 5.2000e-004 | 0.2777 | 0.0290 | 5.0000e-004 | 0.0295 | | 26.8909 | 26.8909 | 1.1400e-003 | 4.2600e-003 | 28.1897 |
| Vendor | 2.1700e-003 | 0.0775 | 0.0303 | 3.7000e-004 | 0.4431 | 5.5000e-004 | 0.4436 | 0.0467 | 5.3000e-004 | 0.0473 | | 39.9270 | 39.9270 | 1.0100e-003 | 5.9000e-003 | 41.7096 |
| Worker | 0.0795 | 0.0551 | 0.7441 | 2.4800e-003 | 12.6757 | 1.4400e-003 | 12.6772 | 1.3169 | 1.3300e-003 | 1.3182 | | 255.7186 | 255.7186 | 4.3100e-003 | 5.5900e-003 | 257.4909 |
| **Total** | **0.0825** | **0.1815** | **0.7862** | **3.1000e-003** | **13.3960** | **2.5100e-003** | **13.3986** | **1.3926** | **2.3600e-003** | **1.3950** | | **322.5364** | **322.5364** | **6.4600e-003** | **0.0158** | **327.3902** |

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.0889 | 9.6759 | 14.8534 | 0.0237 | | 0.4548 | 0.4548 | | 0.4318 | 0.4318 | 0.0000 | 2,274.2497 | 2,274.2497 | 0.4936 | | 2,286.5892 |
| **Total** | **1.0889** | **9.6759** | **14.8534** | **0.0237** | **0.0000** | **0.4548** | **0.4548** | **0.0000** | **0.4318** | **0.4318** | **0.0000** | **2,274.2497** | **2,274.2497** | **0.4936** | | **2,286.5892** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2024

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Hauling | 7.8000e-004 | 0.0489 | 0.0118 | 2.5000e-004 | 0.1291 | 5.2000e-004 | 0.1296 | 0.0143 | 5.0000e-004 | 0.0148 | | 26.8909 | 26.8909 | 1.1400e-003 | 4.2600e-003 | 28.1897 |
| Vendor | 2.1700e-003 | 0.0775 | 0.0303 | 3.7000e-004 | 0.2067 | 5.5000e-004 | 0.2073 | 0.0232 | 5.3000e-004 | 0.0237 | | 39.9270 | 39.9270 | 1.0100e-003 | 5.9000e-003 | 41.7096 |
| Worker | 0.0795 | 0.0551 | 0.7441 | 2.4800e-003 | 5.8766 | 1.4400e-003 | 5.8780 | 0.6384 | 1.3300e-003 | 0.6397 | | 255.7186 | 255.7186 | 4.3100e-003 | 5.5900e-003 | 257.4909 |
| **Total** | **0.0825** | **0.1815** | **0.7862** | **3.1000e-003** | **6.2124** | **2.5100e-003** | **6.2149** | **0.6758** | **2.3600e-003** | **0.6782** | | **322.5364** | **322.5364** | **6.4600e-003** | **0.0158** | **327.3902** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Heavy Industry | 0.00 | 0.00 | 0.00 | | |
| Total | 0.00 | 0.00 | 0.00 | | |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Heavy Industry | 0.00 | 0.00 | 0.00 | 59.00 | 28.00 | 13.00 | 92 | 5 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Heavy Industry | 0.540566 | 0.056059 | 0.172680 | 0.136494 | 0.026304 | 0.007104 | 0.011680 | 0.017449 | 0.000554 | 0.000251 | 0.025076 | 0.000954 | 0.004830 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| NaturalGas Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| NaturalGas Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

### 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 5.2 Energy by Land Use - NaturalGas

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | lb/day | | | | | | | | | | lb/day | | | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | lb/day | | | | | | | | | | lb/day | | | | | |
| Mitigated | 9.4100e-003 | 9.3000e-004 | 0.1019 | 1.0000e-005 | | 3.6000e-004 | 3.6000e-004 | | 3.6000e-004 | 3.6000e-004 | | 0.2189 | 0.2189 | 5.7000e-004 | | 0.2331 |
| Unmitigated | 9.4100e-003 | 9.3000e-004 | 0.1019 | 1.0000e-005 | | 3.6000e-004 | 3.6000e-004 | | 3.6000e-004 | 3.6000e-004 | | 0.2189 | 0.2189 | 5.7000e-004 | | 0.2331 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 9.4100e-003 | 9.3000e-004 | 0.1019 | 1.0000e-005 | | 3.6000e-004 | 3.6000e-004 | | 3.6000e-004 | 3.6000e-004 | | 0.2189 | 0.2189 | 5.7000e-004 | | 0.2331 |
| **Total** | **9.4100e-003** | **9.3000e-004** | **0.1019** | **1.0000e-005** | | **3.6000e-004** | **3.6000e-004** | | **3.6000e-004** | **3.6000e-004** | | **0.2189** | **0.2189** | **5.7000e-004** | | **0.2331** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | lb/day | | | | | | | | | | lb/day | | | | | |
| Architectural Coating | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Landscaping | 9.4100e-003 | 9.3000e-004 | 0.1019 | 1.0000e-005 | | 3.6000e-004 | 3.6000e-004 | | 3.6000e-004 | 3.6000e-004 | | 0.2189 | 0.2189 | 5.7000e-004 | | 0.2331 |
| **Total** | **9.4100e-003** | **9.3000e-004** | **0.1019** | **1.0000e-005** | | **3.6000e-004** | **3.6000e-004** | | **3.6000e-004** | **3.6000e-004** | | **0.2189** | **0.2189** | **5.7000e-004** | | **0.2331** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# MWD Copper Basin

**San Bernardino-Mojave Desert County, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| General Heavy Industry | 1,000.00 | 1000sqft | 22.96 | 1,000,000.00 | 0 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.6 | **Precipitation Freq (Days)** | 32 |
| **Climate Zone** | 10 | | | **Operational Year** | 2024 |
| **Utility Company** | | | | | |
| **CO2 Intensity (lb/MWhr)** | 0 | **CH4 Intensity (lb/MWhr)** | 0 | **N2O Intensity (lb/MWhr)** | 0 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Construction Schedule

Off-road Equipment - 50hp barge

Off-road Equipment - summary input sheet

Off-road Equipment - small concrete pump

Off-road Equipment - input summary

Off-road Equipment - concrete pump

Off-road Equipment - summary input sheet

Trips and VMT - lake havasu city

On-road Fugitive Dust - 2 percent unpaved

Grading -

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**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

Vehicle Trips - no operational

Road Dust -

Consumer Products - no operational changes

Area Coating - no operational changes

Energy Use - no operational changes

Water And Wastewater - no operational changes

Solid Waste - no operational changes

Construction Off-road Equipment Mitigation - soil stabilizer or watering reqd by Rule 403

Area Mitigation - no paint

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblAreaCoating | Area_EF_Nonresidential_Exterior | 250 | 0 |
| tblAreaCoating | Area_EF_Nonresidential_Interior | 250 | 0 |
| tblAreaCoating | Area_EF_Parking | 250 | 0 |
| tblAreaCoating | Area_EF_Residential_Exterior | 250 | 0 |
| tblAreaCoating | Area_EF_Residential_Interior | 250 | 0 |
| tblAreaCoating | Area_Nonresidential_Exterior | 500000 | 0 |
| tblAreaCoating | Area_Nonresidential_Interior | 1500000 | 0 |
| tblAreaCoating | ReapplicationRatePercent | 10 | 0 |
| tblConstDustMitigation | WaterUnpavedRoadMoistureContent | 0 | 0.5 |
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 40 |
| tblConstructionPhase | NumDays | 10.00 | 262.00 |
| tblConstructionPhase | NumDays | 10.00 | 523.00 |
| tblConstructionPhase | NumDays | 10.00 | 523.00 |
| tblConstructionPhase | NumDays | 35.00 | 262.00 |
| tblConstructionPhase | NumDays | 10.00 | 262.00 |
| tblConstructionPhase | NumDays | 35.00 | 153.00 |
| tblConsumerProducts | ROG_EF | 2.14E-05 | 0 |
| tblConsumerProducts | ROG_EF_Degreaser | 3.542E-07 | 0 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | |
|---|---|---|---|
| tblConsumerProducts | ROG_EF_PesticidesFertilizers | 5.152E-08 | 0 |
| tblEnergyUse | LightingElect | 2.93 | 0.00 |
| tblEnergyUse | NT24E | 5.02 | 0.00 |
| tblEnergyUse | NT24NG | 17.13 | 0.00 |
| tblEnergyUse | T24E | 1.97 | 0.00 |
| tblEnergyUse | T24NG | 15.20 | 0.00 |
| tblOffRoadEquipment | HorsePower | 172.00 | 50.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 2.00 | 1.00 |
| tblOffRoadEquipment | OffRoadEquipmentUnitAmount | 4.00 | 1.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOffRoadEquipment | UsageHours | 8.00 | 7.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | HaulingPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | |
|---|---|---|---|
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | VendorPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblOnRoadDust | WorkerPercentPave | 100.00 | 98.00 |
| tblSolidWaste | SolidWasteGenerationRate | 1,240.00 | 0.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripLength | 20.00 | 35.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 4.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 2,421.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | HaulingTripNumber | 0.00 | 40.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | VendorTripNumber | 0.00 | 2.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | |
|---|---|---|---|
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripLength | 10.80 | 35.00 |
| tblTripsAndVMT | WorkerTripNumber | 8.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 3.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 5.00 | 4.00 |
| tblTripsAndVMT | WorkerTripNumber | 13.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 13.00 | 20.00 |
| tblTripsAndVMT | WorkerTripNumber | 15.00 | 12.00 |
| tblVehicleTrips | CC_TL | 7.30 | 0.00 |
| tblVehicleTrips | CNW_TL | 7.30 | 0.00 |
| tblVehicleTrips | CW_TL | 9.50 | 0.00 |
| tblVehicleTrips | ST_TR | 6.42 | 0.00 |
| tblVehicleTrips | SU_TR | 5.09 | 0.00 |
| tblVehicleTrips | WD_TR | 3.93 | 0.00 |
| tblWater | ElectricityIntensityFactorForWastewaterTreatment | 1,911.00 | 0.00 |
| tblWater | ElectricityIntensityFactorToDistribute | 1,272.00 | 0.00 |
| tblWater | ElectricityIntensityFactorToSupply | 9,727.00 | 0.00 |
| tblWater | ElectricityIntensityFactorToTreat | 111.00 | 0.00 |
| tblWater | IndoorWaterUseRate | 231,250,000.00 | 0.00 |

## 2.0 Emissions Summary

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 2.1 Overall Construction

### Unmitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2022 | 0.2300 | 1.9245 | 2.2239 | 5.1100e-003 | 5.4920 | 0.0875 | 5.5795 | 0.5730 | 0.0826 | 0.6556 | 0.0000 | 460.6095 | 460.6095 | 0.0741 | 0.0148 | 466.8787 |
| 2023 | 0.3854 | 3.0991 | 4.1883 | 8.5100e-003 | 8.1084 | 0.1437 | 8.2521 | 0.8456 | 0.1365 | 0.9821 | 0.0000 | 758.1940 | 758.1940 | 0.1206 | 0.0134 | 765.2113 |
| 2024 | 0.0967 | 0.7303 | 1.0386 | 2.0900e-003 | 2.3775 | 0.0325 | 2.4101 | 0.2478 | 0.0311 | 0.2789 | 0.0000 | 184.8701 | 184.8701 | 0.0243 | 1.5500e-003 | 185.9408 |
| **Maximum** | **0.3854** | **3.0991** | **4.1883** | **8.5100e-003** | **8.1084** | **0.1437** | **8.2521** | **0.8456** | **0.1365** | **0.9821** | **0.0000** | **758.1940** | **758.1940** | **0.1206** | **0.0148** | **765.2113** |

### Mitigated Construction

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | tons/yr | | | | | | | | | | MT/yr | | | | | |
| 2022 | 0.2300 | 1.9245 | 2.2239 | 5.1100e-003 | 2.5534 | 0.0875 | 2.6409 | 0.2798 | 0.0826 | 0.3624 | 0.0000 | 460.6091 | 460.6091 | 0.0741 | 0.0148 | 466.8784 |
| 2023 | 0.3854 | 3.0991 | 4.1883 | 8.5100e-003 | 3.7688 | 0.1437 | 3.9124 | 0.4125 | 0.1365 | 0.5490 | 0.0000 | 758.1934 | 758.1934 | 0.1206 | 0.0134 | 765.2107 |
| 2024 | 0.0967 | 0.7303 | 1.0386 | 2.0900e-003 | 1.1047 | 0.0325 | 1.1372 | 0.1208 | 0.0311 | 0.1519 | 0.0000 | 184.8699 | 184.8699 | 0.0243 | 1.5500e-003 | 185.9407 |
| **Maximum** | **0.3854** | **3.0991** | **4.1883** | **8.5100e-003** | **3.7688** | **0.1437** | **3.9124** | **0.4125** | **0.1365** | **0.5490** | **0.0000** | **758.1934** | **758.1934** | **0.1206** | **0.0148** | **765.2107** |

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## EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio-CO2 | Total CO2 | CH4 | N20 | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **53.52** | **0.00** | **52.65** | **51.21** | **0.00** | **44.52** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

| Quarter | Start Date | End Date | Maximum Unmitigated ROG + NOX (tons/quarter) | Maximum Mitigated ROG + NOX (tons/quarter) |
|---|---|---|---|---|
| **1** | **6-1-2022** | **8-31-2022** | 0.9209 | 0.9209 |
| **2** | **9-1-2022** | **11-30-2022** | 0.9138 | 0.9138 |
| **3** | **12-1-2022** | **2-28-2023** | 0.8479 | 0.8479 |
| **4** | **3-1-2023** | **5-31-2023** | 0.8335 | 0.8335 |
| **5** | **6-1-2023** | **8-31-2023** | 0.9146 | 0.9146 |
| **6** | **9-1-2023** | **11-30-2023** | 0.8994 | 0.8994 |
| **7** | **12-1-2023** | **2-29-2024** | 0.6308 | 0.6308 |
| **8** | **3-1-2024** | **5-31-2024** | 0.4908 | 0.4908 |
| **9** | **6-1-2024** | **8-31-2024** | 0.0053 | 0.0053 |
| | | **Highest** | 0.9209 | 0.9209 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 2.2 Overall Operational

**Unmitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 8.5000e-004 | 8.0000e-005 | 9.1700e-003 | 0.0000 | | 3.0000e-005 | 3.0000e-005 | | 3.0000e-005 | 3.0000e-005 | 0.0000 | 0.0179 | 0.0179 | 5.0000e-005 | 0.0000 | 0.0190 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **8.5000e-004** | **8.0000e-005** | **9.1700e-003** | **0.0000** | **0.0000** | **3.0000e-005** | **3.0000e-005** | **0.0000** | **3.0000e-005** | **3.0000e-005** | **0.0000** | **0.0179** | **0.0179** | **5.0000e-005** | **0.0000** | **0.0190** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 2.2 Overall Operational

**Mitigated Operational**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Area | 8.5000e-004 | 8.0000e-005 | 9.1700e-003 | 0.0000 | | 3.0000e-005 | 3.0000e-005 | | 3.0000e-005 | 3.0000e-005 | 0.0000 | 0.0179 | 0.0179 | 5.0000e-005 | 0.0000 | 0.0190 |
| Energy | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Mobile | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **8.5000e-004** | **8.0000e-005** | **9.1700e-003** | **0.0000** | **0.0000** | **3.0000e-005** | **3.0000e-005** | **0.0000** | **3.0000e-005** | **3.0000e-005** | **0.0000** | **0.0179** | **0.0179** | **5.0000e-005** | **0.0000** | **0.0190** |

| | **ROG** | **NOx** | **CO** | **SO2** | **Fugitive PM10** | **Exhaust PM10** | **PM10 Total** | **Fugitive PM2.5** | **Exhaust PM2.5** | **PM2.5 Total** | **Bio- CO2** | **NBio-CO2** | **Total CO2** | **CH4** | **N20** | **CO2e** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Percent Reduction** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 3.0 Construction Detail

**Construction Phase**

| Phase Number | Phase Name | Phase Type | Start Date | End Date | Num Days Week | Num Days | Phase Description |
|---|---|---|---|---|---|---|---|
| 1 | Gunnite | Site Preparation | 6/1/2022 | 6/1/2023 | 5 | 262 | |
| 2 | Field Office | Site Preparation | 6/1/2022 | 6/1/2024 | 5 | 523 | |
| 3 | Barge Use | Site Preparation | 6/1/2022 | 6/1/2024 | 5 | 523 | |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4 | Road Grading | Grading | 6/1/2022 | 6/1/2023 | 5 | 262 | |
| 5 | Dam Valve Activites | Site Preparation | 6/1/2023 | 6/1/2024 | 5 | 262 | |
| 6 | Electrical Pad and Quipment | Grading | 6/1/2023 | 1/1/2024 | 5 | 153 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 0**

**Acres of Paving: 0**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Gunnite | Air Compressors | 2 | 7.00 | 78 | 0.48 |
| Gunnite | Other Construction Equipment | 1 | 7.00 | 172 | 0.42 |
| Field Office | Generator Sets | 1 | 7.00 | 84 | 0.74 |
| Barge Use | Cranes | 1 | 7.00 | 231 | 0.29 |
| Barge Use | Other Construction Equipment | 1 | 7.00 | 50 | 0.42 |
| Road Grading | Excavators | 1 | 7.00 | 158 | 0.38 |
| Road Grading | Rubber Tired Loaders | 1 | 7.00 | 203 | 0.36 |
| Road Grading | Skid Steer Loaders | 1 | 7.00 | 65 | 0.37 |
| Road Grading | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Road Grading | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Dam Valve Activites | Aerial Lifts | 1 | 7.00 | 63 | 0.31 |
| Dam Valve Activites | Air Compressors | 1 | 7.00 | 78 | 0.48 |
| Dam Valve Activites | Generator Sets | 1 | 7.00 | 84 | 0.74 |
| Dam Valve Activites | Skid Steer Loaders | 1 | 7.00 | 65 | 0.37 |
| Dam Valve Activites | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |
| Electrical Pad and Quipment | Air Compressors | 1 | 7.00 | 78 | 0.48 |
| Electrical Pad and Quipment | Excavators | 1 | 7.00 | 158 | 0.38 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | | | | | |
|---|---|---|---|---|---|
| Electrical Pad and Quipment | Generator Sets | 1 | 7.00 | 84 | 0.74 |
| Electrical Pad and Quipment | Other Construction Equipment | 1 | 7.00 | 172 | 0.42 |
| Electrical Pad and Quipment | Skid Steer Loaders | 1 | 7.00 | 65 | 0.37 |
| Electrical Pad and Quipment | Tractors/Loaders/Backhoes | 1 | 7.00 | 97 | 0.37 |

**Trips and VMT**

| Phase Name | Offroad Equipment Count | Worker Trip Number | Vendor Trip Number | Hauling Trip Number | Worker Trip Length | Vendor Trip Length | Hauling Trip Length | Worker Vehicle Class | Vendor Vehicle Class | Hauling Vehicle Class |
|---|---|---|---|---|---|---|---|---|---|---|
| Gunnite | 3 | 20.00 | 2.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Field Office | 1 | 20.00 | 0.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Barge Use | 2 | 4.00 | 0.00 | 4.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Road Grading | 5 | 20.00 | 2.00 | 2,421.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Dam Valve Activites | 5 | 20.00 | 2.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |
| Electrical Pad and Quipment | 6 | 12.00 | 2.00 | 40.00 | 35.00 | 7.30 | 35.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0617 | 0.5068 | 0.5928 | 9.4000e-004 | | 0.0279 | 0.0279 | | 0.0268 | 0.0268 | 0.0000 | 81.9091 | 81.9091 | 0.0147 | 0.0000 | 82.2770 |
| **Total** | **0.0617** | **0.5068** | **0.5928** | **9.4000e-004** | **0.0000** | **0.0279** | **0.0279** | **0.0000** | **0.0268** | **0.0268** | **0.0000** | **81.9091** | **81.9091** | **0.0147** | **0.0000** | **82.2770** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 6.0000e-005 | 2.7500e-003 | 5.7000e-004 | 1.0000e-005 | 0.0113 | 3.0000e-005 | 0.0114 | 1.1900e-003 | 3.0000e-005 | 1.2200e-003 | 0.0000 | 1.1596 | 1.1596 | 5.0000e-005 | 1.8000e-004 | 1.2156 |
| Vendor | 2.7000e-004 | 7.3400e-003 | 2.5500e-003 | 3.0000e-005 | 0.0310 | 8.0000e-005 | 0.0311 | 3.2800e-003 | 8.0000e-005 | 3.3600e-003 | 0.0000 | 2.9234 | 2.9234 | 8.0000e-005 | 4.3000e-004 | 3.0543 |
| Worker | 0.0107 | 9.6000e-003 | 0.1177 | 3.4000e-004 | 1.4772 | 2.0000e-004 | 1.4774 | 0.1539 | 1.9000e-004 | 0.1541 | 0.0000 | 31.6573 | 31.6573 | 6.4000e-004 | 8.0000e-004 | 31.9101 |
| **Total** | **0.0110** | **0.0197** | **0.1208** | **3.8000e-004** | **1.5195** | **3.1000e-004** | **1.5199** | **0.1584** | **3.0000e-004** | **0.1587** | **0.0000** | **35.7403** | **35.7403** | **7.7000e-004** | **1.4100e-003** | **36.1801** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2022

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0617 | 0.5068 | 0.5928 | 9.4000e-004 | | 0.0279 | 0.0279 | | 0.0268 | 0.0268 | 0.0000 | 81.9090 | 81.9090 | 0.0147 | 0.0000 | 82.2769 |
| **Total** | **0.0617** | **0.5068** | **0.5928** | **9.4000e-004** | **0.0000** | **0.0279** | **0.0279** | **0.0000** | **0.0268** | **0.0268** | **0.0000** | **81.9090** | **81.9090** | **0.0147** | **0.0000** | **82.2769** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 6.0000e-005 | 2.7500e-003 | 5.7000e-004 | 1.0000e-005 | 5.2900e-003 | 3.0000e-005 | 5.3200e-003 | 5.9000e-004 | 3.0000e-005 | 6.2000e-004 | 0.0000 | 1.1596 | 1.1596 | 5.0000e-005 | 1.8000e-004 | 1.2156 |
| Vendor | 2.7000e-004 | 7.3400e-003 | 2.5500e-003 | 3.0000e-005 | 0.0145 | 8.0000e-005 | 0.0146 | 1.6400e-003 | 8.0000e-005 | 1.7200e-003 | 0.0000 | 2.9234 | 2.9234 | 8.0000e-005 | 4.3000e-004 | 3.0543 |
| Worker | 0.0107 | 9.6000e-003 | 0.1177 | 3.4000e-004 | 0.6863 | 2.0000e-004 | 0.6865 | 0.0750 | 1.9000e-004 | 0.0752 | 0.0000 | 31.6573 | 31.6573 | 6.4000e-004 | 8.0000e-004 | 31.9101 |
| **Total** | **0.0110** | **0.0197** | **0.1208** | **3.8000e-004** | **0.7061** | **3.1000e-004** | **0.7064** | **0.0772** | **3.0000e-004** | **0.0775** | **0.0000** | **35.7403** | **35.7403** | **7.7000e-004** | **1.4100e-003** | **36.1801** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2023

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0410 | 0.3296 | 0.4212 | 6.7000e-004 | | 0.0175 | 0.0175 | | 0.0169 | 0.0169 | 0.0000 | 58.3505 | 58.3505 | 0.0103 | 0.0000 | 58.6083 |
| **Total** | **0.0410** | **0.3296** | **0.4212** | **6.7000e-004** | **0.0000** | **0.0175** | **0.0175** | **0.0000** | **0.0169** | **0.0169** | **0.0000** | **58.3505** | **58.3505** | **0.0103** | **0.0000** | **58.6083** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.5600e-003 | 3.7000e-004 | 1.0000e-005 | 8.0700e-003 | 2.0000e-005 | 8.0800e-003 | 8.5000e-004 | 2.0000e-005 | 8.6000e-004 | 0.0000 | 0.7898 | 0.7898 | 3.0000e-005 | 1.3000e-004 | 0.8279 |
| Vendor | 1.3000e-004 | 4.1700e-003 | 1.6500e-003 | 2.0000e-005 | 0.0221 | 3.0000e-005 | 0.0221 | 2.3400e-003 | 3.0000e-005 | 2.3700e-003 | 0.0000 | 1.9989 | 1.9989 | 5.0000e-005 | 3.0000e-004 | 2.0882 |
| Worker | 7.0400e-003 | 5.9800e-003 | 0.0765 | 2.4000e-004 | 1.0524 | 1.4000e-004 | 1.0525 | 0.1097 | 1.3000e-004 | 0.1098 | 0.0000 | 21.9590 | 21.9590 | 4.0000e-004 | 5.2000e-004 | 22.1234 |
| **Total** | **7.2000e-003** | **0.0117** | **0.0785** | **2.7000e-004** | **1.0825** | **1.9000e-004** | **1.0827** | **0.1129** | **1.8000e-004** | **0.1130** | **0.0000** | **24.7477** | **24.7477** | **4.8000e-004** | **9.5000e-004** | **25.0395** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.2 Gunnite - 2023

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0410 | 0.3296 | 0.4212 | 6.7000e-004 | | 0.0175 | 0.0175 | | 0.0169 | 0.0169 | 0.0000 | 58.3504 | 58.3504 | 0.0103 | 0.0000 | 58.6083 |
| **Total** | **0.0410** | **0.3296** | **0.4212** | **6.7000e-004** | **0.0000** | **0.0175** | **0.0175** | **0.0000** | **0.0169** | **0.0169** | **0.0000** | **58.3504** | **58.3504** | **0.0103** | **0.0000** | **58.6083** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.5600e-003 | 3.7000e-004 | 1.0000e-005 | 3.7700e-003 | 2.0000e-005 | 3.7800e-003 | 4.2000e-004 | 2.0000e-005 | 4.4000e-004 | 0.0000 | 0.7898 | 0.7898 | 3.0000e-005 | 1.3000e-004 | 0.8279 |
| Vendor | 1.3000e-004 | 4.1700e-003 | 1.6500e-003 | 2.0000e-005 | 0.0103 | 3.0000e-005 | 0.0104 | 1.1700e-003 | 3.0000e-005 | 1.2000e-003 | 0.0000 | 1.9989 | 1.9989 | 5.0000e-005 | 3.0000e-004 | 2.0882 |
| Worker | 7.0400e-003 | 5.9800e-003 | 0.0765 | 2.4000e-004 | 0.4890 | 1.4000e-004 | 0.4891 | 0.0534 | 1.3000e-004 | 0.0536 | 0.0000 | 21.9590 | 21.9590 | 4.0000e-004 | 5.2000e-004 | 22.1234 |
| **Total** | **7.2000e-003** | **0.0117** | **0.0785** | **2.7000e-004** | **0.5031** | **1.9000e-004** | **0.5032** | **0.0550** | **1.8000e-004** | **0.0552** | **0.0000** | **24.7477** | **24.7477** | **4.8000e-004** | **9.5000e-004** | **25.0395** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0221 | 0.1960 | 0.2461 | 4.4000e-004 | | 9.8300e-003 | 9.8300e-003 | | 9.8300e-003 | 9.8300e-003 | 0.0000 | 37.8336 | 37.8336 | 1.8000e-003 | 0.0000 | 37.8785 |
| **Total** | **0.0221** | **0.1960** | **0.2461** | **4.4000e-004** | **0.0000** | **9.8300e-003** | **9.8300e-003** | **0.0000** | **9.8300e-003** | **9.8300e-003** | **0.0000** | **37.8336** | **37.8336** | **1.8000e-003** | **0.0000** | **37.8785** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.3800e-003 | 2.9000e-004 | 1.0000e-005 | 5.6700e-003 | 1.0000e-005 | 5.6900e-003 | 6.0000e-004 | 1.0000e-005 | 6.1000e-004 | 0.0000 | 0.5809 | 0.5809 | 3.0000e-005 | 9.0000e-005 | 0.6090 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0107 | 9.6000e-003 | 0.1177 | 3.4000e-004 | 1.4772 | 2.0000e-004 | 1.4774 | 0.1539 | 1.9000e-004 | 0.1541 | 0.0000 | 31.6573 | 31.6573 | 6.4000e-004 | 8.0000e-004 | 31.9101 |
| **Total** | **0.0107** | **0.0110** | **0.1180** | **3.5000e-004** | **1.4829** | **2.1000e-004** | **1.4831** | **0.1545** | **2.0000e-004** | **0.1547** | **0.0000** | **32.2382** | **32.2382** | **6.7000e-004** | **8.9000e-004** | **32.5191** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2022

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0221 | 0.1960 | 0.2461 | 4.4000e-004 | | 9.8300e-003 | 9.8300e-003 | | 9.8300e-003 | 9.8300e-003 | 0.0000 | 37.8335 | 37.8335 | 1.8000e-003 | 0.0000 | 37.8785 |
| **Total** | **0.0221** | **0.1960** | **0.2461** | **4.4000e-004** | **0.0000** | **9.8300e-003** | **9.8300e-003** | **0.0000** | **9.8300e-003** | **9.8300e-003** | **0.0000** | **37.8335** | **37.8335** | **1.8000e-003** | **0.0000** | **37.8785** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.3800e-003 | 2.9000e-004 | 1.0000e-005 | 2.6500e-003 | 1.0000e-005 | 2.6600e-003 | 2.9000e-004 | 1.0000e-005 | 3.1000e-004 | 0.0000 | 0.5809 | 0.5809 | 3.0000e-005 | 9.0000e-005 | 0.6090 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0107 | 9.6000e-003 | 0.1177 | 3.4000e-004 | 0.6863 | 2.0000e-004 | 0.6865 | 0.0750 | 1.9000e-004 | 0.0752 | 0.0000 | 31.6573 | 31.6573 | 6.4000e-004 | 8.0000e-004 | 31.9101 |
| **Total** | **0.0107** | **0.0110** | **0.1180** | **3.5000e-004** | **0.6890** | **2.1000e-004** | **0.6892** | **0.0753** | **2.0000e-004** | **0.0755** | **0.0000** | **32.2382** | **32.2382** | **6.7000e-004** | **8.9000e-004** | **32.5191** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2023

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0348 | 0.3089 | 0.4174 | 7.5000e-004 | | 0.0146 | 0.0146 | | 0.0146 | 0.0146 | 0.0000 | 64.2924 | 64.2924 | 2.8300e-003 | 0.0000 | 64.3631 |
| **Total** | **0.0348** | **0.3089** | **0.4174** | **7.5000e-004** | **0.0000** | **0.0146** | **0.0146** | **0.0000** | **0.0146** | **0.0146** | **0.0000** | **64.2924** | **64.2924** | **2.8300e-003** | **0.0000** | **64.3631** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.8600e-003 | 4.4000e-004 | 1.0000e-005 | 9.6400e-003 | 2.0000e-005 | 9.6600e-003 | 1.0100e-003 | 2.0000e-005 | 1.0300e-003 | 0.0000 | 0.9437 | 0.9437 | 4.0000e-005 | 1.5000e-004 | 0.9893 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0168 | 0.0143 | 0.1825 | 5.6000e-004 | 2.5103 | 3.2000e-004 | 2.5106 | 0.2616 | 3.0000e-004 | 0.2619 | 0.0000 | 52.3793 | 52.3793 | 9.6000e-004 | 1.2400e-003 | 52.7714 |
| **Total** | **0.0168** | **0.0161** | **0.1830** | **5.7000e-004** | **2.5199** | **3.4000e-004** | **2.5203** | **0.2626** | **3.2000e-004** | **0.2629** | **0.0000** | **53.3230** | **53.3230** | **1.0000e-003** | **1.3900e-003** | **53.7607** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2023

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0348 | 0.3089 | 0.4174 | 7.5000e-004 | | 0.0146 | 0.0146 | | 0.0146 | 0.0146 | 0.0000 | 64.2923 | 64.2923 | 2.8300e-003 | 0.0000 | 64.3630 |
| **Total** | **0.0348** | **0.3089** | **0.4174** | **7.5000e-004** | **0.0000** | **0.0146** | **0.0146** | **0.0000** | **0.0146** | **0.0146** | **0.0000** | **64.2923** | **64.2923** | **2.8300e-003** | **0.0000** | **64.3630** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.8600e-003 | 4.4000e-004 | 1.0000e-005 | 4.5000e-003 | 2.0000e-005 | 4.5200e-003 | 5.0000e-004 | 2.0000e-005 | 5.2000e-004 | 0.0000 | 0.9437 | 0.9437 | 4.0000e-005 | 1.5000e-004 | 0.9893 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 0.0168 | 0.0143 | 0.1825 | 5.6000e-004 | 1.1663 | 3.2000e-004 | 1.1666 | 0.1275 | 3.0000e-004 | 0.1278 | 0.0000 | 52.3793 | 52.3793 | 9.6000e-004 | 1.2400e-003 | 52.7714 |
| **Total** | **0.0168** | **0.0161** | **0.1830** | **5.7000e-004** | **1.1708** | **3.4000e-004** | **1.1711** | **0.1280** | **3.2000e-004** | **0.1283** | **0.0000** | **53.3230** | **53.3230** | **1.0000e-003** | **1.3900e-003** | **53.7607** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2024

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0137 | 0.1225 | 0.1763 | 3.2000e-004 | | 5.3300e-003 | 5.3300e-003 | | 5.3300e-003 | 5.3300e-003 | 0.0000 | 27.2006 | 27.2006 | 1.1000e-003 | 0.0000 | 27.2281 |
| **Total** | **0.0137** | **0.1225** | **0.1763** | **3.2000e-004** | **0.0000** | **5.3300e-003** | **5.3300e-003** | **0.0000** | **5.3300e-003** | **5.3300e-003** | **0.0000** | **27.2006** | **27.2006** | **1.1000e-003** | **0.0000** | **27.2281** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 1.0000e-005 | 7.9000e-004 | 1.9000e-004 | 0.0000 | 4.0800e-003 | 1.0000e-005 | 4.0900e-003 | 4.3000e-004 | 1.0000e-005 | 4.4000e-004 | 0.0000 | 0.3923 | 0.3923 | 2.0000e-005 | 6.0000e-005 | 0.4113 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 6.6300e-003 | 5.3200e-003 | 0.0717 | 2.3000e-004 | 1.0621 | 1.3000e-004 | 1.0622 | 0.1107 | 1.2000e-004 | 0.1108 | 0.0000 | 21.6894 | 21.6894 | 3.6000e-004 | 4.8000e-004 | 21.8421 |
| **Total** | **6.6400e-003** | **6.1100e-003** | **0.0719** | **2.3000e-004** | **1.0661** | **1.4000e-004** | **1.0663** | **0.1111** | **1.3000e-004** | **0.1112** | **0.0000** | **22.0817** | **22.0817** | **3.8000e-004** | **5.4000e-004** | **22.2534** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.3 Field Office - 2024

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0137 | 0.1225 | 0.1763 | 3.2000e-004 | | 5.3300e-003 | 5.3300e-003 | | 5.3300e-003 | 5.3300e-003 | 0.0000 | 27.2006 | 27.2006 | 1.1000e-003 | 0.0000 | 27.2281 |
| **Total** | **0.0137** | **0.1225** | **0.1763** | **3.2000e-004** | **0.0000** | **5.3300e-003** | **5.3300e-003** | **0.0000** | **5.3300e-003** | **5.3300e-003** | **0.0000** | **27.2006** | **27.2006** | **1.1000e-003** | **0.0000** | **27.2281** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 1.0000e-005 | 7.9000e-004 | 1.9000e-004 | 0.0000 | 1.9000e-003 | 1.0000e-005 | 1.9100e-003 | 2.1000e-004 | 1.0000e-005 | 2.2000e-004 | 0.0000 | 0.3923 | 0.3923 | 2.0000e-005 | 6.0000e-005 | 0.4113 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 6.6300e-003 | 5.3200e-003 | 0.0717 | 2.3000e-004 | 0.4934 | 1.3000e-004 | 0.4936 | 0.0539 | 1.2000e-004 | 0.0540 | 0.0000 | 21.6894 | 21.6894 | 3.6000e-004 | 4.8000e-004 | 21.8421 |
| **Total** | **6.6400e-003** | **6.1100e-003** | **0.0719** | **2.3000e-004** | **0.4953** | **1.4000e-004** | **0.4955** | **0.0541** | **1.3000e-004** | **0.0543** | **0.0000** | **22.0817** | **22.0817** | **3.8000e-004** | **5.4000e-004** | **22.2534** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0478 | 0.3976 | 0.2548 | 5.2000e-004 | | 0.0203 | 0.0203 | | 0.0186 | 0.0186 | 0.0000 | 45.8366 | 45.8366 | 0.0148 | 0.0000 | 46.2073 |
| **Total** | **0.0478** | **0.3976** | **0.2548** | **5.2000e-004** | **0.0000** | **0.0203** | **0.0203** | **0.0000** | **0.0186** | **0.0186** | **0.0000** | **45.8366** | **45.8366** | **0.0148** | **0.0000** | **46.2073** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 1.4000e-004 | 3.0000e-005 | 0.0000 | 5.7000e-004 | 0.0000 | 5.7000e-004 | 6.0000e-005 | 0.0000 | 6.0000e-005 | 0.0000 | 0.0581 | 0.0581 | 0.0000 | 1.0000e-005 | 0.0609 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.1400e-003 | 1.9200e-003 | 0.0235 | 7.0000e-005 | 0.2954 | 4.0000e-005 | 0.2955 | 0.0308 | 4.0000e-005 | 0.0308 | 0.0000 | 6.3315 | 6.3315 | 1.3000e-004 | 1.6000e-004 | 6.3820 |
| **Total** | **2.1400e-003** | **2.0600e-003** | **0.0236** | **7.0000e-005** | **0.2960** | **4.0000e-005** | **0.2961** | **0.0308** | **4.0000e-005** | **0.0309** | **0.0000** | **6.3895** | **6.3895** | **1.3000e-004** | **1.7000e-004** | **6.4429** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2022

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0478 | 0.3976 | 0.2548 | 5.2000e-004 | | 0.0203 | 0.0203 | | 0.0186 | 0.0186 | 0.0000 | 45.8366 | 45.8366 | 0.0148 | 0.0000 | 46.2072 |
| **Total** | **0.0478** | **0.3976** | **0.2548** | **5.2000e-004** | **0.0000** | **0.0203** | **0.0203** | **0.0000** | **0.0186** | **0.0186** | **0.0000** | **45.8366** | **45.8366** | **0.0148** | **0.0000** | **46.2072** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 1.4000e-004 | 3.0000e-005 | 0.0000 | 2.6000e-004 | 0.0000 | 2.7000e-004 | 3.0000e-005 | 0.0000 | 3.0000e-005 | 0.0000 | 0.0581 | 0.0581 | 0.0000 | 1.0000e-005 | 0.0609 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 2.1400e-003 | 1.9200e-003 | 0.0235 | 7.0000e-005 | 0.1373 | 4.0000e-005 | 0.1373 | 0.0150 | 4.0000e-005 | 0.0150 | 0.0000 | 6.3315 | 6.3315 | 1.3000e-004 | 1.6000e-004 | 6.3820 |
| **Total** | **2.1400e-003** | **2.0600e-003** | **0.0236** | **7.0000e-005** | **0.1375** | **4.0000e-005** | **0.1376** | **0.0150** | **4.0000e-005** | **0.0151** | **0.0000** | **6.3895** | **6.3895** | **1.3000e-004** | **1.7000e-004** | **6.4429** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2023

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0765 | 0.6276 | 0.4224 | 8.9000e-004 | | 0.0317 | 0.0317 | | 0.0291 | 0.0291 | 0.0000 | 77.8972 | 77.8972 | 0.0252 | 0.0000 | 78.5270 |
| **Total** | **0.0765** | **0.6276** | **0.4224** | **8.9000e-004** | **0.0000** | **0.0317** | **0.0317** | **0.0000** | **0.0291** | **0.0291** | **0.0000** | **77.8972** | **77.8972** | **0.0252** | **0.0000** | **78.5270** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 1.9000e-004 | 4.0000e-005 | 0.0000 | 9.6000e-004 | 0.0000 | 9.7000e-004 | 1.0000e-004 | 0.0000 | 1.0000e-004 | 0.0000 | 0.0944 | 0.0944 | 0.0000 | 1.0000e-005 | 0.0989 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 3.3600e-003 | 2.8500e-003 | 0.0365 | 1.1000e-004 | 0.5021 | 6.0000e-005 | 0.5021 | 0.0523 | 6.0000e-005 | 0.0524 | 0.0000 | 10.4759 | 10.4759 | 1.9000e-004 | 2.5000e-004 | 10.5543 |
| **Total** | **3.3600e-003** | **3.0400e-003** | **0.0365** | **1.1000e-004** | **0.5030** | **6.0000e-005** | **0.5031** | **0.0524** | **6.0000e-005** | **0.0525** | **0.0000** | **10.5702** | **10.5702** | **1.9000e-004** | **2.6000e-004** | **10.6532** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2023

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0765 | 0.6276 | 0.4224 | 8.9000e-004 | | 0.0317 | 0.0317 | | 0.0291 | 0.0291 | 0.0000 | 77.8971 | 77.8971 | 0.0252 | 0.0000 | 78.5269 |
| **Total** | **0.0765** | **0.6276** | **0.4224** | **8.9000e-004** | **0.0000** | **0.0317** | **0.0317** | **0.0000** | **0.0291** | **0.0291** | **0.0000** | **77.8971** | **77.8971** | **0.0252** | **0.0000** | **78.5269** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 1.9000e-004 | 4.0000e-005 | 0.0000 | 4.5000e-004 | 0.0000 | 4.5000e-004 | 5.0000e-005 | 0.0000 | 5.0000e-005 | 0.0000 | 0.0944 | 0.0944 | 0.0000 | 1.0000e-005 | 0.0989 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 3.3600e-003 | 2.8500e-003 | 0.0365 | 1.1000e-004 | 0.2333 | 6.0000e-005 | 0.2333 | 0.0255 | 6.0000e-005 | 0.0256 | 0.0000 | 10.4759 | 10.4759 | 1.9000e-004 | 2.5000e-004 | 10.5543 |
| **Total** | **3.3600e-003** | **3.0400e-003** | **0.0365** | **1.1000e-004** | **0.2337** | **6.0000e-005** | **0.2338** | **0.0255** | **6.0000e-005** | **0.0256** | **0.0000** | **10.5702** | **10.5702** | **1.9000e-004** | **2.6000e-004** | **10.6532** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2024

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0307 | 0.2490 | 0.1751 | 3.7000e-004 | | 0.0125 | 0.0125 | | 0.0115 | 0.0115 | 0.0000 | 32.9539 | 32.9539 | 0.0107 | 0.0000 | 33.2203 |
| **Total** | **0.0307** | **0.2490** | **0.1751** | **3.7000e-004** | **0.0000** | **0.0125** | **0.0125** | **0.0000** | **0.0115** | **0.0115** | **0.0000** | **32.9539** | **32.9539** | **0.0107** | **0.0000** | **33.2203** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 8.0000e-005 | 2.0000e-005 | 0.0000 | 4.1000e-004 | 0.0000 | 4.1000e-004 | 4.0000e-005 | 0.0000 | 4.0000e-005 | 0.0000 | 0.0392 | 0.0392 | 0.0000 | 1.0000e-005 | 0.0411 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.3300e-003 | 1.0600e-003 | 0.0143 | 5.0000e-005 | 0.2124 | 3.0000e-005 | 0.2124 | 0.0221 | 2.0000e-005 | 0.0222 | 0.0000 | 4.3379 | 4.3379 | 7.0000e-005 | 1.0000e-004 | 4.3684 |
| **Total** | **1.3300e-003** | **1.1400e-003** | **0.0144** | **5.0000e-005** | **0.2128** | **3.0000e-005** | **0.2129** | **0.0222** | **2.0000e-005** | **0.0222** | **0.0000** | **4.3771** | **4.3771** | **7.0000e-005** | **1.1000e-004** | **4.4096** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.4 Barge Use - 2024

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0307 | 0.2490 | 0.1751 | 3.7000e-004 | | 0.0125 | 0.0125 | | 0.0115 | 0.0115 | 0.0000 | 32.9538 | 32.9538 | 0.0107 | 0.0000 | 33.2203 |
| **Total** | **0.0307** | **0.2490** | **0.1751** | **3.7000e-004** | **0.0000** | **0.0125** | **0.0125** | **0.0000** | **0.0115** | **0.0115** | **0.0000** | **32.9538** | **32.9538** | **0.0107** | **0.0000** | **33.2203** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 8.0000e-005 | 2.0000e-005 | 0.0000 | 1.9000e-004 | 0.0000 | 1.9000e-004 | 2.0000e-005 | 0.0000 | 2.0000e-005 | 0.0000 | 0.0392 | 0.0392 | 0.0000 | 1.0000e-005 | 0.0411 |
| Vendor | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Worker | 1.3300e-003 | 1.0600e-003 | 0.0143 | 5.0000e-005 | 0.0987 | 3.0000e-005 | 0.0987 | 0.0108 | 2.0000e-005 | 0.0108 | 0.0000 | 4.3379 | 4.3379 | 7.0000e-005 | 1.0000e-004 | 4.3684 |
| **Total** | **1.3300e-003** | **1.1400e-003** | **0.0144** | **5.0000e-005** | **0.0989** | **3.0000e-005** | **0.0989** | **0.0108** | **2.0000e-005** | **0.0108** | **0.0000** | **4.3771** | **4.3771** | **7.0000e-005** | **1.1000e-004** | **4.4096** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2022

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0598 | 0.6079 | 0.7129 | 1.3200e-003 | | 0.0269 | 0.0269 | | 0.0248 | 0.0248 | 0.0000 | 115.8960 | 115.8960 | 0.0375 | 0.0000 | 116.8331 |
| **Total** | **0.0598** | **0.6079** | **0.7129** | **1.3200e-003** | **0.0000** | **0.0269** | **0.0269** | **0.0000** | **0.0248** | **0.0248** | **0.0000** | **115.8960** | **115.8960** | **0.0375** | **0.0000** | **116.8331** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.9100e-003 | 0.1665 | 0.0347 | 7.1000e-004 | 0.6854 | 1.7600e-003 | 0.6871 | 0.0721 | 1.6900e-003 | 0.0738 | 0.0000 | 70.1856 | 70.1856 | 3.0300e-003 | 0.0111 | 73.5763 |
| Vendor | 2.7000e-004 | 7.3400e-003 | 2.5500e-003 | 3.0000e-005 | 0.0310 | 8.0000e-005 | 0.0311 | 3.2800e-003 | 8.0000e-005 | 3.3600e-003 | 0.0000 | 2.9234 | 2.9234 | 8.0000e-005 | 4.3000e-004 | 3.0543 |
| Worker | 0.0107 | 9.6000e-003 | 0.1177 | 3.4000e-004 | 1.4772 | 2.0000e-004 | 1.4774 | 0.1539 | 1.9000e-004 | 0.1541 | 0.0000 | 31.6573 | 31.6573 | 6.4000e-004 | 8.0000e-004 | 31.9101 |
| **Total** | **0.0149** | **0.1834** | **0.1550** | **1.0800e-003** | **2.1936** | **2.0400e-003** | **2.1956** | **0.2293** | **1.9600e-003** | **0.2312** | **0.0000** | **104.7662** | **104.7662** | **3.7500e-003** | **0.0124** | **108.5407** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2022

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0598 | 0.6079 | 0.7129 | 1.3200e-003 | | 0.0269 | 0.0269 | | 0.0248 | 0.0248 | 0.0000 | 115.8959 | 115.8959 | 0.0375 | 0.0000 | 116.8330 |
| **Total** | **0.0598** | **0.6079** | **0.7129** | **1.3200e-003** | **0.0000** | **0.0269** | **0.0269** | **0.0000** | **0.0248** | **0.0248** | **0.0000** | **115.8959** | **115.8959** | **0.0375** | **0.0000** | **116.8330** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.9100e-003 | 0.1665 | 0.0347 | 7.1000e-004 | 0.3200 | 1.7600e-003 | 0.3217 | 0.0356 | 1.6900e-003 | 0.0373 | 0.0000 | 70.1856 | 70.1856 | 3.0300e-003 | 0.0111 | 73.5763 |
| Vendor | 2.7000e-004 | 7.3400e-003 | 2.5500e-003 | 3.0000e-005 | 0.0145 | 8.0000e-005 | 0.0146 | 1.6400e-003 | 8.0000e-005 | 1.7200e-003 | 0.0000 | 2.9234 | 2.9234 | 8.0000e-005 | 4.3000e-004 | 3.0543 |
| Worker | 0.0107 | 9.6000e-003 | 0.1177 | 3.4000e-004 | 0.6863 | 2.0000e-004 | 0.6865 | 0.0750 | 1.9000e-004 | 0.0752 | 0.0000 | 31.6573 | 31.6573 | 6.4000e-004 | 8.0000e-004 | 31.9101 |
| **Total** | **0.0149** | **0.1834** | **0.1550** | **1.0800e-003** | **1.0208** | **2.0400e-003** | **1.0228** | **0.1122** | **1.9600e-003** | **0.1142** | **0.0000** | **104.7662** | **104.7662** | **3.7500e-003** | **0.0124** | **108.5407** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2023

### Unmitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0394 | 0.3881 | 0.5062 | 9.4000e-004 | | 0.0165 | 0.0165 | | 0.0152 | 0.0152 | 0.0000 | 82.5992 | 82.5992 | 0.0267 | 0.0000 | 83.2671 |
| **Total** | **0.0394** | **0.3881** | **0.5062** | **9.4000e-004** | **0.0000** | **0.0165** | **0.0165** | **0.0000** | **0.0152** | **0.0152** | **0.0000** | **82.5992** | **82.5992** | **0.0267** | **0.0000** | **83.2671** |

### Unmitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 1.5700e-003 | 0.0945 | 0.0225 | 4.8000e-004 | 0.4883 | 1.0200e-003 | 0.4893 | 0.0513 | 9.7000e-004 | 0.0523 | 0.0000 | 47.7995 | 47.7995 | 2.0600e-003 | 7.5800e-003 | 50.1090 |
| Vendor | 1.3000e-004 | 4.1700e-003 | 1.6500e-003 | 2.0000e-005 | 0.0221 | 3.0000e-005 | 0.0221 | 2.3400e-003 | 3.0000e-005 | 2.3700e-003 | 0.0000 | 1.9989 | 1.9989 | 5.0000e-005 | 3.0000e-004 | 2.0882 |
| Worker | 7.0400e-003 | 5.9800e-003 | 0.0765 | 2.4000e-004 | 1.0524 | 1.4000e-004 | 1.0525 | 0.1097 | 1.3000e-004 | 0.1098 | 0.0000 | 21.9590 | 21.9590 | 4.0000e-004 | 5.2000e-004 | 22.1234 |
| **Total** | **8.7400e-003** | **0.1046** | **0.1007** | **7.4000e-004** | **1.5627** | **1.1900e-003** | **1.5639** | **0.1633** | **1.1300e-003** | **0.1645** | **0.0000** | **71.7575** | **71.7575** | **2.5100e-003** | **8.4000e-003** | **74.3206** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.5 Road Grading - 2023

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0394 | 0.3881 | 0.5062 | 9.4000e-004 | | 0.0165 | 0.0165 | | 0.0152 | 0.0152 | 0.0000 | 82.5991 | 82.5991 | 0.0267 | 0.0000 | 83.2670 |
| **Total** | **0.0394** | **0.3881** | **0.5062** | **9.4000e-004** | **0.0000** | **0.0165** | **0.0165** | **0.0000** | **0.0152** | **0.0152** | **0.0000** | **82.5991** | **82.5991** | **0.0267** | **0.0000** | **83.2670** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 1.5700e-003 | 0.0945 | 0.0225 | 4.8000e-004 | 0.2279 | 1.0200e-003 | 0.2290 | 0.0254 | 9.7000e-004 | 0.0263 | 0.0000 | 47.7995 | 47.7995 | 2.0600e-003 | 7.5800e-003 | 50.1090 |
| Vendor | 1.3000e-004 | 4.1700e-003 | 1.6500e-003 | 2.0000e-005 | 0.0103 | 3.0000e-005 | 0.0104 | 1.1700e-003 | 3.0000e-005 | 1.2000e-003 | 0.0000 | 1.9989 | 1.9989 | 5.0000e-005 | 3.0000e-004 | 2.0882 |
| Worker | 7.0400e-003 | 5.9800e-003 | 0.0765 | 2.4000e-004 | 0.4890 | 1.4000e-004 | 0.4891 | 0.0534 | 1.3000e-004 | 0.0536 | 0.0000 | 21.9590 | 21.9590 | 4.0000e-004 | 5.2000e-004 | 22.1234 |
| **Total** | **8.7400e-003** | **0.1046** | **0.1007** | **7.4000e-004** | **0.7272** | **1.1900e-003** | **0.7284** | **0.0800** | **1.1300e-003** | **0.0811** | **0.0000** | **71.7575** | **71.7575** | **2.5100e-003** | **8.4000e-003** | **74.3206** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0540 | 0.4912 | 0.7177 | 1.1600e-003 | | 0.0224 | 0.0224 | | 0.0218 | 0.0218 | 0.0000 | 100.3240 | 100.3240 | 0.0160 | 0.0000 | 100.7234 |
| **Total** | **0.0540** | **0.4912** | **0.7177** | **1.1600e-003** | **0.0000** | **0.0224** | **0.0224** | **0.0000** | **0.0218** | **0.0218** | **0.0000** | **100.3240** | **100.3240** | **0.0160** | **0.0000** | **100.7234** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 4.0000e-005 | 2.1800e-003 | 5.2000e-004 | 1.0000e-005 | 0.0113 | 2.0000e-005 | 0.0113 | 1.1800e-003 | 2.0000e-005 | 1.2100e-003 | 0.0000 | 1.1013 | 1.1013 | 5.0000e-005 | 1.7000e-004 | 1.1545 |
| Vendor | 1.7000e-004 | 5.8200e-003 | 2.3000e-003 | 3.0000e-005 | 0.0308 | 4.0000e-005 | 0.0308 | 3.2600e-003 | 4.0000e-005 | 3.3000e-003 | 0.0000 | 2.7875 | 2.7875 | 7.0000e-005 | 4.1000e-004 | 2.9120 |
| Worker | 9.8200e-003 | 8.3300e-003 | 0.1067 | 3.3000e-004 | 1.4676 | 1.9000e-004 | 1.4678 | 0.1529 | 1.7000e-004 | 0.1531 | 0.0000 | 30.6218 | 30.6218 | 5.6000e-004 | 7.2000e-004 | 30.8510 |
| **Total** | **0.0100** | **0.0163** | **0.1095** | **3.7000e-004** | **1.5096** | **2.5000e-004** | **1.5099** | **0.1574** | **2.3000e-004** | **0.1576** | **0.0000** | **34.5105** | **34.5105** | **6.8000e-004** | **1.3000e-003** | **34.9175** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2023

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0540 | 0.4912 | 0.7177 | 1.1600e-003 | | 0.0224 | 0.0224 | | 0.0218 | 0.0218 | 0.0000 | 100.3239 | 100.3239 | 0.0160 | 0.0000 | 100.7233 |
| **Total** | **0.0540** | **0.4912** | **0.7177** | **1.1600e-003** | **0.0000** | **0.0224** | **0.0224** | **0.0000** | **0.0218** | **0.0218** | **0.0000** | **100.3239** | **100.3239** | **0.0160** | **0.0000** | **100.7233** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 4.0000e-005 | 2.1800e-003 | 5.2000e-004 | 1.0000e-005 | 5.2500e-003 | 2.0000e-005 | 5.2800e-003 | 5.8000e-004 | 2.0000e-005 | 6.1000e-004 | 0.0000 | 1.1013 | 1.1013 | 5.0000e-005 | 1.7000e-004 | 1.1545 |
| Vendor | 1.7000e-004 | 5.8200e-003 | 2.3000e-003 | 3.0000e-005 | 0.0144 | 4.0000e-005 | 0.0145 | 1.6300e-003 | 4.0000e-005 | 1.6700e-003 | 0.0000 | 2.7875 | 2.7875 | 7.0000e-005 | 4.1000e-004 | 2.9120 |
| Worker | 9.8200e-003 | 8.3300e-003 | 0.1067 | 3.3000e-004 | 0.6818 | 1.9000e-004 | 0.6820 | 0.0745 | 1.7000e-004 | 0.0747 | 0.0000 | 30.6218 | 30.6218 | 5.6000e-004 | 7.2000e-004 | 30.8510 |
| **Total** | **0.0100** | **0.0163** | **0.1095** | **3.7000e-004** | **0.7015** | **2.5000e-004** | **0.7018** | **0.0767** | **2.3000e-004** | **0.0770** | **0.0000** | **34.5105** | **34.5105** | **6.8000e-004** | **1.3000e-003** | **34.9175** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0369 | 0.3355 | 0.5193 | 8.4000e-004 | | 0.0142 | 0.0142 | | 0.0138 | 0.0138 | 0.0000 | 72.6147 | 72.6147 | 0.0114 | 0.0000 | 72.9000 |
| **Total** | **0.0369** | **0.3355** | **0.5193** | **8.4000e-004** | **0.0000** | **0.0142** | **0.0142** | **0.0000** | **0.0138** | **0.0138** | **0.0000** | **72.6147** | **72.6147** | **0.0114** | **0.0000** | **72.9000** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.5800e-003 | 3.8000e-004 | 1.0000e-005 | 8.1400e-003 | 2.0000e-005 | 8.1600e-003 | 8.6000e-004 | 2.0000e-005 | 8.7000e-004 | 0.0000 | 0.7831 | 0.7831 | 3.0000e-005 | 1.2000e-004 | 0.8210 |
| Vendor | 1.2000e-004 | 4.2500e-003 | 1.6400e-003 | 2.0000e-005 | 0.0223 | 3.0000e-005 | 0.0223 | 2.3600e-003 | 3.0000e-005 | 2.3900e-003 | 0.0000 | 1.9895 | 1.9895 | 5.0000e-005 | 2.9000e-004 | 2.0783 |
| Worker | 6.6300e-003 | 5.3200e-003 | 0.0717 | 2.3000e-004 | 1.0621 | 1.3000e-004 | 1.0622 | 0.1107 | 1.2000e-004 | 0.1108 | 0.0000 | 21.6894 | 21.6894 | 3.6000e-004 | 4.8000e-004 | 21.8421 |
| **Total** | **6.7800e-003** | **0.0112** | **0.0737** | **2.6000e-004** | **1.0925** | **1.8000e-004** | **1.0927** | **0.1139** | **1.7000e-004** | **0.1140** | **0.0000** | **24.4620** | **24.4620** | **4.4000e-004** | **8.9000e-004** | **24.7414** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.6 Dam Valve Activites - 2024

### Mitigated Construction On-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0369 | 0.3355 | 0.5193 | 8.4000e-004 | | 0.0142 | 0.0142 | | 0.0138 | 0.0138 | 0.0000 | 72.6146 | 72.6146 | 0.0114 | 0.0000 | 72.8999 |
| **Total** | **0.0369** | **0.3355** | **0.5193** | **8.4000e-004** | **0.0000** | **0.0142** | **0.0142** | **0.0000** | **0.0138** | **0.0138** | **0.0000** | **72.6146** | **72.6146** | **0.0114** | **0.0000** | **72.8999** |

### Mitigated Construction Off-Site

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 3.0000e-005 | 1.5800e-003 | 3.8000e-004 | 1.0000e-005 | 3.8000e-003 | 2.0000e-005 | 3.8200e-003 | 4.2000e-004 | 2.0000e-005 | 4.4000e-004 | 0.0000 | 0.7831 | 0.7831 | 3.0000e-005 | 1.2000e-004 | 0.8210 |
| Vendor | 1.2000e-004 | 4.2500e-003 | 1.6400e-003 | 2.0000e-005 | 0.0104 | 3.0000e-005 | 0.0105 | 1.1800e-003 | 3.0000e-005 | 1.2100e-003 | 0.0000 | 1.9895 | 1.9895 | 5.0000e-005 | 2.9000e-004 | 2.0783 |
| Worker | 6.6300e-003 | 5.3200e-003 | 0.0717 | 2.3000e-004 | 0.4934 | 1.3000e-004 | 0.4936 | 0.0539 | 1.2000e-004 | 0.0540 | 0.0000 | 21.6894 | 21.6894 | 3.6000e-004 | 4.8000e-004 | 21.8421 |
| **Total** | **6.7800e-003** | **0.0112** | **0.0737** | **2.6000e-004** | **0.5077** | **1.8000e-004** | **0.5079** | **0.0555** | **1.7000e-004** | **0.0557** | **0.0000** | **24.4620** | **24.4620** | **4.4000e-004** | **8.9000e-004** | **24.7414** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2023

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0875 | 0.7873 | 1.1279 | 1.8000e-003 | | 0.0387 | 0.0387 | | 0.0368 | 0.0368 | 0.0000 | 156.7755 | 156.7755 | 0.0342 | 0.0000 | 157.6314 |
| **Total** | **0.0875** | **0.7873** | **1.1279** | **1.8000e-003** | **0.0000** | **0.0387** | **0.0387** | **0.0000** | **0.0368** | **0.0368** | **0.0000** | **156.7755** | **156.7755** | **0.0342** | **0.0000** | **157.6314** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 6.0000e-005 | 3.7300e-003 | 8.9000e-004 | 2.0000e-005 | 0.0193 | 4.0000e-005 | 0.0193 | 2.0300e-003 | 4.0000e-005 | 2.0600e-003 | 0.0000 | 1.8859 | 1.8859 | 8.0000e-005 | 3.0000e-004 | 1.9770 |
| Vendor | 1.7000e-004 | 5.8200e-003 | 2.3000e-003 | 3.0000e-005 | 0.0308 | 4.0000e-005 | 0.0308 | 3.2600e-003 | 4.0000e-005 | 3.3000e-003 | 0.0000 | 2.7875 | 2.7875 | 7.0000e-005 | 4.1000e-004 | 2.9120 |
| Worker | 5.8900e-003 | 5.0000e-003 | 0.0640 | 2.0000e-004 | 0.8805 | 1.1000e-004 | 0.8807 | 0.0918 | 1.0000e-004 | 0.0919 | 0.0000 | 18.3731 | 18.3731 | 3.4000e-004 | 4.3000e-004 | 18.5106 |
| **Total** | **6.1200e-003** | **0.0146** | **0.0672** | **2.5000e-004** | **0.9306** | **1.9000e-004** | **0.9308** | **0.0970** | **1.8000e-004** | **0.0972** | **0.0000** | **23.0464** | **23.0464** | **4.9000e-004** | **1.1400e-003** | **23.3996** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2023

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0875 | 0.7873 | 1.1279 | 1.8000e-003 | | 0.0387 | 0.0387 | | 0.0368 | 0.0368 | 0.0000 | 156.7754 | 156.7754 | 0.0342 | 0.0000 | 157.6312 |
| **Total** | **0.0875** | **0.7873** | **1.1279** | **1.8000e-003** | **0.0000** | **0.0387** | **0.0387** | **0.0000** | **0.0368** | **0.0368** | **0.0000** | **156.7754** | **156.7754** | **0.0342** | **0.0000** | **157.6312** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 6.0000e-005 | 3.7300e-003 | 8.9000e-004 | 2.0000e-005 | 8.9900e-003 | 4.0000e-005 | 9.0300e-003 | 1.0000e-003 | 4.0000e-005 | 1.0400e-003 | 0.0000 | 1.8859 | 1.8859 | 8.0000e-005 | 3.0000e-004 | 1.9770 |
| Vendor | 1.7000e-004 | 5.8200e-003 | 2.3000e-003 | 3.0000e-005 | 0.0144 | 4.0000e-005 | 0.0145 | 1.6300e-003 | 4.0000e-005 | 1.6700e-003 | 0.0000 | 2.7875 | 2.7875 | 7.0000e-005 | 4.1000e-004 | 2.9120 |
| Worker | 5.8900e-003 | 5.0000e-003 | 0.0640 | 2.0000e-004 | 0.4091 | 1.1000e-004 | 0.4092 | 0.0447 | 1.0000e-004 | 0.0448 | 0.0000 | 18.3731 | 18.3731 | 3.4000e-004 | 4.3000e-004 | 18.5106 |
| **Total** | **6.1200e-003** | **0.0146** | **0.0672** | **2.5000e-004** | **0.4325** | **1.9000e-004** | **0.4327** | **0.0473** | **1.8000e-004** | **0.0475** | **0.0000** | **23.0464** | **23.0464** | **4.9000e-004** | **1.1400e-003** | **23.3996** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2024

**Unmitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 5.4000e-004 | 4.8400e-003 | 7.4300e-003 | 1.0000e-005 | | 2.3000e-004 | 2.3000e-004 | | 2.2000e-004 | 2.2000e-004 | 0.0000 | 1.0316 | 1.0316 | 2.2000e-004 | 0.0000 | 1.0372 |
| **Total** | **5.4000e-004** | **4.8400e-003** | **7.4300e-003** | **1.0000e-005** | **0.0000** | **2.3000e-004** | **2.3000e-004** | **0.0000** | **2.2000e-004** | **2.2000e-004** | **0.0000** | **1.0316** | **1.0316** | **2.2000e-004** | **0.0000** | **1.0372** |

**Unmitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 2.0000e-005 | 1.0000e-005 | 0.0000 | 1.3000e-004 | 0.0000 | 1.3000e-004 | 1.0000e-005 | 0.0000 | 1.0000e-005 | 0.0000 | 0.0122 | 0.0122 | 0.0000 | 0.0000 | 0.0128 |
| Vendor | 0.0000 | 4.0000e-005 | 1.0000e-005 | 0.0000 | 2.0000e-004 | 0.0000 | 2.0000e-004 | 2.0000e-005 | 0.0000 | 2.0000e-005 | 0.0000 | 0.0181 | 0.0181 | 0.0000 | 0.0000 | 0.0189 |
| Worker | 4.0000e-005 | 3.0000e-005 | 3.9000e-004 | 0.0000 | 5.7900e-003 | 0.0000 | 5.7900e-003 | 6.0000e-004 | 0.0000 | 6.0000e-004 | 0.0000 | 0.1183 | 0.1183 | 0.0000 | 0.0000 | 0.1191 |
| **Total** | **4.0000e-005** | **9.0000e-005** | **4.1000e-004** | **0.0000** | **6.1200e-003** | **0.0000** | **6.1200e-003** | **6.3000e-004** | **0.0000** | **6.3000e-004** | **0.0000** | **0.1486** | **0.1486** | **0.0000** | **0.0000** | **0.1508** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 3.7 Electrical Pad and Quipment - 2024

**Mitigated Construction On-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Fugitive Dust | | | | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 5.4000e-004 | 4.8400e-003 | 7.4300e-003 | 1.0000e-005 | | 2.3000e-004 | 2.3000e-004 | | 2.2000e-004 | 2.2000e-004 | 0.0000 | 1.0316 | 1.0316 | 2.2000e-004 | 0.0000 | 1.0372 |
| **Total** | **5.4000e-004** | **4.8400e-003** | **7.4300e-003** | **1.0000e-005** | **0.0000** | **2.3000e-004** | **2.3000e-004** | **0.0000** | **2.2000e-004** | **2.2000e-004** | **0.0000** | **1.0316** | **1.0316** | **2.2000e-004** | **0.0000** | **1.0372** |

**Mitigated Construction Off-Site**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Hauling | 0.0000 | 2.0000e-005 | 1.0000e-005 | 0.0000 | 6.0000e-005 | 0.0000 | 6.0000e-005 | 1.0000e-005 | 0.0000 | 1.0000e-005 | 0.0000 | 0.0122 | 0.0122 | 0.0000 | 0.0000 | 0.0128 |
| Vendor | 0.0000 | 4.0000e-005 | 1.0000e-005 | 0.0000 | 9.0000e-005 | 0.0000 | 1.0000e-004 | 1.0000e-005 | 0.0000 | 1.0000e-005 | 0.0000 | 0.0181 | 0.0181 | 0.0000 | 0.0000 | 0.0189 |
| Worker | 4.0000e-005 | 3.0000e-005 | 3.9000e-004 | 0.0000 | 2.6900e-003 | 0.0000 | 2.6900e-003 | 2.9000e-004 | 0.0000 | 2.9000e-004 | 0.0000 | 0.1183 | 0.1183 | 0.0000 | 0.0000 | 0.1191 |
| **Total** | **4.0000e-005** | **9.0000e-005** | **4.1000e-004** | **0.0000** | **2.8400e-003** | **0.0000** | **2.8500e-003** | **3.1000e-004** | **0.0000** | **3.1000e-004** | **0.0000** | **0.1486** | **0.1486** | **0.0000** | **0.0000** | **0.1508** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| General Heavy Industry | 0.00 | 0.00 | 0.00 | | |
| Total | 0.00 | 0.00 | 0.00 | | |

## 4.3 Trip Type Information

| | Miles | | | Trip % | | | Trip Purpose % | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | H-W or C-W | H-S or C-C | H-O or C-NW | H-W or C-W | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| General Heavy Industry | 0.00 | 0.00 | 0.00 | 59.00 | 28.00 | 13.00 | 92 | 5 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General Heavy Industry | 0.540566 | 0.056059 | 0.172680 | 0.136494 | 0.026304 | 0.007104 | 0.011680 | 0.017449 | 0.000554 | 0.000251 | 0.025076 | 0.000954 | 0.004830 |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Electricity Mitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| NaturalGas Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| NaturalGas Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 5.2 Energy by Land Use - NaturalGas

**Unmitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated**

| | NaturalGas Use | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Land Use | kBTU/yr | tons/yr | | | | | | | | | | MT/yr | | | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 5.3 Energy by Land Use - Electricity

**Unmitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated**

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Category | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Mitigated | 8.5000e-004 | 8.0000e-005 | 9.1700e-003 | 0.0000 | | 3.0000e-005 | 3.0000e-005 | | 3.0000e-005 | 3.0000e-005 | 0.0000 | 0.0179 | 0.0179 | 5.0000e-005 | 0.0000 | 0.0190 |
| Unmitigated | 8.5000e-004 | 8.0000e-005 | 9.1700e-003 | 0.0000 | | 3.0000e-005 | 3.0000e-005 | | 3.0000e-005 | 3.0000e-005 | 0.0000 | 0.0179 | 0.0179 | 5.0000e-005 | 0.0000 | 0.0190 |

## 6.2 Area by SubCategory

**Unmitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 8.5000e-004 | 8.0000e-005 | 9.1700e-003 | 0.0000 | | 3.0000e-005 | 3.0000e-005 | | 3.0000e-005 | 3.0000e-005 | 0.0000 | 0.0179 | 0.0179 | 5.0000e-005 | 0.0000 | 0.0190 |
| **Total** | **8.5000e-004** | **8.0000e-005** | **9.1700e-003** | **0.0000** | | **3.0000e-005** | **3.0000e-005** | | **3.0000e-005** | **3.0000e-005** | **0.0000** | **0.0179** | **0.0179** | **5.0000e-005** | **0.0000** | **0.0190** |

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 6.2 Area by SubCategory

**Mitigated**

| | ROG | NOx | CO | SO2 | Fugitive PM10 | Exhaust PM10 | PM10 Total | Fugitive PM2.5 | Exhaust PM2.5 | PM2.5 Total | Bio- CO2 | NBio- CO2 | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SubCategory | tons/yr | | | | | | | | | | MT/yr | | | | | |
| Architectural Coating | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.0000 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Landscaping | 8.5000e-004 | 8.0000e-005 | 9.1700e-003 | 0.0000 | | 3.0000e-005 | 3.0000e-005 | | 3.0000e-005 | 3.0000e-005 | 0.0000 | 0.0179 | 0.0179 | 5.0000e-005 | 0.0000 | 0.0190 |
| **Total** | **8.5000e-004** | **8.0000e-005** | **9.1700e-003** | **0.0000** | | **3.0000e-005** | **3.0000e-005** | | **3.0000e-005** | **3.0000e-005** | **0.0000** | **0.0179** | **0.0179** | **5.0000e-005** | **0.0000** | **0.0190** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Heavy Industry | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

### 7.2 Water by Land Use

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| General Heavy Industry | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 8.0 Waste Detail

### 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Unmitigated | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| General Heavy Industry | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | | **0.0000** | **0.0000** | **0.0000** | **0.0000** |

## 9.0 Operational Offroad

| Equipment Type | Number | Hours/Day | Days/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied**

## 10.0 Stationary Equipment

**Fire Pumps and Emergency Generators**

| Equipment Type | Number | Hours/Day | Hours/Year | Horse Power | Load Factor | Fuel Type |
|---|---|---|---|---|---|---|

**Boilers**

| Equipment Type | Number | Heat Input/Day | Heat Input/Year | Boiler Rating | Fuel Type |
|---|---|---|---|---|---|

**User Defined Equipment**

| Equipment Type | Number |
|---|---|

## 11.0 Vegetation

# Appendix B

Biological Resources Technical Report and Jurisdictional Delineation Report

# BIOLOGICAL TECHNICAL REPORT

## Copper Basin Discharge Valve Replacement and Access Road Improvements Project

***Prepared for***

**Metropolitan Water District of Southern California**

700 North Alameda Street
Los Angeles, CA 90012-2944

***Submitted by***

Aspen environmental group

**December 2022**

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# EXECUTIVE SUMMARY

This report was prepared under contract to the Metropolitan Water District of Southern California (Metropolitan) to describe potential biological resources at the Copper Basin Discharge Valve Replacement and Copper Basin Access Road Repair Project (proposed Project) in San Bernardino County, California. Metropolitan is evaluating options to repair approximately two miles of access roads along the southern edge of the Copper Basin Reservoir to gain access to the base of Copper Basin Dam. The current access road is drivable but needs repairs and may need to be modified to allow access for heavy equipment. In some areas the road is unsafe and is only passible by four-wheel drive vehicles. Copper Basin Dam was completed in 1941 as part of Metropolitan's Colorado River Aqueduct (CRA) system to provide water to southern California. The original discharge valve at the base of the dam needs to be replaced and Metropolitan is evaluating several options to access and replace the valve.

No federally or State listed plants were observed during focused surveys and none are expected to occur in the proposed Project area. Surveys did identify the presence of four non-listed special-status plants, including rough-stemmed forget-me-not (*Cryptantha [Johnstonella] holoptera*) (CRPR 4.3), Darlington's blazing star (*Mentzelia puberula*) (CRPR 2B.2), yellow palo verde (*Parkinsonia microphylla*) (CRPR 4.3), and desert beardtongue (*Penstemon pseudospectabilis*) (CRPR 2B.2). Saguaro (*Carnegiea gigantea*) (CRPR 2B.2) was observed in adjacent upland habitat, but not within the proposed Project area. The literature review identified an additional 23 special-status plant species that have been recorded within the four USGS 7.5-minute quadrants associated with the proposed Project area. Of these, 11 were determined to have a moderate to high potential to occur.

One State listed species, bald eagle (*Haliaeetus leucocephalus*), is known to nest on a steep cliff adjacent to the proposed Project area. Southwestern willow flycatcher (*Empidonax traillii extimus*), a State and federally listed species was detected at the Copper Basin Reservoir and likely nests in the area. A single unoccupied cavity in a rock face with recent sign of burrowing owl (*Athene cunicularia*) was detected along an access road. American peregrine falcon (*Falco peregrinus anatum*), loggerhead shrike (*Lanius ludovicianus*), Lucy's warbler (*Oreothlypis luciae*), yellow-breasted chat (*Icteria virens*), ringtail (*Bassariscus astutus*), mountain lion (*Puma concolor*), and desert bighorn sheep (*Ovis canadensis nelson*) were also detected or are known to occur in the region.

Two additional State listed species have a potential to be present and include Gila woodpecker (*Melanerpes uropygialis*) and Arizona Bell's vireo (*Vireo bellii arizonae*). They were not detected during focused and protocol surveys at the Reservoir or within the Copper Basin Wash. Golden eagle (*Aquila chrysaetos*) was not observed but has a potential to occur. Desert tortoise (*Gopherus agassizii*) are known from the region but are considered to have a low to moderate potential to occur at the Copper Basin Reservoir.

Several special-status plants were observed or have the potential to be present in the Survey Area. These include saguaro (*Carnegiea gigantea*), Darlington's blazing star (*Mentzelia puberula*), desert beardtongue (*Penstemon pseudospectabilis* ssp. *pseudospectabilis*), narrow-leaved psorothamnus (*Psorothamnus fremontii* var. *attenuatus*), rough stemmed forget-me-not [*Cryptantha* (*Johnstonella*) *holoptera*], and yellow paloverde (*Parkinsonia microphylla)*.

Three sensitive natural communities are also present within the Survey Area and include saguaro - foothill palo verde - velvet mesquite desert scrub, Fremont cottonwood forest and woodland, and arrow weed thickets. Nesting birds and wildlife movement within the Survey Area may also be impacted by the proposed Project. Wetlands are also present along the margin of the Reservoir and within portions of the Copper Basin Wash below the Reservoir. Waters under the jurisdiction of U.S. Army Corps of Engineers, Colorado River Regional Water Quality Control Board, and California Department of Fish & Wildlife are present within the proposed Project area.

# 1. INTRODUCTION

The Metropolitan Water District's (Metropolitan) Copper Basin Discharge Valve Replacement and Access Road Improvements Project (proposed Project) would include replacement of the discharge valve at the Copper Basin Dam and improvements to portions of the existing unpaved Copper Basin Access Road from the Copper Basin Chlorine Tank Farm to the base of Copper Basin Dam.

This Biological Resources Technical Report is being prepared to provide a review of the proposed Project in sufficient detail as to determine to what extent it may affect sensitive biological resources. For the purposes of this analysis, sensitive biological resources include:

- Listed as a threatened or endangered species under the federal Endangered Species Act (FESA)
- Listed or candidates for listing as a threatened or endangered species under the California Endangered Species Act (CESA)
- Bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA)
- Species designated as Fully Protected (FP) by the California Department of Fish and Wildlife (CDFW)
- Animals designated as Species of Special Concern (SSC) by CDFW
- Animals included in the CDFW "Special Animals" (SA) list
- Plants assigned a California Rare Plant Rank (CRPR) of 1 or 2 by the California Native Plant Society (CNPS)
- Plants listed as rare under the California Native Plant Protection Act (CNPPA)
- Vegetation types designated as Sensitive Natural Communities by CDFW
- Features meeting the requirements of jurisdictional waters or wetlands of the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and/or CDFW

# 2. PROPOSED PROJECT LOCATION

The proposed Project would be constructed at the Copper Basin Reservoir (Reservoir), a large manmade feature located on lands owned and managed by Metropolitan (see Figure 1). Copper Basin is situated within the Whipple Mountains, a small range located west of the Colorado River in the southwestern portion of the U.S. Geological Survey's (USGS) Gene Wash 7.5-minute topographic quadrangle (quad). Copper Basin Wash, a narrow canyon with nearly vertical walls, is located below the Reservoir.

The Survey Area and immediately adjacent lands primarily consists of undeveloped open space owned by Metropolitan. The topography in the general area is complex and includes alluvial plains, steep mountainous slopes, and rocky terrain. Elevations in the proposed Project area vary from 970 feet above mean sea level (amsl) below the Reservoir to approximately 1,230 feet amsl along the access road.

The region is characterized by a desert climate that experiences extreme fluctuations of daily temperatures, strong seasonal winds, and low rainfall. The average annual high temperature is about 86.2°F and the average annual low is about 62.1°F (WRCC, 2022). Precipitation in the region occurs mainly between November and April, with monsoonal rains in August and September (SWRCB, 2019). The mean seasonal precipitation for Parker Reservoir, approximately five miles west of the Project is 5.5 inches (WRCC, 2022). Rainfall was below average in the region during the 2021-2022 rainfall year (July 1 through June 30). Approximately 20 percent of normal rainfall has been recorded in southeastern portions of California during that period (NOAA, 2022).

Access to the Project would occur along existing paved and unpaved roads including Trail End Camp Road and an unnamed dirt road which runs from the west end of the Reservoir to Copper Basin Wash. Trail End Camp Road is subject to daily vehicle and truck traffic to support operation of the Metropolitan facility.

Currently, an average of 1,148 gallons of water per minute seeps from the Copper Basin Dam, creating perennial water flow through portions of Copper Basin Wash. Typically, this flow does not provide connectivity to the Colorado River.

Throughout this report, the “proposed Project area” refers to the access roads repair and the discharge valve replacement under consideration at Copper Basin Reservoir and Copper Basin Dam, while “Survey Area” refers to the proposed Project area and a 50-foot to 300-foot buffer.

**Figure 1. Project Overview**

# 3. REGULATORY FRAMEWORK

## 3.1. Federal Regulations

**Endangered Species Act**

The FESA and its subsequent amendments protect plants and wildlife (and their habitats) listed as endangered or threatened by the United States Fish and Wildlife Service (USFWS). Section 9 of the FESA specifically prohibits the taking of FESA-protected wildlife and lists prohibited actions. The FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct (50 Code of Federal Regulations [CFR] 17.3). The FESA also governs the removal, possession, malicious damage, or destruction of endangered plants on federal land. Pursuant to the requirements of the FESA, an agency proposing a project or reviewing a proposed project within its jurisdiction (action agency) must determine whether any federally listed species may be present in the proposed Project area and determine whether the proposed Project will have a significant effect upon such species or its habitat.

**Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations to protect migratory birds and their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized by regulation or permit. Regulations governing migratory bird permits are found in 50 CFR 13 – General Permit Procedures and 50 CFR 21 – Migratory Bird Permits.

**Bald and Golden Eagle Protection Act**

Bald and golden eagles are protected under the BGEPA, originally passed in 1940 and amended in 1962. The BGEPA prohibits the take, possession, sale, purchase, barter, offer to sell, transport, export, or import of any bald or golden eagle, alive or dead, including any part, nest, egg, unless allowed by permit (15 U.S.C. 668[a]; 50 CFR 22). The USFWS regulates activities that may take bald eagles or golden eagles. Take is defined as "pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, and disturbing" bald or golden eagles, and as activities causing: "(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" (USFWS 2007).

**Federal Clean Water Act Section 404**

The purpose of the federal Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within waters of the United States (excluding de minimis incidental fallback of material) and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). Waters of the United States may include rivers, streams, estuaries, territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that are under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.7b).

**Federal Clean Water Act Section 401**

Section 401 of the CWA requires that any applicant, for a federal permit for activities that involve a discharge to "waters of the state", shall provide the federal permitting agency a certification (from the

state in which the discharge is proposed) that states that the discharge will comply with the applicable provisions under the CWA. Therefore, before the United States Army Corps of Engineers (USACE) may issue a Section 404 permit, a permittee must apply for and receive a Section 401 Water Quality Certification from the applicable Regional Water Quality Control Board (RWQCB). The RWQCB may add conditions to its certification to remove or mitigate potential impacts to water quality standards. Such conditions must ultimately be included in the federal Section 404 permit.

## 3.2. State Regulations

**California Environmental Quality Act**

The California Environmental Quality Act (CEQA) requires state agencies, local governments, and special districts to evaluate and disclose impacts from projects in the state. Section 15380 of the CEQA Guidelines clearly indicates that plant and wildlife species designated by the CDFW as FP or SSC should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity outlined therein.

**California Endangered Species Act**

The CESA provides that certain species of plants and wildlife that are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of California are of statewide concern and should be conserved, protected, and enhanced along with their habitats. The CESA establishes policy that state agencies should not approve projects that would jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species if there are reasonable and prudent alternatives consistent with conserving the species or its habitat that would prevent jeopardy.

**Fully Protected Designations**

California Fish and Game Code (FGC) Sections 3511, 4700, 5050, and 5515 designate 36 fish and wildlife species as FP from take, including hunting, harvesting, and other activities. The FGC sections dealing with FP species state that these species "…may not be taken or possessed at any time and no provisions of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species". Most of the species on these lists have been subsequently listed under the FESA or CESA.

**Native Bird Protections**

FGC Sections 3503, 3503.3, and 3513 prohibit take, possession, or needless destruction of birds, ness, or eggs except as otherwise provided by the FGC. Section 3513 provides for the adoption of the MBTA's provisions (see Section 3.1).

**Furbearing Mammal Protections**

FGC Section 251.1 prohibits the harassment of any furbearing mammal. Harass is defined as an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering.

**California Code of Regulations Title 14**

Title 14 Cal. Code of Regulations § 460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time. Cal. Code Regs. Tit. 14, § 362 - Nelson Bighorn Sheep regulates the taking of Nelsons Bighorn Sheep.

**California Native Plant Protection Act**

The CNPPA of 1977 (FGC Sections 1900-1913) was created with the intent to "preserve, protect, and enhance rare and endangered plants in California". The NPPA is administered by CDFW while the Fish and Game Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take.

**California Streambed Alteration Notification/Agreement**

Section 1602 of the FGC requires that a streambed alteration application be submitted to CDFW for "any activity that may substantially divert or obstruct the natural flows or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources.

## 3.3. Local Regulations

**County of San Bernardino Desert Native Plant Protection Ordinance**

The County of San Bernardino Desert Native Plant Protection ordinance protects certain desert native plants and does not allow the removal of the following plants with stems two inches or greater in diameter or six feet greater in height: smoketree (*Dalea spinosa*), Joshua tree (*Yucca brevifolia*), all species of the genus *Prosopis*, all species of the family Agavaceae, and creosote rings 10 feet or greater in diameter (San Bernardino County, 2007). In addition, any part of any of the following species, whether living or dead, may not be removed: desert ironwood (*Olneya tesota*), all species of the genus *Prosopis*, and all species of the genus *Cercidium*. During the 2021 and 2022 reconnaissance field surveys, multiple trees of the *Prosopis* and *Cercidium* (*Parkinsonia*) genera and smoketree were identified within and adjacent to the proposed Project area. Although mapping of these resources was not included in the 2021 and 2022 surveys, numerous *Cercidium* and *Prosopis* trees were observed within temporary and permanent impact areas. Trees of the genera *Prosopis* and *Cercidium* along with smoketrees were also observed downstream of the dam; however, not within any temporary and permanent impact areas.

# 4. METHODS

Prior to the site visit a literature search was conducted to identify sensitive biological resources, including sensitive natural communities and special-status plants and wildlife species, known from the vicinity of the proposed Project area. This included a review of the California Natural Diversity Database (CNDDB) (CDFW, 2022a) for the USGS 7.5-minute topographic quads where the Survey Area is located and those adjacent quads within five miles, including Cross Roads, Parker, Whipple Wash, and Gene Wash. The USFWS Information for Planning and Conservation (IPaC) program was also reviewed utilizing an approximately five-mile buffer surrounding the proposed Project area. The results of the CNDDB and IPaC searches can be found in Attachment 2. Additional data regarding the potential occurrence of sensitive biological resources was obtained from the following sources:

- CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2022)
- Consortium of California Herbaria (CCH) records for San Bernardino County (CCH, 2022)
- iNaturalist online sources for the Copper Basin region (iNaturalist, 2022)
- eBird online sources for the Copper Basin region (eBird, 2022)

Reconnaissance-level biological surveys were conducted on March 29 and 30, 2021. These surveys focused on mapping vegetation within the proposed Project area, assessing the potential for the proposed Project area to support special-status species, searching for any special-status plants and wildlife, and identifying any potential jurisdictional wetlands or other waters. Floristic surveys for special-status plants

were performed on March 15 and 16, 2022. A delineation of federal and state waters was also conducted during this time. Protocol-level surveys for southwestern willow flycatcher (*Empidonax traillii extimus*) and Arizona Bell's vireo (*Vireo bellii arizonae*) were conducted between May and July and April and July 2022, respectively. Visual and acoustic surveys for special-status bats were completed between March and August 2022.

During the field surveys, all plant and wildlife species observed were recorded in field notes and are listed in Attachment 3. General notes were also recorded on the vegetation within the proposed Project area. Vegetation within the expansion area is further described below using the names and descriptions in *A Manual of California Vegetation* (Sawyer et al., 2009). Plants that could not be identified in the field were collected and later identified using keys, descriptions, and illustrations in Baldwin et al. (2012).

# 5. RESULTS

## 5.1. Vegetation

Vegetation and habitat along the access road is dominated by xeric desert communities, which are characterized by species such as yellow paloverde (*Parkinsonia microphylla*), creosote bush (*Larrea tridentata*), and various species of cactus that grow on the steep rocky slopes. Downstream of Copper Basin Dam, the vegetation changes rapidly to a mesic riparian woodland dominated by Fremont cottonwood (*Populus fremontii*), willows (*Salix* spp.), tamarisk (*Tamarix ramosissima*), and a broad low-flow channel dominated by cattails (*Typha domingensis*) and other species of hydrophytic vegetation. Four native vegetation alliances and two additional land cover types were identified within the Survey Area.

CDFW evaluates Natural Communities using the Heritage Methodology, the same system used to assign global and state rarity ranks for plant and animal species in the CNDDB. Natural communities with ranks of S1 (Critically Imperiled), S2 (Imperiled), or S3 (Vulnerable) are considered Sensitive Natural Communities by CDFW. CDFW has stated that Sensitive Natural Communities should be addressed in the CEQA environmental review process (CDFW 2022b). Based on these rankings, three Sensitive Natural Communities were documented in the Survey Area. These include saguaro – foothill palo verde – velvet mesquite desert scrub (*Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina* Provisional Shrubland Alliance) (S2), Fremont cottonwood forest and woodland (*Populus fremontii - Fraxinus velutina - Salix gooddingii* Forest & Woodland Alliance) (S3), and arrow weed thickets (*Pluchea sericea* Alliance) (S3).

Vegetation types within the Survey Area are described in further detail below. The acreages of vegetation types and cover areas are shown below in Table 1 and Figure 2.

**Table 1. Summary of Vegetation and Cover Types in Survey Area**

| Vegetation and Land Cover Types | Type | Total Acres | Percentage of Total Acreage (%) |
|---|---|---|---|
| Saguaro - foothill palo verde - velvet mesquite desert scrub* | Upland | 15.75 | 54.7 |
| Fremont cottonwood forest and woodland* | Riparian | 0.18 | 0.6 |
| Arrow weed thickets* | Riparian | 3.14 | 11.2 |
| Cattail marsh | Riparian | 1.06 | 4.9 |
| **Other Cover Types**** | | | |
| Developed and Disturbed | N/A | 7.76 | 27.8 |
| Open Water | N/A | 0.21 | 0.8 |

| Vegetation and Land Cover Types | Type | Total Acres | Percentage of Total Acreage (%) |
|---|---|---|---|
| Total | -- | 28.10 | 100 |

*These communities are designated as "Sensitive Natural Communities" by CDFW.
**These communities/land cover types are not defined in Sawyer et al. (2009) or Holland (1986) but are included in this table for acreage calculation purposes.

**Saguaro - foothill palo verde - velvet mesquite desert scrub (*Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina* Provisional Shrubland Alliance).** This vegetation is characterized by the presence of yellow paloverde which dominates the uplands throughout the Survey Area. Other species such as creosote bush, white bursage (*Ambrosia dumosa*), chollas (*Cylindropuntia* spp.), and brittlebush (*Encelia farinosa*) are also present in low numbers. Saguaro (*Carnegiea gigantea*) are also present in low numbers just beyond the limits of the Survey Area. This vegetation matches the description of Arizonan woodland in Holland (1986). This vegetation has a State rank or S2 and is considered a Sensitive Natural Community in California (CDFW, 2022b).

**Fremont cottonwood forest and woodland (*Populus fremontii - Fraxinus velutina - Salix gooddingii* Forest & Woodland Alliance).** This vegetation is characterized by the presence of Fremont cottonwood (*Populus fremontii*) and Gooding's black willow (*Salix gooddingii*). These species form a high overstory above species such as arrow weed (*Pluchea sericea*), umbrella plant (*Cyperus involucratus*), and narrowleaf willow (*Salix exigua*). This vegetation matches the description of Sonoran cottonwood-willow riparian forest in Holland (1986). This vegetation has a State rank or S3 and is considered a Sensitive Natural Community in California (CDFW, 2022b).

**Arrow weed thickets (*Pluchea sericea* Shrubland Alliance).** This vegetation is dominated by arrow weed, narrowleaf willow, tamarisk, and other lower growing vegetation. It is present in the canyon bottom downstream of Copper Basin Dam and is also present along the margins on Copper Basin Reservoir. This vegetation matches the description of arrow weed scrub in Holland (1986). This vegetation has a State rank of S3 and is considered to be a Sensitive Natural Community in California (CDFW, 2022b).

**Cattail marshes [*Typha* (*angustifolia, domingensis, latifolia*) Herbaceous Alliance].** This vegetation community is dominated by cattails (*Typha* spp.), umbrella plant, and numerous other herbaceous species. It is present in the wettest portions of the canyon bottom downstream of Copper Basin Dam and along the margins on Copper Basin Reservoir. It should also be noted that this vegetation is mapped immediately below the dam which is in fact only dominated by umbrella plant on the channel bottom and Venus hair (*Adiantum capillus-veneris*) and yellow monkey flower (*Erythranthe guttata*) on the canyon walls. This vegetation matches the description of arrow weed scrub in Holland (1986). This vegetation has a State rank or S5 and is not considered a Sensitive Natural Community in California (CDFW, 2022b).

**Developed and Disturbed.** Developed and disturbed lands are those portions of the Survey Area with human-dominated land uses, including the existing communications facility, a small development, and the unpaved access roads. Vegetation, where present, is dominated by native and non-native ruderal (weedy) species.

**Open Water.** Open water are those portions of the survey area located within the Reservoir. Vegetation, where present, is dominated by native aquatic species.

**Figure 2. Vegetation**

N
0
50
100
Feet
Survey Area
Temporary Impact
Vegetation and Cover Types
Disturbed or Developed
Figure 2b
Vegetation

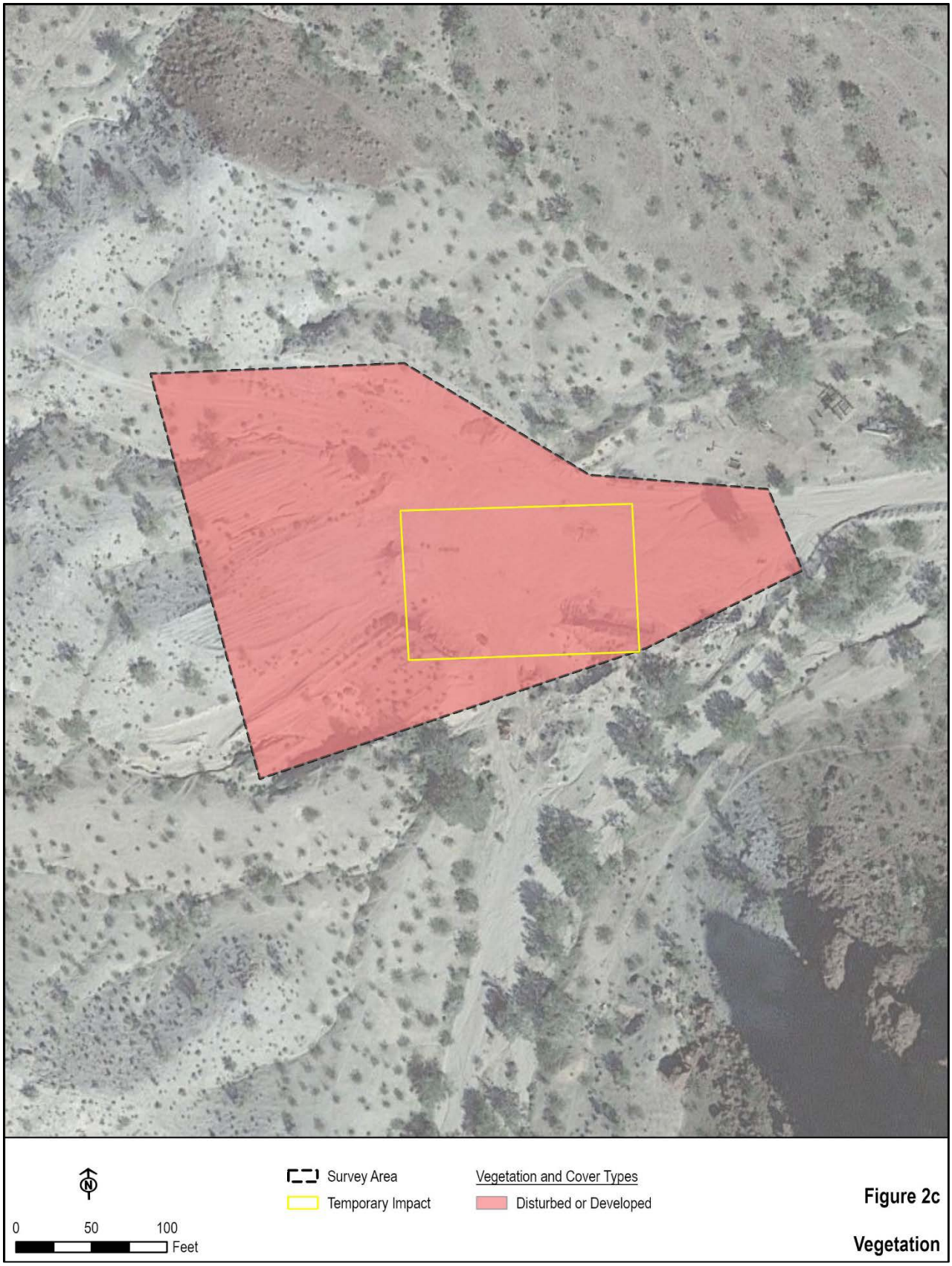

Survey Area
Temporary Impact
Vegetation and Cover Types
Disturbed or Developed
0
50
100
Feet
Figure 2c
Vegetation

**Figure 2d**

**Vegetation**

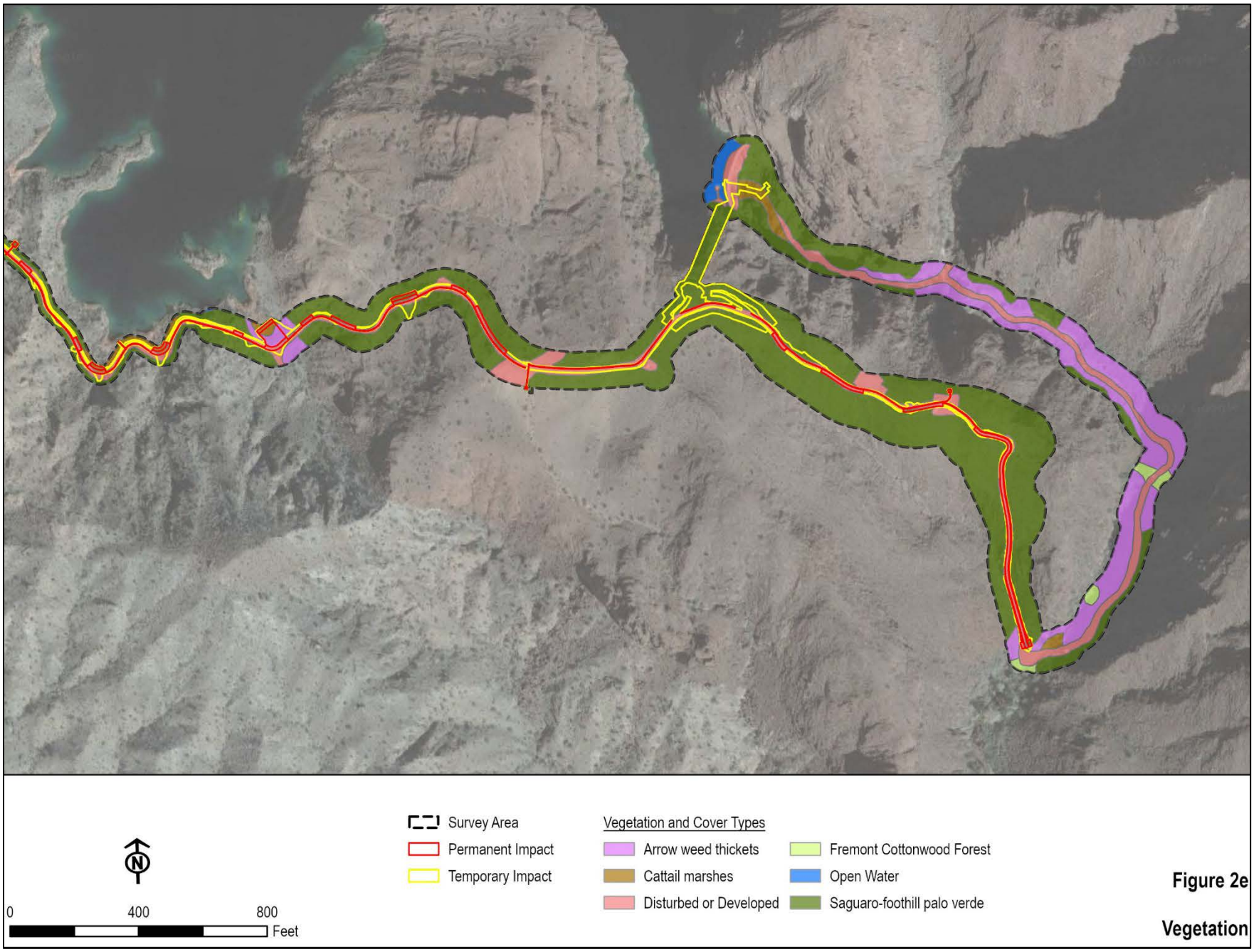



**Figure 2e**

**Vegetation**

## 5.2. Special-Status Species

Plants or wildlife may be ranked as special-status species due to declining populations, vulnerability to habitat change, or restricted distributions. These include listed species that have been formally designated as federally endangered or threatened by USFWS, pursuant to the FESA or as state endangered, threatened, or rare (for plants only) by CDFW pursuant to the CESA or the NPPA. CDFW FP species are considered rare or facing possible extinction and receive additional protection under Sections 3511, 4700, 5050, or 5515 of the California FGC while Species of Special Concern are those species, subspecies, or distinct populations of an animal native to California that are considered for protection by CDFW for a variety of reasons, such as population declines or range restrictions. "Special Animals" is a broad term used to refer to all the animal taxa tracked by the CNDDB, regardless of their legal or protection status. The Special Animals list includes taxa that are biologically rare, very restricted in distribution, or declining throughout their range, but not currently threatened with extirpation. Some species are considered rare (but not formally listed) by resource agencies, organizations with biological interests/expertise (e.g., Audubon Society, The Wildlife Society, etc.), and the scientific community.

Table 2 includes species that were identified during the literature search but are not expected to be present because of a lack of suitable habitat, distance to geographic or elevation range of the species, or other notes as provided below. These species are not addressed further in this report.

**Table 2. Special-Status Species with No Potential to be Present**

| Latin Name | Common Name | Reason for Exclusion |
|---|---|---|
| **PLANTS** | | |
| *Androstephium breviflorum* | Small-flowered androstephium | No suitable sand dune or sand field habitat. |
| *Berberis harrisoniana* | Kofa Mountain barberry | Well below the species elevation range. |
| *Bouteloua trifida* | Three-awned grama | Well below the species elevation range. |
| *Coryphantha chlorantha* | Desert pincushion | Well outside of species geographic range. |
| *Erigeron oxyphyllus* | Wand-like fleabane daisy | Well below the species elevation range. |
| *Euphorbia abramsiana* | Abrams' spurge | No suitable sand flat habitat. |
| *Lycium exsertum* | Arizona desert-thorn | Well outside of species geographic range. |
| *Mentzelia tridentata* | Creamy blazing star | Well outside of species geographic range. |
| *Nemacaulis denudate var. gracilis* | Slender cottonheads | No suitable sand dune or sand field habitat. |
| *Petalonyx linearis* | Narrow-leaf sandpaper-plant | Well outside of species geographic range. |
| *Phacelia anelsonii* | Aven Nelson's phacelia | Well outside of species geographic range. |
| *Pholistoma auritum var. arizonicum* | Arizona pholistoma | No suitable sand dune or sand field habitat. |
| **FISHES** | | |
| *Catostomus latipinnis* | Flannelmouth sucker | Known from Colorado River upstream of Lake Havasu, unlikely to enter the CRA intake and reach Gene and Copper Basins. |
| *Gila elegans* | Bonytail chub | Known from Colorado River upstream of Lake Havasu, unlikely to enter the CRA intake and reach Gene and Copper Basins. |
| *Xyrauchen texanus* | Razorback sucker | Known from Colorado River upstream of Lake Havasu, unlikely to enter the CRA intake and reach Gene and Copper Basins. |

| Latin Name | Common Name | Reason for Exclusion |
|---|---|---|
| **MAMMALS** | | |
| *Sigmodon arizonae plenus* | Colorado River cotton rat | Known from one historic (1934) record near Parker, unlikely to reach Copper Basin because of discontinuous habitat. |

Table 3 summarizes geographic range, habitat, and conservation status for all special-status species with a potential to occur in the Survey Area.

**Table 3. Special-Status Species with a Potential to be Present**

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| **PLANTS** | | | |
| *Carnegiea gigantea* **Saguaro** | Cactus; rocky Sonoran Desert scrub; about 150-5000 ft. elev.; San Bernardino and Imperial Cos., east into AZ and south into Mex.; May-Jun. | FED: None CA: S1, CRPR 2B.2 | **High**; numerous saguaros observed within about 200 feet of the Survey Area, including one dead individual within the Survey Area. |
| *Castela emoryi* **Emory's crucifixion-thorn** | Shrub; widespread but rare, Calif. deserts to Ariz., Baja and Sonora; fine sand or silt, washes, plains, non-saline bottomlands, about 350-2100 ft. elev.; June-July. | FED: None CA: S2S3, CRPR 2B.2 | **Low**: suitable habitat is largely absent from the Survey Area, large conspicuous plant not observed during survey. |
| *Chylismia arenaria* **Sand evening-primrose** | Annual or short-lived perennial; rocky or sandy Sonoran Desert scrub; about 200-3000 ft. elev.; San Bernardino, Riverside, and Imperial Cos. east to AZ; Nov-May. | FED: None CA: S2S3, CRPR 2B.2 | **Low**: suitable habitat is present but all records in the vicinity are along the Colorado River floodplain more than 3 miles to the southeast. |
| *Cryptantha (Johnstonella) holoptera* **Rough stemmed forget-me-not** | Annual; Mojavean and Sonoran Desert scrub; about 300-4500 ft. elev.; San Bernardino, San Diego, Inyo, Imperial, and Riverside Cos. east to AZ, NV, and south to Mex.; Mar-Apr. | FED: None CA: S4, CRPR 4.3 | **Present**: one individual observed along the access road in the canyon downstream of the dam. |
| *Delphinium scaposum* **Bare-stem larkspur** | Perennial herb; rocky areas and washes in Sonoran Desert scrub; about 600-3500 ft. elev.; San Bernardino Co. east to NM, CO, and UT; Mar-Apr. | FED: None CA: S1, CRPR 2B.3 | **Moderate**: suitable habitat is present; known from recent records near Gene Wash about 2.7 miles to the northwest. |
| *Ditaxis claryana* **Glandular ditaxis** | Perennial herb; sandy soils below about 350 ft. elev.; or rocky uplands & sandy washes to 3000 ft.; widely scattered, Sonoran Desert, CA to AZ and mainland Mex.; Oct-Mar. | FED: None CA: S2, CRPR 2B.2 | **Low**: suitable habitat is present but all records in the vicinity are along the Colorado River floodplain more than 3 miles to the southeast. |
| *Hymenoxys odorata* **Bitter hymenoxys** | Annual; sandy soils in riparian scrub and Sonoran Desert scrub; about 150-500 ft. elev.; San Bernardino, Riverside, and Imperial Cos., east to CO and TX; Feb-Nov. | FED: None CA: S2, CRPR 2B.1 | **Low**: suitable habitat is present but all records in the vicinity are along the Colorado River floodplain more than 3 miles to the southeast. |
| *Mammillaria grahamii var. grahamii* **Graham fishhook cactus** | Cactus; gravelly or rocky soils in Sonoran Desert scrub; about 900-2000 | FED: None CA: S2, CRPR 2B.2 | **Moderate**: suitable habitat is present; known from numerous recent records within 3 miles. |

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| | ft. elev.; San Bernardino County east to TX.; Apr-Sept. | | |
| *Matelea parvifolia* **Spear-leaf matelea** | Low twining vine; rocky sites in desert shrublands, central and eastern deserts and Anza-Borrego State Park; NV and TX south into Mex.; about 1400-3600 ft. elev.; Mar-May. | FED: None CA: S2, CRPR 2B.2 | **Low**: suitable habitat is present, one record from within about 7 miles to the west. |
| *Mentzelia puberula* **Darlington's blazing star** | Perennial herb; sandy or rocky soils in Sonoran Desert scrub; about 300-3000 ft. elev.; San Bernardino, Riverside, and Imperial Cos., east to UT and south to Mex.; Mar-May. | FED: None CA: S2, CRPR 2B.2 | **Present**: approx. 5 plants observed along the access road in the canyon below the dam, more plants are likely to be present. |
| *Parkinsonia microphylla* **Yellow paloverde** | Tree; rocky areas in Mojavean Desert scrub; about 150-3500 ft. elev.; San Bernardino Co. east to AZ and south to Mex.; Apr-May. | FED: None CA: S3, CRPR 4.3 | **Present**: hundreds of trees present within the Survey Area. |
| *Penstemon pseudospectabilis ssp. pseudospectabilis* **Desert beardtongue** | Perennial herb; washes and rocky soils in Mojavean Desert and Sonoran Desert scrub; about 300-6000 ft. elev.; San Bernardino, Riverside, and Imperial Cos., east to AZ.; Jan-May. | FED: None CA: S3, CRPR 2B.2 | **Present**: approx. 10 plants observed on the north-facing canyon wall above the access road below the dam, more plants are likely to be present. |
| *Psorothamnus fremontii var. attenuatus* **Narrow-leaved psorothamnus** | Perennial herb; granitic and volcanic soils in Sonoran Desert scrub; about 1100-3000 ft. elev.; San Bernardino Co., east to AZ and NV.; Apr. | FED: None CA: S3, CRPR 2B.3 | **High**: approx. 3 plants observed along the margins of the Survey Area, additional plants are likely to be present. |
| *Senna covesii* **Cove's cassia** | Perennial herb; dry desert washes and slopes in Sonoran Desert scrub; below about 2000 ft. elev.; San Bernardino, Riverside, and Imperial Cos., east to AZ, NV, and south to Mex.; Jan-May. | FED: None CA: S3, CRPR 2B.2 | **Moderate**: suitable habitat is present; known from numerous recent records within 3 miles. |
| *Tetracoccus hallii* **Holly leaved spurge** | Shrub; Mojavean and Sonoran Desert scrub; below about 3500 ft. elev.; San Bernardino, Riverside, and Imperial Cos. east to NV and AZ, south to Mex.; Jan-May. | FED: None CA: S4, CRPR 4.3 | **Moderate**: suitable habitat is present; known from within 5 miles in Copper Basin Wash. |
| *Teucrium glandulosum* **Desert germander** | Perennial herb; dry desert washes in Sonoran Desert scrub; below about 1300 ft. elev.; San Bernardino Co., east to AZ and south to Mex.; Apr-May. | FED: None CA: S2, CRPR 2B.3 | **Moderate**: suitable habitat is present; known from numerous recent records within 2 miles. |
| **INVERTEBRATES** | | | |
| *Oliarces clara* **Cheeseweed owlfly** | Insect; lower Colorado River floodplain in Sonoran Desert scrub; adults present in years with above average rainfall. | FED: None CA: S2 | **Low**: marginally suitable habitat is present; known from recent records within 5 miles. |
| **AMPHIBIANS and REPTILES** | | | |
| *Scaphiopus couchi* **Couch's spadefoot** | In addition to summer rain pools, and backwater areas, Couch's spadefoot requires soft, sandy soils for burrowing and generally is found at the edges of | FED: None CA: SSC, S2 | **Low**: marginally suitable habitat is present; known from records along the Colorado River. |

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| | arroyos or in open soil around the bases of shrub. | | |
| *Gopherus agassizii*<br>**Mojave desert tortoise** | Terrestrial tortoise; desert shrublands where soil suitable for burrows; Mojave and Sonoran des. (E CA, S NV, W AZ, and south to Mex.; spring-fall. | FED: **THR**<br>CA: **THR**, S2 | **Low to Moderate**: suitable habitat is present; known from recent records in the eastern Whipple Mountains 10 miles east of the Survey Area. No burrows detected during the surveys. May occur in adjacent lands in low densities. |
| *Heloderma suspectum cinctum*<br>**Banded Gila monster** | Lizard; rocky outcrops in desert shrubland; scarce in scattered eastern mountain ranges of CA deserts; to S NV, W AZ, and Mex.; warm Seasons. | FED: None<br>CA: SSC, S1 | **Low to Moderate**: suitable habitat is present; known from a single historic record presumably from within the Whipple Mountains and Survey Area, within the range of this species. |
| **BIRDS** | | | |
| *Aquila chrysaetos*<br>**Golden eagle** | Nests in remote trees and cliffs; forage over shrublands and grasslands; breeds throughout western North America, winters to east coast; year-round. | FED: BGEPA<br>CA: FP, S3 | **Low (nesting):** suitable nest sites occupied by bald eagles.<br>**High (foraging):** expected to forage throughout the Survey Area. |
| *Athene cunicularia*<br>**Burrowing owl** | Nests mainly in rodent burrows, usually in open grassland or shrubland; forages in open habitat; increasingly uncommon in S CA; occurs through W US and Mex.; year-around. | FED: None<br>CA: SSC, S3 | **High (nesting and foraging):** one unoccupied burrow with burrowing owl sign was observed approximately 60 feet beyond the Survey Area. |
| *Calypte costae*<br>**Costa's hummingbird** | Forages and nests in the arid habitats of central CA, southern NV, UT, NM, CA, and Mex. Nests in a variety of trees and shrubs usually along canyons and washes near other nesting conspecifics. | FED: None<br>CA: SA, S4 | **High (nesting):** suitable nesting habitat is present; however, no nests observed during surveys.<br>**Present (foraging):** observed within Survey Area. |
| *Coccyzus americanus occidentalis*<br>**Western yellow-billed cuckoo** | Large patches of riparian forest and woodland, usually near surface water; historically common in floodplain habitats. Nests in riparian vegetation with willows, cottonwoods, and understories of grape, nettles, and blackberries; | FED: **THR**<br>CA: **END,** S1 | **Low (nesting and foraging):** marginal riparian habitat is present downstream of Copper Basin dam, nearest records about 10 miles south. |
| *Colaptes chrysoides*<br>**Gilded flicker** | Saguaro woodlands and riparian woodlands in the low deserts of southern AZ, Mex., and eastern CA; year-round. | FED: None<br>CA: **END**, S1 | **Low (nesting and foraging):** marginal habitat is present in an around the Survey Area, nearest records about ten miles south. |
| *Dendroica petechia sonorana*<br>**Sonoran yellow warbler** | Breeds in willow and cottonwood riparian habitat in the lower Colorado River Valley; winters Mexico to S America. | FED: None<br>CA: SSC, S2 | **Low (nesting and foraging):** marginal habitat present; known from within about 5 miles of the Survey Area. |
| *Empidonax traillii*<br>**Willow flycatcher** | Consists of three subspecies in California; however, species is protected at state level; breeds in | FED: None<br>CA: **END**, S1 | **Low (nesting):** although the Survey Area supports suitable nesting habitat, this species was |

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| | thickets of deciduous trees and shrubs, especially willows; species is widespread throughout California. | | not observed nesting during 2022 protocol-level surveys. **Present (foraging):** Two individual migrants observed during 2022 protocol-level surveys. |
| *Empidonax traillii extimus* **Southwestern willow flycatcher** | Subspecies of willow flycatcher (above); breeds in dense riparian forests & shrublands; scattered locations in AZ, CA, and North Baja; near sea level to about 8000 ft. elevation; winters in Central America; summer | FED: **END** CA: **END**, S1 | **Low (nesting and foraging):** although suitable riparian habitat is present downstream of Copper Basin dam, subspecies not identified during 2022 protocol-level surveys. |
| *Falco peregrinus anatum* **American peregrine falcon** | Raptor; breed in open landscapes with cliffs or man-made structures for nest sites; nest on cliffs from 25 – 1,300 ft. elev. and can use abandoned nests in places without cliffs; scattered distribution in N America; typically transient but can be present year-around. | FED: None CA: FP, S3S4 | **Moderate (nesting):** suitable cliff for nesting present in and around the Survey Area; however, no nests observed during surveys. **Present (foraging)**: observed flying over lower canyon within Survey Area. |
| *Haliaeetus leucocephalus* **Bald eagle** | Raptor; breed in large trees, usually near major rivers or lakes; winters more widely; scattered distribution in N America; esp. coastal regions. | FED: BGEPA CA: **END**, FP, S3 | **High (nesting):** has been recently documented nesting in the Survey Area; however, most recent surveys indicated known nest site was inactive. **Present (foraging):** observed flying over reservoir and perching on high cliffs. |
| *Icteria virens* **Yellow-breasted chat** | Riparian forests and woodlands, typically in dense thickets; summer resident of so. CA. and scattered locations in northern CA.; typically, below above 4,500 ft. elev. | FED: None CA: SSC, S3 | **Moderate (nesting and foraging):** suitable nesting and foraging habitat is present downstream of Copper Basin dam, several records within 20 miles of the Survey Area. |
| *Lanius ludovicianus* **Loggerhead shrike** | Woodlands, shrublands, open areas with scattered perch sites; not dense forest; widespread in N America; valley floors to about 7000 ft. elev.; year-around. | FED: None CA: SSC, S4 | **High (nesting):** suitable nesting habitat present; however, no nests observed during surveys. **Present (foraging):** observed along access road, suitable foraging habitat is present throughout the Survey Area. |
| *Leiothlypis lucae* **Lucy's warbler** | Breeds in desert riparian woodlands through the lower Colorado River Valley; winters on Pacific Coast of mainland Mexico. | FED: None CA: SSC, S2S3 | **High (nesting):** suitable nesting habitat present; however, no nests observed during surveys. **Present (foraging):** observed foraging in the Survey Area during 2022 surveys. |
| *Melanerpes uropygialis* **Gila woodpecker** | Saguaro woodlands, sometimes other woodlands; cavity nester in trees, | FED: None CA: **END**, S1 | **Moderate (nesting and foraging):** suitable foraging and nesting habitat present; known |

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| | cactus, and man-made structures; SE CA, S AZ, W Mex. | | from numerous occurrences within about 3 miles of Survey Area. |
| *Micrathene whitneyi* **Elf owl** | Desert woodland and cactus stands; cavity nester in trees, cactus, and man-made structures; forages over surrounding area; breeds SE CA, S AZ, and Mex.; winters in Mex. | FED: None CA: **END**, S1 | **Low (nesting and foraging):** marginal nesting and foraging habitat is present; known from one occurrence within about 8 miles of the Survey Area. |
| *Nannopterum auritum* **Double-crested cormorant** | Large aquatic bodies with suitable fish stock to support their diet; nests and breeds in smaller lagoons or ponds within 40 miles of larger bodies of water; winters and migrates through SE CA; year-round along the Colorado River. | FED: None CA: SA (nesting colony), S4 | **Not Expected (nesting):** no suitable nesting habitat present. **Present (foraging)**: observed in reservoir and known from within 5 miles of the Survey Area in suitable habitat. |
| *Pyrocephalus rubinus* **Vermilion flycatcher** | Desert riparian woodlands and shrublands; SE Calif., east through S Texas, and S through Mexico; winters in Mexico; spring-summer. | FED: None CA: SSC, S2S3 | **Moderate (nesting and foraging):** suitable foraging and nesting habitat present; known from several occurrences within about 5 miles of the Survey Area. |
| *Rallus obsoletus yumanensis* **Yuma Ridgway's rail** | Marshlands along the lower Colorado River and tributaries in Arizona, California, Nevada, and Utah. | FED: **END** CA: **THR**, FP, S1S2 | **Low (nesting):** marginal nesting habitat present along margins of Copper Basin Reservoir. **Moderate (foraging):** suitable foraging habitat present and known from several records along the river to the north and south of the Survey Area. |
| *Vireo bellii arizonae* **Arizona Bell's vireo** | Willow and mesquite riparian; Sonoran desert along lower Colorado River; Spring-summer. | FED: None CA: **END**, S1S2 | **Moderate (nesting and foraging):** suitable foraging and nesting habitat present downstream of Copper Basin Dam, several records within 20 miles of the Survey Area. |
| **MAMMALS** | | | |
| *Antrozous pallidus* **Pallid bat** | Bat; roost in rock outcrops in shrublands, mostly below about 6000 ft. elev.; forages on insects which are captured on the ground; CA, SW N America through interior OR and WA; does not migrate; hibernates in winter. | FED: None CA: SSC, S3 | **High (roosting and foraging):** suitable roosting and foraging habitat present; known to occur near Parker less than ten miles south of Survey Area; not detected during acoustic and emergent bat surveys. |
| *Bassariscus astutus* **Ringtail** | Many habitats throughout CA and W N Amer.; primarily nocturnal and highly secretive. | FED: None CA: FP | **High**: multiple observations by Metropolitan staff in vicinity of the Survey Area. |
| *Corynorhinus townsendii* **Townsend's big-eared bat** | Many habitats throughout CA and W N Amer., scattered populations in E; day roosts in caves, tunnels, mines; feed primarily on moths. | FED: None CA: SSC, S2 | **High (roosting and foraging):** suitable roosting and foraging habitat present; recorded approximately two miles north |

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| | | | of Reservoir; not detected during acoustic and emergent bat surveys. |
| *Eumops perotis californicus* **Western mastiff bat** | Lowlands (with rare exceptions); cent. and S CA, S AZ, NM, SW TX, N Mex.; roost in deep rock crevices, forage over wide area | FED: None CA: SSC, S3S4 | **High (roosting and foraging):** suitable roosting and foraging habitat present; record near Buckskin State Park approximately three miles southeast of Survey Area; not detected during acoustic and emergent bat surveys. |
| *Macrotus californicus* **California leaf-nosed bat** | Arid lowlands, S CA, S and W AZ, south to Mex.; roost in mineshafts, forage over open shrub-lands. | FED: None CA: SSC, S3 | **Low (roosting):** no suitable mine-shafts present. **High (foraging):** suitable foraging habitat present; not detected during acoustic and emergent bat surveys. |
| *Myotis velifer* **Cave myotis** | Mex. through AZ to Colorado River area, also SE US. In CA, restricted to desert along Colorado Riv.; gen. roosts in caves; feeds over water or riparian veg. | FED: None CA: SSC, S1 | **High (roosting and foraging):** suitable roosting and foraging habitat present. Not detected during acoustic and emergent bat surveys. |
| *Myotis yumanensis* **Yuma myotis** | W N. America, British Columbia to cent. Mex.; in the US, mostly the Pacific states; roost in buildings, bridges, caves, mines; feed over open water. | FED: None CA: SA, S4 | **Present (roosting and foraging):** suitable roosting and foraging habitat present; species detected in Survey Area during acoustic and emergent bat surveys. |
| *Neotoma albigula venusta* **Colorado Valley woodrat** | Desert shrublands; SE CA, SW AZ, S NV, and Mex.; closely associated with beavertail or mesquite thickets; year-around. | FED: None CA: SA, S1S2 | **Low:** suitable habitat is present in the Survey Area, nearest record is 9 miles to the south. |
| *Ovis canadensis nelsoni* **Desert bighorn sheep** | Open shrublands and conifer forest, remote mountains; scattered populations in desert mountains and surrounding ranges; year-round. | FED: None CA: Title 14 | **Present:** herd of about 10 animals observed within the Survey Area, suitable habitat throughout the Survey Area. |
| *Puma concolor* **Mountain lion** | Mountain lions are known from virtually all ecosystems including desert scrub, riparian, scrub, chaparral, grassland, and woodland habitats. Known also from the urban wilderness interface. | FED: None CA: **CAN** | **High (denning and foraging):** suitable foraging habitat includes mule deer and desert bighorn sheep. Access to perennial water and numerous cavities within the Whipple Mountains; if present, likely occurs in low densities. |
| *Taxidea taxus* **American badger** | Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils; require sufficient food source, friable soils, and open, uncultivated ground; prey on burrowing rodents. | FED: None CA: SSC, S3 | **Moderate:** suitable habitat is present along the Reservoir; however friable soils are limited. Not detected during surveys. |

| Species Name | Habitat and Distribution | Conservation Status | Occurrence Potential |
|---|---|---|---|
| *Vulpes macrotis arsipus* **Desert kit fox** | Open, arid scrublands, grasslands, and agricultural lands. Creosote bush scrub is the most common habitat association for desert kit fox in California (McGrew, 1979). Desert kit fox require friable soils for digging dens. | FED: None CA: Title 14 | **High**: suitable habitat is present along the Reservoir; however friable soils are limited. Not detected during surveys. |

General references: American Ornithologists' Union, 1998; Baldwin et al. 2012; CDFW, 2022a; CDFW, 2022c; Feldhamer et al, 2003; Harvey et al, 1999; Jepson Flora Project. 2021; and Zeiner,et al, 1990.

**Conservation Status**

Federal designations: (federal ESA, USFWS)

END: Federally listed, endangered
THR: Federally listed, threatened
BGEPA: Bald and Golden Eagle Protection Act
DE: Delisted

State designations: (CESA, CDFW)

END: State listed, endangered
THR: State listed, threatened
CAN: State Candidate for listing
SSC: California species of special concern. Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
FP: Fully protected. May not be taken or possessed without permit from CDFG.
FGC: Fish and Game Code. Species regulated under California Fish and Game Code.
Title 14: Cal. Code Regs. Tit. 14, § 460 states that fisher, marten, river otter, desert kit fox and red fox may not be taken at any time.
DE: Delisted

CDFW Natural Diversity Data Base Designations: Applied to special-status plants and sensitive plant communities; where correct category is uncertain, CDFW uses two categories or question marks

S1: Fewer than 6 occurrences or fewer than 1000 individuals or less than 2000 acres
S1.1: Very threatened
S1.2: Threatened
S1.3: No current threats known
S2: 6-20 occurrences or 1000-3000 individuals or 2000-10,000 acres (decimal suffixes same as above)
S3: 21-100 occurrences or 3000-10,000 individuals or 10,000-50,000 acres (decimal suffixes same as above)

CDFW Natural Diversity Data Base Designations: Applied to special-status wildlife; where correct category is uncertain, CDFW uses two categories or question marks

S1: Critically Imperiled – At high risk of extirpation in state due to restricted range, very few population occurrences, very steep declines, severe threats, or other factors
S2: Imperiled – At high risk of extirpation in state due to the above causes
S3: Vulnerable – At moderate risk of extirpation in state due to the above causes
S4: Apparently Secure – At a fairly low risk of extirpation in the state due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors
S5: Secure – At very low risk of extirpation in the state

California Native Plant Society (CNPS) Rare Plant Rank designations. Note: According to CNPS (http://www.cnps.org/cnps/rareplants/ranking.php), plants ranked as CRPR 1A, 1B, and 2 meet definitions as threatened or endangered and are eligible for state listing. That interpretation of the state Endangered Species Act is not in general use.

1A: Plants presumed extinct in California
1B: Plants rare and endangered in California and throughout their range
2: Plants rare, threatened or endangered in California but more common elsewhere in their range
3: Plants about which we need more information; a review list
4: Plants of limited distribution; a watch list

California Rare Plant Rank Threat designations:

.1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 Fairly endangered in California (20-80% occurrences threatened)
.3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

**Definitions of occurrence probability:** Estimated occurrence probabilities-based literature sources cited earlier and field surveys and habitat analyses reported here.

Present: Observed on the site during the surveys
High: Habitat is a type often utilized by the species and the site is within the known range of the species
Moderate: Site is within the known range of the species and habitat on the site is a type occasionally used
Low: Site is within the species' known range but habitat is rarely used, or the species was not found during focused surveys covering less than 100% of potential habitat or completed in marginal seasons

### 5.2.1. Special-Status Plants

#### Listed Threatened or Endangered Plants

No federal or state plants listed as threatened or endangered have been reported from the USGS 7.5-minute topo quads surrounding the Survey Area and none are expected to be present.

#### CRPR 2B Plants

CRPR 2B species are plants that are considered rare, threatened, or endangered in California but more common elsewhere. Three CRPR 2 plant species were observed within the Survey Area during the surveys, including saguaro, Darlington's blazing star, and desert beardtongue. An additional five CRPR 2B species have a moderate to high potential to occur. These include bare-stem larkspur, Graham fishhook cactus, narrow-leaved psorothamnus, Cove's cassia, and desert germander. The paragraphs below provide additional information about the CRPR 2B plant species observed within the Survey Area or with a moderate to high potential to occur.

**Saguaro (*Carnegiea gigantea*).** Saguaro is a large species of cactus that can reach as much as 16 meters (Baldwin et al 2012). Saguaro is common in Arizona and south into Mexico but has a limited range in California which is restricted to the Whipple Mountains of San Bernardino County, Palo Verde Mountains of Riverside County and further south into portions of Imperial County (CNPS, 2021). Saguaro lives in rocky mountainous terrain and has been impacted by human activities such as off-roading and shooting. Many saguaros were observed in the hills around the Survey Area and one dead saguaro was observed within the Survey Area.

**Bare-stem larkspur (*Delphinium scaposum*).** Bare-stem larkspur is a perennial herb that is found in rocky substrates and within washes within Sonoran Desert scrub. Although not observed during surveys, this species is known from the Whipple Mountains and has been recorded along the Metropolitan access road between Copper Basin and Gene Wash Reservoirs within two miles of the proposed Project area (CNPS, 2022; CDFW, 2022c).

**Graham fishhook cactus (*Mammillaria grahamii* var. *grahamii*).** Graham fishhook cactus is a perennial stem that occurs in gravelly and rocky habitats within Sonoran Desert scrub. CNPS identifies road maintenance activities as a potential threat to this species (CNPS, 2022). This species is known from several records in the Whipple Mountains and along the Metropolitan access road between Copper Basin and Gene Wash Reservoirs within two miles of the proposed Project area; however, it was not observed during surveys (CNPS, 2022; CDFW, 2022c).

**Darlington's blazing star (*Mentzelia puberula*).** Darlington's blazing star is a short-lived perennial herb. It grows in a variety of rocky and sandy soils in Mojavean and Sonoran Desert scrub in scattered locations around San Bernardino, Riverside, and Imperial Counties including the Whipple Mountains. A small patch of approximately five Darlington's blazing star was observed during field survey along the access road downstream of Copper Basin Dam.

**Desert beardtongue (*Penstemon pseudospectabilis* ssp. *Pseudospectabilis*).** Desert beardtongue is a perennial herb that grows in sandy washes and more frequently on rocky canyon walls. It grows in scattered locations around San Bernardino, Riverside, and Imperial Counties including the Whipple Mountains. A patch of approximately ten desert beardtongue plants was observed during the field survey along the access road just downstream of Copper Basin Dam.

**Narrow-leaved psorothamnus (*Psorothamnus fremontii* var. *attenuatus*).** Narrow-leaved psorothamnus is a rare variety of a common plant known to occur throughout much of the Mojave Desert. Narrow-leaved psorothamnus has much more narrow leaves and occurs along the eastern edge of California from the

Whipple Mountains north towards Needles, California. Approximately three narrow-leaved psorothamnus plants were observed just beyond the limits of the Survey Area.

**Cove's cassia (*Senna covesii*).** Cove's cassia is a perennial herb that is most often found within dry, sandy washes and slopes in Sonoran Desert scrub habitat. CNPS identifies road maintenance activities and road use as a primary threat to this species. Cove's cassia was not observed during surveys; however, this species has been recorded within the Whipple Mountains approximately five miles east of the proposed Project area (CDFW, 2022c).

**Desert germander (*Teucrium glandulosum*).** Desert germander is a perennial herb that occurs on rocky substrates in Sonoran Desert scrub habitat. Although not observed during surveys, this species has been documented along the western shore of Copper Basin Reservoir among several records from the Whipple Mountains (CDFW, 2022c).

### CRPR 4 Plants

Plants defined as CRPR 4 are of limited distribution or infrequent throughout a broader area in California; however, these species are not afforded protection under CEQA. Two CRPR 4 species were observed in the Survey Area during surveys, including rough-stemmed forget-me-not and yellow palo verde. One additional CRPR 4 plant, holly leaved spurge, has a moderate potential to occur.

## 5.2.2. Special-Status Wildlife

Table 3 lists the special-status wildlife species reported within the USGS 7.5-minute quads surrounding the Survey Area and others known from the region that have a potential to be present. The paragraphs below provide additional information about the special-status species observed or with a moderate to high potential to occur.

### Listed Threatened, Endangered or Candidate Wildlife

Eleven federal and/or state listed as threatened or endangered wildlife species have been reported from the USGS 7.5-minute topo quad surrounding the Survey Area or were identified during the literature review. Seven of these species, including desert tortoise, willow flycatcher, bald eagle, Gila woodpecker, Yuma Ridgway's rail, Arizona Bell's vireo, and mountain lion are present or have at least a moderate potential to be present and are discussed below.

**Desert tortoise (*Gopherus agassizii*).** The desert tortoise is a state and federally threatened species (CDFW, 2022a). It is a large, long-lived, herbivorous reptile that can feed on a variety of herbaceous annual grasses, forbes, and flowers. In addition, desert tortoise can occur in nearly every desert habitat. For example, they can occupy creosote bush scrub dominated by creosote bush and white bursage (*Ambrosia dumosa*) at lower elevations to rocky slopes in blackbrush scrub and juniper woodland ecotones at higher elevations. However, tortoises are more likely to occur in habitats with friable, well-drained, sandy soils to allow for burrow and nest excavation (USFWS, 1994). These preferred habitats also typically provide sufficient cover, as desert tortoises will burrow beneath shrubs, rock formations, or manmade objects. Desert tortoises are also known to excavate burrows in the open. Although desert tortoises do require access to freestanding water, adult tortoises can survive for more than a year without it.

There is a low to moderate potential for desert tortoise to occur in the proposed Project area. This species has been recorded within the eastern Whipple Mountains approximately ten miles east of the proposed Project area (CDFW, 2022c; iNaturalist, 2022). However, it was not observed during 2021 and 2022 surveys or during monitoring of a nearby facility in 2019 and is not expected to occur below the dam.

**Willow flycatcher (*Empidonax extimus*).** The willow flycatcher is listed as state endangered under CESA (CDFW, 2022a). It nests primarily within willow thickets along streams in broad valleys, canyon bottoms, mountainside seepages, and at the margins of lakes and pools (Sedgewick, 2000; Gaines, 2005). Willow flycatchers can also be found within bushes, brushy fields, and upland stands of trees near streams or marshes. The current California breeding range of this species is predominantly northern California within the Sierra Nevada and Cascade Mountains region, ranging from southern Shasta County to northern Kern County and along the lower Colorado River (Sedgewick, 2000).

Although two willow flycatcher individuals were observed within the riparian habitat around the Copper Basin Reservoir during 2022 protocol-level surveys, they were detected prior to the nesting season. Since no nesting activity was identified during subsequent surveys, these individuals were determined to be migrants and not the federally listed southwestern willow flycatcher subspecies (*E. t. extimus*). Therefore, willow flycatcher and southwestern willow flycatcher are not expected to nest in or near the proposed Project area.

**Bald eagle (*Haliaeetus leucocephalus*).** The bald eagle has been a state listed endangered species in California since 1971 (CDFW, 2022a). It was federally listed as endangered in 1978, then relisted as threatened in 1995, and delisted in 2007 (USFWS, 1978, 2007a, and 2007b). It is also protected under the BGEPA. The bald eagle is an opportunistic, generalized predator and scavenger adapted to hunting and foraging over aquatic habitats. Breeding bald eagles require relatively large bodies of water containing resident populations of suitable-sized fish. Most bald eagles in California breed near reservoirs or lakes. They typically nest in large trees near large bodies or water and may occasionally nest on large powerline structures, and steep cliff faces.

Bald eagles are year-round residents throughout most of their range in eastern California along the Colorado River. In recent years, they have expanded their breeding range and have regularly nested at Copper Basin Reservoir. As recently as 2019, bald eagles had been documented nesting in a tree within the basin; however, this tree fell over during a windstorm in the fall of 2020. The bald eagle pair were subsequently observed nesting on a cliff approximately one-half mile southeast of the dam. The nest was determined to be inactive during the most recent 2021 and 2022 surveys for the proposed Project. There is a high potential that this species could reestablish nesting in or near the proposed Project area and for purposes of this analysis, nesting is assumed present. Bald eagles are regularly observed foraging throughout the region, and one was identified flying over the Copper Basin Reservoir during the 2022 surveys.

**Gila woodpecker (*Melanerpes uropygialis*).** Gila woodpecker is listed as endangered under the CESA. It excavates cavity nests in large trees (mainly restricted to riparian habitats), saguaro cacti, and manmade structures (i.e., wooden power pole). This species feeds on insects and cacti fruits (Rosenberg et al. 1991). Its primary habitat is cottonwood-willow riparian woodland, but it also uses thickets of other desert trees (e.g., desert ironwood), and upland habitats, especially outside the breeding season (McCreedy, 2008). No Gila woodpeckers or active woodpecker cavities were observed in the Survey Area during recent 2021 and 2022 field surveys, but suitable habitat is present. There are dozens of records of Gila woodpecker along the Colorado River and one near Gene Wash within about 3 miles of the Survey Area (CDFW, 2022c). Therefore, there is a moderate potential for Gila woodpecker to breed and forage in or near the proposed Project area.

**Yuma Ridgway's rail (*Rallus obsoletus yumanensis*).** Yuma Ridgway's rail is a federally endangered, state threatened, and CDFW FP species. It lives in freshwater marshes dominated by cattail and bulrush (*Scirpus* ssp.) with a mix of riparian tree and shrub species (*Salix exigua*, *S. gooddingii*, *Tamarix* sp., *Tessaria serica*, and *Baccaris* sp.) along the shoreline of the marsh. It is endemic to freshwater marshes along the lower Colorado River, Gila River, and the Salton Sea. Nest site selection involves a compromise between higher sites with less cover, to avoid flooding, and lower-lying sites with tall grasses and better concealment from

predators. The birds (usually the males) build their nests in clumps of vegetation or in shrubs, from just above ground level to about 4 feet off the ground (AAB, 2022). There are several occurrence records for this species along the river to the north and south of the proposed Project area (CDFW, 2022c). Although this species was not observed during 2020 and 2021 surveys, there is a moderate potential for this species to occur as a forager in the proposed Project area. However, the proposed Project area only supports very limited suitable nesting habitat and the potential for the Yuma Ridgway's rail to establish nests is low.

**Arizona Bell's vireo (*Vireo bellii arizonae*).** Arizona Bell's vireo is listed as endangered under the CESA. It is a small songbird that nests in riparian vegetation and mesquite thickets along the lower Colorado River. Arizona Bell's vireo were once widespread along the Colorado River, but their range has been greatly reduced due to parasitism by brown-headed cowbirds (*Molothrus ater*) concurrent with agricultural development. Although not observed during protocol-level surveys in 2022, suitable riparian habitat for Arizona Bell's vireo is present along the canyon's riparian edges downstream of Copper Basin Dam and there are several records along the lower Colorado River within 20 miles of the proposed Project area. Therefore, there is a moderate potential for this species to breed and forage in or near the proposed Project area.

**Mountain lion (*Puma concolor*).** The mountain lion is a State Candidate for listing and is a large solitary felid that is considered both nocturnal and crepuscular but has been observed during daylight hours (Dickson and Beier 2006). During daylight hours, mountain lions are frequently found in riparian habitats, suggesting that they prefer to rest in areas with dense understory vegetation for cover (Dickson and Beier 2006). During the evening hours, mountain lions will utilize many habitats within their range to hunt including riparian, scrub, chaparral, grassland, and woodland habitats (Dickson et al. 2005). While hunting, mountain lions prefer to stalk and pursue their prey along canyon bottoms and gentle slopes (Dickson and Beier 2006). Mountain lions are opportunistic hunters and will also feed on other ungulates (such as bighorn sheep, pronghorns, deer, and domestic livestock), bobcats, coyotes, fox, skunks, raccoons, squirrels, rabbits, rodents, and insects (Spalding and Lesowski, 1971; Currier, 1983).

Mountain lions can be found in a variety of habitat types between sea level and 10,000 feet in elevation and are expected to occur near the region. This species is expected to forage on bighorn sheep and other local species and is a likely visitor to the riparian corridor below Copper Basin. Mountain lion habitat, population numbers, and genetic diversity have been declining rapidly, especially within Southern California populations (Yap et al. 2019) and this species is currently being evaluated by the State of California for listing.

Mountain lions were not observed during surveys; however, the proposed Project area provides suitable foraging habitat and a prey base including mule deer (*Odocoileus hemionus*) and desert bighorn sheep and access to perennial water. The Whipple Mountains provide numerous cavities for denning. Therefore, there is a high potential for mountain lions to occur.

## Other Special-Status Wildlife

A total of seven non-listed special-status wildlife were observed during the 2021 and 2022 surveys and an additional twenty have a moderate to high potential to occur. These are discussed below.

**Banded Gila monster (*Heloderma suspectum cinctum*).** The banded Gila monster is recognized as a CDFW Species of Special Concern. The banded Gila monster's range extends from the southwest corner of Utah south through southeastern Nevada into eastern Riverside and San Bernardino Counties in California, south through Arizona to southwestern New Mexico and south into Sonora Mexico (Nafis, 2022). They inhabit the lower slopes of rocky canyons and arroyos with deeply incised topography and are associated with large and relatively high mountain ranges but are also found on desert flats among scrub and succulents. They prefer rocky areas in desert scrub and semi-desert grassland. Found in lower mountain

slopes, rocky bajadas, canyon bottoms, and arroyos (Nafis, 2022). Eggs are laid in soil in excavated nest in sandy or friable soils.

Banded Gila monster was not observed during surveys; however, there is a historical record from the Whipple Mountains and the proposed Project area is within the known range of the species (CDFW, 2022a). Therefore, there is a low to moderate potential for banded Gila monster to occur.

**Golden eagle (*Aquila chrysaetos*).** In addition to being a BGEPA protected species, the golden eagle is also a CDFW FP species. Golden eagles are year-around residents throughout most of their range in the western United States. In the Southwest, they are more common during winter months. They breed from late January through August (Pagel et al., 2010). In the desert, they generally nest in steep, rugged terrain, often on sites with overhanging ledges, cliffs or large trees as cover. Golden eagles are wide-ranging predators, especially outside of the nesting season, when they have no need to return daily to eggs or young at their nests.

The nearest known golden eagle nest sites are in the Whipple Mountains, approximately 5 miles west of the Survey Area (BLM data cited by WRI 2010). Suitable nesting habitat is present immediately adjacent to the Survey Area on steep cliffs already occupied by bald eagles and discussed below. Golden eagles may nest in the Survey Area and are expected to forage in the Survey Area during the nesting season. If bald eagles are nesting in or adjacent to the Survey Area, the potential for golden eagles to be present is significantly decreased due to competition. Wintering golden eagles, or unmated golden eagles in nesting season, are likely to forage occasionally in the proposed Project area. No golden eagles were observed during the field surveys in 2021 or 2022.

**Burrowing owl (*Athene cunicularia*).** The burrowing owl is a CDFW Species of Special Concern and a Bird of Conservation Concern (CDFW, 2022). In the deserts, burrowing owls are generally uncommon, but they can be found in much higher densities near agricultural lands or riparian habitats where rodent and insect prey tend to be more abundant. They typically use the burrows of ground squirrels and other rodents for shelter and nesting. They forage in open areas, including agricultural fields, disturbed lands, grasslands, and other open habitats.

During the 2021 field surveys, one inactive burrow with owl sign was located about 60 feet outside of the Survey Area. The burrow was inactive at the time but sign at the burrow indicates that it was likely occupied by a wintering or transient burrowing owl in the recent past. No burrowing owl or their sign were detected during the 2022 field surveys. There is a high potential for burrowing owls to occur.

**Costa's hummingbird (*Calytpe costae*).** The Costa's hummingbird is a Bird of Conservation Concern (CDFW, 2022). Costa's hummingbirds generally breed and forage in arid habitats on the southwest including desert wash, desert riparian edges, coastal scrub, desert scrub, low-elevation chaparral, and palm oases. Costa's hummingbirds will typically nest in a wide variety of trees such as cacti, shrubs, woody forbs, and vines along canyons and washes. During the 2022 field survey, one individual was detected within the southern portion of the Survey Area. Suitable nesting and foraging habitat is present throughout the proposed Project area. Therefore, there is a high potential for Costa's hummingbird to occur.

**American peregrine falcon (*Falco peregrinus anatum*).** The American peregrine falcon was state and federally delisted in 1999. Currently, it is a California Fully Protected Species and a USFWS Bird of Conservation Concern (CDFW, 2022). The peregrine falcon has a patchy distribution within North America but can be found world-wide. In California, the American peregrine falcon is an uncommon breeder or winter migrant, but it may occur almost anywhere that suitable habitat is present (USACE and CDFC, 2010). Generally, peregrine falcons use a variety of open habitats for foraging, including tundra, marshes, seacoasts, savannahs, grasslands, meadows, open woodlands, and agricultural areas, frequently near rivers, or lakes. Riparian areas support year-round habitat for this species. Peregrine falcons

predominately breed in woodland, forest, and coastal habitats (Zeiner et al, 1990a; and CDFC, 2010). Peregrine falcons primarily hunt pigeon-sized birds but will also feed on rodents. Nests are typically located in prominent cliffs (164 to 656 ft tall), but can also be founding nesting in trees, small outcrops, or man-made structures like transmission towers, tall buildings, or bridges (USACE and CDFC, 2010). In the Project area, no American peregrine falcon nests were detected. However, one individual was observed flying over the lower canyon within the Project area during the March 2022 field surveys. Although no falcon nests were observed during surveys, suitable habitat is present and there is a moderate potential that falcons could nest in or near the proposed Project area.

**Yellow-breasted chat (*Icteria virens*).** The yellow-breasted chat is a CDFW Species of Special Concern (CDFW, 2022). It is a migratory species, occurring in California only during the breeding season, typically between April and August. In California, it primarily breeds in the northern portion of the state and is scarce in the central and southern portions. It typically utilizes dense riparian thickets and brushy tangles near watercourses for breeding (CDFW, 2021a). The Survey Area is within the breeding range for this species. No yellow-breasted chats were detected during the reconnaissance-level survey, but they are known within about 4 miles of the Survey Area (eBird, 2021) and have a moderate potential to nest or forage within the proposed Project area.

**Loggerhead shrike (*Lanius ludovicianus*).** The loggerhead shrike is a CDFW Species of Special Concern (CDFW, 2022). They forage in a variety of open habitats including agricultural fields and desert shrublands where they use perch sites, at least two feet off the ground, to scan for potential prey (CDFW, 2021a). They feed on insects and small vertebrates such as lizards and snakes. They typically nest in dense vegetation but also may nest in isolated shrubs and trees near agricultural fields (Ehrlich et al. 1988). Suitable nesting habitat and perch sites are present throughout much of the Survey Area. One loggerhead shrike was observed along the access road and may be nesting within the vicinity of the Project area. Other loggerhead shrikes have been reported several times in the riparian vegetation near where Copper Basin Wash enters Copper Basin Reservoir along the shoreline, about 0.8 miles north of the Survey Area (ebird.org, 2021). The loggerhead shrike has a high potential to nest and forage within the proposed Project area.

**Lucy's warbler (*Oreothlypis luciae*).** The Lucy's warbler is a CDFW Species of Special Concern and USFWS Bird of Conservation Concern (CDFW, 2022). Lucy's warbler is a migratory songbird that breeds in desert riparian woodlands and winters on Pacific Coast of mainland Mexico. Its breeding range extends through much of Arizona, and parts of the eastern California deserts. Lucy's warblers' nest throughout much of the lower Colorado River Valley. They are a cavity-nesting species (i.e., it generally nests in unoccupied woodpecker nests or other cavities in trees). In the lower Colorado River Valley, its primary nesting habitat is honey mesquite thickets, but native riparian trees, screwbean mesquite, and salt cedar are also used (Rosenberg et al. 1991). The riparian vegetation within the Survey Area is suitable nesting habitat for Lucy's warbler. Lucy's warbler was identified during the 2022 focused bird surveys in the canyon just below the dam and at the laydown area. In addition. Lucy's warbler has been reported several times in the riparian vegetation where Copper Basin Wash enters Copper Basin Reservoir along the shoreline, about 0.8 miles north of the Survey Area (eBird, 2022). Therefore, there is a high potential for this species to breed and forage in or near the proposed Project area.

**Double-crested cormorant (*Nannopterum auritum*).** The double crested cormorant is a CDFW Watch List species and a CDFW Special Animal (CDFW, 2022). Double-crested cormorants are colonial waterbirds that seek aquatic bodies large enough to support their mostly fish diet. They may roost and form breeding colonies on smaller lagoons or ponds and fly up to 40 miles within a feeding area. They eat a wide variety of fish, but can also consume some insects, crustaceans, and amphibians. During the 2022 field survey, one individual was seen within the Copper Basin Reservoir. Suitable foraging habitat is present within the

reservoir. There is high potential for the species to forage within the proposed Project area; however, double crested cormorants are not expected to nest in the proposed Project area.

**Vermilion flycatcher (*Pyrocephalus rubinus*).** The vermilion flycatcher is designated by CDFW as a California Species of Special Concern. In California, the vermilion flycatcher was formerly considered a more common and widespread breeder along the lower Colorado River, Imperial Valley, Coachella Valley, upper Mojave River drainage, and San Diego County (Grinnell and Miller, 1944), but its breeding range has declined throughout this area. Currently, in California, there are some isolated breeding populations in the lowlands in the south central and southeast portions of the state, including San Bernardino, Riverside, San Diego, Santa Barbara, Ventura, and Kern counties. Zeiner et al. (1990) state that there are sporadic breeding populations in desert oases west and north of the Morongo Valley and Mojave Narrows in San Bernardino County. This species is found in riparian thickets near open, mesic habitats. It breeds in cottonwood, willow, mesquite, oak, sycamore, and other vegetation in desert riparian communities that are located adjacent to irrigated fields, irrigated ditches, or pastures (Zeiner et al., 1990).

This species has been recently documented south of Parker Dam and around Buckskin Mountain State Park approximately five miles southeast and south, respectively, from the proposed Project area (iNaturalist, 2022). Suitable nesting and foraging habitat is present within the proposed Project area, and the species has moderate potential to occur.

**Ringtail (*Bassariscus astutus*).** Ringtail are recognized by CDFW as Fully Protected species under the state Fish and Game Code (CDFW, 2022a). Ring-tailed cats are nocturnal and high-secretive animals that inhabit a variety or rocky habitats throughout the southwestern United States. Suitable denning and foraging habitat is present in the dense riparian portions of the Study Area Ringtail have been reported by Metropolitan employees in an around the Survey Area although none were observed during the recent reconnaissance-level survey. Ringtail has a high potential to occur within the proposed Project area.

**Desert bighorn sheep (*Ovis canadensis nelson*).** Desert bighorn sheep live in mountains of California, Nevada, northern Arizona, and Utah deserts. Populations in the Peninsular Ranges (the Santa Rosa and San Jacinto Mountains, and southward into Baja California) are federally listed as a threatened distinct vertebrate population segment. However, populations in eastern San Bernardino County have no CESA or ESA listing status. They are, however, recognized by CDFW as Fully Protected under the state Fish and Game Code and Title 14 (CDFW, 2022a). A herd of desert bighorn sheep were observed during the 2021 and 2022 field surveys within the Survey Area and are known to frequent the area around Copper Basin Dam. The proposed Project area provides suitable foraging habitat and a source of perennial water, and the species has a high potential to occur.

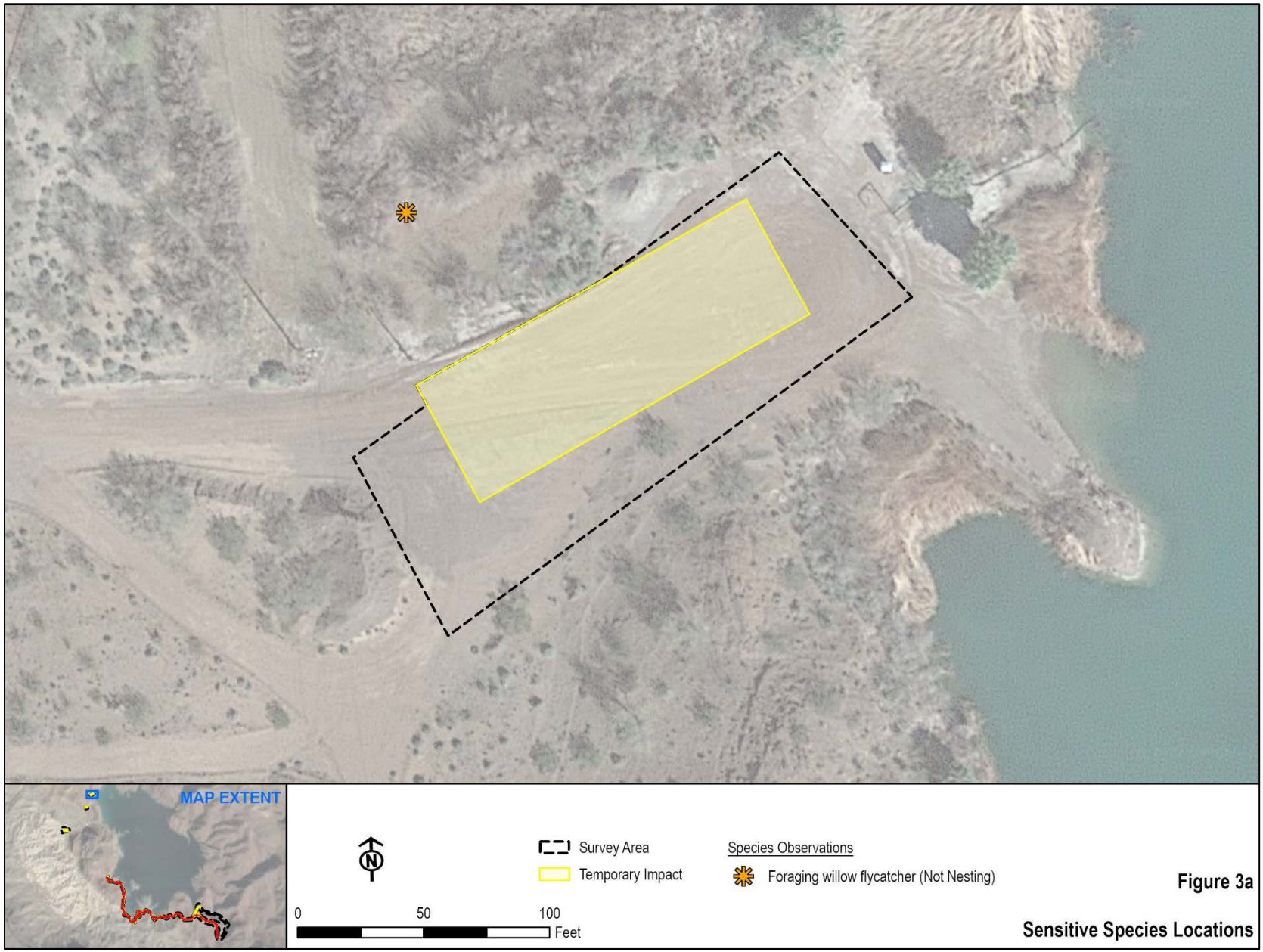
**American badger (*Taxidea taxus*).** The American badger is a CDFW Species of Special Concern. American badgers exploit a wide variety of open, arid habitats, but are mostly found in grasslands, savannas, mountain meadows, and open areas of desert scrub (Stephenson and Calcarone, 1999). Basic requirements that have been identified for this species appear to be sufficient food (burrowing rodents), friable soils, and relatively open, uncultivated ground (Williams, 1986). American badgers are most often solitary animals that are primarily nocturnal but have been reported occasionally foraging and dispersing during the daytime (Lindzey, 1978; Messick and Hornocker, 1981). This species was not detected within the proposed Project area during the 2021 and 2022 reconnaissance surveys, but suitable habitat is present; however friable soils are limited. No burrows or other sign was detected. These wide-ranging species could enter the Project area or occur in adjacent buffer areas that were not subject to extensive surveys. American badgers have a moderate potential to occur.

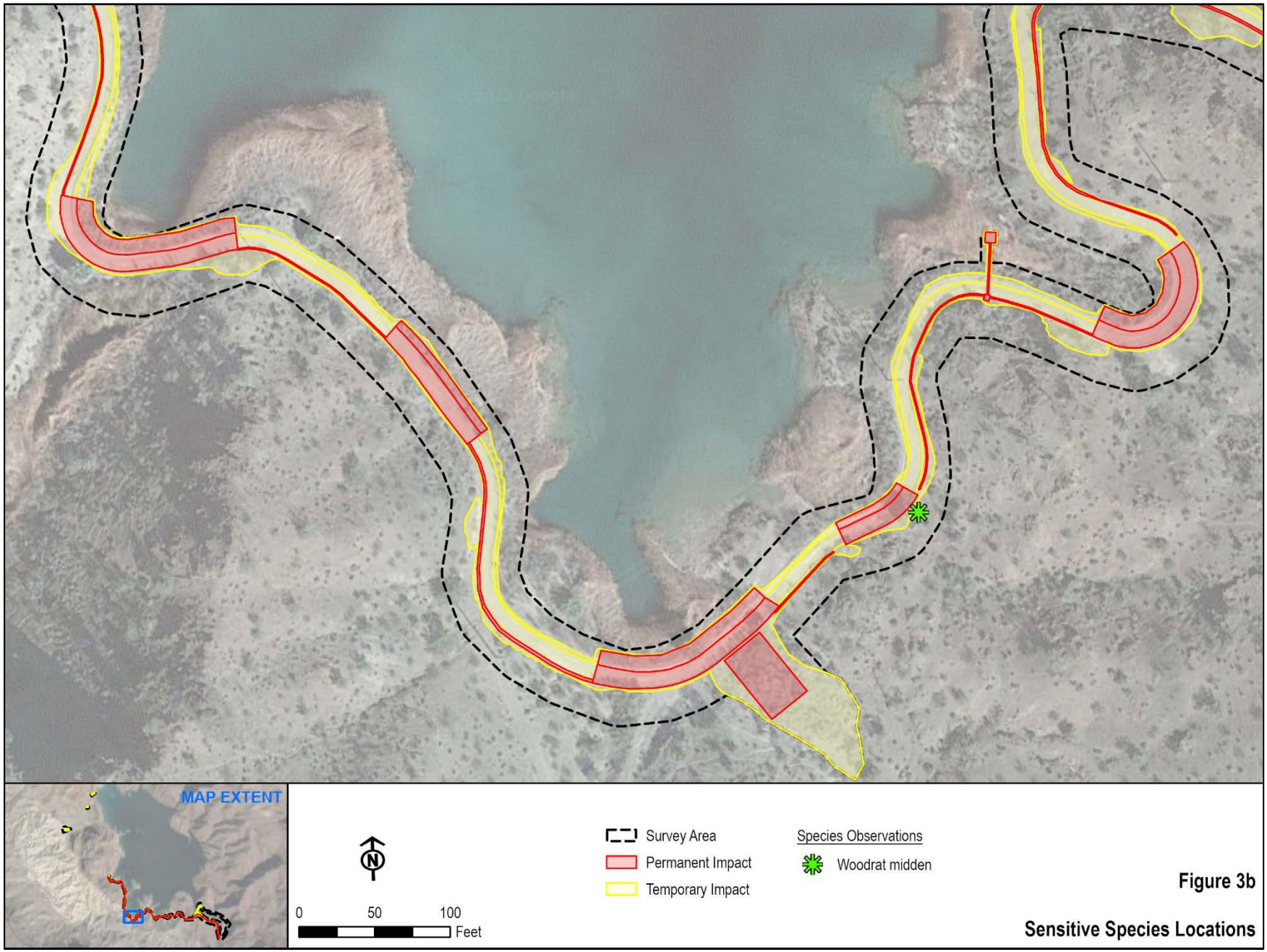
**Desert kit fox (*Vulpes macrotis arsipus*).** The desert kit fox is a California Protected Furbearing Mammal. Desert kit fox habitat includes open, arid scrublands, grasslands, and agricultural lands. Creosote bush scrub is the most common habitat association for desert kit fox in California (McGrew, 1979). Desert kit

fox require friable soils for digging dens. Dens are used for cover, protection from predators and heat, and pup rearing. Suitable soil for dens may be a limited resource for kit fox distribution. This species was not detected within the Project area during the 2021 and 2022 reconnaissance field surveys, but suitable habitat is present. No burrows or other sign was detected. These wide-ranging species could enter the Project area or occur in adjacent buffer areas that were not subject to extensive surveys. There is a high potential for desert kit fox to occur.

**Bats.** Six special-status bat species have a high potential to forage over the Survey Area including pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), Western mastiff bat (*Eumops perotis californicus*), California leaf-nosed bat (*Macrotus californicus*), cave myotis (*Myotis velifer*), and Yuma myotis (*Myotis yumanensis*). Most of these bat's roost in caves, rock crevices, rock overhangs, and dead tree snags which are all present in or adjacent to the Survey Area and bats. All special-status regional bats are insectivorous, catching their prey either on the wing or on the ground. Some species forage over open shrublands such as those found throughout the Survey Area and others forage over open water, which is also present in the Survey Area. Other special-status bats, not identified in the literature review, may occasionally fly over or forage on insects within the Survey Area. Acoustic bat surveys were included in the survey efforts within the Survey Area on March 15, 2022. One special-status bat species, Yuma myotis, was detected within the Survey Area. Special-status bats have a moderate to high potential to occur.

**Figure 3. Sensitive Species Locations**




MAP EXTENT
N
0
50
100
Feet
Survey Area
Permanent Impact
Temporary Impact
Species Observations
Woodrat midden
Figure 3b
Sensitive Species Locations

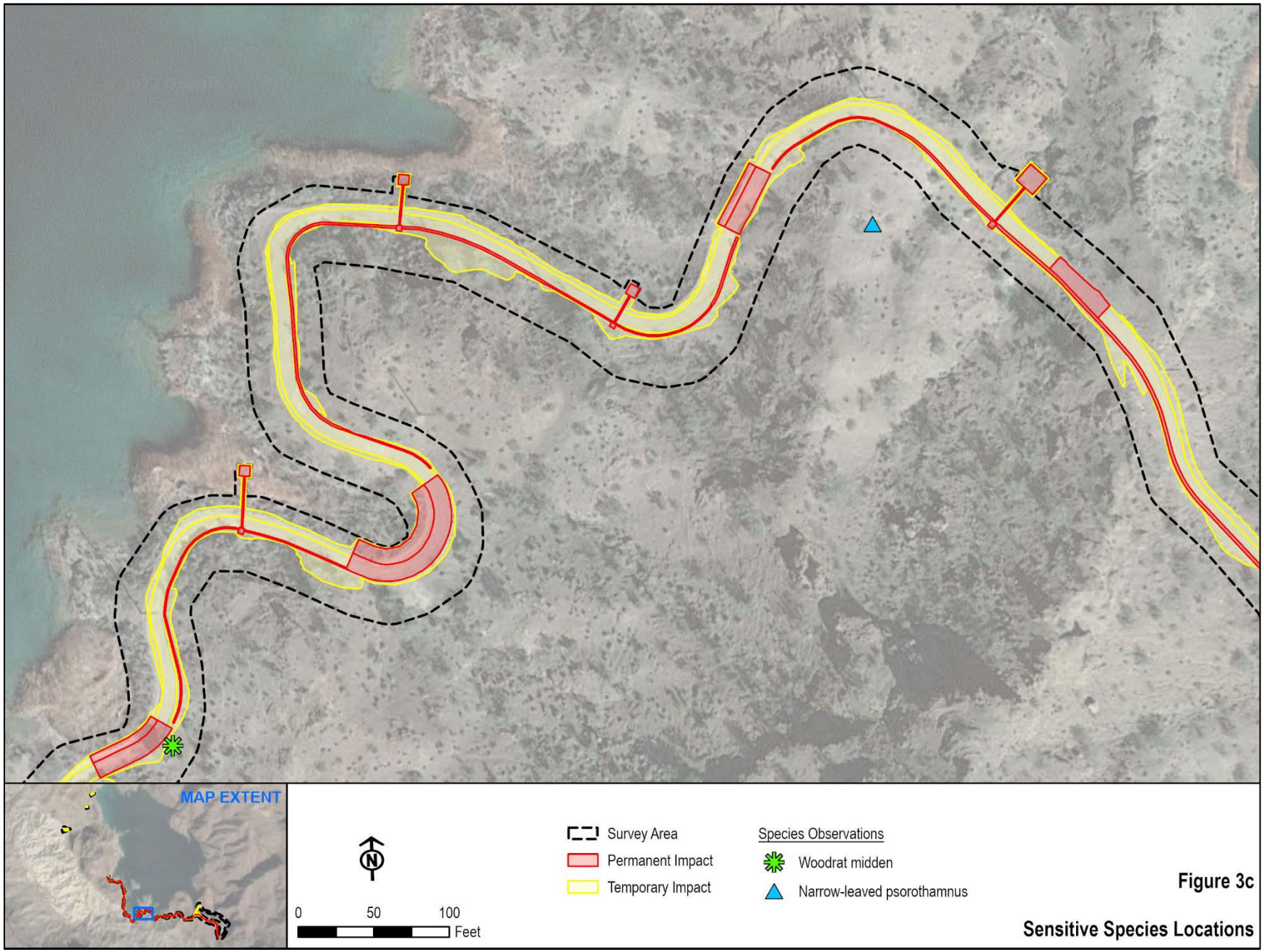



**Figure 3c**

**Sensitive Species Locations**

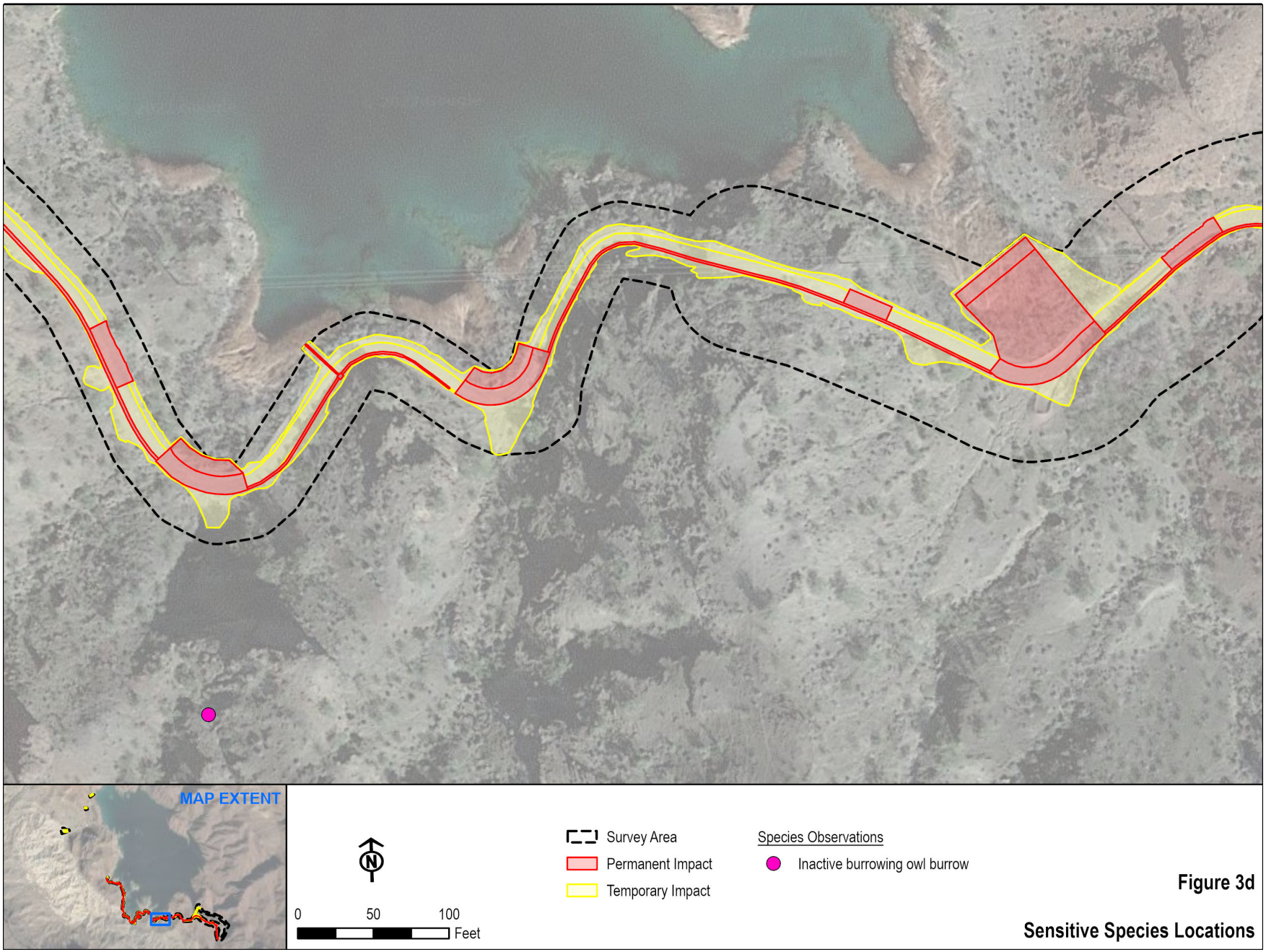



**Figure 3d**

**Sensitive Species Locations**

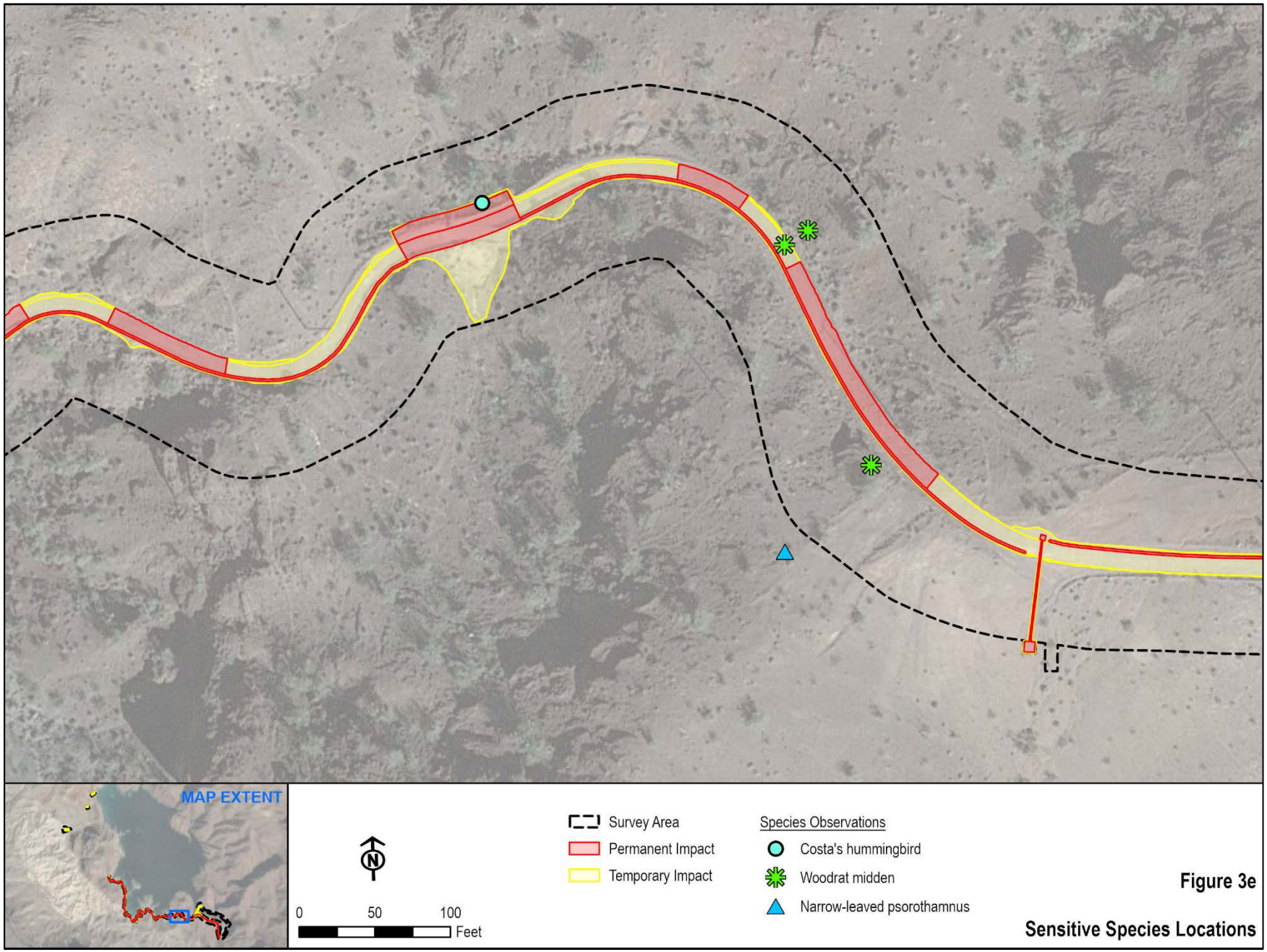
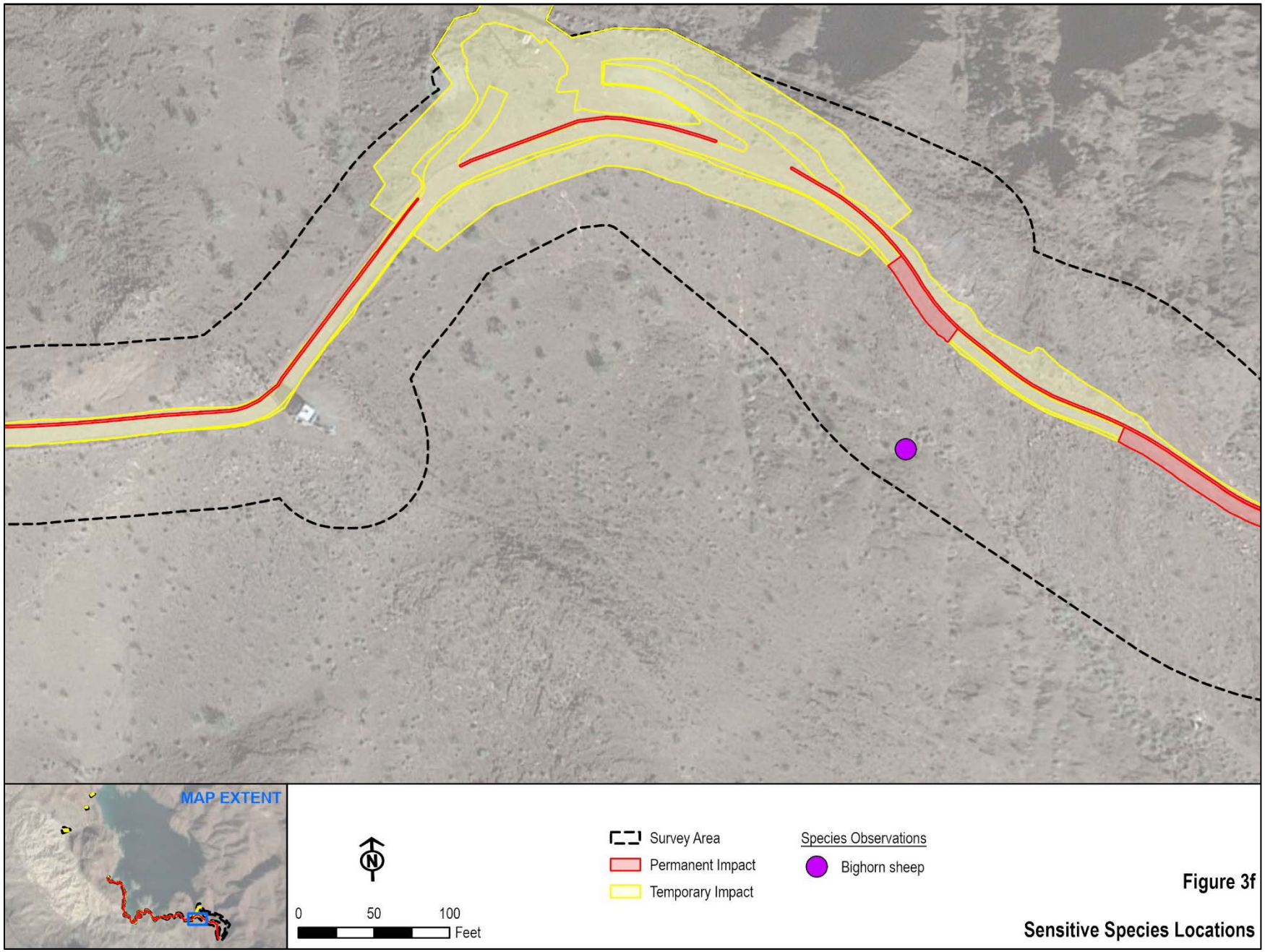
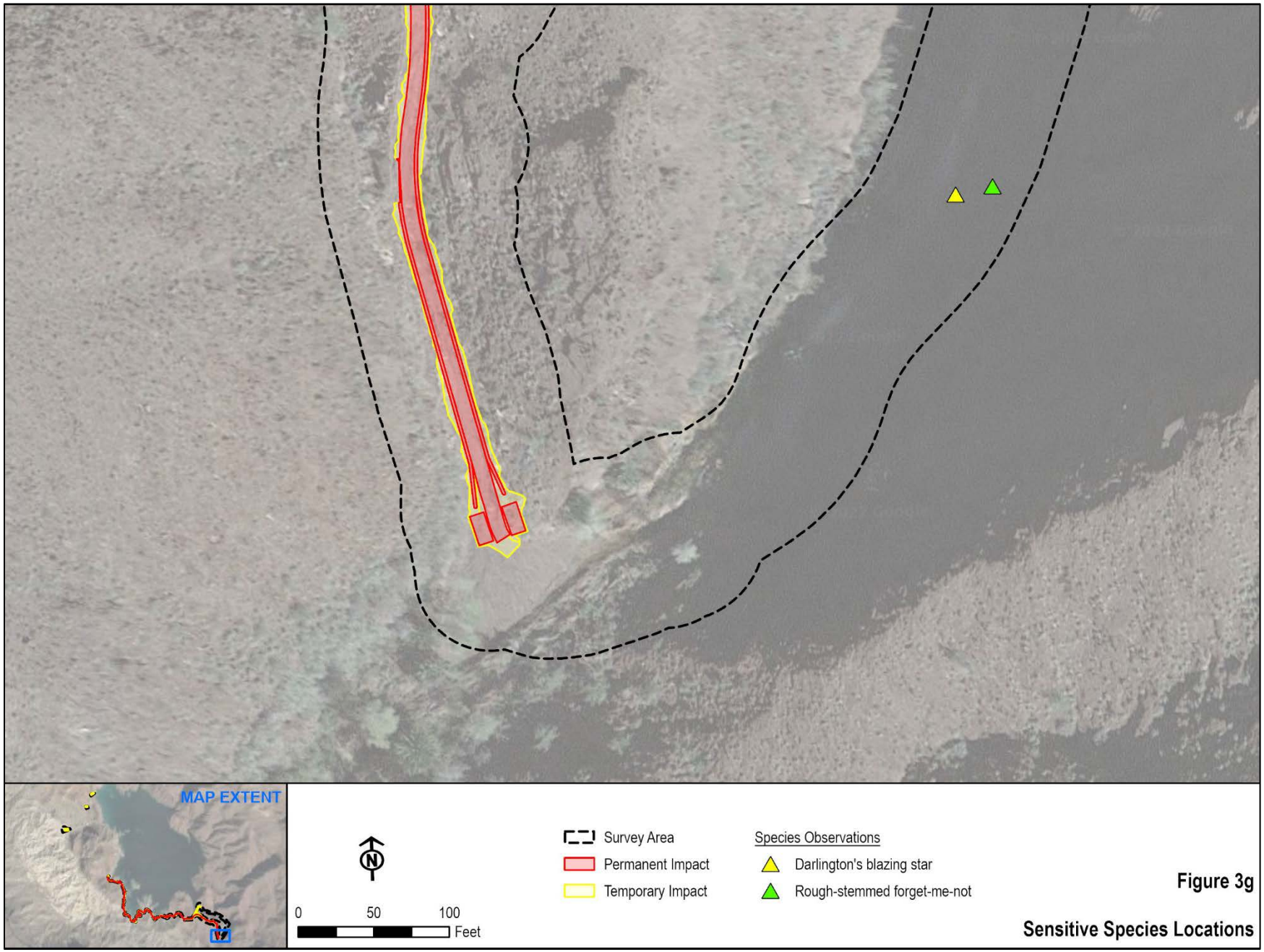
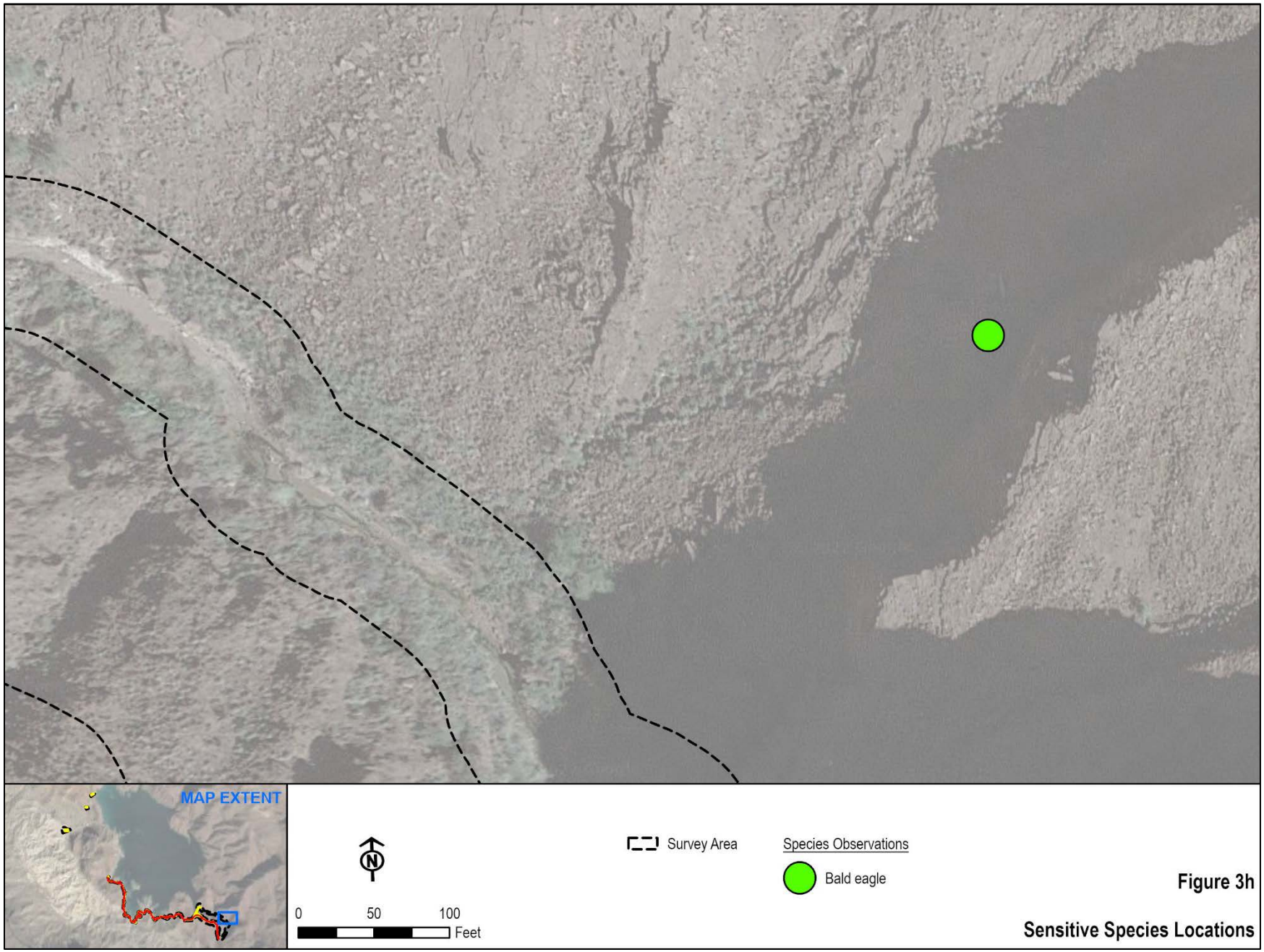


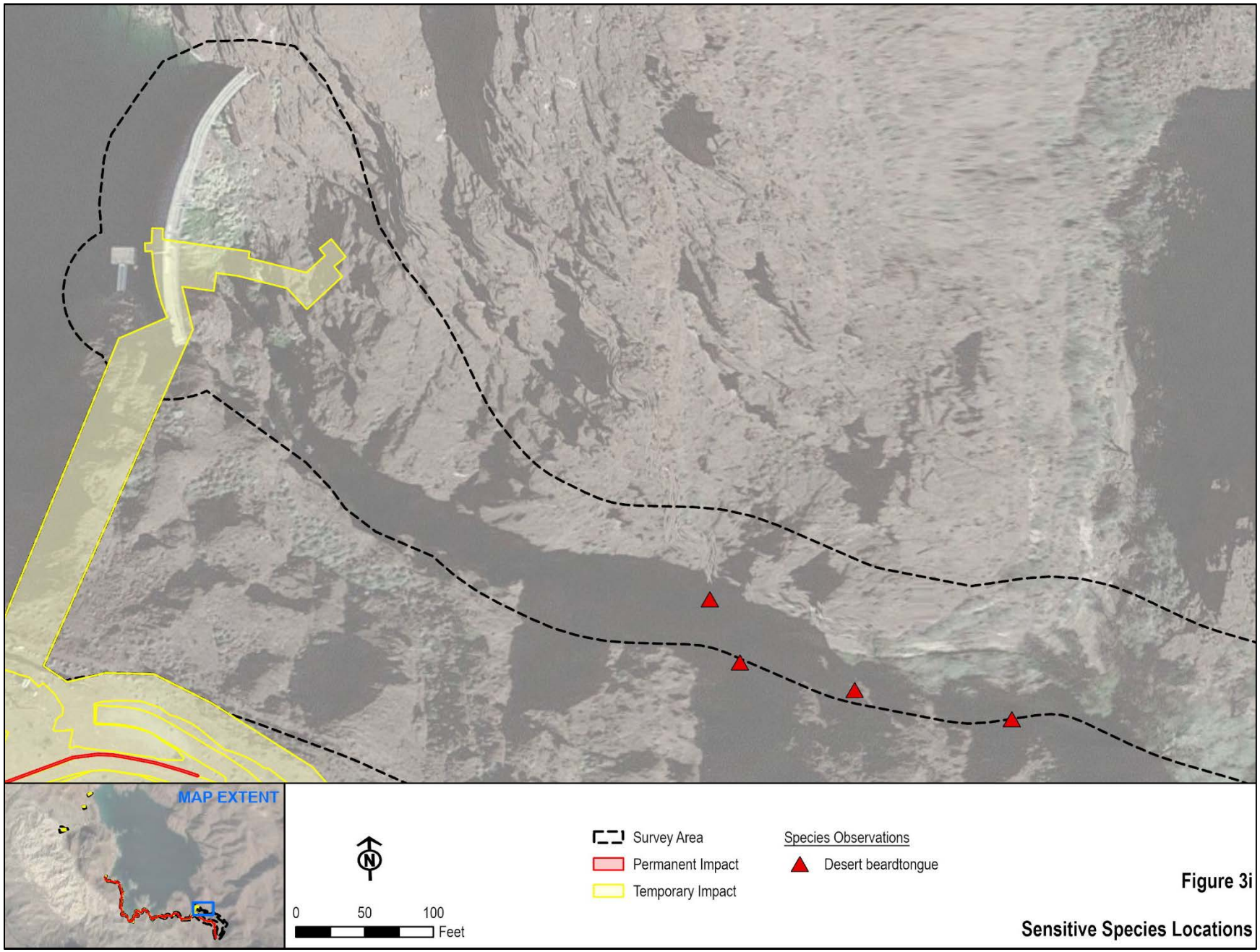

**Figure 3e**

**Sensitive Species Locations**


MAP EXTENT
N
0
50
100
Feet
Survey Area
Permanent Impact
Temporary Impact
Species Observations
Bighorn sheep
Figure 3f
Sensitive Species Locations


MAP EXTENT
N
0
50
100
Feet
Survey Area
Permanent Impact
Temporary Impact
Species Observations
Darlington's blazing star
Rough-stemmed forget-me-not
Figure 3g
Sensitive Species Locations


MAP EXTENT
N
0
50
100
Feet
Survey Area
Species Observations
Bald eagle
Figure 3h
Sensitive Species Locations


MAP EXTENT
N
0
50
100
Feet
Survey Area
Permanent Impact
Temporary Impact
Species Observations
Desert beardtongue
Figure 3i
Sensitive Species Locations

## 5.3. Wildlife Habitat

The term habitat refers to the environment and ecological conditions where a species is found. Wildlife habitat is often described in terms of vegetation, though a more thorough explanation includes detail such as availability or proximity to water, suitable nesting or denning sites, shade, foraging perches, cover sites to escape from predators, soils that are suitable for burrowing or hiding, proximity of noise and disturbance, and other factors that are unique to each species. For many wildlife species, vegetation reflects important components of habitat, including regional climate, physical structure, and biological productivity and food resources. Thus, the vegetation descriptions in Section 4.1 are useful overarching descriptors for wildlife habitat.

**Wildlife Movement.** The ability for wildlife to move freely among populations and habitat areas is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to the individual animal's ability to occupy their home ranges, if their ranges extend across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities.

The Proposed Project is in a remote and largely undeveloped mountain range in the eastern deserts of San Bernardino County. The Survey Area is likely utilized as a wildlife movement corridor for many species moving up and down the canyon or around the perimeter of the reservoir.

## 5.4. Waters

The jurisdictional features present within the Survey Area are summarized below in Table 4. A complete discussion of the jurisdictional features within the Survey Area is provided in the aquatic resource delineation report as Attachment 4.

**Table 4. Summary of Federal and State Waters and Wetlands within the Project area**

| | USACE Waters and Wetlands (acres)a | | CRBRWQCB Waters and Wetlands (acres)a | | CDFW Streambeds and Riparian Habitat (acres) |
|---|---|---|---|---|---|
| | Non-wetland Waters of the U.S. | Wetlands | Non-wetland Waters of the State | Wetlands | |
| Total Survey Area | 1.30 | 0.94 | 1.30 | 0.94 | 5.55 |

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# Attachment 1

## PHOTO EXHIBIT

Photo 1: West-facing view of the Copper Basin valve at the base of the dam

Photo 2: North-facing overview of Copper Basin Reservoir

Photo 3: West-facing view of wetland areas along Copper Basin Wash

Photo 4: Southeast-facing view of the Copper Basin access road adjacent to Copper Basin Reservoir

Photo 5: North-facing view of the access road adjacent to Copper Basin Wash downstream of the dam

Photo 6: Southeast-facing view of the access road leading down into Copper Basin Wash

Photo 7: North-facing view of the access road along Copper Basin Wash, downstream of the dam

Photo 8: Northwest-facing view of the access road leading down into Copper Basin Wash

# Attachment 2

## CALIFORNIA NATURAL DIVERSITY DATABASE AND IPAC RESULTS

# Selected Elements by Scientific Name

## California Department of Fish and Wildlife

## California Natural Diversity Database

**Query Criteria:** Quad IS (Gene Wash (3411432) OR Whipple Wash (3411433) OR Parker (3411423) OR Cross Roads (3411422))

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| ***Androstephium breviflorum***<br>small-flowered androstephium | PMLIL06010 | None | None | G4 | S2? | 2B.2 |
| ***Antrozous pallidus***<br>pallid bat | AMACC10010 | None | None | G4 | S3 | SSC |
| ***Arizonan Woodland***<br>Arizonan Woodland | CTT75400CA | None | None | G3 | S1.2 | |
| ***Berberis harrisoniana***<br>Kofa Mountain barberry | PDBER02030 | None | None | G2 | S1 | 1B.2 |
| ***Bouteloua trifida***<br>three-awned grama | PMPOA100L0 | None | None | G4G5 | S3 | 2B.3 |
| ***Carnegiea gigantea***<br>saguaro | PDCAC12010 | None | None | G5 | S1 | 2B.2 |
| ***Castela emoryi***<br>Emory's crucifixion-thorn | PDSIM03030 | None | None | G3G4 | S2S3 | 2B.2 |
| ***Catostomus latipinnis***<br>flannelmouth sucker | AFCJC02110 | None | None | G3G4 | S1 | |
| ***Chylismia arenaria***<br>sand evening-primrose | PDONA03020 | None | None | G4? | S2S3 | 2B.2 |
| ***Coccyzus americanus occidentalis***<br>western yellow-billed cuckoo | ABNRB02022 | Threatened | Endangered | G5T2T3 | S1 | |
| ***Colaptes chrysoides***<br>gilded flicker | ABNYF10040 | None | Endangered | G5 | S1 | |
| ***Corynorhinus townsendii***<br>Townsend's big-eared bat | AMACC08010 | None | None | G4 | S2 | SSC |
| ***Coryphantha chlorantha***<br>desert pincushion | PDCAC040J0 | None | None | G4 | S3 | 2B.1 |
| ***Delphinium scaposum***<br>bare-stem larkspur | PDRAN0B1M0 | None | None | G5 | S1 | 2B.3 |
| ***Ditaxis claryana***<br>glandular ditaxis | PDEUP080L0 | None | None | G3G4 | S2 | 2B.2 |
| ***Erigeron oxyphyllus***<br>wand-like fleabane daisy | PDAST3M2Z0 | None | None | G4 | S2 | 2B.3 |
| ***Eumops perotis californicus***<br>western mastiff bat | AMACD02011 | None | None | G4G5T4 | S3S4 | SSC |
| ***Euphorbia abramsiana***<br>Abrams' spurge | PDEUP0D010 | None | None | G4 | S2 | 2B.2 |
| ***Gila elegans***<br>bonytail | AFCJB13100 | Endangered | Endangered | G1 | SH | |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| ***Haliaeetus leucocephalus*** bald eagle | ABNKC10010 | Delisted | Endangered | G5 | S3 | FP |
| ***Heloderma suspectum cinctum*** banded Gila monster | ARACE01011 | None | None | G4T4 | S1 | SSC |
| ***Hymenoxys odorata*** bitter hymenoxys | PDAST530E0 | None | None | G5 | S2 | 2B.1 |
| ***Icteria virens*** yellow-breasted chat | ABPBX24010 | None | None | G5 | S3 | SSC |
| ***Lanius ludovicianus*** loggerhead shrike | ABPBR01030 | None | None | G4 | S4 | SSC |
| ***Lycium exsertum*** Arizona desert-thorn | PDSOL0G090 | None | None | G4G5 | S1 | 2B.1 |
| ***Macrotus californicus*** California leaf-nosed bat | AMACB01010 | None | None | G3G4 | S3 | SSC |
| ***Mammillaria grahamii var. grahamii*** Graham fishhook cactus | PDCAC0A021 | None | None | G4T4 | S2 | 2B.2 |
| ***Matelea parvifolia*** spear-leaf matelea | PDASC0A0J0 | None | None | G5 | S3 | 2B.3 |
| ***Melanerpes uropygialis*** Gila woodpecker | ABNYF04150 | None | Endangered | G5 | S1 | |
| ***Mentzelia puberula*** Darlington's blazing star | PDLOA031F0 | None | None | G5 | S2 | 2B.2 |
| ***Mentzelia tridentata*** creamy blazing star | PDLOA031U0 | None | None | G3 | S3 | 1B.3 |
| ***Micrathene whitneyi*** elf owl | ABNSB09010 | None | Endangered | G5 | S1 | |
| ***Myotis velifer*** cave myotis | AMACC01050 | None | None | G4G5 | S1 | SSC |
| ***Myotis yumanensis*** Yuma myotis | AMACC01020 | None | None | G5 | S4 | |
| ***Nemacaulis denudata var. gracilis*** slender cottonheads | PDPGN0G012 | None | None | G3G4T3? | S2 | 2B.2 |
| ***Neotoma albigula venusta*** Colorado Valley woodrat | AMAFF08031 | None | None | G5T3T4 | S1S2 | |
| ***Oliarces clara*** cheeseweed owlfly (cheeseweed moth lacewing) | IINEU04010 | None | None | G1G3 | S2 | |
| ***Penstemon pseudospectabilis ssp. pseudospectabilis*** desert beardtongue | PDSCR1L562 | None | None | G4G5T4 | S3 | 2B.2 |
| ***Petalonyx linearis*** narrow-leaf sandpaper-plant | PDLOA04010 | None | None | G4 | S3? | 2B.3 |
| ***Phacelia anelsonii*** Aven Nelson's phacelia | PDHYD0C060 | None | None | G3 | S2 | 2B.3 |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| ***Pholistoma auritum var. arizonicum*** Arizona pholistoma | PDHYD0D011 | None | None | G5T4? | S3 | 2B.3 |
| ***Psorothamnus fremontii var. attenuatus*** narrow-leaved psorothamnus | PDFAB3C031 | None | None | G5T4? | S3 | 2B.3 |
| ***Pyrocephalus rubinus*** vermilion flycatcher | ABPAE36010 | None | None | G5 | S2S3 | SSC |
| ***Rallus obsoletus yumanensis*** Yuma Ridgway's rail | ABNME0501A | Endangered | Threatened | G3T3 | S1S2 | FP |
| ***Senna covesii*** Cove's cassia | PDFAB491X0 | None | None | G5 | S3 | 2B.2 |
| ***Sigmodon arizonae plenus*** Colorado River cotton rat | AMAFF07022 | None | None | G5T2T3 | S1S2 | SSC |
| ***Teucrium glandulosum*** desert germander | PDLAM20040 | None | None | G4 | S2 | 2B.3 |
| ***Vireo bellii arizonae*** Arizona Bell's vireo | ABPBW01111 | None | Endangered | G5T4 | S1S2 | |
| ***Xyrauchen texanus*** razorback sucker | AFCJC11010 | Endangered | Endangered | G1 | S1S2 | FP |

**Record Count: 49**

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

## Location

San Bernardino County, California

## Local office

Carlsbad Fish And Wildlife Office

(760) 431-9440
(760) 431-5901

2177 Salk Avenue - Suite 250
Carlsbad, CA 92008-7385

http://www.fws.gov/carlsbad/

NOT FOR CONSULTATION

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

NOT FOR CONSULTATION

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

# Birds

| NAME | STATUS |
|---|---|
| Southwestern Willow Flycatcher *Empidonax traillii extimus*<br>Wherever found<br>There is **final** critical habitat for this species. The location of the critical habitat is not available.<br>https://ecos.fws.gov/ecp/species/6749 | Endangered |
| Yuma Ridgway''s Rail *Rallus obsoletus yumanensis*<br>Wherever found<br>No critical habitat has been designated for this species.<br>https://ecos.fws.gov/ecp/species/3505 | Endangered |

# Fishes

| NAME | STATUS |
|---|---|
| Bonytail *Gila elegans*<br>Wherever found<br>There is **final** critical habitat for this species. The location of the critical habitat is not available.<br>https://ecos.fws.gov/ecp/species/1377 | Endangered |
| Razorback Sucker *Xyrauchen texanus*<br>Wherever found<br>There is **final** critical habitat for this species. The location of the critical habitat is not available.<br>https://ecos.fws.gov/ecp/species/530 | Endangered |

# Insects

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>Wherever found<br>No critical habitat has been designated for this species.<br>https://ecos.fws.gov/ecp/species/9743 | Candidate |

NOT FOR CONSULTATION

# Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

# Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

NOT FOR CONSULTATION

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.) |
|---|---|
| Gila Woodpecker *Melanerpes uropygialis*<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/5960 | Breeds Apr 1 to Aug 31 |

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# Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

**Probability of Presence** (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

**Breeding Season** (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

**Survey Effort** (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

**No Data** (–)
A week is marked as having no data if there were no survey events for that week.

**Survey Timeframe**
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort – no data

| SPECIES | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

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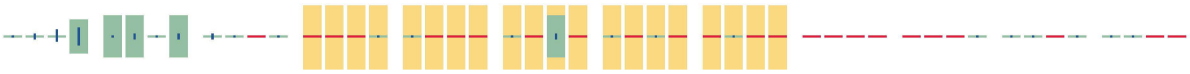
Gila Woodpecker BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

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**How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

**What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

**Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

**What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

**Proper Interpretation and Use of Your Migratory Bird Report**

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The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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# Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

## Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

# Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

**Data limitations**

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

**Data exclusions**

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

**Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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# Attachment 3

## SPECIES OBSERVED

| Latin Name | Common Name |
|---|---|
| **VASCULAR PLANTS** | |
| **DICOTLYDONS** | |
| FILICALES | FERN FAMILIES (SEVERAL INCLUDED TOGETHER) |
| *Adiantum capillus-veneris* | Venus hair |
| *Cheilanthes parryi* | Parry's lip fern |
| APOCYNACEAE | DOGBANE FAMILY |
| *Asclepias albicans* | White-stemmed milkweed, wax milkweed |
| ASTERACEAE | ASTER FAMILY |
| *Ambrosia dumosa* | White bur-sage, burrobush |
| *Ambrosia salsola* | Common burrobrush, cheesebush |
| *Baccharis salicifolia* | Mule fat |
| *Baccharis sergiloides* | Desert baccharis, waterweed |
| *Bebbia juncea var. aspera* | Sweetbush |
| *Chaenactis carphoclinia* | Pebble pincushion |
| *Encelia actoni* | Acton brittlebush |
| *Encelia farinosa* | Brittlebush |
| *Gnaphalium palustre* | Meadow everlasting, lowland cudweed |
| *Perityle emoryi* | Emory's rock daisy |
| *Peucephyllum schottii* | Pygmy-cedar |
| *Pleurocoronis pluriseta* | Arrowleaf |
| *Pluchea sericea* | Arrow-weed |
| *Psathrotes ramosissima* | Turtleback, velvet rosettes |
| **Pulicaria paludosa* | Spanish sunflower |
| *Senecio mohavensis* | Mojave ragwort, Mojave groundsel |
| **Sonchus oleraceus* | Common sow thistle |
| *Stephanomeria pauciflora* | Wire-lettuce, desert straw |
| *Trixis californica var. californica* | California trixis |
| *Xanthisma spinulosum var. gooddingii* | Goodding’s aster |
| BORAGINACEAE | BORAGE OR WATERLEAF FAMILY |
| *Cryptantha angustifolia* | Narrow-leaved cryptantha |
| *Cryptantha barbigera* | Bearded cryptantha |
| *Cryptantha holoptera* | Winged cryptantha |
| *Phacelia crenulata* | Heliotrope phacelia |
| BRASSICACEAE | MUSTARD FAMILY |
| **Brassica tournefortii* | Sahara mustard, wild turnip |
| *Lepidium lasiocarpum* | Sand peppergrass |
| CACTACEAE | CACTUS FAMILY |
| ***Carnegiea gigantea* | Saguaro |
| *Cylindropuntia acanthocarpa* | Buckhorn cholla |
| *Cylindropuntia bigelovii* | Teddy-bear cholla |
| *Cylindropuntia echinocarpa* | Silver cholla |
| *Echinocactus polycephalus* | Clustered barrel cactus, cottontop cactus |
| *Mammillaria tetrancistra* | Common fishhook cactus |
| *Opuntia basilaris var. basilaris* | Beavertail cactus |

| Latin Name | Common Name |
|---|---|
| CHENOPODIACEAE | GOOSEFOOT FAMILY |
| *Atriplex polycarpa* | Allscale saltbush |
| EUPHORBIACEAE | SPURGE FAMILY |
| *Euphorbia polycarpa* | Smallseed sandmat |
| FABACEAE | LEGUME FAMILY, PEA FAMILY |
| *Dalea mollis* | Silk dalea |
| *Lupinus arizonicus* | Arizona lupine |
| *Marina parryi* | Parry dalea |
| *Parkinsonia florida* | Blue palo verde |
| *Parkinsonia microphylla* | Little-leaved palo verde |
| *Prosopis glandulosa var. torreyana* | Honey mesquite, mesquite |
| *Prosopis pubescens* | Screw bean |
| ***Psorothamnus fremontii var. attenuatus* | Fremont's indigo bush |
| *Psorothamnus fremontii* | Fremont's dalea |
| *Senegalia greggii* | Catclaw, catclaw acacia |
| FOUQUIERIACEAE | OCOTILLO FAMILY |
| *Fouquieria splendens ssp. splendens* | Ocotillo |
| GENTIANACEAE | GENTIAN FAMILY |
| *Eustoma exaltatum ssp. exaltatum* | Catchfly gentian |
| KRAMERIACEAE | RHATANY FAMILY, KRAMERIA FAMILY |
| *Krameria bicolor* | White rhatany |
| LAMIACEAE | MINT FAMILY |
| *Condea emoryi* | Desert lavender |
| *Salvia columbariae* | Chia |
| *Salvia mohavensis* | Mohave sage |
| LOASACEAE | LOASA FAMILY, STICK-LEAF FAMILY |
| *Eucnide urens* | Desert rocknettle |
| *Mentzelia puberula* | Argus blazing star |
| MALVACEAE | MALLOW FAMILY |
| *Hibiscus denudatus* | Pale face |
| *Sphaeralcea ambigua* | Globemallow, desert mallow |
| NYCTAGINACEAE | FOUR O'CLOCK FAMILY |
| *Mirabilis laevis* | Wishbone bush |
| PAPAVERACEAE | POPPY FAMILY |
| *Argemone munita* | Chicalote, prickly poppy |
| *Eschscholzia minutiflora* | Small-flowered poppy |
| PLANTAGINACEAE | PLANTAIN FAMILY |
| ***Penstemon pseudospectabilis ssp. pseudospectabilis* | Desert beardtongue |
| *Plantago ovata* | Desert plantain |
| POLEMONIACEAE | PHLOX FAMILY |
| *Gilia sp.* | Unid. annual |
| *Linanthus jonesii* | Jones linanthus |
| PHRYMACEAE | LOPSEED FAMILY |
| *Mimulus guttatus* | Seep monkeyflower |

| Latin Name | Common Name |
|---|---|
| POLYGONACEAE | BUCKWHEAT FAMILY |
| *Eriogonum fasciculatum* | California buckwheat |
| *Eriogonum inflatum* | Desert trumpet |
| *Eriogonum thomasii* | Thomas' wild buckwheat |
| RUTACEAE | RUE FAMILY, CITRUS FAMILY |
| *Thamnosma montana* | Turpentine-broom |
| SALICACEAE | WILLOW FAMILY |
| *Populus fremontii* | Fremont cottonwood |
| *Salix exigua* | Narrow-leaf willow, sandbar willow |
| *Salix gooddingii* | Goodding's black willow |
| SOLANACEAE | NIGHTSHADE FAMILY |
| *Lycium andersonii* | Anderson thornbush |
| *Nicotiana obtusifolia* | Desert tobacco |
| *Physalis crassifolia* | Thick-leaf ground-cherry |
| *Solanum americanum* | White nightshade |
| TAMARICACEAE | TAMARISK FAMILY |
| **Tamarix ramosissima* | Saltcedar, tamarisk |
| URTICACEAE | NETTLE FAMILY |
| *Parietaria hespera (P. floridana)* | Pellitory |
| VISCACEAE | MISTLETOE FAMILY |
| *Phoradendron californicum* | Desert mistletoe |
| ZYGOPHYLLACEAE | CALTROP FAMILY |
| *Fagonia laevis* | Smooth-stem fagonia |
| *Larrea tridentata* | Creosote bush |
| **MONOCOTYLEDONS** | |
| ARECACEAE | PALM FAMILY |
| **Phoenix canariensis* | Canary Island palm |
| *Washingtonia filifera* | California fan palm |
| CYPERACEAE | SEDGE FAMILY |
| **Cyperus involucratus* | Umbrella sedge |
| *Schoenoplectus americanus* | Olney's three-square bulrush |
| POACEAE | GRASS FAMILY |
| *Aristida purpurea* | Three-awn grass |
| **Cynodon dactylon* | Bermuda grass |
| *Distichlis spicata* | Salt grass |
| *Festuca octoflora* | Sixweeks grass, slender fescue |
| **Pennisetum setaceum* | Crimson fountain grass, African fountain grass |
| TYPHACEAE | CATTAIL FAMILY |
| *Typha domingensis* | Southern cattail, slender cattail |
| **INVERTEBRATES** | |
| CAMBARIDAE | FRESHWATER CRAYFISH |
| **Procambarus clarkii* | Red swamp crayfish |

| Latin Name | Common Name |
|---|---|
| **VERTEBRATES** | |
| **AMPHIBIA** | **AMPHIBIANS** |
| BUFONIDAE | TRUE TOADS |
| *Bufo punctatus* | Red-spotted toad |
| ACTINOPTERYGII | RAY-FINNED FISHES |
| CENTRARCHIDAE | SUNFISHES |
| *Micropterus salmoides* | Largemouth bass |
| ICTALURIDAE | CAT FISHES |
| *Ictalurus punctatus* | Channel catfish |
| CICHLIDAE | CICHLIDS |
| *Tilapia ssp.* | Tilapia |
| **REPTILIA** | **REPTILES** |
| IGUANIDAE | IGUANID LIZARDS |
| *Sauromalus obesus* | Common chuckwalla |
| *Uta stansburiana* | Side-blotched lizard |
| TEIIDAE | WHIPTAILS |
| *Cnemidophorus tigris* | Western whiptail |
| PHRYNOSOMATIDAE | HORNED LIZARDS |
| *Sceloporus magister* | Desert spiny lizard |
| EUBLEPHARIDAE | GECKOS |
| *Coleonyx variegatus* | Western banded gecko |
| **AVES** | **BIRDS** |
| ANATIDAE | DUCKS, GEESE, and SWANS |
| *Anas carolinensis* | Green-winged teal |
| *Anas platyrhynchos* | Mallard |
| *Bucephala clangula* | Common goldeneye |
| ODONTOPHORIDAE | NEW WORLD QUAILS |
| *Callipepla gambelii* | Gambel's quail |
| PHALACROCORACIDAE | CORMORANTS AND SHAGS |
| ***Nannopterum auritum* | Double-crested cormorant |
| PODICIPEDIDAE | GREBES |
| *Podilymbus podiceps* | Pied-billed grebe |
| CATHARTIDAE | VULTURES |
| *Cathartes aura* | Turkey vulture |
| ACCIPITRIDAE | EAGLES, HAWKS, KITES, OSPREY |
| ***Haliaeetus leucocephalus* | Bald eagle |
| FALCONIDAE | FALCONS |
| ***Falco peregrinus anatum* | American peregrine falcon |
| RALLIDAE | CRAKES, COOTS, and GALLINULES |
| *Fulica americana* | American coot |
| COLUMBIDAE | PIGEONS AND DOVES |
| *Zenaida macroura* | Mourning dove |

| Latin Name | Common Name |
|---|---|
| CUCULIDAE | CUCKOOS |
| *Geococcyx californianus* | Greater roadrunner |
| STRIGIDAE | OWLS |
| ***Athene cunicularia* | Burrowing owl |
| *Bubo virginianus* | Great horned owl |
| APODIDAE | SWIFTS |
| *Aeronautes saxatalis* | White-throated swift |
| TROCHILIDAE | HUMMINGBIRDS |
| *Calypte anna* | Anna’s hummingbird |
| ***Calypte costae* | Costa's hummingbird |
| PICIDAE | WOODPECKERS |
| *Dryobates scalaris* | Ladder-backed woodpecker |
| TYRANNIDAE | TYRANT FLYCATCHERS |
| *Myiarchus cinerascens* | Ash-throated flycatcher |
| *Sayornis saya* | Say's phoebe |
| LANIIDAE | SHRIKES |
| ***Lanius ludovicianus* | Loggerhead shrike |
| CORVIDAE | CROWS AND JAYS |
| *Corvus corax* | Common raven |
| REGULIDAE | KINGLETS |
| *Regulus calendula* | Ruby-crowned kinglet |
| REMIZIDAE | VERDINS |
| *Auriparus flavipes* | Verdin |
| HIRUNDINIDAE | SWALLOWS, MARTINS, and SAW-WINGS |
| *Tachycineta thalassina* | Violet-green swallow |
| PTILOGONATIDAE | SILKY FLYCATCHERS |
| *Phainopepla nitens* | Phainopepla |
| TROGLODYTIDAE | WRENS |
| *Catherpes mexicanus* | Canyon wren |
| *Salpinctes obsoletus* | Rock wren |
| PASSERELLIDAE | NEW WORLD SPARROWS |
| *Amphispiza bilineata* | Black-throated sparrow |
| *Melospiza lincolnii* | Lincoln’s sparrow |
| *Melospiza melodia* | Song sparrow |
| *Spizella passerina* | Chipping sparrow |
| *Zonotrichia leucophrys* | White-crowned sparrow |
| FRINGILLIDAE | FINCHES |
| *Carduelis psaltria* | Lesser goldfinch |
| *Haemorhous mexicanus* | House finch |
| EMBERIZIDAE | SPARROWS, WARBLERS, TANAGERS |
| *Dendroica coronata* | Yellow-rumped warbler |
| *Dendroica nigrescens* | Black-throated gray warbler |
| PARULIDAE | NEW WORLD WARBLERS |
| *Cardellina pusilla* | Wilson’s warbler |

| Latin Name | Common Name |
|---|---|
| **MAMMALIA** | **MAMMALS** |
| EQUIDAE | HORSES, BURROS AND ZEBRAS |
| **Equus astinus* | Feral donkey |
| BOVIDAE | SHEEP AND GOATS |
| ***Ovis canadensis* | Desert bighorn sheep |
| CANIDAE | DOGS and FOXES |
| *Urocyon cinereoargenteus* | Gray fox |
| FELIDAE | CATS |
| *Lynx rufus* | Bobcat |
| LEPORIDAE | RABBITS and HARES |
| *Sylvilagus audubonii* | Desert cottontail |
| VESPERTILIONIDAE | VESPER BATS (EVENING BATS) |
| ***Myotis yumanensis* | Yuma myotis |
| Parastrellus Hesperus | Canyon bat |
| MOLOSSIDAE | FREE-TAILED BATS |
| *Tadarida brasiliensis* | Mexican free-tailed bat |

* Nonnative or invasive species
** Special-status species

# Attachment 4

## AQUATIC RESOURCES DELINEATION REPORT

# AQUATIC RESOURCES DELINEATION REPORT

## Copper Basin Discharge Valve Replacement and Access Road Improvements Project

***Prepared for***

**Metropolitan Water District of Southern California**

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Los Angeles, CA 90012-2944

***Submitted by***

Aspen environmental group

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# 1. INTRODUCTION

The Metropolitan Water District of Southern California (Metropolitan) proposes to conduct repairs at the Copper Basin Reservoir (Reservoir), which is one of four reservoirs located along the Colorado River Aqueduct (CRA). This report presents the findings of an investigation of jurisdictional features conducted by Aspen Environmental Group (Aspen) for the Copper Basin Discharge Valve Replacement and Access Road Improvements Project (proposed Project). The proposed Project is located west of Parker Dam and north of Parker Strip in southeastern San Bernardino County, California (Figure 1 in Attachment A).

Field surveys were conducted by Aspen Senior Biologist Justin Wood on March 15 and 16, 2022. The assessment was conducted to determine the extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and Colorado River Basin Regional Water Quality Control Board (CRBRWQCB).

Throughout this report, the "proposed Project area" refers to the access roads repair and the discharge valve replacement under consideration at Copper Basin Reservoir and Copper Basin Dam, while "Survey Area" refers to the proposed Project area and a 25-foot buffer along the western half of the access road and a 50-foot buffer along the eastern half of the access road and dam infrastructure.

## 1.1. Project Description

The proposed Project is located along a four-mile-long dirt access road between the base of Copper Basin Dam and Echo Weir near Parker Dam Road in San Bernardino County, California. The road runs through Copper Basin Wash, a tributary to the Colorado River.

The proposed Project would rehabilitate the slide gate valve and replace the discharge valve within the Copper Basin Dam valve house; install new conduit and electrical components within the valve house; install three new concrete pads and electrical components 250 feet southwest of the Copper Basin Dam; install and anchor-in-place approximately 250 feet of above-ground electrical conduit from the new concrete pads to Copper Basin Dam; replace the ladder on the dam face; install a new catwalk and stairs immediately downstream of and adjacent to the valve house; remove and reconstruct two existing concrete weirs approximately 125 feet downstream of Copper Basin Dam, and; install electrical conduit and instrumentation from the two weirs, along the catwalk, to the valve house. Material and equipment staging is proposed at three existing staging/operations areas along the west side of the Reservoir as noted in Figure 1.

The proposed Project would improve approximately 1.66 miles of the existing dirt access road around the perimeter of the Reservoir to facilitate safe access to the base of Copper Basin Dam. Improvements to this existing dirt access road include re-grading the road; paving steep segments of road and installing metal beam guard railing for safety; constructing Arizona crossings at drainage crossing locations; installing v-ditches and riprap outlet structures along the access road to control runoff, and installing vehicle turn out areas and safety signs.

## 1.2. Lead Agency and Contact Information

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## 1.3. Site Access

Driving directions to the Survey Area are provided below in Table 1.

**Table 1. Driving Directions to Survey Area**

| From The Greater Los Angeles Area of Southern California: |
|---|
| Take Interstate 10 east towards Desert Center.<br>Take SR-177 (Rice Road) north from Desert Center towards Parker.<br>Turn right and continue east of SR-62 towards Parker.<br>Continue straight on Parker Dam Road and head northeast along the Colorado River.<br>Turn left at METROPOLITAN Road and head west.<br>Turn left on Copper Basin Road and reach locked gate.<br>Enter gate with METROPOLITAN escort for access to Copper Basin Dam. |

# 2. EXISTING CONDITIONS

## 2.1. Topography and Surrounding Land Uses

The Survey Area is located in the southwestern portion of the U.S. Geological Survey's (USGS) Gene Wash 7.5-minute topographic quadrangle. The Survey Area occurs in the Whipple Mountains, a small mountain range located along the Colorado River near the transition between the Mojave and Sonoran Deserts. The topography of the Survey Area varies from around 970 feet above mean sea level (msl) below the Reservoir, to approximately 1230 feet above msl along the access road. The topography of the Survey Area is very steep with many vertical canyon walls, steep slopes, and rocky terrain. The Survey Area and the immediate surrounding land is undeveloped open space owned by Metropolitan.

## 2.2. Vegetation

During the field surveys, all plant and wildlife species noted were recorded in field notes and plants that could not be identified in the field were collected and later identified using keys, descriptions, and illustrations in Baldwin et al. (2002, 2012). General notes were also recorded on the vegetation within the Survey Area. Vegetation within the Survey Area is further described below using the names and descriptions in *A Manual of California Vegetation* (Sawyer et al., 2009).

Vegetation and habitat in the Survey Area along the access road supports xeric desert communities dominated by yellow paloverde (*Parkinsonia microphylla*), creosote bush (*Larrea tridentata*) and various species of cactus that are growing on the steep rocky slopes. Downstream of Copper Basin Dam the vegetation changes rapidly to a mesic riparian woodland dominated by arrow weed (*Pluchea sericea*), Fremont cottonwood (*Populus fremontii*), willows (*Salix* spp.), and tamarisk (*Tamarix ramosissima*). A broad low-flow channel occurs in this area dominated by cattails (*Typha domingensis*) and other hydrophytic vegetation. Vegetation within the Survey Area is described below and shown on Figures 2a through 2e in Attachment A.

**Table 2. Summary of Vegetation and Cover Types in Survey Area**

| Vegetation and Land Cover Types | Type | Total Acres | Percentage of Total Acreage (%)[1] |
|---|---|---|---|
| Saguaro - foothill palo verde - velvet mesquite desert scrub* | Upland | 15.75 | 56.2 |
| Fremont cottonwood forest and woodland* | Riparian | 0.18 | 0.6 |

| Vegetation and Land Cover Types | Type | Total Acres | Percentage of Total Acreage (%)[1] |
|---|---|---|---|
| Arrow weed thickets* | Riparian | 3.14 | 11.1 |
| Cattail marsh | Riparian | 1.06 | 3.8 |
| **Other Cover Types**** | | | |
| Developed and Disturbed | N/A | 7.76 | 27.5 |
| Open Water | N/A | 0.21 | 0.8 |
| **Total** | **--** | **28.10** | **100** |

* These communities are designated as "Sensitive Natural Communities" by CDFW.
** These communities/cover types are not defined in Sawyer et al. (2009) or Holland (1986) but are included in this table for acreage calculation purposes.

**Saguaro - foothill palo verde - velvet mesquite desert scrub (*Carnegiea gigantea - Parkinsonia microphylla - Prosopis velutina* Provisional Shrubland Alliance).** This vegetation is characterized by the presence of yellow paloverde which dominates the uplands throughout the Survey Area. Other species such as creosote bush, white bursage (*Ambrosia dumosa*), chollas (*Cylindropuntia* spp.), and brittlebush (*Encelia farinosa*) are also present in low numbers. Saguaros (*Carnegiea gigantea*) are also present in low numbers just beyond the limits of the Survey Area. This vegetation matches the description of Arizonan woodland in Holland (1986). This vegetation has a state rank of S2.2 and is considered a sensitive natural community in California (CDFW, 2020).

**Fremont cottonwood forest and woodland (*Populus fremontii - Fraxinus velutina - Salix gooddingii* Forest & Woodland Alliance).** This vegetation is characterized by the presence of Fremont (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*). These species form a high overstory above species such as arrow weed (*Pluchea sericea*), umbrella plant (*Cyperus involucratus*), narrowleaf willow (*Salix exigua*). This vegetation matches the description of Sonoran cottonwood-willow riparian forest in Holland (1986). This vegetation has a state rank of S3.2 and is considered a sensitive natural community in California (CDFW, 2020).

**Arrow weed thickets (*Pluchea sericea* Shrubland Alliance).** This vegetation is dominated by arrow weed, narrowleaf willow, tamarisk, and other lower growing vegetation. It is present in the canyon bottom downstream of Copper Basin Dam and is also present along the margins on the Reservoir. This vegetation matches the description of arrow weed scrub in Holland (1986). This vegetation has a State rank of S3 and is considered to be a Sensitive Natural Community in California (CDFW, 2022).

**Cattail marshes [*Typha* (*angustifolia, domingensis, latifolia*) Herbaceous Alliance].** This vegetation community is dominated by cattails (*Typha* spp.), umbrella plant, and numerous other herbaceous species. It is present in the wettest portions of the canyon bottom downstream of Copper Basin Dam and also along the margins on the Reservoir. It should also be noted that this vegetation is mapped immediately below the dam which is in fact only dominated by umbrella plant on the channel bottom and Venus hair (*Adiantum capillus-veneris*) and yellow monkey flower (*Erythranthe guttata*) on the canyon walls. This vegetation matches the description of arrow weed scrub in Holland (1986). This vegetation has a State rank or S5 and is not considered a Sensitive Natural Community in California (CDFW, 2022).

**Developed and Disturbed.** Developed and disturbed lands are those portions of the Survey Area with human-dominated land uses, including the existing communications facility, a small development, and the unpaved access roads. Vegetation, where present, is dominated by native and non-native ruderal (weedy) species.

**Open Water.** Open water are those portions of the Survey Area located within the Reservoir. Vegetation, where present, is dominated by native aquatic species.

## 2.3. Climate

The region is characterized by a desert climate that experiences extreme fluctuations of daily temperatures, strong seasonal winds, and low rainfall. The average annual high temperature is about 86.4°F and the average annual low is about 62.1°F (WRCC, 2022). Precipitation in the region occurs mainly between November and April, with monsoonal rains in August and September (SWRCB, 2019). The mean seasonal precipitation for Parker Reservoir, approximately 5 miles west of the proposed Project is 5.5 inches (WRCC, 2022). Rainfall was below average in the region during both the 2020-2021 and 2021-2022 rainfall years (July 1 through June 30). Approximately 20 percent of normal rainfall has been recorded in the southeastern portion of California during that period (NOAA, 2022).

## 2.4. Hydrology, Geology and Geomorphology

The Survey Area is located within the East Colorado River Planning Area of the Colorado River Basin. This area is composed of deep alluvial deposits of silt, clay, and sand from previous alignments of the Colorado River. The mountains in the region generally run along northwest trending faults that have largely influenced the area's northwest-oriented valleys, mountains, and dry lakes. These mountains predominantly consist of metamorphic and igneous rocks from pre-Cambrian to Tertiary era (SWRCB, 2019). Currently, an average of 1,148 gallons of water per minute seep from the Copper Basin Dam, creating perennial water flow through Copper Basin Wash. Typically, this flow does not provide connectivity to the Colorado River.

The Colorado River Basin region in southeastern California covers approximately 13 million miles, which is only a small portion of the total Colorado River drainage. The Colorado River drainage spans additional states of Arizona, Nevada, Utah, Wyoming, Colorado, New Mexico, and portions of northwestern Mexico. The Colorado River flows for 230 miles within California. Several dams, including the nearby Parker Dam, are located within the East Colorado River Planning Area and water is diverted to Metropolitan facilities for export through the California Aqueduct to coastal counties (SWRCB, 2019).

## 2.5. Soils

Aspen used soil data from the Natural Resources Conservation Service (NRCS) historic mapping projects to determine if and where hydric soils could be present in the Survey Area (NRCS, 2022). Figures 3a through 3d in Attachment A illustrate the location of these mapped soil types in relation to the Survey Area. Table 3 describes the soils within the Survey Area. The mapped soil types are well-drained and are not prone to flooding. In general, the descriptions of soil types within the Survey Area indicate that hydric soil conditions are not expected. It is possible that the mapped soils below may include small pockets of other soil types that were not captured within the NRCS mapping scale but that were assessed as part of the field work.

**Table 3. Soil Units Occurring in the Survey Area**

| Map Unit Symbol | Map Unit Name | Description | Acres |
|---|---|---|---|
| s1126 | Tecopa-Rock outcrop-Lithic Torriorthents | A well-drained soil generally found on steep slopes; parent material consists of colluvium weathered from quartzite and gneiss; not prone to flooding. | 15.54 |
| s1129 | Rositas-Beeline-Badland | A well-drained soil: parent material consists of mixed alluvium and eolian sands; not prone to flooding. | 10.28 |

| Map Unit Symbol | Map Unit Name | Description | Acres |
|---|---|---|---|
| -- | Not Mapped | These areas have not been previously mapped and soil data is not available. | 2.28 |
| **Total** | | | **28.10** |

# 3. REGULATORY BACKGROUND

Jurisdictional waters, wetlands, and riparian habitat are regulated by the USACE, CRRWCQB, and CDFW. The USACE Regulatory Program regulates activities pursuant to Section 404 of the CWA; the CDFW regulates activities under California Fish and Game Code Section 1600-1607; and the SWRCB regulates activities under Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act. Additional details on regulatory authorities and background are provided below.

## 3.1. Section 404 of the Clean Water Act (CWA)

Section 404 of the CWA regulates the discharge of dredged material, placement of fill material, or certain types of excavation within "Waters of the U.S." (resulting in more than incidental fallback of material) and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Permits can be issued for individual projects (individual permits) or for general categories of projects (general permits). "Waters of the U.S." are defined by the CWA as "rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands." Wetlands are defined by the CWA as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." USACE has adopted several revisions to their regulations in order to more clearly define "Waters of the U.S." Until the beginning of 2001, "Waters of the U.S." included, among other things, isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable "Waters of the U.S."

The jurisdictional extent of USACE regulation changed with the 2001 SWANCC (Solid Waste Agency of Northern Cook County) ruling. The U.S. Supreme Court held that the USACE could not apply Section 404 of the CWA to extend their jurisdiction over an isolated quarry pit. The Court ruled that the CWA does not extend Federal regulatory jurisdiction over non-navigable, isolated, intra-state waters. However, the Court made it clear that non-navigable wetlands adjacent to navigable waters are still subject to USACE jurisdiction.

In 2020, the U.S. Environmental Protection Agency (EPA) updated the CWA and their definition of navigable waters (USACE and USEPA, 2020). The Navigable Waters Protection Rule regulates the nation's navigable waters and the core tributary systems that provide perennial or intermittent flows into these systems. As such, "Waters of the U.S." encompass traditional navigable waters; perennial and intermittent tributaries that contribute surface waters flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters. Based on this ruling, ephemeral waters were not mapped as "Waters of the U.S." In 2021, the EPA and USACE were directed by the Biden Administration and the U.S. District Court to vacate the 2020 Navigable Waters Protection Rule and revert back to the pre-2020 rule. This revision of the Waters of the U.S. rule meant that ephemeral drainages were once again being treated as Waters of the U.S.

On April 6, 2022, the U.S. Supreme Court issued a stay of the 2021 order by the U.S. District Court for the Northern District of California that vacated the EPA's 2020 Clean Water Act Section 401 Certification Rule.

Therefore, the CWA section 401 certification process is once again governed by the CWA section 401 certification regulations promulgated by EPA in 2020 (40 CFR 121). On June 1, 2022, the EPA Administrator signed a proposed rule to improve the CWA section 401 certification process. The proposed rule would replace and update the existing regulations at 40 CFR 121, to be more consistent with the statutory text of the 1972 CWA and clarify elements of section 401 certification practice that has evolved over the 50 years since the 1971 regulation was promulgated. On June 9, 2022, the proposed rule was published in the Federal Register (EPA, 2022). Based on a high degree of uncertainly and on-going changes in policy, ephemeral drainages are treated as jurisdictional Waters of the U.S. in this report.

## 3.2. Porter Cologne Water Quality Control Act and Section 401 of the Clean Water Act

The RWQCBs regulate activities affecting 'Waters of the State' according to the Porter-Cologne Water Quality Control Act and Section 401 of the CWA. The Porter-Cologne Act defines Waters of the State as all surface and subsurface waters. The RWQCBs may issue permits (called Waste Discharge Requirements or WDRs) or may issue a waiver for a given application. In addition, the California Water Resources Control Board (CWRCB) has started to implement a new regulatory program for all Waters of the state in 2020 (CWRCB 2019). For non-wetland Waters of the state, CWRCB procedures and guidelines recognize the ordinary high-water mark (OHWM) as defined by federal guidelines (CWRCB 2019, 2020; see also USACE 2008a, 2008b) as the limits of jurisdiction. However, Waters of the State include isolated waters and need not have downstream surface connection to federally jurisdictional waters. The new program uses the soils, hydrology, and vegetation criteria to identify wetlands, but may define certain unvegetated sites (e.g., mud flats or playas) as wetlands based on only the soils and hydrology criteria. The Survey Area is within the jurisdictional boundaries of the Colorado River RWQCB.

Section 401 of the CWA requires that:

> *…any applicant for a Federal permit for activities that involve a discharge to "Waters of the State," shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act.*

Therefore, before the USACE may issue a Section 404 permit, a permittee must apply for and receive a Section 401 Water Quality Certification from the RQWCB, Colorado River Region. The RWQCB may add conditions to their certification to remove or mitigate potential impacts to water quality standards.

On April 2, 2019, the State Water Resources Control Board (SWRCB) adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State. The adopted definitions and procedure allow for the presence of hydric substrates as a criterion for wetland identification (not just wetland soils) and wetland hydrology for an area devoid of vegetation (less than 5% cover) to be considered a wetland. Waters of the State were delineated based on the OHWM in the field.

## 3.3. Section 1602 of the California Fish and Game Code

Section 1602 of the California Fish and Game Code requires any person, State or local governmental agency, or public utility which proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or use materials from a streambed, or result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake, to first notify the CDFW of the proposed project. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least

periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. Based on the notification materials submitted, the CDFW will determine if the proposed project may impact fish or wildlife resources.

If the CDFW determines that a proposed project may substantially adversely affect existing fish or wildlife resources, a Lake or Streambed Alteration Agreement (SAA) will be required. A completed CEQA document must be submitted to CDFW before a SAA will be issued.

# 4. WATERS DELINEATION METHODOLOGY

This section describes the methods used by Aspen during surveys conducted in March 2022 to determine the extent of potentially jurisdictional waters and/or wetlands that occur in the Survey Area. Prior to conducting the field assessment, Aspen reviewed current and historic aerial photographs; previous delineations conducted in the area; hydrological studies; detailed topographic maps (1-foot intervals); historical Soil Surveys (NRCS); CDFW guidelines for dryland watersheds, and the local and state hydric soil list to evaluate the potential active channels and wetland features that occur in the Survey Area. During the field assessment, hydrology was mapped using a Bad Elf GPS unit and identified on aerial photographs on a tablet (see Figures 4a through 4o in Attachment A). In a few locations, photographs were taken to document areas that were not drainages but may appear as drainages on aerial photographs (see Attachment B). Field maps were digitized using Geographic Information System (GIS) and the total jurisdiction area for each jurisdiction was calculated.

## 4.1. Federal Waters/Wetlands

Federally jurisdictional non-wetland “Waters of the U.S.” were delineated based on the limits of the OHWM, as determined by changes in physical and biological features, such as bank erosion, vegetation, or debris wrack. This is consistent with methods described in the USACE Wetland Delineation Manual (1987) and the Arid West Supplement (2008). Federal wetlands were delineated based on three wetland parameters: hydrophytic vegetation, wetland hydrology, and hydric soils.

## 4.2. CRBRWQCB Wetlands/Waters

The SWRCB issued new procedures which went into effect in May 2020 (SWRCB, 2020). These procedures expanded the definition of wetlands to include areas that may not meet the definition of a wetland based on the USACE Wetland Delineation Manual and Regional Supplements. Areas that may be included as wetlands per the new procedures include areas that are unvegetated but otherwise meet the criteria of federal wetlands, any natural wetlands, wetlands created by a modification to Waters of the state, and wetlands that have formed as a result of historic human activity. Jurisdictional non-wetland Waters of the state were delineated based on the limits of the OHWM as determined by changes in physical and biological features, such as bank erosion, deposited vegetation or debris, and vegetative characteristics.

## 4.3. CDFW Jurisdiction

CDFW jurisdiction was delineated to the top of the banks of the channel and/or to the highest level of confinement that could be reasonably identified, and in the southern portion of the Survey Area it was also mapped to the edge of any riparian vegetation. Due to the presence of human disturbances such as roads, remnant channels that continue to collect water and function as swales were also mapped.

# 5. RESULTS

Five types of jurisdictional features were documented within the Survey Area: USACE wetland Waters of the U.S., USACE non-wetland Waters of the U.S., CRBRWQCB wetland Waters of the State, CRBRWQCB non-wetland Waters of the State, and CDFW streambeds and vegetation (see Figures 4a through 4o in Attachment A; Attachment C; Attachment D). The jurisdictional features are summarized in Table 4, and descriptions of the drainages follow the table. A complete aquatic resource table for USACE jurisdiction is provided as Attachment E and impacts to CRBRWQCB and CDFW are summarized in Attachment F.

**Table 4. Jurisdictional Wetlands, Waters, and Streambeds Within the Survey Area**

| | USACE Waters and Wetlands (Acres)[a] | | CRBRQWCB Waters and Wetlands (Acres)[a] | | CDFW Jurisdictional Habitat (Acres)[b] |
|---|---|---|---|---|---|
| | Non-wetland Waters of U.S. | Wetlands[b] | Non-wetland Waters of U.S. | Wetlands[b] | |
| Total Survey Area | 1.30 | 0.94 | 1.30 | 0.94 | 5.55 |
| Total Project Area | 0.15 | 0.09 | 0.15 | 0.09 | 0.53 |
| Permanent Impact Area | 0.04 | 0.06 | 0.04 | 0.06 | 0.25 |
| Temporary Impact Area | 0.11 | 0.02 | 0.11 | 0.02 | 0.29 |

(a) Non-wetland Waters of the United States and Non-wetland Waters of the State overlap; as such, jurisdictional acreages are not additive.
(b) Wetlands fall under the jurisdiction of the USACE, SWRCB, and CDFW, each with separate extents that overlap; as such, wetland acreages are not additive.

Additional details on the drainages mapped within the Survey Area are provided below. Several of these categorized into sub-drainages (i.e., 1a, 1b, etc.) in the aquatic resources table (Attachment E) and CRBRWQCB and CDFW impact summary table (Attachment F); however, for the purpose of this summary each drainage is discussed as single feature.

- **Drainages 9, 11, 12, 15, 16, 18, 19, 21--23, 25, 26, 30, 31, 33, 34, 36, 38, 47, 49, 50, 54, and 55.** These drainages are located where ephemeral features connect with the Reservoir. Most of these drainages are wetlands along the margins of the Reservoir, just beyond the defined OHWM. They are primarily vegetated by cattail marsh with some areas of arrow weed thickets also present. The wetlands are mapped as Freshwater Forested/Shrub Wetland (PSS1C) and Freshwater Emergent Wetland (PEM1C) in the National Wetlands Inventory (USFWS, 2022). These drainages make up a large portion of the USACE wetland water of the U.S. and CRBRQWCB wetlands of the state within the Survey Area. They also fall under CDFW jurisdiction. Most of these drainages will be avoided during construction of the proposed Project.
- **Drainage 1-8, 10, 13, 14, 17, 26-28, 32, 35-37, 39-46, 48, 51-53, and 56-67.** These drainages make up a series of ephemeral washes and channels that enter the Reservoir from the south and west. Drainages 1 and 2 flow east through the staging area and eventually enter the Reservoir. The remaining drainages flow onto or off the unpaved access road and eventually enter the Reservoir from the south. These ephemeral drainages are largely unvegetated or vegetated by upland vegetation such as saguaro - foothill palo verde - velvet mesquite desert scrub. The drainages are not mapped in the National Wetlands Inventory (USFWS, 2022).
- **Drainage 68.** This drainage is the largest drainage within the Survey Area and includes Copper Basin Wash downstream of the Reservoir. Drainage 64 includes USACE wetland Waters of the U.S., CRBRQWCB wetlands of the state, USACE non-wetland Waters of the U.S., CRBRQWCB non-wetland Waters of the State, and CDFW streambeds and vegetation. Vegetation along drainage 64 is a diverse

matrix of saguaro – foothill palo verde – velvet mesquite desert scrub, Fremont cottonwood forest and woodland, arrow weed thickets, and cattail marsh. The wetlands along this drainage are primarily mapped as Freshwater Forested/Shrub Wetland (PSS1B) in the National Wetlands Inventory (USFWS, 2022). The OHWM downstream of the Reservoir does not span the entire canyon bottom and is therefore flanked by federally jurisdictional wetlands.

- **Drainage 69.** This drainage includes the Reservoir, a large deep reservoir located within the Survey Area which is mapped as USACE Waters of the U.S. It is also expected to be considered CRBRQWCB non-wetland Waters of the State and CDFW jurisdictional lakebed. Drainage 65 is mapped as Lake (L1UBH) in the National Wetlands Inventory (USFWS, 2022).

## 5.1. Wetland Waters of the U.S.

Based on the field assessment, including the wetland sample locations, federal wetlands were determined to be present within the Survey Area (see Figures 4a through 4o in Attachment A). The assessment determined that hydrology, hydric soils, and hydrophytic vegetation were all present in portions of drainages 9, 11, 12, 15, 16, 18, 19, 21--23, 25, 26, 30, 31, 33, 34, 36, 38, 47, 49, 50, 54, and 55. These wetlands were all present at or above the OHWM of the Reservoir and Copper Basin Wash. Wetland hydrology, included the presence of surface water and a high ground-water table. Hydric soils were present as indicated by a strong hydrogen sulfur odor and a sandy gleied-matrix. A dominance of hydrophytic vegetation was also present and included several wetland and riparian plant species. The Wetland Determination Data Forms for the Arid West Region are included in Attachment B. All impacts to wetland Waters of the U.S. are quantified in Attachment E.

## 5.2. Non-wetland Waters of the U.S.

Based on this assessment of OHWMs and Aspen's professional opinion, non-wetland Waters of the U.S. as outlined in 33 CFR Part 328, were determined to be present within the Survey Area (Table 4 and Figure 4 of Attachment A). This includes drainage 1-8, 10, 13, 14, 17, 26-28, 32, 35-37, 39-46, 48, 51-53, and 56-67, and portions of drainage 68. Some of the key hydrology indicators noted during the delineation included the indicators listed below. See Tables 3-1 and 3-2 in Attachment D for additional information. All impacts to non-wetland Waters of the U.S. are quantified in Attachment E.

- A11 – Scour holes downstream of obstructions
- A16 – Desiccation/mud cracks
- B3 – Benches
- B6 – Break in bank slope
- B8 – Change in particle size distribution
- B10 – Exposed root hairs below intact soil layer
- B11 – Silt deposits
- B12 – Litter (organic debris, small twigs and leaves)
- B13 – Drift (organic debris, larger than twigs)
- C8 – Soil development

## 5.3. Wetlands of the State

Based on a field assessment, including wetland sample locations, and Aspen's professional opinion, wetlands of the State are present in the Survey Area (Table 4 and Figure 4 of Attachment A). This includes portions of drainages 9, 11, 12, 15, 16, 18, 19, 21--23, 25, 26, 30, 31, 33, 34, 36, 38, 47, 49, 50, 54, and 55, and 68. These wetlands were all present along the margins of the Reservoir and Copper Basin Wash. Wetland hydrology, hydric soils, and hydrophytic vegetation are all discussed above on Section 5.1. A summary of all impacts to CRBRWQCB jurisdictional features are summarized in Attachment F.

## 5.4. Waters of the State

Based on this assessment of OHWMs and Aspen's professional opinion, Waters of the State are present within the Survey Area (Table 4 and Figure 4 of Attachment A). This includes drainage 1-8, 10, 13, 14, 17, 26-28, 32, 35-37, 39-46, 48, 51-53, 56-67, 69 and portions of 68. . The limits of the Waters of the State match the limits of the Waters of the U.S. described above in Section 5.2. A summary of all impacts to CRBRWQCB jurisdictional features are summarized in Attachment F.

## 5.5. CDFW Jurisdictional Waters

Based on the field assessment and Aspen's professional opinion, CDFW jurisdictional streambeds and adjacent jurisdictional vegetation are present in the Survey Area (Table 4 and Figure 4 of Attachment A). This includes portions of Drainages 1 through 65 and is based on the presence of bed and bank and riparian vegetation. A summary of all impacts to CDFW jurisdictional features are summarized in Attachment F.

# 6. SUMMARY AND CONCLUSIONS

All of the potentially jurisdictional features mapped in the western portions of the Survey Area are characterized as ephemeral desert dry washes, whereas the drainage in the eastern portion of the Survey Area, below the Dam is characterized as perennial and supports jurisdictional wetlands. The dry washes in the western half of the Survey Area exhibited field indicators of linear deposits of sediment and/or plant debris, bank scour, and erosion. The wetlands in the eastern half of the Survey Area exhibited hydric soils, hydrophytic vegetation, and hydrology. It was determined that the Survey Area supports the following jurisdictional features:

- 0.94 acre of wetlands under the jurisdiction of the USACE and CRBRWQCB, including 0.02 acre that will be temporarily impacted and 0.06 acre that will be permanently impacted.
- 1.30 acres of Waters of the U.S./Waters of the State fall under the jurisdiction of the USACE and CRBRWQCB, including 0.11 acre that will be temporarily impacted and 0.04 acre that will be permanently impacted.
- 5.55 acres of streambeds and riparian habitat under the jurisdiction of CDFW, including 0.29 acres that will be temporarily impacted and 0.25 acres that will be permanently impacted.

The presence and locations of these features should help guide Metropolitan with the development of the project designs and reduce potential impacts or the need to obtain regulatory permits. The conclusions presented above represent Aspen's professional opinion based on knowledge and experience with the Corps, the SWRCB, and the CDFW, including regulatory guidance documents and manuals. The Corps, CRBRWQCB, and CDFW have final authority in determining the status and presence and extent of jurisdictional wetlands/waters.

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# Attachment A

## FIGURES

N

0 500 1,000 Feet

Survey Area

Project Area

**Figure 1**

**Project Overview**

Survey Area

Temporary Impact

Vegetation and Cover Types

Disturbed or Developed

0 50 100 Feet

**Figure 2a**

**Vegetation**

Survey Area

Temporary Impact

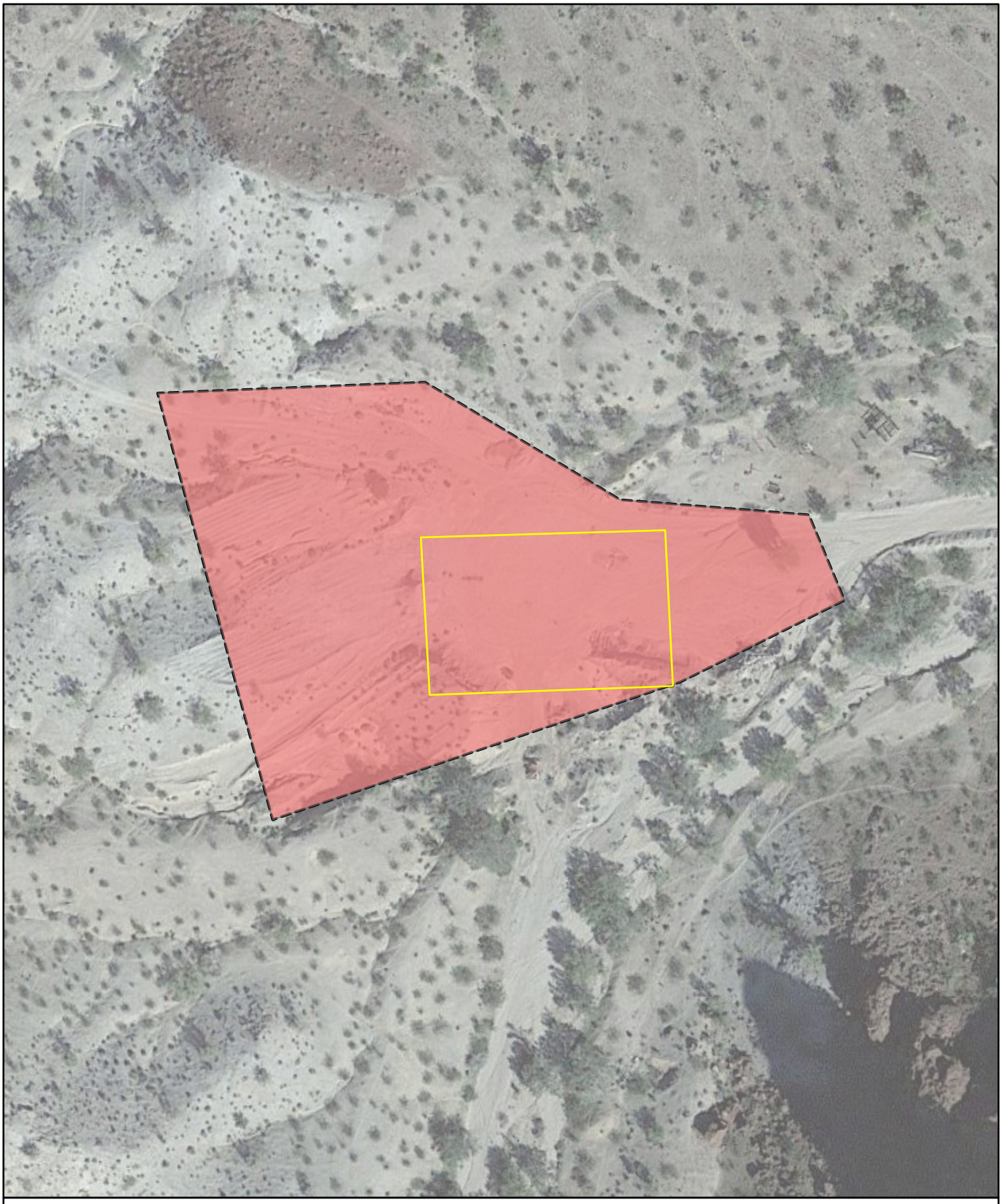
Vegetation and Cover Types

Disturbed or Developed

0 50 100 Feet

**Figure 2b**

**Vegetation**



Survey Area

Temporary Impact

Vegetation and Cover Types

Disturbed or Developed

0 50 100 Feet

**Figure 2c**

**Vegetation**

Survey Area
Permanent Impact
Temporary Impact

Vegetation and Cover Types

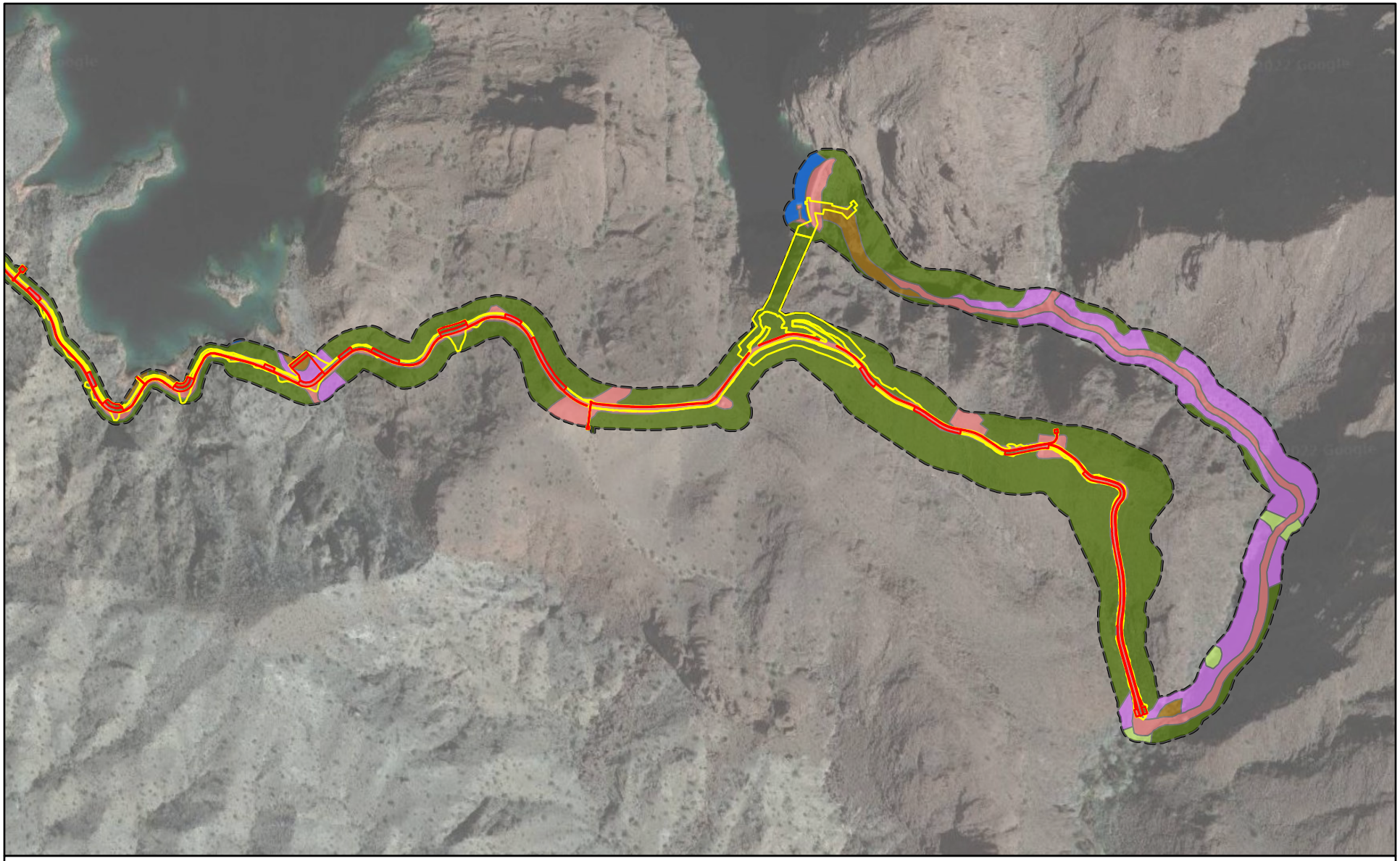
Arrow weed thickets
Cattail marshes
Disturbed or Developed
Open Water
Saguaro-foothill palo verde

N

0 400 800 Feet

**Figure 2d**

**Vegetation**



Survey Area
Permanent Impact
Temporary Impact

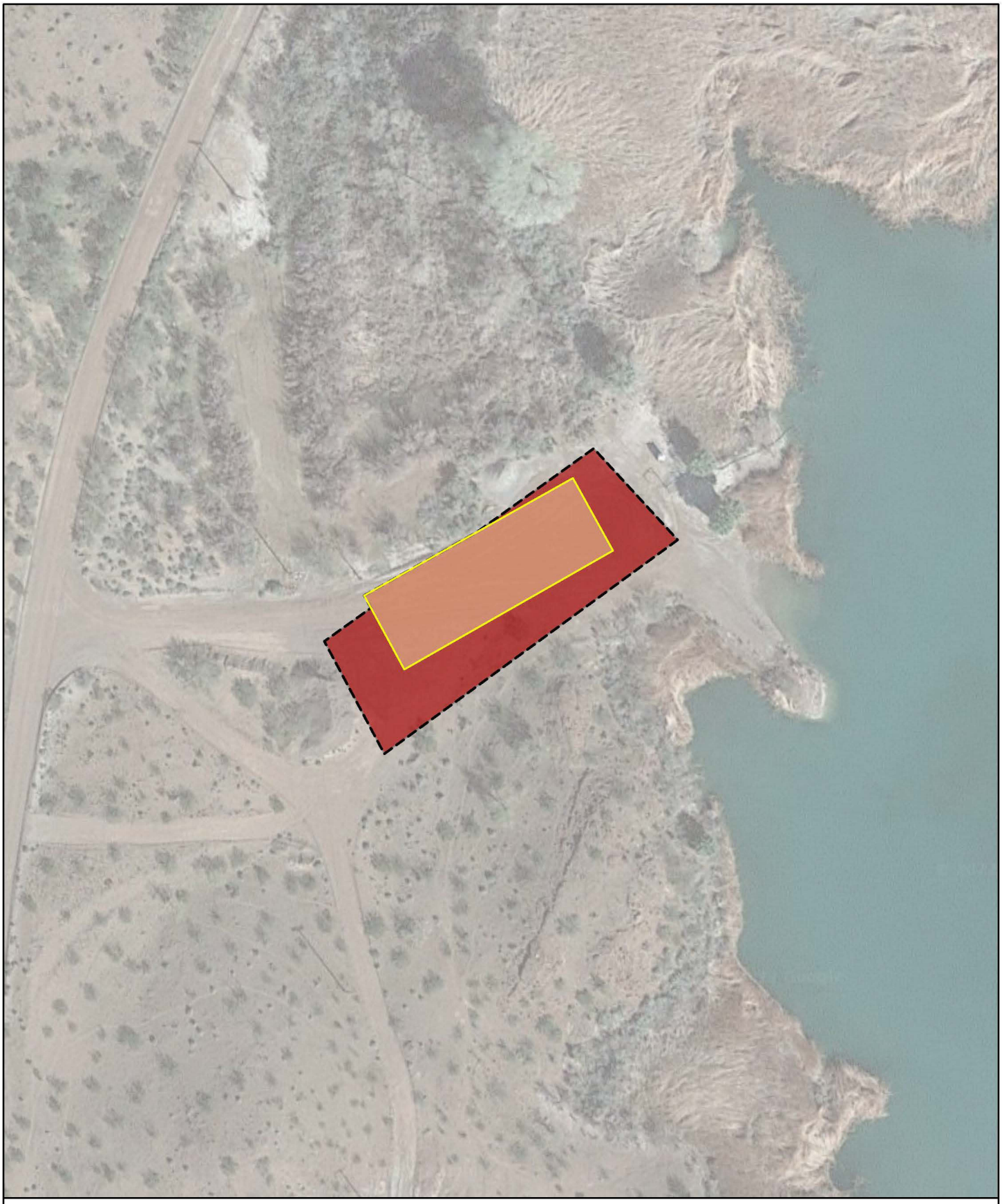
Vegetation and Cover Types
Arrow weed thickets
Cattail marshes
Disturbed or Developed
Fremont Cottonwood Forest
Open Water
Saguaro-foothill palo verde

N

0 400 800 Feet

**Figure 2e**

**Vegetation**



N

0 50 100 Feet

Survey Area

Temporary Impact

Soils

Not Mapped

**Figure 3a**

**Soils**

N

0 50 100 Feet

Survey Area

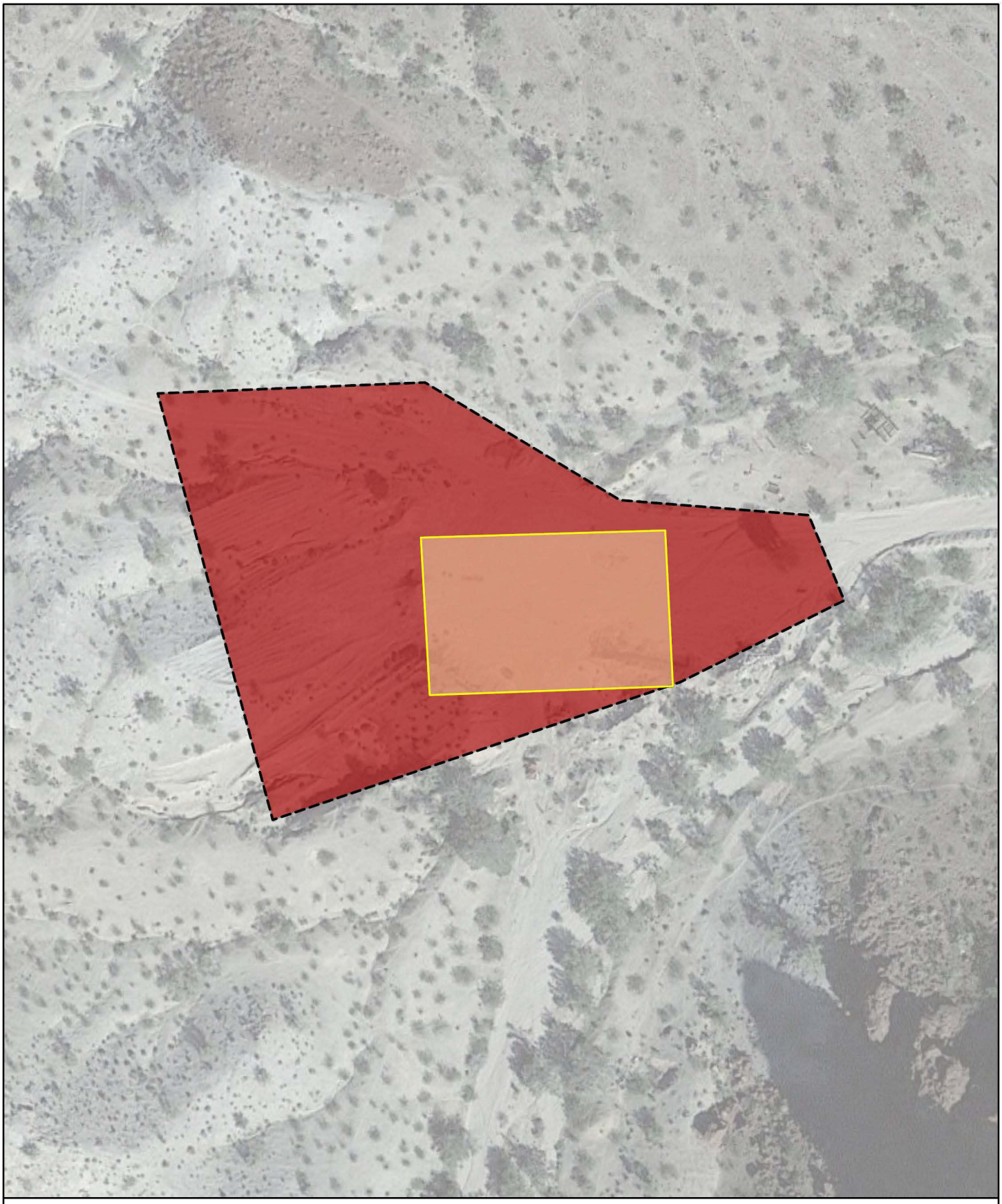
Temporary Impact

Soils

Not Mapped

**Figure 3b**

**Soils**



N

0 50 100 Feet

Survey Area

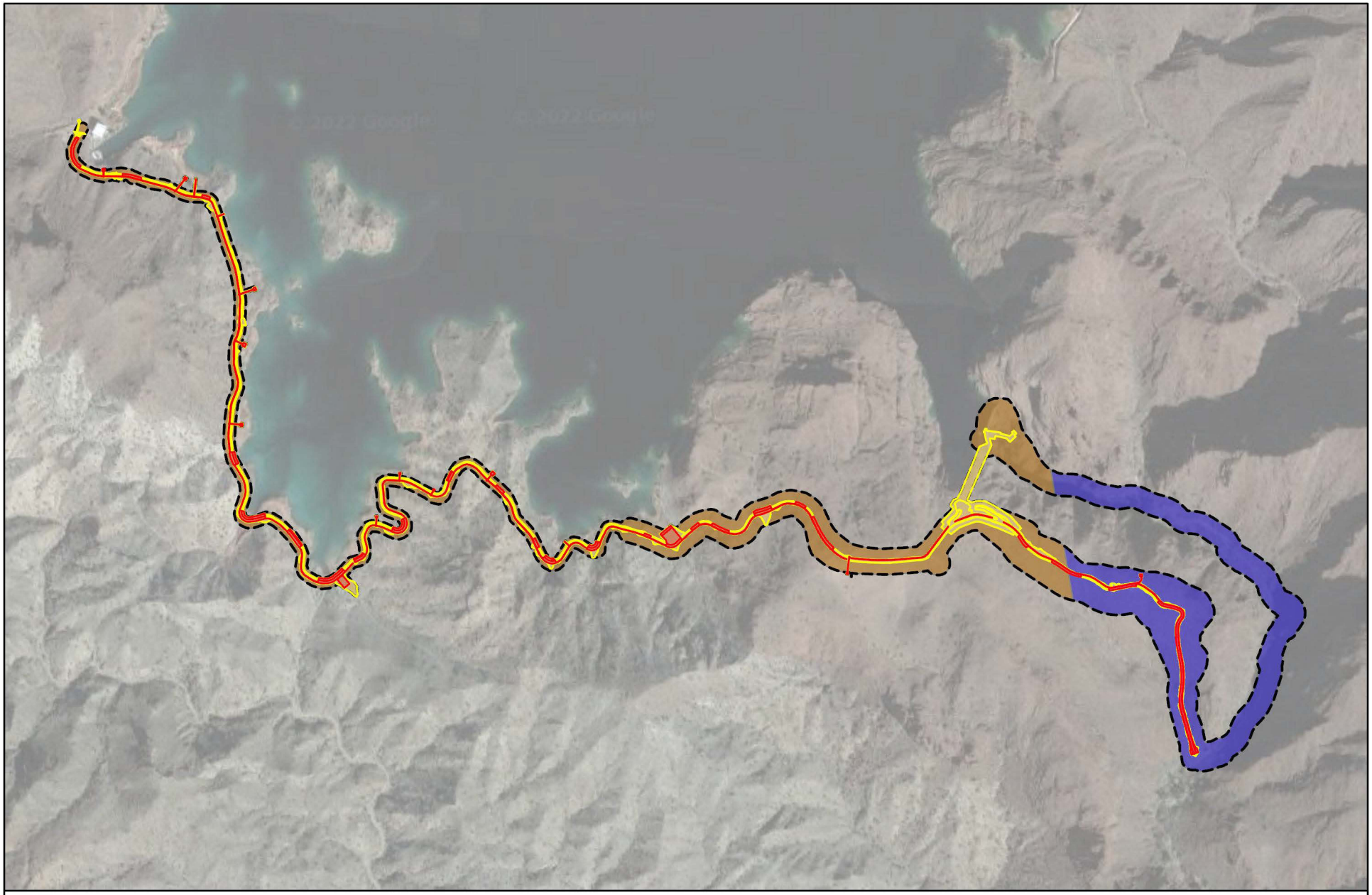
Temporary Impact

Soils

Not Mapped

**Figure 3c**

**Soils**




N

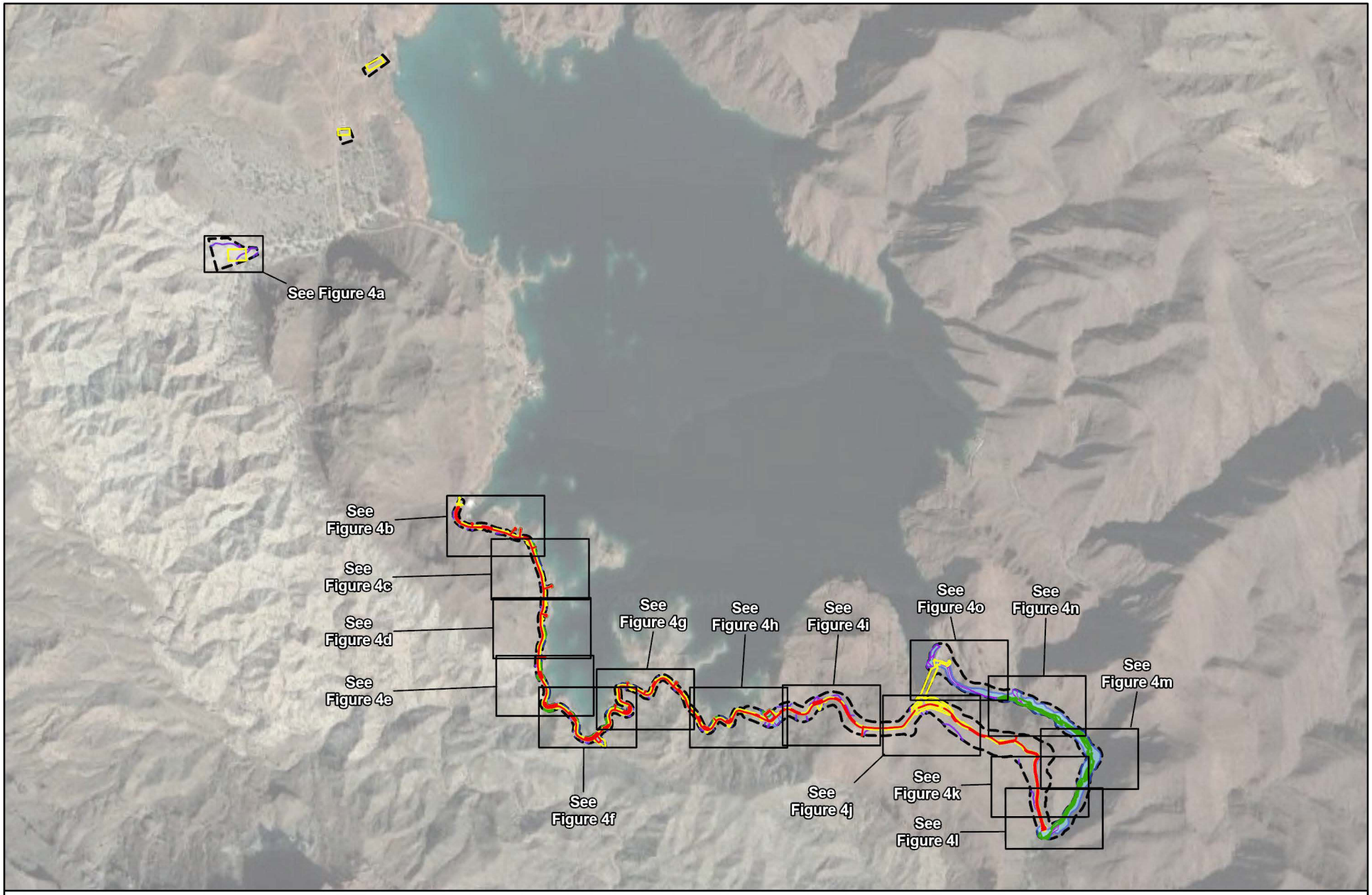
0 500 1,000 Feet

Survey Area
Permanent Impact
Temporary Impact

Soils
s1126, Tecopa-Rock outcrop-Lithic Torriorthents
s1129, Rositas-Beeline-Badland

**Figure 3d**

**Soils**




N

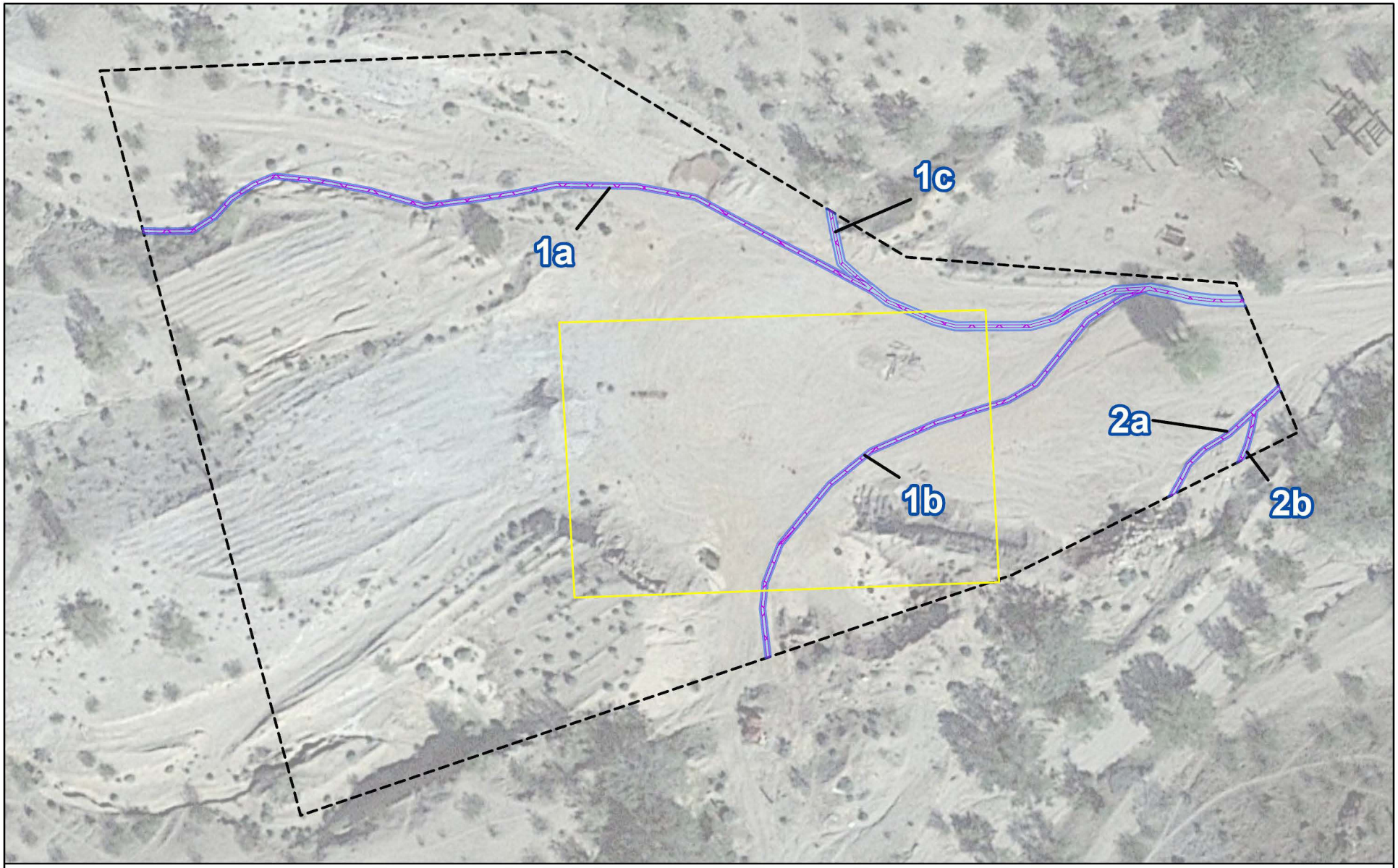
0 500 1,000 Feet

Survey Area
Permanent Impact
Temporary Impact

Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

**Figure 4**

**Aquatic Resources Delineation Map**




N

0 30 60 Feet

Survey Area

Temporary Impact

Jurisdictional Delineation

CDFW

CRBRWQCB/USACE Waters of the U.S.

**Figure 4a**

**Aquatic Resources Delineation Map**

Survey Area
Permanent Impact
Temporary Impact

Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4b**

**Aquatic Resources Delineation Map**

Survey Area
Permanent Impact
Temporary Impact

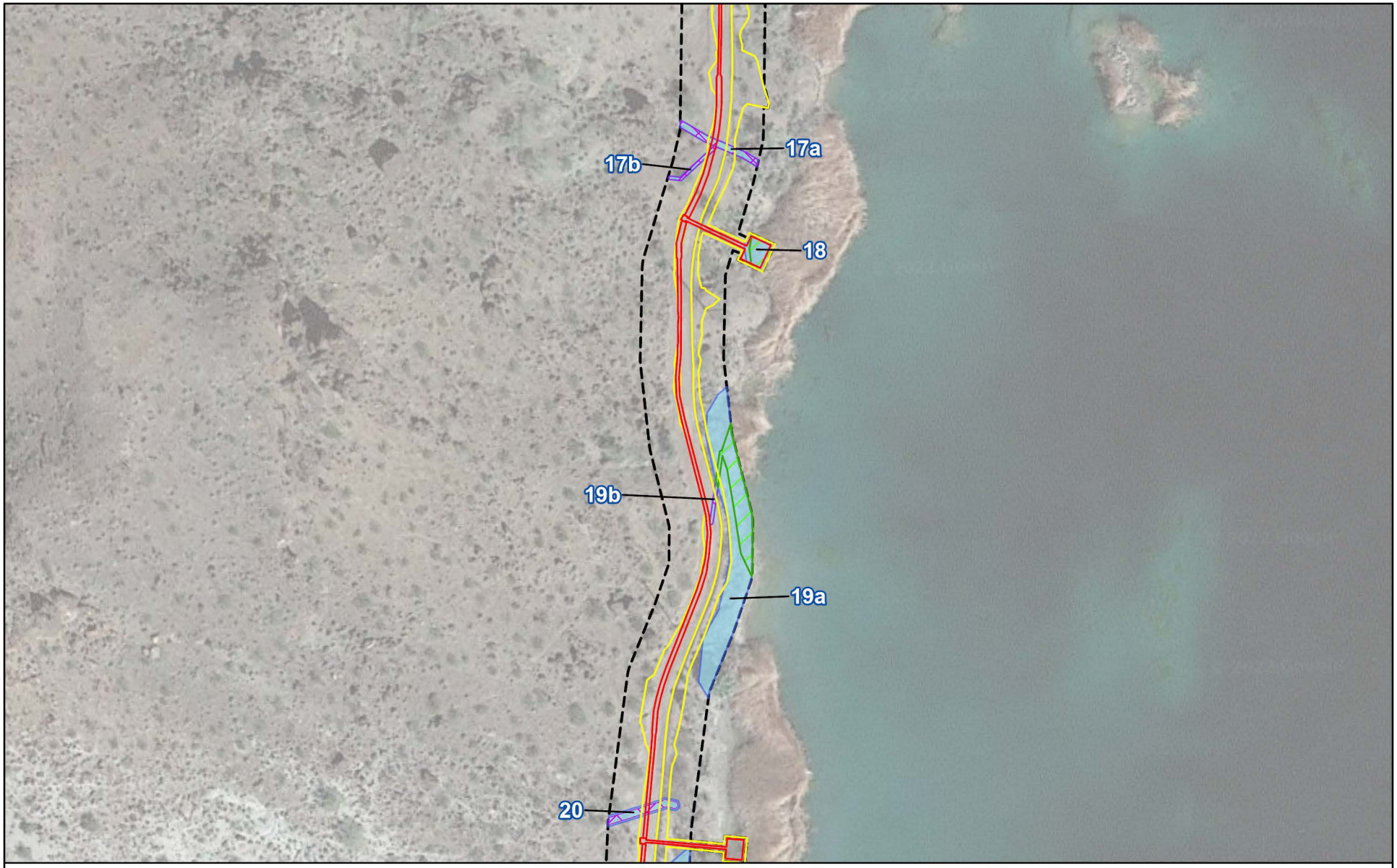
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4c**

**Aquatic Resources Delineation Map**




Jurisdictional Delineation

Survey Area
Permanent Impact
Temporary Impact

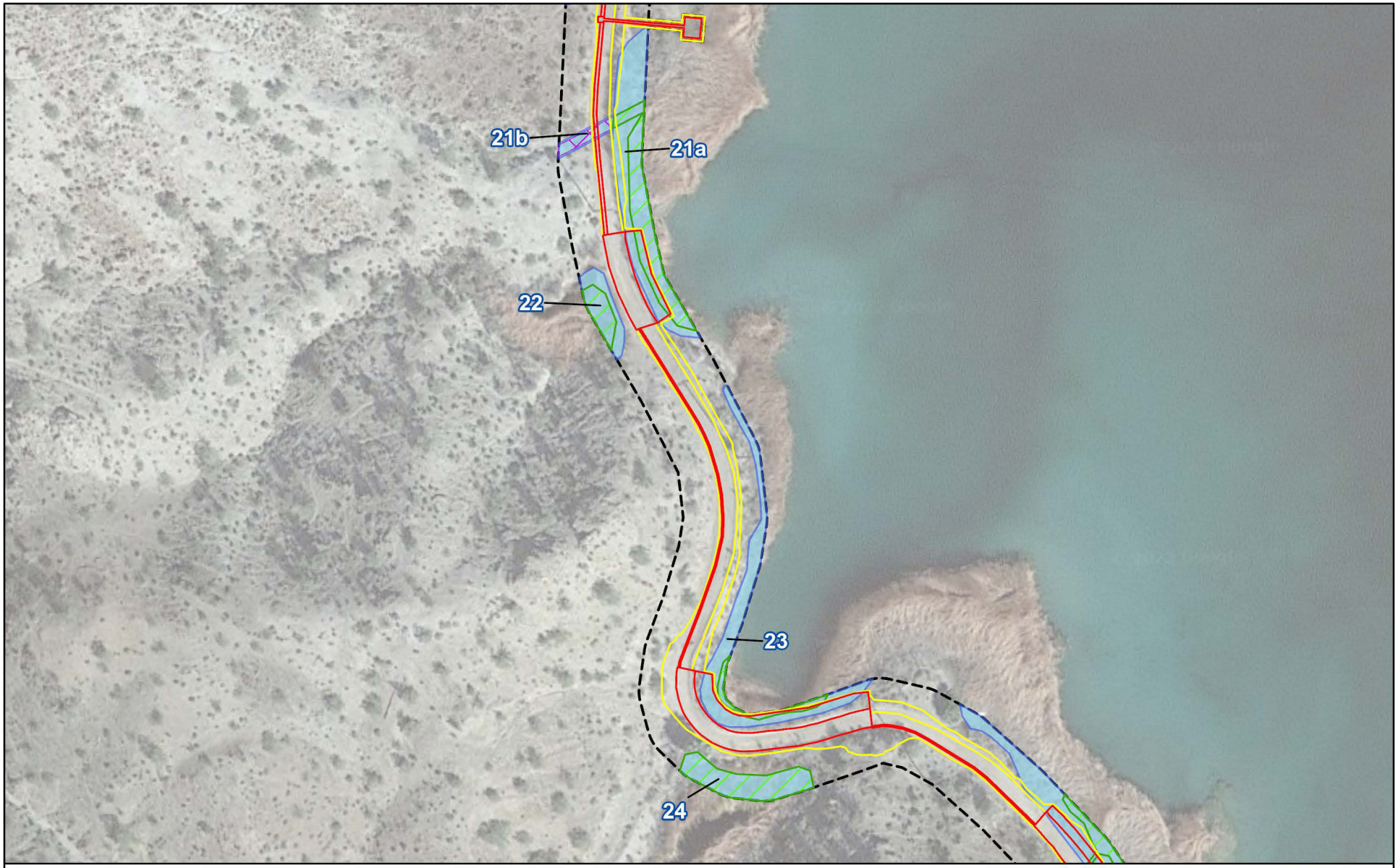
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4d**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

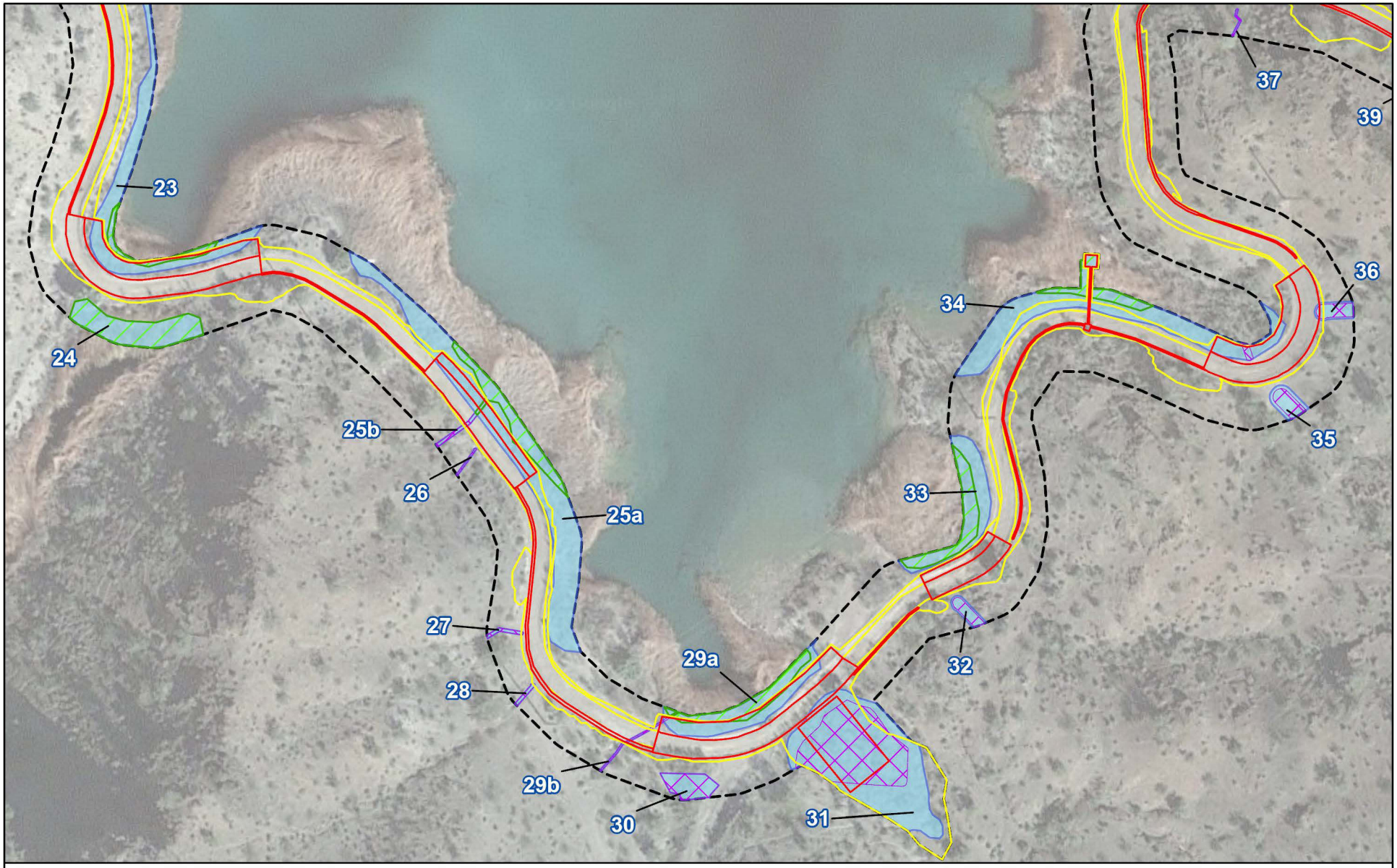
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4e**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

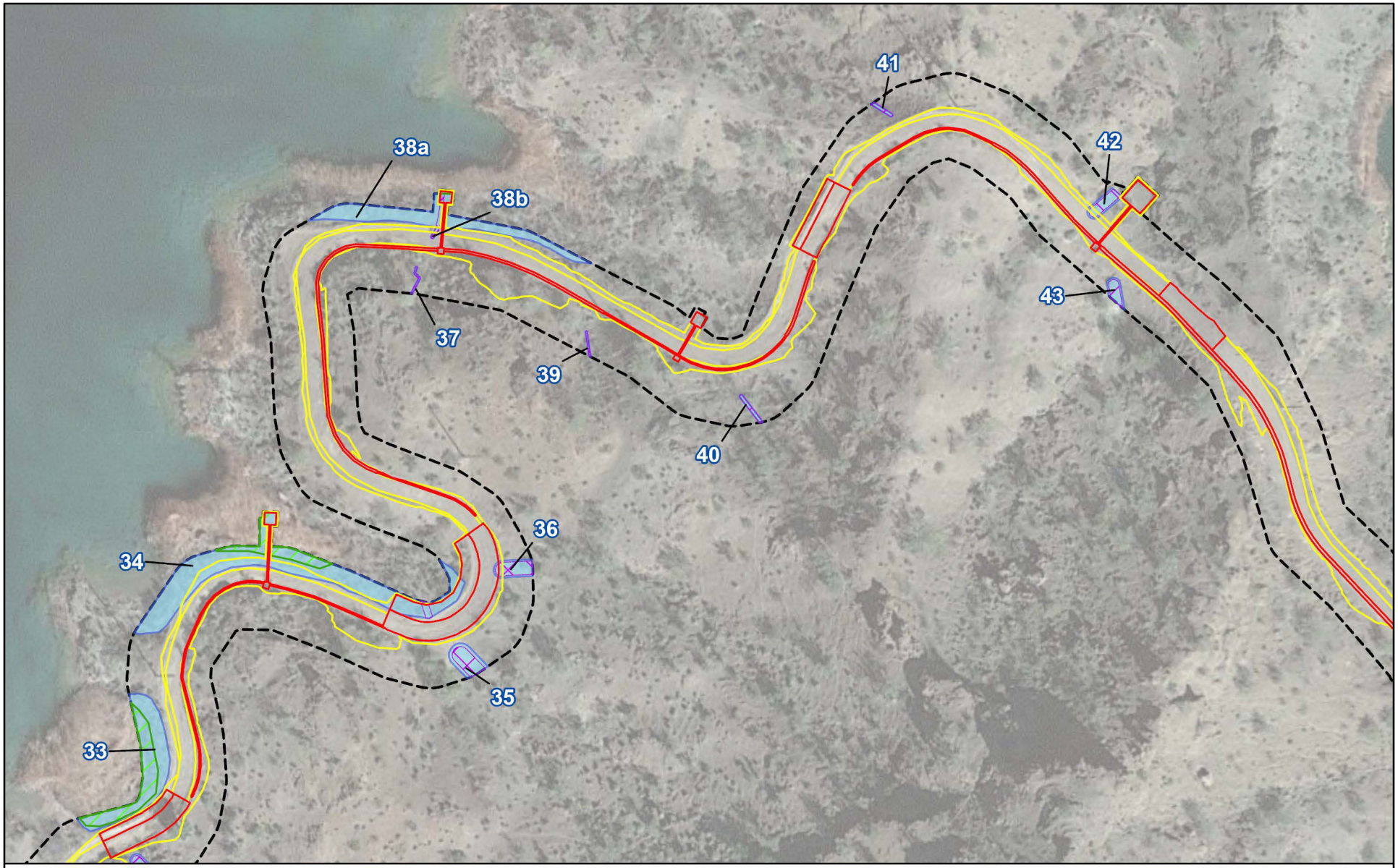
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4f**

**Aquatic Resources Delineation Map**




Jurisdictional Delineation

Survey Area
Permanent Impact
Temporary Impact

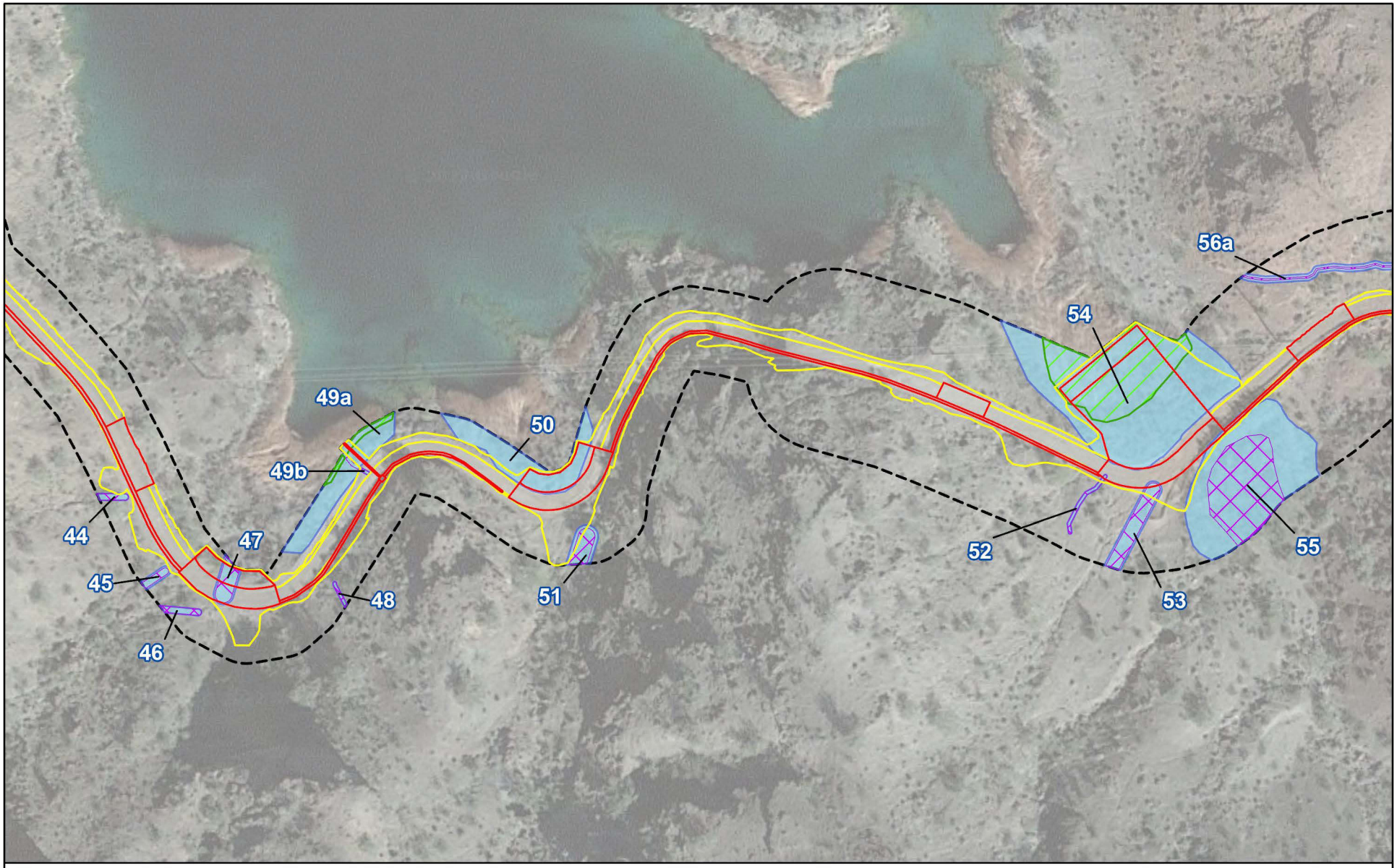
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4g**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

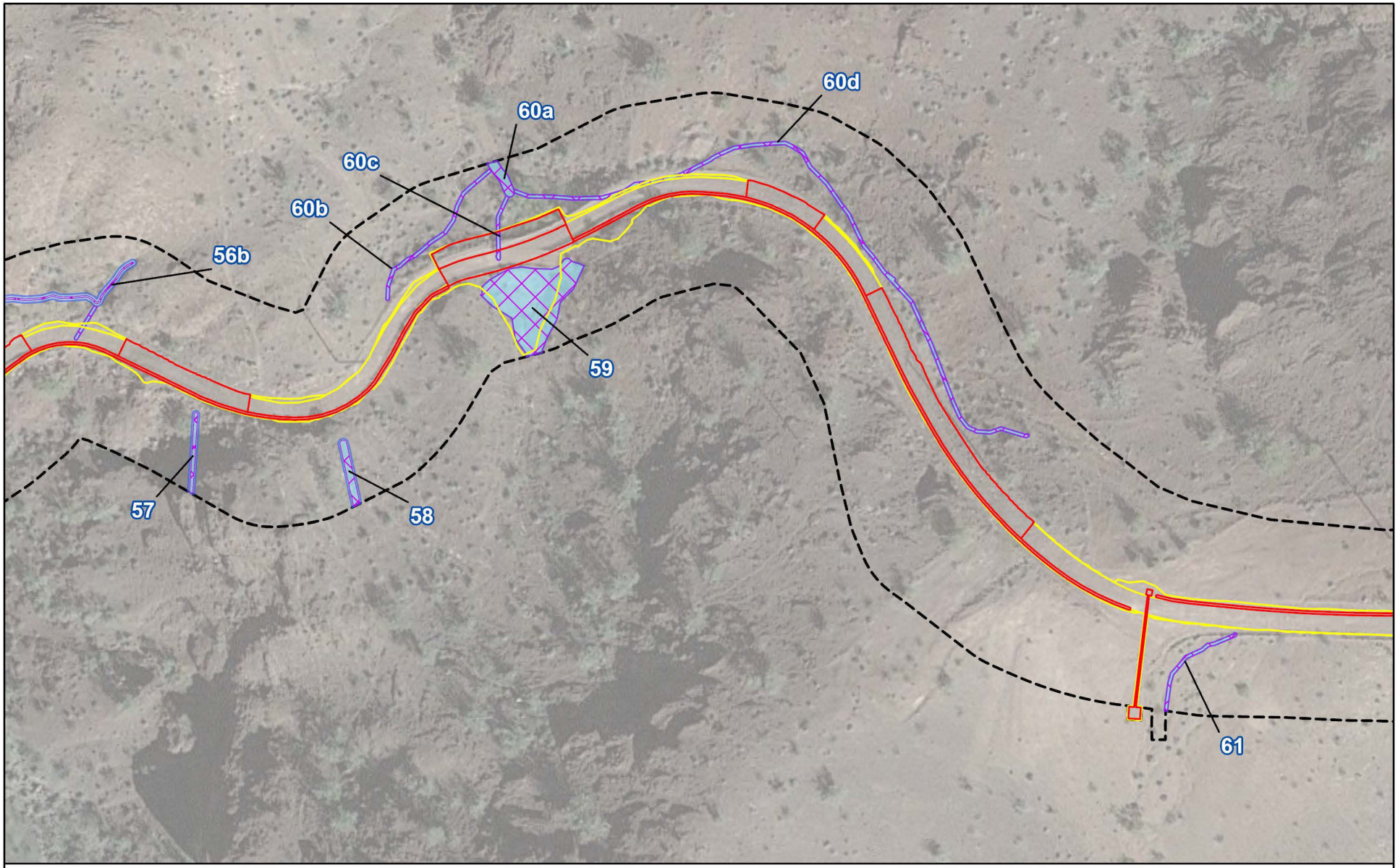
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4h**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

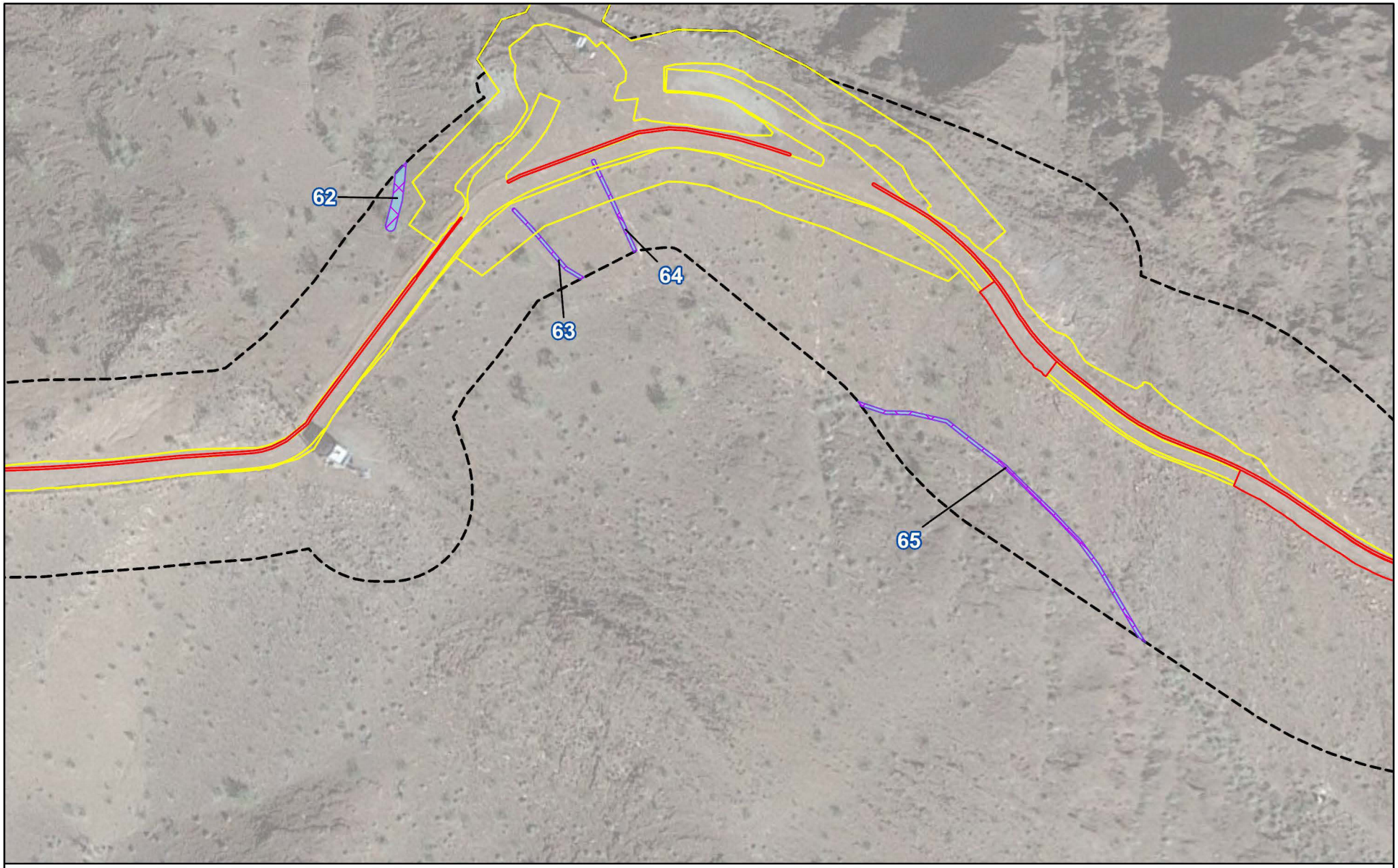
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.

N

0 50 100 Feet

**Figure 4i**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

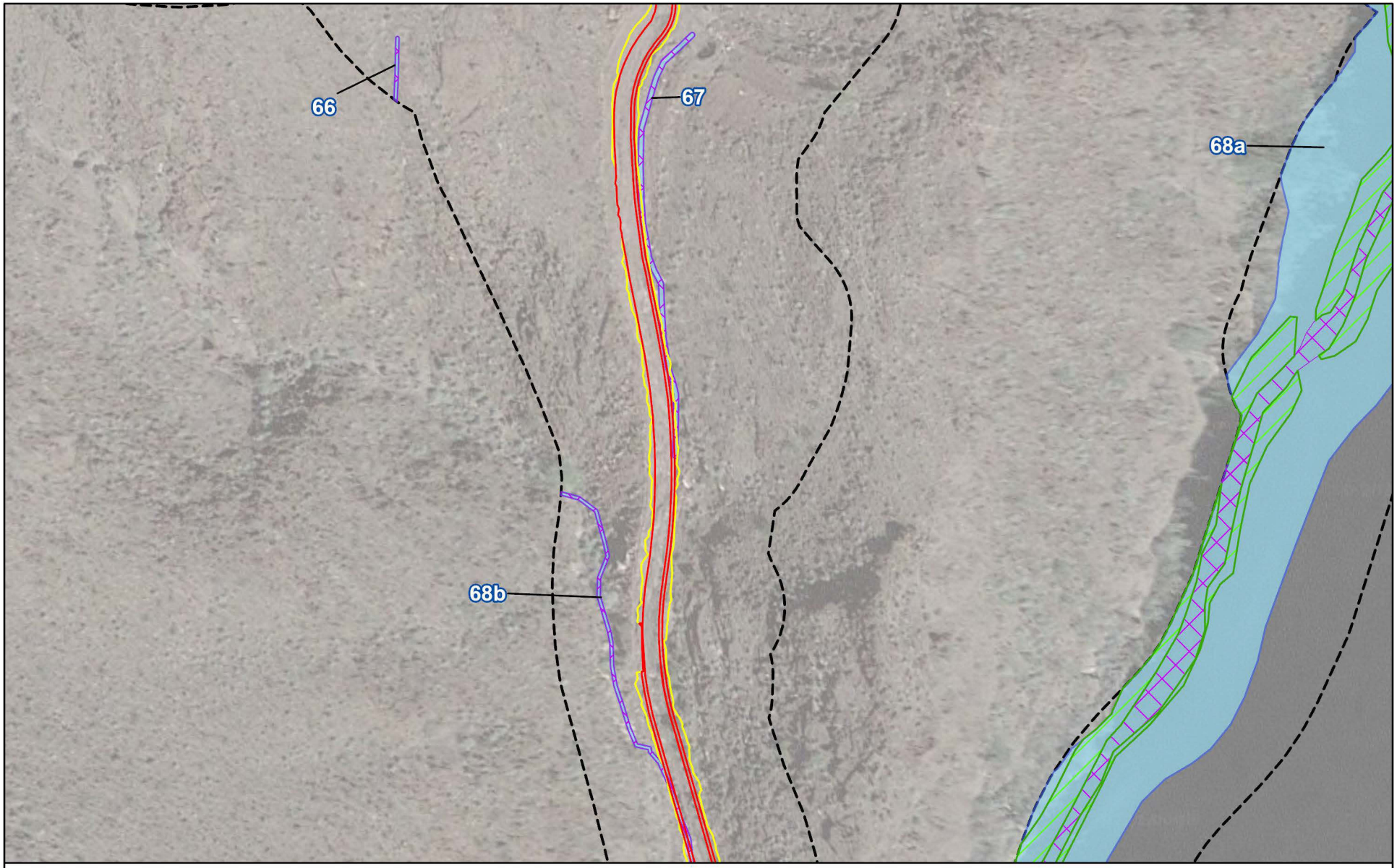
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.

N

0 50 100
Feet

**Figure 4j**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

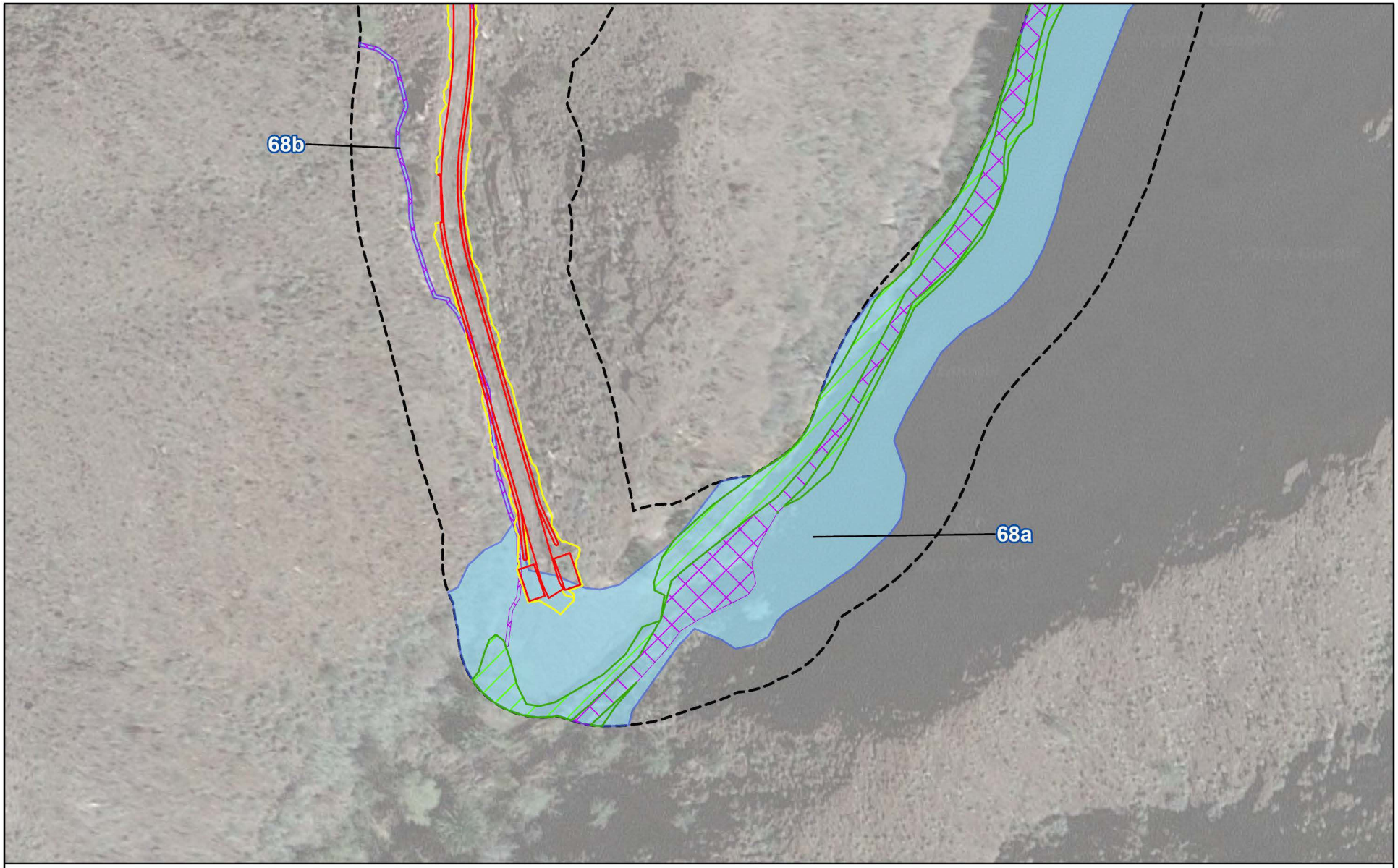
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4k**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

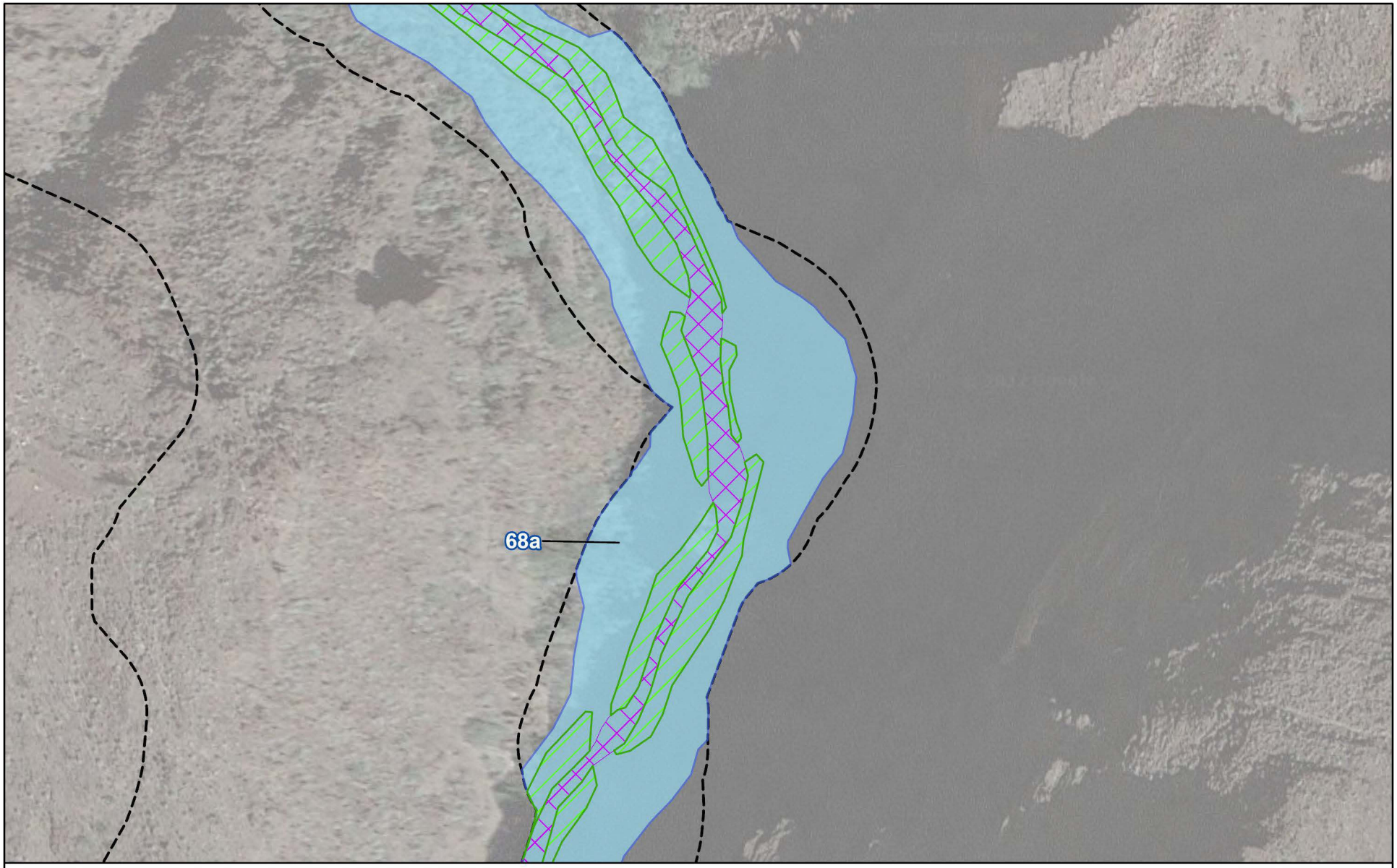
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4I**

**Aquatic Resources Delineation Map**




Survey Area

Jurisdictional Delineation

CDFW

CRBRWQCB/USACE Waters of the U.S.

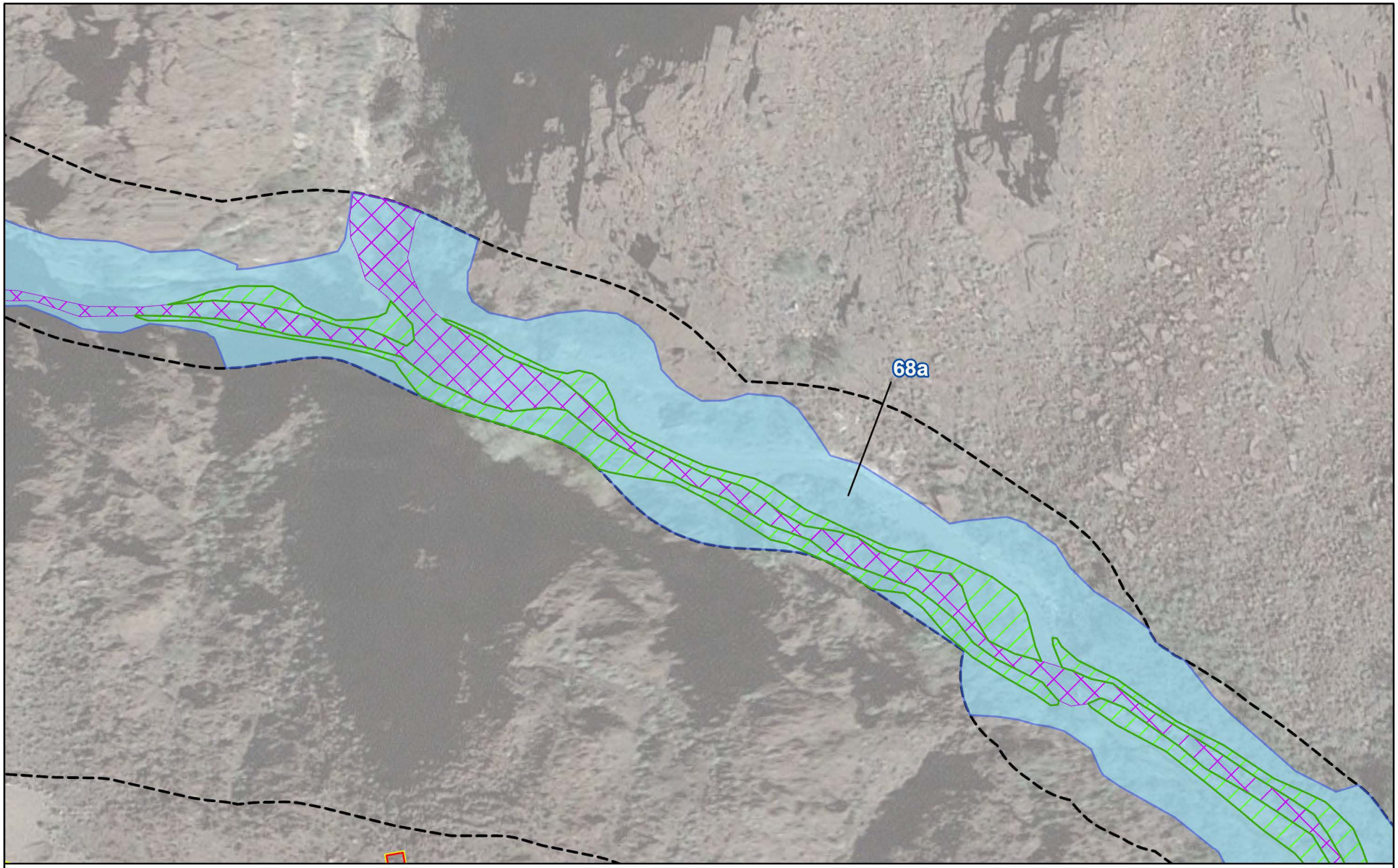
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4m**

**Aquatic Resources Delineation Map**




Survey Area
Permanent Impact
Temporary Impact

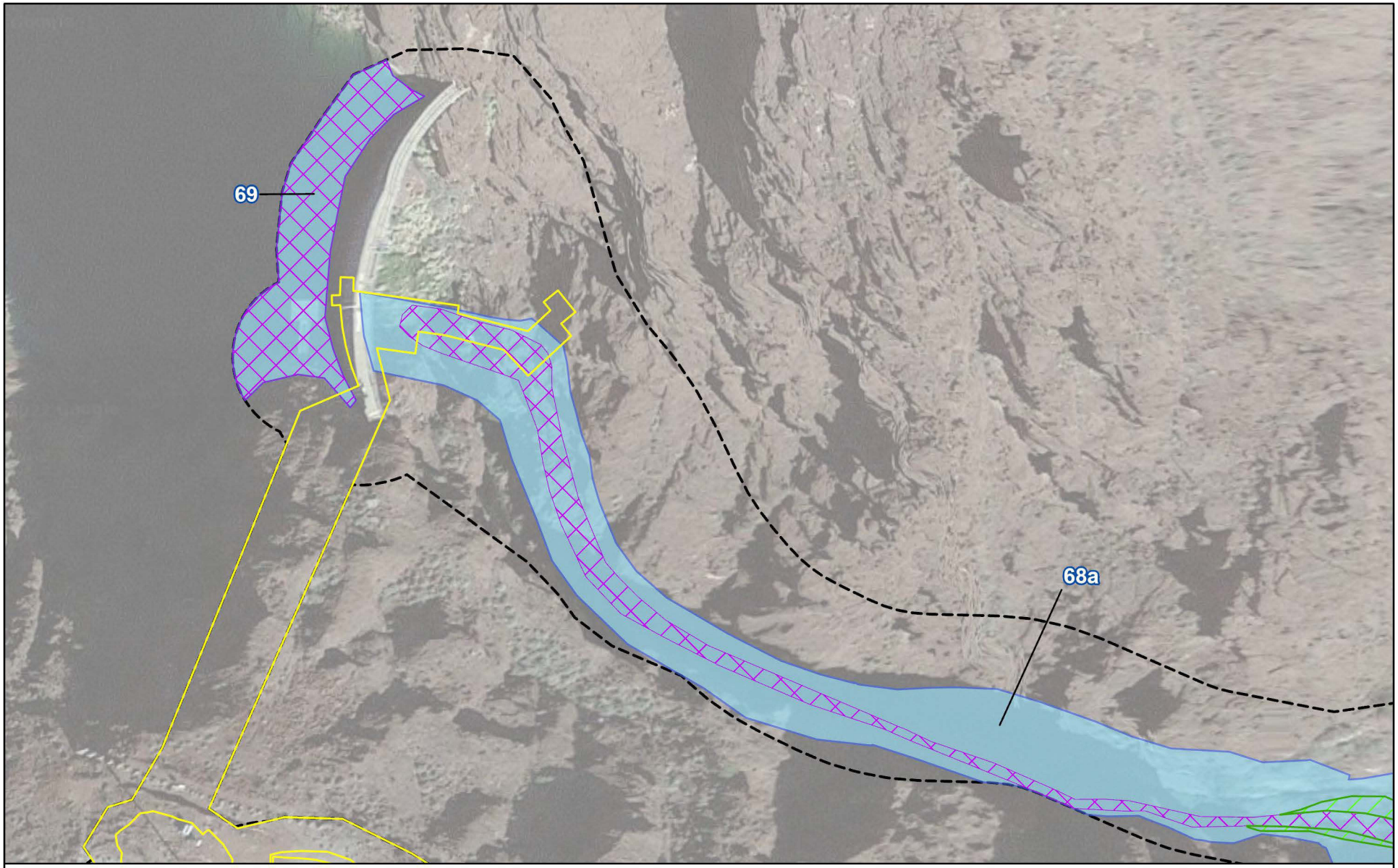
Jurisdictional Delineation
CDFW
CRBRWQCB/USACE Waters of the U.S.
CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4n**

**Aquatic Resources Delineation Map**




Survey Area

Temporary Impact

Jurisdictional Delineation

CDFW

CRBRWQCB/USACE Waters of the U.S.

CRBRWQCB/USACE Wetlands of the U.S.

N

0 50 100 Feet

**Figure 4o**

**Aquatic Resources Delineation Map**

# Attachment B

## PHOTO EXHIBIT

Photo 1: West-facing view of the Copper Basin valve up the upper terminus of drainage 64a.

Photo 2: East-facing view of Copper Basin Wash (drainage 64a) from the downstream-side of the dam in.

Photo 3: West-facing view of wetland areas along Copper Basin Wash (drainage 64a).

Photo 4: West-facing view of upstream portion of Copper Basin Wash (drainage 64a).

Photo 5: North-facing view of the access road adjacent to Copper Basin Wash (drainage 64b), downstream of the dam.

Photo 6: Southeast-facing view of the access road leading down into Copper Basin Wash (drainage 64b).

Photo 7: North-facing view of the access road along Copper Basin Wash (drainage 64b), downstream of the dam.

Photo 8: Northwest-facing view of the access road leading down into Copper Basin Wash (drainage 64b) with drainage 64b shown on the left side of the road.

Photo 9: North-facing overview of Copper Basin Reservoir, near drainage 6.

Photo 10: Northeast-facing view of wetlands along the margins of Copper Basin Reservoir, near drainage 15.

Photo 11: Northeast-facing view of drainage 21, adjacent to the Copper Basin access road.

Photo 12: East-facing view of wetlands along the margins of Copper Basin Reservoir, near drainage 20.

Photo 13: Southeast-facing view of the Copper Basin access road adjacent to Copper Basin Reservoir (drainage 22a).

Photo 14: South-facing view of ephemeral drainage 3 along the Copper Basin access road.

Photo 15: Northwest-facing view ephemeral drainage 60, near the Copper Basin access road.

Photo 16: Northwest-facing view of the Copper Basin access road adjacent to ephemeral drainage 63.

# Attachment C

## WETLAND DELINEATION FORMS

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Copper Basin City/County: Earp/San Bernardino Sampling Date: 3/31/2021

Applicant/Owner: MWD State: CA Sampling Point: 1

Investigator(s): Justin Wood, Chris Huntely Section, Township, Range: S11, T2N, R26E

Landform (hillslope, terrace, etc.): Canyon bottom Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): West Range Lat: 34° 16' 41" Long: 114° 13' 15" Datum: NAD84

Soil Map Unit Name: Not mapped 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 – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | _____ = Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: _____)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum (Plot size: 1-m x 1-m)** | | | |
| 1. Adiantum capillus-veneris | 30 | Yes | FACW |
| 2. Cyperus involucratus | 20 | Yes | FACW |
| 3. Pulicaria paludosa | 20 | Yes | FAC |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | _____ = Total Cover | | |
| **Woody Vine Stratum (Plot size: _____)** | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (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:

## SOIL

Sampling Point: 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 % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-2 | 7.5YR 4/2 | 100 | | | | | Sandy loan | |
| 2-18 | GLEY1 5/10Y | 100 | | | | | Sandy loan | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✔ **No** ___

Remarks:

## 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): _____

Water Table Present? Yes ✔ No ___ Depth (inches): 2

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

**Wetland Hydrology Present?** **Yes** ✔ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Copper Basin City/County: Earp/San Bernardino Sampling Date: 3/31/2021

Applicant/Owner: MWD State: CA Sampling Point: 2

Investigator(s): Justin Wood, Chris Huntely Section, Township, Range: S10, T2N, R26E

Landform (hillslope, terrace, etc.): Canyon bottom Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR): West Range Lat: 34° 16' 41" Long: 114° 14' 00" Datum: NAD84

Soil Map Unit Name: Not mapped NWI classification: Not mapped

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 – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | _____ = Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: _____)** | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | _____ = Total Cover | | |
| **Herb Stratum (Plot size: 1-m x 1-m)** | | | |
| 1. Typha sp. | 50 | Yes | OBL |
| 2. Distichlis spicata | 5 | No | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| | 55 = Total Cover | | |
| **Woody Vine Stratum (Plot size: _____)** | | | |
| 1. | | | |
| 2. | | | |
| | _____ = Total Cover | | |

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

**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:

## SOIL

Sampling Point: 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 % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-4 | 2.5YR 5/6 | 100 | | | | | Silty loam | |
| 4-16 | GLEY2 7/5PB | 100 | | | | | Silty loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

[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: _____

Depth (inches): _____

**Hydric Soil Present?** **Yes** ✔ **No** ___

Remarks:

## 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): _____

Water Table Present? Yes ✔ No ___ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 4

**Wetland Hydrology Present?** **Yes** ✔ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# Attachment D

## FEDERAL NON-WETLAND/WETLAND WATERS INDICATOR INFORMATION

**Table 1. Potential Geomorphic Indicators of Ordinary High Water Marks for the Arid West**

| (A) Below OHW | (B) At OHW | (C) Above OHW |
|---|---|---|
| 1. In-stream dunes<br>2. Crested ripples<br>3. Flaser bedding<br>4. Harrow marks<br>5. Gravel sheets to rippled sands<br>6. Meander bars<br>7. Sand tongues<br>8. Muddy point bars<br>9. Long gravel bars<br>10. Cobble bars behind obstructions<br>11. Scour holes downstream of obstructions<br>12. Obstacle marks<br>13. Stepped-bed morphology in gravel<br>14. Narrow berms and levees<br>15. Streaming lineations<br>16. Desiccation/mud cracks<br>17. Armored mud balls<br>18. Knick Points | 1. Valley flat<br>2. Active floodplain<br>3. Benches: low, mid, most prominent<br>4. Highest surface of channel bars<br>5. Top of point bars<br>6. Break in bank slope<br>7. Upper limit of sand-sized particles<br>8. Change in particle size distribution<br>9. Staining of rocks<br>10. Exposed root hairs below intact soil layer<br>11. Silt deposits<br>12. Litter (organic debris, small twigs and leaves)<br>13. Drift (organic debris, larger than twigs) | 1. Desert pavement<br>2. Rock varnish<br>3. Clast weathering<br>4. Salt splitting<br>5. Carbonate etching<br>6. Depositional topography<br>7. Caliche rubble<br>8. Soil development<br>9. Surface color/tone<br>10. Drainage development<br>11. Surface relief<br>12. Surface rounding |

**Table 2. Potential Vegetation Indicators of Ordinary High Water Marks for the Arid West**

| | (D) Below OHW | (E) At OHW | (F) Above OHW |
|---|---|---|---|
| Hydroriparian indicators | 1. Herbaceous marsh species<br>2. Pioneer tree seedlings<br>3. Sparse, low vegetation<br>4. Annual herbs, hydromesic ruderals<br>5. Perennial herbs, hydromesic clonals | 1. Annual herbs, hydromesic ruderals<br>2. Perennial herbs, hydromesic clonals<br>3. Pioneer tree seedlings<br>4. Pioneer tree saplings | 1. Annual herbs, xeric ruderals<br>2. Perennial herbs, non-clonal<br>3. Perennial herbs, clonal and non-clonal co-dominant<br>4. Mature pioneer trees, no young trees<br>5. Mature pioneer trees w/upland species<br>6. Late-successional species |
| Mesoriparian Indicators | 6. Pioneer tree seedlings<br>7. Sparse, low vegetation<br>8. Pioneer tree saplings<br>9. Xeroriparian species | 5. Sparse, low vegetation annual herbs, hydromesic ruderals<br>6. Perennial herbs, hydromesic clonals<br>7. Pioneer tree seedlings<br>8. Pioneer tree saplings<br>9. Xeroriparian species<br>10. Annual herbs, xeric ruderals | 7. Xeroriparian species<br>8. Annual herbs, xeric ruderals<br>9. Perennial herbs, non-clonal<br>10. Perennial herbs, clonal and non-clonal codominent<br>11. Mature pioneer trees, no young trees<br>12. Mature pioneer trees, xeric understory<br>13. Mature pioneer trees w/upland species<br>14. Late-successional species<br>15. Upland species |
| Xeroriparian indicators | 10. Sparse, low vegetation<br>11. Xeroriparian species<br>12. Annual herbs, xeric ruderals | 12. Sparse, low vegetation<br>13. Xeroriparian species<br>14. Annual herbs, xeric ruderals | 16. Annual herbs, xeric ruderals<br>17. Mature pioneer trees w/upland species<br>18. Upland species |

**Table 3. Summary of Wetland Indicator Status**

| Category | | Probability |
|---|---|---|
| Obligate Wetland | OBL | Almost always occur in wetlands (estimated probability >99%) |
| Facultative Wetland | FACW | Usually occur in wetlands (estimated probability of 67–99%) |
| Facultative | FAC | Equally likely to occur in wetlands/non-wetlands (estimated probability of 34–66%) |
| Facultative Upland | FACU | Usually occur in non-wetlands (estimated probability 67–99%) |
| Obligate Upland | UPL | Almost always occur in non-wetlands (estimated probability >99%) |
| Non-Indicator | NI | No indicator status has been assigned |

Source: Reed, 1988; USFWS, 1997; USACE, 2012.

**Table 4. Wetland Hydrology Indicators***

| Primary Indicators | Secondary Indicators |
|---|---|
| Watermarks | Oxidized Rhizospheres Associated with Living Roots |
| Water-Borne Sediment Deposits | FAC-Neutral Test |
| Drift Lines | Water-Stained Leaves |
| Drainage Patterns Within Wetlands | Local Soil Survey Data |

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

**Table 5. Wetland Hydrology Indicators for the Arid West***

| | Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present) | Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present) |
|---|---|---|
| **Group A – Observation of Surface Water or Saturated Soils** | | |
| A1 – Surface Water | X | |
| A2 – High Water Table | X | |
| A3 – Saturation | X | |
| **Group B – Evidence of Recent Inundation** | | |
| B1 – Water Marks | **X** (Non-riverine) | **X** (Riverine) |
| B2 – Sediment Deposits | **X** (Non-riverine) | **X** (Riverine) |
| B3 – Drift Deposits | **X** (Non-riverine) | **X** (Riverine) |
| B6 – Surface Soil Cracks | X | |
| B7 – Inundation Visible on Aerial Imagery | X | |
| B9 – Water-Stained Leaves | X | |
| B10 – Drainage | X | X |
| B11 – Salt Crust | X | |
| B12 – Biotic Crust | X | |
| B13 – Aquatic Invertebrates | X | |
| **Group C – Evidence of Current or Recent Soil Saturation** | | |
| C1 – Hydrogen Sulfide Odor | X | |
| C2 – Dry-Season Water Table | | X |

**Table 5. Wetland Hydrology Indicators for the Arid West***

| | Primary Indicator (any one indicator is sufficient to make a determination that wetland hydrology is present) | Secondary Indicator (two or more indicators are required to make a determination that wetland hydrology is present) |
|---|---|---|
| C3 – Oxidized Rhizospheres along Living Roots | X | |
| C4 – Presence of Reduced Iron | X | |
| C6 – Recent Iron Reduction in Tilled Soils | X | |
| C7 – Thin Muck Surface | X | |
| C8 – Crayfish Burrows | | X |
| C9 – Saturation Visible on Aerial Imagery | | X |
| **Group D – Evidence from other Site Conditions or Data** | | |
| D3 – Shallow Aquitard | | X |
| D5 – FAC-Neutral Test | | X |

*Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.

**Table 6. Field Indicators of Hydric Soil Conditions***

| 1. Indicators of Historical Hydric Soil Conditions | 2. Indicators of Current Hydric Soil Conditions |
|---|---|
| a. Histosols<br>b. Histic epipedons;<br>c. Soil colors (e.g., gleyed or low-chroma colors, soils with bright mottles (Redoximorphic features) and/or depleted soil matrix<br>d. High organic content in surface of sandy soils<br>e. Organic streaking in sandy soils<br>f. Iron and manganese concretions<br>g. Soil listed on county hydric soils list | a. Aquic or peraquic moisture regime (inundation and/or soil saturation for *7 continuous days)<br>b. Reducing soil conditions (inundation and/or soil saturation for *7 continuous days)<br>c. Sulfidic material (rotten egg smell) |

*Table adapted from 1987 USACE Manual and Related Guidance Documents.

**Table 7. Hydric Soil Indicators for the Arid West***

| Hydric Soil Indicators | | | |
|---|---|---|---|
| **All Soils** | **Sandy Soils** | **Loamy and Clay Soils** | **Hydric Soil Indicators for Problem Soils**** |
| A1 – Histosol | S1 – Sandy Mucky Mineral | F1 – Loamy Mucky Mineral | A9 – 1 cm Muck |
| A2 – Histic Epipedon | S4 – Sandy Gleyed Matrix | F2 – Loamy Gleyed Matrix | A10 – 2 cm Muck |
| A3 – Black Histic | S5 – Sandy Redox | F3 – Depleted Matrix | F18 – Reduced Verti |
| A4 – Hydrogen Sulfide | S6 – Stripped Matrix | F6 – Redox Dark Surface | TF2 – Red Parent Material |
| A5 – Stratified Layers | — | F7 – Depleted Dark Surface | Other (See Section 5 of Regional Supplement, Version 2.0) |
| A9 – 1 cm Muck | — | F8 – Redox Depressions | — |
| A11 – Depleted Below Dark Surface | — | F9 – Vernal Pools | — |
| A12 – Thick Dark Surface | — | — | — |

* Table adapted from Regional Supplement to the USACE of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0.
** Indicators of hydrophytic vegetation and wetland hydrology must be present.

# Attachment E

## AQUATIC RESOURCE TABLE (USACE)

| Waters Name | State | Cowardin Code | HGM Code | Meas Type | Impact_Type | | | | Units | Waters Type | Latitude | Longitude | Local Waterway |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wetlands | | Waters | | | | | | |
| | | | | | Perm | Temp | Perm | Temp | | | | | |
| 1a | CA | R4SB | RIVERINE | AREA | - | - | - | 27 | SQ_FT | NRPW | 2345895.196 | 594025.7321 | COPPER_BASIN_WASH |
| 1b | CA | R4SB | RIVERINE | AREA | - | - | - | 111 | SQ_FT | NRPW | 2345912.612 | 594003.9859 | COPPER_BASIN_WASH |
| 3 | CA | R4SB | RIVERINE | AREA | - | - | - | 44 | SQ_FT | NRPW | 2346483.783 | 593375.9682 | COPPER_BASIN_WASH |
| 4 | CA | R4SB | RIVERINE | AREA | - | 0 | - | 9 | SQ_FT | NRPW | 2346470.012 | 593331.2952 | COPPER_BASIN_WASH |
| 8 | CA | R4SB | RIVERINE | AREA | - | 20 | - | 31 | SQ_FT | NRPW | 2346591.9 | 593286.3361 | COPPER_BASIN_WASH |
| 9 | CA | L2AB | LACUSTRINE | AREA | 48 | - | 19 | - | SQ_FT | RPW | 2346629.737 | 593298.8588 | COPPER_BASIN_WASH |
| 10 | CA | R4SB | RIVERINE | AREA | - | - | - | 1 | SQ_FT | NRPW | 2346624.518 | 593273.4825 | COPPER_BASIN_WASH |
| 11 | CA | L2AB | LACUSTRINE | AREA | 30 | - | 70 | - | SQ_FT | RPW | 2346643.736 | 593294.5179 | COPPER_BASIN_WASH |
| 12 | CA | L2AB | LACUSTRINE | AREA | 19 | - | 36 | - | SQ_FT | RPW | 2346685.831 | 593230.2742 | COPPER_BASIN_WASH |
| 14 | CA | R4SB | RIVERINE | AREA | - | - | - | 19 | SQ_FT | NRPW | 2346709.267 | 593146.3479 | COPPER_BASIN_WASH |
| 15 | CA | L2AB | LACUSTRINE | AREA | - | - | - | 13 | SQ_FT | RPW | 2346711.069 | 593122.1716 | COPPER_BASIN_WASH |
| 16 | CA | R4SB | RIVERINE | AREA | - | 12 | - | 57 | SQ_FT | NRPW | 2346705.605 | 593092.5169 | COPPER_BASIN_WASH |
| 17a | CA | R4SB | RIVERINE | AREA | - | 10 | - | 5 | SQ_FT | NRPW | 2346701.017 | 593088.4403 | COPPER_BASIN_WASH |
| 17b | CA | R4SB | RIVERINE | AREA | 150 | - | 63 | - | SQ_FT | NRPW | 2346712.875 | 593072.9084 | COPPER_BASIN_WASH |
| 18 | CA | L2AB | LACUSTRINE | AREA | - | - | 12 | - | SQ_FT | RPW | 2346707.919 | 593020.3926 | COPPER_BASIN_WASH |
| 19a | CA | L2AB | LACUSTRINE | AREA | - | 0 | - | 48 | SQ_FT | RPW | 2346705.373 | 593026.6801 | COPPER_BASIN_WASH |
| 19b | CA | R4SB | RIVERINE | AREA | - | 9 | - | 59 | SQ_FT | NRPW | 2346693.033 | 592970.4152 | COPPER_BASIN_WASH |
| 20 | CA | L2AB | LACUSTRINE | AREA | 195 | - | 69 | - | SQ_FT | RPW | 2346700.667 | 592934.318 | COPPER_BASIN_WASH |
| 21a | CA | L2AB | LACUSTRINE | AREA | - | 13 | - | 73 | SQ_FT | RPW | 2346690.533 | 592943.5012 | COPPER_BASIN_WASH |
| 21b | CA | R4SB | RIVERINE | AREA | 69 | - | 45 | - | SQ_FT | NRPW | 2346722.523 | 592853.1345 | COPPER_BASIN_WASH |
| 23 | CA | L2AB | LACUSTRINE | AREA | 21 | - | 9 | - | SQ_FT | RPW | 2346788.954 | 592803.844 | COPPER_BASIN_WASH |
| 25a | CA | L2AB | LACUSTRINE | AREA | - | 18 | - | 3 | SQ_FT | RPW | 2346779.988 | 592807.947 | COPPER_BASIN_WASH |
| 25b | CA | R4SB | RIVERINE | AREA | - | - | - | 2 | SQ_FT | NRPW | 2346788.977 | 592771.1952 | COPPER_BASIN_WASH |
| 27 | CA | R4SB | RIVERINE | AREA | - | - | - | 1 | SQ_FT | NRPW | 2346792.874 | 592759.8412 | COPPER_BASIN_WASH |
| 28 | CA | R4SB | RIVERINE | AREA | 74 | 4 | 47 | 1 | SQ_FT | NRPW | 2346833.509 | 592758.5256 | COPPER_BASIN_WASH |
| 29a | CA | L2AB | LACUSTRINE | AREA | - | 5 | - | 22 | SQ_FT | RPW | 2346812.119 | 592751.0714 | COPPER_BASIN_WASH |
| 29b | CA | R4SB | RIVERINE | AREA | - | 1282 | - | 991 | SQ_FT | NRPW | 2346855.32 | 592748.5916 | COPPER_BASIN_WASH |
| 31 | CA | R4SB | RIVERINE | AREA | 68 | 33 | 59 | 2 | SQ_FT | NRPW | 2346898.231 | 592829.238 | COPPER_BASIN_WASH |
| 34 | CA | L2AB | LACUSTRINE | AREA | - | 10 | - | 20 | SQ_FT | RPW | 2346940.182 | 592831.4976 | COPPER_BASIN_WASH |
| 36 | CA | R4SB | RIVERINE | AREA | 9 | 10 | 9 | 5 | SQ_FT | NRPW | 2346924.992 | 592894.9468 | COPPER_BASIN_WASH |
| 38a | CA | L2AB | LACUSTRINE | AREA | - | - | - | 14 | SQ_FT | RPW | 2346925.14 | 592892.6866 | COPPER_BASIN_WASH |

| Waters Name | State | Cowardin Code | HGM Code | Meas Type | Impact_Type | | | | Units | Waters Type | Latitude | Longitude | Local Waterway |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Wetlands | | Waters | | | | | | |
| | | | | | Perm | Temp | Perm | Temp | | | | | |
| 38b | CA | R4SB | RIVERINE | AREA | - | - | - | 22 | SQ_FT | NRPW | 2347047.269 | 592899.1754 | COPPER_BASIN_WASH |
| 42 | CA | R4SB | RIVERINE | AREA | - | - | - | 1 | SQ_FT | NRPW | 2347110.701 | 592798.9039 | COPPER_BASIN_WASH |
| 44 | CA | L2AB | LACUSTRINE | AREA | - | 212 | - | 6 | SQ_FT | RPW | 2347131.62 | 592783.4754 | COPPER_BASIN_WASH |
| 47 | CA | R4SB | RIVERINE | AREA | 6 | - | 31 | 0 | SQ_FT | NRPW | 2347152.379 | 592802.4225 | COPPER_BASIN_WASH |
| 49a | CA | L2AB | LACUSTRINE | AREA | - | - | - | 13 | SQ_FT | RPW | 2347156.586 | 592804.0967 | COPPER_BASIN_WASH |
| 49b | CA | R4SB | RIVERINE | AREA | - | - | - | 25 | SQ_FT | NRPW | 2347196.785 | 592790.8623 | COPPER_BASIN_WASH |
| 50 | CA | L2AB | LACUSTRINE | AREA | - | 5 | - | 5 | SQ_FT | RPW | 2347288.202 | 592799.7285 | COPPER_BASIN_WASH |
| 51 | CA | R4SB | RIVERINE | AREA | - | 11 | - | 52 | SQ_FT | | 2347297.513 | 592795.5532 | COPPER_BASIN_WASH |
| 52 | CA | R4SB | RIVERINE | AREA | 2115 | - | 445 | - | SQ_FT | NRPW | 2347296.134 | 592820.4987 | COPPER_BASIN_WASH |
| 53 | CA | R4SB | RIVERINE | AREA | - | - | - | 22 | SQ_FT | NRPW | 2347347.157 | 592838.9202 | COPPER_BASIN_WASH |
| 54 | CA | L2AB | LACUSTRINE | AREA | - | - | - | 1382 | SQ_FT | RPW | 2347428.764 | 592843.9191 | COPPER_BASIN_WASH |
| 56b | CA | R4SB | RIVERINE | AREA | - | 35 | - | 1 | SQ_FT | NRPW | 2347422.692 | 592857.0693 | COPPER_BASIN_WASH |
| 59 | CA | R4SB | RIVERINE | AREA | - | - | - | 40 | SQ_FT | NRPW | 2347692.581 | 592830.2735 | COPPER_BASIN_WASH |
| 60c | CA | R4SB | RIVERINE | AREA | - | - | - | 54 | SQ_FT | NRPW | 2347704.877 | 592837.6423 | COPPER_BASIN_WASH |
| 63 | CA | R4SB | RIVERINE | AREA | - | 24 | - | 171 | SQ_FT | NRPW | 2347997.45 | 592674.9744 | COPPER_BASIN_WASH |
| 64 | CA | R4SB | RIVERINE | AREA | - | 5 | - | 1345 | SQ_FT | NRPW | 2348019.695 | 592752.3594 | COPPER_BASIN_WASH |
| 67 | CA | R4SB | RIVERINE | AREA | - | 99 | - | 72 | SQ_FT | NRPW | 2347995.909 | 592585.0149 | COPPER_BASIN_WASH |
| 68a | CA | R4SB | RIVERINE | AREA | - | - | - | 58 | SQ_FT | NRPW | 2347720.428 | 592975.2111 | COPPER_BASIN_WASH |
| 68b | CA | R4SB | RIVERINE | AREA | - | - | - | 27 | SQ_FT | NRPW | 2345895.196 | 594025.7321 | COPPER_BASIN_WASH |
| 69 | CA | L2AB | LACUSTRINE | AREA | - | - | - | 111 | SQ_FT | RPW | 2345912.612 | 594003.9859 | COPPER_BASIN_WASH |

# Attachment F

## IMPACTS TO CDFW AND RWQCB JURISDICTIONAL RESOURCES

| Order | Drainage ID | Easting | Northing | Temp Impacted Length (Ft) (CDFW and RWQCB) | Temp Impact Area (SqFt) (CDFW) | Perm Impacted Length (Ft) (CDFW and RWQCB) | Perm Impact Area (SqFt) (CDFW) | Temp Impact Area Waters (SqFt) (RWQCB) | Perm Impact Area Waters (SqFt) (RWQCB) | Temp Impact Area Wetlands (SqFt) (RWQCB) | Perm Impact Area Wetlands (SqFt) (RWQCB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1a | 2345895.196 | 594025.7321 | 22 | 82 | - | - | 27 | - | - | - |
| 2 | 1b | 2345912.612 | 594003.9859 | 109 | 221 | - | - | 111 | - | - | - |
| 3 | 1c | 2345904.126 | 594026.3251 | - | - | - | - | - | - | - | - |
| 4 | 2a | 2345946.176 | 594005.8963 | - | - | - | - | - | - | - | - |
| 5 | 2b | 2345949.021 | 594005.9714 | - | - | - | - | - | - | - | - |
| 6 | 3 | 2346483.783 | 593375.9682 | 10 | 103 | - | - | 44 | - | - | - |
| 7 | 4 | 2346470.012 | 593331.2952 | 17 | 23 | 10 | 606 | 9 | 0 | - | - |
| 8 | 5 | 2346484.016 | 593307.4854 | - | - | - | - | - | - | - | - |
| 9 | 6 | 2346506.355 | 593297.7937 | - | - | - | - | - | - | - | - |
| 10 | 7 | 2346518.458 | 593295.8445 | - | - | - | - | - | - | - | - |
| 11 | 8 | 2346591.9 | 593286.3361 | 28 | 51 | 13 | 468 | 31 | 20 | - | - |
| 12 | 9 | 2346629.737 | 593298.8588 | 53 | 50 | 14 | 177 | - | - | 19 | 48 |
| 13 | 10 | 2346624.518 | 593273.4825 | 2 | 1 | - | - | 1 | - | - | - |
| 14 | 11 | 2346643.736 | 593294.5179 | 58 | 114 | 26 | 165 | - | - | 70 | 30 |
| 15 | 12 | 2346685.831 | 593230.2742 | 148 | 503 | 23 | 3634 | - | - | 36 | 19 |
| 16 | 13 | 2346699.512 | 593152.4615 | - | - | - | - | - | - | - | - |
| 17 | 14 | 2346709.267 | 593146.3479 | 8 | 43 | - | - | 19 | - | - | - |
| 18 | 15 | 2346727.036 | 593150.8567 | 10 | 17 | 4 | 26 | - | - | - | - |
| 19 | 16 | 2346711.069 | 593122.1716 | 4 | 13 | - | - | 13 | - | - | - |
| 20 | 17a | 2346705.605 | 593092.5169 | 13 | 57 | 3 | 209 | 57 | 12 | - | - |
| 21 | 17b | 2346701.017 | 593088.4403 | 2 | 5 | 3 | 71 | 5 | 10 | - | - |
| 22 | 18 | 2346712.875 | 593072.9084 | 47 | 81 | 14 | 267 | - | - | 63 | 150 |
| 23 | 19a | 2346707.919 | 593020.3926 | 92 | 122 | - | - | - | - | 12 | - |
| 24 | 19b | 2346705.373 | 593026.6801 | 24 | 48 | 1 | 48 | 48 | 0 | - | - |
| 25 | 20 | 2346693.033 | 592970.4152 | 13 | 89 | 4 | 264 | 59 | 9 | - | - |
| 26 | 21a | 2346700.667 | 592934.318 | 177 | 359 | 57 | 3121 | - | - | 69 | 195 |
| 27 | 21b | 2346690.533 | 592943.5012 | 14 | 97 | 7 | 296 | 73 | 13 | - | - |
| 28 | 22 | 2346694.033 | 592911.975 | - | - | - | - | - | - | - | - |
| 29 | 23 | 2346722.523 | 592853.1345 | 112 | 101 | 115 | 2211 | - | - | 45 | 69 |
| 30 | 24 | 2346721.046 | 592826.1658 | - | - | - | - | - | - | - | - |
| 31 | 25a | 2346788.954 | 592803.844 | 181 | 373 | 92 | 4249 | - | - | 9 | 21 |
| 32 | 25b | 2346779.988 | 592807.947 | 1 | 3 | 7 | 61 | 3 | 18 | - | - |
| 33 | 26 | 2346781.739 | 592802.283 | - | - | - | - | - | - | - | - |
| 34 | 27 | 2346788.977 | 592771.1952 | 2 | 2 | - | - | 2 | - | - | - |
| 35 | 28 | 2346792.874 | 592759.8412 | 2 | 1 | - | - | 1 | - | - | - |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 29a | 2346833.509 | 592758.5256 | 97 | 81 | 106 | 1424 | 1 | 4 | 47 | 74 |
| 37 | 29b | 2346812.119 | 592751.0714 | 20 | 22 | 2 | 49 | 22 | 5 | - | - |
| 38 | 30 | 2346823.186 | 592743.5037 | - | - | - | - | - | - | - | - |
| 39 | 31 | 2346855.32 | 592748.5916 | 183 | 2555 | 79 | 4395 | 991 | 1282 | - | - |
| 40 | 32 | 2346873.522 | 592775.7919 | - | - | - | - | - | - | - | - |
| 41 | 33 | 2346872.527 | 592795.0549 | 3 | 0 | - | - | - | - | - | - |
| 42 | 34 | 2346898.231 | 592829.238 | 258 | 576 | 83 | 2879 | 2 | 33 | 59 | 68 |
| 43 | 35 | 2346931.683 | 592814.6611 | - | - | - | - | - | - | - | - |
| 44 | 36 | 2346940.182 | 592831.4976 | 11 | 25 | 10 | 225 | 20 | 10 | - | - |
| 45 | 37 | 2346921.767 | 592884.0508 | - | - | - | - | - | - | - | - |
| 46 | 38a | 2346924.992 | 592894.9468 | 59 | 55 | 20 | 1223 | 5 | 10 | 9 | 9 |
| 47 | 38b | 2346925.14 | 592892.6866 | 7 | 14 | - | - | 14 | - | - | - |
| 48 | 39 | 2346953.335 | 592872.7235 | - | - | - | - | - | - | - | - |
| 49 | 40 | 2346983.197 | 592861.1302 | - | - | - | - | - | - | - | - |
| 50 | 41 | 2347006.664 | 592916.0317 | - | - | - | - | - | - | - | - |
| 51 | 42 | 2347047.269 | 592899.1754 | 8 | 36 | - | - | 22 | - | - | - |
| 52 | 43 | 2347049.649 | 592883.2757 | - | - | - | - | - | - | - | - |
| 53 | 44 | 2347110.701 | 592798.9039 | 1 | 1 | - | - | 1 | - | - | - |
| 54 | 45 | 2347118.723 | 592784.2899 | 1 | 0 | - | - | - | - | - | - |
| 55 | 46 | 2347123.424 | 592778.2435 | - | - | - | - | - | - | - | - |
| 56 | 47 | 2347131.62 | 592783.4754 | 13 | 11 | 22 | 287 | 6 | 212 | - | - |
| 57 | 48 | 2347152.354 | 592781.5779 | - | - | - | - | - | - | - | - |
| 58 | 49a | 2347152.379 | 592802.4225 | 33 | 104 | 16 | 1294 | 0 | - | 31 | 6 |
| 59 | 49b | 2347156.586 | 592804.0967 | 7 | 13 | - | - | 13 | - | - | - |
| 60 | 50 | 2347186.158 | 592807.0954 | 82 | 142 | 49 | 1470 | - | - | - | - |
| 61 | 51 | 2347196.785 | 592790.8623 | 26 | 76 | - | - | 25 | - | - | - |
| 62 | 52 | 2347288.202 | 592799.7285 | 2 | 5 | 1 | 87 | 5 | 5 | - | - |
| 63 | 53 | 2347297.513 | 592795.5532 | 10 | 65 | 8 | 568 | 52 | 11 | - | - |
| 64 | 54 | 2347296.134 | 592820.4987 | 192 | 1286 | 91 | 7049 | - | - | 445 | 2115 |
| 65 | 55 | 2347318.105 | 592804.5191 | 78 | 116 | 30 | 4609 | - | - | - | - |
| 66 | 56a | 2347337.814 | 592843.4253 | - | - | - | - | - | - | - | - |
| 67 | 56b | 2347347.157 | 592838.9202 | 9 | 22 | - | - | 22 | - | - | - |
| 68 | 57 | 2347367.168 | 592815.4493 | - | - | - | - | - | - | - | - |
| 69 | 58 | 2347395.705 | 592812.051 | - | - | - | - | - | - | - | - |
| 70 | 59 | 2347428.764 | 592843.9191 | 61 | 1382 | - | - | 1382 | - | - | - |
| 71 | 60a | 2347423.066 | 592866.0464 | - | - | - | - | - | - | - | - |
| 72 | 60b | 2347410.829 | 592855.9089 | - | - | - | - | - | - | - | - |
| 73 | 60c | 2347422.692 | 592857.0693 | 2 | 1 | 15 | 79 | 1 | 35 | - | - |
| 74 | 60d | 2347477.604 | 592853.3688 | 30 | 56 | - | - | 56 | - | - | - |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 75 | 61 | 2347549.849 | 592778.5794 | - | - | - | - | - | - | - | - |
| 76 | 62 | 2347665.105 | 592838.3968 | - | - | - | - | - | - | - | - |
| 77 | 63 | 2347692.581 | 592830.2735 | 18 | 40 | - | - | 40 | - | - | - |
| 78 | 64 | 2347704.877 | 592837.6423 | 25 | 54 | - | - | 54 | - | - | - |
| 79 | 65 | 2347779.268 | 592785.1035 | - | - | - | - | - | - | - | - |
| 80 | 66 | 2347949.218 | 592705.6498 | - | - | - | - | - | - | - | - |
| 81 | 67 | 2347997.45 | 592674.9744 | 132 | 171 | 30 | 802 | 171 | 24 | - | - |
| 82 | 68a | 2348019.695 | 592752.3594 | 242 | 2863 | 34 | 175391 | 1345 | 5 | - | - |
| 83 | 68b | 2347995.909 | 592585.0149 | 59 | 72 | 49 | 657 | 72 | 99 | - | - |
| 84 | 69 | 2347720.428 | 592975.2111 | 7 | 58 | - | - | 58 | - | - | - |

# Appendix C

Phase I Cultural Resources Assessment Report

# Copper Basin Dam and Access Road Project
# San Bernardino County, California

# PHASE I CULTURAL RESOURCES ASSESSMENT REPORT

**Prepared for:**

Metropolitan Water District
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Los Angeles, CA 90012

**Prepared by:**

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July 2022

# NATIONAL ARCHAEOLOGICAL DATABASE INFORMATION

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San Bernardino County, California

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# Executive Summary

On behalf of the Metropolitan Water District of Southern California, Aspen Environmental Group conducted archaeological literature reviews and record searches, as well as an intensive field survey in support of the Copper Basin Dam and Access Road Project in March 2022. The main goal of this investigation was to gather and analyze the information needed to determine if the Project would impact cultural resources.

The purpose of the Project is to replace an existing valve located at the base of the Copper Basin Dam and install a new ladder system on the face of the dam that is an essential requirement for the safe operation of the dam. That portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. Various improvements are, therefore, required to Copper Basin Access Road.

On March 8 and 30, 2022 an intensive archaeological survey was conducted in support of the Project. Elliot D'Antin, Cultural Resource Specialist, B.S., and Christina Peterson, M.A, RPA of Aspen Environmental Group conducted the pedestrian survey of the Project area. Mr. D'Antin and Ms. Peterson have in-depth familiarity with the prehistoric and historic period cultural resources of San Bernardino County. The survey crew utilized intuitive survey methods covering 100% Project area, with transects spaced 15-meters apart, or less. Ground visibility was high (90-100%).

No new prehistoric or historic archaeological resources were identified in the Project area. Two historic-aged built environment features were identified during the survey, Copper Basin Dam Access Road and Copper Basin Dam and Reservoir. Both resources have be previously determined to be eligible for the National Register of Historic Places and the California Register of Historical Resources as contributing features of the Colorado River Aqueduct Historic District. A Project impact analysis was conducted for Copper Basin Access Road only as part of this study. A separate technical document is being prepared for an analysis of Copper Basin Dam.

In summary, Copper Basin Dam Access Road is recommended as individually not eligible for either the national or state register. Additionally, it was concluded that the Project would not impact the integrity of Copper Basin Access Road as a contributor to the Colorado River Aqueduct Historic District, nor would the integrity of the district as whole be impacted by the Project.

# Introduction

At the request of the Metropolitan Water District (Metropolitan), Aspen Environmental Group (Aspen) performed a cultural resources records search and pedestrian survey for the proposed Copper Basin Dam and Access Road Project (Project). These investigations are designed to meet the requirements for consideration of cultural resources under state, and local regulations. The Project area is located in unincorporated San Bernardino County, California.

To identify any previously recorded cultural or tribal cultural resources eligible for the California Register of Historical Resources (CRHR), Aspen conducted a cultural resources records search at the California Historical Resources Information System (CHRIS), South Central Coastal Information Center (SCCIC), at California State University, Fullerton; reviewed ethnographic literature; completed historical background research; and conducted a pedestrian survey of the Project area. Native American outreach was also conducted with State-recognized tribal groups that may have traditional or cultural ties to the Project area or surrounding areas.

The following report is a full account of the methods and results of research, the conclusions of the study, and recommendations for the treatment of cultural and tribal cultural resources potentially affected by the Project.

# Project Location and Description

## Project Location

Copper Basin Access Road extends from its intersection with Trail End Camp Road in a general westerly, then southerly, and then easterly direction to the base of the Copper Basin Dam. It consists of an unpaved and graded dirt road. The section of Copper Basin Access Road from Trail End Camp Road through Bandit Pass to the gate at the outlet structure is approximately 4.22 miles long and it varies in width from 18’ to 27’ wide. This section of Copper Basin Access Road is not part of the Project.

The section of Copper Basin Access Road within the Project area extends from the outlet structure gate southerly and easterly to the base of the dam, and is approximately 1.66 miles long. This section of the access road varies in width from 10’ to 12’ wide.

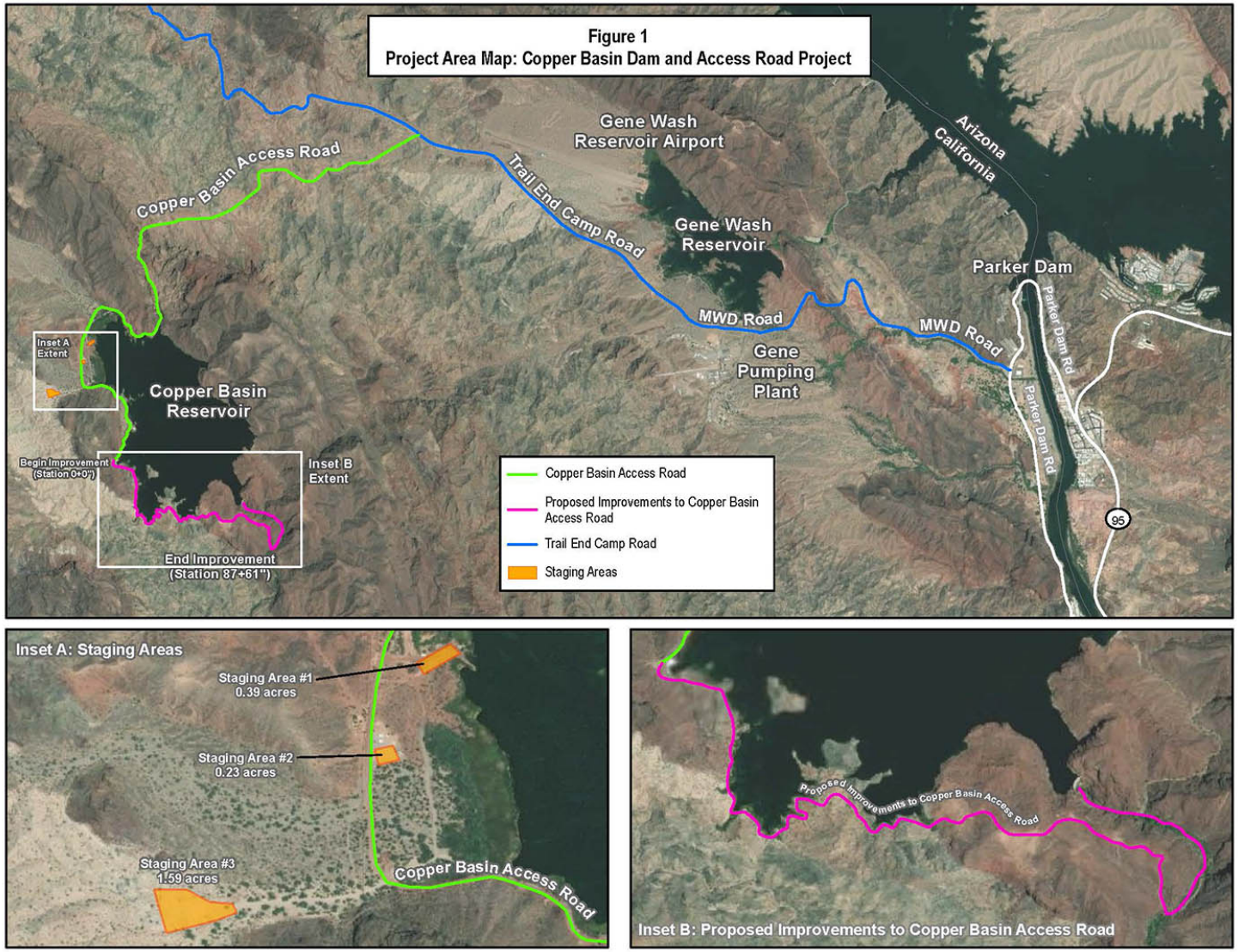
The Project area also consists of three staging areas totaling 2.21 acres. The northernmost staging area (Staging Area 1) measures 0.39 acres, the middle staging area (Staging Area 2) measures 0.23 acres, and the southernmost (Staging Area 3) measures 1.59 acres. The 0.23 acre staging area is located directly adjacent to Copper Basin Access Road. The 0.4 acre and 1.59 acre staging area require a short access road to enter, however, these spur access roads were not surveyed as they are regularly used, maintained, and in good condition not requiring alteration (Figure 1).

# Project Description

Metropolitan proposes to replace an existing valve located at the base of the Copper Basin Dam and install a new ladder system on the face of the dam that is an essential requirement for the safe operation of the dam. That portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. Various improvements are, therefore, required to Copper Basin Access Road.

Vegetation within the approximately 1.66-mile-long existing unpaved Copper Basin Access Road that leads from the outlet structure to the base of Copper Basin Dam would be removed to allow for construction work and vehicle access during operation and maintenance (O&M). Portions of the access road would then be graded and paved with gunite concrete (i.e., a dry mixed form of sprayed concrete typically containing fine particles) including pavement along all areas of the access road where slopes are 20 percent or greater. A grader or other similar type of equipment would be used for grading activities. The construction contractor would likely mix concrete on site to produce gunite, as it is infeasible to regularly travel to the nearest concrete plant, which is approximately two to three hours away from Copper Basin. The amounts of cut and fill associated with grading are estimated to be approximately 2,120 cubic yards and approximately 728 cubic yards, respectively. No fill material would be imported. Approximately 222 cubic yards of riprap (large-sized rock and gravel measuring 7 to 12 inches) would be imported and placed at the end of the storm drainpipe, V-ditch outlets, and Arizona crossings.

## Figure 1. Project Area Map



# Regulatory Framework

Numerous laws, ordinances, regulations, and standards on federal, state, and local levels seek to protect and manage cultural resources. The primary state regulation governing significant cultural resources is the California Environmental Quality Act (CEQA).

## State

The primary regulation used in evaluating significant historic and cultural resources for a project is the California Environmental Quality Act (CEQA). Applicable State of California regulations include Public Resources Code (PRC) Sections 21000 et seq., Section 5024, Section 5024.5; and California Code of Regulations (CCR) Title 14, Chapter 3, Sections 15000 et seq.

CEQA (1970) (PRC Sections 21000 et seq., Section 5024, Section 5024.5; CCR Title 14, Chapter 3, Sections 15000 et seq.) establishes that historical and archaeological resources must be afforded consideration and protection (14 CCR Section 21083.2, 14 CCR Section 15064).

A historical resource is a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historic Resources (CRHR);" or "a resource listed in a local register of historical resources or identified as significant in a historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code;" or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (14 CCR Section 15064.5[a][3]).

Historical resources automatically listed in the California Register include California cultural resources listed in or formally determined eligible for the National Register. Locally listed resources are entitled to a presumption of significance unless a preponderance of evidence in the record indicates otherwise.

Under CEQA, a resource is generally considered historically significant if it meets the criteria for listing in the CRHR. A resource must meet at least one of the following criteria (PRC 5024.1; 14 CCR Section 15064.5[a][3]):

> *1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. Title 14, CCR Section 4852(b)(1) adds, "is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States."*
>
> *2. Is associated with the lives of persons important in our past. Title 14, CCR Section 4852(b)(2) adds, "is associated with the lives of persons important to local, California, or national history."*
>
> *3. Embodies the distinctive characteristics of a type, period, region, or method of construction; or represents the work of an important creative individual; or possesses high artistic values. Title 14, CCR 4852(b)(3) allows a resource to be CRHR eligible if it represents the work of a master.*
>
> *4. Has yielded, or may be likely to yield, information important in prehistory or history. Title 14, CCR 4852(b)(4) specifies that importance in prehistory or history can be defined at the scale of "the local area, California, or the nation."*

Historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (14 CCR 4852[c]).

Finally, the discussion of Project impacts is in accordance with CEQA Guidelines Section 15126.4(b)(1).

> Where maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of the historical resource will be conducted in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995), Weeks and Grimmer, the project's impact on historical resources shall generally be considered mitigated below a level of significance and thus is not significant.

Specifically, *The Secretary of the Interior's Standards for the Treatment of Historic Properties* and in accordance with the Secretary's Standards for Rehabilitation (§67.7) are applied herein.

## Local

This report has also been prepared in accordance with the County of San Bernardino General Plan (General Plan).

### Cultural Resources Goal CO 3:

The County will preserve and promote its historic and prehistoric cultural heritage.

***Policies***

**CO 3.1-** Identify and protect important archaeological and historic cultural resources in areas of the County that have been determined to have known cultural resource sensitivity.

**CO 3.2**- Identify and protect important archaeological and historic cultural resources in all lands that involves disturbance of previously undisturbed ground.

# Environmental Setting

## Geography and Geology

The location of the Project area is situated within the Whipple Mountains near the eastern boundary of the Mojave Desert, comprising the southwestern quadrant of the Basin and Range physiographic province. This province is characterized by its vast region which is dominated by rugged mountain ranges and alluvium filled basins (Rojo 2009). Abutted to the east and south is the Colorado Desert.

Geologically within the higher elevations, Quarternary alluvium or Pleistocene marine rock comprise the soils near streams and the Colorado River. Small systems of stabilized sand dunes are near the Colorado River. Desert pavement is common in the bajadas and plains around the mountains (De Groot 2007). Another prominent geological feature is desert varnish or rock varnish, created by bacteria that live on rock surfaces which interact with the natural occurring oxidizing manganese and iron oxide as well as clay minerals, which in turn forms a coating over the rocks. Elevations in the Project area vary between 754 feet (230 meters [m]) and 1407 feet (429 m) above mean sea level (AMSL).

## Climate and Vegetation

Conditions of the Mojave vary and are characterized by extreme variation in daily temperature as well as more arid conditions than other desert regions in the United States. Precipitation averages in the region are less than 12 centimeters but can be highly variable from year to year. In the higher elevation regions, freezing temperatures occur during winter, and summers are usually dry, windy, and hot. Intense summer thunderstorms are rare, but occasionally occur in the region (Rojo 2009). Vegetation typical to the Mojave include ironwood, blue palo verde, chuparosa, spiny menodora, and desert senna.

# Cultural Setting

## Prehistoric Overview

While the Project area is at a transitional boundary between geographic deserts, the cultural tradition is well within the influential sphere associated with the Colorado Desert. An accepted chronology of the Colorado Desert includes: Paleoindian/ San Dieguito, Archaic/ Pinto & Amargosa, Late Prehistoric/ Patayan, Ethnohistoric, and Historic Euro-American. Date ranges are presented in years before present (B.P).

### Paleoindian/San Dieguito Period (12,000–7,000 cal BP)

The San Dieguito Period marks some of the oldest cultural material remnants in the Colorado Desert, however, absolute dates for particular sites remain elusive (Schaefer 1994). To understand the context of San Dieguito artifacts and features, archaeologists rely on a large area with similarly identified San Dieguito material to ascertain possible dates and significance, stretching as far as the San Diego coast. Within the desert, sites typically consist of cleared circles, rock rings, geoglyphs, and heavily varnished simple stone tools (Roger 1966). These tools included bifacially and unifacially reduced choppers, concave scrapers, bilateral-notched pebbles, scraper planes, blades, and relatively smaller bifacial points. In later years, pressure flaked blades, projectile points, crescentics, and elongated bifacial knives appear (Schaefer et al. 1997). Stratified sites were discovered along the coast (Warren 1966; Carrico et al. 1991), and in Arizona (Haury 1950) which allowed some insight into a chronology of San Dieguito sites.

### Archaic Period/Pinto & Amargosa Complexes (7,000–1,500 cal BP)

As with the San Dieguito Period, archaeologists must rely on a vast area to ascertain context for Archaic sites, or lack of sites, near the Project area including portions of the Great Basin, Mohave Desert, and Sonoran Desert east of the Colorado River (Schaefer et al. 1997). The Pinto and Amargosa Complex can be characterized as specializations within the already existing hunter-gatherer lifestyles established during the San Dieguito Period (Schaefer et al. 1997). Few substantial, subsurface discoveries have been made in the Colorado Desert dating to the Archaic Period, with data implying a reliance on hunting and gathering settlement-subsistence strategy that relied heavily on food storage, and strategically stored food processing equipment for mobile peoples (Bean et al. 1995; Love 1996 McDonald 1992; Schaefer et al. 1997). However, no subsurface Archaic sites have been discovered near the Project area.

A defining feature of the Pinto and Amargosa Complexes is the Elko Series Projectile Points. Although, recorded in relative abundance at the Indian Hill Rockshelter site - 140 miles southwest of the Project area - these tools are largely unrecorded in the Colorado Desert of California (Schaefer 1994). This has led some to believe that an environmental change labeled the Altithermal (7,000 to 4,000 B.P.) forced mobile people to relocate to more hospitable locations such as springs, tanks, lakes, and rivers (Antevs 1948,

1952; Crabtree 1981; Weide 1976). However, Schaefer (1994) states that evidence of the Altithermal, or other severe environmental change is lacking in the Colorado Desert. Regardless of an environmental anomaly, or lack of one, it is likely the Colorado Desert was a marginally used area, with the bulk of undiscovered sites either buried under Colorado River alluvium or obscured by later settlements (Schaefer 1994; Weide 1976).

## Late Prehistoric/Patayan Period (1,500 - 450 cal BP)

The Patayan era is marked by strong regional cultural developments, especially in the southern California desert regions, which were heavily influenced by the Patayan culture of the lower Colorado River area (Warren 1984). Specifically, turquoise mining and long-distance trade networks appear to have attracted both the Anasazi and Patayan peoples into the California deserts from the east as evidenced by the introduction of Buff and Brown Ware pottery, and Cottonwood and Desert Side-notched projectile points. Brown and Buff Ware pottery, first appearing on the lower Colorado River at about 1,200 B.P., started to diffuse across the California deserts by about 1,100 B.P. Associated with the diffusion of this pottery were Desert Side-notched and Cottonwood Triangular arrow points dating to about 800 to 850 B.P., suggesting a continued spread of Patayan influences.

Trade along the Mojave River also expanded resulting in middlemen between coastal and Colorado River populations. The Patayan influence in coastal and inland southern California regions appears to have diminished during the late Protohistoric period when the extensive trade networks along the Mojave River and in Antelope Valley appear to have broken down, and large village sites were abandoned (Warren 1984). Evidence presented by Jones et al. (1999) points to the apparent concordance between the reduction in use of the interior desert and the Medieval Climatic Anomaly. This period, lasting from approximately 1,100 to 450 B.P., was typified by increased aridity here as elsewhere in the southwest (Stine 1994; Warren 1984). This dry period may have led to the withdrawal of southwestern Native populations, such as the Anasazi, from marginal desert areas. Warren (1984) also suggests that the apparent disruption in trade networks may have been caused by the movement of Chemehuevi populations southward across the trade routes during late Prehistoric times.

## Ethnohistoric (450 - 100 BP)

At the time of contact the Native American inhabitants in the vicinity of the Project area were Yuman-speaking people, primarily living along the Colorado River. The earliest accounts by Spanish explorers provide insight into how territory was divided and/or shared amongst the Yuman cultures. In 1605 when Juan de Oñate traveled from Mexico up the east side of the river to the relative vicinity of the Project area it was presumed the Mohave people laid claim over the area, but their primary population was within the Mohave Valley to the north (Schaefer et al. 1997). Abutted against the Mohave to the south were the Quechan, and further south were the Halchidhoma. At some point between 1605 and 1776 during the Anza Expeditions, the Halchidhoma had moved northward between the Mohave and Quechan (Underwood 2005).

Historical accounts and Yuman oral traditions tell that the Halchidhoma constantly were at war with the Quechan and Mohave alliance. Eventually the Halchidhoma moved eastward to join with the Maricopa along the Gila River over a very gradual time, and by 1840 all Halchidhoma had moved away from the Colorado River. A detailed ethnography of the Halchidhoma during their Colorado River occupation could never be completed as they were well assimilated into the Maricopa before a study could be made. As a result of their migration, the Quechan and Mohave filled the gap made in their absence until the Chemehuevi appeared.

The Chemehuevi people are the most southern group of the Southern Paiute Indians, who are linguistically related to the greater Uto-Aztecan language family. The name Chemehuevi was given by the Mohave, a name they used for all Southern Paiute people (Stewart 1968). The Chemehuevi call themselves *Numu*, meaning "People". The Chemehuevi likely entered the river area between 1833 and 1859 and made an alliance with the Mohave which allowed them plots of land to cultivate within Mohave territory (Kelly and Fowler 1986). Chemehuevi belief even held that Southern Fox, and "the woman with whom the Sun conceived twin sons" called the Whipple Mountains home (Laird 1976 and 1984).

Traditionally the Chemehuevi were seasonal hunter gatherers who ranged over the eastern half of the Mojave Desert. Small family groups would migrate hunting small game and gathering wild plants. Kroeber (1925) suggested that some Chemehuevi came from mountain and desert areas to the north.

The Quechans, Mohaves, and Chemehuevi shared similar dwellings. Their earth lodges, or winter houses, were built in shallow, excavated pits, which were surrounded by beams and poles, covered with a flat roof, and coated with earth and mud. Shapes varied from round to oblong and rectangular. They also constructed separate sweat lodges. Their pottery resembled that of the Colorado River Yumans (Hovens and Herlaar 2004).

## Historic Overview

Schaefer et al. (1997) provide a coherent overview of Spanish exploration into the general lower Colorado Area:

> Díaz and Alarcón were the first to sail up the Colorado River as far as Yuma in 1540 as the nautical element of the Coronado expedition. Oñate made the first entrada up the river in 1604 and reached Mohave territory before heading up the Bill Williams River toward the Hopi. Almost a century passed until Jesuit missionary Eusebio Francisco Kino's 1700 and 1701 visits to the juncture of the Gila and Colorado Rivers. The Yuma crossing area was again visited by the 1774 Anza expedition bringing settlers from Sonora to California. During the second Anza Expedition of 1775-1776, Franciscan missionary Francisco Garcés left the expedition at Yuma and explored the Colorado River as far north and east as the Hopi mesas. Garcés was the first to be guided along the so-called Mohave trail that proceeds north from Pilot Knob on the western side of the Cargo Muchacho Mountains and the Big Maria Mountains, within the southern half of the project area, as well as routes along the river. His are some of the first detailed descriptions of the Halchidhoma and Mohave.

The Spanish era ended in 1821 and was followed by the Mexican occupation of the area, although, the Mexican government hardly found use, or reason to venture deep into the desert. After one particular expedition from Los Angeles to the Colorado River via the San Gorgonio Pass in 1825 it was decided the route was impractical and Mexicans largely left the lower Colorado River area alone (Hoyt 1948; Johnston 1977; Nordland 1977).

The California Gold Rush ushered in numerous Euro-Americans in the mid-19$^{th}$ century, and the discovery of gold at La Paz stimulated high interest in the general vicinity of the Project area. As with other Native American groups across the U.S. that were affected by Manifest Destiny, the tribes of the Colorado River found themselves at odds with these new emigrants. As a result of ensuing hostilities between Native Americans and Euro-Americans, the U.S. Government established Fort Yuma and Fort Mohave as a way to provide resources and protection to its citizens. A number of reservations were subsequently created along the Colorado River.

Small to large mining operations would follow in the general vicinity of the Project area including the Ironwood Mining District, U.S. Gypsum, the Bendigo District, and the Calzona Mines Company. (Vredenburgh et al. 1981; E. Warren et al. 1981). Particular to the Whipple Mountains were mines owned and operated by the Copper Basin mine, the Crescent mine, New American Eagle mine, the Turk Silver mine, and at least seven other patented mines (Sherman et al. 1988), but this does not include the numerous prospect mines that dot the landscape. These operations noted by Sherman et al. (1988) mined for manganese, copper, gold, and decorative rock for building, but the most successful venture was from the Bessie and Independence mines that extracted gold from the Whipple Mountains (Gudde 2004). Product from mines were shipped by stagecoach and steamboat in the early days of the 19th century, but with the construction of Laguna Dam in 1908 steamboat travel to Yuma ceased. In 1910 with completion of the Atchison, Topeka, & Santa Fe Railway Cadiz Cutoff (now BNSF Railway) from Cadiz to Earp through Vidal, transportation of mining products began to take a more modern route by railway and automobiles (Robertson 1998).

One of the many prospectors of the region was Wyatt Earp. Earp and his third wife, Josephine Marcus Earp, owned property in Vidal. They would spend winters there while Earp prospected for gold in the Whipple Mountains, as well as in Vidal Valley. The town of Earp would forever memorialize Wyatt Earp's name in the landscape by naming their community after him (Gudde 2004).

## History of Colorado River Aqueduct and Copper Basin Dam and Reservoir

The following text is quoted from the 2021 Copper Basin Dam Historical Resources Technical Report by Annie McCausland and Debi Howell-Ardila. Key elements of interest in the below quoted text are that Copper Basin Dam and Reservoir are contributing features to the CRA NRHP & CRHR eligible district.

> The Copper Basin Dam and Reservoir are contributors to the Colorado River Aqueduct Historic District, a multi-resource district determined eligible for the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR) through the Section 106 process, and formal concurrence with the California State Historic Preservation Officer (SHPO) (Caltrans 2010). Therefore, the Copper Basin Dam and Reservoir are listed in the California Historic Resources Inventory with a "2D2" California Historic Resources Status Code; this code indicates SHPO concurrence on NRHP eligibility and automatic listing on the CRHR. As a CRHR-listed property, the Copper Basin Dam and Reservoir qualify as historical resources pursuant to the California Environmental Quality Act (McCausland 2021: ES-1).
>
> **Copper Basin Dam**
> The Copper Basin Dam was constructed in 1938 as an integral part of the CRA system. Though smaller than its counterpart, Lake Havasu, the Copper Basin Reservoir remains a key facility in maintaining water levels and removing silt from the CRA system. Water in the reservoir is received from Gene Wash Reservoir via a tunnel. A concrete ogee spillway is located on the southeast side of the reservoir, and an outlet structure to the CRA Whipple Mountain Tunnel is located on the southwest side of the reservoir. The Copper Basin Dam is located on the southeast side of the reservoir, south of the spillway. The Copper Basin dam was constructed by the J. F. Shea Company, which also built the CRA Gene Dam and Parker Dam (Chasteen 2016). Because of the proximity of the dam sites to the company's already-existing construction camp near Parker Dam, no additional living quarters were necessary (Gruen 1998).
>
> Concrete aggregate for the construction of Copper Basin Dam came from the aggregate plant at the Parker Dam construction site. Trucks transported the aggregate to the dam construction site, where it was mixed with cement and then placed in buckets dangled from a high-line cable system strung across the rocks before pouring began (McCausland 2021: 10-11).

## Copper Basin Dam Access Road Construction History

On February 12, 1937, Metropolitan issued a notice inviting bids for the Construction of Gene Wash and Copper Basin Dams and Appurtenant Works. This highly detailed document references roads and roads rights of way in some detail. Specifically,

> **Construction roads**. Existing roads in the vicinity of the work are shown on the drawings. The Contractor shall at his own cost and expense provide, construct, and maintain all other roads necessary to be provided, constructed, and maintained to reach the various parts of the work, and for the transportation thereto of materials of construction and other necessary materials from railroad stations or other points of delivery, and from borrow pits and quarries. Construction roads for hauling cement or steel shall be constructed over the shortest practicable routes as determined by the Engineer, and shall be maintained in reasonably good condition for the class and amount of traffic to be carried; Roads may be constructed by the Contractor on lands owned or controlled by the District near the site of the work, and the District will provide rights of way for roads required to reach sand pits, gravel pits, or quarries as provided in Section 77. Any rights of way for roads other than as herein specifically provided shall be obtained by the Contractor at his own expense (Metropolitan 1937: 52-53).

The Metropolitan 1938 Historical Record, Contract Number 308, detailing the construction of Gene Wash and Copper Basin Dams, clearly records the condition of roads in the vicinity of the Project area immediately prior to construction. The report reads,

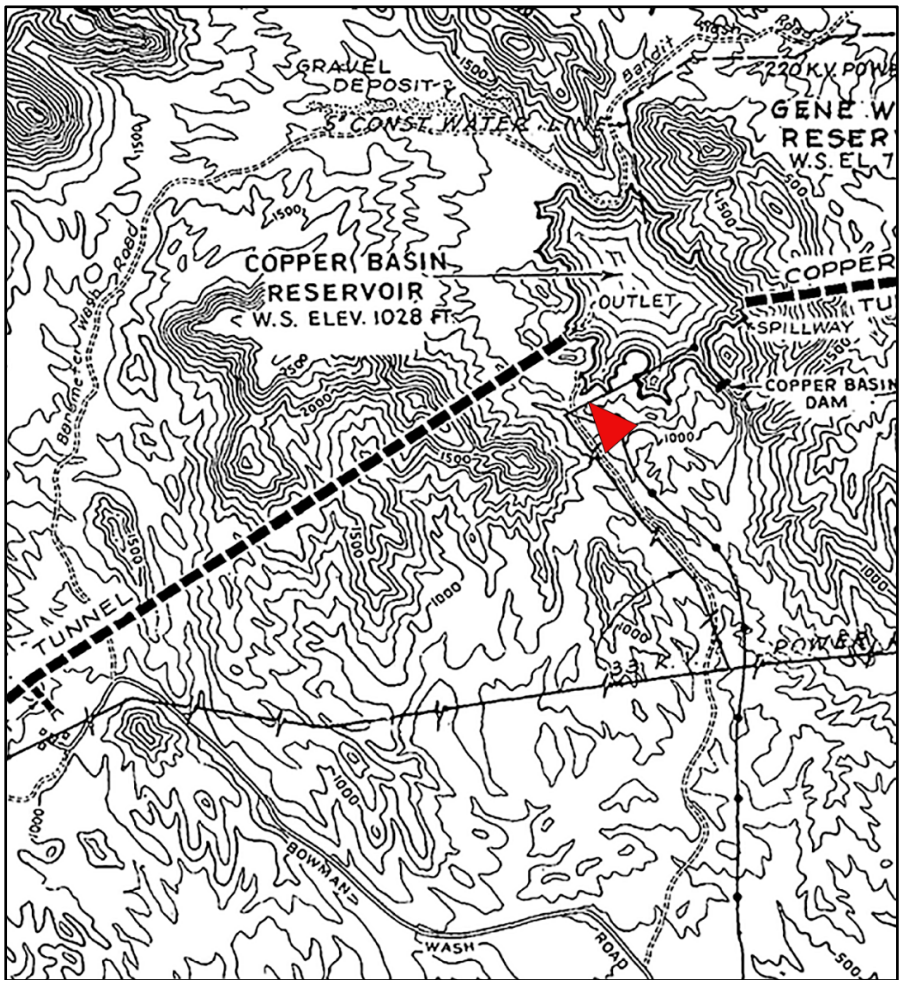
> At the time the contract was let, there were no suitable construction roads to the various features of the work except the District highway from Earp, California, to Division No. 1, and the contractor was forced to undertake the widening and straightening of about 10 miles of old survey trails and prospector's roads, so that the hauling of construction materials could be accomplished without unnecessary cost. At the present time there are good earthen roads from the District highway to all features of both dams (Metropolitan 1938: 15).

The historical chronology presented in the Metropolitan 1938 Historical Record notes that work was started on Copper Basin Dam on March 29, 1937, and that work was completed on August 15, 1938, indicating that all road improvements related specifically to the construction of Copper Basin Dam were made prior to September of 1938 (Metropolitan 1938: 16).

Additional consultation of historic maps and aerials completes our understanding of the construction history of today's Copper Basin Access Road, which is detailed below.

A map prepared on September 22, 1936, entitled *Gene Wash & Copper Basin Reservoirs Vicinity Map*, depicts various road improvements, powerlines, and telephone lines in the vicinity of the Gene Wash and Copper Basin Dams project prior to construction (Figure 2). Three historic named roads, an unnamed trail, two powerlines and one telephone line existed near the Copper Basin construction site. The named roads were Bandit Wash Road, Barometer Wash Road, and Bowman Wash Road. Bandit Wash Road comprises a small portion of today's Copper Basin Access Road, as does a portion of the unnamed trail leading from Bowmans Wash Road to just south of today's outlet structure.

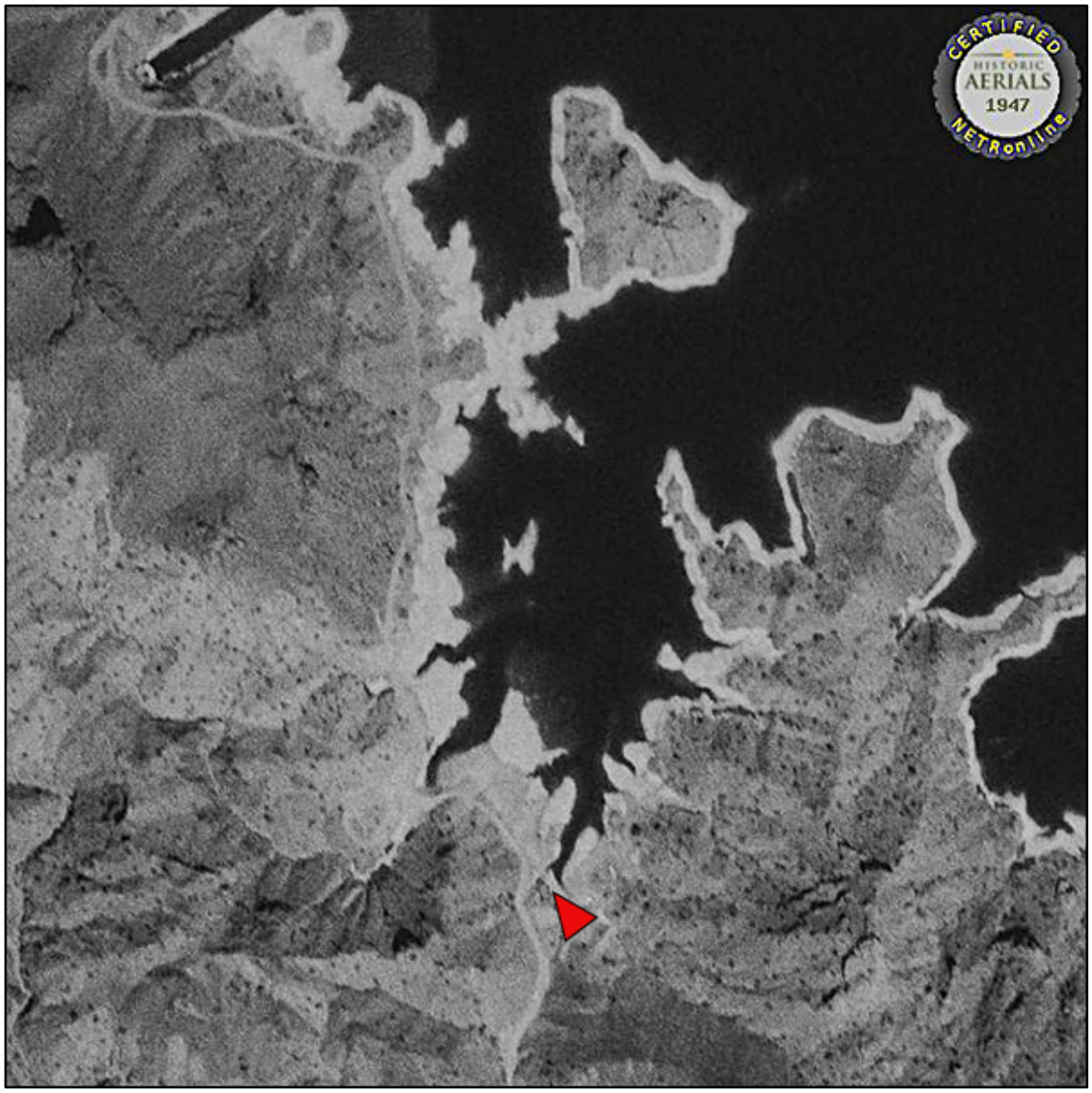
**Figure 2. Historic 1936 Image**




**1936 Metropolitan Map Detail Depicting Bandit Wash Road, Barometer Wash Road, Bowman Wash Road, and an Unnamed Trail Leading to Future Jeep Trail Intersection.**

Following construction of the Copper Basin Dam the initial maintenance access road system in the immediate vicinity of the Project area is depicted on a 1947 historic aerial (Figure 3). Note especially, the north-south access trail splitting off from Bowmans Wash Road. This trail ends approximately where today's Jeep Trail cuts off to the east.

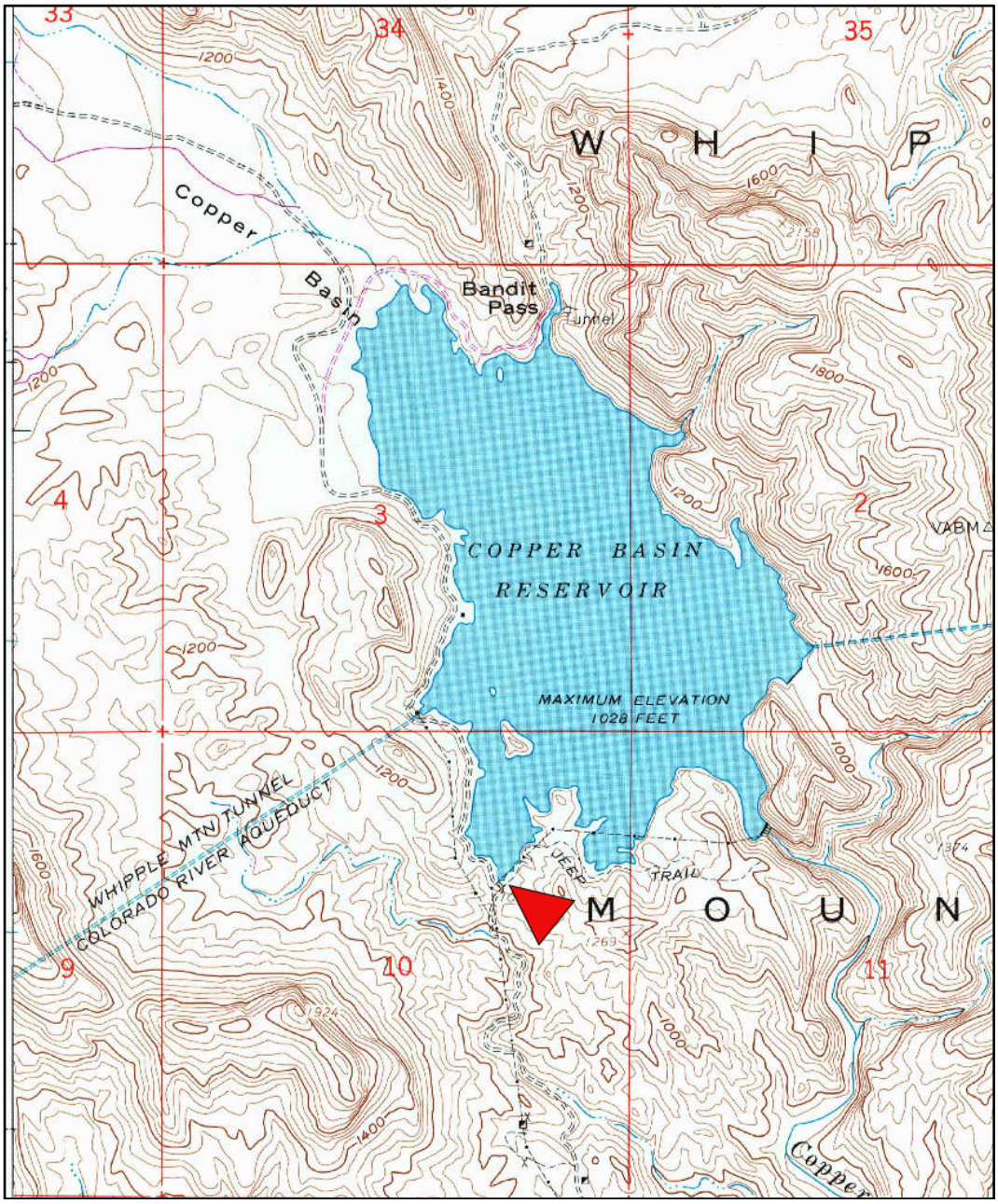
**Figure 3. Historic 1947 Aerial**




**1947 Historic Aerial Depicting Colorado River Aqueduct Outlet Structure in Top Left Corner of Image and a Portion of Copper Basin Access Road in Project area Leading Southerly to Future Intersection of the Jeep Trail.**
See **RED** Arrow

The above 1947 historic aerial depicts the Outlet Structure near the extreme northern end of the Project area in the upper left-hand corner of the image. Note, however, that the Jeep Trail comprising a key portion of the Project area is not depicted as cutting off to the east from the older historic north-south access road depicted on Figure 2. This aerial was used to prepare the 1950 edition Parker Dam Area USGS 15 Minute topographic map that was field checked in 1949 prior to publication in 1950. This indicates that the Jeep Trail, currently comprising the southerly and easterly portion of Copper Basin Access Road in the Project area depicted on Figure 4 below, was not built until after 1949.

**Figure 4. Historic 1954 Gene Wash USGS Map**




**1959 Historic Gene Wash (Photo-Revised in 1979) USGS Map Depicting Historic Jeep Trail**

The above 1959 USGS map, prepared from data based on a 1955 aerial depicts the Jeep Trail that comprises much of today's Project area. Compared to the 1947 historic aerial (Figure 3 above), and with the knowledge that the Jeep Trail does not appear on a 1950 Parker Dam Area USGS map field checked in 1949, the 1959 USGS map leads to the conclusion that the Jeep Trail portion of the Project area was constructed between 1949 and 1955. In addition, Figure 4 depicts a minor realignment of Copper Basin Access Road (see purple line near Bandit Pass) was made at some point between 1959 and 1979 when this map was photo revised. Consultation of a 1969 historic aerial available at www.historicaerials.com shows that this roadway segment was, in fact, realigned prior to 1969.

In review, that portion of today's Copper Basin Access Road within the Project area is comprised of various historic and much newer road segments. From the Outlet Structure at the extreme north end of the Project area, Copper Basin Access Road leads southerly for approximately one-quarter mile. This section of road did not exist prior to 1936 and was likely built from 1937 to 1938. A very small segment of Copper Basin Access Road within the Project area is depicted on a 1911 historic USGS map. The remaining portion of Copper Basin Access Road within the Project area, the "Jeep Trail" was built at some point between 1949 and 1955. Therefore, the entire portion of Copper Basin Access Road within the Project area was built prior to 1955. This is important as the Period Significance for contributing features to the *DPR 523D Colorado River Aqueduct District Record (CA-RIV-6726H/CA-SBR-105121H)* extends from 1923 to 1972 (Chasteen 2016: 1).

# Background Research: Methods and Results

A cultural resources records search was conducted by Aspen's archaeologist Albert Knight, B.A. at the CHRIS South Central Coastal Information Center (SCCIC) at California State University, Fullerton, California, on February 8, 2022, and included a search of the Project area and a surrounding 0.25-mile buffer area. The SCCIC is the official repository for all cultural resources site records and reports for San Bernardino County.

The records search did not identify any previously recorded cultural resources or archaeological studies within the Project area or the 0.25-mile records search buffer. However, one previously recorded cultural resource is known to exist, and this is the Colorado River Aqueduct which includes all associated appurtenant features essential for the operation of the aqueduct and for conveying water to southern California. This NRHP/CRHR eligible cultural resource is recorded on a DPR 523 District Record as follows in Table 1.

**Table 1. Cultural Resources Previously Recorded within 0.25- Miles of the Project Area**

| Primary No. | Trinomial | Age | Name | NRHP/CRHR Criteria | Recorded |
|---|---|---|---|---|---|
| 33-11265 | CA-RIV-6726H | Historic | Colorado River Aqueduct | A/1; B/2; C/3; D/4 | 8-8-2016 |
| 36-010521 | CA-SBR-10521H | Historic | Colorado River Aqueduct | A/1; B/2; C/3; D/4 | 8-8-2016 |

## Colorado River Aqueduct Previous Determination of Significance

The CRA has previously been determined as NRHP eligible in a *DPR 523D Colorado River Aqueduct District Record (CA-RIV-6726H/CA-SBR-105121H),* under Criteria A, B, C, and D thus making the resource eligible to the CRHR. This document also concludes that various features of the CRA are eligible to the NRHP and CRHR in accordance. It also lays out guidelines for evaluating various engineering features such as dams, siphons, tunnels, access roads and other CRA district contributing features (Chasteen 2016).

### CRA District Record Referencing Access Roads

The following text referencing CRA access roads is taken from Chasteen's DPR 523D Colorado River Aqueduct District Record. Key elements of interest in the below quoted text are that access roads were among the first constructed of many CRA appurtenant features, that right-of-way generally extended out 150 feet from the centerline of access roads, and that desert drainage channels were frequently crossed by paved dips.

> As defined here, the "Colorado River Aqueduct (CRA) system" is the canal system, including many appurtenant features, such as access roads and power transmission lines, essential for the operation of the aqueduct and conveying water to Southern California.
>
> Generally, the district boundaries are drawn one-half mile out from the centerline of the aqueduct and 150 feet from the centerlines of roads, wasteways, and transmission lines. (Chasteen 2016: 1-4).
>
> Infrastructure construction came first: roads, water, electric power, and telephones. The contractors often started work on the aqueduct as soon as the infrastructure was completed, or as soon as there were usable roads and power.
>
> Infrastructure
>
> Before the aqueduct construction could proceed, four infrastructure elements were needed: roads, water, power, and communication. On January 1, 1933, District forces began work on these systems; some of the work was put out for bid.
>
> The main roads were paved or oiled; these connected to the state highways and to the division camps. These roads were 20 feet wide with shoulder widths of 2 to 6 feet, paved with oilcake (Metropolitan 1939:142–143). "A few timber bridges, corrugated-iron culverts, and occasional timber culverts were used, but in general desert drainage channels were crossed by paved dips with easy vertical curves. The lower side of each dip was protected against scour, in case of flood, by a concrete cut-off wall extending the length of the dip." The roads could be built independently, based on the existing roads, and the aqueduct and camp locations (Chasteen 2016: 1-4).

Additionally, elements of interest in the below quoted text are that CRA access roads are district linear features, that the historic district boundary encompasses the entire CRA, that historic grading does not cause a loss of integrity, and that access roads that retain their integrity of location, design, setting, materials, workmanship, feeling, and association still contribute to the CRA Historic District.

> The district includes many structures that are linear features, such as the aqueduct itself, transmission lines, and roads; buildings, such as the pumping plants and their associated villages; and historic sites, such as the construction camps. The historic district boundary encompasses the entire CRA, including all water conveyance, power transmission, access, and telecommunications facilities, as well as historic sites, buildings, structures, and objects no longer in use but related to earlier surveys and construction of the CRA.
>
> Access Roads. Metropolitan maintains dirt roads to access points along the CRA. These roads are graded at least once a year. This does not cause a loss of integrity of the roadway or grade. The roads retain their integrity of location, design, setting, materials, workmanship, feeling, and association and still contribute to the CRA Historic District (Chasteen 2016: 27-29).
>
> The access roads are simple, 20-foot wide dirt roads located throughout the entire CRA water conveyance system to allow for maintenance of the canal, transmission lines, microwave towers, and other associated infrastructure (Chasteen 2016: 59).

# Native American Heritage Commission Sacred Lands File Search

On April 26, 2022, Aspen requested that the Native American Heritage Commission (NAHC) complete a search of its Sacred Lands File (SLF) to determine if resources significant to Native Americans have been recorded within the Project footprint. On May 27, 2022, Aspen received a response from the NAHC stating that the search of its Sacred Lands File was negative for the presence of resources within the Project area or surrounding vicinity. The NAHC also provided their contact list of Native American tribal governments to contact for additional information regarding resources in the area.

On June 13, 2022, Aspen sent out Tribal outreach letters via USPS Certified mail representatives of the Chemehuevi Indian Tribe, Colorado Indian River Tribes, Fort Mojave Indian Tribe, Quechan Tribe of the Fort Yuma Reservation, and the Twenty-Nine Palms Band of Mission Indians (Appendix 1).

On June 30, 2022, Aspen received a email from Jill McCormick, Historic Preservation Officer of the Quechan Indian Tribe, saying the tribe had no comments on this Project. No other responses have been received as of the date of this report.

# Survey Methods and Results

## Archaeological Pedestrian Survey Methods and Results

On March 8, 2022, Aspen Cultural Resources Field Operations Lead, Elliot D'Antin, B.S., and Cultural Resources Specialist, Christina Peterson, M.S., RPA (Survey Crew), surveyed a 100-foot wide corridor along the approximately 1.66-mile-long portion of Copper Basin Access Road within the Project area. The ground visibility was high (90%) for a majority of the 1.66-mile portion of the Project area allowing for an intensive survey utilizing 15 meter transects. Finally, 0.66 miles of the Copper Basin Access Road within Copper Basin Wash was opportunistically surveyed due to dense vegetation, and ground visibility being less than 50%.

On March 30, 2022, Mr. D'Antin surveyed an additional 2.21-acres of land for the three staging areas, which had 100% ground visibility, allowing for an intensive survey utilizing 15 meter transects. Staging areas 1 and 2 are currently in use housing maintenance equipment regularly used by Metropolitan. Staging area 3 has also been used previously and extensively as an area to store soil spoils, and extract minerals in modern times (Figure 5).

For prehistoric resources, the Survey Crew examined the ground surface searching visually for evidence of cultural material, which typically includes fragments of economically important stone materials used in the production of cutting and hunting tools (e.g., chert, rhyolite, quartzite, obsidian), stone tools used for grinding/pounding plants or animals (e.g., metates, manos, pestles, bedrock milling surfaces), evidence of rock art, remains of dietary materials that may have been consumed in the past (e.g., fragments of bone), and features such as shelters, trails, cleared circles, and geoglyphs.

The ground surfaces surveyed were also inspected for elements of historic uses, including aged roadbeds, barbed wire fencing, standing or fallen wooden posts, structural remains of buildings, cairns, wells, prospects, and metal or tin debris (e.g., tin cans, abandoned machinery or vehicles) as well as mining features.

The archaeological survey did not identify any historic-aged archaeological or prehistoric archaeological resources in the Project area (Figure 6).

## Built Environment Survey Methods and Results

Two built environment surveys of Copper Basin Access Road were conducted by Elliot D'Antin in March 2022. Photographs were taken at various locations. The portion of Copper Basin Access Road within the Project area was surveyed on March 8, 2022. The northerly portion of Copper Basin Access Road was surveyed on March 30, 2022, under the direction of Roger Hatheway, Aspen's Architectural Historian and built environment specialist. Mr. Hatheway subsequently conducted research sufficient to evaluate impacts to Copper Basin Access Road in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Secretary's Standards).

The built environment survey identified two historic-aged resources within or immediately adjacent to the Project area. Copper Basin Access Road and Copper Basin Reservoir and Dam which be have previously been determined as eligible to the NRHP and CRHR as contributing features of the *Colorado River Aqueduct District Record (CA-RIV-6726H/CA-SBR-105121H)*.

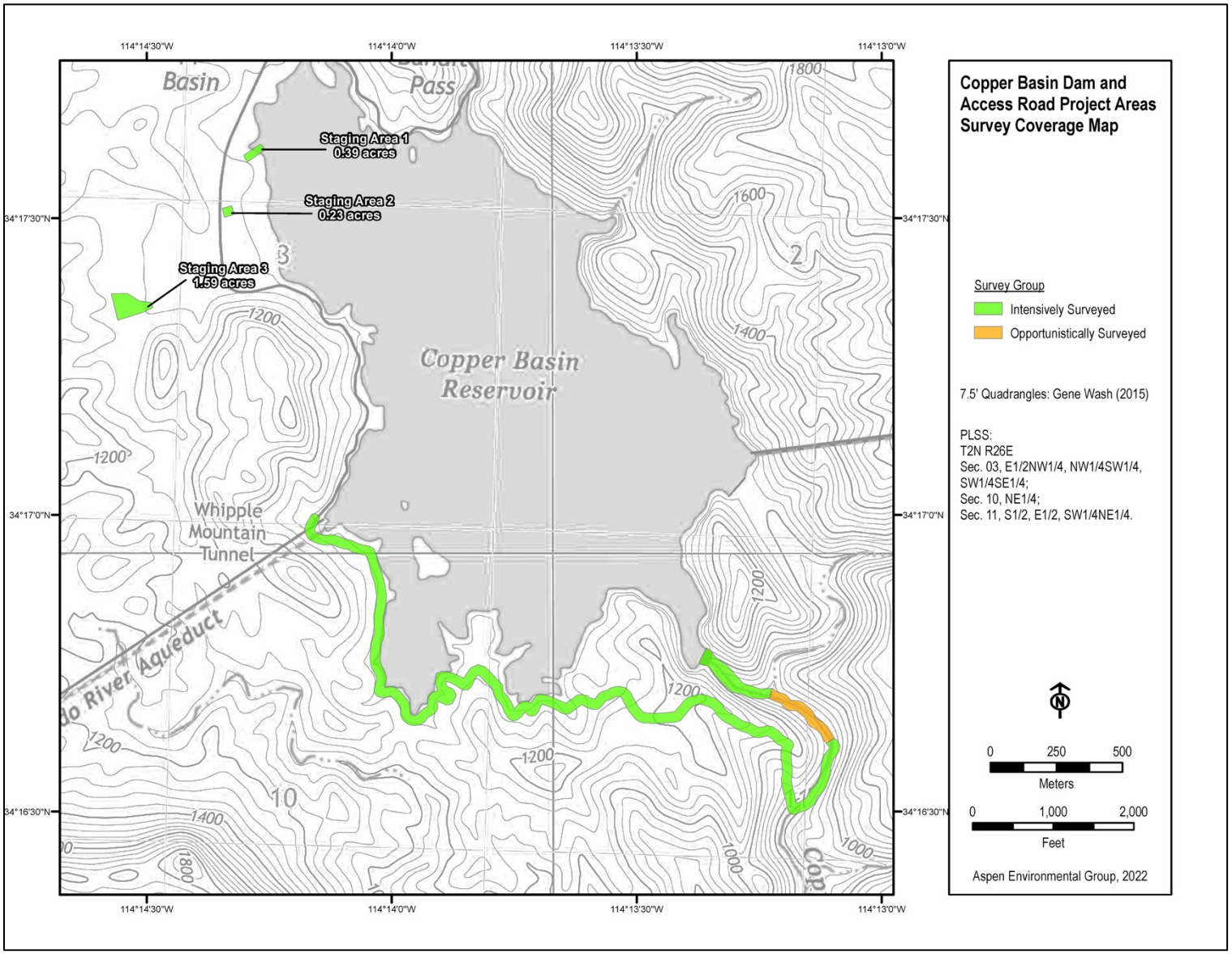
## NRHP and CRHR Evaluation

Copper Basin Access Road and Copper Basin Dam have previously been determined as eligible to the NRHP and CRHR as contributing features of the *Colorado River Aqueduct District Record (CA-RIV-6726H/CA-SBR-105121H)*. Based on in-depth historic research and field studies conducted during preparation of this report, Aspen recommends that the entirety of Copper Basin Access Road from its intersection with Trail End Camp Road to the base of Copper Basin Dam should remain a contributing feature to the NRHP/CRHR eligible *Colorado River Aqueduct District Record*.

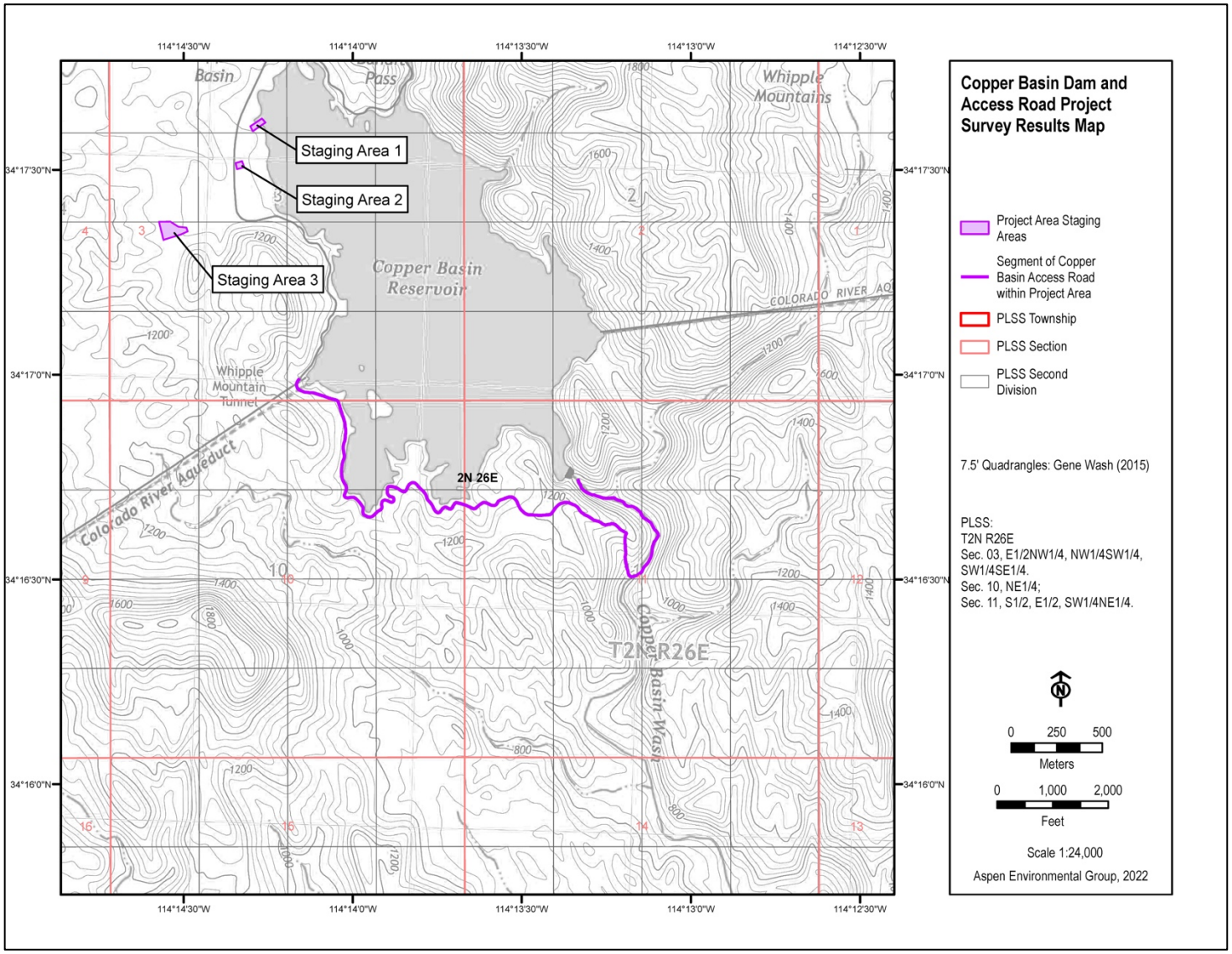
The entirety of Copper Basin Access Road is comprised of various component parts including the following: historic roads and trails that existed prior to 1911; roadway segments that were built during construction of Copper Basin Dam from 1937-1938; a Jeep Trail in the Project area built at some point between 1949 and 1955; and minor realignments outside of the Project area made at some point between 1959 and 1969. Therefore, Aspen recommends that Copper Basin Access Road, including the portion within the Project area, is not individually eligible to the NRHP or CRHR. There are no singular historic events or individuals associated with all the component parts of Copper Basin Access Road extending from Trail End Camp Road to the base of Copper Basin Dam, it lacks singular construction integrity having been built and/or modified during the period of time extending from at least 1911 to circa 1969, and it has no unusual design or engineering features.

Accordingly, Project related impacts to Copper Basin Access Road are evaluated below.

## Figure 5. Survey Coverage Map



## Figure 6. Survey Results Map



# Discussion of Impacts to Historical Resources

The following discussion of Project impacts regarding the Copper Basin Access Road is in accordance with CEQA Guidelines Section 15126.4(b)(1). Specifically,

> Where maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of the historical resource will be conducted in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (SOI 1995), Weeks and Grimmer, the project's impact on historical resources shall generally be considered mitigated below a level of significance and thus is not significant.

It should be noted that Project impacts to Copper Basin Dam are not analyzed here, but rather will be analyzed in a separate technical document.

## Summary Statement: Secretary of the Interior's Standards

In consideration of the above, the following determinations are made relative to the Project in accordance with The Secretary of the Interior's Standards for the Treatment of Historic Properties and in accordance with the Secretary's Standards for Rehabilitation (§67.7).

**Standard 1: A property will be used as it was historically or be given a new use that requires minimal change.**

Project is consistent. The use of the Copper Basin Access Road will not be changed.

**Standard 2: The historic character of a property will be retained and preserved.**

Project is consistent. The essential historic character of the Copper Basin Access Road as assembled from component parts originally built before 1911 and extending to circa 1969 will be retained and preserved. The Project does include minor modifications to the historic fabric of the road, but these alterations will allow the roadway to continue to perform much in its original design capacity as a Copper Basin Dam maintenance access road.

**Standard 3: Each property will be recognized as a physical record of its time, place, and use.**

Project is consistent. Proposed modifications to the Copper Basin Access Road will not introduce a false sense of history through conjectural features or elements. The proposed improvements are not conjectural. The Project would make minor modifications to the original historic fabric, and all new proposed construction would be for safety reasons.

**Standard 4: Changes to a property that have acquired historic significance will be retained and preserved.**

Project is consistent. Copper Basin Access Road has no known elements or changes that have acquired significance over time outside of the period of significance for the CRA as extending from 1923-1972. The Project would not impact the eligibility of any previously eligible NRHP or CRHR resource.

**Standard 5: Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.**

Project is consistent. The Project would preserve the great majority of distinctive features, finishes, and construction techniques that characterize Copper Basin Access Road.

**Standard 6: Deteriorated historic features will be repaired rather than replaced.**

Project is consistent. Proposed modifications to the Copper Basin Access Road will consist primarily of repair with minor new construction, and the access road will retain its overall appearance.

**Standard 7: Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible.**

Project is consistent. No damage to historic fabric through chemical or physical treatments would take place during implementation of the Project.

**Standard 8**: **Archaeological resources will be protected and preserved in place.**

Project is consistent. Archeological resources will be protected and preserved in place. No significant archaeological resources were identified during the field survey of Copper Basin Access Road from the gate near the Outlet Structure to the base of the dam.

**Standard 9: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property.**

Project is consistent. Proposed modifications to the Copper Basin Access Road will not destroy historic materials that characterize the property.

**Standard 10: New additions and adjacent new construction shall be undertaken such that, if removed in the future, the essential form/integrity of historic property would be unimpaired.**

Project is consistent. Project construction would include minor alterations, but all new construction is being undertaken for either safety or maintenance reasons. The essential form of the Copper Basin Access Road and its character-defining features will remain intact and unimpaired.

Finally, in evaluating impacts of the proposed Project on Copper Basin Access Road, the following aspects of integrity have been examined in accordance with the 1997 bulletin How to Apply the National Register Criteria of Evaluation, and in accordance with criteria applied by Carrie Chasteen in the 2016 DPR 523D Colorado River Aqueduct District Record.

**Location:** Copper Basin Access Road in the Project area will remain almost entirely in its existing footprint, and it will retain integrity of location.

**Design:** Copper Basin Access Road in the Project area will retain the majority of its existing design.

**Setting:** The setting of the Copper Basin Access Road in the Project area has not substantially changed since it was completed in stages between 1937 and 1969 and it will retain its integrity of setting following completion of the Project.

**Materials:** Copper Basin Access Road in the Project area retains integrity of materials. It was built as a graded dirt Jeep trail/road and will remain an almost entirely graded dirt access road with minor gunite surfaces following implementation of minor project related improvements.

**Workmanship:** Copper Basin Access Road in the Project area is a simple graded roadway alignment, and it will retain integrity of workmanship following implementation of minor project related improvements.

**Feeling:** Copper Basin Access Road in the Project area will retain integrity of feeling as a functioning access maintenance road following implementation of minor project related improvements.

**Association:** Copper Basin Access Road in the Project area will retain integrity of association as a functioning access maintenance road within the larger CRA system of NRHP eligible contributing features, following implementation of minor project related improvements.

## Discussion of Substantial Adverse Change to Historical Resources

According to CEQA guidelines, a project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

***Substantial adverse change*** in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

The significance of an historical resource is ***materially impaired*** according to CEQA Guidelines Section 15064.5(4)(b)(2) when a project:

A. Demolishes or materially alters in an adverse manner those physical characteristics of an historic resource that convey its historic significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or

B. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historic resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of the evidence that the resource is not historically or culturally significant; or

C. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historic significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

***Answers to the above items A-C are as follows:***

The Project would not materially alter, to any significant degree, the physical characteristics that convey the historic significance of Copper Basin Access Road. The proposed Project minimally alters Copper Basin Access Road in a manner that appears as generally consistent with the Secretary of the Interior's guidelines, and the proposed alterations to Copper Basin Access Road would not compromise it's continued eligibility as a NRHP contributor or for inclusion in the CRHR.

Finally, the Project is within "a responsible preservation context." Or, in accordance with Preservation Brief #14 that asks the following questions.

1. Does the proposed addition preserve significant historic materials and features?

   a. **YES** – The proposed Project would preserve the great majority of significant historic materials and features of Copper Basin Access Road. The great majority of all proposed repairs are minor.

2. Does the proposed addition preserve the historic character?

   a. **YES** – The proposed Project would preserve the essential historic character of Copper Basin Access Road. As previously discussed, the proposed Project would make minor modifications to the original historic fabric for safety reasons, while preserving the essential historic nature and character of Copper Basin Access Road.

3. Does the proposed addition protect the historical significance by making a visual distinction between old and new?

   a. **YES** – The Project will add gunite at select and minor locations. The current alignment is a graded dirt road and there will be a clear visual distinction between old and new.

# Summary and Recommendations

Aspen conducted archaeological literature reviews and record searches, as well as an intensive field survey in support of the Project in March 2022. The main goal of this investigation was to gather and analyze the information needed to determine if cultural resources are present within the Project area and if they would be impacted.

The record search and archival research did not reveal any previously documented resources within the Project area. Additionally, the record search revealed that no cultural resource investigations had been conducted previously that encompassed all or a portion of the Project area. Also, the NAHC sent results of its Sacred Lands File search on May 27, 2022, which were negative. Aspen completed a field survey of the Project area on March 8 and March 30, 2022, that determined there are no new prehistoric or historic archaeological resources in the Project area. Therefore, no further archaeological investigations are recommended.

The use of Copper Basin Access Road will not change, and the grading of or modifying a small segment of the road in the Project area to allow it to function as a CRA maintenance road does not change the significance of the road or the CRA as NRHP or CRHR eligible resources. The CRA Historic District would still be associated with broad patterns of CA history, associated with Metropolitan/CRA founders (important persons of the past), and continue to represent distinct construction methods. Therefore, implementation of the proposed Project is not expected to result in a significant adverse impact or material impairment to the historic integrity of Copper Basin Access Road and following Project implementation it would retain its status as a contributor to the CRA Historic District. Finally, no indirect Project related impacts are expected to result to the larger CRA Historic District *(CA-RIV-6726H/CA-SBR-105121H)* in implementing the Project. Therefore, no recommendations for additional studies or treatment are made for built environment resources.

In the unlikely event cultural materials are encountered during future Project construction, Aspen recommends the following:

1. **Inadvertent Discovery of Cultural Resources.** A professional archaeologist meeting the Secretary of Interior qualifications should be available on-call to identify and evaluate previously unidentified cultural resources discovered during construction activities. Upon inadvertent discovery of a potential resource, avoidance measures will be implemented by construction crews. These should include halting construction work within 100 feet of the find and directing construction away from the discovery until the archaeologist assesses the significance of the resource. The archaeologist will consult with the appropriate responsible public agency regarding necessary plans for treatment of the find(s), and for the evaluation and mitigation of impacts if the finds are thought to be potentially eligible for the CRHR or may qualify as a unique archaeological resource under CEQA Section 21083.2.

2. **Inadvertent Discovery of Human Remains.** In the event that human remains, or potential human remains are discovered, construction activities within 100-feet of the find shall be immediately halted. The construction Project Manager shall immediately notify the appropriate responsible public agency and the County Coroner. The County Coroner will make a determination as to the origin of the remains and, if determined to be of Native American origin, will contact the Native American Heritage Commission (NAHC) by telephone within 24 hours. If the remains are not of Native American origin, the County Coroner will make a determination as to the disposition of the remains. Once contacted by the County Coroner, the NAHC shall immediately identify and notify the Most Likely Descendant (MLD). The MLD has 48 hours to make recommendations to the landowner for treatment or disposition of the human remains. If the descendant does not make recommendations within 48 hours, the appropriate responsible public agency shall reinter the remains in an area of the property secure from further disturbance. If the responsible public agency does not accept the descendant's recommendations, the appropriate responsible public agency or the descendant may request mediation by the NAHC. Construction may continue once compliance with all relevant sections of the California Health and Safety Code have been addressed and authorization to proceed is issued by the County Coroner and the responsible public agency.

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# Appendix 1

NAHC and Tribal Correspondence

# NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
**Laura Miranda**
*Luiseño*

VICE CHAIRPERSON
**Reginald Pagaling**
*Chumash*

PARLIAMENTARIAN
**Russell Attebery**
*Karuk*

SECRETARY
**Sara Dutschke**
*Miwok*

COMMISSIONER
**William Mungary**
*Paiute/White Mountain Apache*

COMMISSIONER
**Isaac Bojorquez**
*Ohlone-Costanoan*

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*Yokayo Pomo, Yuki, Nomlaki*

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COMMISSIONER
**Stanley Rodriguez**
*Kumeyaay*

EXECUTIVE SECRETARY
**Raymond C. Hitchcock**
*Miwok/Nisenan*

**NAHC HEADQUARTERS**
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

May 27, 2022

Elliot D'Antin
Aspen Environmental Group

Via Email to: edantin@aspeneg.com

**Re: Copper Basin Dam and Access Road Project, San Bernardino County**

Dear Mr. D'Antin:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
*Cultural Resources Analyst*

Attachment

**Native American Heritage Commission**
**Native American Contact List**
**San Bernardino County**
**5/27/2022**

***Chemehuevi Indian Tribe***
Sierra Pencille, Chairperson
P.O. Box 1976 1990 Palo Verde Drive — Chemehuevi
Havasu Lake, CA, 92363
Phone: (760) 858 - 4219
Fax: (760) 858-5400
chairman@cit-nsn.gov

***Colorado River Indian Tribes***
Rebecca Loudbear, Attorney General
26600 Mohave Road — Chemehuevi
Parker, AZ, 85344 — Mojave
Phone: (928) 669 - 1271
Fax: (928) 669-5675
rloudbear@critdoj.com

***Fort Mojave Indian Tribe***
Timothy Williams, Chairperson
500 Merriman Ave — Mojave
Needles, CA, 92363
Phone: (760) 629 - 4591
Fax: (760) 629-5767
lindaotero@fortmojave.com

***Quechan Tribe of the Fort Yuma Reservation***
Jill McCormick, Historic Preservation Officer
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (760) 572 - 2423
historicpreservation@quechantribe.com

***Quechan Tribe of the Fort Yuma Reservation***
Manfred Scott, Acting Chairman
Kw'ts'an Cultural Committee
P.O. Box 1899 — Quechan
Yuma, AZ, 85366
Phone: (928) 750 - 2516
scottmanfred@yahoo.com

***Twenty-Nine Palms Band of Mission Indians***
Anthony Madrigal, Tribal Historic Preservation Officer
46-200 Harrison Place — Chemehuevi
Coachella, CA, 92236
Phone: (760) 775 - 3259
amadrigal@29palmsbomi-nsn.gov

***Twenty-Nine Palms Band of Mission Indians***
Darrell Mike, Chairperson
46-200 Harrison Place — Chemehuevi
Coachella, CA, 92236
Phone: (760) 863 - 2444
Fax: (760) 863-2449
29chairman@29palmsbomi-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Copper Basin Dam and Access Road Project, San Bernardino County.

Aspen environmental group

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
(818) 597-3407
www.aspeneg.com

June 13, 2022

Attorney General Rebecca Loudbear

Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ, 85344

RE: Copper Basin Dam and Access Road Project- Tribal Outreach

Dear Attorney General Loudbear,

On April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provided a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Colorado River Indian Tribes were included in the NAHC list, I am writing to request any additional information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response within 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

Sincerely,

Lauren DeOliveira, M.S., RPA
Senior Cultural Resources Specialist

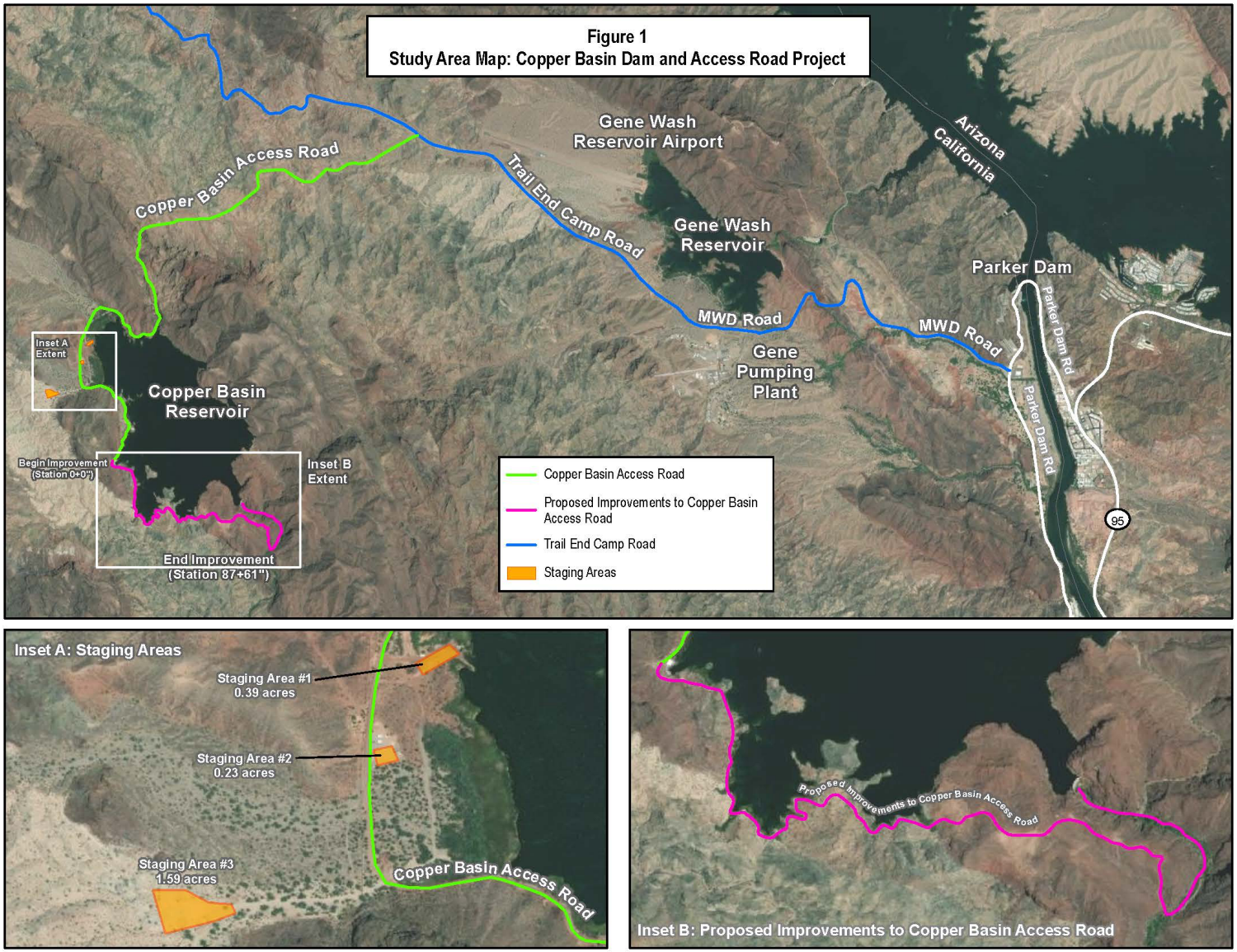


**Figure 1**
**Study Area Map: Copper Basin Dam and Access Road Project**

Aspen environmental group

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Agoura Hills, CA 91301
(818) 597-3407
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June 13, 2022

Chairperson Darrell Mike

Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA, 92236

RE: Copper Basin Dam and Access Road Project- Tribal Outreach

Dear Chairperson Mike,

On, April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provide a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Twenty-Nine Palms Band of Mission Indians was included in the NAHC list, I am writing to request any information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response within 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

Sincerely,

Lauren DeOliveira, M.S., RPA
Senior Cultural Resources Specialist

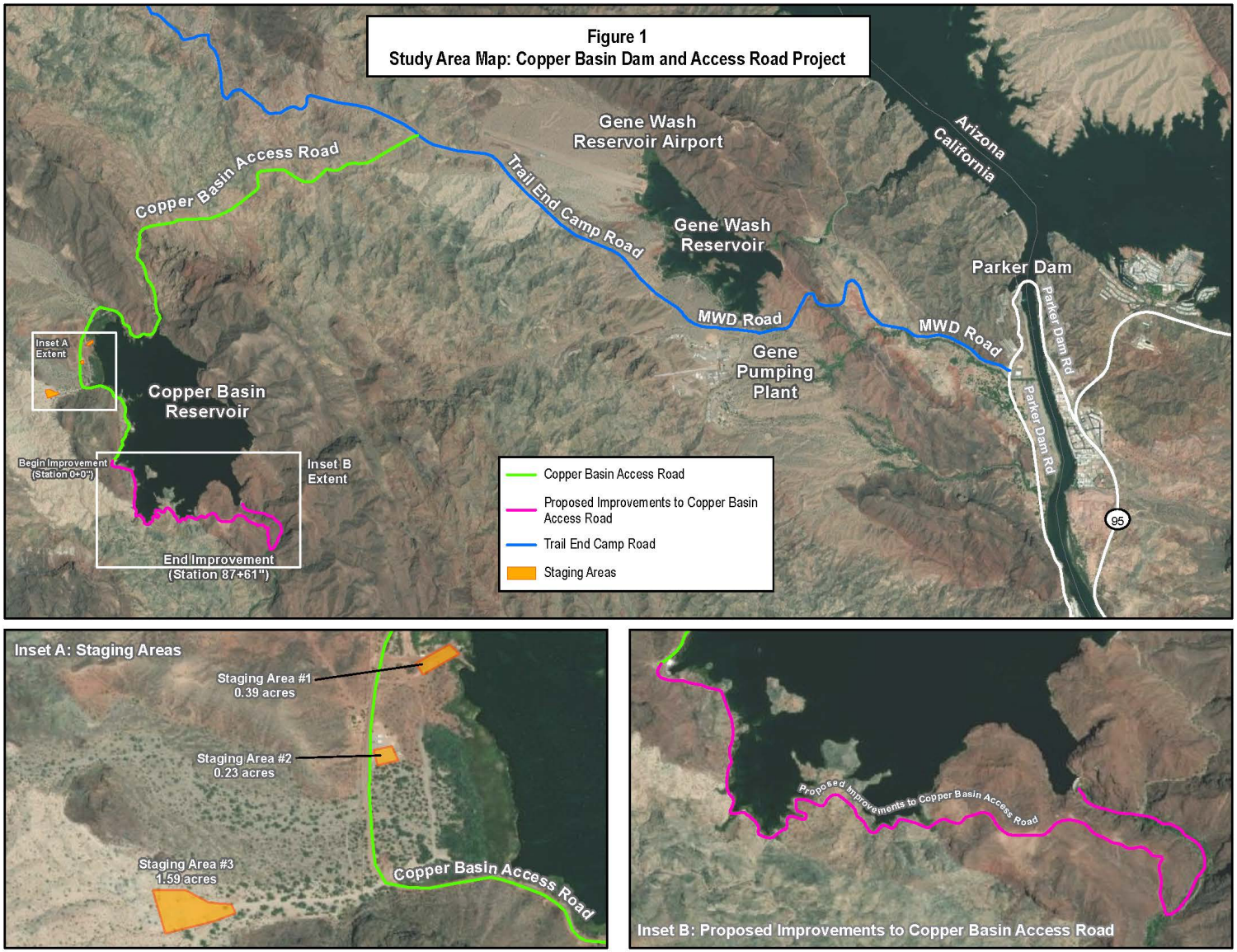



**Figure 1**
**Study Area Map: Copper Basin Dam and Access Road Project**

Aspen environmental group

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
(818) 597-3407
www.aspeneg.com

June 13, 2022

Chairperson Sierra Pencille,

Chemehuevi Indian Tribe
P.O. Box 1976
1990 Palo Verde Drive
Havasu Lake, CA, 92363

RE: Copper Basin Dam and Access Road Project- Tribal Outreach

Dear Chairperson Pencille,

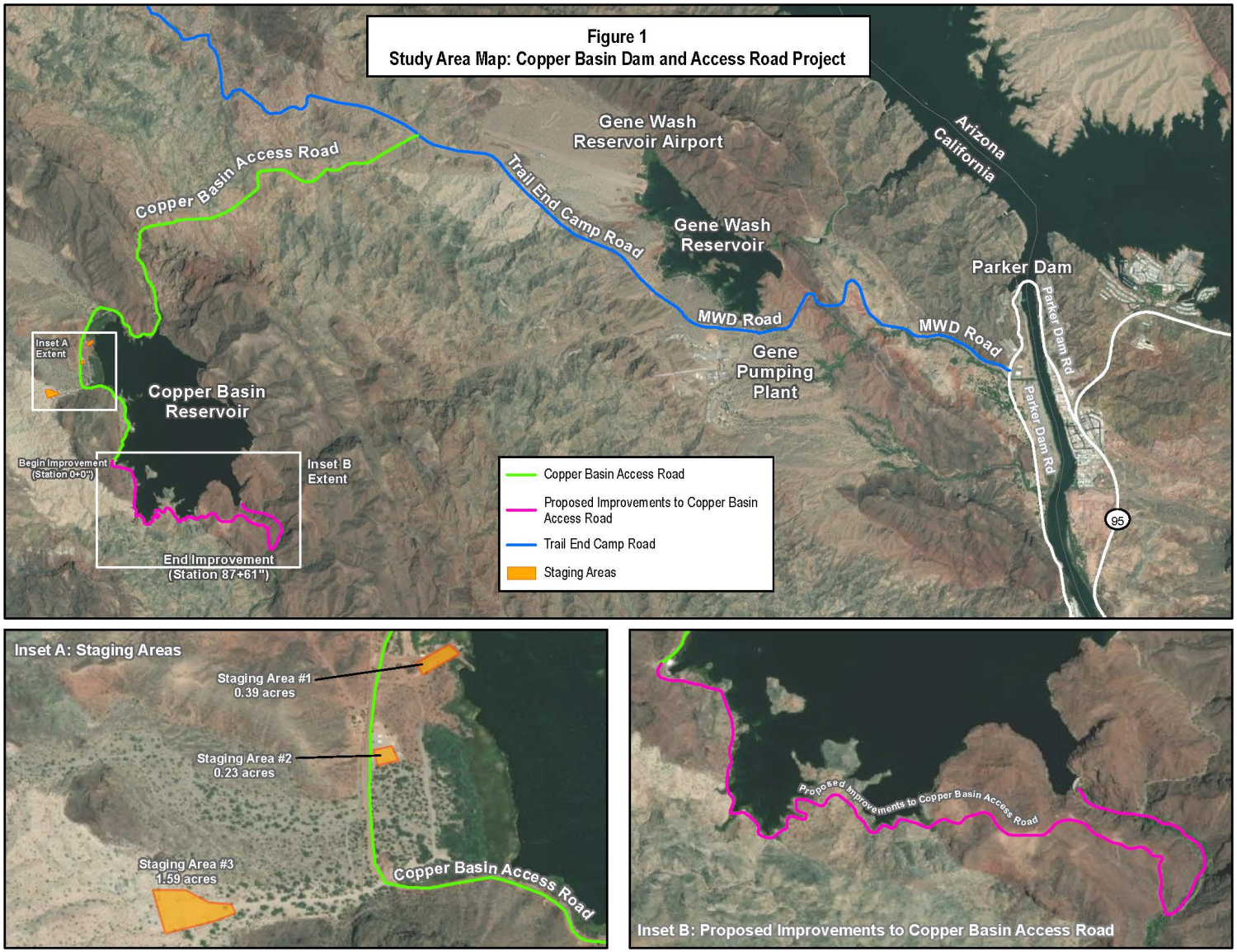
On April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provide a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Chemeheuvi Indian Tribe was included in the NAHC list, I am writing to request any information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response within 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

Sincerely,

Lauren DeOliveira, M.S., RPA
Senior Cultural Resources Specialist

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(818) 597-3407
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June 13, 2022

Acting Chairperson Manfred Scott

Quechan Tribe of the Fort Yuma Reservation
P.O. Box 1899
Yuma, AZ, 85366

RE: Copper Basin Dam and Access Road Project

Dear Chairperson Scott,

On April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provide a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Quechan Tribe was included in the NAHC list, I am writing to request any information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response within 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

Sincerely,

Lauren DeOliveira, M.S., RPA
Senior Cultural Resources Specialist

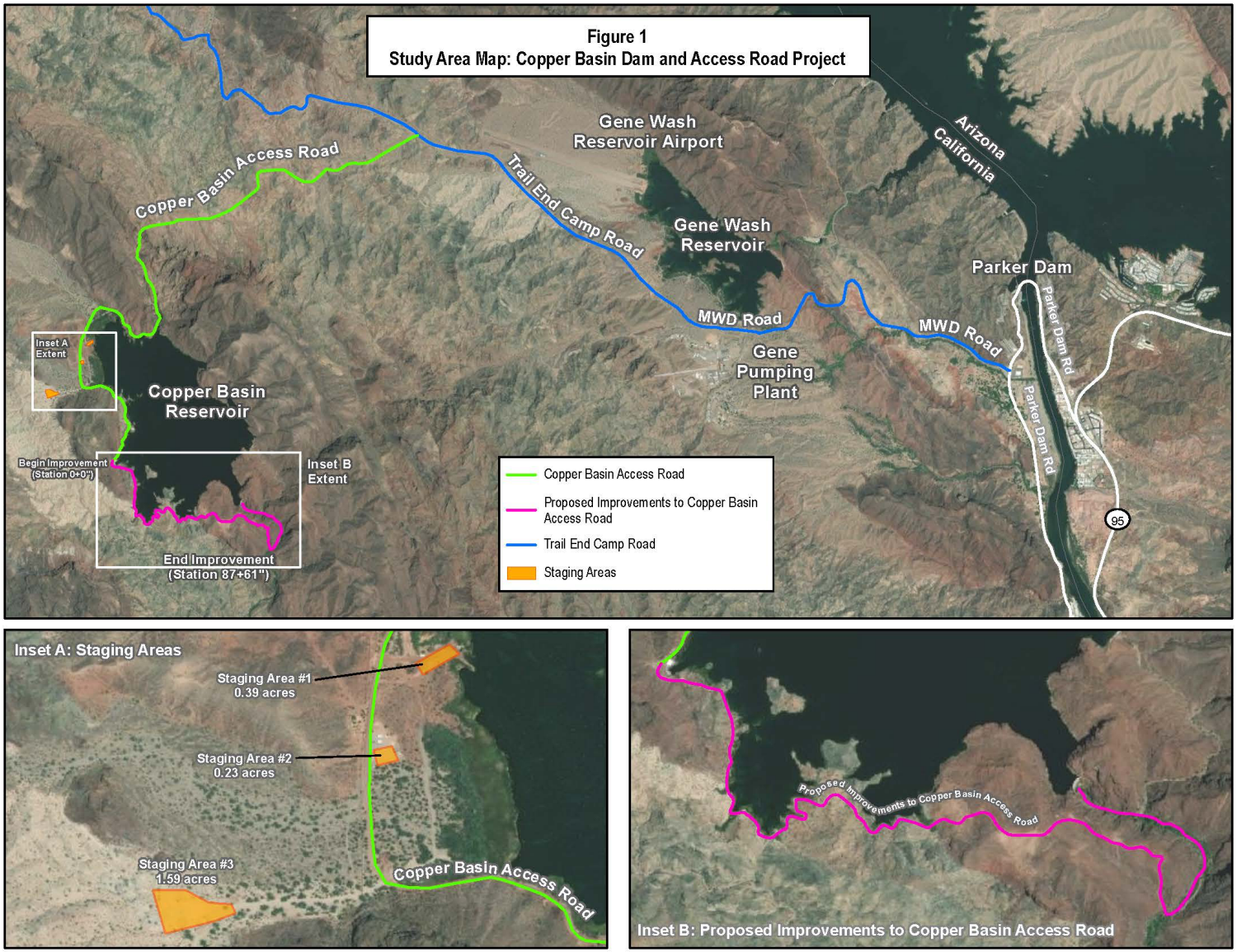


**Figure 1**
**Study Area Map: Copper Basin Dam and Access Road Project**

Aspen environmental group

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
(818) 597-3407
www.aspeneg.com

June 13, 2022

Chairperson Timothy Williams,

Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, CA, 92363

RE: Copper Basin Dam and Access Road Project- Tribal Outreach

Dear Chairperson Williams,

On April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provide a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Fort Mojave Indian Tribe was included in the NAHC list, I am writing to request any information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response with 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

Sincerely,

Lauren DeOliveira, M.S., RPA
Senior Cultural Resources Specialist

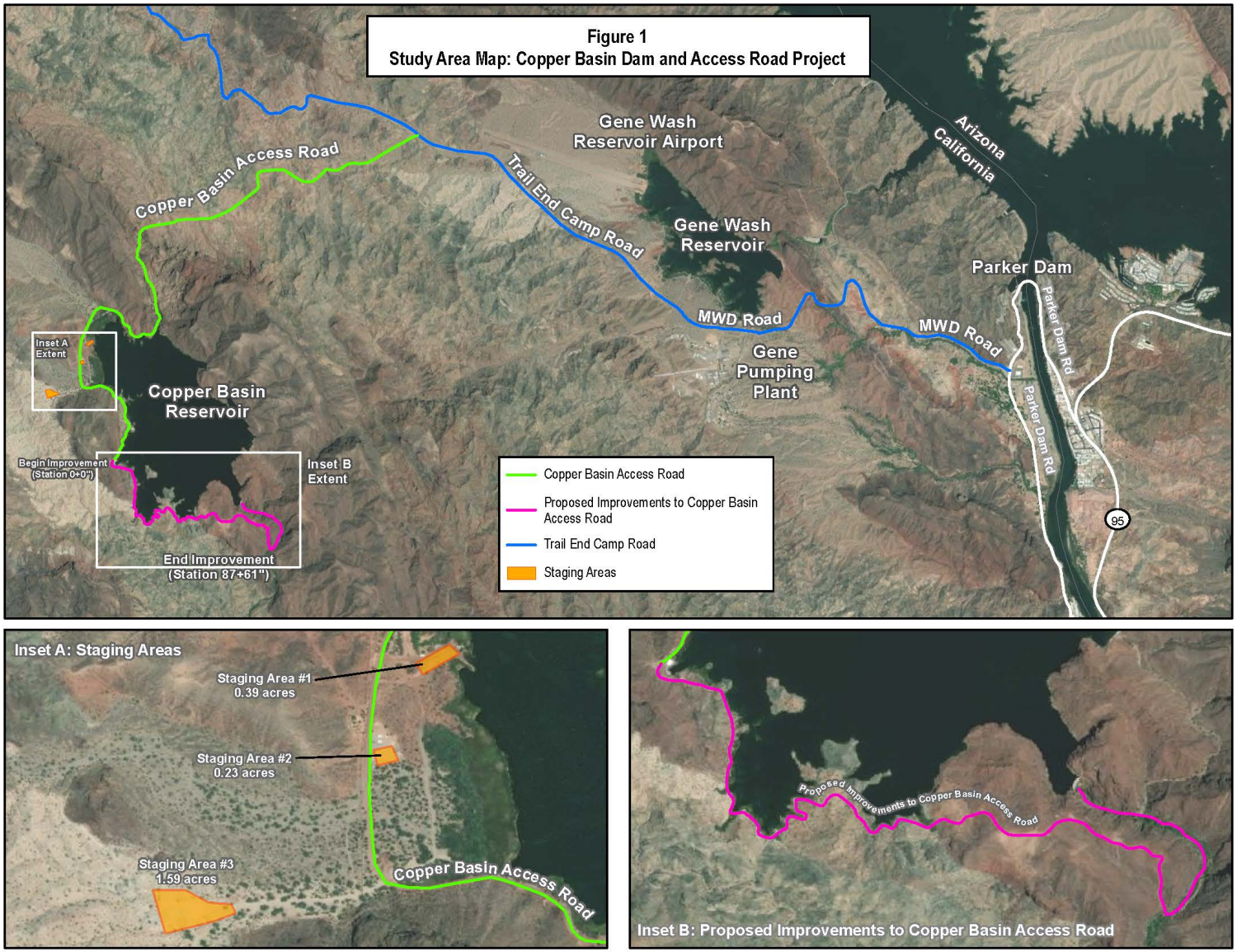


**Figure 1**
**Study Area Map: Copper Basin Dam and Access Road Project**

Aspen environmental group

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
(818) 597-3407
www.aspeneg.com

June 13, 2022

Historic Preservation Officer Jill McCormick

Quechan Tribe of the Fort Yuma Reservation
P.O. Box 1899
Yuma, AZ, 85366

RE: Copper Basin Dam and Access Road Project- Tribal Outreach

Dear Ms. McCormick,

On April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provide a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Quechan Tribe was included in the NAHC list, I am writing to request any information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response within 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

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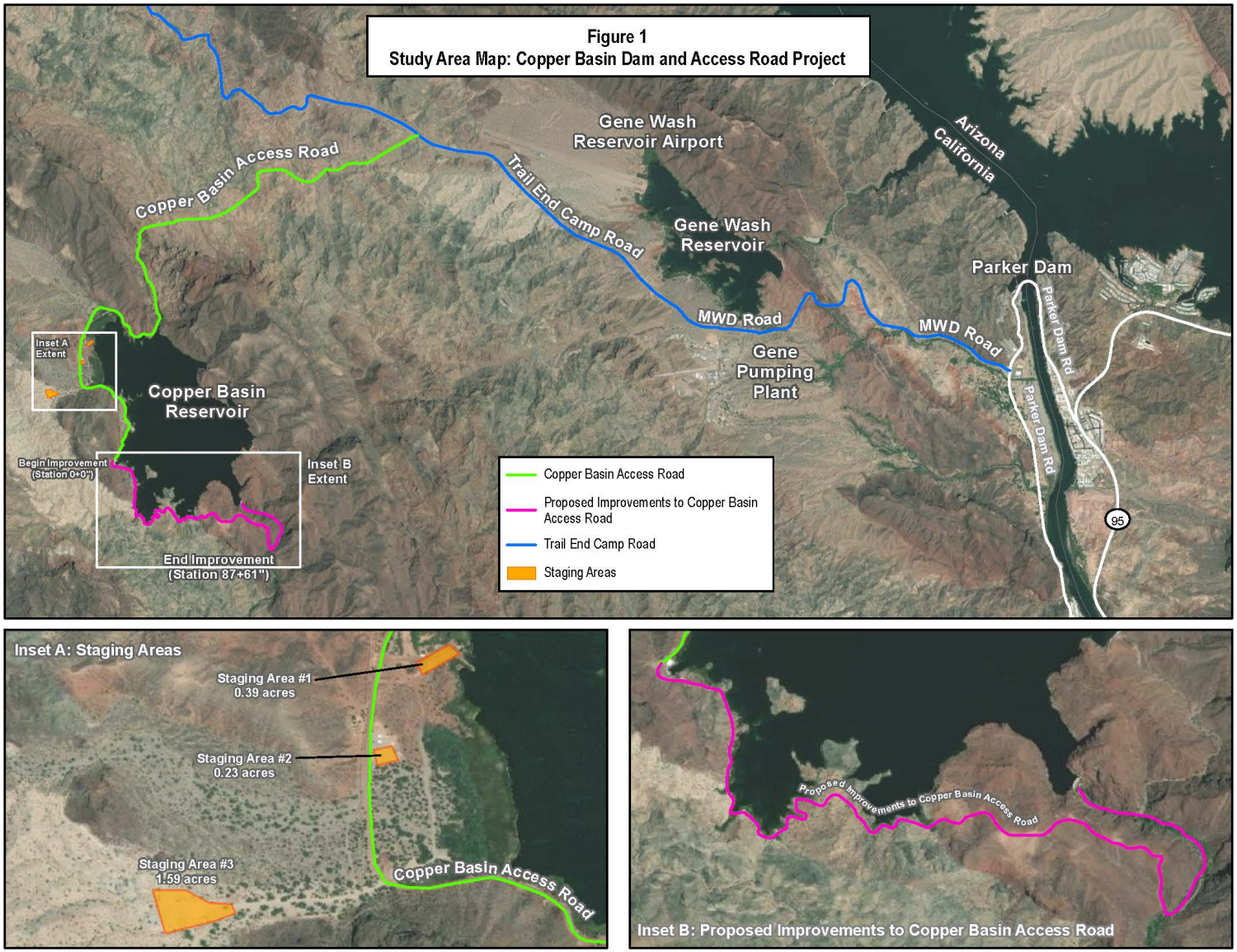


**Figure 1**
**Study Area Map: Copper Basin Dam and Access Road Project**

Aspen environmental group

5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301
(818) 597-3407
www.aspeneg.com

June 13, 2022

Tribal Historic Preservation Officer Anthony Madrigal

Twenty-Nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA, 92236

RE: Copper Basin Dam and Access Road Project- Tribal Outreach

Dear Mr. Madrigal,

On, April 28, 2022, Aspen Environmental Group (Aspen) requested the Native American Heritage Commission to conduct a Sacred Lands File search for the Copper Basin Dam and Access Road Project (Project). The proposed Project will replace an existing valve located at the base of the Copper Basin Dam, and that portion of Copper Basin Access Road leading from the outlet structure to the base of the dam is steep and too hazardous for most vehicles and will not support the type of construction vehicles required to complete the proposed Project. As such, the proposed Project will involve improvements to approximately 1.66 miles of Copper Basin Access Road at the extreme southern end of the alignment, beginning at the outlet structure and extending to the base of the dam. These improvements would involve clearing vegetation and grading the access road and paving it with gunite in steep areas. The Project site is located in San Bernardino County north of the community of Earp, California (location map attached).

On May 27, 2022, Aspen received the results of the file search for the Project. The results were negative. The NAHC provide a list of interested Native Americans who might provide additional information on cultural resources or sacred tribal areas within the Project area. As the Twenty-Nine Palms Band of Mission Indians was included in the NAHC list, I am writing to request any information you may be willing to share about important Tribal cultural resource sites and issues. Please let me know if you need any additional information.

If you could provide your comments in writing to my attention via mail, to the address above, or e-mail at ldeoliveira@aspeneg.com , I'll be sure the comments are provided to our client as part of this Project. We would appreciate a response within 30 days. Please feel free to contact me on my office line, (818) 338-6625, or via e-mail with any questions.

Sincerely,

Lauren DeOliveira, M.S., RPA
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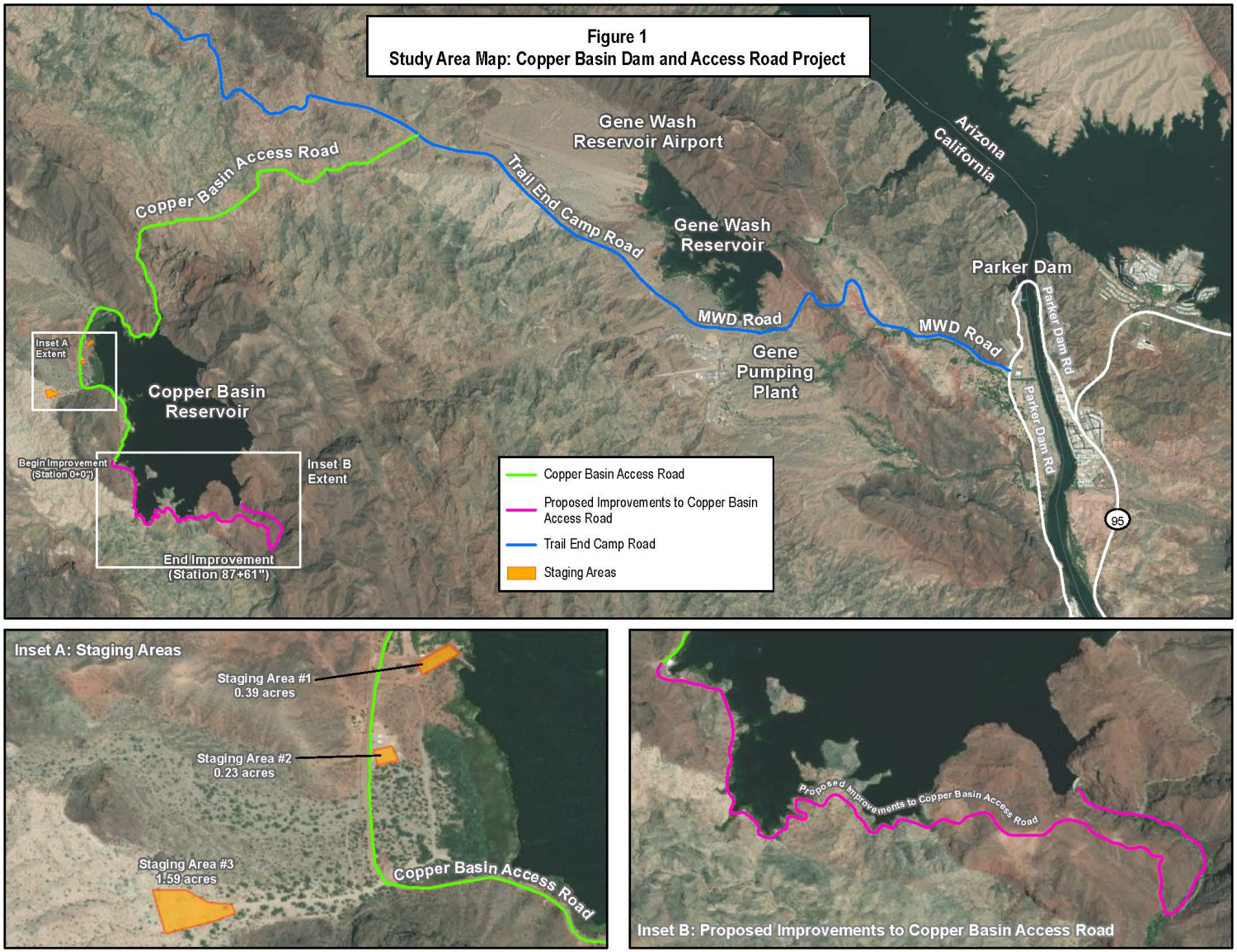



**Figure 1**
**Study Area Map: Copper Basin Dam and Access Road Project**

# Appendix 2

Copper Basin Access Road DPR 523 Form

| State of California — The Resources Agency<br>DEPARTMENT OF PARKS AND RECREATION<br>**PRIMARY RECORD** | **Primary #** 33-11265/36/010521<br>**HRI #**<br>**Trinomial** CA-RIV-6726H/CA-SBR-10521H<br>**NRHP Status Code** A/1; B/2; C/3; D/4 |
|---|---|
| **Other Listings:** | |
| **Review Code** | **Reviewer** **Date** |

 ***Resource Name or #:** Copper Basin Access Road

**P1**. Other Identifier:

***P2. Location:** ☐ **Not for Publication** **X Unrestricted** ***a. County:** San Bernardino

**and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** *Gene Wash* **Date:** 1959 Photo-Rev., 1975 **T2**N; **R**26E; Por. **Secs** 3, 10, 11 San Bernardino **B.M.**

c. Address: 158000 MWD Road City: Parker Dam Zip: 92267

d. UTM: Nad83 Zone: 11N; 754459mE 3796969mN (G.P.S.) – Copper Basin Dam Access Road Near Outlet Structure Gate

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Copper Basin Access Road extends from its intersection with Trail End Camp Road in a general westerly, then southerly, then easterly direction to the base of the Copper Basin Dam. It consists of an unpaved and graded dirt road. That section of Copper Basin Access Road from Trail End Camp Road through Bandit Pass to the gate at the outlet structure is approximately 4.22 miles long and it varies in width from 18′ to 27′ wide. That section of Copper Basin Access Road from the outlet structure gate southerly and easterly to the base of the dam is approximately 1.66 miles long and it varies in width from 10′ to 12′ wide. This section of roadway has steep grades and dip crossings. It is depicted and labelled as "Jeep Trail" on the USGS Gene Wash 1959/Rev.1975 Quad. map. The proposed Project Area extends from the outlet structure gate to the base of the dam. Therefore, the proposed project impacts only a small portion of the overall 5.88 length of Copper Basin Access Road.

***P3b. Resource Attributes:** (List attributes and codes) HP37. Highway/trail NRHP A/1; B/2; C/3; D/4

***P4. Resources Present:** ☐Building ☐Structure ☐Object ☐Site ☐District **X** Element of District ☐Other (Isolates, etc.)

**P5a.** Photo or Drawing (Photo required for buildings, structures, and objects.)
View Looking Easterly. UTM Zone 11; 754549.00 mE, 3796941.00 mN.

Typical View Copper Basin Access Road in Project Area

**P5b. Description of Photo:** March 8, 2022: Typical view of Copper Basin Access Road in Project Area.

***P6. Date Constructed/Age and Sources:** 1937-1955 **X** Historic Altered: Yearly Grading ☐Prehistoric ☐Both

***P7. Owner and Address:** Metropolitan Water District
700 North Alameda Street
Los Angeles, CA 90054-0153

***P8. Recorded by:** (Name, affiliation, and address)
Roger Hatheway
Aspen Environmental Group
5020 Cheseboro Road, Suite 200
Agoura Hills, CA 91301

***P9. Date Recorded**: 4/1/2022

***P10. Survey Type:** Pedestrian

***P11. Report Citation:** *Cultural Resources Record Search and Pedestrian Survey for the Copper Basin Dam and Access Road Project, Aspen Environmental*, Prepared for: Metropolitan Water District, Prepared by Aspen Environmental Group, June 2022.

***Attachments:** ☐NONE **X**Location Map ☐Sketch Map ☐Continuation Sheet **X**Building, Structure, and Object Record ☐Archaeological Record ☐District Record **X**Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other

***Resource Name or #:** Copper Basin Access Road
B1. Historic Name: Copper Basin Access Road
B2. Common Name: Copper Basin Access Road
B3. Original Use: Road B4. Present Use: Road
***B5. Architectural Style:** N/A
***B6. Construction History:** (Construction date, alterations, and date of alterations) Pre-1911 to Circa 1969
***B7. Moved? X No ☐Yes ☐Unknown Date:** 1934 - 1969 **Original Location:** Road built by and/or for Metropolitan Water District from 1937-1969. There have several road additions and one minor realignment.
***B8. Related Features:** Copper Basin Dam and Reservoir
B9a. Architect/Engineer: N/A b. Builder: Built by Contractor for and/or by Metropolitan Water District
***B10. Significance: Theme:** Colorado River Aqueduct – Access Roads **Area:** High Desert – Colorado River Aqueduct
**Period of Significance:** 1923-1972 **Property Type:** Highway/Trail **Applicable Criteria:** NRHP A/1; B/2; C/3; D/4

Copper Basin Access Road and Copper Basin Dam have previously been determined as eligible to the NRHP as contributing features of the *Colorado River Aqueduct District Record (CA-RIV-6726H/CA-SBR-105121H)*.

Based on in-depth historical research and field studies conducted during preparation of the 2022 *Cultural Resources Record Search and Pedestrian Survey for the Copper Basin Dam and Access Road Project* report, Aspen recommends that the entirety of Copper Basin Access road from its intersection with Trail End Camp Road to the base of Copper Basin Dam should remain as a contributing feature to the NRHP eligible *Colorado River Aqueduct District Record*. However, the entirety of Copper Basin Access Road is comprised of various component parts including the following: historic roads and trails that existed prior to 1911; roadway segments that were built during construction of Copper Basin Dam from 1937-1938; a Jeep Trail in the Project Area built at some point between 1949 and 1955; and minor realignments outside of the Project Area made between 1959 and 1969. Aspen recommends, therefore, that Copper Basin Access Road, including that portion within the Project Area, is not individually eligible to the NRHP. There are no singular historic events or individuals associated with all the component parts of Copper Basin Access Road extending from Trail End Camp Road to the base of Copper Basin Dam, it lacks singular construction integrity having been built and/or modified during the period of time extending from at least 1911 to circa 1969, and it has no unusual design or engineering features.

**B11. Additional Resource Attributes: (List attributes and codes)**
RESOURCE ATTRIBUTE CODE(S):
HP37. Highway/trail
**B12. References:**
See *Cultural Resources Record Search and Pedestrian Survey for the Copper Basin Dam and Access Road Project, Aspen Environmental*, Prepared for: Metropolitan Water District, Prepared by Aspen Environmental Group, June 2022.
**B13. Remarks:**
Historical and Transportation Context developed in report entitled *Phase I Cultural Resource Assessment for the Stagecoach Solar Project, Northern Lucerne Valley, San Bernardino County, California,* Prepared for: California Lands Commission, Prepared by: Aspen Environmental Group, Inc., 2020.

***B14. Evaluator:** Roger Hatheway, Aspen Environmental Group, 5020 Cheseboro Road, Suite 200, Agoura Hills, CA 91301

***Date of Evaluation:** June 26, 2022

(Sketch Map with north arrow required.)

**Please see Location Maps DPR 523 Pages 4 and 5**

(This space reserved for official comments.)

**L1. Historic and/or Common Name:** Copper Basin Access Road

**L2a. Portion Described:** **X** Entire Resource ☐ Segment ☐ Point Observation **Designation:** Named Used by MWD Staff

**b. Location of point or segment:** Typical in Project Area: See Location Maps – DPR 523 Pages 4 and 5.

**USGS 7.5' Quad:** 7.5′ USGS *Gene Wash* 7.5′ USGS CA **Date:** 1959 Photo-Rev 1979

**L3. Description:** (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)
Copper Basin Access Road extends from its intersection with Trail End Camp Road in a general westerly, then southerly, the easterly direction to the base of the Copper Basin Dam. It consists of an unpaved and graded dirt road. That section of Copper Basin Access Road from Trail End Camp Road through Bandit Pass to the gate at the outlet structure is approximately 4.22 miles long and it varies in width from 18′ to 27′ wide. That section of Copper Basin Access Road from the outlet structure gate southerly and easterly to the base of the dam is approximately 1.66 miles long and it varies in width from 8′ to 12′ wide. This section of roadway has steep grades and dip crossings. It is depicted and labelled as "Jeep Trail" on the USGS Gene Wash 1959/Rev.1975 Quad. map. The proposed project Study Area extends from the outlet structure gate to the base of the dam. Therefore, the proposed project impacts only a small portion of the overall 5.88 length of Copper Basin Access Road.

**L4. Dimensions:** (In feet for historic features and meters for prehistoric features)

**a. Top Width:** Varies – 12.0 to 27.0 Feet
**b. Bottom Width:** Varies - 10.0 to 18.0 Feet
**c. Height or Depth:** Varies – 1.0 to 2.0 Feet
**d. Length of Segment:** Approx. 5.88 Miles

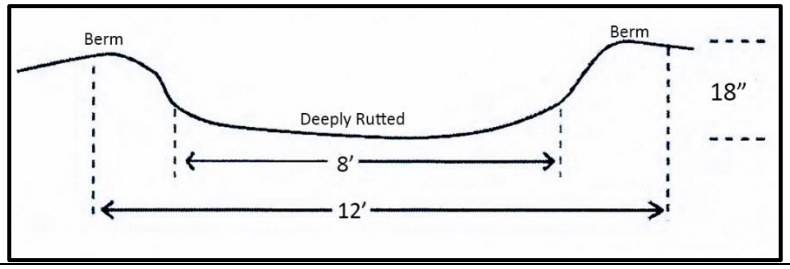
**L5. Associated Resources:** Copper Basin Dam and Reservoir.

**L6. Setting:** Desert/Remote

**L7. Integrity Considerations:**

**L8b. Description of Photo, Map, or Drawing**
There are no drawings or profiles of this private road. Aspen field crews surveyed the alignment and prepared the L4e Sketch.

**L4e. Sketch of Average Cross-Section in 1.66 Mile-Long Project Area - Actual Sections Along Entire 5.66 Mile Length Vary Widely**




**L9. Remarks:** See Historical context and evaluation developed in report entitled *Cultural Resources Record Search and Pedestrian Survey for the Copper Basin Dam and Access Road Project, Aspen Environmental*, Prepared for: Metropolitan Water District, Prepared by Aspen Environmental Group, June 2022.

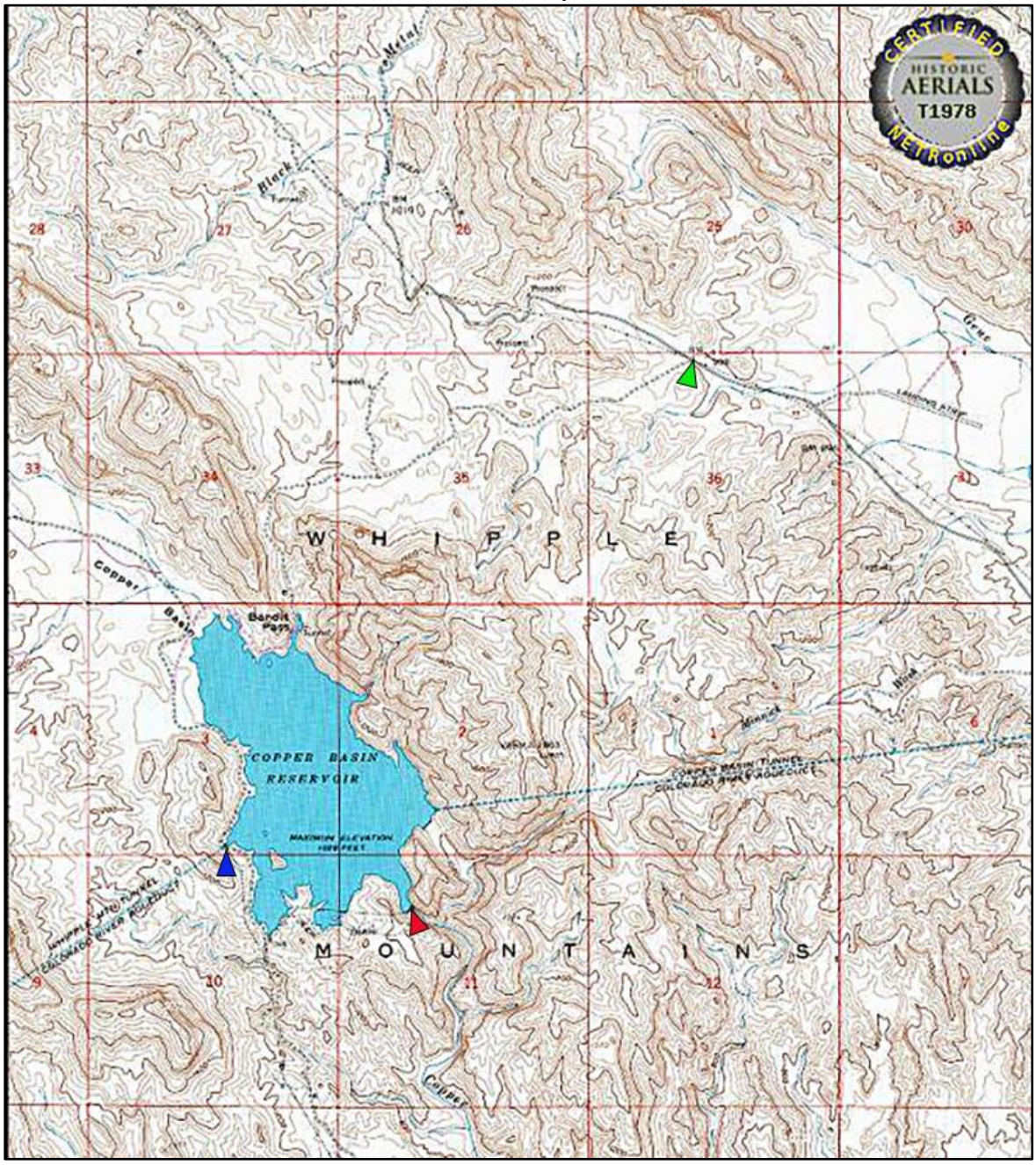
**L10. Form Prepared by:** Roger Hatheway, Aspen Environmental Group, 5020 Cheeseboro Road, Suite 200, Agoura Hills, CA 91301

**L11. Date:** 6/26/2022

**L8a. 3/8/2022 Typical View of Copper Basin Access Road in Project Area**

**Looking Easterly. UTM Zone 11; 754549.00 mE, 3796941.00 mN.**

***Map Name:** 7.5 ' USGS *Gene Wash* ***Scale:** 1: 24,000 ***Date of Map:** 1978 - www.historicaerials.com



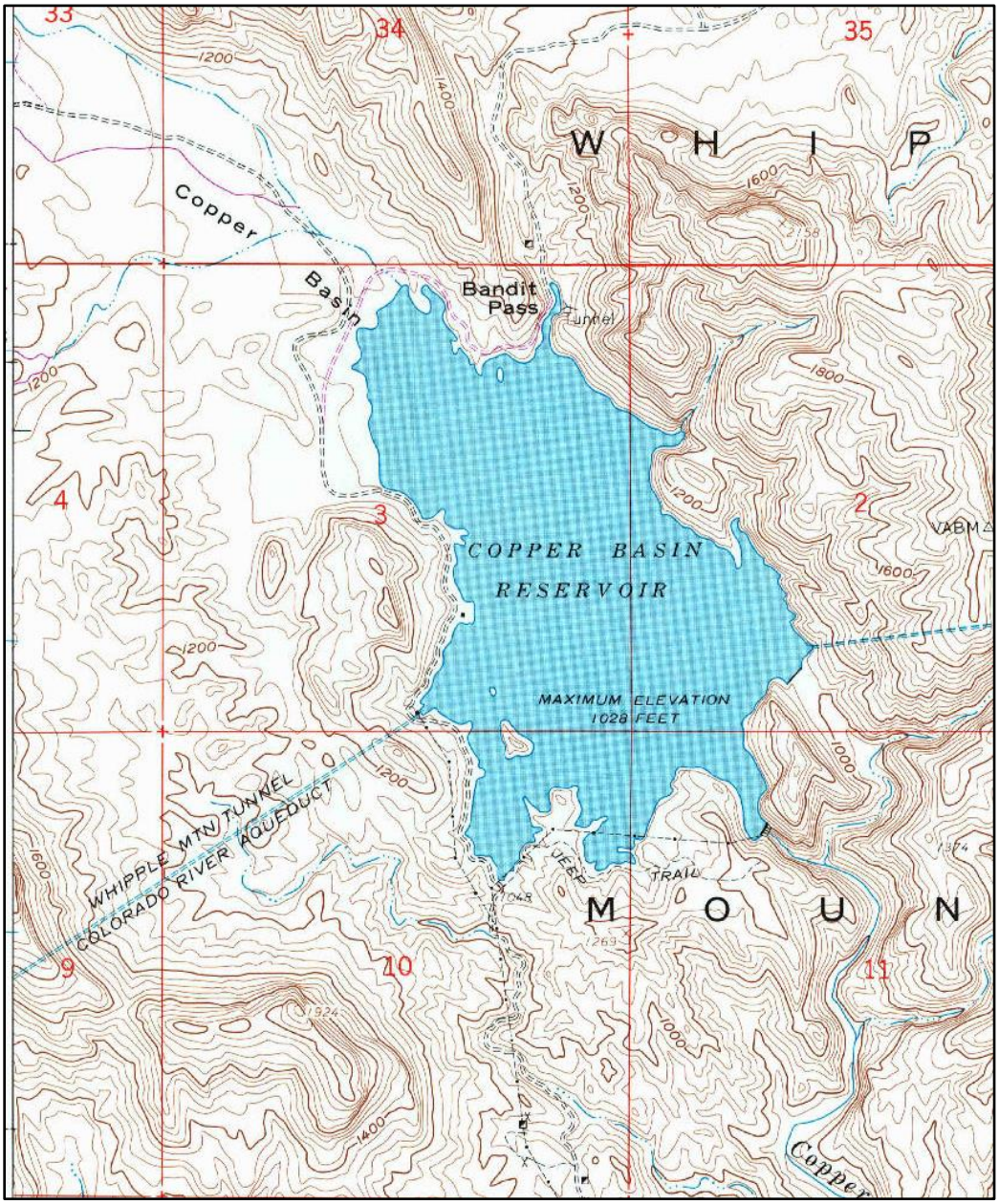

***Gene Wash*, USGS Quadrangle Map, Original Scale: 1:24,000**
**Depicting Entire Length of Copper Basin Access Road**

**Entire Length of Copper Basin Access Road Data as Depicted on Map**

- This map depicts the 5.88-mile length of Copper Basin Access Road from its intersection with Trail End Camp Road to the base of Copper Basin Dam.

**GREEN ARROW** = Copper Basin Access Road at Intersection with Trail End Camp Road.
**BLUE ARROW** = Copper Basin Access Road at Outlet Structure Gate (Northwesterly End of Project Study Area).
**RED ARROW** = Copper Basin Access Road at Base of Copper Basin Dam (Southeasterly End of Project Study Area).

***Map Name:** 7.5′ USGS *Gene Wash* ***Scale:** Original = 1: 24,000 ***Date of Map:** 1959 Photo-Revised 1979




**DETAIL: 1959 *Gene Wash*, Calif.-Ariz., USGS Quadrangle Map (Photo-Revised 1979) Original Scale: 1:24,000**

**Relevant Copper Basin Access Road Data Depicted on Detail Map**

This 1959 USGS map, prepared from data based on a 1955 aerial depicts the Jeep Trail that comprises the majority of today's Project Area. This Jeep Trail does not appear on a 1950 Parker Dam Area USGS map field checked in 1949, the 1959 USGS map, leading to the conclusion that the Jeep Trail portion of the Project Area was constructed between 1949 and 1955. In addition, the 1959 map depicts a minor realignment of Copper Basin Access Road (see purple line near Bandit Pass) made at some point between 1959 and 1979 when this map was photo revised. Consultation of a 1969 historic aerial available at www.historicaerials.com shows that this roadway segment was, in fact, realigned prior to 1969.

# Appendix D

Historical Resources Technical Report

# Copper Basin Dam Valve Replacement Project

## Historical Resources Technical Report

August 2022 | 00501.00050.006

*Prepared for:*

**Metropolitan Water District of Southern California**
P.O. Box 54153
Los Angeles, CA 90054

*Prepared by:*


Stacie Wilson
Senior Archaeologist

**HELIX Environmental Planning, Inc.**
7578 El Cajon Boulevard
La Mesa, CA 91942

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**National Archaeological Database Information**

| | |
|---|---|
| Authors: | Debi Howell-Ardila, M.H.P., Annie McCausland, M.A., Teri Delcamp, M.A. |
| Firm: | HELIX Environmental Planning, Inc. |
| Client/Project: | Metropolitan Water District of Southern California / Copper Basin Dam Valve Replacement Project |
| Report Date: | August 2022 |
| Report Title: | Historical Resources Technical Report for the Copper Basin Dam Valve Replacement Project, San Bernardino County, California |
| Prepared for: | Metropolitan Water District of Southern California |
| Type of Study: | Historical Resources Technical Report |
| New Sites: | None |
| Updated Sites: | P- 33-11265 and P-36-010521 |
| USGS Quad: | Parker 7.5' Quadrangle |
| Key Words: | Howell-Bunger valve; Colorado River Aqueduct Historic District; Copper Basin Dam; San Bernardino County; Township 2 North, Range 26 East, Section 11 |

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ASCE | American Society of Civil Engineers |
| Cal/OSHA | California Division of Occupational Safety and Health |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| CRA | Colorado River Aqueduct |
| CRHR | California Register of Historical Resources |
| DPR | California Department of Parks and Recreation |
| DSOD | California Division of Safety of Dams |
| HAER | Historic American Engineering Record |
| HELIX | HELIX Environmental Planning, Inc. |
| HRTR | Historical Resources Technical Report |
| Metropolitan | Metropolitan Water District of Southern California |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| OSHA | Occupational Safety and Health Administration |
| PRC | Public Resources Code |
| project | Copper Basin Dam Valve Replacement Project |
| Reclamation | U.S. Bureau of Reclamation |
| SHPO | State Historic Preservation Officer |
| USGS | U.S. Geological Survey |

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# EXECUTIVE SUMMARY

## PURPOSE AND SCOPE

The Metropolitan Water District of Southern California (Metropolitan) contracted HELIX Environmental Planning, Inc. (HELIX) to prepare a Historical Resources Technical Report (HRTR) in support of the Copper Basin Dam Valve Replacement Project (project) in the unincorporated community of Parker Dam, San Bernardino County, California. This technical study provides Metropolitan with the substantial evidence necessary to confirm the historical resource status of the dam and to assess the potential impacts from the proposed project.

The Copper Basin Dam and Reservoir are contributors to the Colorado River Aqueduct Historic District, a multi-resource district determined eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) through the Section 106 process via formal concurrence by the California State Historic Preservation Officer (SHPO) (Caltrans 2010). Therefore, the Copper Basin Dam and Reservoir are listed in the California Historic Resources Inventory with a "2D2" California Historic Resources Status Code; this code indicates SHPO concurrence on NRHP eligibility and automatic listing on the CRHR. In 2016, Metropolitan retained Applied EarthWorks, Inc. (Æ) to record the entirety of the Colorado River Aqueduct (CRA), including the pumping plants, reservoirs, dams and appurtenant features, and structures as a continuous historic district. As a CRHR-listed property, the Copper Basin Dam and Reservoir qualify as historical resources pursuant to the California Environmental Quality Act (CEQA).

Due to site access issues at the time of the resource's documentation in 2016, the Copper Basin Dam was not documented in detail. Furthermore, the dam has not been previously evaluated for individual historical significance. This report and accompanying Department of Parks and Recreation (DPR) Series 523 form update provide the necessary additional analysis and detail to evaluate the dam's individual historical significance, characterize the resource and its character-defining features, and assess potential impacts.

The project proposes minor maintenance upgrades to various equipment and features associated with the dam. The project involves the in-kind replacement of an extant, large-scale water discharge valve known as the "Howell-Bunger" valve (described in more detail below). The Howell-Bunger valve was originally installed on the Copper Basin Dam in 1938, at the time of the dam's construction. After more than 75 years of continuous service, the valve is in need of replacement. Other associated work includes the replacement of the main ladder that provides access to the existing valve house from the top of the dam, replacement of the main weir, adit weir and catwalk panels located downstream of the dam, installation of concrete steps from the existing valve house to the new catwalk system, and electrical and mechanical upgrades. This study examines the proposed project and the potential impacts to the dam as a historical resource. The project components are described and examined for compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Secretary's Standards*).

All activities were conducted in accordance with the requirements of the Public Resources Code (PRC), CEQA, as well as the applicable best practices and regulations. Metropolitan is the lead agency under CEQA.

## DATES OF INVESTIGATION

In June 2021, HELIX Architectural Historian Annie McCausland completed a literature review, primary- and secondary-source research, and a desktop inspection of the Copper Basin Dam, its overall design, construction methods, materials, features, and setting. Metropolitan staff conducted a site visit and provided detailed photographs of the resource. HELIX Senior Architectural Historian, Debi Howell-Ardila, MHP, served as the principal author of the draft report and provided senior review and QA/QC. Following completion of the draft report in 2022, HELIX Architectural Historian Teri Delcamp completed a literature review, primary- and secondary-source research, and a field survey to record and photograph the Copper Basin Dam and the additional associated features not previously described in the project scope. HELIX Cultural Resources Manager, Mary Robbins-Wade, and Senior Cultural Resources Project Manager, Stacie Wilson, provided QA/QC and strategic oversight for the project. Resumes for key staff follow this report as Appendix A.

This intensive-level analysis included a detailed physical description, integrity evaluation, identification of character-defining features, an evaluation of the dam as an individual historical resource per NRHP and CRHR criteria, and an impacts analysis relative to the dam's historical status. An updated set of DPR Series 523 forms was prepared; the compiled set follows this report as Appendix B.

## SUMMARY OF FINDINGS

This intensive-level analysis confirms the previous finding of eligibility for the Copper Basin Dam as a contributor to the CRA Historic District and concludes that the dam is eligible for inclusion in the NRHP and CRHR as an individually significant historical resource. This analysis also defines the dam's character-defining features, which include the dam's sluiceway system.

The proposed project would replace, in-kind, one of the original components of the Copper Basin Dam sluiceway system, an extant Howell-Bunger valve and gate valve installed at the time of the dam's construction in 1938. In addition, other related components will be replaced to meet California Division of Occupational Safety and Health (Cal/OSHA) and federal Occupational Safety and Health Administration (OSHA) safety standards that will become effective in 2036 (Hazen and Sawyer 2020). Lastly, the project includes upgrades to electrical, communication, and mechanical systems. All of these project components will allow for the continuing operation of the dam within the larger CRA.

Although the Howell-Bunger valve and gate valve are large in scale, they are comparatively small features when compared with the scale of the dam itself. As currently envisioned, the project proposes to replace the valves, in-kind, to match the existing valves in materials, dimensions, and use, and care will be taken to avoid the destruction or obstruction of adjacent character-defining features. The two weir structures will be replaced with reinforced concrete structures of essentially the same design and dimensions in their current locations. Other project components involve access and safety features, including the replacement of the main access ladderway, metal landing platforms and non-historic catwalk panels, as well as the installation of concrete stairs to access the new catwalk system from the valve house. While the project will somewhat alter the appearance of the valve house area when viewed from downstream, the changes are associated with appurtenances connected to the valve house and do not change the structure of the valve house itself. These alterations are insignificant to the larger dam structure; the project does not propose any significant changes to the dam, and the use of the dam will not change.

Therefore, the project complies with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Secretary's Standards*). Implementation of the proposed project would not be expected to result in a significant adverse impact or material impairment. The historical resource would retain its historic integrity following project implementation, and its status as a contributor to the CRA Historic District and as an individual historic resource. In addition, no indirect impacts would be expected to result to the larger CRA Historic District as a result of project implementation.

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# 1.0 INTRODUCTION

The Metropolitan Water District of Southern California (Metropolitan) contracted HELIX Environmental Planning, Inc. (HELIX) to prepare a Historical Resources Technical Report (HRTR) in support of the Copper Basin Dam Valve Replacement Project (project) in the unincorporated community of Parker Dam, San Bernardino County, California. This technical study provides Metropolitan with the substantial evidence necessary to confirm the historical resource status of the dam and to assess the potential impacts from the proposed project.

The Copper Basin Dam and Reservoir are contributors to the Colorado River Aqueduct (CRA) Historic District, a multi-resource district determined eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) through the Section 106 process via formal concurrence by the California State Historic Preservation Officer (SHPO) (Caltrans 2010). Therefore, the Copper Basin Dam and Reservoir are listed in the California Historic Resources Inventory with a "2D2" California Historic Resources Status Code; this code indicates SHPO concurrence on NRHP eligibility and automatic listing on the CRHR. In 2016, Metropolitan retained Applied EarthWorks, Inc. (Æ) to record the entirety of the CRA, including the pumping plants, reservoirs, dams and appurtenant features and structures as a continuous historic district. As a CRHR-listed property, the Copper Basin Dam and Reservoir qualify as historical resources pursuant to the California Environmental Quality Act (CEQA).

Due to site access issues at the time of the resource's documentation in 2016, the Copper Basin Dam was not documented in detail. Furthermore, the dam has not been previously evaluated for individual historical significance. This report and accompanying Department of Parks and Recreation (DPR) Series 523 form update provide the necessary additional analysis and detail to evaluate the dam's individual historical significance, characterize the resource and its character-defining features and assess potential impacts.

The project proposes relatively minor maintenance upgrades to various equipment and features associated with the dam. The project involves the in-kind replacement of an extant, large-scale water discharge valve known as the "Howell-Bunger" valve (described in more detail below). The Howell-Bunger valve was originally installed on the Copper Basin Dam in 1938, at the time of the dam's construction. After more than 75 years of continuous service, the valve is in need of replacement. Other associated work includes the replacement of the ladderway that accesses the existing valve house, installation of a new platform grate on the valve house in front of the valve, replacement of the main weir, adit weir and catwalk panels located downstream of the dam, and installation of concrete steps from the existing valve house to the new catwalk system. This study examines the proposed project and its potential impacts to the dam as a historical resource. The project components are described and examined for compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Secretary's Standards*).

All activities were conducted in accordance with the requirements of the Public Resources Code (PRC), CEQA, as well as the applicable best practices and regulations. The Metropolitan Water District of Southern California is the lead agency under CEQA.

This report includes the following sections: (1) Introduction; (2) Regulatory Framework; (3) Methods; (4) Historic Context and Setting; (5) Architectural Description; (6) Evaluation, including an assessment of the dam's individual historical significance as well as its historic integrity and character-defining

features; (7) Project Impacts Analysis, including an overview of the project and its compliance with the *Secretary's Standards*; (8) Conclusion; and (9) References.

## 1.1 PROJECT LOCATION

The project is located in the unincorporated community of Parker Dam, San Bernardino County, California (Figure 1, *Regional Location*). The project site is part of the CRA system located within the southeastern portion of the Mojave Desert. The dam is located within Section 11 of Township 2 North, Range 26 East, on the U.S. Geological Survey (USGS) 7.5' Parker quadrangle (Figure 2, *USGS Topography*). The project intends to replace the valve on the downstream portion of the dam, located south of the Copper Basin Wash (Figure 3, *Aerial Photograph*).

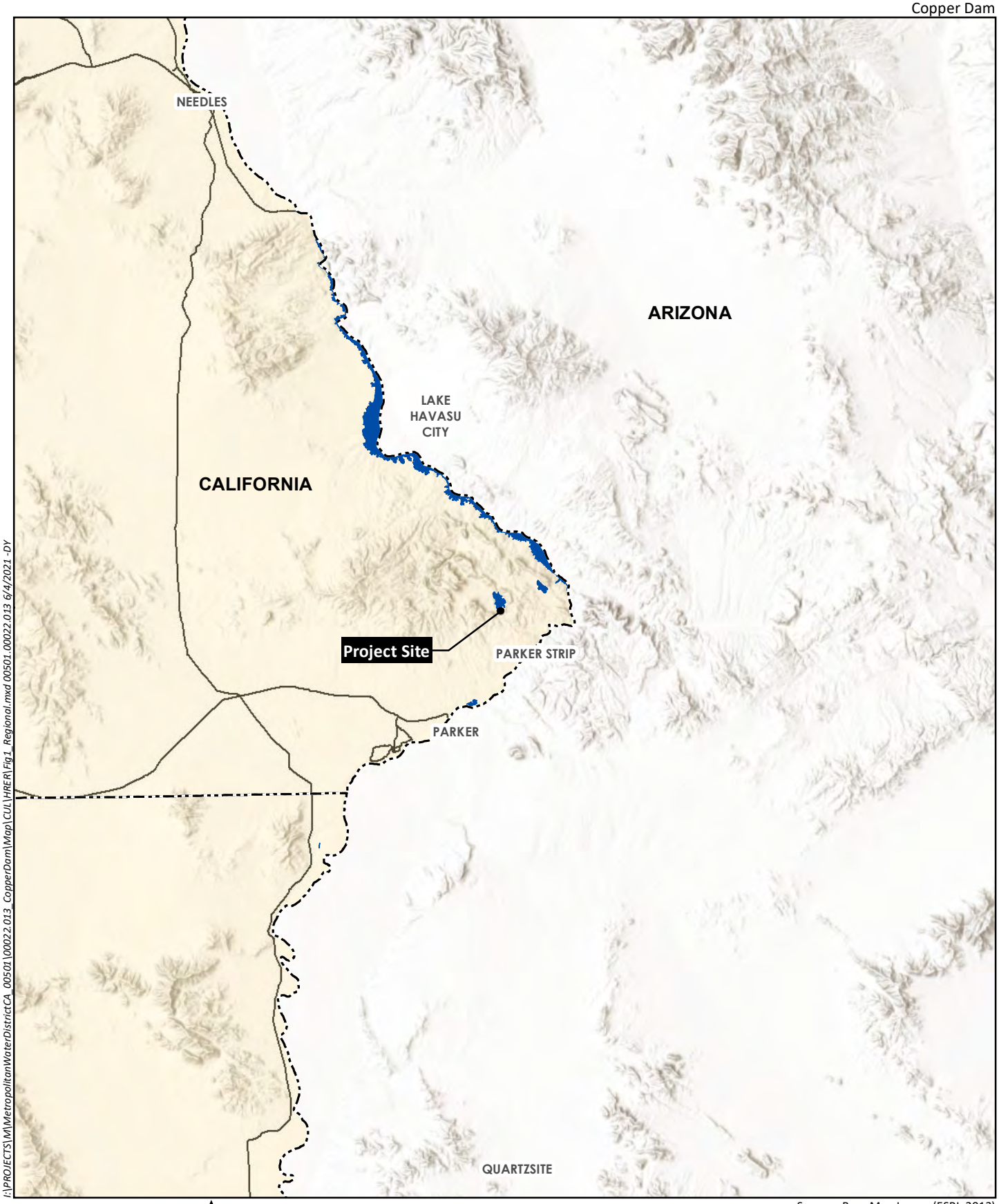
## 1.2 PROJECT BACKGROUND AND DESCRIPTION

The Colorado River Aqueduct is a regional water conveyance system that consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four regulating reservoirs, and 242 miles of aqueduct, siphons, canals, conduits, and pipelines from Lake Havasu to Lake Mathews in Riverside County. Metropolitan owns, operates, and manages the CRA and is responsible for operating, maintaining, rehabilitating, and repairing its various components. The entire CRA was completed in 1941, and a planned expansion was completed in 1959.

The Copper Basin Reservoir, one of Metropolitan's four reservoirs along the CRA, is a critical hydraulic component of the CRA that enables Metropolitan to balance and control aqueduct flows. The Copper Basin Reservoir is located approximately 4.5 miles west of Lake Havasu (i.e., the Colorado River). Water arrives at Copper Basin via the Gene Wash Reservoir, which receives its water directly from the Colorado River through an intake pumping plant. From the basin the water flows through an underground tunnel into the aqueduct system and is eventually delivered to the metropolitan areas of Southern California via additional pumping plants along the way.

The Copper Basin Reservoir was constructed with a thin arch concrete dam, outlet tower and emergency spillway; reservoir water levels are maintained and controlled with the dam and outlet tower gates and valves. The reservoir holds approximately 24,200 acre-feet of water with a surface area of approximately 427 acres. The construction of the dam, which included the extant sluiceway system, access ladderway and valve house, was completed in 1938. The sluiceway system is a discharge structure at the base of the dam that contains a debris rack, a four-foot diameter outlet pipe, a shutoff gate valve, and a fixed cone (Howell-Bunger) discharge valve. The gate valve and fixed cone valve function to rapidly drain the reservoir in the event of an emergency. Also associated with the dam are a weir and an adit weir downstream of the dam, and two access ladderways on the downstream face of the dam. As of 2022, much of the original mechanical equipment within the sluiceway system and valve house, as well as the access ladderways and weirs, remain in use. Metropolitan and the California Division of Safety of Dams (DSOD) staff regularly perform gate valve and fixed cone valve tests to ensure that the valves are functional and in adequate condition. After more than 75 years of continuous service and regular maintenance, the equipment in the discharge structure has become unreliable during operation.

The purpose of the project is to replace the existing Copper Basin Dam valve components to continue proper operations of the dam and the larger CRA infrastructure. The proposed project includes the replacement and rehabilitation of certain dam components to enhance operations and to meet OSHA




I:\PROJECTS\M\MetropolitanWaterDistrictCA_00501\00022.013_CopperDam\Map\CUL\HRER\Fig1_Regional.mxd 00501.00022.013 6/4/2021 -DY

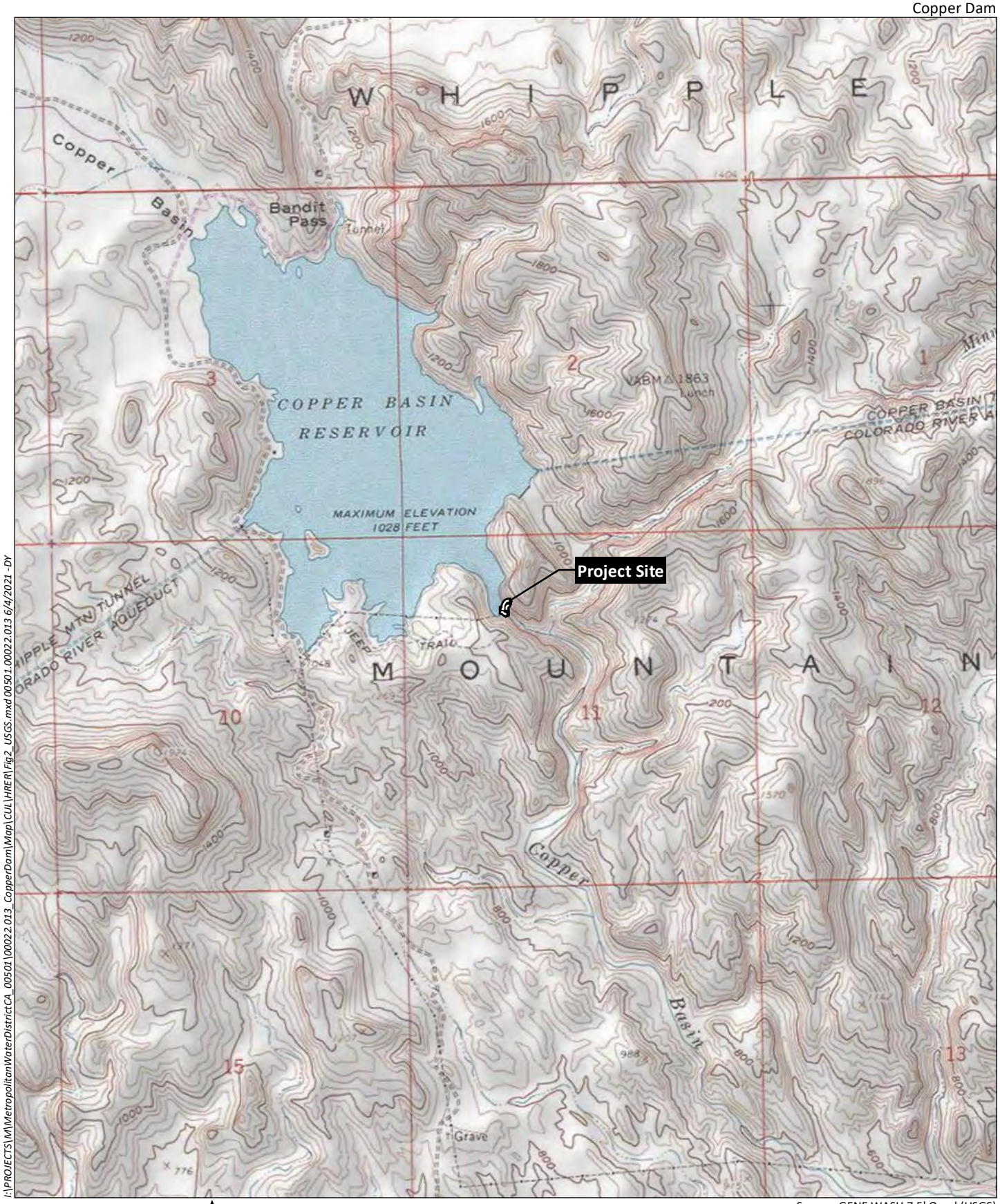
0 10 Miles

Source: Base Map Layers (ESRI, 2013)

HELIX Environmental Planning

# Regional Location

Figure 1

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0 2,000 Feet

Source: GENE WASH 7.5' Quad (USGS)

HELIX Environmental Planning

# USGS Topography

Figure 2

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0 200 Feet

Source: Aerial (Maxar, 2018)

HELIX Environmental Planning

# Aerial Photograph

Figure 3

safety requirements (Moffatt & Nichol 2017; Hazen and Sawyer 2020). The project will replace and rehabilitate the gate valve and Howell-Bunger discharge valve within the dam; install new conduit and electrical components within the valve structure; install a new concrete pad and transformer and approximately 250 feet of electrical conduit from the transformer to the valve structure; replace the main access ladderway on the dam face; install a new catwalk and stairs adjacent to the discharge valve structure and weir structures; remove and reconstruct two existing concrete weirs approximately 100 feet downstream of the dam; and install surface conduit and instrumentation from the discharge valve structure, along the catwalks, to the two weirs. Project staging is proposed at three existing staging/operations areas along the west side of the reservoir. The majority of this work will take place in or in the immediate vicinity of the existing dam with minimal excavation and/or soil disturbance. The project will also improve approximately 1.66 miles of the existing dirt access road around the perimeter of the reservoir, with approximately 13 segments of concrete paving and associated improvements.

The project proposes the following specific improvements and upgrades to the Copper Basin Dam and sluiceway system that are addressed in this report:

- plug the existing 60-inch discharge pipe;
- protect in place the trash rack on the upstream dam face;
- remove the existing discharge plug;
- install new custom discharge plug in order to facilitate valve replacement work downstream;
- remove the Howell-Bunger valve (cone valve);
- remove the actuator and stem of the slide gate replacement;
- install new Howell-Bunger valve;
- replace existing steel doors in opening above Howell-Bunger valve and metal platform extending from valve house below the valve;
- remove and replace ladderway extending from crest of dam to valve house;
- update mechanical systems, electrical systems, and communication systems inside of the valve house;
- replace the extant concrete main weir and adit weir structures located downstream of the dam with newly designed but similar weir structures in their existing locations;
- remove existing catwalk panels on the canyon floor to the weir;
- install a new ladderway, concrete stairs, and new catwalk system to access the weir; and
- conduct post-installation testing.

A modular crane may be used to install the new upstream plug and provide any lifting services during the duration of the project. Rockfall protection may also be provided inside the gorge.

# 2.0 REGULATORY FRAMEWORK

## 2.1 FEDERAL

### 2.1.1 National Register of Historic Places

The National Register of Historic Places (NRHP) was established by the National Historic Preservation Act of 1966 as "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 CFR 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. A property is eligible for the NRHP if it:

**Criterion A** Is associated with events that have made a significant contribution to the broad patterns of our history; or

**Criterion B** Is associated with the lives of persons significant in our past; or

**Criterion C** Embodies the distinctive characteristics of a type, period, or method of installation, or represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or

**Criterion D** Has yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting these criteria, a property must retain historic integrity, which is defined in National Register Bulletin 15 as the "ability of a property to convey its significance" (NPS 1997). In order to assess integrity, the National Park Service recognizes seven aspects or qualities that, considered together, define historic integrity.

To retain integrity, a property must possess several, if not all, of these seven qualities, which are defined in the following manner in National Register Bulletin 15:

1. **Location.** The place where the historic property was constructed, or the place where the historic event occurred.

2. **Design.** The combination of elements that created the form, plan, space, structure, and style of a property.

3. **Setting.** The physical environment of a historic property.

4. **Materials.** The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

5. **Workmanship.** The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

6. **Feeling.** A property's expression of the aesthetic or historic sense of a particular period of time.

7. **Association.** The direct link between an important historic event or person and a historic property.

Some aspects of integrity may be accorded more weight than others, depending on the type of resource being evaluated and the applicable eligibility criteria. Integrity can be assessed only after it has been concluded that a resource is significant.

### 2.1.2 Secretary of the Interior's Standards for Rehabilitation

In accordance with the National Park Service and CEQA Guidelines, projects that comply with the *Secretary's Standards for the Treatment of Historic Properties* and the *Secretary's Standards for Rehabilitation* (*Secretary's Standards*) are projects that retain the historic integrity of the resource. According to CEQA Guidelines, a project that complies with the *Secretary's Standards* is generally considered to be a project that will not cause a significant adverse impact to a historical resource.

The goal of the *Secretary's Standards* is to outline treatment approaches that allow for the retention of and/or sensitive changes to the distinctive materials and features that lend a historical resource its significance. The *Secretary's Standards* and Guidelines offer general recommendations for preserving, maintaining, repairing, and replacing historical materials and features, as well as designing new additions or making alterations. These standards also provide guidance on new construction adjacent to historic districts and properties in order to ensure that there are no indirect adverse impacts to historic properties.

Rehabilitation is the most flexible treatment approach of the *Secretary's Standards*. The ten *Secretary's Standards for Rehabilitation* are:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires the replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy the historic materials that characterize the property. The new work shall be differentiated from the old, and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

The *Secretary's Standards and Guidelines* offer general recommendations for preserving, maintaining, repairing, and replacing historical materials and features, as well as designing new additions or making alterations. The *Secretary's Standards for Rehabilitation* also provide guidance on new construction adjacent to historic districts and properties, in order to ensure that there are no adverse indirect impacts to integrity as a result of a change in setting. Applying the *Secretary's Standards* to new construction adjacent to historic resources helps ensure avoidance of indirect impacts and also ensures the retention of the setting and feeling of the historic resource and its surrounding environment.

*Secretary's Standards* compliance begins with the identification and documentation of the "character-defining," or historically significant, features of the historical resource. According to Preservation Brief 17, *Architectural Character: Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving Their Character*, there is a three-step process to identifying character-defining features (Nelson, 1982). Step 1 involves assessing the physical aspects of the building exterior as a whole, including its setting, shape and massing, orientation, roof and roof features, projections, and openings. Step 2 looks at the building more closely—at materials, trim, secondary features, and craftsmanship. Step 3 encompasses the interior, including individual spaces, relations or sequences of spaces (floor plan), surface finishes and materials, exposed structure, and interior features and details. Alterations and replacement of character-defining features over time can impair a historic property's integrity and result in a loss of historic status. Therefore, to ensure that a historic property remains eligible after the implementation of projects, character-defining features should be identified and preserved.

## 2.2 STATE

The policies of the National Historic Preservation Act are implemented at the state level by the California Office of Historic Preservation, a division of the California Department of Parks and Recreation. The Office of Historic Preservation is also tasked with carrying out the duties described in the PRC and maintaining the California Historic Resources Inventory and the CRHR. The state-level regulatory framework also includes CEQA, which requires the identification and mitigation of substantial adverse impacts that may affect the significance of eligible historical and archeological resources.

### 2.2.1 California Register of Historical Resources

Created in 1992 and implemented in 1998, the CRHR is "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Sections 21083.2 and 21084.1). Certain properties, including those listed in or formally determined eligible for listing on the NRHP and California Historical Landmarks, numbered 770 and higher, are automatically included on the CRHR.

According to PRC Section 5024.1(c), a resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

**Criterion 1:** It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

**Criterion 2:** It is associated with the lives of persons important in our past

**Criterion 3:** It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values

**Criterion 4:** Has yielded, or may be likely to yield, information important in prehistory or history

Properties that do not retain sufficient integrity for NRHP listing can still qualify for listing in the CRHR. Historical resources eligible for listing in the California Register must meet one of the criteria of significance described above and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance.

### 2.2.2 California Environmental Quality Act

CEQA requires a lead agency to analyze whether historic and/or archaeological resources may be adversely impacted by a proposed project. Under the CEQA Statutes, "A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (PRC Section 21084.1). The first step in this analysis is to determine if the proposed project involves cultural resources, and then to determine whether there are eligible or listed historical resources. According to CEQA, the fact that a resource is not listed in or determined eligible for listing in the California Register or is not included in a local register or survey shall not preclude the lead agency from determining that the resource may be a historical resource (PRC Section 5024.1). If historical resources are present, the proposed project must be analyzed for its potential to cause a "substantial adverse change in the significance" of the resource.

According to CEQA Guidelines Section 15064.5, historical resources are:

1. A resource listed in, or formally determined eligible for listing in, the California Register of Historical Resources (PRC 5024.1, Title 14 CCR, Section 4850 et seq);

2. A resource included in a local register of historical resources, as defined in PRC Section 5020.1(k), or identified as significant in a historic resources survey meeting the requirements of PRC Section 5024.1(g);

3. Any building, structure, object, site, or district that the lead agency determines eligible for national, state, or local landmark listing; generally, a resource shall be considered by the lead agency to be historically significant (and therefore a historic resource under CEQA) if the resource meets the criteria for listing on the California Register (as defined in PRC Section 5024.1, Title 14 CCR, Section 4852).

Resources nominated to the CRHR must retain enough of their historic character or appearance to convey the reasons for their significance. Resources whose historic integrity (as defined in the previous section) does not meet NRHP criteria may still be eligible for listing in the CRHR.

CEQA Guidelines specify that "substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines, Section 15064.5). Material impairment occurs when a project alters in an adverse manner or demolishes "those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion" or eligibility for inclusion in the NRHR, CRHR, or local register. In addition, pursuant to CEQA Guidelines Section 15126.2, the "direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects."

In order to avoid direct and indirect impacts to historical resources, "Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource" (CEQA Guidelines, Section 15064.5(b)(3)).

Metropolitan is not subject to the County of Riverside or the County of San Bernardino Municipal Codes. Therefore, there are no local regulatory requirements that apply to the project.

# 3.0 METHODS

## 3.1 PREVIOUS HISTORIC RESOURCE STUDIES

As noted previously, the Copper Basin Dam is a contributor to the CRA Historic District, a multi-property resource previously found eligible for the NRHP and CRHR (P-33-11265/P-36-010521). The CRA as a whole has been recorded multiple times by various agencies. The CRA was first recorded as a historic site in 2000 (Goodman and Neves 2000) and again in 2001 (Dice 2001). Portions of the CRA were visited in 2003 (Boggs et al 2003), 2005 (Beedle 2005), 2007 (Cannon 2007) and 2008 (Beedle 2008). In 2010, a portion of the CRA at Metropolitan's Eagle Mountain Pumping Plant was recorded as part of the BLM's solar farm project (Chandler et al 2010). Also, in that year, Caltrans prepared a determination of the CRA's eligibility for listing in the NRHP and CRHR as part of the State Route 79 realignment project. As a result, the CRA Historic District was formally determined NRHP and CRHR eligible through SHPO concurrence and the Section 106 process (Caltrans 2010). Properties listed or formally determined

eligible for listing in the NRHP as part of the Section 106 process/SHPO concurrence are automatically listed in the CRHR. Therefore, Copper Basin Dam is listed on the CRHR. Then, during a due diligence effort in 2016, Metropolitan retained Æ to record the entirety of the CRA, including the pumping plants, reservoirs, dams and appurtenant features, and structures as a continuous historic district. The intent of that effort was to update the CRA Historic District Record by accurately recording the various features associated with CRA's construction since previous records by others were varied, piecemeal, and included some inaccurate information.

The CRA was also selected in 1955 as one of the "Seven Modern Civil Engineering Wonders" by the American Society of Civil Engineers for the "project's unprecedented length, cost, pumping rate, lift, and severe climate and terrain" (ASCE 2020). In 1970, the Los Angeles Section of the ASCE designated the CRA as an outstanding historic civil engineering landmark in the Los Angeles Section region. As a result, the CRA was designated a National Historic Engineering Landmark by the ASCE in 1994 (ASCE 2020; Chasteen 2016). Historic American Engineering Record (HAER) photographs were taken of Copper Basin Dam in 1968 (Lowe 1968). Several of those photographs are figures in this report. In addition, additional HAER documentation, including written data, measured drawings, and photographs, was completed in 1998 (Gruen 1998).

## 3.2 FIELD SURVEY

On February 24, 2021, Malinda Stalvey, Senior Environmental Specialist with Metropolitan, conducted a field survey of the Copper Basin Dam on behalf of HELIX to photograph the dam, including its valve house on the ground floor of the downstream side of the dam. Annie McCausland, Architectural Historian with HELIX, completed a desk review of the photographs in conjunction with historic plans, aerials and other archival materials to document the dam's historic materials including concrete and steel, visual and construction characteristics. On July 14, 2022, Teri Delcamp, Architectural Historian with HELIX, conducted a follow-up field survey to record and photograph the Copper Basin Dam and the additional associated character-defining features not described in the project scope in 2021, including the access ladderway, weirs, and catwalk panels. A DPR 523 form update was completed for the Copper Basin Dam. The compiled DPR set, including the original forms and 2022 update by HELIX, follow this report as Appendix B.

## 3.3 ARCHIVAL RESEARCH AND LITERATURE REVIEW

HELIX reviewed previous studies and documents provided by Metropolitan in order to ascertain and characterize the historic resource status of the Copper Basin Dam; these materials included historic as-built drawings, photographs, previous studies, as well as the 2016 DPR form prepared for the CRA Historic District. These materials were supplemented with additional research where needed.

## 3.4 PROJECT PERSONNEL

HELIX Architectural Historian Annie McCausland, MA, completed a literature review, primary- and secondary-source research, and a desktop inspection of the Copper Basin Dam, its overall design, construction methods, materials, features, and setting. HELIX Architectural Historian Teri Delcamp completed a literature review, primary- and secondary-source research, and a field survey to record and photograph the Copper Basin Dam and additional associated features not previously described in the project scope. Ms. McCausland and Ms. Delcamp also served as co-authors of the report. Metropolitan staff conducted a site visit and provided detailed photographs of the resource. HELIX Senior

Architectural Historian, Debi Howell-Ardila, MHP, served as the principal author of this report and provided senior review and QA/QC. HELIX Cultural Resources Manager, Mary Robbins-Wade, and Senior Cultural Resources Project Manager, Stacie Wilson, provided QA/QC and strategic oversight for the project. Resumes for key staff follow this report as Appendix A. Ms. McCausland, Ms. Delcamp, and Ms. Howell-Ardila meet and exceed the Secretary of the Interior's Professional Qualification Standards for architectural history and history, as codified in 36 CFR Part 61.

# 4.0 HISTORIC CONTEXT AND SETTING

In accordance with best practice and National Park Service (NPS) guidance, properties must be evaluated within their historic context to ensure a thorough application of the eligibility criteria. The National Register defines context as "those patterns or trends in history by which a specific occurrence, property or site is understood and its meaning (and ultimately its significance) within history or prehistory is made clear."[1] Theme, place, and time are the basic elements that define the historic context (NPS 1997). The context statement incorporates stages of physical development, including the evolution of building forms and architectural style, as well as highlighting facets of industries or events.

Historic context is also linked to the built environment through the concept of property type. A property type is "a grouping of individual properties characterized by common physical and/or associative attributes (NPS 1999). Physical attributes include style, structural type, size, scale, proportions, design, architectural details, method of construction, orientation, spatial arrangement or plan, materials, workmanship, artistry, and environmental relationships. Associative attributes include the property's relationship to important persons, activities, and events, based on information such as dates, functions, cultural affiliations, and relationship to important research topics."[2] Historic contexts, therefore, become useful tools for gauging the relative importance and integrity of properties. In order to provide a contextual framework for this intensive-level evaluation of the Copper Basin Dam, this section provides the historic setting and context for the property.

## 4.1 COLORADO RIVER AQUEDUCT

The CRA was constructed between 1933 and 1941 to convey water to Southern California.[3] The construction of the aqueduct employed more than 30,000 people. William Mulholland conceived the aqueduct during his early explorations of the Mojave Desert. In 1929, Frank E. Weymouth was contracted by the City of Los Angeles as the Chief Engineer and charged with designing a way to harness the Colorado River as a new water source for Southern California (Chasteen 2016).

The construction of the aqueduct system significantly changed the landscape of the southwest through the addition of open canals, covered conduits, siphons, tunnels, and pumping plants that carried water from the desert to the coastal regions of Southern California. In addition, several temporary camps and roads were created to support the construction of the aqueduct system and provide housing for more than 10,000 contractors. After the aqueduct was completed, the construction camps were largely obliterated, leaving only concrete slab foundations, street layouts, and some refuse sites. However, the

[1] United States Department of the Interior, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, (Washington, DC: National Park Service, rev. 1997): 7.

[2] United States Department of the Interior, *National Register Bulletin 16B: How to Complete the National Register Multiple Property Documentation Form*, (Washington, DC: National Park Service, rev. 1999), p. 14.

[3] For the complete historic context of the CRA, see Chasteen, 2016.

area was reinvigorated during the early years of World War II, when General George Patton established the Desert Training Center within the Mojave and Sonoran Deserts of California and Arizona.

The end of World War II led to significant economic and population growth within Los Angeles County. By the late 1950s, the aqueduct required expansion to increase the overall capacity of the aqueduct. Construction on the expansion of the aqueduct started in the 1950s, with the installation of new motors and pipes, as well as second barrels on double siphons, to bring the pumping plants to full capacity. In the existing pumping plant villages, new community buildings and housing were added as needed, but the overall layouts of the sites were unchanged. In recent years, Metropolitan has upgraded the aqueduct, including mechanizing older manual functions, and changing instruments and equipment throughout the CRA system from analog to digital.

### 4.1.1 Reservoirs and Dams

The CRA has four reservoirs with associated structures, including the Copper Basin reservoir and dam. Unlike many reservoirs and dams, the CRA structures west of Parker Dam were not built to individually impound and divert an existing flow of water from a river, creek, or watershed. Rather, the reservoirs and dams located along the aqueduct were part of the CRA's design to lift, store and convey water from the Colorado River to the terminal reservoir at Lake Mathews in western Riverside County. From there, water is conveyed to urban and coastal regions of Southern California via pipelines (Chasteen 2016).

The dams in the CRA system are non-overflow dams that maintain water levels and remove silt from water transported through the system. As such, the structures in the CRA system are connected to each other as part of a single, complex distribution system. The Copper Basin reservoir holds water transported to it from the Gene Wash reservoir via a tunnel. Likewise, water is then transported from the Copper Basin reservoir to the Iron Mountain pumping plant, then on to the Eagle Mountain and Julian Hinds pumping plants via open canals, inverted siphons, tunnels, and conduits. The pumping plants raise the water by more than 1,600 feet across the length of the CRA (Chasteen 2016).

The Gene Wash and Copper Basin dams were built under the same contract during 1937 and 1938. They are both designed as concrete thin arch dams and have associated spillways and inlet and outlet structures. Although the construction of thin arch dams rarely occurred in the late 1800s, they were more common in the early to the middle parts of the 20$^{th}$ century, especially after the establishment of the U.S. Bureau of Reclamation (Reclamation). One of the first thin arch dams built in the region was the Upper Otay Dam in San Diego, patterned after the Bear Valley Dam in the San Bernardino Mountains. Construction on the Upper Otay Dam began in 1896 and was completed in 1902. Its thin arch design was considered to be novel at the time (Murray 2020). Several thin arch dams were built by or are under the control of Reclamation. These include Warm Springs and Gerber Dams in Oregon, completed in 1919 and 1925, respectively. Three dams constructed in Arizona were thin arch dams and completed between 1927 and 1930—Mormon Flat, Horse Mesa, and Stewart Mountain Dams (Scott et al. 2008).

The dams within these various locations are part of regional water and/or energy distribution systems and were critical for the development of those areas. Especially in Southern California, by the early 20$^{th}$ century, the burgeoning population meant water was a critical need for the social and economic development of the area. Reclamation's efforts to harness the Colorado River through the passage of the Boulder Canyon Act were assisted by Metropolitan's agreement in 1928 to purchase more than a third of the power generated by the Boulder Canyon (Hoover) Dam. In that same year bonds were passed for the construction of the CRA.

The significant growth of the Los Angeles metropolitan region would not have been possible without the CRA. The CRA's dams were built within rocky canyons to create reservoirs for storing and conveying diverted Colorado River water through the aqueduct system. As such, the CRA dams and reservoirs are engineered structures and constructed water features that together created new panoramic vistas. They are examples of humans deliberately changing the character of the land for a purpose and are reflective of important cultural landscapes (NPS 2021a).

### 4.1.2 Copper Basin Dam

The Copper Basin Reservoir was completed in 1938 as an integral part of the CRA system and remains a key facility in maintaining water levels and removing silt. Water in the reservoir is received from Gene Wash Reservoir via a tunnel. A concrete ogee spillway is located on the southeast side of the Copper Basin Reservoir and an outlet structure to the CRA Whipple Mountain Tunnel is located on the southwest side of the reservoir (Figure 4 and Figure 5). Because the Copper Basin Dam is a non-overflow dam, the purpose of the spillway is to enable the reduction of the reservoir's water level quickly in an emergency. The spillway ensures water does not overtop the dam and damage or destroy it. The Copper Basin spillway is uncontrolled and only utilizes the height of the spillway crest to control the water. Its curved ogee shape allows water to flow more naturally over it and maintain contact with the spillway. The outlet structure controls water leaving the reservoir via the raising or lowering of gates. The proposed project does not involve the spillway or the outlet structure. The Copper Basin Dam is located on the southeast side of the reservoir, south of the spillway, as illustrated in Figure 6. Additional features associated with the dam are a boat dock and submerged trash rack on the upstream side, a modern metal catwalk leading to a concrete weir located across the canyon downstream from the dam's discharge valve, and an adit weir located at the entrance to a cave in the canyon wall near the downstream side of the dam. The Copper Basin Dam was constructed by the J. F. Shea Company, which also built the CRA Gene Dam and Parker Dam (Chasteen 2016). Because of the proximity of the dam sites to the company's already-existing construction camp near Parker Dam, no additional living quarters were necessary (Gruen 1998).

Concrete aggregate for the construction of Copper Basin Dam was sourced from pits on the Bill Williams River two miles east of Parker Dam and came to the dam site from the aggregate batching plant at the Parker Dam construction site. Trucks transported the aggregate to the dam construction site, where it was mixed with cement and then placed in buckets dangled from a high-line cable system strung across the rocks before pouring began. Concrete was placed within block sections in a series of some 5-foot, but mostly 10-foot, concrete lifts between horizontal construction joints. In order to prepare the concrete for grouting the construction joints, the concrete needed to be cooled to 50 degrees after being poured. To cool the concrete, refrigerated water was pumped through one-inch diameter, thin-walled steel cooling coils placed horizontally every five feet. Finished concrete surfaces were painted with coal tar pitch and a final layer of whitewash (Metropolitan 1938a).

Copper Basin Dam consists of a massive concrete arch, rising approximately 184 feet and with a crest length spanning 265 feet (Hazen and Sawyer 2020). The dam design included a sluiceway system with an intake trash rack on the upstream face of the dam attached via a cast-iron discharge pipe to a concrete valve house and valve system on the downstream face (Figure 7 and Figure 8). The valve used was a Howell-Bunger valve, which represented cutting-edge technology in the 1930s. The valve was invented and patented by two Reclamation engineers, C.H. Howell and Howard P. Bunger (Ball and Hebert 1948). The valve offered a balanced design and lightweight construction (Figure 9 and Figure 10). The innovative design for the Howell-Bunger valve was first manufactured by the S. Morgan Smith Company,

which manufactured the valve used on Copper Basin Dam. Metropolitan utilized the Howell-Bunger valve for several dams constructed for the CRA project.

*Figure 4. Copper Basin Reservoir concrete ogee spillway, 1938. Source: Metropolitan*

*Figure 5. Copper Basin Reservoir outlet structure, 1938. Source: Metropolitan*

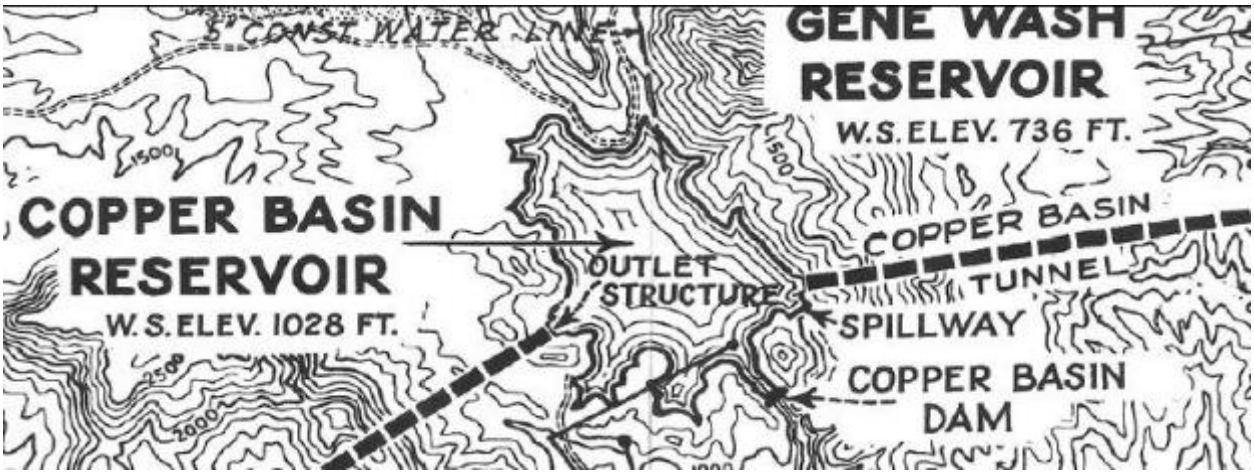


*Figure 6. Map from the Historical Record of Gene Wash and Copper Basin Dams, 1937-1938. Source: Metropolitan*

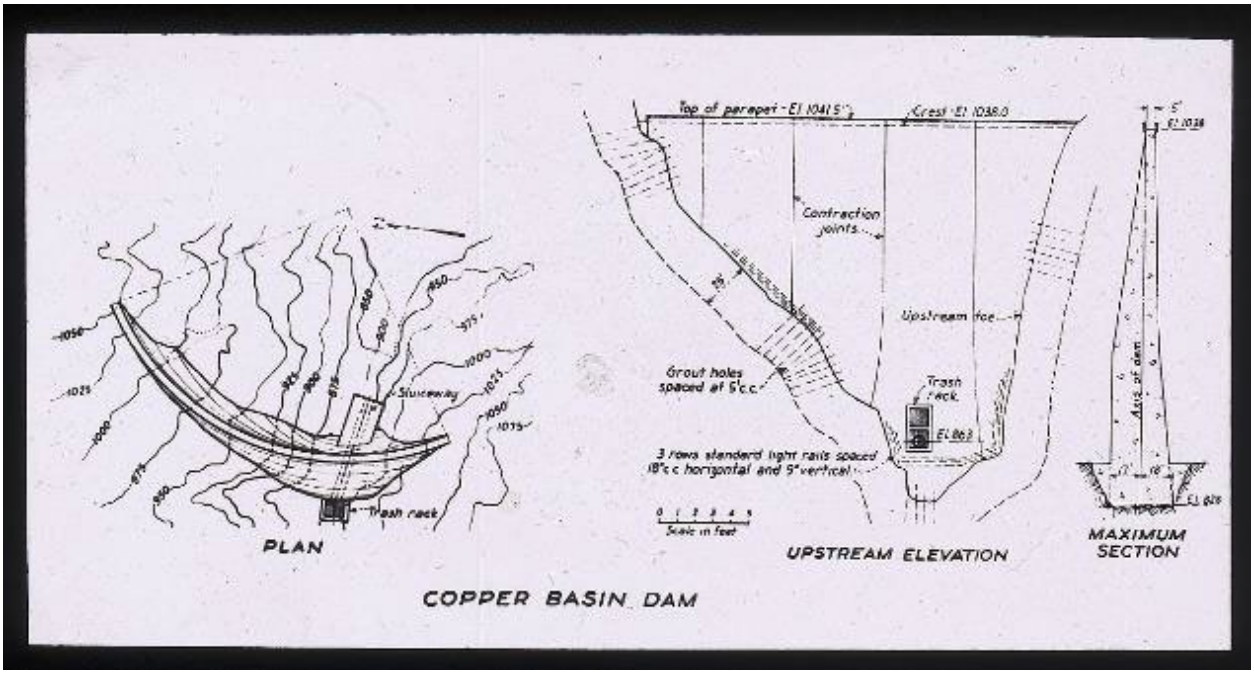


*Figure 7. Copper Basin Dam Building Plan, circa 1938. Source: Metropolitan*

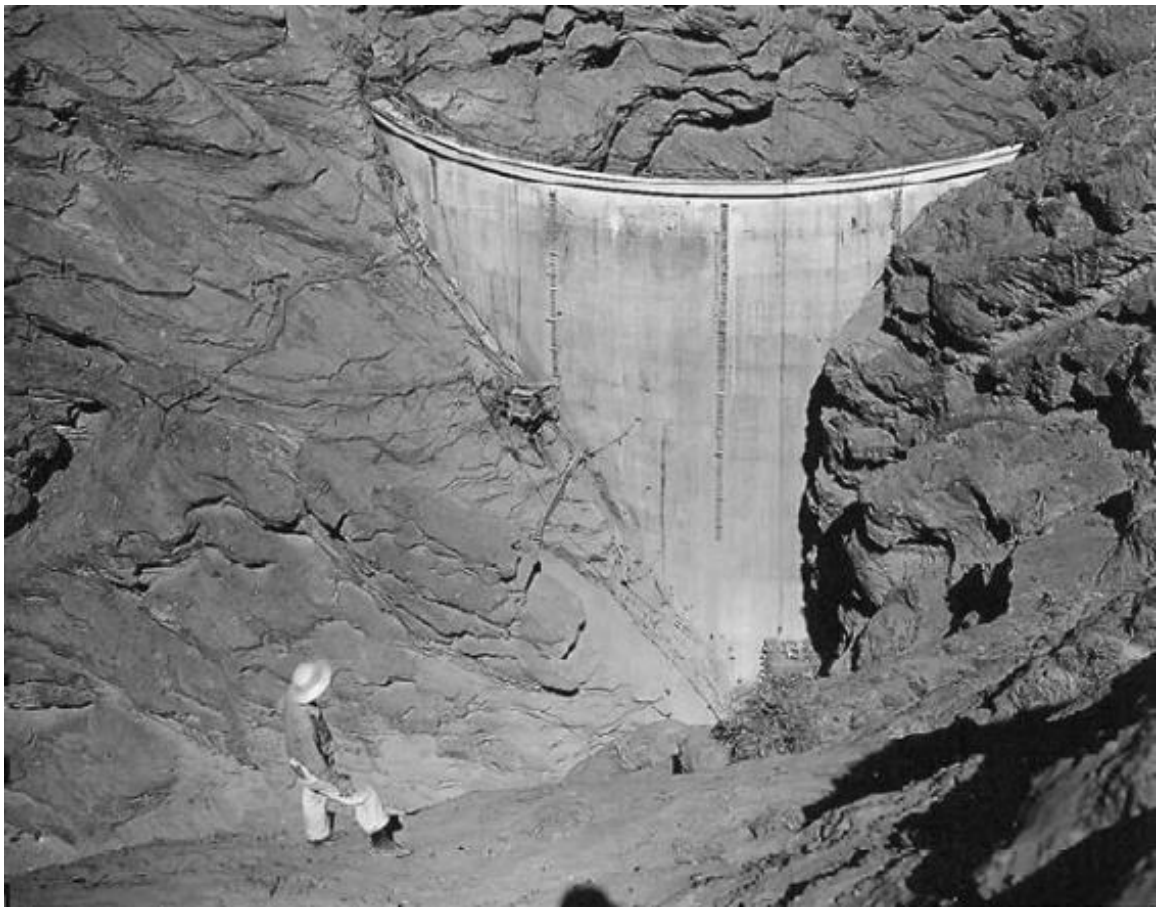

*Figure 8. Copper Basin Dam, upstream dam face with ladder and trash rack, 1938. Source: Metropolitan*

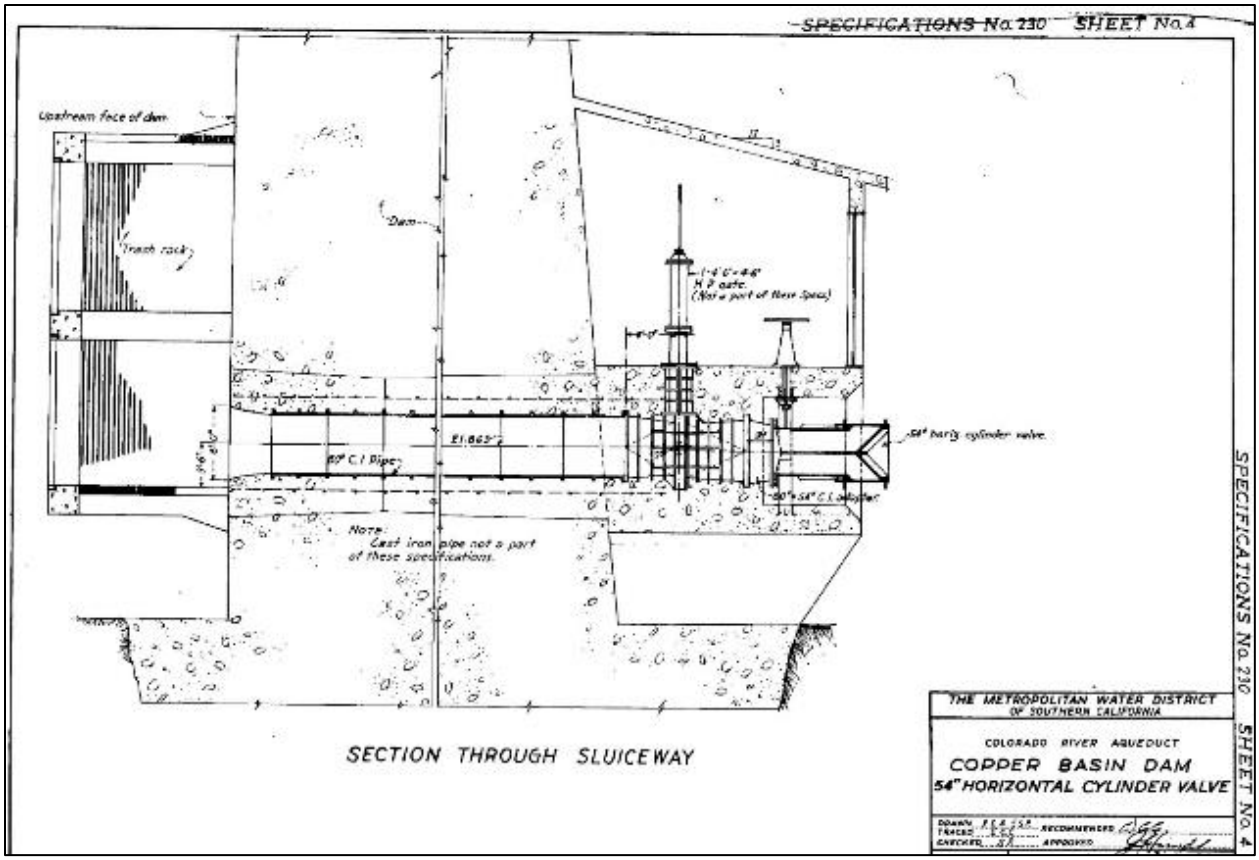


*Figure 9. "Copper Basin Dam 54" Horizontal Cylinder Valve," 1937. Source: Metropolitan*

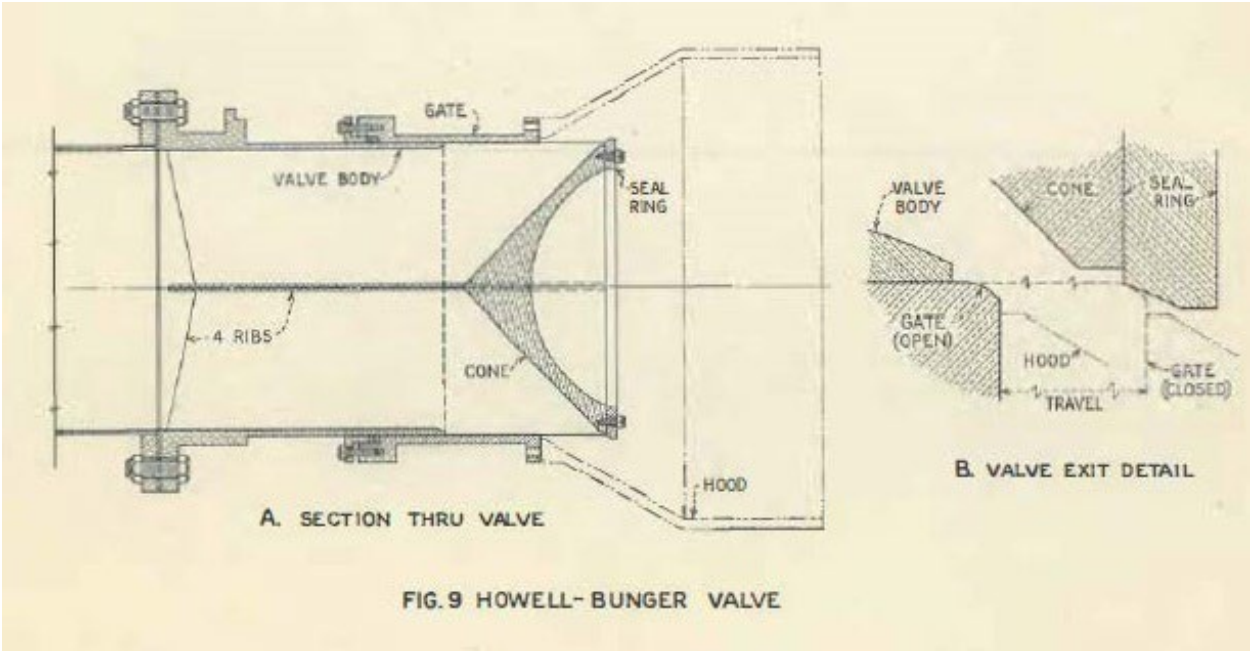


*Figure 10. Howell-Bunger valve schematic (Ball and Hebert 1948)*

# 5.0 ARCHITECTURAL DESCRIPTION

Copper Basin Dam was previously recorded at the reconnaissance level by Æ in 2016 and determined to be a contributing resource within the CRA Historic District (P-33-11265/P-36-010521) (Chasteen 2016). However, the dam has not been previously evaluated for its individual historical significance. The following section provides an intensive-level description of the dam and its features, including the Howell-Bunger valve, ladderways, weirs, and catwalk proposed for replacement by the project, and associated structures as well as artifacts related to the dam's construction.

## 5.1.1 Copper Basin Dam

Located in the Mojave Desert, west of Parker Dam, California, the Copper Basin Dam has regulated water levels in the associated Copper Basin Reservoir since its construction in the late 1930s. As part of the CRA system, the Copper Basin Dam and its adjacent, 22,000-acre-foot reservoir are located just over two miles from the Gene Pumping Plant in San Bernardino County, California.

The focal point of the Copper Basin Dam is a prominent, cast-concrete, unreinforced arch that rises approximately 184 feet and has a crest length that spans 265 feet (Hazen and Sawyer 2020). The dam is a thin arch design, which is most appropriate for locations in narrow canyons like Copper Basin (Figure 13). The convex surface of the arch faces the water, and the concave surface faces downstream. An arch dam is designed to use its shape and the weight of the water behind it as part of its strength, since concrete is strong when it is being pushed in compression. The base section of the dam is approximately 33 feet wide, narrowing to approximately five feet wide at the crest of the dam. Steel reinforcement is only in the foundation and north and south abutments of the dam. The dam includes various associated features and structures (Hazen and Sawyer 2020; Metropolitan 1938a).

### 5.1.1.1 Deck and Ladders

Along the top (crest) of the structure, a deck framed with a concrete parapet extending 3.5 feet above the crest on the upstream side and an original metal railing along the downstream side provides pedestrian access (Figure 14). The railing consists of two horizontal pipe rails with posts spaced every 10 feet. Gates in the railing access two ladderways on the downstream side, and a ladderway on the upstream side that extends to the trash rack. Minor modifications have been made to the deck area, including the installation circa 2000 of five lifeline/fall protection anchors spaced 20 to 69 feet apart under the handrail along the cantilevered downstream edge of the dam (Metropolitan 2000).

The downstream side displays two caged ladderways with periodic landings/rest platforms and fence fall guards (Figure 15); one longer ladderway of approximately 168 feet that connects the crest of the dam to the discharge valve house and another that partially extends about 76 feet down the face of the dam (Metropolitan 1942, 2022). The shorter ladderway was installed in 1942 to house a plumb line to monitor dam movement (Metropolitan 1942). The longer ladderway is original to the dam's construction and is configured in eight staggered ladderways between landings (Figure 16). The distances between landings were planned to be approximately 21 feet, but in actuality are mostly 23 to 24 feet apart, with the distance to the landing above the bottom ladderway section being approximately 30 feet (Metropolitan 1937; Hazen and Sawyer 2020).

The ladderways are constructed of galvanized carbon steel, with the ladderway sections and bracket-framed landings mounted to the face of the dam with embedded anchors that were cast into the

concrete during the dam's construction. The ladderways are also braced with angle bars anchored into the dam face. Each of the landings extends approximately three feet out from the face of the dam and are about 4.5 feet wide; the uppermost landing extends about 4.5 feet out to account for the cantilevered design under the crest of the dam. Landing floors are constructed of open triangular mesh steel, and the fence fall guard panels are of triangular woven galvanized steel wire. The anchors attaching the ladderways and platforms to the dam appear to be embedded by about 5 to 6 inches; the distance between attachment anchors varies anywhere from 6 feet to 10 feet apart (Metropolitan 1937; Hazen and Sawyer 2020).

#### 5.1.1.2 Sluiceway System

Starting at the upstream side of the dam, a sluiceway system extends from the trash rack located below the water line on the upstream side to the discharge valve house located on the downstream side of the dam. The Howell-Bunger valve is described previously in this report. The gate and discharge valves within the valve house are not used to regulate water levels in the reservoir but are for an emergency or sluicing event. The valve house is attached to the downstream side of the dam. It is a two-story concrete structure raised and supported by a concrete beam footing and a pair of concrete legs resting on the floor of the downstream gorge. Due to the uneven gorge floor, the structure tilts to the east.

The primary elevation (on the east) displays paired steel doors with louvers on the upper floor and the outlet end of the Howell-Bunger valve on the lower floor (Figure 17). The structure is capped with a concrete shed roof. On the north elevation, a square concrete platform on the upper floor leads to paired doors providing access to the valve mechanisms. The platform also connects to the longer ladderway leading to the crest of the dam. The south elevation is a solid concrete surface, with the exception of a small window opening on the upper floor.

The lower floor of the valve house contains the slide gate valve and the Howell-Bunger valve. The Howell-Bunger valve is set within a rectangular beveled opening and mounted to a bolt ring with bolts, nuts, and washers. Two metal platforms supported by angle brackets with guardrails connected by a chain extend out from each corner of the opening below the Howell-Bunger valve. An unprotected modern ladderway is attached to the north side of the valve house just forward of the concrete platform and extends down toward the gorge floor (Figure 18). The wall next to this ladder shows anchor holes from the rungs installed with the original construction (Metropolitan 1938b).

#### 5.1.1.3 Weirs

Two concrete weir structures about 100 feet downstream from the valve house collect and measure the water that leaks or is released through the dam and valves. Weirs are generally designed to be perpendicular to the flow of water. As a result of the uneven gorge floor, the main weir is set diagonally relative to the downstream face of the dam (Figure 17). This weir has a square top that is approximately one foot deep, 26 feet wide, and extends one foot above grade on the downstream side. A smaller weir is located across an adit to a cave part way up the canyon wall at the north end of the main weir (Figure 19). It is of the same design as the main weir but is approximately 8 inches deep, 6 feet wide, and extends one foot above grade. Each weir has a rectangular opening in the concrete that has a metal plate with a V-notch to allow water to trickle through. Both weirs are constructed in an "L" shape, with the footing serving as the base of the "L" (Metropolitan 2022).

#### 5.1.1.4 Catwalk

A series of steel grating panels extend from near the base of the valve house toward the weirs as a catwalk. The catwalk consists of three pairs of panels placed end to end, giving them an angled and haphazard appearance (Figure 17). They are overlapped at the ends rather than being connected and do not have guardrails. They are periodically supported by, but not affixed to, concrete pads that were submerged in water at the time of the 2022 field survey. The first set of catwalk panels extending from near the valve house is approximately 20 feet long, and the second and final sets are approximately 16 feet long (Metropolitan 2022). The catwalk panels are of modern materials and are not historic or character-defining. There are several prior panels dotted along the gorge floor further downstream that apparently were washed out in a previous discharge event.

#### 5.1.1.5 Associated Structures

As mentioned previously, other structures are associated with the reservoir, including the ogee spillway and the outlet tower (Figure 20 and Figure 21). These structures were observed and photographed but are not affected by the project and are not included in the evaluation of the dam's historical significance.

#### 5.1.1.6 Dam Construction Artifacts

Various artifacts were identified along and on top of the canyon walls rising from the dam that are remnants of the dam's construction. These artifacts include iron spikes, posts, rings and cables, a winch pulley, and concrete posts (Figure 22 and Figure 23). These historic objects were used during the dam's original construction and are associated resources to the dam.

The following figures illustrate Copper Basin Dam.

*Figure 11. Copper Basin Reservoir and Dam looking northwest, HAER CA-243. Source: Library of Congress*

*Figure 12. Copper Basin, looking west-northwest, HAER CA-243. Source: Library of Congress*

*Figure 13. Copper Basin Dam and Reservoir, looking northwest. Source: HELIX*

*Figure 14. Pedestrian deck and handrail on the crest of Copper Basin Dam, looking northeast. Source: Metropolitan*

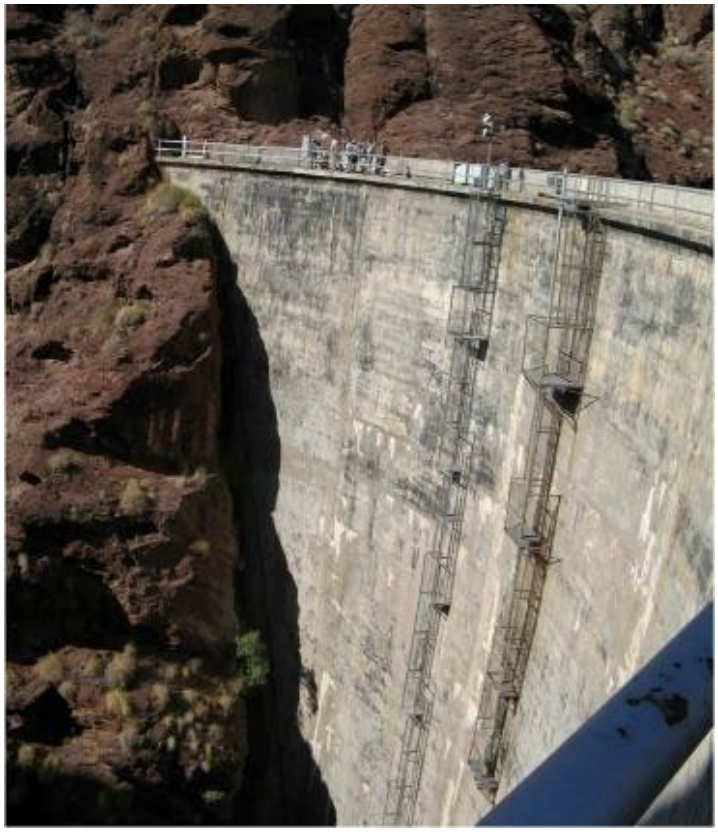

*Figure* 15. *Downstream face of Copper Basin Dam, with attached main ladder (left) and plumb line ladder (right), looking southwest. Source: Metropolitan*

*Figure 16. Ladder ascent on the downstream face of dam. Source: Metropolitan*

*Figure* 17. *Valve with the Howell-Bunger valve, louvred doors and metal platforms, and main weir and catwalk panels in foreground, looking west. Source: HELIX*

*Figure 18. North side of valve house with modern ladder extending down in front of concrete platform. Source: HELIX*

*Figure 19. Adit weir looking north-northwest into cave. Source: HELIX*

*Figure 20. Construction-era posts and cable artifacts on canyon wall east of dam, looking north. Source: HELIX*

*Figure 21. Construction-era reinforced concrete post artifacts adjacent to access road south of dam in background, looking northwest. Source: HELIX*

*Figure 22. Northern end of ogee spillway structure looking north-northeast. Source: HELIX*

*Figure 23. Upstream side of outlet tower structure, looking south-southwest. Source: HELIX*

# 6.0 EVALUATION

## 6.1 NRHP/CRHR

Resources that are found to be significant under one or more of the NRHP and/or CRHR significance criteria must also be evaluated for integrity. If a resource is not found to be historically significant under any of the criteria, then an integrity evaluation is not applicable. The following NRHP/CRHR evaluation adheres to the NPS guidelines for evaluation as provided in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (NPS 1997).

This section provides (1) a summary of the historical significance of the Copper Basin Dam within the larger CRA Historic District and (2) an evaluation of the potential individual historic significance of the Copper Basin Dam per the NRHP and CRHR. The historic integrity of the structure is also assessed, and character-defining features are described.

## 6.2 COLORADO RIVER AQUEDUCT HISTORIC DISTRICT (P-33-11265/P-36-010521)

As originally documented, the CRA Historic District consists of a variety of contributing buildings, structures, sites, and objects, including diversion structures, conduits, flow-control devices, sand traps, pumping plant villages, dikes/ditches, fencing, access roads, and infrastructure and construction features (Chasteen 2016). The historic district boundary encompasses the entire CRA system, including historic sites, buildings, structures, and objects no longer in use but related to earlier surveys and construction of the CRA.

The 2016 DPR form describes the CRA Historic District boundary in the following way:

> the district spans a one-mile-wide corridor extending from the Whitsett Pumping Plant to the eastern edge of Lake Mathews including the western adit of the San Jacinto, Bernasconi, and Valverde tunnels and the Casa Loma Siphon. Generally, the district boundaries are drawn one-half mile out from the centerline of the aqueduct and 150 feet from the centerlines of roads, wasteways, and transmission lines. This buffer includes the canal structure, the pumping stations, power lines, access roads, pumping plant villages, and other associated infrastructure that allowed the CRA to be constructed and maintained over the course of time. As defined here, the “CRA system” begins at the Whitsett Intake Pumping Plant on the western (i.e., California) side of Lake Havasu, and extends westward across the desert to the aqueduct terminus at Lake Mathews--a distance of approximately 242 miles. Approximately 237 miles of 230kV transmission lines extend south from the Hoover Dam to the five CRA pump plants to provide the necessary power for the operation of the CRA (Chasteen 2016).

The CRA Historic District has been formally determined NRHP eligible and listed on the CRHR under multiple criteria of significance: Criteria A/1 (as an exemplification of an institutional infrastructure advancement that allowed the American Southwest to grow and flourish in the twentieth century); Criteria B/2 (for its association with Frank E. Weymouth); and under Criteria C/3 (for its design as a unique, distinctive civil engineering landmark). The district was also formally determined NRHP eligible and is CRHR listed under Criteria D/4 (for its potential to yield information about living and working conditions during the time of survey and construction).

The period of significance defined for the CRA Historic District begins in 1923, with the initial planning and surveying process for the CRA, and ends in 1972, signaling the 45-year threshold for consideration as of the 2016 evaluation. Any changes and additions made to the CRA since 1972 may have since acquired significance in their own right, and therefore, may be considered contributors and/or character-defining; as those additions surpass the 45-year threshold typically used to warrant an evaluation, it is recommended that subsequent evaluations be completed (Chasteen 2016). One of the contributing elements to the Historic District is the CRA's diversion structures, which include the dams and pumping plants. The district record acknowledges that the diversion structures have had some modifications over time, but they generally retain their integrity of location, design, setting, feeling and association, as well as workmanship and most of their materials. Based on the analysis in this report, the Copper Basin Dam retains its integrity, as discussed below, and continues to be a contributor to the CRA Historic District.

## 6.3 COPPER BASIN DAM EVALUATION

### 6.3.1 Significance Criteria A/1

**NRHP Criterion A:** Is associated with events that have made a significant contribution to the broad patterns of our history

**Criterion 1:** It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

The subject property **does appear individually eligible** under Criteria A/1. Criteria A/1 is related not only to broad patterns of history but also to historic cultural landscapes. As defined by the National Park Service, a historically significant cultural landscape is "*a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values"* (NPS 2021b). Cultural landscapes can be associated with a method of construction and include not only designed and rural landscapes and vegetation but also historic buildings and structures, vistas, circulation systems, and sites of cultural traditions and practices. In particular, they can include engineered structures and constructed water features such as dams and reservoirs. Within the context of historic cultural landscapes, Copper Basin Dam is an engineered structure constructed through monumental human effort within a natural gorge setting. As demonstrated in Figure 13, the dam is set against the backdrop of the reservoir that the dam's construction created. The dam would not have been built if not for the construction of the overall CRA, but likewise, the CRA system could not exist without the dam. The dam's construction by humans within a natural canyon setting irrevocably changed the landscape in a significant way, while it also made significant contributions to the development patterns of the Southwest. In this way, Copper Basin Dam is historically significant in its own right as part of a cultural landscape, for its important role in the CRA system, and thus in its significant contributions to California's history.

Therefore, the subject property **does appear eligible** under Criteria A/1.

### 6.3.2 Significance Criteria B/2

**NRHP Criterion B:** Is associated with the lives of persons significant in our past

**Criterion 2:** It is associated with the lives of persons important in our past

The subject property **does not appear individually eligible** under Criteria B/2. Copper Basin Dam is historically significant as an intrinsic part of the overall CRA Historic District, which is significant for its association with F.E. Weymouth as well as Julian Hinds. However, even though Metropolitan constructed the dam under specifications issued under F.E. Weymouth, with construction drawings approved by Julian Hinds, there is no evidence that the dam's design engineer(s) were important individuals who made significant contributions at the state or national level. The importance of the dam's association with Weymouth and Hinds is further discussed under Criteria C/3.

Therefore, the subject property **does not appear eligible** under Criteria B/2.

### 6.3.3 Significance Criteria C/3

**NRHP Criterion C:** Embodies the distinctive characteristics of a type, period, or method of installation, or represents the work of a master, possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction

**Criterion 3:** It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values

The subject property **does appear individually eligible** under Criteria C/3. Copper Basin Dam is historically significant not only as an intrinsic part of the overall CRA Historic District but also individually as an excellent and intact example of an early twentieth-century concrete dam constructed by the J.F. Shea Company. The dam was constructed under Metropolitan Specifications No. 190 issued under F.E. Weymouth, and most of the construction drawings were approved by Julian Hinds. Weymouth and Hinds were important individuals in the history of water conveyance systems and structures, specifically the CRA, with responsibility for overall construction decisions and designs. Copper Basin Dam embodies the distinctive characteristics of a thin arch concrete dam design, a design that was ultimately decided upon and approved by Weymouth and Hinds. Even though it was not the first of the type to be constructed, it was the ideal type of dam to build within a narrow gorge setting. The use of the Howell-Bunger valve was also ideal for this setting, where it is intended for emergency water discharge. Metropolitan and other agencies continued to use the valve within the sluiceway systems of additional similar dams, including the CRA's Gene Wash Dam. The dam continues to function and operate in the same manner today as it did 75 years ago, with its original design and virtually all of its original materials intact.

Therefore, the subject property **does appear eligible** under Criteria C/3.

### 6.3.4 Significance Criteria D/4

**NRHP Criterion D:** It has yielded, or may be likely to yield, information important in prehistory or history

**Criterion 4:** It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation

The subject property **does not appear individually eligible** under Criterion D/4. The history and importance of the CRA, and the Copper Basin Dam within that context, are well-documented. There does not appear to be any evidence that the dam on its own has yielded, or has the potential to yield, additional information important in the state's or nation's prehistory or history.

Therefore, the subject property **does not appear eligible** under Criterion D/4.

## 6.4 HISTORIC INTEGRITY ANALYSIS

Copper Basin Dam is a contributing structure within the CRA Historic District, and is, therefore, considered a historical resource/historic property for the purposes of CEQA and Section 106 of the National Historic Preservation Act.

As noted above, "integrity" is the ability of a historic resource to convey the reasons for its significance, through the retention of character-defining features, materials, and components. Historic integrity is weighed through a consideration of seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. This section provides an analysis of the historic integrity of the Copper Basin Dam.

**Location:** Copper Basin Dam sits in its original footprint and retains integrity of location.

**Design:** Copper Basin Dam retains its original 1937/1938 design. No major changes or additions have been made to the dam since its initial construction. Therefore, design integrity of the dam is retained.

**Setting:** The setting of Copper Basin Dam has not changed since its construction. The dam is located within a narrow red rock canyon. Therefore, the dam retains integrity of setting.

**Materials:** Copper Basin Dam retains integrity of materials. Most of the materials extant are original, including concrete and metal.

**Workmanship:** Copper Basin Dam retains integrity of workmanship, as illustrated in the extensive and intact concrete work completed by J. F. Shea Company.

**Feeling:** The Copper Basin Dam retains integrity of feeling as a functioning dam and reservoir cultural landscape within the CRA system because it retains physical characteristics that evoke the historic scene dating to the late 1930s.

**Association:** The Copper Basin Dam retains integrity of association as a functioning dam and reservoir cultural landscape that retains its original materials and design within the CRA system dating to the late 1930s.

## 6.5 CHARACTER-DEFINING FEATURES

The following list identifies the character-defining features of Copper Basin Dam:

- Adjacency to the Copper Basin Reservoir; prominent, large-scale thin arch design and massing
- Board-form concrete construction and features
- Sluiceway system, including the trash rack on the upstream face through to the valve house on the downstream face
- Presence of attached, sheltered metal ladderways to access the valve house and enclose the plumb line
- Pedestrian deck on dam crest with parapet and metal railings
- Presence of concrete weir and adit weir in the current locations
- Remote setting and location, within a red rock gorge
- Detached concrete ogee spillway and CRA outlet tower
- Construction-era remnants, including iron spikes and posts, iron hoops, winch/pulley wheel, and reinforced concrete posts on and on top of the red rock gorge abutments

# 7.0 PROJECT IMPACTS ANALYSIS

As noted in Section 2, projects in compliance with the *Secretary's Standards* generally avoid adverse impacts to historical resources (CEQA Guidelines Section 15064.5(b)(3)). The goal of the *Secretary's Standards* is to outline treatment approaches that allow for the retention of and/or sensitive changes to the distinctive materials and features that lend a historical resource its significance. Of the four treatment approaches defined in the *Secretary's Standards*, rehabilitation is the most flexible approach. Rehabilitation is the appropriate treatment for the proposed project, which involves relatively minor maintenance upgrades to the dam's sluiceway system, access ladderways, weirs, and electrical and mechanical systems. The following section provides an analysis of the project's compliance with the *Secretary's Standards*:

**Table 1**
**PROJECT CONSISTENCY WITH SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION**

| Standard for Rehabilitation | SOIS Consistency Determination |
|---|---|
| **Standard 1**: A property will be used as it was historically or be given a new use that requires minimal change. | Consistent. The use of the resource will not be changed. |
| **Standard 2**: The historic character of a property will be retained and preserved. | Consistent. The project does not alter the thin arch dam structure, parapet, railing, or valve house. The existing valve will be replaced like-for-like. The trash rack will be protected or reinstalled in its original location after the gate and discharge valves are replaced. The replacement ladderway will be in substantially the same location and of the same materials and design, with only minor changes necessary to meet safety requirements. The weirs will be replaced in the same locations and of substantially the same materials and dimensions. The catwalk panels are not character-defining features of the dam but will be replaced in the same locations with a similar but improved and safer design. While the addition of concrete steps leading from the valve house to the new catwalk will alter the appearance of that area of the gorge, they represent a safer and better way to access the weirs than the existing method of climbing down rocks and across haphazard catwalk panels. All of these changes are minor in relation to the size and significance of the dam structure. The historic character of the dam will be retained and preserved by the project. |
| **Standard 3**: Each property will be recognized as a physical record of its time, place, and use. | Consistent. The new valve will not introduce a false sense of history through conjectural features or elements. The replacement ladderway and two weirs will be in the same locations and of substantially the same designs and materials as the original. The new concrete stairs at the base of the valve house and the new catwalk will be clearly modern and will not create a false sense of history. |
| **Standard 4**: Changes to a property that have acquired historic significance will be retained and preserved. | Consistent. There are no known changes to the dam or associated structures that have acquired historic significance. |
| **Standard 5**: Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved. | Consistent. The project retains the distinctive materials/features that characterize the property. |

| Standard for Rehabilitation | SOIS Consistency Determination |
|---|---|
| **Standard 6**: Deteriorated historic features will be repaired rather than replaced. | Consistent. The concrete dam structure, trash rack, valve house, pedestrian railing, and plumb line ladderway will continue to be repaired rather than replaced. The project will replace components that are too deteriorated or parts that are unavailable for repair. The valve will be replaced in-kind in materials, function, and overall appearance within the existing valve house. The existing catwalk panels are not historic. The ladderway will be replaced, but in the same location and of substantially the same materials and design, but with an improved design for safety purposes. The weirs have deteriorated to an extent they need to be replaced, but again will be replaced in the same locations and of substantially the same designs and materials as the original weirs. |
| **Standard 7**: Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. | Consistent. The valve replacement will be undertaken to avoid damage to adjacent materials and features, including protection or reinstallation of the trash rack. No chemical or physical treatments are proposed to the concrete arch dam. |
| **Standard 8**: Archeological resources will be protected and preserved in place. | Consistent. Part of the project includes the placement of the concrete stairs and the removal of boulders on the canyon floor to accommodate the replacement catwalk to the weirs. These improvements occur within areas previously disturbed during the original construction of the dam and weirs. |
| **Standard 9**: New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. | Consistent. The valve replacement will not destroy historic materials that characterize the property because the new valve will be a like-for-like replacement. The replacement ladderway and weirs will be in the same location and of substantially the same design and materials in terms of the property's character. The new catwalk will not affect character-defining features of the dam. The concrete stairs will be adjacent to the valve house extending along the canyon floor to the catwalk and will not affect historic materials. |
| **Standard 10**: New additions and adjacent new construction shall be undertaken such that, if removed in the future, the essential form/integrity of historic property would be unimpaired. | Consistent. The essential form of the Copper Basin Dam and its character-defining features will remain intact and unimpaired. Any future removal of new additions, such as the catwalk and concrete stairs, would leave the essential form, integrity, and function of the historic dam intact and unimpaired. |

# 8.0 IMPACTS DISCUSSION AND CONCLUSION

As currently envisioned, the proposed plans for the replacement of the gate valve and Howell-Bunger discharge valve, the main access ladderway, main weir, adit weir and the catwalk, as well as the addition of concrete stairs between the valve house and new catwalk and other system upgrades and modernization comply with the *Secretary's Standards*.

The historic integrity and character-defining features of the dam will be retained, including the scale, setting, and location of the dam, its prominent concrete thin arch design, and board-form concrete fabric, as well as its feeling and association as an individually significant structure and within the CRA Historic District context. In addition, upgrades to safety proposed with the improved ladderway, addition of stairs and replaced catwalk to the weirs, as well as the upgrades to the electrical, communication, and mechanical systems, would allow for the continuous historical use of the dam and the overall CRA, and would not adversely impact character-defining features. The use of the dam will not change and will continue to function as a dam within the Copper Basin reservoir, serving its originally intended function as part of the CRA system.

As discussed in the previous section, the valves will be replaced in-kind to match the existing valves in materials, dimensions, and use; care will be taken to avoid the destruction, obscuring, or removal of adjacent character-defining features. No new conjectural features or significantly different detailing will be added to the valves or dam that would change the overall character. Although the Howell-Bunger valve is large in scale, it is a comparatively small feature in relation to the scale of the dam itself. The existing trash rack will be protected in place during construction. The deck of the dam has had electrical and other equipment and conduit added over time as necessary for the continued operation of the dam; the proposed upgrades are designed in an organized manner along the dam, deck, and parapet in a similar location as existing. The main access ladderway and weir character-defining features are historic more for their function and location than for their specific design, but they are essentially proposed to be replaced like for like. A new main access ladderway in substantially the same location and of substantially the same, but safer, design will replace the original main ladder. The weir and adit weir will be replaced in substantially the same location and of the same materials and design. The existing catwalk is not historic but necessary for safety, and an intentionally designed new catwalk will replace the existing one so safe access to the weirs is maintained. The only other entirely new feature to be added by the project is a set of concrete stairs which are a minor but necessary addition for safe access to the catwalk from the valve house. The stairs are of similar materials to those used for the dam but are clearly a new feature, and although unlikely, they could be removed in the future and leave the essential form and integrity of the dam intact. The plans do not propose any changes, grading, or construction that would affect the character-defining artifacts visible on the red rock gorge abutments to the dam, including no impacts to the concrete posts adjacent to the access road improvements south of the dam.

Therefore, the project complies with the *Secretary's Standards* and implementation of the proposed project would not be expected to result in a significant adverse impact to the historical resource and its character-defining features. The historical resource would retain its historic integrity, following project implementation, and retain its status as an individually historically significant structure and as a contributor to the CRA Historic District.

In addition, no indirect impacts would be expected to result to the larger historic district.

In conclusion, as designed, the proposed project would not be expected to cause a significant adverse impact or material impairment to the Copper Basin Dam or the larger CRA Historic District, and no further CEQA analysis is required.

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# Appendix A

## Resumes of Key Personnel

# Teri Delcamp
## Architectural Historian

HELIX Environmental Planning

## Summary of Qualifications

Ms. Delcamp is a qualified historian/architectural historian who meets the Secretary of the Interior's standards for her profession. Ms. Delcamp has more than 20 years of professional experience in preparing history and architectural history studies in California. She has served as Principal Planner for the City of Carlsbad, Senior Planner (Historic Preservation) for the City of Riverside, Historic Preservation Manager for the City of San Juan Capistrano, and Senior Planner for the cities of San Diego, Oceanside, and San Clemente. Ms. Delcamp's experience includes a wide range of study types, from the preparation of historic context studies to historic built environment evaluations.

## Selected Project Experience

**Tijuana River Valley Regional Park Brown Fill Property** (2022). Architectural Historian for a cultural resources study in support of a potential restoration project at the Brown Fill Property within the Tijuana River Valley Regional Park in San Diego County. Assisted in the preparation of the technical report and DPR Form in compliance with state and federal regulations. Project scope included a cultural resources records search, literature review and archival research, review of historic maps and aerials, field survey, historic significance evaluation and preparation of a technical report. Work performed for the County of San Diego Department of Parks and Recreation.

**Shady View Residential Project Environmental Impact Report** (2022) Architectural Historian for a cultural resources study in support of the proposed the development of 159 single-family homes, open space and recreational amenities, and associated street, utility/infrastructure, and drainage improvements in the City of Chino Hills in San Bernardino County. Assisted in the preparation of the technical report and DPR Form in compliance with state and federal regulations. Project scope included a cultural resources records search, literature review and archival research, review of historic maps and aerials, field survey, historic significance evaluation and preparation of a technical report in support of the Project EIR. Work performed for the City of Chino Hills.

**Marysville Parks & Open Space Master Plan** (2021) Senior Architectural Historian for the City of Marysville Parks and Open Space Master Plan project, which proposes minor upgrades to Ellis Lake Park, including rerouting and widening a three-foot path to six feet and adding a series of benches, exercise stations, a playground, and an event stage. The project includes in-depth historical research and preparing a Historic Resource Evaluation Report for Ellis Lake Park. Work performed for the City of Marysville.

## Education

Master of Arts, History, California State University San Marcos, 2015

Bachelor of Arts, Liberal Studies (History), California State University Long Beach, 1986

## Professional Affiliations

American Planning Association

National Trust for Historic Preservation

California Preservation Foundation

## Awards

Association of Environmental Professionals, Merit Award, Carlsbad Tribal, Cultural and Paleontological Resources Guidelines, 2018

American Institute of Architects San Diego Chapter, Divine Detail Award, Montanez Adobe, San Juan Capistrano, CA, 2010

**Coachella Canal Midline Storage Project** (2021 - 2022). Architectural Historian for a project in the City of Niland proposing an inline reservoir on the Coachella Canal that will be formed by removing the existing embankment between the existing lined canal with the original earthen canal to form a single wide trapezoidal section. Responsible for reviewing extant data on the historicity of the National Register of Historic Places (NRHP)-eligible Canal, surveying the project, and completing an impacts/effects analysis utilizing the data from the survey and the literature review. Work performed as a subconsultant to Harvey Consulting Group, with Coachella Valley Water District and U.S. Bureau of Reclamation as the lead agencies.

### Previous Experience

**Principal Planner, City of Carlsbad** (2015 - 2020). Manage the current planning and customer service sections supervising 11 employees, including senior planners, associate planners and planning technicians. Review the most complex development projects ranging across the full spectrum of land uses and entitlements. Make CEQA determinations for both sections; provide cultural resource CEQA significance determinations for section development projects and provide internal peer review of cultural resource studies. Conduct CEQA analyses including preparation of initial studies and mitigated negative declarations. Implement and administer a variety of local land use regulations including Tribal, Cultural & Paleontological Resources Guidelines; Local Coastal Program; Habitat Management Plan and Airport Land Use Compatibility Plan. Prepare and present reports to Commissions and Council. Respond to inquiries and meet with community members to provide information and discuss land use-related concerns.

**Carlsbad Tribal, Cultural, and Paleontological Resources Guidelines** (2015 - 2020). Senior Planner for the update to cultural resources guidelines for the City of Carlsbad. Oversaw consultant contract, oversaw tribal consultation, collaborated and edited draft and final document, and achieved City Council adoption. Work performed for the City of Carlsbad.

**City of Carlsbad Cultural Resource CEQA Determinations for Development Projects** (2015 - 2020). Senior Planner for determining the need for cultural resources/historical reports for numerous projects including single family homes, historic theater, historic school campus buildings, churches, commercial and institutional sites. Work performed for the City of Carlsbad.

**City of Carlsbad Tribal Consultation Projects** (2015 - 2020). Senior Planner for leading or assisting City colleagues conducting AB 52 and SB 18 tribal consultations for numerous development projects, General Plan Amendments and Specific Plan Amendments. Work performed for the City of Carlsbad.

**City of Riverside Historic Preservation Senior Planner** (2011 - 2015). Manage and oversee day-to-day operation of historic preservation section within the Neighborhood Engagement Division. Detailed analysis and presentation of planning cases to decision-makers. Manage projects and consultant contracts for various surveys and CEQA documents. Acting Historic Preservation Officer for Administrative Certificates of Appropriateness. Prepare and secure grants and prepare progress reports and annual reports in conjunction with the Certified Local Government program. Write and review cultural resource reports submitted in support of designation, historical significance evaluations and/or in accordance with the California Environmental Quality Act. Supervise Associate Planner and Assistant

Planner. Partner with community preservation organizations and other departments to achieve preservation goals. Provide customer service via public counter, telephone and email regarding land uses, development standards and historic preservation. Work performed for the City of Riverside.

**City of Riverside Consultant Contract Management** (2011 - 2015). Senior Planner focused on Historic Preservation in the City of Riverside. Prepared Requests for Proposals and managed professional consultant contracts for preparation of Environmental Impact Report and Mitigated Negative Declaration for historic resource demolition and area-wide Utility Department infrastructure improvements, respectively. Prepared Requests for Proposals and managed professional consultant contracts for preparation of historic surveys for grant funded work and Specific Plan updates. Work performed for the City of Riverside.

**City of Riverside Historic Preservation Ambassador Training Program** (2011 - 2015). Prepared Request for Proposals and managed consultant for new training manual and workshop series to create cohort of community preservation leaders to assist city in preservation education and advocacy. Work performed for the City of Riverside.

**Relocation of the Cooper House** (2011 - 2015). As Senior Planner, prepared a Cultural Resources Report and Evaluation of Impacts for the Cooper House. Work performed for the City of Riverside.

**4135 Market Street, Structure of Merit Designation** (2011 - 2015). Senior Planner for the preparation of a Historic Evaluation & DPR Form for a significant structure located at 4135 Market Street in Riverside.

**Historic Evaluation & DPR Form Recordation for the James & Jessie Shaw Residence** (2011 - 2015). Senior Planner for preparation of a historic evaluation and landmark designation for a private residence at 8410 Cleveland Avenue. Work performed for the City of Riverside.

**Historic Evaluation & DPR Form Recordation for the Frank and Katherine Wells-Patsy O'Toole House** (2011 - 2015). Senior Planner for the preparation of a historic evaluation, DPR form and landmark designation for a private residence at 1945 Arroyo Drive. Work performed for the City of Riverside.

**Historic Evaluation & DPR Form Recordation for the Mackey House** (2011 - 2015). Senior Planner for the preparation of a historic evaluation, DPR form and landmark designation for a private residence at 6140 Tiburon Drive. Work performed for the City of Riverside.

**Cultural Resources Report and Evaluation of Impacts, Demolition of 11134 and 11144 Pierce Street** (2011 - 2015). Senior Planner for the preparation of a cultural resources report prior to the demolition of properties located at 11134 and 11144 Pierce Street. Work performed for the City of Riverside.

**Riverside Mid-Century Modern Building Survey Certified Local Government Grant** (2011 - 2015). Grant writer and contract and project manager for a survey and inventory of mid-century modern buildings in Riverside. Work performed for the City of Riverside.

**Riverside Mid-Century Modern Subdivision Oral Histories Certified Local Government Grant,** (2011 - 2015). Grant writer and contract and project manager for preparation of oral histories surrounding mid-century modern buildings in Riverside. Work performed for the City of Riverside.

**American Recovery and Reinvestment Act (ARRA) Surveys** (2011 - 2015). Senior Planner for the completion of historical contexts and preparation of a multiple property DPR form. Work performed for the City of Riverside.

**Management of Certificates of Appropriateness** (2011 - 2015). Senior Planner for the analysis, preparation for Board and Council consideration, and supervision or approval of numerous planning applications for master plans, additions, adaptive re-use, relocation and/or restoration of historic commercial, industrial, educational and residential landmarks and district contributors, including commercial offices/stores, train depots, packing houses, individual homes and college campus landmarks, etc. Work performed for the City of Riverside.

**Historic Preservation Fund Grant Program** (2011 - 2015). Senior Planner for the management of bi-annual General Fund competitive grant program for historic preservation projects including staff to Council-created committee for award of grants. Work performed for the City of Riverside.

**Historic Preservation Manager, City of San Juan Capistrano** (2005 - 2011). Solely responsible for management and administration of the City's historic preservation program. Staffed City's Cultural Heritage Commission. Reviewed complex development projects affecting designated historic sites. Managed planning, design, bid and construction phases of 7year Capital Improvement Program for City-owned historic sites (approximate budget $1.3 million). Developed and administered Historic Preservation section's annual budget and coordinated annual historic building maintenance budget and priorities with Public Works. Wrote and presented reports to Commissions, Council, community organizations and public. Coordinated with other departments and state and federal agencies on historic preservation issues and projects. Prepared, supervised and/or reviewed National Register, California Register and local nominations. Conducted historic preservation public outreach including events and workshops.

**Forster Mansion Exclusive Events Conditional Use Permit** (2005 - 2011). Historic Preservation Manager for controversial, complex case for outdoor special events within mixed use residential and commercial area. Work performed for the City of San Juan Capistrano.

**Zoomars on Los Rios Conditional Use Permit** (2005 - 2011). Historic Preservation Manager for the management of a complex expansion of non-conforming use case for petting zoo in residential historic district. Work performed for City of San Juan Capistrano.

**Montanez Adobe Restoration and Seismic Repair** (2005 - 2011). Historic Preservation Manager for the preparation of RFPs and managed contracts; managed design, bid and construction. Montanez Adobe project received state award 2012. Work performed for the City of San Juan Capistrano.

**7-Year Capital Improvement Program for City-Owned Historic Structures** (2005 - 2011). Contract & Project Manager for bid and construction projects including Harrison House Repair & Restoration, Roger Williams/Swanner House Historic Paint Restoration, Roger Williams /Swanner House and Water Tower

Foundation Repairs, Roger Williams/Swanner House Interior Repairs  Joel Congdon House Repairs, and Blas Aguilar Adobe Repairs. Work performed for the City of San Juan Capistrano.

**Seven-Year Capital Improvement Program for City-Owned Historic Structures** (2005 - 2011). Contract & Project Manager for Design RFP, Bid & Construction, including Montanez Adobe Restoration & Seismic Repair, Joel Congdon House ADA Improvements**,** Joel Congdon House Water Tower Restoration, Parra Adobe Seismic Repair and Restoration Historic Structure Report. Work performed for the City of San Juan Capistrano.

**Seven-Year Capital Improvement Program for City-Owned Historic Structures** (2005 - 2011). Contract & Project Manager for RFP for Historic Structure Report and Rehabilitation Plans, including Parra Adobe Save America's Treasures Grant, The Ecology Center at the Congdon House, Blas Aguilar Adobe Repair and Native Education Facility, Mission San Juan Capistrano: Rectory Garden; Entry Restoration and Gift Shop projects, Historic Evaluation Report, Nick's Café, 26755 Verdugo Street, SB18 Tribal Consultation for General Plan and Specific Plan projects, and management of Historic Preservation Week 2006, 2007, 2008, 2009. Work performed for the City of San Juan Capistrano.

**Senior Planner, City of Oceanside** (2004 - 2005). Under direction of City Planner, supervised the current planning and customer service section. Supervised Associate Planners and Assistant Planners, including completion of performance evaluations. Reviewed complex development projects ranging across the full spectrum of land uses and entitlements, including CEQA initial studies and documents. Implemented Local Coastal Program. Wrote and presented reports to Commission and Council. Work performed for the City of Oceanside.

**Senior Planner, Historic Preservation, City of San Diego** (2002 - 2004). Staffed Old Town Community group and Design Review Board; evaluated and presented planning cases to both. Managed and administered City's historic preservation program and supervised staff including Administrative Interns, Secretary and Senior Planners on team. Conducted detailed review of historic resource reports and surveys for designation. Oversaw and participated in historic resource surveys. Reviewed projects for consistency with Secretary of the Interior's Standards. Staffed Historical Resources Board. Participated in Section 106 consultation and managed MOU and PA compliance, coordinating with Port Authority, Navy Region Southwest and various historic preservation organizations, etc. Fulfilled Certified Local Government duties. Wrote and presented reports to Board, Commissions, Council, community organizations and public. Conducted historic preservation public outreach including events, training, and workshops.

**Naval Training Center Historic District Plancheck Drawings** (2002 - 2004). Senior Planner for an evaluation of the Liberty Station Re-Use plans for consistency with Secretary of the Interior's Standards. Work performed for the City of San Diego.

**Secretary of the Interior's Standards Consistency Determinations (**2002 - 2004). Senior Planner for the San Diego Zoo/Balboa Park expansion; Salk Institute Expansion; SDG&E Station A adaptive re-use; Santa Fe Depot/Museum of Contemporary Art; Coronado Belt Line bike trail; Hard Rock Hotel/Depot re-use; various rehabilitation and re-use projects in Gaslamp Historic District, Old Town San Diego, etc. Work performed for the City of San Diego.

**US Navy, US Marine Corps and San Diego Airport Authority Section 106 Programmatic Agreement (PA) Compliance** (2002 - 2004) Senior Planner to review proposals for consistency with the PA. Met with agency representatives and property owners.

**La Jolla Intensive Historic District Survey** (2002 - 2004). Senior Planner on a survey team for the La Jolla Historic District. Work performed for the City of San Diego.

**Burlingame and Islenair Historic Districts** (2002 - 2004). Senior Planner for the supervision of the preparation of historic contexts and historic district nominations. Work performed for the City of San Diego.

**East Village, Warehouse, and African American Historic District Surveys** (2002-2004). Outreach team member for inventories of historic districts in the East Village, Warehouse District, and the historic African American district of San Diego. Work performed for the City of San Diego.

**Individual Historic Designations and Mills Act Program** (2002 - 2004). Reviewed all historic designation requests and referrals, prepared staff reports, supervised staff and managed Mills Act contract program comprising 80-100 property evaluations per year; worked with Deputy Director, community, preservation stakeholders and Land Use Committee to develop methodology for implementing new fees for designations and Mills Act contracts.

**Senior Planner, City of San Clemente** (2002). As Senior Planner, supervised the current planning and customer service section. Supervised Associate Planners and Assistant Planners, including completion of performance evaluations. Reviewed complex development projects ranging across the full spectrum of land uses and entitlements, including CEQA initial studies and documents. Supervised consultant contracts on various projects including General Plan amendments, Specific Plans and implementing entitlements, grants and CEQA documents. Served as Air Quality Planner and LOSSAN rail corridor technical advisory committee member. Managed and administered Planning Commissions and Design Review Subcommittee. Fulfilled Certified Local Government duties. Wrote and presented reports to Commissions, Council, community organizations and public. Established and implemented Mills Act incentive program. Conducted public outreach including community workshops and training.

**Marblehead Coastal Project** (1990 - 2002). Managed mid-1990s re-activation of 117 acre, 400+ dwelling unit and 61 acre regional commercial project; supervised and coordinated consultants for General Plan Amendment, Specific Plan and EIR; managed all associated entitlements including tentative tract, site plan review, conditional use permits, design review; coordinated weekly meetings with developer team, and meetings and reviews with other agencies including Coastal Commission and Department of Fish and Game; coordinated all revised project documentation and reports through numerous public hearings; processed project through to approval by Planning Commission and City Council.

**San Clemente Metrolink Station**(1990 - 2002). Managed city portion of award-winning project adjacent to National Register community building; liaised with OCTA consultant; supervised separate design consultant for ancillary “depot” building; coordinated staff and community meetings; developed ancillary

building budget and design priorities; completed shared parking analysis, coordinated Coastal Commission's acceptance of methodology, and conducted required monitoring.

**City of San Clemente Certified Local Government** (1990 - 2002). Assisted in preparation of application, program, ordinance, etc., to obtain CLG status; prepared grant application; managed OHP and consultant contracts for grant; conducted research, outreach, workshops and public hearings to adopt updated survey; conducted workshops with CLG grant consultant; planned, prepared and obtained approval for City of San Clemente's first Mills Act Contract program.

**City of San Clemente Downtown/Business Park Economic Development Achievements and Housing Balance** (1990 - 2002). Managed numerous retail, office and industrial from discretionary entitlements through plancheck to permit issuance for 200,000+ square feet in new projects including DeNaults Hardware; Sav-On; Rip-Curl; Rancho San Clemente Plaza Pacifica; Rancho San Clemente Industrial Park; Talega Business Park; Rancho San Clemente Business Park; as well as residential subdivisions for 500+ dwelling units throughout Forster Ranch and Rancho San Clemente Specific Plan areas, Cross Hill, and numerous individual home developments.

**City of San Clemente Advanced Planning** (1990 - 2002). **P**repared SCAQMD AQMP baseline analysis for City as representative to Orange County Air Quality Technical Advisory Committee; wrote Zoning Code for amended site plan review process and historic preservation incentives; member of staff advisory committee for Citywide General Plan and comprehensive Zoning Code updates, and new Urban Design Guidelines; represented City on LOSSAN rail corridor technical advisory committee which resulted in new Metrolink Station; prepared grant applications for transportation enhancement projects.

# Debi Howell-Ardila, MHP

**Senior Architectural Historian**

HELIX Environmental Planning

## Summary of Qualifications

Ms. Howell-Ardila is an award-winning architectural historian and historic preservation professional with 15 years of experience in environmental compliance, historic resource assessments, survey, and documentation. She has extensive experience in researching and writing about architectural history, as well as applying the regulatory framework of its diverse cities to the built environment.

Ms. Howell-Ardila's project experience has included oversight and completion of a variety of project types, including Secretary of the Interior's Standards project review, preparation of environmental compliance studies, federal and local landmark nominations, Mills Act applications, and Historic American Buildings Survey documentation. She has conducted site investigations and led historic resource surveys and evaluations throughout California, with an emphasis on Southern California. Her experience includes preparation of environmental compliance studies and documentation in support of the California Environmental Quality Act (CEQA) and contributions to studies in support of the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). Ms. Howell-Ardila meets and exceeds requirements in the Secretary of the Interior's Professional Qualification Standards in Architectural History and History.

## Selected Project Experience

**Contract Planning Project Review for South Pasadena** (2020 - 2021). Preservation Planner and Project Manager for project review, permit processing, and preservation planning support to the City of South Pasadena Planning and Building Department. Duties included preparing historic resource evaluations, assessing projects for compliance with the City's Municipal Code, design guidelines, and the Secretary of the Interior's Standards, and preparing and presenting staff reports to the Cultural Heritage Commission. Work performed for the City of South Pasadena Planning and Building Department.

**John Hinkel Park Historic Resources Evaluation and Amphitheater Improvements Project** (2018). Principal Author/Investigator and Project Manager for a historic resources evaluation of John Hinkel Park in the City of Berkeley, in support of park upgrades and improvement projects. The evaluation informed preservation project review of proposed upgrades to the park facilities, as well as new construction, to ensure compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. Recommendations were made to the City of Berkeley and project architect in order to facilitate compliance with the Secretary's Standards, to avoid adverse impacts to historic resources, and to streamline environmental compliance review. Work performed for the City of Berkeley.

## Education

Masters of Historic Preservation, University of Southern California, Los Angeles

Bachelor of Arts, German and Architectural History, University of California, Berkeley

## Registrations/ Certifications

Meets/exceeds Secretary of the Interior's Professional Qualification Standards in Architectural History and History

## Awards

California Preservation Foundation, Preservation Design Award (Riverside Latino Historic Context Statement, 2019; City of San Gabriel Historic Preservation Ordinance Update, 2018; and LAUSD Historic Context Statement, 2014)

Los Angeles Conservancy, Preservation Award (City of San Gabriel Historic Preservation Ordinance Update, 2018; and LAUSD Historic Context Statement, 2015)

**Riverside Latino Historic Context Statement** (2018). Principal Author/Investigator and Project Manager for preparation of a Latino Historic Context Statement, which explored over a century of history and culture of Riverside's Latino community. The Historic Context Statement provided a comprehensive framework for assessing properties associated with the Latino community. This effort was recognized with an award from the California Preservation Foundation in 2019. Work performed for the City of Riverside and the California Office of Historic Preservation (OHP).

**University of California, Riverside Campus-wide Historic Resources Survey Report** (2019 - 2021). Author and Project Manager for a campus-wide historic resources survey of the University of California, Riverside. The resulting Historic Resources Survey Report, along with a focused historic context statement and ArcGIS maps, offered the University an accurate, comparative baseline of historic resources and University assets, in support of master planning and upgrades projects. Work performed for the University of California, Riverside.

**California State University, Fullerton Master Plan EIR Historic Resources Survey Report** (2019 - 2020). Principal Author and Project Manager for a campus-wide historic resources survey of California State University, Fullerton (CSUF). The resulting Historic Resources Survey Report, along with a focused historic context statement and ArcGIS maps, offered the University an accurate, comparative baseline of historic resources and University assets, in support of master planning and upgrades projects. In addition, the survey results provided a sound basis for an analysis of historic resource impacts, alternatives, and mitigation measures for the CSUF Master Plan EIR. Work performed for the California State University, Fullerton.

**Long Beach Grant Neighborhood Historic Context Statement and Survey** (2018 - 2019). Principal Author/Investigator and Project Manager for preparation of a historic context statement and conducting a survey of Long Beach's Grant Neighborhood. As a result of the project, Grant Neighborhood's first historic district was identified and designated by City Council in 2018. Work performed for the City of Long Beach.

**Anacapa Courts/Top Hat Rehabilitation Project Secretary of the Interior's Standards Project Review** (2017). Principal Author and Investigator for Secretary of the Interior's Standards project review for the Anacapa Courts/Top Hat Rehabilitation Project in the City of Ventura. Project plans, including architectural drawings, site plans, and elevations, were analyzed for compliance with the Secretary of the Interior's Standards. Recommendations were made for project modifications and refinements aimed at facilitating compliance with the standards. Work performed for the City of San Buenaventura.

**250 Mills Road Rehabilitation Project Secretary of the Interior's Standards Project Review** (2017). Principal Author and Investigator for Secretary of the Interior's Standards project review for the 250 Mills Road Rehabilitation Project in the City of Ventura. Project plans, including architectural drawings, site plans, and elevations, were analyzed for compliance with the Secretary of the Interior's Standards. Recommendations were made for project modifications and refinements aimed at facilitating compliance with the standards. Work performed for the City of San Buenaventura.

# Annie McCausland

**Architectural Historian**

HELIX Environmental Planning

## Summary of Qualifications

Ms. McCausland meets the Secretary of the Interior's Professional Qualification Standards for Architectural History and History. Her expertise includes the Secretary of the Interior's Standards for the Treatment of Historic Properties, archival research, historic contexts, significance evaluations, and historic district documentation. She has completed numerous studies for residential, agricultural, military, rural, commercial, and industrial properties across California. She has prepared numerous technical reports including Historical Resources Evaluation Reports (HRER), Historic Property Survey Reports (HPSR), Historic Building Assessment Reports, Rehabilitation Reports, and Cultural Resources Phase I and II Reports, to satisfy compliance requirements under National Historic Preservation Act (NHPA) Section 106, California Environmental Quality Act (CEQA), and local government preservation ordinances. Ms. McCausland has worked extensively under the California Department of Transportation (Caltrans) Districts 5 and 8, as well as the U.S. Army Corps of Engineers (USACE), Bureau of Land Management (BLM), and the Bureau of Reclamation (BOR), as well as many local governments.

## Selected Project Experience

**One Alexandria Square Environmental Consulting** (2020). Architectural Historian preparing a historic built-environment resources memo report for a proposed mixed-use development in the University City community of the City of San Diego. Work was conducted for Alexandria Real Estate Equities, with the City of San Diego as the lead agency.

**Dam Maintenance Program** (2019 - ongoing). Architectural Historian for Dam Maintenance Program at 13 dams across San Diego County. Led effort to survey, document, research, and evaluate historical resources within the 13 project areas, including a previously documented City of San Diego Water System discontiguous historic district. Lead Author for the Historical Resources Assessment Report and Co-author for the Cultural Resources Assessment Report. Historic contexts, evaluations, and DPR 523 forms were prepared utilizing archival sources. Work performed for the City of San Diego Public Utilities Department.

**Sycamore Drive Bridge Project** (2020 - 2021). Architectural Historian for a bridge project located on the boundary of the City of San Marcos and unincorporated community of Twin Oaks within unincorporated San Diego County. The proposed project consists of replacing the existing timber box culvert bridge over San Marcos Creek with a new bridge designed to meet current standards and convey the 100-year storm event and may involve realignment of Sycamore Drive in the vicinity of the bridge to improve the substandard curve at the bridge's southern approach. Conducted survey for historic built-environment resources within the APE.

## Education

Master of Arts, Public History, California State University, Sacramento, California, 2015

Bachelor of Arts, History, Chapman University, Orange, California, 2010

## Registrations/ Certifications

Huntington Library San Marino, Registered Reader,

## Professional Affiliations

California Council for the Promotion of History

American Association for State and Local History

National Council on Public History

California Preservation Foundation

Los Angeles Conservancy

Society of Architectural Historians

**Buckman Springs Road Bridge Widening Technical Studies** (2020 - ongoing). Architectural Historian for the rehabilitation and widening of the existing Cottonwood Creek Bridge crossing of Buckman Springs Road over Cottonwood Creek, located in eastern San Diego County. The project proponent was the County of San Diego Department of Public Works, with local assistance funding from the FHWA. Responsibilities included review records search material; field survey; and preparation of an Historical Resources Evaluation Report (HRER), Historic Property Survey Report (HPSR), consistent with Caltrans format and content requirements. Duties also included the direction and oversight of the completion of a draft Finding of No Adverse Effect and Secretary of Interior's Standards Action Plan for the Cottonwood Creek Bridge, a contributing feature of Buckman Springs Road. Work performed under the County of San Diego Department of Public Works as-needed environmental services contract and completed for Caltrans review and oversight for the completion of the environmental review process.

**Sycuan/Sloane Canyon Trail IS/MND** (2019 - 2020). Architectural Historian for environmental documentation addressing an approximately five-mile-long proposed trail, in the unincorporated Crest-Dehesa community of eastern San Diego County, which crosses lands owned by the County, San Diego National Wildlife Refuge, Sycuan Band of the Kumeyaay Nation, and lands owned by the Kumeyaay Diegueño Land Conservancy, and includes bridge crossings of Harbison Canyon Creek and the Sweetwater River. Reviewed records search results, conducted archival research, and produced a project area historic context to be included in the study. Work performed for the County of San Diego Department of Parks and Recreation under an as-needed environmental services contract.

**Downtown Riverside Metrolink Station Track & Platform Project** (2019). Architectural Historian conducting historic and archaeological record search for this project to construct an additional platform, extended bridge and elevator, and associated tracks on the south side of the station, which will allow for two trains to service the station off the BNSF Railway (BNSF) mainline. Work performed as a subconsultant to HNTB, with Riverside County Transportation Commission and Federal Transit Authority as the lead agencies for CEQA and NEPA, respectively.

**Padre Dam Municipal Water District East County Advanced Water Purification Program Year 3** (2019 - ongoing). Architectural Historian preparing appropriate State of California Department of Parks and Recreation (DPR) 523 forms for three historic resources: Ray Stoyer Wastewater Treatment Facility, Chet Harritt Dam, and Monte Tunnel (San Diego Flume). Evaluated the individual significance and eligibility of the resources for listing in the NRHP/CRHR. Responsibilities also include the preparation of the El Monte Tunnel Rehabilitation Plan, which provided preliminary rehabilitation guidelines for the Monte Tunnel which is eligible for the NRHP and the CRHR as a remaining extant feature of the San Diego Flume. The DPR forms and rehabilitation plan were prepared to supplement the Environmental Package component of the Financial Assistance Application for the State Water Resources Control Board (SWRCB) Clean/Drinking Water State Revolving Fund.

**Pure Water San Diego Conveyance Project** (2019 - ongoing). Architectural Historian providing support for environmental compliance under the Construction Management contract for Phase 1 (also referred to as the North City Project) of the San Diego Pure Water Program. Responsibilities include preparation of a Cultural Resources Monitoring and Treatment Plan and a Site Protection and Stabilization Plan for a stone wall associated with a 1930s residence and providing environmental compliance monitoring

oversight and reporting during construction. Work performed as subconsultant, with the City of San Diego as lead agency.

**San Diego High School Whole Site Modernization and Long-Range Facilities Master Plan EIR** (2020 - 2021). Architectural Historian to evaluate potential impacts to historic resources associated with near- and long-term project components as part of campus master plan at San Diego High School in downtown San Diego. A total of 10 historic built environment resources were identified for further evaluation as part of environmental review. Specific tasks consisted of directing a cultural resources historic evaluation with the support of a subconsultant. The historic evaluation is comprised of archival research, a historic built-environment survey (including photo documentation, architectural descriptions, character-defining feature identification and integrity notes), and completion of forms from the Department of Parks and Recreation. The results of the historic evaluation will be presented in a CEQA Cultural Resources Technical Report and summarized in the forthcoming EIR. Work performed for San Diego Unified School District.

**San Diego High School Whole Site Modernization Cultural Resources Evaluation and Technical Report** (2020 - 2021). Architectural Historian to evaluate potential impacts to historic resources associated with near- and long-term project components as part of campus master plan at San Diego High School in downtown San Diego. A total of 10 historic built environment resources were identified for further evaluation as part of environmental review. Specific tasks consisted of directing a cultural resources historic evaluation with the support of a subconsultant. The historic evaluation is comprised of archival research, a historic built-environment survey (including photo documentation, architectural descriptions, character-defining feature identification and integrity notes), and completion of forms from the Department of Parks and Recreation. The results of the historic evaluation will be presented in a CEQA Cultural Resources Technical Report and summarized in the forthcoming EIR. Work performed for San Diego Unified School District.

**Learn and Play Montessori School Project** (2021 - ongoing). Architectural Historian performing a built-environment survey, archival research, and preparing DPR 523 forms, historic contexts, significance and eligibility evaluations, and report for a historic Minimal Traditional house in Union City, Alameda County. The house will be evaluated for eligibility for listing in the CRHR and as a local City Landmark. Work performed for Union City with Union City as the lead agency.

**Escondido Centre City Pkwy Condominium** (2020 - 2021). Architectural Historian performing a built-environment survey, archival research, and preparing DPR 523 forms, historic contexts, significance evaluations, and report including several historic resources within five properties in the City of Escondido. The resources were evaluated for eligibility for listing in the CRHR and as a local City Landmark. Work performed for Warmington Residential, with City of Escondido as the lead agency.

**Aramis Solar Energy Generation and Storage Project EIR** (2020). Architectural Historian performing built-environment survey, archival research, and preparing DPR 523 forms, historic contexts, and significance and eligibility evaluation for an active historic ranch in east Alameda County. The ranch features a post and beam barn and shed and is owned and managed by the same family since circa 1869. The resource was recommended eligible for listing in the NRHP, CRHR and the Alameda County

Register of Historic Resources. Ms. McCausland also identified the potential for a larger historic landscape and/or historic district in this portion of eastern Alameda County. Work performed for Intersect Power, with the County of Alameda as the CEQA lead agency.

**7-Eleven at 43 Middle Rincon Road** (2020 - ongoing). Architectural Historian performing built-environment survey, archival research, and preparing historic contexts, DPR 523 forms, and significance and eligibility evaluations for listing the CRHR and as a local City of Santa Rosa Landmark. Work performed for TAIT & Associates, with City of Santa Rosa as the lead agency.

### Previous Project Experience

**196 San Miguel and 379 Second Street Historic Evaluation Report** (2019). Architectural Historian preparing a Historic Evaluation Report including built-environment survey, site record, historic contexts, and significance evaluation for a 1940s vernacular beach cottage located in the community of Avila Beach, San Luis Obispo County. The study found the cottage eligible for the National Register of Historic Place (NRHP) and California Register of Historical Resources (CRHR) at the local level. Work performed for private developer, Sullivan & Associates, with San Luis Obispo County as lead agency.

**Sonoma Valley Historical Society** (2016 - 2017).Archivist and Collections Registrar with the Sonoma Valley Historical Society managing both the Marcy House Archives and Research Center, and the Society's analog and digital collections. Advised the Society's Board of Directors and served as chair of both the Acquisitions and Archives Committees. The management of the Archives and Research Center encompassed the creation and implementation of standing collection and research policies and procedures, oversight of collection organization, storage, and accessibility between six facilities, the management of all collection-related contracts and agreements, as well as the coordination and oversight of all intern training and scheduling, volunteer training, grant proposals, and outreach events. The management of the analog and digital collections encompassed the creation and oversight of Society-wide database systems. Acquired the California Revealed Grant through the California State Library, which allowed the digitization of the last remaining copies of the *Sonoma Valley Expositor* newspaper.

**De la Vina Street Bridge Replacement** (2018 - 2019). Architectural Historian preparing the Caltrans HRER, HPSR, and City Memo for a bridge replacement project in the City of Santa Barbara. Nine properties were included in the study and one property was found eligible as a local historic landmark. Presented findings to the City of Santa Barbara Historic Landmarks Commission, who approved the local designation. Work performed for Bengal Engineering, Inc. with the City of Santa Barbara as the lead agency in consultation with Caltrans District 5.

**Chuckwalla Valley Road Bridge Replacements** (2019). Architectural Historian preparing the Caltrans HRER for the replacement of four historic bridges on NRHP/California Register of Historic Places (CRHR) eligible Chuckwalla Valley Road, near Desert Center in Riverside County. The bridges were found eligible for listing as character defining features of Chuckwalla Valley Road (Highway 60/70). Work performed for Riverside County in consultation with Caltrans District 8.

**East Mountain Drive Water Crossing Replacement** (2018 - 2019). Architectural Historian preparing the Caltrans HRER for a water crossing replacement project in the community of Montecito. The study recommended a property eligible for the NRHP and the CRHR. Work performed for the design engineer in consultation with the County of Santa Barbara and Caltrans District 5.

**Montecito Creek Bridge Emergency Replacement** (2018). Architectural Historian preparing the Caltrans HRER for emergency replacement of a NRHP/CRHR eligible bridge in the community of Montecito. The bridge no longer retained integrity after the 2018 mudslide event and was found not eligible for listing in the NRHP/CRHR prior to its emergency demolition. Work performed for Santa Barbara County in consultation with Caltrans District 5.

**Railroad Avenue Bridge** (2019).Architectural Historian preparing the Caltrans HRER for the replacement of two historic bridges on Railroad Avenue located in Riverside County. The bridges were recommended not eligible for listing in any register. A segment of the Pacific Crest Trail was documented and found eligible for listing in the NRHP and the CRHR. Work performed for Riverside County in consultation with Caltrans District 8.

**Historic Building Assessment at 250 South Tustin Street** (2018). Architectural Historian preparing a Historic Building Assessment for an early twentieth century craftsman house in the City of Orange. Work performed for private developer, Klassic Engineering and Construction, Inc., with the City of Orange as lead agency.

**Avila Beach Schoolhouse Conversion** (2018 - 2019). Architectural Historian consulting with contractor on the rehabilitation of a schoolhouse in San Luis Obispo County, into a bed and breakfast, adhering to the Secretary of the Interior's Standards for the Treatment of Historic Properties. Work performed for private developer, Hodge Company, with County of San Luis Obispo as the lead agency.

**Brea Dam Electrical Modernization** (2018 - 2019). Architectural Historian consulting with contractors on the electrical and utility rehabilitation of the NRHP and CRHR eligible Brea Dam, a USACE property in the City of Fullerton. Prepared a Historic Property Rehabilitation Report and monitored removal and positioning of historic features. Work performed for Power Pro Plus, Inc. in consultation with USACE Los Angeles District as lead agency.

**Port of Long Beach Master Plan Update** (2018 - 2019). Architectural Historian producing the cultural resource chapter of a Programmatic Environmental Impact Report (EIR) for the Port of Long Beach, as well as a technical survey and evaluation report. Conducted intensive and windshield surveys for historic built environment resources within the entire Port of Long Beach. Work performed as a subconsultant in consultation with the Port of Long Beach.

**1121 Montalban Street** (2019). Architectural Historian preparing the Historic Building Assessment for a private developer in the City of San Luis Obispo. The assessment included two properties and a 1920s Spanish Colonial Revival house. The study found the properties and dwelling not eligible for listing in the CRHR or the city register. Work performed for CoVelop, Inc., with the City of San Luis Obispo as the lead agency.

**Tranquillity Irrigation District Southeast Service Area Water Conservation and Conveyance Improvement** (2018). Architectural Historian implementing the built environment study for a Cultural Resource Inventory and Evaluation in Fresno County. Work performed for Provost & Pritchard Consulting Group, with U.S. Bureau of Reclamation as the lead agency.

**Gordon Acres Water Company Water System Improvements** (2018). Architectural Historian implementing the built environment survey and preparation of architectural resources investigation report for water system improvements in the town of Lucerne Valley. Work performed for NV5, with California State Water Resources Control Board as the lead agency.

**Bloomington Commerce Center** (2018). Architectural Historian implementing the built environment survey and preparation of cultural resources assessment report for a 56.6-acre commercial site in the community of Bloomington, San Bernardino County. Work performed for Howard Industrial Partners,with San Bernardino County as the lead agency.

**Prologis Trailer Parking Expansion** (2018). Architectural Historian implementing the built environment survey and preparation of cultural resources assessment report for expansion of a trailer parking area near the City of Redlands, San Bernardino County. Work performed for Albert A. Webb Associates, with San Bernardino County as the lead agency.

**Interstate 215 and University Parkway Interchange Improvements** (2018). Architectural Historian preparing the Caltrans HRER for improvements to the I-215 interchange in the City of San Bernardino. Work performed for HDR in consultation with the City of San Bernardino and Caltrans District 8.

**Interstate 10/Monroe Street Interchange Improvements** (2018). Architectural Historian preparing the Caltrans HRER for interchange improvements in the City if Indio. Work performed for Michael Baker in consultation with the City of Indio and Caltrans District 8.

**Biola Community Services District Recycled Water Improvements Feasibility Study** (2018). Architectural Historian implementing the built environment survey and preparation of architectural resources investigation report for recycled water improvements in Fresno County. Work performed for Crawford & Bowen Planning, Inc., with U,S, Bureau of Reclamation as the lead agency.

**Athos Renewable Energy Project** (2018 - 2019). Architectural Historian implementing the built environment survey and preparation of historic contexts and resource evaluations for a 2,848-acre solar facility, a 6-mile-long transmission line corridor, and a surrounding 5-mile-wide buffer in Riverside County. Resources documented are associated with Desert Training Center, a designated multi-property historic district. Work performed for IP Athos, LLC and Aspen Environmental Group, with BLM as the lead agency.

**Blythe Airport Fence Project** (2018). Architectural Historian implementing the built environment survey and preparation of Phase-I Cultural Report for an improvement project within the Blythe Army Air Base Historic District. Contributing features to the historic district were newly identified and documented including runways. The overall significance evaluation of the Blythe Army Air Base Historic District was also updated as a historic district contributing to the Desert Training Center/California-Arizona Maneuver Area Multiple Property Historic District. Work performed as a subconsultant for Mead & Hunt, with the Federal Aviation Administration (FAA) as the lead agency.

**University of California Riverside Plant Growth Facility** (2018). Architectural Historian implementing the built environment survey and preparation of a Historic Building Assessment report for a campus facility expansion project in the City of Riverside. Work performed for Albert A. Webb Associates,with University of California Riverside as the lead agency.

**Victorville Water District Distribution System Phase I Cultural Resource Assessment** (2017). Architectural Historian preparing site records, significance evaluations, and historic contexts for a water distribution system project in the City of Victorville. Work performed for Meridian Consultants, LLC., with City of Victorville as the lead agency.

**Cultural Resource Study: 196 San Miguel and 379 Second Street Avila Beach, San Luis Obispo County, California** (2019). Architectural Historian preparing a built-environment survey, site record, historic contexts, and significance evaluation for a 1940s vernacular beach cottage located in the community of Avila Beach. The study found the cottage eligible for the NRHP and CRHR at the local level. Work performed for private developer, Sullivan & Associates, with San Luis Obispo County as the lead agency.

**Alabama and Palmetto Project Phase 1 Cultural Resources Assessment** (2019). Architectural Historian preparing a built-environment survey, site records, historic contexts, and significance evaluations for a development project in San Bernardino County. Work completed for Albert A. Webb Associates with County of San Bernardino as lead agency.

**Sierra Avenue Widening Project Cultural Resources Assessment Revision** (2018). Architectural Historian preparing a built-environment survey, site record, historic context, and significance evaluation for a street widening project in the City of Fontana. Work completed for HDR, with the City of Fontana as lead agency.

**City of Orange Cove Water Treatment Improvement Project Historic Property Identification Report** (2019). Architectural Historian preparing a Historic Property Identification Report in the City of Orange Cove in Fresno and Tulare counties. Work performed for Crawford & Bowen Planning Inc. with the City of Orange Cove as lead agency.

**LA Waterwheel Project Cultural Resources Assessment Report** (2019). Architectural Historian preparing a built-environment survey, site record, historic context, and significance evaluation for a portion of the Los Angeles River Channel in the City of Los Angeles. Work performed for Ruth Villalobos & Associates, Inc. with the City of Los Angeles as lead agency.

**Southern California Logistics Airport Cultural Resources Assessment Report** (2019). Architectural Historian preparing a site record update for George Airforce Base in the City of Victorville, California. Work performed for Michael Baker and Associates with the City of Victorville as lead agency.

**Fort Visalia Historic Review** (2018). Architectural Historian assisting with research and preparing historic contexts for the Fort Visalia site investigation. Work performed for the City of Visalia who is working to preserve the city's early history as the location of a fort in the mid-19th century.

# Appendix B

## Department of Parks and Recreation Series 523 Forms

*Recorded by: Debi Howell-Ardila, Annie McCausland, and Teri Delcamp | HELIX Environmental Planning *Date: July 2022 ☒ Update

***P3a. Description**

This DPR update describes the Copper Basin Dam, located at 158000 MWD Road, in Parker Dam, San Bernardino County, California.

Located in the Mojave Desert, west of Parker Dam, California, the Copper Basin Dam has regulated water levels in the associated Copper Basin Reservoir since its construction in the late 1930s. As part of the CRA system, the Copper Basin Dam and its adjacent, 22,000-acre-feet reservoir are two miles west of the Gene Pump Plant in San Bernardino County, California.

The focal point of the Copper Basin Dam is a prominent, cast-concrete, unreinforced arch that rises approximately 184 feet and spans 265 feet. Steel reinforcement is only present in the foundation and north and south abutments of the dam. Along the top of the structure, a deck framed with a parapet and original metal railing provide pedestrian access. At the upstream side of the dam, a sluiceway connects from the trash rack to the discharge valve house on the downstream side of the dam. The downstream side displays two caged ladderways, one built with the dam's original construction in 1938 that connects the crest of the dam to the valve house and another added in 1942 that partially extends down the face of the dam and encloses a plumb line that monitors dam movement. The valve house is attached to the downstream side of the dam. It is a two-story concrete structure raised and supported by a concrete beam footing and a pair of concrete legs resting on the floor of the downstream gorge. Due to the uneven gorge floor, the structure tilts to the east. The lower floor of the valve house contains the slide gate valve and the Howell-Bunger valve. The structure is capped with a concrete shed roof.

The primary elevation (on the east) displays paired steel doors with louvers on the upper floor and the outlet end of the Howell-Bunger valve on the lower floor. The Howell-Bunger valve is set within a rectangular beveled opening and mounted to a bolt ring with bolts, nuts, and washers. Two metal platforms supported by angle brackets with guardrails connected by a chain extend out from each corner of the opening below the Howell-Bunger valve.

On the north elevation, a square concrete platform on the upper floor leads to paired doors providing access to the valve mechanisms. The platform also connects to a ladder leading to the crest of the dam and gives access to a modern ladder on the side of the valve house that extends down toward the gorge floor. A concrete weir structure and adit weir structure within the downstream gorge, near the valve house, measure the water that leaks through the dam and valves. Three sets of modern catwalk panels occur at angles to each other along the gorge floor east of the valve house and provide access to the weirs.

The Copper Basin Dam retains its integrity of location, design, setting, materials, workmanship, feeling and association and is individually eligible for inclusion in the NRHP and CRHR, and is a contributing structure within the CRA Historic District.

Character-defining features of the dam include:

- Adjacency to the Copper Basin Reservoir; prominent, large-scale thin arch design and massing
- Board-form concrete construction and features
- Sluiceway system, including the trash rack on upstream face through to the valve house on downstream face
- Presence of attached, sheltered metal ladderways; pedestrian deck on dam crest with parapet and metal railings
- Presence of concrete weir and adit weir in current locations
- Remote setting and location, within a red rock gorge
- Detached concrete ogee spillway and CRA outlet tower
- Construction-era remnants including iron spikes and posts, iron hoops, winch/pulley wheel and reinforced concrete posts on and on top of the red rock gorge abutments

***Recorded by:** Debi Howell-Ardila, Annie McCausland, and Teri Delcamp **|** HELIX Environmental Planning ***Date:** July 2022 ☒ Update

***P5b. Photograph or Drawing**

Figure 1. Copper Basin Reservoir and Dam looking northwest, HAER CA-243, after 1968, Source: Library of Congress

*Recorded by: Debi Howell-Ardila, Annie McCausland, and Teri Delcamp | HELIX Environmental Planning *Date: July 2022 ☒ Update

Figure 2. Copper Basin, looking west-northwest, HAER CA-243, after 1968, Source: Library of Congress

Figure 3. Pedestrian deck on the crest of Copper Basin Dam, looking northeast. Source: Metropolitan

*Recorded by: Debi Howell-Ardila, Annie McCausland, and Teri Delcamp | HELIX Environmental Planning *Date: July 2022 ☒ Update

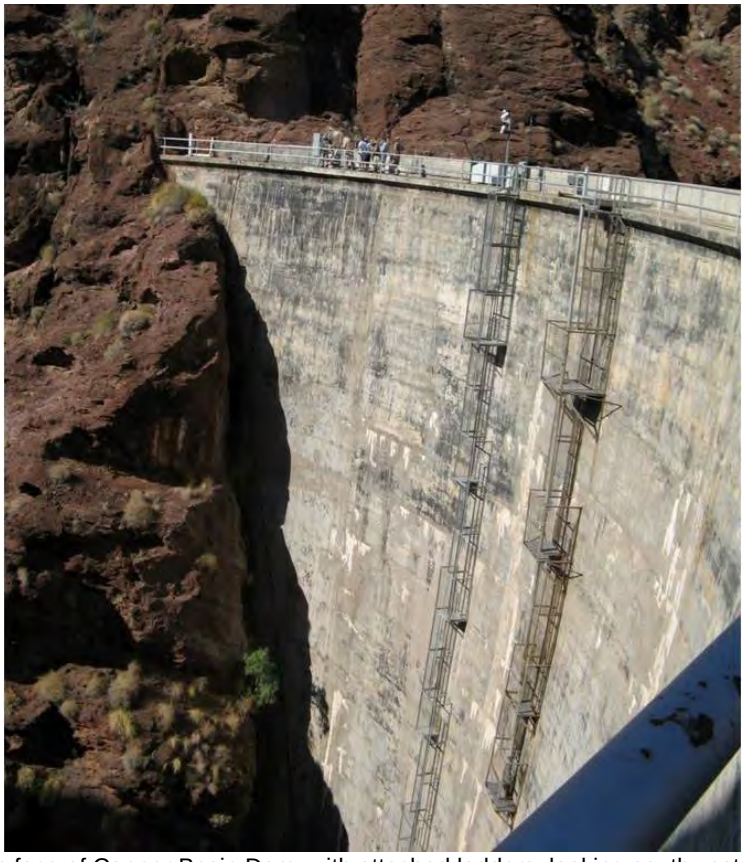


Figure 4. Downstream face of Copper Basin Dam, with attached ladders, looking southwest. Source: Metropolitan

Figure 5. Ladder ascent on the downstream face of dam. Source: Metropolitan

*Recorded by: Debi Howell-Ardila, Annie McCausland, and Teri Delcamp | HELIX Environmental Planning *Date: July 2022 ☒ Update

Figure 6. Valve with the Howell-Bunger valve, louvred doors and metal platforms, and main weir and catwalk panels in foreground, looking west. Source: HELIX

Figure 7. Adit weir looking north-northwest into cave. Source: HELIX

***Recorded by:** Debi Howell-Ardila, Annie McCausland, and Teri Delcamp **|** HELIX Environmental Planning ***Date:** July 2022 ☒ Update

Figure 8. Construction-era posts and cable artifacts on canyon wall east of dam, looking north. Source: HELIX

***P11. Report Citation:**

Howell-Ardila, Debi, Annie McCausland, and Teri Delcamp, 2022, *Historical Resources Technical Report for the Copper Basin Dam Valve Replacement Project,* HELIX Environmental Planning, Inc., La Mesa, CA. Prepared for Metropolitan Water District of Southern California.

| State of California — The Resources Agency<br>DEPARTMENT OF PARKS AND RECREATION<br>**PRIMARY RECORD** | Primary #<br>HRI #<br>Trinomial<br>NRHP Status Code | |
|---|---|---|
| Other Listings<br>Review Code | Reviewer | Date |

 ***Resource Name or #:** Copper Basin Dam

**P1. Other Identifier:**

***P2. Location:** ■ **Not for Publication** ☐ **Unrestricted** ***a. County:** San Bernardino County

**and** (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Gene Wash **Date:** 1978 **T** 2N; **R** 26E; NE ¼ **of** NW ¼ **of Sec** 11; S.B.**B.M.**

c. Address: City: Zip:

d. UTM Zone: 11S; 755696 mE/ 3796641 mN (Northern Extent; G.P.S.)
UTM Zone: 11S; 755681 mE/ 3796582 mN (Southern Extent; G.P.S.)

e. Other Locational Data:

The dam is located at the south end of the Copper Basin Reservoir, two miles southwest of the Gene Pumping Plant and approximately five miles west of Parker, Arizona. Elevation: 990 to 1050 ft amsl.

***P3a. Description:**

The Copper Basin Dam, completed in 1938, is an arched, cast concrete dam used to maintain water levels in the 22,000-acre-foot Copper Basin Reservoir. The dam rises approximately 184 feet from the base of the narrow canyon, and spans 265 feet at the crest. The dam is approximately 33 feet wide at the base and about five feet wide at the crest. Steel reinforcement is located in the foundation and north and south abutments of the dam. (See Continuation Sheet.)

***P3b. Resource Attributes:** (HP21)--Dam

***P4. Resources Present:** ☐ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

**P5b**. Description of Photo:
Overview of dam from south, view to the north northwest.
IMG_084158435

***P6. Date Constructed/Age and Sources:**
■ Historic ☐ Prehistoric ☐ Both
Completed in 1938.

***P7. Owner and Address:**
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054

***P8. Recorded by:**
Teri Delcamp, M.A.
HELIX Environmental
7578 El Cajon Boulevard
La Mesa, CA 91942

***P9. Date Recorded:**
July 22, 2022

***P10. Survey Type:**
Intensive Pedestrian

***P11. Report Citation:**
Howell-Ardila, Debi, Annie McCausland, and Teri Delcamp. 2022. Historical Resources Technical Report for the Copper Basin Dam Valve Replacement Project, San Bernardino County, California

***Attachments:** ☐ NONE ■ Location Map ☐ Sketch Map ■ Continuation Sheet ■ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

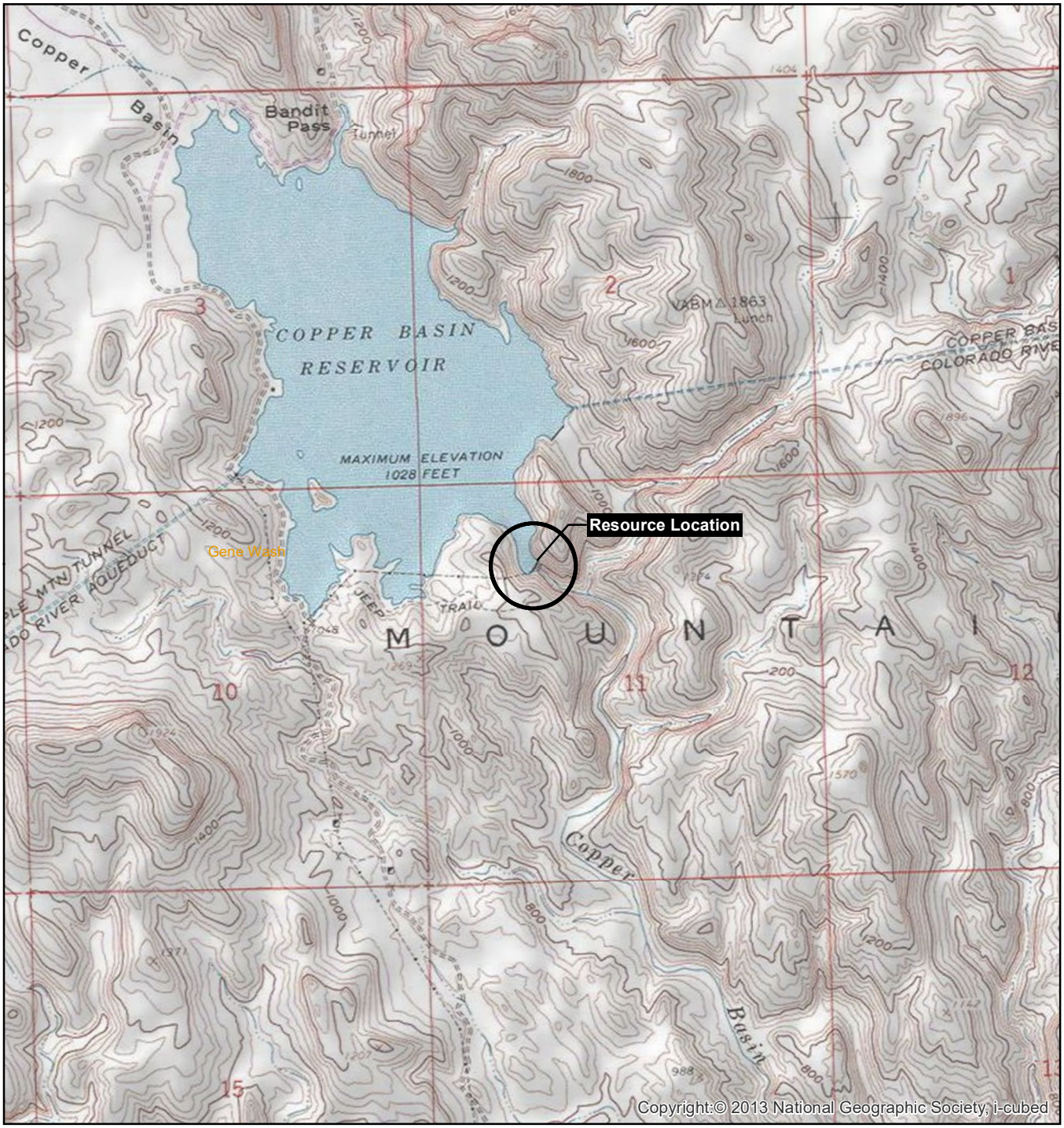
# LOCATION MAP

**Primary #:**
**HRI #**
**Trinomial:**



***Resource Name or #:** Copper Basin Dam

***Map Name:** Gene Wash ***Scale:** 1:24,000 ***Date:** 1978




SCALE 1:24,000

1 0.5 0 1 Miles

1,000 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

TRUE NORTH

B1. Historic Name: Copper Basin Dam
B2. Common Name: Copper Basin Dam
B3. Original Use: Dam B4. Present Use: Same
***B5. Architectural Style:** Thin Arch Concrete Dam
***B6. Construction History:**
See Continuation Sheet

***B7. Moved?** ■ **No** ☐ **Yes** ☐ **Unknown** **Date:** **Original Location:** N/A
***B8. Related Features:**
Additional features associated with the dam are a boat dock and submerged trash rack on the upstream side, discharge valve house containing a Howell-Bunger valve on the downstream side, 168-ft access ladderway from the dam crest to the valve house and 76-ft plumbline ladderway on the downstream side, modern metal catwalk leading to a concrete weir located across the canyon downstream from the dam's discharge valve, and an adit weir located at the entrance to a cave in the canyon wall above the north end of the main weir.

B9a. Architect: N/A b. Builder: J. F. Shea Company
***B10. Significance: Theme:** Water Conveyance **Area:** Colorado River Aqueduct
**Period of Significance:** 1938 - 1977 **Property Type:** Dam **Applicable Criteria:** A/1, C/3
See Continuation Sheet.

B11. Additional Resource Attributes: (HP11)—Engineering Structure

***B12. References:**
See Continuation Sheet.

B13. Remarks:

***B14. Evaluator:** Teri Delcamp, M.A.

***Date of Evaluation:** July 2022

(This space reserved for official comments.)

***P3a. Description (continued):**

Located in the Mojave Desert, west of Parker Dam, California, the Copper Basin Dam has regulated water levels in the associated Copper Basin Reservoir since its construction in the late 1930s (Chasteen 2016). As part of the CRA system, the Copper Basin Dam and its adjacent, 22,000-acre-foot reservoir are located just over two miles from the Gene Pumping Plant in San Bernardino County, California. Water in the reservoir is received from Gene Wash Reservoir via a tunnel, and exits via another tunnel to be conveyed to Iron Mountain Pumping Plant.

The focal point of the Copper Basin Dam is a prominent, cast-concrete, unreinforced arch that rises approximately 184 feet and has a crest length that spans 265 feet (Hazen and Sawyer 2020). The Copper Basin Dam is located on the southeast side of the reservoir. The dam is a thin arch design, which is most appropriate for locations in narrow canyons like Copper Basin. The convex surface of the arch faces the water, and the concave surface faces downstream. An arch dam is designed to use its shape and the weight of the water behind it as part of its strength, since concrete is strong when it is being pushed in compression. Concrete aggregate for the construction of Copper Basin Dam was sourced from pits on the Bill Williams River two miles east of Parker Dam and came to the dam site from the aggregate batching plant at the Parker Dam construction site. Trucks transported the aggregate to the dam construction site, where it was mixed with cement and then placed in buckets dangled from a high-line cable system strung across the rocks before pouring began. Concrete was placed within block sections in a series of some five-foot, but mostly 10-foot, concrete lifts between horizontal construction joints. In order to prepare the concrete for grouting the construction joints, the concrete needed to be cooled to 50 degrees after being poured. To cool the concrete, refrigerated water was pumped through one-inch diameter, thin-walled steel cooling coils placed horizontally every five feet. Finished concrete surfaces were painted with coal tar pitch and a final layer of whitewash (Metropolitan 1938a). The base section of the dam is approximately 33 feet wide, narrowing to approximately five feet wide at the crest of the dam. Steel reinforcement is only in the foundation and north and south abutments of the dam (Figure 1).

The dam design includes a sluiceway system with an intake trash rack on the upstream face of the dam attached via a cast-iron discharge pipe to a concrete valve house and valve system on the downstream face. Additional features related to the dam are a non-historic boat dock on the upstream side, a submerged trash rack on the upstream side that is part of the sluiceway system, a modern metal catwalk leading to a concrete weir located across the canyon downstream from the dam's discharge valve, and an adit weir located at the entrance to a cave in the canyon wall near the downstream side of the dam. Features and structures related to the dam are described below.

**Deck and Ladders**

Along the top (crest) of the dam, a deck framed with a concrete parapet extending 3.5 feet above the crest on the upstream side and an original metal railing along the downstream side provides pedestrian access (**Error! Reference source not found.**2). The railing consists of two horizontal pipe rails with posts spaced every 10 feet. Gates in the railing access two ladderways on the downstream side, and a ladderway on the upstream side that extends to the trash rack. The railings are original and have been maintained and sealed with regular applications of silver paint. Five lifeline/fall protection anchors spaced 20' to 69' apart under the handrail along the cantilevered downstream edge of the dam were installed in 2000 (Metropolitan 2000).

The downstream side of the dam displays two caged ladderways with periodic landings/rest platforms and fence fall guards (**Error! Reference source not found.**3); one longer ladderway of approximately 168 feet that connects the crest of the dam to the discharge valve house and another that partially extends about 76 feet down the face of the dam (Metropolitan 1942, 2022). The shorter ladderway was installed in 1942 to house a plumb line to monitor dam movement (Metropolitan 1942). The longer ladderway is original to the dam's construction and is configured in eight staggered ladderways between landings (**Error! Reference source not found.**4). The distances between landings were planned to be approximately 21 feet, but in actuality are mostly 23 to 24 feet apart, with the distance to the

landing above the bottom ladderway section being approximately 30 feet (Metropolitan 1937; Hazen and Sawyer 2020).

The ladderways are constructed of galvanized carbon steel, with the ladderway sections and bracket-framed landings mounted to the face of the dam with embedded anchors that were cast into the concrete during the dam's construction. The ladderways are also braced with angle bars anchored into the dam face. Each of the landings extends approximately three feet out from the face of the dam and are about 4.5 feet wide; the uppermost landing extends about 4.5 feet out to account for the cantilevered design under the crest of the dam. Landing floors are constructed of open triangular mesh steel, and the fence fall guard panels are of triangular woven galvanized steel wire. The anchors attaching the ladderways and platforms to the dam appear to be embedded by about five to six inches; the distance between attachment anchors varies anywhere from 6 feet to 10 feet apart (Metropolitan 1937; Hazen and Sawyer 2020).

**Sluiceway System**

Starting at the upstream side of the dam, the sluiceway system extends from the trash rack located below the water line on the upstream side to the discharge valve house located on the downstream side of the dam. The valve is a Howell-Bunger valve, which represented cutting-edge technology in the 1930s. The valve was invented and patented by two Reclamation engineers, C. H. Howell and Howard P. Bunger (Ball and Hebert 1948). The valve offered a balanced design and lightweight construction. The innovative design for the Howell-Bunger valve was first manufactured by the S. Morgan Smith Company, which manufactured the valve used on Copper Basin Dam. Metropolitan utilized the Howell-Bunger valve for several dams constructed for the CRA project (Hazen and Sawyer 2020; Metropolitan 1938a). The gate and discharge valves within the valve house are not used to regulate water levels in the reservoir but are for an emergency or sluicing event.

The valve house is attached to the downstream side of the dam. It is a two-story concrete structure raised and supported by a concrete beam footing and a pair of concrete legs resting on the floor of the downstream gorge. Due to the uneven gorge floor, the structure tilts to the east. The primary elevation (on the east) displays paired steel doors with louvers on the upper floor and the outlet end of the Howell-Bunger valve on the lower floor (Figure 5). The structure is capped with a concrete shed roof. On the north elevation, a square concrete platform on the upper floor leads to paired doors providing access to the valve mechanisms. The platform also connects to the longer ladderway leading to the crest of the dam. The south elevation is a solid concrete surface, with the exception of a small window opening on the upper floor.

The lower floor of the valve house contains the slide gate valve and the Howell-Bunger valve. The Howell-Bunger valve is set within a rectangular beveled opening and mounted to a bolt ring with bolts, nuts, and washers. Two metal platforms supported by angle brackets with guardrails connected by a chain extend out from each corner of the opening below the Howell-Bunger valve. An unprotected modern ladderway is attached to the north side of the valve house just forward of the concrete platform and extends down toward the gorge floor (Figure 6). The wall next to this ladder shows anchor holes from the rungs installed with the original construction that were removed and replaced at some point in time with the current ladder (Metropolitan 1938b).

**Weirs**

Two concrete weir structures about 100 feet downstream from the valve house collect and measure the water that leaks or is released through the dam and valves. Weirs are generally designed to be perpendicular to the flow of water. As a result of the uneven gorge floor, the main weir is set diagonally relative to the downstream face of the dam (Figure 5). This weir has a square top that is approximately one foot deep, 26 feet wide, and extends one foot above grade on the downstream side. A smaller weir is located across an adit to a cave part way up the canyon wall at the north end of the main weir (Figure 7). It is of the same design as the main weir but is approximately eight

inches deep, six feet wide, and extends one foot above grade. Each weir has a rectangular opening in the concrete that has a metal plate with a V-notch to allow water to trickle through. Both weirs are constructed in an "L" shape, with the footing serving as the base of the "L" (Metropolitan 2022).

**Catwalk**

A series of steel grating panels extend from near the base of the valve house toward the weirs as a catwalk. The catwalk consists of three pairs of panels placed end to end, giving them an angled and haphazard appearance (Figure 5). They are overlapped at the ends rather than being connected and do not have guardrails. They are periodically supported by, but not affixed to, concrete pads that were submerged in water at the time of the 2022 field survey. The first set of catwalk panels extending from near the valve house is approximately 20 feet long, and the second and final sets are approximately 16 feet long (Metropolitan 2022). The catwalk panels are of modern materials and are not historic or character-defining. There are several prior panels dotted along the gorge floor further downstream that apparently were washed out in a previous discharge event.

**Dam Construction Artifacts**

Various artifacts were identified along and on top of the canyon walls rising from the dam that are remnants of the dam's construction. These artifacts include iron spikes, posts, rings and cables, a winch pulley, and concrete posts (Figure 8 and Figure 9). These historic objects were used during the dam's original construction and are associated resources to the dam.

**Reservoir Structures**

Other structures are associated with the reservoir and dam include the ogee spillway and the outlet tower (Figure 10 and Figure 11). The concrete ogee spillway is located on the southeast side of the Copper Basin reservoir and the outlet structure to the CRA Whipple Mountain Tunnel is located on the southwest side of the reservoir. Because the Copper Basin Dam is a non-overflow dam, the purpose of the spillway is to enable the reduction of the reservoir's water level quickly in an emergency. The spillway ensures water does not overtop the dam and damage or destroy it. The Copper Basin spillway is uncontrolled and only utilizes the height of the spillway crest to control the water. Its curved ogee shape allows water to flow more naturally over it and maintain contact with the spillway. The outlet structure controls water leaving the reservoir via the raising or lowering of gates. These structures were observed and photographed but are not affected by the project and are not included in the evaluation of the dam's historical significance.

**P5b. Photographs (continued)**

*Figure 1. Copper Basin Reservoir and Dam looking northwest, HAER CA-243. Source: Library of Congress*

*Figure 2. Pedestrian deck and handrail on the crest of Copper Basin Dam, looking northeast. Source: Metropolitan*

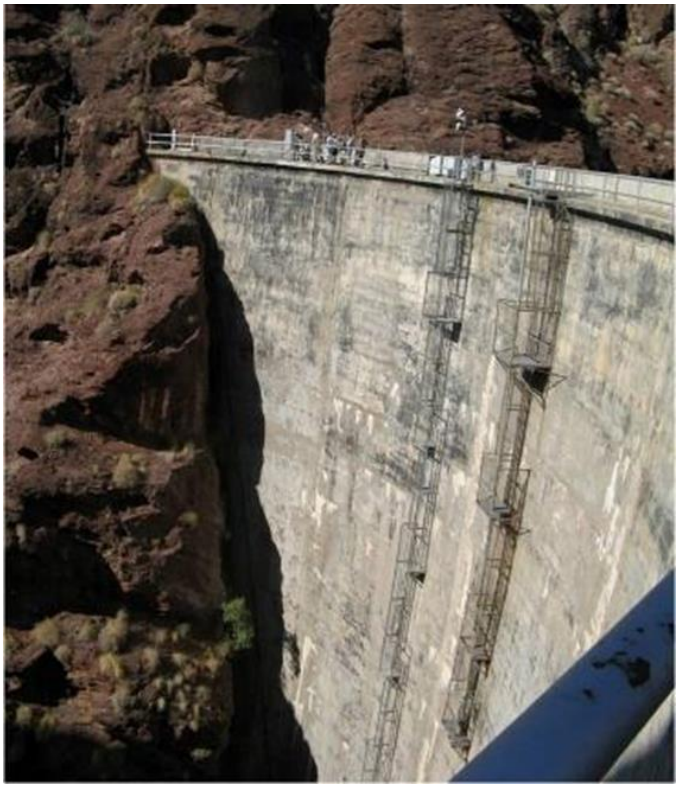


*Figure 3. Downstream face of Copper Basin Dam, with attached main ladder (left) and plumb line ladder (right), looking southwest. Source: Metropolitan*

*Figure 4. Ladder ascent on the downstream face of dam. Source: Metropolitan*

*Figure 5. Valve with the Howell-Bunger valve, louvred doors and metal platforms, and main weir and catwalk panels in foreground, looking west. Source: HELIX*

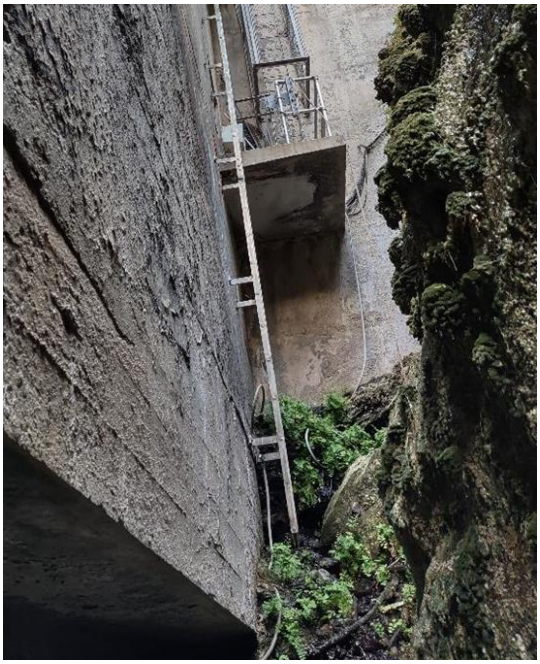


*Figure 6. North side of valve house, modern ladder extending down in front of concrete platform. Source: HELIX*

*Figure 7. Adit weir looking north-northwest into cave. Source: HELIX*

*Figure 8. Construction-era posts and cable artifacts on canyon wall east of dam, looking north. Source: HELIX*

*Figure 9. Construction-era reinforced concrete post artifacts adjacent to access road south of dam in background, looking northwest. Source: HELIX*

*Figure 10. Northern end of ogee spillway structure looking north-northeast. Source: HELIX*

*Figure 11. Upstream side of outlet tower structure, looking south-southwest. Source: HELIX*

***B6. Construction History:**

1937-1938 – Dam constructed by the J. F. Shea Company

1942 - Plumbline and ladderway added on the downstream face of the dam

2000 - Five lifeline anchors added at the cantilevered edge of the dam deck

***B10. Significance:**

The Copper Basin Dam and Reservoir are contributors to the Colorado River Aqueduct (CRA) Historic District, a multi-resource district determined eligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) through the Section 106 process via formal concurrence by the California State Historic Preservation Officer (SHPO) (Caltrans 2010). Therefore, the Copper Basin Dam and Reservoir are listed in the California Historic Resources Inventory with a "2D2" California Historic Resources Status Code; this code indicates SHPO concurrence on NRHP eligibility and automatic listing on the CRHR.

This current evaluation documents Copper Basin Dam's individual historical significance per the NRHP and CRHR, and evaluates the integrity of the historic resource.

**NRHP Criterion A/CRHR Criterion1:** The subject property does appear eligible under Criteria A/1 within the context of historic cultural landscapes which are defined by the National Park Service as "*a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values"* (NPS 2021b). Copper Basin Dam is an engineered structure constructed through monumental human effort within a natural gorge setting. The dam would not have

been built if not for the construction of the overall CRA, but likewise, the CRA system could not exist without the dam. The dam's construction by humans within a natural canyon setting irrevocably changed the landscape in a significant way, while it also made significant contributions to the development patterns of the Southwest. In this way, Copper Basin Dam is historically significant in its own right as part of a cultural landscape, for its important role in the CRA system, and thus in its significant contributions to California's history.

**NRHP Criterion B/CRHR Criterion 2:** The subject property does not appear eligible under Criteria B/2. Copper Basin Dam is historically significant as an intrinsic part of the overall CRA Historic District, which is significant for its association with F.E. Weymouth as well as Julian Hinds. However, even though Metropolitan constructed the dam under specifications issued under F. E. Weymouth, with construction drawings approved by Julian Hinds, there has been no information available about the dam's design engineer(s) or evidence that the dam's design engineer(s) were important individuals who made significant contributions at the state or national level.

**NRHP Criterion C/CRHR Criterion 3:** The subject property does appear eligible under Criteria C/3. Copper Basin Dam is historically significant not only as an intrinsic part of the overall CRA Historic District but also individually as an excellent and intact example of an early twentieth-century concrete dam constructed by the J.F. Shea Company. The dam was constructed under Metropolitan Specifications No. 190 issued under F. E. Weymouth, and most of the construction drawings were approved by Julian Hinds. Weymouth and Hinds were important individuals in the history of water conveyance systems and structures, specifically the CRA, with responsibility for overall construction decisions and designs. Copper Basin Dam embodies the distinctive characteristics of a thin arch concrete dam design, a design that was ultimately decided upon and approved by Weymouth and Hinds. Even though it was not the first of the type to be constructed, it was the ideal type of dam to build within a narrow gorge setting. The use of the Howell-Bunger valve was also ideal for this setting, where it is intended for emergency water discharge. Metropolitan and other agencies continued to use the valve within the sluiceway systems of additional similar dams, including the CRA's Gene Wash Dam. The dam continues to function and operate in the same manner today as it did 75 years ago, with its original design and virtually all of its original materials intact.

**NRHP Criterion D/CRHR Criterion 4:** The subject property does not appear eligible under Criterion D/4. The history and importance of the CRA, and the Copper Basin Dam within that context, are well-documented. There does not appear to be any evidence that the dam on its own has yielded, or has the potential to yield, additional information important in the state's or nation's prehistory or history.

**Integrity Analysis:** Copper Basin Dam sits in its original footprint and retains integrity of location. Copper Basin Dam retains its original 1937/1938 design. No major changes or additions have been made to the dam since its initial construction, so it retains design integrity. The setting of Copper Basin Dam within a narrow red rock canyon has not changed since its construction, so it retains integrity of setting. Virtually all of the dam's extant materials are original, including concrete and metal, and illustrate the extensive and intact work completed by J. F. Shea Company, so the dam retains integrity of materials and workmanship. The Copper Basin Dam is a functioning dam and reservoir cultural landscape that retains its original materials, design and physical characteristics that evoke the historic scene dating to the late 1930s so the dam retains integrity of feeling and association within the CRA system dating to the late 1930s. Therefore, Copper Basin Dam retains its integrity of location, design, setting, materials, workmanship, feeling and association and is individually eligible for inclusion in the NRHP and CRHR.

Character-defining features of the dam include:

- Adjacency to the Copper Basin Reservoir; prominent, large-scale thin arch design and massing
- Board-form concrete construction and features
- Sluiceway system, including the trash rack on upstream face through to the valve house on downstream face

- Presence of attached, sheltered metal ladderways; pedestrian deck on dam crest with parapet and metal railings
- Presence of concrete weir and adit weir in current locations
- Remote setting and location, within a red rock gorge
- Detached concrete ogee spillway and CRA outlet tower
- Construction-era remnants including iron spikes and posts, iron hoops, winch/pulley wheel and reinforced concrete posts on and on top of the red rock gorge abutments

**B12. References:**

Ball, J.W. and D.J. Hebert
1948 *The Development of High-Head Outlet Valves*. United States Department of the Interior, Bureau of Reclamation.

Chasteen, Carrie
2016 DPR Form for the Colorado River Aqueduct (CRA) System (P-33-11265/P-36-010521). Applied EarthWorks, Inc., Hemet, CA. Form on file at the South Central Coastal Information Center, California State University Fullerton, and the Eastern Information Center, University of California Riverside.

Hazen and Sawyer
2020 *Copper Basin and Gene Wash Dams Ladder Replacement – Study*. Los Angeles, CA. On file with Metropolitan.

Metropolitan Water District of Southern California (Metropolitan)
1937 "Colorado River Aqueduct: Gene Wash and Copper Basin Dams Ladderways." As-built drawings on file with Metropolitan.

1938a "Historical Record of Gene Wash and Copper Basin Dams, 1937-1938." Report on file with Metropolitan.

1938b "Colorado River Aqueduct: Copper Basin Dam Valve House Sections & Details." As-built drawings on file with Metropolitan.

1942 "Copper Basin Dam: Details of Plumbline Ladderway." As-built drawings on file with Metropolitan.

2000 "Gene and Copper basin Dam Fall Protection Anchor: Anchor Location Plan." As-built drawings on file with Metropolitan.

2022 *Copper Basin and Gene Wash Dams Ladder Replacement Preliminary Design Report.* On file with Metropolitan.