Initial Study/Environmental Assessment

Adelanto R³ Extension Project

Mojave Water Agency

Baldy Mesa, CA

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1 INTRODUCTION

The Mojave Water Agency (MWA) is proposing the Adelanto R³ Extension Project (Project) to extend its wholesale water delivery service to the community of Adelanto by extending a new pipeline along Mesa View Drive in the Baldy Mesa area of Victorville to the existing Adelanto pipeline and reservoir located near Mesa View and Olivine Road south of the City of Adelanto. The Project will construct approximately 1 mile of underground pipeline along Mesa View Drive, beginning at MWA's existing turnout located approximately 0.13 mile north of Del Rosa Road, continuing to the Adelanto reservoir tanks located on Olivine Road, approximately 0.17 mile west of the intersection with Mesa View Drive (Figure 1 and Figure 2). The Project includes upgrades to MWA's existing Turnout 6/7 by the addition of a booster pump unit, minor piping and electrical modifications, and the relocation of Turnout 7 to the Adelanto reservoir tanks site.

1.1 Project Relationship to Past Environmental Documents

MWA operates under a Regional Water Management Plan (RWMP), revised in 2004 (2004 Regional Water Management Plan, see MWA 2004a), adopted on February 24, 2005 following adoption of a Final Program Environmental Impact Report (2004 PEIR; State Clearinghouse Number 2003101119) (see MWA 2004b). The 2004 PEIR identified potential projects and performed an environmental evaluation at a programmatic level. The current Project is consistent with the RWMP category of "Banking water agreements with outside agencies" (MWA, 2004b, Table 2-3).

The RWMP has evolved into what is now titled the Regional Recharge and Recovery Project (the "R³ Project"), a phased project designed to address the MWA's previously identified facilities storage, recharge, and funding issues.

A Project-specific Environmental Impact Report (2006 R³ EIR) was prepared in January 2006 (State Clearinghouse Number 2005041103, MWA 2006), *titled Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program*, which tiered off of the 2004 PEIR to primarily evaluate several specific projects that had been envisioned but not fully identified in the 2004 EIR. The 2006 R³ EIR identified one of the projects as "additional pipelines to convey water to and from recharge basins and wells."

Following adoption of the R³ EIR, several subsequent addendums were prepared to analyze other projects as details became available. In 2010, Addendum No. 2 of the R³ EIR (2010 R³ EIR Addendum 2, State Clearinghouse Number 2005041103) addressed a Phase I portion of the "Regional Recharge and Recovery Project," which is comprised of portions of the "Minimum Facilities" and "Small Facilities" recharge alternatives addressed in the 2006 FEIR. Exhibit 2-7 of the 2010 R³ EIR Addendum 2 identifies the pipeline extension to serve community of Adelanto as one of the potential projects.

1.2 General Information About this Document

The MWA now proposes to proceed with the Adelanto R³ Extension Project. The Project is consistent with what has been identified in previous EIRs and subsequent addendums. The MWA is the Lead Agency for this Project.

The MWA has determined that an Initial Study is the appropriate environmental document for the proposed Project, and the analysis would likely result in a Mitigated Negative Declaration. The Initial Study for the proposed Project relies on the 2004 PEIR, 2006 R³ EIR and 2010 R³ EIR Addendum 2. These documents identified the general effects of the overall conveyance system, and the 2010 R³ EIR Addendum 2 Exhibit 2-7 identified the location of all of the Phase 1 facilities, including the proposed Adelanto R³ Extension.

The tiering of the environmental analysis for the Project allows the Initial Study to rely on the 2004 EIR and R³ EIR for: (1) a discussion of general background and setting information for environmental topic areas; (2) overall

growth-related issues; (3) issues that were evaluated in sufficient detail in both EIRs, and for which there is not significant new information, a change in circumstances, project changes, or new significant environmental impacts requiring further analysis; and (4) long-term cumulative impacts.

The purpose of this Initial Study is to evaluate the potential environmental impacts of the Adelanto R³ Extension Project with respect to the analysis previously contained in the 2004 PEIR, 2006 R³ EIR and 2010 R³ EIR Addendum 2, update studies as necessary given the design details, and to determine what level of additional environmental review, if any, is appropriate. Hence, this Initial Study reviews the changes to the existing conditions that have occurred since the 2006 FEIR was certified as well as since the 2010 R³ EIR Addendum 2 was adopted. It also reviews any new information of substantial importance that was not known and could not have been known with exercise of reasonable diligence at the time the 2004 PEIR, 2006 R³ EIR and 2010 R³ EIR Addendum 2 were certified. It further examines whether, as a result of any changes or any new information, a subsequent or supplemental EIR should be prepared. This examination includes an analysis of the provisions of Section 21166 of CEQA and Section 15162 of the State CEQA Guidelines and their applicability to the proposed Project.

1.3 Documents Incorporated by Reference

Section 15150 of the State CEQA Guidelines permits an environmental document to incorporate by reference other documents that provide relevant data.

The documents cited below are hereby incorporated by reference, and the pertinent material is summarized throughout this Addendum, where that information is relevant to the analysis of impacts of the project. All documents incorporated by reference are available for review at MWA Headquarters Office, 13846 Conference Center Drive, Apple Valley, CA 92307. The following documents are incorporated by reference:

- *County of San Bernardino 2007 General Plan* (general background information and land uses)
- *County of San Bernardino 2007 Development Code, Adopted March 13, 2007, Effective April 12, 2007, Amended January 15, 2009* (land use compatibility)
- *County of San Bernardino 2006 General Plan Program, Final Environmental Impact Report and Appendices, SCH# 2005101038, February 2007* (evaluates County buildout and related environmental issues)
- *Water Spreading Agreement and Memorandum of Understanding Between Mojave Water Agency and [San Bernardino County Flood Control] District*, May 21, 1996, and related Initial Study/Mitigated Negative Declaration, SCH#90020980, adopted November 13, 1990 (addresses use of up to 50,800 acre-feet of State Water Project water, released annually from Silverwood Lake for the purposes of groundwater recharge, for up to 50 years)
- *Mojave Water Agency 2004 Regional Water Management Plan, Final Program Environmental Impact Report, SCH# 2003101119, February 2005* (original 2004 PEIR for the Project)
- *Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program, Final Project Environmental Impact Report, SCH# 2005041103, January 2006* (certified Final EIR for the Project and the subject of this Addendum EIR No. 2)
- *Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program, Final Project Environmental Impact Report Addendum No. 1, November 2008.*

- *Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program, Final Project Environmental Impact Report Addendum No. 2, January 2010.*

The Technical Appendices included in those studies which are considered in this document include but are not limited to the following:

- *Reconnaissance Biological Survey Report for the Mojave Water Agency's R³ Project*, prepared by Tom Dodson & Associates, March 2009.

- *Focused Survey for Desert Tortoise, Southwestern Arroyo Toad, and Western Burrowing Owl, Habitat Evaluation for Mohave Ground Squirrel, and General Biological Resource Assessment for the Mojave Water Agency's R³ Project,* prepared by Tom Dodson & Associates, July 2009.

- *Reconnaissance Biological Survey Report for the Mojave Water Agency's Oro Grande Wash Recharge Ponds Project Phases A, B & C,* prepared by Tom Dodson & Associates, November 2, 2009.

2 PROJECT LOCATION AND SETTING

The proposed Project is located in the Baldy Mesa area of the City of Victorville, in San Bernardino County.

Improvements will occur within the existing footprint of the MWA's existing Turnout 6/7 facility located approximately 650 feet north of 5th Street/Del Rosa Road (southern end of the Project), and in the road right-of-way of Mesa View Drive, beginning at MWA's existing Turnout 6/7 to the City of Adelanto's existing reservoir tanks located on Olivine Road, approximately 930 feet west of the intersection with Mesa View Drive (northern end of the Project) as well as within the City of Adelanto's existing reservoir tank site, as depicted on Figures 1 and 2. Improvements will also occur within the disturbed, previously developed turnout and reservoir site facilities. The Project site can be found on *Baldy Mesa* USGS 7.5' quadrangle, Township 5 North, Range 5 West, Section 33 approximately latitude 34.47181, longitude -117.40739.

There are no commercial developments adjacent to the Project. Adjacent residential developments are located approximately 100 feet to the north of the intersection of Mesa View Drive and Olivine Road and along Mesa View Drive, south of Bear Valley Road.

Mesa View Drive is an unpaved roadway between MWA's Turnout 6/7 to approximately 1,300 feet north, near the intersection with Bear Valley Road. The remainder of Mesa View Drive between approximately Bear Valley Road and Olivine Road is a paved, two-lane roadway. Olivine Road, from the intersection of Mesa View Drive and the reservoir site is an unimproved dirt roadway.

3 BACKGROUND

The MWA was formed in 1959 by an act of the California Legislature. The MWA manages groundwater in portions of the Mojave Basin and Morongo Basin, has a service area of over 4,900 miles and has as its primary function the utilization of available water supplies in a manner consistent with California Water Code Section 79562.5(b). The MWA holds a State Water Project contract and utilizes various facilities to import and distribute water to replenish groundwater basins and to meet the obligations of the Mojave Basin Area and Warren Valley judgments related to groundwater supply. As a state water contractor, MWA is entitled to receive an annual allotment of up to 85,800 (stepping up to 89,800 in 2020) acre-feet (AF) of water from the State Water Project via the California Aqueduct.

MWA manages six major basins within its service area, of which five are sub-basins of the larger Mojave River Basin. The MWA operates under the Mojave Basin Area Judgment, which sets limits on the amount of groundwater production that can occur in each of the Mojave Basin's subareas without incurring an obligation to purchase imported water.

The MWA also operates under a Regional Water Management Plan (RWMP), which was revised in 2004, adopted on February 24, 2005, and defines the MWA's overall water management objectives for the period of 2004 through 2020. The adopted RWMP projected that groundwater overdraft, combined with expected growth and associated increasing demand for water, were projected to result in a substantial groundwater recharge requirement by 2020. The 2004 RWMP notes that there are two fundamental actions that could be taken to address the problem of groundwater overdraft and future growth/water demand: (1) Supply enhancement projects, either involving groundwater recharge or an increase in groundwater efficiency; and (2) Management actions involving conservation, storage agreements, and water transfers/water banking. The 2004 RWMP also identified a variety of potential facilities that might be developed to balance future water demands with available supplies and to maximize the overall beneficial use of water throughout the MWA's service area.

Since the development of the RWMP, the MWA, and its stakeholders created a phased implementation plan designed to address the MWA's previously identified facilities storage, recharge, and funding issues. The phases are now collectively identified as the Regional Recharge and Recovery Project (the "R³ Project"). The R³ Project is a conjunctive use project that stores State Water Project (SWP) water underground in the local aquifer and later recover and distribute the water to local retail water purveyors. The R³ Project utilizes unused aquifer storage capacity in the Mojave Basin to enhance the regional supply of water by recharging the aquifer with inflow from the State Water Project aqueduct. The stored recharged water is then extracted by well facilities for delivery to purveyor turnout locations. Portions of the Phase 1 of the R³ Project were constructed and started delivering water in 2013.

The 2010 R³ EIR Addendum 2 Exhibit 2-7 identified a number of facilities that would be required to meet the delivery requirements, including the Adelanto R³ Extension Project (Figure 3).

The Adelanto pipeline extension will convey R³ water from the existing Turnout 6/7 facility to the Adelanto reservoir site in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto. Included with this project is the construction of a new Turnout 7 facility. This project will deliver the R³ water on an average annual flow basis, with no significant peaking capacity provided (Kennedy-Jenks, July 2019).

The Turnout 6 modifications project will add booster pumping capability to Turnout 6 such that the R³ water provided will exceed the minimum pressure requirement of 40 pounds per square inch (psi) in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 19, 2013, between MWA and the City of Victorville as well as providing sufficient pressure for Victorville's 3485 Pressure Zone (estimated to be 55 psi). Current operation of the Turnout 6 facility does not satisfy this pressure requirement. Included in this project will be modifying the existing Turnout 7 facility for consolidated use solely with Turnout 6. The capacity of Turnout 6 is not proposed to be increased, only the pressure needed for delivery.

4 PROJECT PURPOSE AND NEED

The purpose of the R³ project is to allow MWA's Project stakeholders to become less dependent on supplies from the SWP during drought periods or when the Sacramento Delta is under increased stress. While the R³ Project will allow MWA to manage overall water supplies within its territory, the delivery system components will also allow MWA to build a sustainable water delivery system that provides long-term benefits to the local area.

This project will enable Adelanto to receive the R³ water as a supplemental water source. Adelanto currently receives water from groundwater pumping and the City of Victorville. The MWA's responsibility is to ensure that its customers have adequate water supply for its existing and projected service needs. The Project will allow the MWA to initially deliver 3,000 acre feet per year (AFY) to the City of Adelanto, with ultimate delivery planned at 7,900 AFY. Currently, the City of Victorville provides water to Adelanto on a limited basis via an existing pipeline interconnection.

The proposed R³ project is in agreement with the California Department of Water Resources (DWR) water management goals. DWR recognizes, in its California Water Plan Update 2005, the benefits from conjunctive water management, which include improving water supply reliability, reducing groundwater overdraft, and protecting water quality and environmental conditions (RBF, October 2009).

5 PROJECT COMPONENTS

The Project includes the following components:

Existing Turnout 6 Modifications

The existing Turnout 6/7 facility will be modified into a dedicated Turnout 6 facility to solely provide water supply to the City of Victorville. Modifications will include adding a pumping unit, modifying the turnout piping and related electrical and instrumentation improvements (Figure 4). This project also includes upgrading the existing electrical service from 240V to 480V, which will include a new 5-inch underground conduit along Mesa Drive from Turnout 6/7 to 5th Street/Del Rosa Road and will also include an additional line to the existing overhead electrical line for approximately 500 feet along Mesa View Drive to the south of 5th Street/Del Rosa Road.

The piping modifications will consist of modifying the above-ground portion of the 16-inch diameter pipeline for the installation of a booster pump, flow control valve and isolation valve.

Relocated Turnout 7

The existing Turnout 7, currently located within Turnout 6 facility, will be relocated to within the boundaries of the existing Adelanto reservoir facility (Figure 5). The relocated Turnout 7 will be sized to convey the full volume of the R³ water delivery to the City of Adelanto.

The turnout structure will be constructed within an approximate 18-foot wide by 46-foot long by 18-foot-high concrete block building with galvanized metal roof decking. The concrete block building with be surrounded by a 20-foot wide gravel base and a 15-wide gravel road and a new driveway gate and manway gate will be installed to provide access to the Turnout 7 building from Olivine Road.

Equipment to be installed within the turnout facility building include a 16-inch diameter steel piping (epoxy-lined), magnetic flow meter, electronic flow control valve, isolation valves, air release valves, calcium hypochlorite tablet chlorination system, chlorine residual analyzers, eye wash station, 20-foot high radio antennae, lighting panel and two control panels. The water delivered from Turnout 7 will be disinfected with chlorine prior to blending with the existing transmission pipeline.

Outside of the turnout building, two, 4-foot by 4-foot pre-cast concrete vaults will be installed underground. One vault will be used for pipeline water quality sampling and the other vault will be used as a drainage chamber basin.

The newly relocated Turnout 7 will also require the installation of a new 120/240V electrical service and related utility infrastructure such as a utility transformer, two meters and underground conduit. The existing underground

utility conduit, owned by Southern California Edison (SCE), will need to be extended approximately 900 lineal feet underground from the intersection of Mesa View Drive and Olivine Road to the new service connection. This typically involves excavation approximately 30 inches deep and up to 12 inches wide for installation of the 5-inch underground conduit and cable.

The relocated Turnout 7 will connect to the City of Adelanto's existing water conveyance system located at the reservoir facility, with approximately 300 lineal feet of a 20-inch or 24-inch diameter steel pipeline which will support the future on-site reservoir pipeline distribution system. Access to Turnout 7 will be from the existing reservoir site access, and no new access entrance from Olivine Road will be required. Within the reservoir site, a separate 15-foot-wide road will be graded over the pipeline alignment to the connection.

New Pipeline

The Project will install approximately 5,800 lineal feet of a 20-inch, 30-inch and 36-inch diameter pipeline between Turnout 6 and Turnout 7 (Figure 2). The 30-inch pipeline will connect to the existing terminus of the 30-inch diameter pipeline at Turnout 6, located on Mesa View Drive, approximately 650 feet north of 5th Street/del Rosa Road. The Victorville pipeline improvements, shown on Figure 3, will facilitate the future construction of the 36-inch diameter pipeline from the Le Panto Reservoir to Turnout 6. The 30-inch pipeline will continue north (approximately 4,650 lineal feet) on Mesa View Drive until the intersection of Olivine Road.

At the intersection of Mesa View Drive and Olivine Road, the pipeline facility will include a cross fitting with partial valving which will accommodate the potential extension of the R³ pipeline into the City Adelanto in the future. From the intersection of Mesa View Drive and Olivine Road, a 20-inch diameter will continue west on Olivine Road (approximately 900 lineal feet) until the terminus at the re-located Turnout 7 at the Adelanto reservoir facility.

The preliminary pipeline alignment is estimated to located on the west side of Mesa View Drive (south of Bear Valley Road), the east side of Mesa View Drive (north of Bear Valley Road) and on the south side of Olivine Road. The pipeline alignment will be finalized after completion of the project survey and evaluation of the underground utilities and future road improvements. The pipeline facility will be constructed completely by open cut construction methods.

It is anticipated that after construction of Turnout 7, the existing pipeline inter-tie between the City of Adelanto and the City of Victorville would remain in place at the existing reservoir site and would be used only for emergency purposes.

5.1 Construction Scenario

Construction is anticipated to begin in early 2020 and will last approximately one (1) year and will occur within the existing rights-of-way for public roadway or MWA or Adelanto site facilities. In general, construction consists of:

- Earthwork – Turnout 7 building foundation (over-excavation, scarification, re-compaction, soil import/export)
- Earthwork – Pipeline & conduit trenching (trench excavation, pipeline installation, conduit installation, backfill, compaction, soil import/export, welding)
- Building Construction – Turnout 7 (concrete placement, CMU wall construction, steel roof framing, metal roofing, welding, piping, mechanical, electrical construction)
- Facility Modification – Turnout 6 Modifications (concrete cutting, concrete placement, welding, piping, mechanical, electrical construction).

Grading and construction will occur over approximately 3 acres includes the following approximate areas:

- Turnout 7 building and access road – 27,500 square feet (approx. 0.6 acre)
- Turnout gravel road – estimated 15 wide by 50 feet long (approx. 0.017 acre)
- Pipeline – 6,040 feet long x 17 feet wide (approx. 2.4 acres)

Trenching for the project is anticipated not to exceed 15 feet deep, and excavated soils are anticipated to be reused as backfill. Imported material would be used for backfill if the existing soils are not found to be suitable. The greatest quantity anticipated for import of fill would be the pipeline backfill, approximately 3,354 cubic yards. Imported material would come from a local source, within the Victorville area.

5.2 Potential Construction Equipment

Project construction will require the use of heavy equipment. While the final types and numbers of construction equipment will be determined by the construction contractor, Table 1 is an estimate of the types and numbers of equipment that will be utilized for this work.

Table 1
Potential Equipment for Adelanto R³ Extension Construction

Equipment Type	Numbers of Equipment	Duration
Backhoe loader	1	6 months
Excavator (standard/full size)	1	6 months
Dump Truck/Hauling Truck	10	6 months
Delivery Truck (for structural items, such as rebar)	1	6 months
Asphalt paver	1	5 days
Steel wheel roller	1	10 days
Concrete Mixer truck	3	20 days
Concrete boom pump truck (28 meter Z-fold)	1	10 days
Truck mounted boom crane (Terex T340-1)	1	20 days
Dozer	1	6 months
Water Truck	1	6 months
Welding Truck	1	6 months
Electric Generator (5 kW)	1	6 months

5.3 Avoidance and Minimization Measures

5.3.1 Worker Environmental Awareness Plan

Prior to the start construction activities, MWA or its contractor shall develop a Worker Environmental Awareness Plan (WEAP). A presentation prepared by personnel qualified in the subject areas will be used to train site personnel prior to the commencement of work. A record of all trained personnel will be kept. This process would be repeated prior to and during the future construction activities.

The WEAP training will include a list of phone numbers of MWA designated environmental specialist personnel associated with the Project (archaeologist, biologist, environmental compliance coordinator, and regional spill response coordinator), and will cover the following topics, including but not limited to:

- **Cultural/Archaeological/Paleontological Resources Training**

  - Any Environmentally Sensitive Area (ESA) that has been physically delineated and marked to protect an archaeological resource
  - All work and equipment staging, storing, and placement shall remain outside the ESA
  - Procedures to follow if unanticipated archaeological resources are discovered, including:
    - If cultural, archaeological or paleontological resources are discovered during construction activities, all work in the vicinity of the find shall halt
    - The cultural/archaeological monitor shall be informed
    - The cultural/archaeological monitor shall notify the project foreman and designated Project cultural specialist/archaeologist immediately
    - Cultural/archaeological monitors have the authority to temporarily halt work in the area of archaeological discoveries until the resource has been evaluated by a qualified cultural specialist or archaeologist
    - Work in the area of the discovery shall not resume until written notification is received from the Project cultural/archaeological specialist
    - The Project cultural specialist/archaeologist will provide an estimate of how long an excavation of the resource would take
    - The Project has established procedures to follow if human remains are encountered.

- **Biological Resources Training.** Workers will be informed of general and Project- specific biological impact reduction measures, including:

  - Keep vehicles on existing roads and pads
  - Avoid impacts to drainages
  - Minimize clearing of vegetation
  - Avoid trapping animals by covering trenches/holes at the end of each day
  - Requirements and actions under Migratory Bird Treaty Act
  - Protected plant and wildlife species that may be found in the Project Area, where they have been identified during past surveys, and protection measures that may be implemented

- **SWPPP Training**

  - Presentation of activities covered under the Construction General Permit, and requirements of the Construction General Permit
  - Site-Specific SWPPP requirements including but not limited to:
    - Eliminate or control non-stormwater
    - Visual inspections
    - Identification of SWPPP requirements
    - Daily inspection checklist
    - Maps
    - BMPs
    - Spill prevention and control, and spill notification procedures
  - Identification of common stormwater violations
  - Education on how to identify problems and devise solutions
    - Instruction on the importance of maintaining the construction site. All trash must be removed from the job sites daily, and all construction debris shall be removed at the end of construction
    - Instructions to notify the foreman and regional spill response coordinator in case of a hazardous materials spill or leak from equipment, or upon the discovery of soil or groundwater contamination

- Instruction that noncompliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the Project

6 PROJECT ALTERNATIVES

No Action Alternative

Under the No Action Alternative, the Proposed Action would not be undertaken. No facility upgrades would be made, and public health and safety may be compromised due to additional water supply being unavailable to the City of Adelanto and the City of Victorville.

Turnout Alternatives

An alternative piping configuration for Turnout 6 was investigated but was not selected for final design due to the additional extra work required as well as constructing additional facilities outside of the turnout building.

An alternative site location for Turnout 7 was investigated but was not selected for final design due to interference for the use of the radio antennae, constrained site location and increased project cost related to the additional length of pipeline required. In addition, the proposed site location and pipeline improvements reduces the City of Adelanto's future capital expenditures for pipeline improvements necessary to distribute water to the future reservoir facilities.

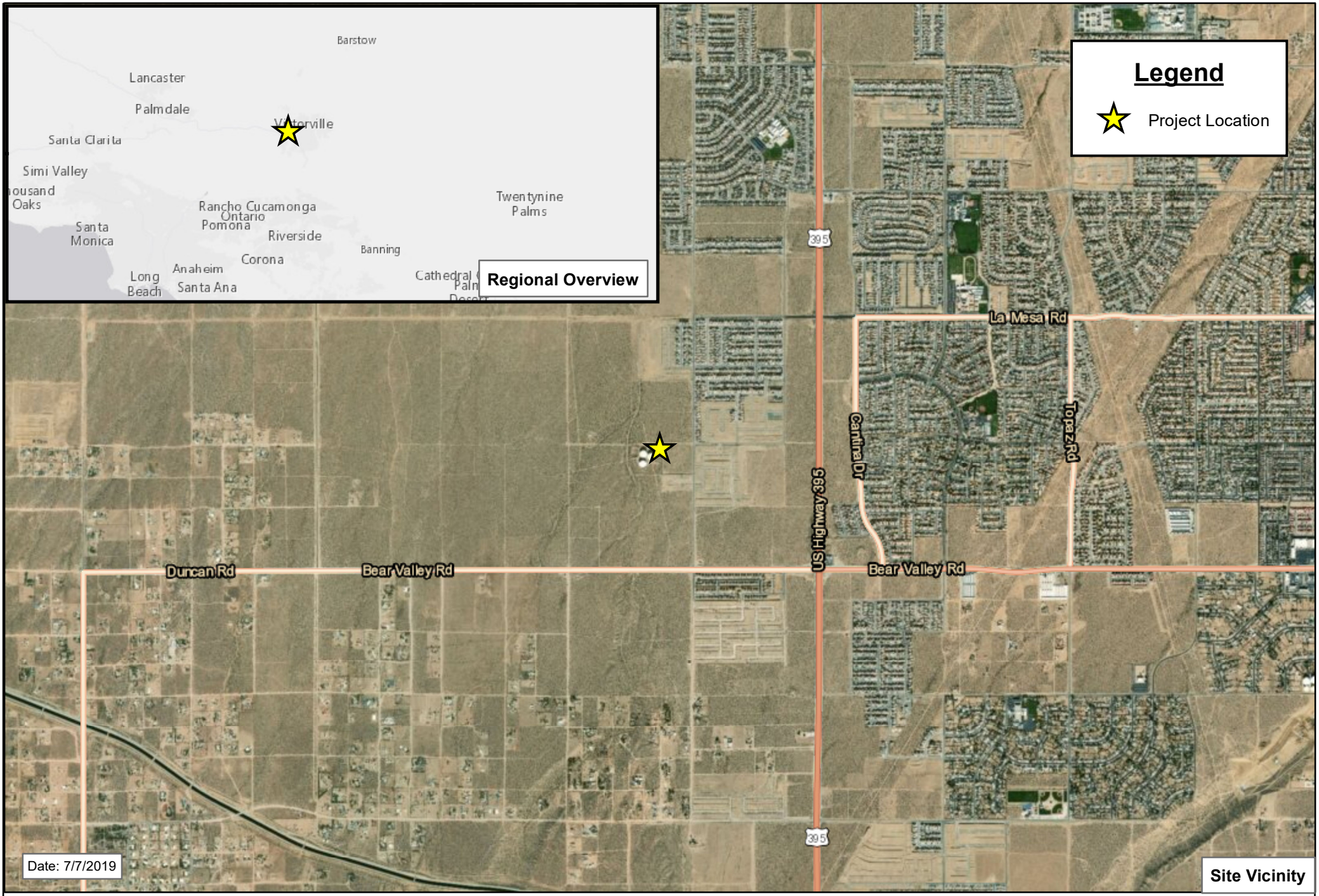
7 PURPOSE OF THIS INITIAL STUDY/ENVIRONMENTAL ASSESSMENT

The proposed Project/Action is a discretionary action under the California Environmental Quality Act (CEQA) Guidelines Section 15378 identifies a Project as an activity that is undertaken by a public agency and/or where the activity would be supported in whole or in part through public grants or loans. The Mojave Water Agency has expressed interest in obtaining financial assistance through the State Clean Water State Revolving Fund (CWSRF) program to fund the Adelanto R³ Extension Project capital improvement project. The CWSRF program is a partnership United States Environmental Protection Agency (USEPA) that provides communities a permanent, independent source of low-cost financing for a wide range of water quality infrastructure projects.

The State Water Board, Division of Financial Assistance administers the CWSRF program. Due to the federal nexus with USEPA, federal laws and regulations (e.g. federal cross-cutters) apply to all projects pursuing CWSRF financing. Under the CWSRF Program, the Division under the State Water Board uses the CEQA document plus the federal cross-cutting documentation in place of a National Environmental Policy Act (NEPA) document in what is termed "CEQA-Plus" documentation. The State Board does not complete a NEPA review process, but rather completes the "NEPA-like" process of CEQA-Plus.

The CEQA-Plus MND is where the Initial Study is prepared both in accordance with the California Code of Regulations, Title 14, Article 5 and Article 7 as well as federal regulations, specifically, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Sections 1500–1508) issued by the Council on Environmental Quality (CEQ) (1970, as amended), the *Environmental Review Guide for Special Appropriation Grants* (EPA 2008), and the *Environmental Review Process Guidelines for State Revolving Fund Applicants* (SWRCB 2004).

A "CEQA-Plus" environmental document contains information pertaining to both State and federally-designated endangered species, cultural resource protection, conformity with applicable air management plans, and other federal executive orders and federal regulations.



0 0.3 0.6 1.2 1.8 2.4 Miles

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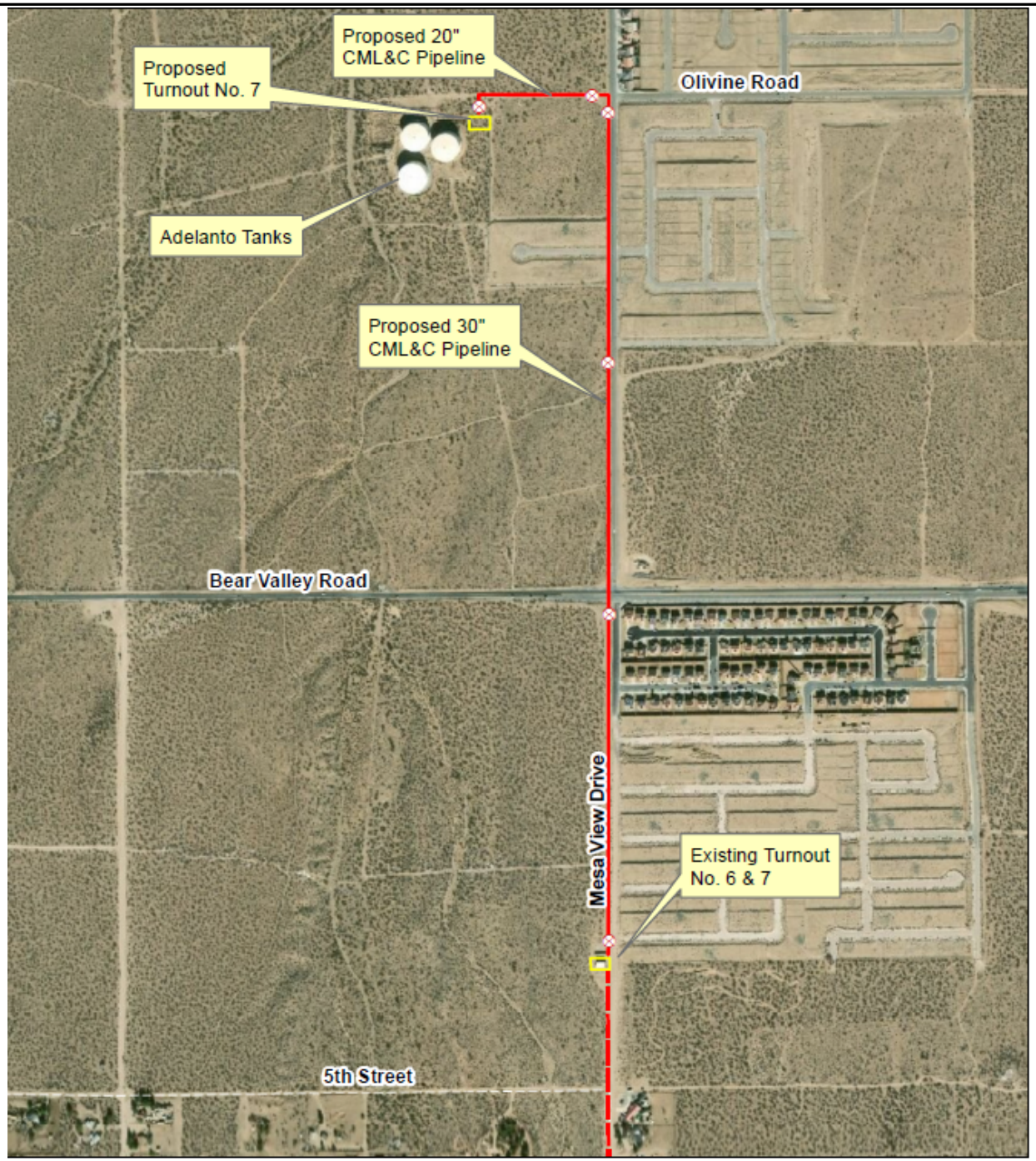
JERICHO SYSTEMS INCORPORATED

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Figure 1 - Regional Overview Site Vicinity

MWA Adelanto R^3 Extension Project
Victorville, CA

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Legend

- Proposed CML&C Steel Pipeline
- Existing 30" Pipeline
- Proposed Valve Locations

Map Source: Kennedy-Jenks, June 2019

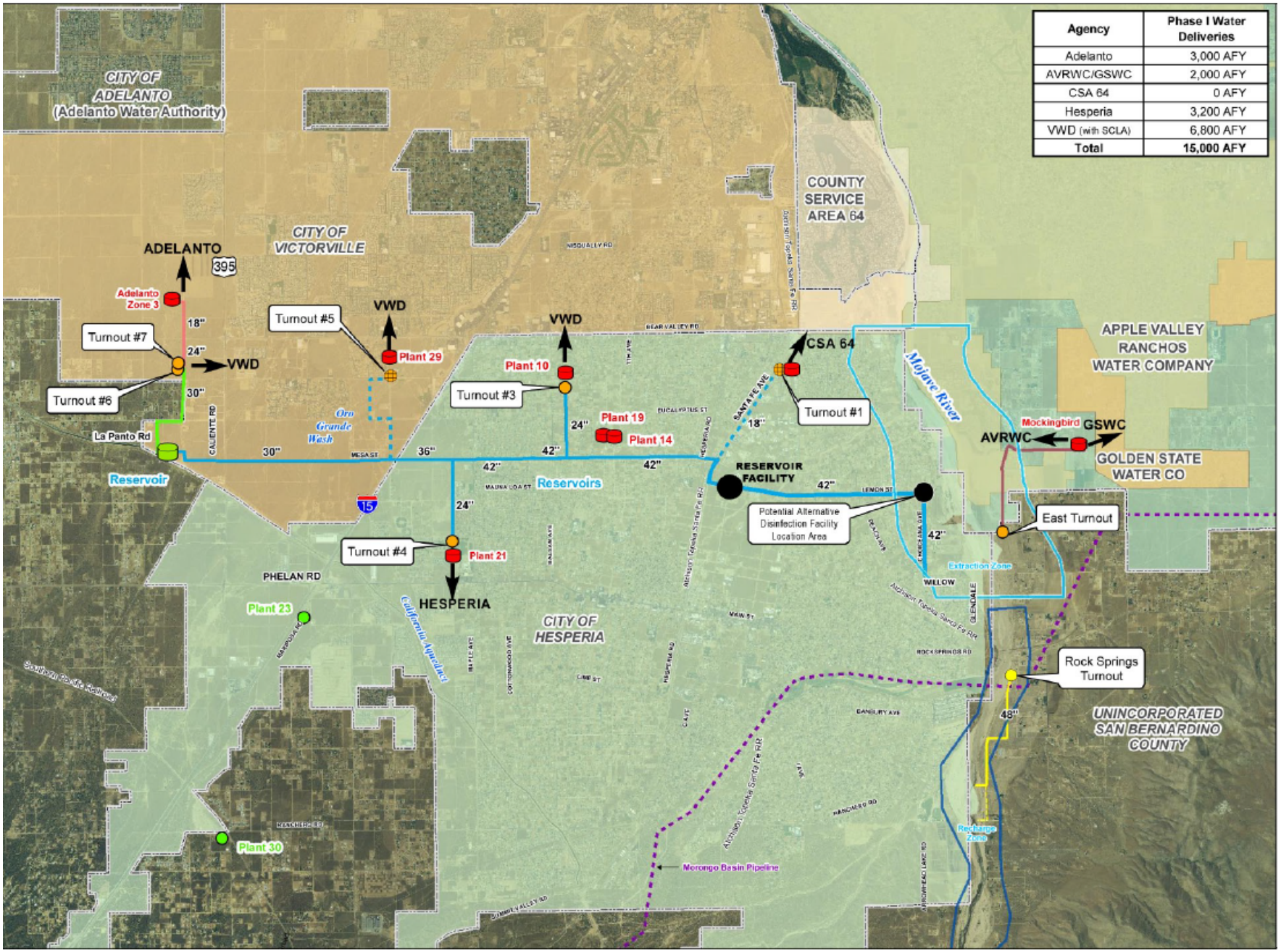
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
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0 250 500
Feet
Scale is Approximate

Figure 2
Project Location

MWA Adelanto R^3 Extension Project
Victorville, CA

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Agency	Phase I Water Deliveries
Adelanto	3,000 AFY
AVRWC/GSWC	2,000 AFY
CSA 64	0 AFY
Hesperia	3,200 AFY
VWD (with SCLA)	6,800 AFY
Total	**15,000 AFY**

Legend

- MWA Pump Station
- MWA Reservoir
- Future MWA Reservoir (Ultimate Condition)
- Possible MWA-Acquired Tank from VWD
- Stakeholder Reservoir
- Turnout
- Future Turnout (Ultimate Condition)
- Recharge Turnout
- Potential Disinfection Facility Location Area
- City of Hesperia Plant
- Preliminary Phase I Extraction Zone
- Recharge Zone
- AVRWC Transmission System
- Pipeline needed to serve Adelanto
- Possible MWA-Acquired Pipeline from VWD
- R3 Conveyance System (Phase 1)
- Future Lateral Pipeline (Ultimate Conditions)
- South of Rock Springs Turnout Pipeline
- Future South of Rock Springs Turnout Pipeline
- Existing Morongo Basin Pipeline
- Highways
- Roads
- City Boundary

Source: RBF Consulting, Mojave Water Agency Addendum 2 EIR, Exhibit 2-7

NOTE: Titles and location of facilities may change.

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
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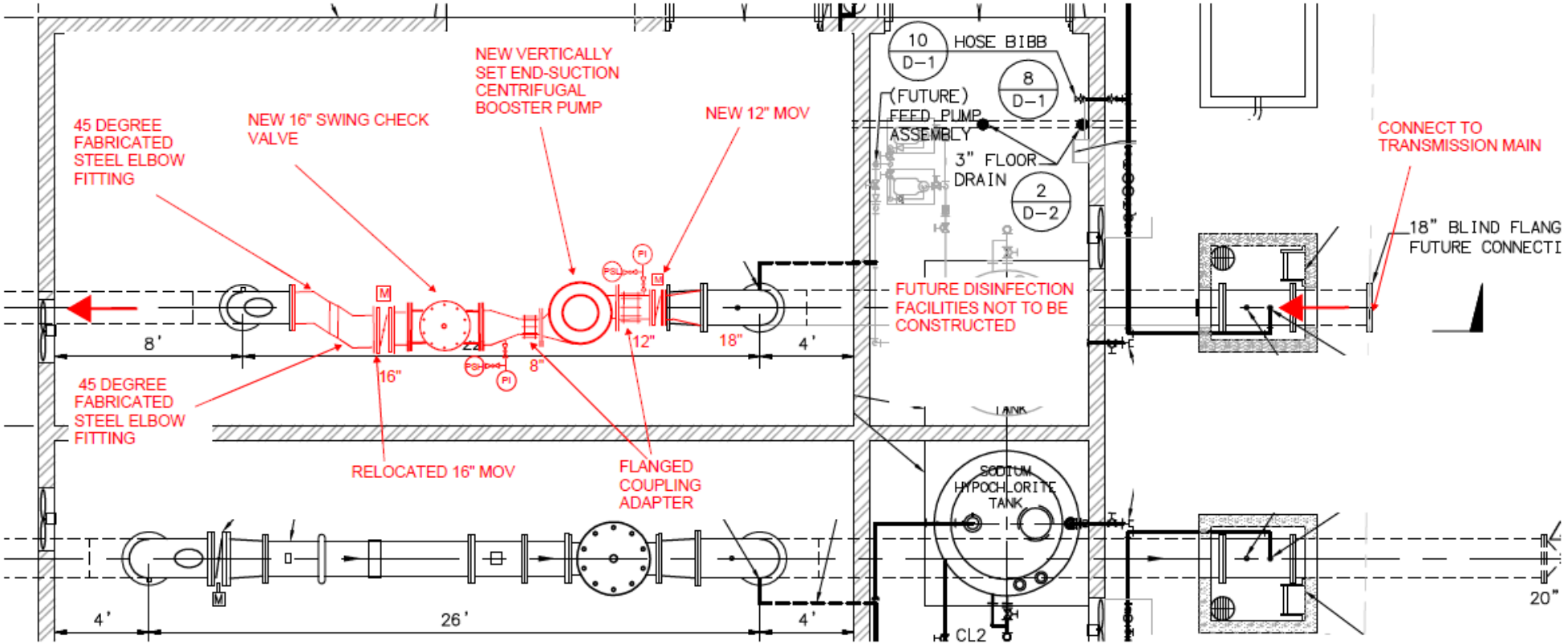
JERICHO SYSTEMS INCORPORATED

Not to Scale

Figure 3
MWA Conveyance System

MWA Adelanto R^3 Extension Project
Victorville, CA

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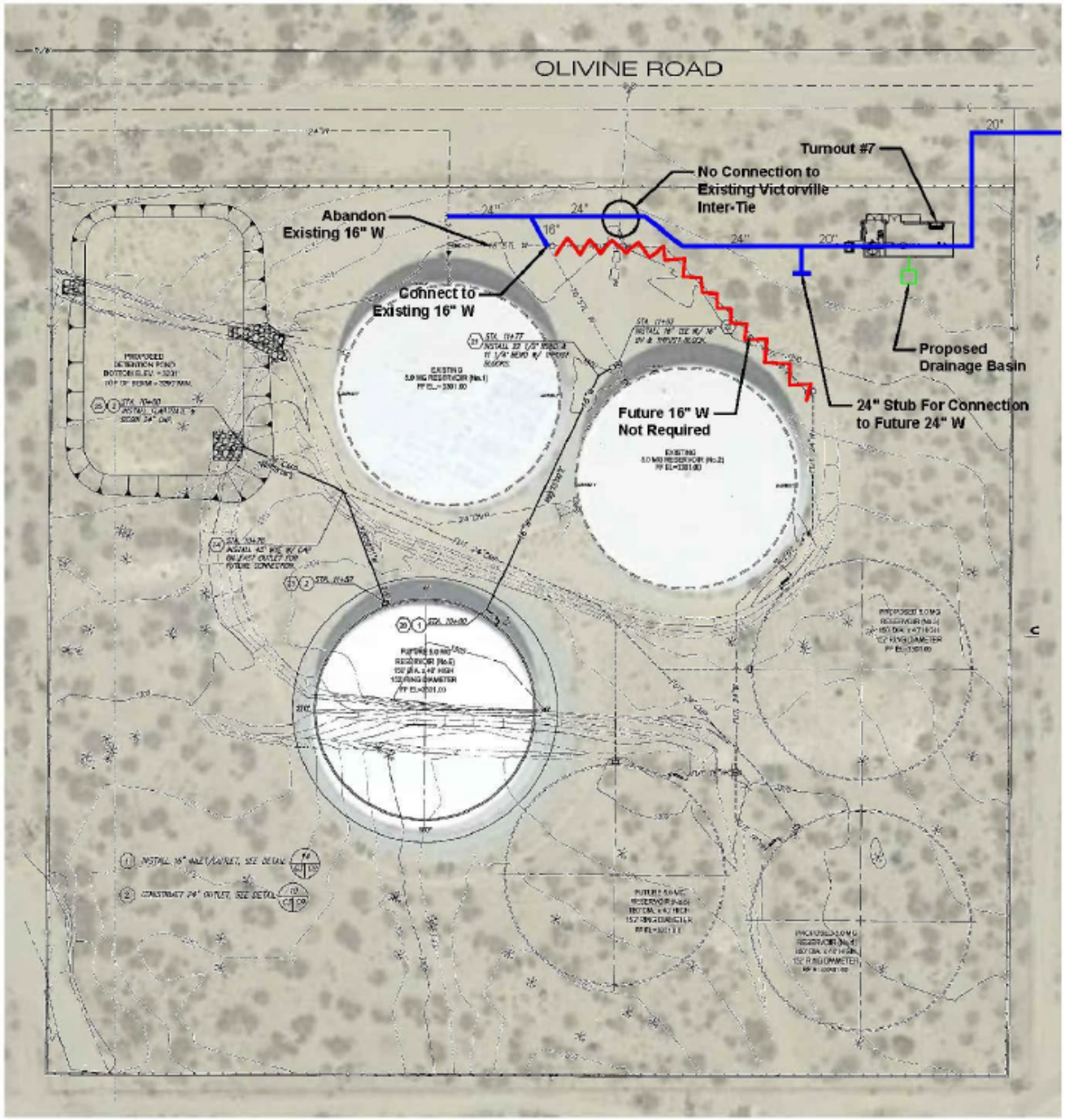
Source:Kennedy-Jenks, August 2019

Not to Scale

Figure 4
Turnout 6 Modifications Plan View

MWA Adelanto R^3 Extension Project
Victorville, CA

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Legend

Proposed CML&C Steel Pipeline

0 40 80

SCALE: 1"=80'-0"

Scale is Approximate

Source:Kennedy-Jenks, June 2019

Figure 5
Turnout 7 Modifications Plan View

MWA Adelanto R^3 Extension Project
Victorville, CA

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8 ENVIRONMENTAL CHECKLIST FORM

1. Project Title: Adelanto R³ Extension Project

2. Lead Agency Name: Mojave Water Agency
Address: 13846 Conference Center Drive
Apple Valley, CA 92307

3. Contact Person: Tony Winkel, Senior Hydrogeologist/Engineer
Mojave Water Agency
twinkel@mojavewater.org

Phone Number: (760) 946-7000

4. Project Location: Topographic Quad (USGS 7.5"): *Baldy Mesa.* T5N, R5W, Sections 33
Approximately latitude 34.47181, longitude -117.40739

6. General Plan Designation: Public and Civic (Adelanto Reservoir)
Roadways (Pipeline)
Single-Family (Existing Turnout 6/7)

7. Zoning: Same as General Plan Designation

8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project and any secondary, support, or off-site features necessary for its implementation).

The Mojave Water Agency (MWA) is proposing the Adelanto R³ Extension Project (Project) to extend its wholesale water delivery service to the community of Adelanto by constructing approximately 1 mile of underground pipeline along Mesa View Drive, beginning at MWA's existing turnout 6/7 located approximately 0.13 mile north of Del Rosa Road and continuing to the Adelanto reservoir tanks located on Olivine Road, approximately 0.17 mile west of the intersection with Mesa View Drive (Figure 1 and Figure 2). The Project includes upgrades to MWA's existing Turnout 6/7 by the addition of a booster pump unit, minor piping and electrical modifications, and the relocation of Turnout 7 to the Adelanto reservoir tank site.

9. Surrounding land uses and setting (Briefly describe the project's surroundings)

The pipeline will be constructed entirely within road rights-of-way and the turnout structures will be constructed entirely within facilities already utilized for water service. Adjacent land uses are vacant or single-family residential.

10. Other agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):

Bureau of Reclamation:

- Issuance of grants or loans

State Water Resources Control Board:

- Storm Water Pollutant Prevention Plan
- Groundwater/Construction Water Discharge Permit
- Amended Domestic Water Supply Permit
- Issuance of grants or loans

Lead Agency Discretionary Actions:

- Award contracts for construction

Local Agency Discretionary Actions:

- City of Victorville Utility & Transportation Permit

11. 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, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

NOTE: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

On June 12, 2019, CRM TECH submitted a written request to the State of California's Native American Heritage Commission (NAHC) for a records search in the commission's sacred lands file. Following the NAHC's recommendations and previously established consultation protocol, CRM TECH further contacted a total of five Native American representatives in the region in writing on June 27, 2019, for additional information on potential Native American cultural resources in the APE vicinity. Follow-up telephone solicitations were then carried out between July 15 and July 19, 2019. Correspondence between CRM TECH and the Native American representatives is summarized below and attached to this report in Appendix C.

- Travis Armstrong, Tribal Historic Preservation Officer, Morongo Band of Mission Indians
- Donna Yucum, Chairperson, San Fernando Band of Mission Indians
- Lee Clauss, Director of Cultural Resources, San Manuel Band of Mission Indians
- Mark Cochrane, Co-Chairperson, Serrano Nation of Mission Indians
- Wayne Walker, Co-Chairperson, Serrano Nation of Mission Indians

As a result of CRM Tech's outreach, the following responses were received:

- Donna Yocum, Chairperson, San Fernando Band of Mission Indians. The area is culturally sensitive and the tribe requests further consultation.

- Jessica Mauck, Cultural Resources Analyst, San Manuel Band of Mission Indians. Requested copies of the cultural resources and other reports.
- Mark Cochrane, Co-Chairperson, Serrano Nation of Mission Indians. Requested further consultation and immediate notification of cultural resources or human remains during ground-disturbing activities.

On July 25, 2019, MWA notified the following tribal entities pursuant to the provisions of AB52:

- Lee Clauss, Director-CRM Department, San Manuel Band of Mission Indians 26569 Community Center Drive Highland, CA 92346. On August 26, 2019, Jessica Mauck requested copies of the cultural resources report, geotechnical report and project plans, and the MWA emailed her the information on September 18, 2019.

On August 19, 2019, MWA additionally notified the following tribal entities per their request during CRM Tech's outreach:

- Travis Armstrong, Tribal Historic Preservation Officer, Morongo Band of Mission Indians, 12700 Pumarra Road, Banning, CA 92220. On August 30, 2019, Mr. Armstrong responded via email requesting copies of the cultural resources reports and an interest in initiating consultation. On October 3, 2019, the MWA transmitted a copy of the Cultural Resources report, as well as ensured the tribe was on the list to receive a copy of the Initial Study/Mitigated Negative Declaration for public comment.
- Donna Yocum, Chairperson, San Fernando Band of Mission Indians, P.O. Box 221838, Newhall, CA, 91322. No response from the tribe was received.
- Mark Cochrane, Co-Chairperson, Serrano Nation of Mission Indians, P. O. Box 343, Patton, CA, 92369. No response from the tribe was received.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The Proposed Project could potentially affect ("Potentially Significant" or "Less than Significant with Mitigation Incorporated") the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor and identifies where mitigation measures would be necessary to reduce all impacts to less than significant.

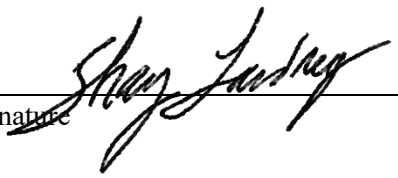
☐	Aesthetics	☐	Agricultural / Forest Resources	☐	Air Quality
☒	Biological Resources	☒	Cultural Resources	☐	Energy
☒	Geology / Soils	☐	Greenhouse Gas Emissions	☒	Hazards / Hazardous Materials
☒	Hydrology / Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☐	Noise	☐	Population / Housing	☐	Public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

DETERMINATION (To be completed by the Lead Agency)

On the basis of this initial evaluation, the following finding is made:

	The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	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.
	The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	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.
	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 or NEGATIVE DECLARATION 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.

Jericho Systems, Inc. — Prepared by
10/3/19 — Date



10/3/19 — Date

EVALUATING ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project would not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analyses Used. Identify and state where they are available for review.
   b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
   c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources. A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:
   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
I. AESTHETICS: Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) In nonurbanized 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 a 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?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

SUBSTANTIATION: (Check ☐ if project is located within a view-shed of any Scenic Route listed in the General Plan.

Environmental Setting

The overall R^3 projects are located within the MWA service area, in the western Mojave Desert of Southern California along the Mojave River at the northern base of the San Bernardino Mountains.

The pipeline extension Project between the MWA's existing Turnout 6 and the Adelanto Reservoir (Project) is located in the Baldy Mesa area of the City of Victorville. Improvements will occur within the right-of-way of Mesa View Drive, beginning at MWA's existing Turnout 6/7 located approximately 650 feet north of 5th Street/del Rosa Road (southern end of the Project) to the Adelanto reservoir tanks located on Olivine Road, approximately 930 feet west of the intersection with Mesa View Drive (northern end of the Project) as depicted on Figures 1 and 2. Improvements will also occur within the disturbed, previously developed turnout and reservoir site facilities. The Project site can be found on *Baldy Mesa* USGS 7.5' quadrangle, Township 5 North, Range 5 West, Section 33 approximately latitude 34.47181, longitude -117.40739.

There are no commercial developments adjacent to the Project. Adjacent residential developments are located approximately 100 feet to the north of the intersection of Mesa View Drive and Olivine Road and along Mesa View Drive, south of Bear Valley Road.

Mesa View Drive is an unpaved roadway between MWA's Turnout 6/7 to approximately 1,300 feet north, near the intersection with Bear Valley Road. The remainder of Mesa View Drive between approximately Bear Valley Road and Olivine Road is a paved, two-lane roadway. Olivine Road, from the intersection of Mesa View Drive and the reservoir site is an unimproved dirt roadway.

The Project area is characterized by a relatively flat topography and is in a geographic subregion of the southwestern Mojave Desert known as the Victor Valley. The Victor Valley is separated from other urbanized areas in Southern California by the San Bernardino and San Gabriel mountains.

Land uses in the Project region consists of a mix of open space, residential, commercial, and limited industrial uses. The most extensively developed area of Yucca Valley lies along SR-62, which generally coincides with the axis of the central valley. With a few exceptions, existing commercial and industrial uses are generally within one-half mile of the SR-62 corridor and concentrated in the Old Town and Mid-Town areas

Night lighting occurs in the residential area only. Individual residences have exterior night lighting on the outskirts of the town and a combination of street lights and individual residential lighting occurs within the various urban areas of the town.

Impact Analysis

a) Have a substantial adverse effect on a scenic vista?

Less Than Significant. The CEQA Guidelines do not provide a definition of what constitutes a "scenic vista" or "scenic resource" or a reference as to from what vantage point(s) the scenic vista and/or resource, if any, should be observed. However, a scenic vista can generally be defined as a viewpoint from a public vantage that provides expansive views of a highly-valued landscape for the benefit of the general public. Common examples include undeveloped hillsides, ridgelines, and open space areas that provide a unifying visual backdrop to a developed area. Scenic resources are those landscape patterns and features that are visually or aesthetically pleasing and that contribute affirmatively to the definition of a distinct community or region such as trees, rock outcroppings, and historic buildings.

The Project area offers expansive views of the desert floor and of the mountains in the backdrop.

Construction will occur within the roadway and within the existing MWA and Adelanto facility sites, and may temporarily disrupt views. The new turnout building is at a smaller scale and is consistent with the existing reservoir site. The pipeline project components will be placed underground or within buildings, and the roadway restored. Therefore, construction impacts are temporary and less than significant and the new above-ground facilities are less than significant.

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

No Impact. The Department of Transportation (Caltrans) manages the State Scenic Highway Program, provides guidance, and assists local government agencies, community organizations, and citizens with the process to officially designate scenic highways. Mesa View Drive is not considered a scenic highway, or a scenic roadway resource by the San Bernardino County General Plan. Therefore, there is no impact.

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 a 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?

Less Than Significant. The Project is located within a rural area. The Project pipeline will be placed below ground surface and therefore has no potential to degrade the existing visual character of pipeline alignment. Construction will occur within the roadway and may temporarily disrupt views. However, the pipeline will be placed underground and the roadway restored. The new turnout building will be constructed within the existing reservoir facility site and is at a smaller scale and is consistent with the existing reservoir site. Therefore, impacts are less than significant.

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

Less Than Significant. Night lighting occurs throughout the Project area. Individual residences have exterior night lighting along or near the alignment. Construction activities would only occur during daylight, therefore, the construction associated with the proposed Project would not cause the emission of light beyond existing circumstances in that area. No permanent lighting, except for exterior security lighting at the new Turnout 7 building, is proposed for the Project. There is a less than significant impact.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
II. 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 Dept. 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:				
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?				X
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?				X
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))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?				X

SUBSTANTIATION: (Check ☐ if project is located in the Important Farmlands Overlay):

Environmental Setting

The Project occurs within existing facilities and roadways that are situated within an urban desert area. According to the California Department of Conservation, California Important Farmland Finder mapping, the Project Area is identified as "Grazing Land."

Impact Analysis

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. The Project Area is identified as "Grazing Land," according to the California Department of Conservation, California Important Farmland Finder mapping (CA Dept of Conservation, 2016). No land under Williamson Act Contract occurs at the Project alignment and no impacts will occur.

b) Conflict with existing zoning for agricultural use or a Williamson Act contract?

No Impact. None of the land on or near the Project alignment is currently under agricultural production, nor are any parcels under a Williamson Act contract. Therefore, no impact is anticipated from the proposed Project.

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. Forest land is defined in Public Resources Code section 12220(g) as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." No timberland or lands zoned Timberland Production as defined above are within the Project site, nor is the Project located in an area zoned for forest land or timber production. Therefore, the Project will not impact the ability of land's ability to support 10 percent native tree cover of any species; thus, no forest lands will be reclassified as non-forest lands under Public Resources Code Section 12220(g). Therefore, there will be no impacts under this criterion.

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

No Impact. As mentioned above, the disturbances associated with the Project activities would not impact the lands' ability to support 10-percent native tree cover of any species, and thus no forest lands as defined in Public Resources Code Section 12220(g) would be lost. In addition, no such lands would be converted to non-forest use as a result of the project construction and operations activities. Therefore, there will be no impacts under this criterion.

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. The construction and operation of the proposed Project do not involve other changes in the existing environment that could result in the conversion of farmland to non-agricultural use or forest land to non-forest land use. Therefore, there will be no impacts to this criterion.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
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?			X	
c) Expose sensitive receptors to substantial pollutant concentrations?			X	
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?			X	

SUBSTANTIATION: (Discuss conformity with the South Coast Air Quality Management Plan, if applicable):

A technical study of the Project's potential Air Quality impacts was prepared and is contained in Appendix A.

Regulatory Setting

Air pollutants are regulated at the national, State, and air basin level; each agency has a different level of regulatory responsibility. The United States Environmental Protection Agency (EPA) regulates at the national level. The California Air Resources Board (CARB) regulates at the State level. The Mojave Desert Air Quality Management District (MDAQMD) regulates at the air basin level.

The EPA is responsible for global, international, and interstate air pollution issues and policies. EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, provides research and guidance for air pollution programs, and sets National Air Quality Standards, also known as federal standards. There are seven common air pollutants, called criteria pollutants, which were identified from the provisions of the Clean Air Act of 1970.

- Ozone
- Nitrogen Dioxide
- Lead
- Particulate Matter (PM10 and PM2.5)
- Carbon Monoxide
- Particulate Matter
- Sulfur Dioxide

The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to project the public health.

Each state prepares State Implementation Plans (SIP) that describes existing air quality conditions and measures that will be followed to attain and maintain federal standards. The SIP for California is administered by CARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. The California SIP incorporates individual federal attainment plans for regional air districts—air district prepares their federal attainment plan, which sent to CARB to be approved and incorporated into the California SIP. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. See http://www.arb.ca.gov/research/aaqs/aaqs.htm for additional information on criteria pollutants and air quality standards.

The federal and state ambient air quality standards are summarized in Table 1, *Ambient Air Quality Standards*, and can also be found at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentrations[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O3)	1-Hour	0.09 ppm	Ultraviolet Photometry	- -	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm		0.070 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)[8]	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µ/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		- -		
Fine Particulate Matter (PM2.5)[8]	24-Hour	- -	- -	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 µg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 µg/m^3)	- -	Non-Dispersive Infrared Photometry (NDIR)
	8-Hour	9.0 ppm (10 µg/m^3)		9 ppm (10 µg/m^3)	- -	
	8-Hour (Lake Tahoe)	6 ppm (7 µg/m^3)		- -	- -	
Nitrogen Dioxide (NO_2)[9]	1-Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	- -	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (357 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1-Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	- -	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3-Hour	- -		- -	0.5 ppm (1300 mg/m^3)	
	24-Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[10]	- -	
	Annual Arithmetic Mean	- -		0.14 ppm (for certain areas)[10]	- -	
Lead[11,12]	30 Day Average	1.5 µg/m^3	Atomic Absorption	- -		
	Calendar Qrtr	- -		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	- -		0.15 µg/m^3		
Visibility Reducing Particles[13]	8-Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Notes:

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
9. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
10. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
11. CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
12. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
13. In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and NOX. NOX is a collective term that includes all forms of nitrogen oxides (NO, NO2, NO3) which are emitted as byproducts of the combustion process.

MDAB Attainment

Currently, the NAAQS and CAAQS are exceeded in most parts of the MDAB. The NAAQS, the Project region within the MDAB is in nonattainment for O3 (8-hour) and PM10. For the CAAQS, the Project region within the MDAB is in nonattainment for O3 (1-hour and 8-hour) and PM10. In response, the MDAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards. AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy.

Environmental Setting

The Mojave Desert Air Basin (MDAB) is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains within the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due

to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB.

The MDAQMD monitors levels of various criteria pollutants at six permanent monitoring stations throughout the air district. The attainment status for the seven common air pollutants in the MDAB is identified in Table 2.

Table 2
Attainment Status of Criteria Pollutants in the MDAB

Criteria Pollutant	State Designation	Federal Designation
O3 – 1-hour standard	Nonattainment	--
O3 – 8-hour standard	Nonattainment	Nonattainment
PM10	Nonattainment	Nonattainment
PM2.5	Attainment	Unclassifiable/Attainment
CO	Attainment	Unclassifiable/Attainment
NO2	Attainment	Unclassifiable/Attainment
SO2	Unclassifiable/Attainment	Unclassifiable/Attainment
Pb	Attainment	Unclassifiable/Attainment

Relative to the Project site, the nearest long-term air quality monitoring site for O3, CO, NO2, PM10, and PM2.5 was obtained from the MDAQMD Victorville-Park Avenue station, located approximately 5.62 miles northeast of the project site in Victorville.

The most recent 3 years of data available is shown on Table 3 and identifies the number of days ambient air quality standards were exceeded for the study area, which is considered to be representative of the local air quality at the Project site. Data for O3, CO, NO2, PM10, and PM2.5 was obtained using the CARB iADAM: Air Quality and Data Statistics and the Air Quality and Meteorological Information System (AQMIS). Data for SO2 has been omitted as attainment is regularly met and few monitoring stations measure SO2 concentrations. It should be noted that the table below is provided for informational purposes.

Table 3
Project Area Air Quality Monitoring Summary 2016-2018

POLLUTANT	STANDARD	Year		
		2016	2017	2018
O_3				
Maximum Federal 1-Hour Concentration (ppm)		0.132	0.156	0.126
Maximum Federal 8-Hour Concentration (ppm)		0.109	0.118	0.107
Number of Days Exceeding Federal 1-Hour Standard	>0.07 ppm	3	4	1
Number of Days Exceeding State 1-Hour Standard	> 0.09 ppm	34	47	34
Number of Days Exceeding Federal 8-Hour Standard	> 0.070 ppm	98	99	123
Number of Days Exceeding State 8-Hour Standard	> 0.070 ppm	103	103	129
CO				
Maximum Federal 1-Hour Concentration	> 35 ppm	11.57	1.52	1.42
NO_2				
Maximum Federal 1-Hour Concentration	> 0.100 ppm	223.1	61.3	59.2
Annual Federal Standard Design Value		14	15	15
PM_{10}				
Maximum Federal 24-Hour Concentration (µg/m^3)	> 150 µg/m^3	246.9	262.3	165.2
Annual Federal Arithmetic Mean (µg/m^3)		29.2	30.1	29.8
Number of Days Exceeding Federal 24-Hour Standard	> 150 µg/m^3	2	2	1
Number of Days Exceeding State 24-Hour Standard	> 50 µg/m^3	18	10	19
$PM_{2.5}$				
Maximum Federal 24-Hour Concentration (µg/m^3)	> 35 µg/m^3	64.8	27.2	40.4
Annual Federal Arithmetic Mean (µg/m^3)	> 12 µg/m^3	20	17	21
Number of Days Exceeding Federal 24-Hour Standard	> 35 µg/m^3	3	0	3

Source: California Air Resource Board iADAM: Air Quality Data Statistics and AQMIS
Note: µg/m^3 – microgram per cubic meter
-- = data not available

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Other sensitive receptors include retirement facilities, hospitals, and schools. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution

can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

The Project is located in primarily vacant areas not near sensitive receptors.

Project Emissions Assumptions

The MDAQMD has developed regional significance thresholds for regulated pollutants, shown below in Table 4. The MDAQMD's Guidelines indicate that any projects in the MDAB with daily regional emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact.

Table 4
MDAQMD Maximum Daily Emissions Thresholds

Pollutant	Daily Threshold (lbs./day)
CO	548 lbs/day
NO_X	137 lbs/day
VOC	137 lbs/day
SO_X	137 lbs/day
PM_{10}	82 lbs/day
$PM_{2.5}$	65 lbs/day

Construction Activities

Construction activities associated with the Project will result in emissions of VOCs, NOX, SOX, CO, PM10, and PM2.5. Construction related emissions are expected from earthwork (excavation, compaction, soil import/export, slope grading and filling), delivery of structural materials, and pouring of concrete and paving activities.

Dust is typically a major concern during grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions". Fugitive dust emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). CalEEMod was utilized to calculate fugitive dust emissions resulting from this phase of activity. Based on information provided by the Project applicant, the Project is expected to require 3,354 cubic yards (CY) of import. For purposes of analysis the CalEEMod default trip length for hauling activities of 20 miles is has been used.

Construction Worker Vehicle Trips

Construction emissions for construction worker vehicles traveling to and from the Project site, as well as vendor trips (construction materials delivered to the Project site) were estimated based on information from CalEEMod defaults.

Construction Duration

Construction is expected to occur in 2020 and will last for a duration of approximately 1 year. For purposes of analysis, construction is expected to commence in March 2020 and will last through March 2021. Construction duration utilized in the analysis represents a "worst-case" analysis scenario should construction occur any time after the respective dates since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent.

Construction Equipment

The associated construction equipment is shown on Table 5 and is based on information provided by the Project applicant.

Table 5
Construction Equipment Assumptions

Equipment	Equipment Name in CalEEMod	Amount	Duration
Backhoe Loader	Tractor/Loader/Backhoe	1	6 months
Excavator	Excavator	1	6 months
Dump Truck/Hauling Truck	Dumper/Tender	10	6 months
Delivery Truck	Off-Highway Truck	1	6 months
Asphalt Paver	Paver	1	5 days
Steel Wheel Roller	Roller	1	10 days
Concrete Mixers Truck	Cement and Mortar Mixer	3	20 days
Concrete Boom Pump Truck	Other Construction Equipment	1	10 days
Truck Mounted Boom Crane	Crane	1	20 days
Dozer	Rubber Tired Dozer	1	6 months
Water Truck	Off-Highway Truck	1	6 months
Welding Truck	Off-Highway Truck	1	6 months
Electric Generator	Generator Set	1	6 months

Construction Emissions

CalEEMod calculates maximum daily emissions for summer and winter periods. The estimated maximum daily construction emissions without mitigation are summarized on Table 6. Detailed construction model outputs are presented in Appendix A. Under the assumed scenarios, emissions resulting from the Project construction will not exceed criteria pollutant thresholds established by the MDAQMD for emissions of any criteria pollutant.

Table 6
Project Construction Emissions Summary

Year	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Summer						
2020	6.52	60.02	41.37	0.10	9.98	6.03
2021	6.07	53.88	40.26	0.10	9.76	5.77
Winter						
2020	6.52	60.03	41.04	0.10	9.98	6.03
2021	6.07	53.89	39.09	0.10	9.76	5.77
Maximum Daily Emissions	**6.52**	**60.03**	**41.37**	**0.10**	**9.98**	**6.03**
MDAQMD Regional Threshold	137	137	548	1377	82	65
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Operational Emissions

Long-term air quality impacts occur from mobile source emission generated from Project-related traffic and from stationary source emissions generated from natural gas. The proposed Project primarily involves construction activity. For on-going operations, mobile emissions would be generated by the motor vehicles traveling to and from the Project sites during on-going maintenance. However, the Project would generate a nominal number of traffic trips for periodic maintenance and inspections and would not result in any substantive new long-term emissions sources. Stationary area source emissions are typically generated by the consumption of natural gas for space and water heating devices and the use of consumer products. As this Project involves upgrading the existing turnout 6, relocating turnout 7, and existing pipeline, heating and consumer products would not be used. Stationary energy emissions would result from energy consumption associated with the proposed Project. All operational equipment associated with the Project would be electrically powered and would not directly generate air emissions.

The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment. As Project operations would not exceed MDAQMD thresholds, the Project would not violate an air quality standard or contribute to an existing violation. Therefore, Project operations would not result in a cumulatively considerable net increase of any criteria pollutant and impacts would be less than significant.

Impact Analysis

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

Less Than Significant. CEQA requires a discussion of any inconsistencies between a proposed project and applicable general plans and regional plans (CEQA Guidelines Section 15125). The applicable air quality plan is the Western Mojave Desert Air Quality Management District's 2016 Air Quality Management Plan (AQMP). The AQMP is a regional blueprint for achieving air quality standards and healthful air. Conflicts with the AQMP would arise if Project activities result in a substantial increase in employment or population that was not previously adopted and/or approved in a General Plan. Large population or employment increases could affect transportation control

strategies, which are among the most important in the air quality plan, since transportation is a major contributor to particulates and ozone for which the Mojave Desert Air Basin is not in attainment.

The Project would conform to local land use plans, comply with all applicable all MDAQMD Rules and Regulations, and would not have the potential to increase the frequency or severity of a violation in NAAQS and CAAQS. On this basis, the Project is considered to consistent with the Federal Particulate Matter Attainment Plan and Ozone Attainment Plan for the Mojave Desert. The Project is therefore considered to be consistent with the AQMP.

The Project does not propose activities that would change population or employment levels within the air basin, the Project would not conflict with or obstruct implementation of the applicable air quality plan. The Project would implement measures to control air emissions during material handling. Therefore, the proposed Project would not conflict with the MDAQMD's AQMP. A less than significant impact is identified, and no mitigation measures are proposed.

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. The proposed construction would require earthmoving, material removal, and other activities such as removal of plants and /or other organics.

The project's construction activities were screened for emission generation using information from CalEEMod defaults. As shown in Table 6 construction emissions would not exceed MDAQMD thresholds. Less than significant impacts are anticipated.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant. As per the MDAQMD's *Guidelines*, the following project types located within a specified distance to an existing or planned sensitive receptor land use must be evaluated to determine exposure of substantial pollutant concentrations to sensitive receptors:

- Any industrial project within 1,000 feet;
- A distribution center (40 or more trucks per day) within 1,000 feet;
- A major transportation project (50,000 or more vehicles per day) within 1,000 feet; *Adelanto R3 Extension* A dry cleaner using perchloroethylene within 500 feet;
- A gasoline dispensing facility within 300 feet.

The proposed Project's land uses do not include the above uses. As such, no analysis for sensitive receptors is required. Additionally. results of the regional analysis indicate that the Project will not exceed the MDAQMD significance thresholds during construction or operations. Therefore, sensitive receptors would not be subject to a significant air quality impact during Project construction and operational activities.

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

Less Than Significant. The Project construction equipment would generate odors from the combustion of fuels. The determination of an impact from Project-generated odors is dependent on a number of variables including:

- Nature of the odor source;
- Frequency of odor generation (e.g., daily, seasonal, activity-specific);
- Intensity of the odor (e.g., concentration);
- Wind direction (e.g., upwind or downwind); and
- Sensitivity of the receptor.

Impacts associated with odors would be temporary during Project construction. It is also anticipated that any short-term odors generated by construction equipment would dissipate.

The Project is not located near any population center. Due to the temporary nature of Project activities impacts and the rural nature of the Project area, the impact would be less than significant and no mitigation measures are proposed.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
IV. BIOLOGICAL RESOURCES: 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 Wildlife or U.S. Fish and Wildlife Service?		X		
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 Wildlife or U.S. Fish and Wildlife Service?				X
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				X
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?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		X		
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?				X

SUBSTANTIATION: (☐ Check if project is located in the Biological Resources Overlay or Contains habitat for any species listed in the California Natural Diversity Database):

A biological resources assessment was prepared by Jericho Systems in June 2019 and is provided in Appendix B.

Regulatory Setting

Federal Endangered Species Act (ESA)

The USFWS administers the federal ESA of 1973. The ESA provides a legal mechanism for listing species as either threatened or endangered, and a process of protection for those species listed. Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any portion of its life history. Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act. Take authorization can be obtained under Section 7 or Section 10 of the act.

No federally listed species were observed during the field survey nor are any expected to occur. No impact to federally protected species or habitats will result from implementation of the proposed Project.

California Endangered Species Act (CESA)

The CDFW administers the State CESA. The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species soon, in the absence of special protection or management. And a rare species is one present in such small numbers throughout its range that it may become endangered if its present environment worsens. Rare species applies to California native plants. Further, all raptors and their nests are protected under Section 3503.5 of the California Fish and Game Code (FGC). Species of Special Concern (SSC) is an informal designation used by CDFW for some declining wildlife species that are not proposed for listing as threatened or endangered. This designation does not provide legal protection but signifies that these species are recognized as sensitive by CDFW.

No State listed species, or other sensitive species were not observed during the field survey nor are any expected to occur. No impact to species protected by the State will result from implementation of the proposed Project.

Migratory Bird Treaty Act (MBTA)

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711) provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA prohibits take of nearly all native birds. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. The USFWS, in coordination with the CDFW administers the MBTA. CDFW's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

Environmental Setting

The proposed Project is located in the City of Victorville between the unincorporated community of Baldy Mesa and the City of Victorville city limits. Pipeline improvements will occur within the right-of-way of Mesa View Drive, beginning at MWA's existing Turnout 6/7 located approximately 650 feet north of 5th Street/del Rosa Road (southern end of the Project) to the Adelanto reservoir tanks located on Olivine Road, approximately 930 feet west of the intersection with Mesa View Drive (northern end of the Project). Improvements will also occur within the disturbed, previously developed turnout and reservoir site facilities. The Project site can be found on *Baldy Mesa* USGS 7.5' quadrangle, Township 5 North, Range 5 West, Section 33 approximately latitude 34.47181, longitude -117.40739.

The local vicinity of Project area occurs in southwestern portion of the high desert in the County of San Bernardino within the Mojave Basin and Range Ecoregion. An Ecoregion is a regional area that has similar ecosystems in terms of type, quality, and quantity of environmental resources. The Mojave Basin and Range Ecoregion consists of broad basins and scattered mountains that are relatively low, warm, and dry. Creosote bush, white bursage, Joshua tree and other yuccas, and blackbrush are typical in the basin are and at the higher elevations, sagebrush, juniper, and single leaf pinyon are typical.

Hydrologically, the Project site is located within the Upper Mojave hydrologic area, in an undefined 556821-acre hydrologic sub-area (HSA 628.20) within the Bell Mountain Wash-Mojave River watershed(HUC 180902080706). Soils in this area consist of Cajon sand with 0 to 2 percent slopes and 9 to 15 percent slopes.

The climate and environment of the area is typical of southern California "high desert" country, so-called because of its higher elevation than the Colorado Desert to the southeast. The climate is marked by extremes in temperature and aridity, with summer highs reaching well over 110ºF and winter lows dipping below freezing. Average annual precipitation is less than 5 inches.

The immediate vicinity of the Project area consists of adjacent residential developments located approximately 100 feet to the north of the intersection of Mesa View Drive and Olivine Road and along Mesa View Drive, south of Bear Valley Road. Mesa View Drive is an unpaved roadway between MWA's Turnout 6/7 to approximately 1,300 feet north, near the intersection with Bear Valley Road. The remainder of Mesa View Drive between approximately Bear Valley Road and Olivine Road is a paved, two-lane roadway. Olivine Road, from the intersection of Mesa View Drive and the reservoir site is an unimproved dirt roadway.

A July 2019 biological resources field survey (Appendix B) identified that habitat adjacent to each Project component consists of Joshua Tree (*Yucca brevifolia*) woodland with an understory of the creosote bush (*Larrea tridentata*), sticky lessingia (*Lessingia glandulifera*), rubber rabbitbrush (*Ericameria nauseosa*), silver cholla (*Cylindropuntia echinocarpa*), and *Schismus ssp*.

No amphibian species were observed or otherwise detected within the Project area and none are expected to occur. Reptile species observed within the Project area include desert spiny lizard *(Sceloporus magister*) and western side-blotched lizard (*Uta stansburiana elegans*). Although not observed, other common reptile species expected to occur within the Project area include desert glossy snake (*Arizona elegans eburnata*), Mohave shovel-nosed snake (*Chionactis occipitalis*), desert banded gecko (*Coleonyx variegatus variegatus*), and northern Mohave rattlesnake (*C. scutulatus scutulatus*).

Avian species observed in the Project area include verdin, greater roadrunner, red-tailed hawk, American kestrel, turkey vulture, common raven, rock wren, loggerhead shrike, black-tailed gnatcatcher, LeConte's thrasher, house sparrow, lesser goldfinch, black phoebe, and house finch.

No State- and/or federally-listed threatened or endangered species, or other sensitive species were observed on site during the July 2019 field survey.

Sensitive Habitat

Joshua tree and cacti are protected under specific sections of the Codes of Regulations for the Cities of Victorville, Hesperia, Apple Valley, and Adelanto and County of San Bernardino. If the Joshua trees on site cannot be avoided, a Relocation-Protected Plant Plan will need to be prepared and approved prior to construction.

There are 53 Joshua Trees within the fence line surrounding the existing water reservoir tanks. Turnout 7 will be constructed within the northeast corner of the fence line. Several Joshua Trees have the potential to be impacted here depending on construction envelope and staging areas.

Further, numerous Joshua Trees occur adjacent to west side of Mesa View Dr. Figure 2 depicts the locations of the Joshua Trees within the fence line and within 50 feet of the roadside as these trees may potentially be impacted by the project construction. Only one Joshua Tree occurs within 25 feet of the roadside. The remaining Joshua Tres are greater than 50 feet from the roadside and were excluded from further analysis because impacts to them will be avoided.

Sensitive Species

The biological resources study (Appendix B) included wildlife database queries from various State and federal relevant databases for the *Baldy Mesa* USGS quadrangle. According to the database queries, 13 sensitive species (7 vertebrates and 6 plant species) have been documented in the *Baldy Mesa* USGS quadrangle.

Of the State- and/or federally-listed species documented within the *Baldy Mesa* USGS quadrangle, the following have been documented in the project vicinity (within approximately 3 miles) of the Project site:

- Desert tortoise (DT)
- Mohave ground squirrel (MGS)
- burrowing owl (BUOW)

Desert Tortoise (Gopherus agassizii) – State and Federal threatened

The DT is a State- and federally listed threatened species typically found in creosote bush scrub. They are most often found on level or sloped ground where the substrate is firm but not too rocky. Tortoise burrows are typically found at the base of shrubs, in the sides of washes and in hillsides. Because a single tortoise may have many burrows distributed throughout its home range, it is not possible to predict exact numbers of individuals on a site based upon burrow numbers.

In 1992 the BLM issued the *California Statewide Desert Tortoise Management Policy* which included categorizing habitat into three levels of classification. The management goal for Category I areas is to maintain stable, viable populations and to increase the population where possible. The management goal for Category II areas is to maintain stable, viable populations. The management goal for Category III areas is to limit population declines to the extent feasible. In April 1993, the BLM amended the CDCA plan to delineate these three categories of desert tortoise habitat on public lands. With the adoption of the West Mojave Plan (BLM 2005), all lands that are outside Desert Wildlife Management Areas are characterized as Category 3 Habitat, which is the lowest priority management area for viable populations of the desert tortoise.

The July 2019 Biological Resources report identified the following regarding DT:

- The Project is not within the USFWS desert tortoise Critical Habitat Overlay
- The Project is not within any BLM-designated Desert Wildlife Management Area (USFWS 2011), and the habitat surrounding the Project components would be characterized as Category 3 Habitat, per the BLM categorization of desert tortoise habitat on public lands.
- DT are documented to occur approximately 5 miles northeast of the Project area. There are no DT occurrences documented within 5 miles of the Project site. The surrounding habitat is considered marginal at best for DT.
- The result of the survey was that no evidence of desert tortoise was found in the survey area. No desert tortoise individuals or sign including burrows or scat were observed. Therefore, desert tortoise are currently considered absent from the Project site and adjacent areas surveyed.

Mohave Ground Squirrel – (Xerospermophilus mohavensis) – State threatened

The MGS is a State-listed threatened species that typically inhabits sandy soils of alkali sink and creosote bush scrub habitat. The Mohave ground squirrel forages on leaves and seeds and aestivate/hibernate for long periods of the year. Plants documented as forage for this species include: fiddleneck (*Amsinckia tessellata*), allscale (*Atriplex canescens* and *A. polycarpa*), desert holly (*A. hymenelytra*), coreopsis (*Coreopsis* sp.), spiny hopsage (*Grayia spinosa*), winterfat (*Krascheninnikovia lanata*), wolfberry (*Lycium andersonii*), Joshua tree (*Yucca brevifolia*) and

the seeds of Joshua tree. It is suspected that Mohave ground squirrel forage on the plant species with the highest water content available at the time.

MGS emerge from hibernation in February and begin pair bonding and mating during March. If rainfall is adequate, MGS will reproduce. If rainfall levels do not provide sufficient rainfall to support significant annual plant growth, then MGS will merely forage on herbaceous perennials and shrubs in order to gain enough body mass to survive another prolonged period of dormancy and will not reproduce in that year. The adult males can enter dormancy as early as late May. Juveniles will remain above-ground until August in order to gain sufficient fat reserves prior to entering dormancy.

MGS occur in the western half of the Mojave Desert. Its historical range encompasses an area between Antelope Valley and Lucerne Valley, in the south. However, MGS occurrences in the southern portion of its range are very rare. The northern limits of the range are near Owens Dry Lakebed, in the north, and through China Lake Naval Weapons Station and Fort Irwin Military Base, in the east. The eastern limits extend to Barstow and south along the Mojave River. The western limits loosely follow Highway 14 and the foothills of the southern Sierra Nevada escarpment.

The July 2019 Biological Resources report identified the following regarding DT:

- An occurrence of MSG is documented within 3 miles of the Project site to the south.
- The habitat on site is does not consist of diverse shrub cover or plant species typically associated with this species and the habitat is in a degraded state and would not be considered suitable to support this species.
- Further investigation is not warranted for this Project.

Burrowing Owl - (Athene cunicularia) – State and Federal Species of Special Concern

The BUOW is a ground dwelling owl typically found in arid prairies, fields, and open areas where vegetation is sparse and low to the ground. The BUOW is heavily dependent upon the presence of mammal burrows, with ground squirrel burrows being a common choice, in its habitat to provide shelter from predators, inclement weather and to provide a nesting place (Coulombe 1971). They are also known to make use of human-created structures, such as cement culverts and pipes, for burrows. BUOW spend a great deal of time standing on dirt mounds at the entrance to a burrow or perched on a fence post or other low to the ground perch from which they hunt for prey. They feed primarily on insects such as grasshoppers, June beetles and moths, but will also take small rodents, birds, and reptiles. They are active during the day and night but are considered a crepuscular owl; generally observed in the early morning hours or at twilight. The breeding season for BUOW is February 1 through August 31.

The BUOW is not listed under the State or federal ESA but is considered both a State and federal SSC. The BUOW is a migratory bird protected by the international treaty under the Migratory Bird Treaty Act of 1918 and by State law under the California FGC (FGC #3513 & #3503.5).

The July 2019 Biological Resources report identified the following regarding DT:

- BUOW are documented within a 3–mile radius of the Project site.
- No evidence of BUOW was found in the Project survey area. No BUOW individuals or sign including pellets, feathers or whitewash were observed.
- The habitat adjacent to all aspects of the Project site is characterized as marginally suitable for this BUOW.

Nesting Birds

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711) provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered a take under federal law. The USFWS, in coordination with the CDFW administers the MBTA. CDFW's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

Vegetation suitable for nesting birds does exist within and adjacent to the Project area. Most birds are protected by the MBTA.

Jurisdictional Waters

Waters of the US

The USACE has authority to permit the discharge of dredged or fill material in waters of the U.S. under Section 404 CWA. WoUS are defined as: "All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters" (Section 404 of the CWA; 33 CFR 328.3 (a). CWA jurisdiction exists over the following:

No drainage areas are identified within or adjacent to any component of the Project activities, therefore no WoUS occur that would be subject to the CWA.

Wetlands

No hydrophitic vegetation, hydric soils and/or wetland hydrology, are present within or adjacent to any of the Project components. Wetlands that would be subject to the CWA do not occur within the alignment or within the Project facilities.

State Lake/Streambed

The Project areas showed no signs of surface flow, banks, beds, or channels that would be subject to the FGC. Streambed waters do not occur on any of the sites or within any portion of the pipeline alignment or within the Project facilities.

Impact Analysis

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 Wildlife or U.S. Fish and Wildlife Service?

Less Than Significant With Mitigation Incorporated. The proposed Project will not affect State or federally listed endangered, threatened species because there is no habitat to support these species within, adjacent to, or in

the broader vicinity of the Project area. In addition, the proposed Project will not adversely affect Critical Habitat as none exists within the Project area. There is marginally suitable habitat for the California sensitive burrowing owl along all of the Project component areas. Therefore, to reduce potential impacts to BUOW **Mitigation Measure BIO-1** is recommended. Mitigation measures are at the end of this section.

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 Wildlife or U.S. Fish and Wildlife Service?

No Impact. There is no riparian habitat or sensitive natural community identified in the Project area or within the existing facilities. There will be no impact.

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

No Impact. There are no wetlands or wetland vegetation or federally-protected wetlands in the Project area or within the existing facilities. There will be no impact.

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 With Mitigation Incorporated. There are no established native resident or migratory wildlife corridors or wildlife nursery sites. However, vegetation bordering and within the Project area has the potential to support nesting birds and migratory birds protected under the MBTA. Therefore, to reduce potential impacts to nesting birds **Mitigation Measure BIO-2** is recommended. Mitigation measures are at the end of this section.

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

Less Than Significant With Mitigation Incorporated. Joshua Trees, which are protected under the City of Victorville, are within the Project area. While it is anticipated that the Project construction and components will not be within areas that will disturb Joshua Trees, **Mitigation Measure BIO-3** is incorporated to ensure impacts will be less than significant. Mitigation measures are located at the end of this section.

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 Project alignment is not within any Habitat Conservation Plan or Natural Community Conservation Plan or other approved local, regional or state plan. Therefore, there is no impact.

Mitigation Measures:

BIO-1 A preconstruction survey by a qualified biologist shall be conducted within 30 days prior to ground disturbance of any Project component to avoid direct take of burrowing owls. If the results of the survey indicate that no burrowing owls are present on-site, then grading can continue. If burrowing owls are found to be present or nesting within any portion of the Project components during the preconstruction survey, then the following recommendations must be adhered to: Exclusion and relocation activities may not occur during the breeding season, which is defined as March 1 through August 31, with the following exception: From March 1 through March 15 and from August 1 through August 31 exclusion and relocation activities should be in accordance with the California Department of Fish and Wildlife (CDFW) recommendations. This determination must be made by a qualified biologist.

BIO-2 Bird nesting season generally extends from February 1 through September 15 in southern California and specifically, April 15 through August 31 for migratory passerine birds. To avoid impacts to nesting birds (common and special status) during the nesting season, a qualified Avian Biologist will conduct pre-construction Nesting Bird Surveys (NBS) prior to project-related disturbance to nestable vegetation to identify any active nests. If no active nests are found, no further action will be required. If an active nest is found, the biologist will set appropriate no-work buffers around the nest which will be based upon the nesting species, its sensitivity to disturbance, nesting stage and expected types, intensity and duration of disturbance. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved no-work buffer zone shall be clearly marked in the field, within which no disturbance activity shall commence until the qualified biologist has determined the young birds have successfully fledged and the nest is inactive.

BIO-3 The Project should be designed to avoid sensitive desert plants such as Joshua Trees and California juniper, as described by the City of Victorville Joshua Tree and Native Vegetation Preservation Ordinance (City of Victorville, Chapter 14.04). This includes equipment staging and storage. In the event said sensitive desert plants cannot be avoided, the MWA shall prepare a relocation plan and obtain all permits through the City of Victorville as required.

Impact Conclusions:

No significant adverse effects are anticipated with the inclusion of the above mitigation measures.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?		X		

SUBSTANTIATION: (Check if project is located in the Cultural ☐ Resources overlays or cite results of cultural resource review)

In August 2019, CRM Tech studied the potential Cultural Resources for the MWA Adelanto R3 Project (Appendix C. The CRM Study consisted of the following:

- Records search at the South Central Coastal Information Center (SCCIC), California State University, Fullerton.
- Geoarchaeological analysis to assess the APE's potential for the deposition and preservation of subsurface cultural deposits from the prehistoric period, which cannot be detected through a standard surface archaeological survey.
- Historical background research for this study.
- Field surveys.

Regulatory Setting

Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act mandates that federal agencies take into account the effects of their undertakings on historic properties and seek ways to avoid, minimize, or mitigate any adverse effects on such properties (36 CFR 800.1(a)). "Historic properties," as defined by the Advisory Council on Historic Preservation, include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior" (36 CFR 800.16(l)). The eligibility for inclusion in the National Register is determined by applying the following criteria, developed by the National Park Service as per provision of the National Historic Preservation Act:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
> (b) that are associated with the lives of persons significant in our past; or
> (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

California Environmental Quality Act

CEQA establishes that a project that may cause a substantial adverse change in the significance of a "historical resource" is a project that may have a significant effect on the environment (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria of historical significance, CEQA guidelines mandate that "generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(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.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

Environmental Setting

More specifically, the APE is located on the southwestern outskirts of the City of Victorville, surrounded mostly by undeveloped desert land (Appendix C). Immediately to the east of the APE, two residential tracts have been laid out in recent years, but most of the home lots in the neighborhoods remain to be built upon. The terrain along the project alignment is relatively level, with a gradual incline to the south, and the elevations range approximately from 3,300 feet to 3,370 feet above mean sea level. Naturally occurring quartz fragments were observed throughout.

The Victor Valley is a part of the Mojave River watershed. During the Late Pleistocene and early Holocene periods, the region experienced four separate high stands of Lake Mojave and other pluvial lakes. These episodes afforded greater access to water by aboriginal groups in the region, while the desiccation of the lakes forced them to move closer to the Mojave River, which provided not only a dependable water source and subsistence resources but also a major route for interregional trade. Many of the Native American archaeological sites identified in and around the Victor Valley consist of ancient habitation debris such as middens, groundstone fragments, chipped-stone pieces, fire-affected rocks, and faunal remains. Rock shelters, bedrock milling features, and rock art panels have also been found in the region. As expected, most of these sites occur along the banks of the Mojave River.

Pre-Historical Context

The Victor Valley area is situated near the vaguely delineated "boundary" between the traditional territories of the Serrano and the Vanyume peoples. The Serrano's territory is centered at the San Bernardino Mountains, but also includes part of the San Gabriel Mountains, much of the San Bernardino Valley, and the Mojave River valley in the southern portion of the Mojave Desert, reaching as far east as the Cady, Bullion, Sheep Hole, and Coxcomb

Mountains. The name of the group, Serrano, was derived from a Spanish term meaning "mountaineer" or "highlander."

Prior to European contact, the Serrano were primarily hunter-gatherers and occasionally fishers, and settled mostly on elevated terraces, hills, and finger ridges near where flowing water emerged from the mountains. They were loosely organized into exogamous clans, which were led by hereditary heads, and the clans in turn were affiliated with one of two exogamous moieties. The clans were patrilineal, but their exact structure, function, and number are unknown, except that the clans were the largest autonomous political and landholding units. There was no pan-tribal political union among the clans, but they shared strong trade, ceremonial, and marital connections that sometimes also extended to other surrounding nations, such as the Kitanemuk, the Tataviam, and the Cahuilla.

Although contact with Europeans may have occurred as early as 1771 or 1772, Spanish influence on Serrano lifeways was negligible until the 1810s, when a mission *asistencia* was established on the southern edge of Serrano territory. Between then and the end of the mission era in 1834, most of the Serrano in the western portion of their traditional territory were removed to the nearby missions. In the eastern portion, a series of punitive expeditions in 1866-1870 resulted in the death or displacement of almost all remaining Serrano population in the San Bernardino Mountains. Today, most Serrano descendants are affiliated with the San Manuel Band of Mission Indians, the Morongo Band of Mission Indians, or the Serrano Nation of Indians.

Historical Context

The first European visitor known to have arrived in the present-day Victor Valley area was the famed Spanish explorer Francisco Garcés, who traveled through the valley in 1776, shortly after the beginning of Spanish colonization Alta California in 1769 (Beck and Haas 1974:15). The earliest Euroamerican settlements appeared in the Victor Valley as early as 1860 (Peirson 1970:128). Despite these "early starts," due to its harsh environment, development in the arid high desert country of southern California was slow and limited for much of the historic period, and the Victor Valley remained only sparsely populated until the second half of the 20th century.

The City of Victorville traces its roots to a station on the Santa Fe Railroad, which was completed by the California Southern Railway Company, a Santa Fe subsidiary, in 1885. The station was initially named Victor, after Jacob Nash Victor, general manager of the California Southern Railway Company (Richards 1966). With the coming of the railroad, settlement activities began in earnest in the Victor Valley in the 1880s, and reached a peak in the 1910s. The townsite was laid out in 1886, and by 1890, Victor had become a settlement of approximately 100 residents. In 1901, the name of the town was changed to Victorville to avoid confusion with Victor, Colorado.

In 1962, the City of Victorville was incorporated with a population of approximately 8,110 and an area of 9.7 square miles (City of Victorville n.d.[a]). Over the 55 years since then, it has become one of the fastest growing cities in California, largely as a "bedroom community" in support of the industrial and commercial centers in the Greater Los Angeles area. At the present, the city has expanded to more than 73 square miles, with an estimated population of more than 120,000.

Results – Historical Resources

According to SCCIC records, portions of the current project alignment have been included in five previous cultural resources studies. Among these were a large-scale overview completed in 1980, a linear survey along the intersecting Bear Valley Road in 1987 and, more recently, three linear studies completed in 2011-2012 for the existing MWA water supply system, which covered the southernmost portion of the APE. The APE as a whole, however, had not been surveyed systematically for cultural resources prior to this study.

Maps maintained by the SCCIC further indicate that as a result of these previous studies, particularly the 1980 overview, two linear features from the early historic period have been recorded as crossing the northern half of the

APE. Designated as Site 36-004203 (CA-SBR-4203H) and Site 36-004411 (CA-SBR-4411H) in the California Historical Resources Inventory, the two linear features represent the former routes of the Tejon Road-Palmdale Cutoff, a branch of the Old Spanish Trail/Mormon Trail system, and the entire length of the Mormon Trail in San Bernardino County, respectively.

Historical sources consulted for this study demonstrate that other than the winding dirt road previously recorded across this area as a part of Site 36-004203 and Site 36-004411, no other man-made features were noted within or adjacent to the APE throughout the 1850s-1950s era. The road was known to be present at least by the 1850s, and was clearly a branch of the Old Spanish Trail/Mormon Trail system. However, based on the historic maps and past studies on this historic trail system, it was evidently not one of the main branches of the Old Spanish Trail or the Mormon Trail, which traversed instead to the east and the south of the project location along more direct routes to the Cajon Pass.

By the early 1940s, a number of automobile highways had been constructed in the surrounding area, including U.S. Routes 66 and 395, State Route 138, Palmdale Road, and Phelan Road. As a result, the components of the original Old Spanish Trail/Mormon Trail system no longer served their original function and had often been obliterated by later development. The branch of the trail across the APE was evidently truncated roughly a mile southwest of the project location, but the segment closer to the APE has survived to the present time (Appendix C).

During the 1950s-1960s, Bear Valley Road/Duncan Road, then an unpaved road at this location, and a few other dirt roads came into being in the project vicinity. Two of the three water tanks at the Adelanto reservoir site were built between 1968 and 1994, followed by the third between 2006 and 2009. Also in the early 2000s, the residential tracts to the east and northeast of the APE, with a small portion extending to the opposite side of Mesa View Drive, were laid out and some of the homes were built, but the development went into hiatus after 2009 and little further construction occurred until late 2017.

Within the APE itself, Olivine Road and the southern portion of Mesa View Drive first appeared between 1968 and 1994. The northern portion of Mesa View Drive, between Bear Valley Road and Olivine Road, did not come into being in its current configuration until 2003-2005, but it soon became a paved road in 2006-2009 while the southern portion has remained unpaved to the present time, as has Olivine Road.

CRM Tech also conducted a field survey of Site 36-004203 (CA-SBR-4203H) and Site 36-004411 (CA-SBR-4411H). The determination was as follows:

- **Site 36-004203/36-004411.** Site 36-004411 represents the entire length of the historic Mormon Trail in San Bernardino County, and Site 36-004203 represents Tejon Road-Palmdale Cutoff, a branch of the trail, both of which date to the mid-19th century and remained in use until the early 20th century. The Mormon Trail, itself a part of the Old Spanish National Historic Trail system, played a crucial role in the early settlement and growth of southern California after the U.S. annexation of the territory in 1848. The overall historic significance of the Mormon Trail as a whole is beyond any question, as demonstrated by the designation of two monuments along other segments of the trail in the Cajon Pass area as California Historical Landmarks Nos. 576 and 577, which were then automatically included in the California Register.

  The segment of Site 36-004203/36-004411 within the APE boundaries, however, has been largely destroyed by past construction activities along the Mesa View Drive corridor. The surviving portion of the trail is now a nondescript dirt road marked by an abundance of recent motor vehicle tire tracks. It is essentially a working component of the modern transportation—and probably recreation—infrastructure and demonstrates no distinctively historical character. As such, the existing road retains little historic integrity—other than the aspect of location—to relate to its heydays between the mid-19th century and the early 20th century, or to the historic period in general.

Based on these considerations, the present study concludes that the portion of Site 36-004203/36-004411 in and near the APE does not appear eligible for listing in the National Register or the California Register, and does not qualify as a "historic property" or a "historical resource." Furthermore, as the proposed undertaking at this location consists solely of trenching within the paved roadbed of Mesa View Drive for pipeline installation, it has no potential to affect the current condition and appearance of the remaining segments of the road.

- **Site 3503-1H.** Site 3503-1H consists of a small surface scatter of common refuse items of unknown but likely incidental origin, which represents the most proliferate type of historic-period sites in the southern California desert region. This minor site does not demonstrate a documented association, let alone a close association, with any person or event of recognized historic significance. In the absence of an exceptional quantity or quality of the artifacts, the site does not hold the potential for any important archaeological data, and what little data potential it may have is largely exhausted through its recordation into the California Historical Resources Inventory. Therefore, Site 3503H does not appear to meet any of the criteria for the National Register or the California Register, and does not constitute a "historic property" or a "historical resource."

Results - Archaeological Resources

Geographically, the APE is located on relatively level, open terrain on the Victor Valley floor. Surface soils in the vicinity have been mapped as part of the Cajon Series, which were developed on alluvial fans and derived from granitic sources (USDA 2019). Morton and Miller (2006) identify the surface sediments along most of the project alignment as alluvial deposits of Mid-Holocene age and those around the northwestern end of the APE, near an intermittent drainage, as fluvial deposits from the Early Holocene Epoch.

Existing prehistoric hunter-gatherer settlement-subsistence models for inland southern California suggest that long-term settlements were more likely to occur on elevated terraces, hills, and finger ridges near permanent or reliable sources of water, while the open valley floor was used mainly for resource procurement and travel routes. The area around the APE has no elevated geographic features, nor a permanent or reliable water source, but may be subject to flooding during the occasional heavy rains. Generally speaking, this geographic setting would not have been favorable for long-term habitation by the aboriginal population in prehistoric times, although the area could have been utilized for hunting, gathering, and temporary camping.

Almost the entire APE is located within the rights-of-way of existing public roadways, including paved as well as unpaved roads, where the surface and near-surface soils have been extensively disturbed by construction activities associated with both the roads themselves and the accompanying underground utility lines. Based on these considerations, the subsurface component of the APE appears to be relatively low in sensitivity for buried deposits of intact, potentially significant archaeological remains, especially those of prehistoric origin.

Impact Analysis

a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?

Less Than Significant with Mitigation Incorporated. The CRM Tech 2019 study concluded that no "historic properties" or "historical resources" as defined by either Section 106 or CEQA are present within the APE. However, in the event an unanticipated resource is discovered, implementation of **Mitigation Measure CUL-1** and **CUL-2** are incorporated to ensure any potential impact will be less than significant. Mitigation measures are located at the end of this section

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

Less Than Significant with Mitigation Incorporated. The CRM Tech 2019 study concluded that the subsurface sediments in the APE appear to be relatively low in archaeological sensitivity. Therefore, there will be no change in an archaeological resource. However, in the event an unanticipated resource is discovered, implementation of **Mitigation Measure CUL-1, CUL-2,** and **CUL-3** are incorporated to ensure any potential impact will be less than significant. Mitigation measures are located at the end of this section.

c) Disturb any human remains, including those interred outside of formal cemeteries?

Less Than Significant With Mitigation Incorporated. There are no known human remains within the vicinity of the project site, and no conditions exist that suggest human remains are likely to be found on the project site. It is not anticipated that implementation of the project would disturb human remains, including those interred outside of formal cemeteries. However, ground-disturbing activities, such as grading or excavation, have the potential to disturb human remains. If human remains are found, those remains would require proper treatment, in accordance with applicable laws. The Native American Graves Protection and Repatriation Act (NAGPRA) includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on federal and tribal lands, and penalties for noncompliance and illegal trafficking. State of California Public Resources Health and Safety Code Section 7050.5-7055 describes the general provisions regarding human remains, including the requirements if any human remains are accidentally discovered during excavation of a site. As required by state law, the requirements and procedures set forth in Section 5097.98 of the California Public Resources Code would be implemented, including notification of the County Coroner, notification of the Native American Heritage Commission and consultation with the individual identified by the Native American Heritage Commission to be the "most likely descendant." If human remains are found during excavation, excavation must stop in the vicinity of the find and any area that is reasonably suspected to overlie adjacent remains until the County Coroner has been called out by local law enforcement, and the remains have been investigated and appropriate recommendations have been made for the treatment and disposition of the remains.

Mitigation Measures CUL-3 would ensure the proper management of human remains if encountered on the project site.

With the implementation of **Mitigation Measures CUL-1** through **CUL-3**, impacts would be less than significant. Mitigation measures are at the end of this section.

Mitigation Measures:

CUL-1 In the event that pre-contact cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI), and any other affiliated Tribes, as decided by the Lead Agency, shall be contacted, as detailed within Mitigation Measure TCR-1, if any such find occurs and be provided information after the archaeologist makes his/her initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment.

CUL-2 If significant cultural resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, the archaeologist shall develop a Monitoring and Treatment Plan, the drafts of which shall be provided to SMBMI for review and comment, but not precluding other

tribes as the Most Likely Descendent, as detailed within Mitigation Measure TCR-1. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly.

CUL-3 If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and Public Resources Code Section 5097.98, and enforced for the duration of the project. These code provisions require notification of the County Coroner and the Native American Heritage Commission, who in turn must notify those persons believed to be most likely descended from the deceased Native American, the Most Likely Descendant (MLD), for appropriate disposition of the remains. Excavation or disturbance may continue in other areas of the project site that are not reasonably suspected to overlie adjacent remains or archaeological resources.

Impact Conclusions:

No significant adverse effects are anticipated with the inclusion of the above mitigation measures.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VI. ENERGY: Would the project:				
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

An energy analysis was performed for the Project by Urban Crossroads and is located in Appendix D. The purpose of the analysis was to ensure that energy implication is considered by the as the lead agency, and to quantify anticipated energy usage associated with construction of the proposed Project, determine if the usage amounts are efficient, typical, or wasteful for the land use type, and to emphasize avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Regulatory Setting

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation, the United States Department of Energy, and the United States Environmental Protection Agency are three federal agencies with substantial influence over energy policies and programs. Federal requirements and programs are generally related to the consumption of energy by vehicles. These include the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) to promote the development of intermodal transportation systems; and the Transportation Equity Act for the 21st Century (TEA-21) enacted in 1998, that ties transportation decisions and land use decisions in order to improve the environment.

Transportation projects developed as part of the intermodal transportation systems proposed in the region are the responsibility of the Southern California Association of Governments (SCAG) through its 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The RTP/SCS provides objectives for meeting emissions reduction targets set forth by the California Air Resources Board (CARB) to reduce greenhouse gas emissions from automobiles and light trucks through integrated transportation, land use, housing, and environmental planning. The intent is to reduce the vehicles miles traveled thus resulting in lower GHG emissions and a reduction in the amount of fossil fuels used in the region.

The State's Regulations include the following:

California Energy Commission

The California Energy Commission is responsible for preparing the State Energy Plan in order to assist regional and local agencies with improvements to transportation systems that would result in reduced traffic congestion, improved air quality, and an increase in the efficiency of fuel supplies. The intent is to ultimately reduce vehicle miles traveled and increase the use of alternatives to cars including mass transit, and safer bicycles and pedestrian access.

California Energy Code

Title 24, Part 6 of the California Code of Regulations which is also referred to as the California Energy Code, enacted in 1978 sets forth the energy efficiency standards for residential and nonresidential buildings that are updated approximately every three years. The latest update took effect in January 2017.

Integrated Energy Policy Report

Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the California Energy Commission to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (Public Resources Code § 25301a]). The Energy Commission prepares these assessments and associated policy recommendations every two years, with updates in alternate years, as part of the Integrated Energy Policy Report.

The 2018 Integrated Energy Policy Report (2018 IEPR) was adopted February 20, 2019, and continues to work towards improving electricity, natural gas, and transportation fuel energy use in California. The 2018 IEPR focuses on a variety of topics such as including the environmental performance of the electricity generation system, landscape-scale planning, the response to the gas leak at the Aliso Canyon natural gas storage facility, transportation fuel supply reliability issues, updates on Southern California electricity reliability, methane leakage, climate adaptation activities for the energy sector, climate and sea level rise scenarios, and the California Energy Demand Forecast.

State of California Energy Plan

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The Plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

Impact Analysis

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

Less Than Significant. Information from the CalEEMod 2016.3.2 outputs for the Air Quality Assessment (Appendix A) was utilized in this analysis, detailing Project related construction equipment, transportation energy demands, and facility energy demands.

Based on the *2017 National Construction Estimator*, the typical power cost per 1,000 square feet of construction per month is estimated to be $2.32. The Project plans to develop approximately 14,590 square feet of area the course of 12 months. Based on Table 7, the total power cost of the on-site electricity usage during the construction of the proposed Project is estimated to be approximately $406.19. Additionally, as of July 26, 2019, SCE's general service rate schedule (GS-1) for general uses are $0.08 per kilowatt hour (kWh) of electricity. As shown on Table 8, the total electricity usage from on-site Project construction related activities is estimated to be approximately 5,077 kWh.

As presented in Table 9, Project construction activities would consume an estimated 114,594 gallons of diesel fuel. Project construction would represent a "single-event" diesel fuel demand and would not require on-going or permanent commitment of diesel fuel resources for this purpose.

Table 7
Project Construction Power Cost

Power Cost (per 1,000 SF of construction area per month)	**Total Construction Area Size** (1,000 SF)	**Construction Duration** (months)	**Project Construction Power Cost**
$2.32	14.590	12	$406.19
		TOTAL PROJECT CONSTRUCTION POWER COST	***$406.19***

Table 8
Project Construction Electricity Usage

Cost per kWh	**Project Construction Electricity Usage (kWh)**
$0.08	5,077
TOTAL PROJECT CONSTURCTION ELECTRICTY	***5,077***

Table 9
Construction Equipment Fuel Consumption Estimates

Equipment	HP Rating	Quantity	Usage Hours	Load Factor	HP-hrs/day	Total Fuel Consumption (gal. diesel fuel)
Cement and Mortar Mixers	9	3	8	0.56	121	1,707
Cranes	231	1	8	0.29	536	7,561
Dumpers/Tenders	16	10	8	0.38	486	6,862
Excavators	158	1	8	0.38	480	6,776
Generator Sets	84	1	8	0.74	497	7,016
Off-Highway Trucks	402	3	8	0.38	3,666	51,724
Other Construction Equipment	172	1	8	0.42	578	8,153
Pavers	130	1	8	0.42	437	6,162
Rollers	80	1	8	0.38	243	3,431
Rubber Tired Dozers	247	1	8	0.40	790	11,151
Tractors/Loaders/Backhoes	97	1	8	0.37	287	4,051
CONSTRUCTION FUEL DEMAND (GALLONS DIESEL FUEL)						***114,594***

As supported by the preceding analyses, Project construction would not result in the inefficient, wasteful or unnecessary consumption of energy. Further, the energy demands of the Project can be accommodated within the context of available resources and energy delivery systems. The Project would therefore not cause or result in the need for additional energy producing or transmission facilities. The Project would not engage in wasteful or inefficient uses of energy and aims to achieve energy conservations goals within the State of California.

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

Less Than Significant. The Project includes construction activity and associated improvements and would not result in the inefficient, wasteful, or unnecessary consumption of energy. In fact, improving the pipelines and maintenance facilities would result in a more efficient process and consequently reduce a wasteful use of energy. Further, the Project would not cause or result in the need for additional energy producing facilities or energy delivery systems.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VII. GEOLOGY AND SOILS: Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
• 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.			X	
• Strong seismic ground shaking?			X	
• Seismic-related ground failure, including liquefaction?			X	
• Landslides?			X	
b) Result in substantial soil erosion or the loss of topsoil?		X		
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			X	
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?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

SUBSTANTIATION: (☐ Check if project is located in the Geologic Hazards Overlay District):

Environmental Setting

A Geotechnical Desktop Study Report was completed for the Project in July 2019 (contained within Project Design Report in Appendix E).

The project alignment is located in the Mojave Desert Geomorphic Province of Southern California. The Mojave Desert is a broad interior region of isolated mountain ranges separated by wide desert plains. The area is roughly triangular shaped and bounded by the Garlock Fault on the north, the San Andreas Fault on the southwest, and the Colorado River on the east. The drainages are primarily closed and terminate in playas within the valley floors.

The province is a seismically active region primarily characterized by a series of northwest-southeast-trending strike-slip faults and east-west trending secondary faults. The most prominent of the nearby fault zones include the

Helendale, Lenwood, Landers, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time. Extension of the region has resulted in exposure of basement rocks dating to the Precambrian age, deposition of young Holocene-aged sedimentary basins, and eruptions of volcanic units.

The pipeline alignment and Turnout No. 7 location are primarily underlain by young (middle Holocene -aged) alluvial fan deposits. These deposits primarily consist slightly to moderately consolidated silt, sand, and gravel with possible cobbles and boulders.

Faults

The Southern California region is seismically active, with the north-south San Andreas Fault dividing the state. The San Andreas Fault is the sliding boundary between the Pacific Plate and the North American Plate. It slices California in two from Cape Mendocino to the Mexican border. San Diego, Los Angeles and Big Sur are on the Pacific Plate. San Francisco, Sacramento and the Sierra Nevada are on the North American Plate.

The Alquist-Priolo Earthquake Fault Zoning Act (California Public Resources Code Sections 2621 et seq.) was signed into law in 1972 to mitigate the hazard of fault rupture by prohibiting structures for human occupancy across the trace of an active fault. This state law was passed in direct response to the 1971 San Fernando earthquake, which caused extensive surface fault ruptures that damaged numerous homes, commercial buildings and other structures. The act requires the State Geologist to delineate "Earthquake Fault Zones" along faults that are "sufficiently active" and "well defined," that is they show evidence of surface displacement within the last 11,500 years (Holocene Epoch) along one or more or their segments (sufficiently active) and are clearly detectable by a trained geologist as a physical feature at or just below the ground surface (well defined).

No portion of the pipeline alignment or Turnout No. 7 is located within a currently designated State of California or San Bernardino County Earthquake Fault Zone (Converse Consultants, Appendix E). The nearest active fault zones are the Apple Valley Fault Zone 12.1 miles east-southeast; the San Andreas Fault Zone 13 miles southwest, and the Helendale-South Lockhart Fault Zone 18.1 miles northeast.

Landslides

Seismically induced landslides and rock falls may occur in areas with steep slopes that contain unconsolidated young alluvial deposits or artificial fills. The Project area is flat, with no hills or slopes.

Liquefaction

Liquefaction is the phenomenon in which loosely deposited granular soils and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure, and causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near saturated cohesionless soils at depths shallower than 50 feet. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking.

Soil liquefaction occurs during or after strong ground shaking. There are several requirements for liquefaction to occur. They are as follows.

- Soils must be submerged
- Soils must be loose to medium-dense
- Ground motion must be intense
- Duration of shaking must be sufficient for the soils to lose shear resistance

Historical high groundwater at the project site is not known but is anticipated to be deeper than 400 feet bgs, based on measurements of two sites within 1 mile of the pipeline alignment, which show groundwater to be between 460 and 500 feet below ground surface. Based on the lack of shallow groundwater, liquefaction is not likely a risk for the pipeline alignment or Turnout No. 7. As part of Project development, MWA will conduct soil borings to conduct a dry seismic evaluation.

Impact Analysis

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

- *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.*
- *Strong seismic ground shaking?*
- *Seismic related ground failure, including liquefaction?*
- *Landslides?*

Less Than Significant. The Southern California region is seismically active, with the north-south San Andreas Fault dividing the state. The Project areas are not within any Alquist-Priolo areas, or areas where strong ground shaking or liquefaction would occur. Therefore, there is a less than significant impact.

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

Less Than Significant With Mitigation Incorporated. In the Yucca Valley area, surface geologic units consisting predominantly of unconsolidated or semiconsolidated sand, silt, and gravel overlie bedrock in the area. During construction, the construction/installation of facilities have a potential to cause soil erosion. Any erosion and sedimentation that may occur due to excavation and grading activities will be controlled through the use of appropriate use of best management practices (BMPs) for wind and water erosion and subsequent sedimentation from the areas disturbed by construction and installation activities. **Mitigation Measure GEO-1** identifies the typical performance standards that must be met by these BMPs. Therefore, potential erosion impacts related to installing the proposed facilities will not cause any significant adverse erosion or sedimentation impacts with the implementation of this mitigation measure.

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

No Impact. The facilities will be installed within flat areas and are not exposed to significant rockfall or other hazard. Therefore, there is no impact.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less Than Significant. Expansive soils are considered those that contain a significant amount of clay and are subject to swelling as a response to changes in water content. Soils with a high content of expansive material can form cracks in drier seasons, and impact building loads. In the Project areas expansive soils are not considered a hazard because the soils contain little clay, and no habitable structures are proposed as part of the Project. Therefore, there is a less than significant impact.

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 is the construction and installation of water service infrastrucutre. The project does not include installation or operation of any proposed septic tanks, so there can be no adverse impacts regarding this issue. Note that as part of implementing the proposed project, the existing septic tanks will be pumped to remove any residual wastewater or related by products and then either demolished or filled to prevent future damage from collapse. None of the Project activities propose or involve the use of septic tanks or alternative wastewater disposal systems. Therefore, there is no impact.

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

Less Than Significant With Mitigation. There are no unique geological features that have been identified in the Project alignment or within the Project facilities. Excavation for the Project components is not anticipated to be greater than 5 feet. The Project components are generally underlain by young (middle Holocene -aged) alluvial fan deposits, and the Project areas are classified as "Low Sensitivity" by the City of Victorville (Comprehensive Planning Services, August 14, 2008). Therefore, while it is unlikely that paleontological resources may occur within the soils found within the Project component areas, to accommodate any unanticipated resources **Mitigation Measure GEO-2** is required for all Project components. Mitigation measures are located at the end of this section.

Mitigation Measures:

GEO-1 The contactor will provide to the MWA an Erosion Control Report (ECR) that will identify the Best Management Practices (BMPs) for managing any excavated or stockpiled materials. The BMPs may include but not be limited to the following:

- Prevent mud and debris from entering roadways, including the main entry road by providing trackout measures.
- Locate stockpiles away from drainage courses, drain inlets or concentrated flows of storm water.
- For wind erosion control, apply water or other dust palliative to stockpiles. Smaller stockpiles may be covered as an alternative.
- Place bagged materials on pallets under cover.
- During the rainy season, non-active soil stockpiles will be covered with heavy plastic and the stockpile contained within a temporary perimeter sediment barrier, such as berms, dikes, silt fences, or sandbag barriers. A soil stabilization measure may be used in lieu of cover.
- During the non-rainy season prior to the onset of rain, the stockpile should either be covered or protect them with temporary perimeter sediment barriers.
- Year-round, active soil stockpiles will be protected with temporary linear sediment barriers prior to the onset of rain.
- Pipelines placed within unpaved roadways will be graded and watered at least once per day, or as often as necessary to control dust.

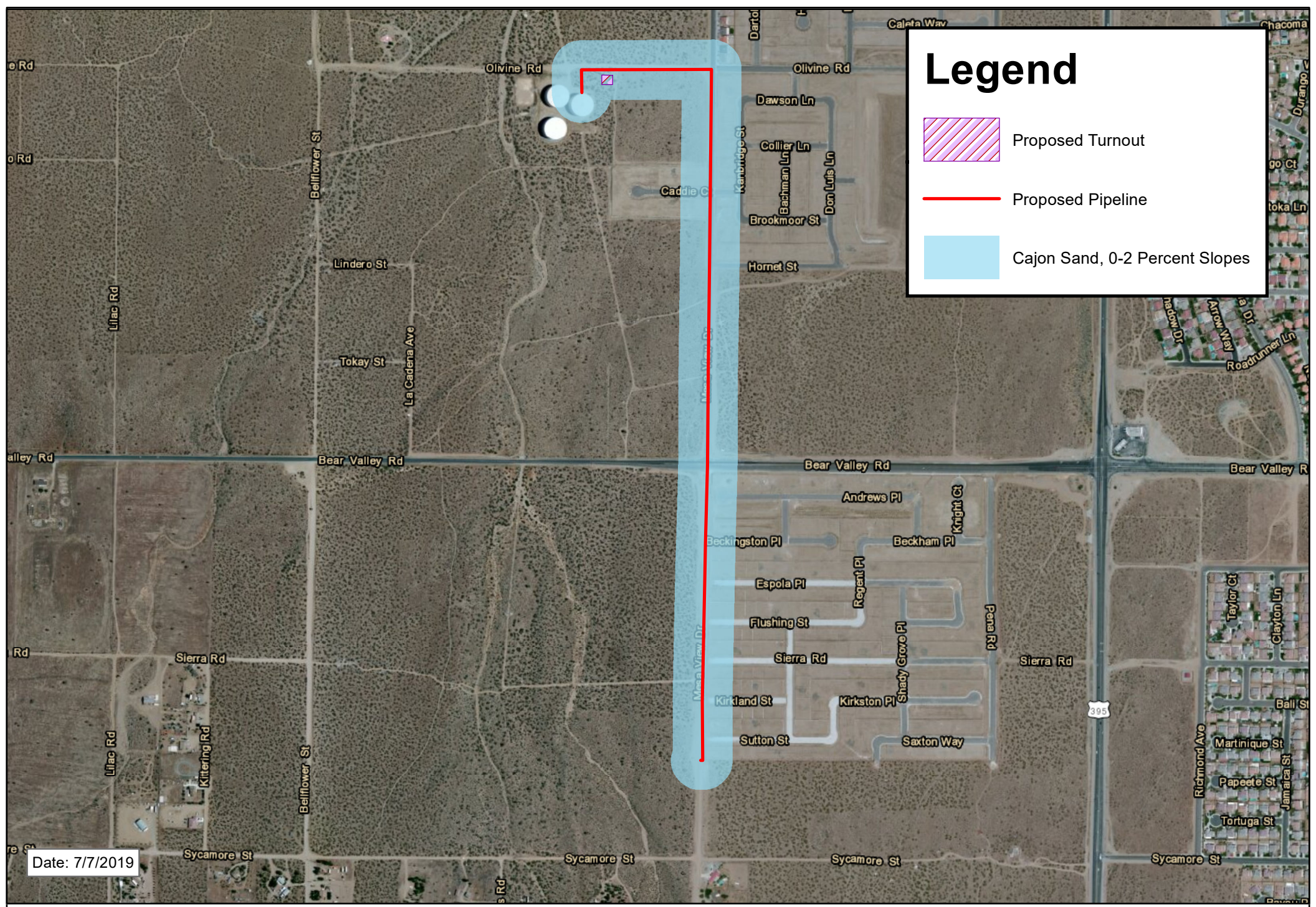
- Trenches will remain open for as short a time as possible.
- The Plan will identify proper compaction for all pipelines and lift station facilities.

GEO-2 **Paleontological Resources**. The contractor performing the work will be required to receive a Worker Environmental Awareness Training that will train workers on various environmental subjects including the potential for paleontological resources. Additionally, any substantial excavations (i.e. over 5 feet in depth) should be monitored closely by the contractor to quickly and professionally recover any fossil remains discovered while not impeding construction.

Impact Conclusions:

No significant adverse effects are anticipated with the inclusion of the above mitigation measures.

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Legend
Proposed Turnout
Proposed Pipeline
Cajon Sand, 0-2 Percent Slopes
Olivine Rd
Dawson Ln
Collier Ln
Brookmoor St
Hornet St
Lindero St
Tokay St
Bear Valley Rd
Andrews Pl
Beckham Pl
Espola Pl
Flushing St
Sierra Rd
Kirkland St
Kirkston Pl
Sutton St
Saxton Way
Sycamore St
Bellflower St
Lilac Rd
La Cadena Ave
Kittering Rd
Knight Ct
Regent Pl
Shady Grove Pl
Pena Rd
Taylor Ct
Clayton Ln
Martinique St
Papeete St
Tortuga St
Jamaica St
Richmond Ave
Roadrunner Ln
Arrow Way
Caddie Ct
Bachman Ln
Don Luis Ln
Kenbridge St
Caleta Way
Chacoma
Durango
395
Date: 7/7/2019
0 0.075 0.15 0.3 0.45 0.6 Miles
1 inch = 804 feet
Imagery Date: 8/6/2017
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,
JERICHO SYSTEMS INCORPORATED
Section Figure VII-1
Soils
MWA Adelanto R3 Extension Project
Victorville, CA

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	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
VIII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

According to CEQA Guidelines Section 15064.4, when making a determination of the significance of greenhouse gas emissions, the "lead agency shall have discretion to determine, in the context of a particular project, whether to (1) use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use." In addition, CEQA Guidelines section 15064.7(c) provides that "a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts" on the condition that "the decision of the lead agency to adopt such thresholds is supported by substantial evidence." For the purpose of this initial study SCAQMD guideline will be adhered to.

An assessment of the Project's anticipated Greenhouse Gas emissions is provided in Appendix F.

Regulatory Setting

State Executive Orders and Legislation

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark AB 32 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

The California State Legislature enacted AB 32, which requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "GHGs" as defined under AB 32 include CO2, CH4, N2O, HFCs, PFCs, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs.

As shown below, the 2010 emission inventory achieved this target.

- 1990: 427 MMTCO2e (AB 32 2020 target)
- 2000: 463 MMTCO2e (an average 8 percent reduction needed to achieve 1990 base)
- 2010: 450 MMTCO2e (an average 5 percent reduction needed to achieve 1990 base)
- 2020: 545 MMTCO2e BAU (an average 21.7 percent reduction from BAU needed to achieve 1990 base)

Over the past several years, the State of California has adopted a number of regulations for fuels, vehicles, and land uses aimed at reducing GHG.

Environmental Setting

Constituent gases of the Earth's atmosphere, called atmospheric greenhouse gases (GHG), play a critical role in the Earth's radiation amount by trapping infrared radiation emitted from the Earth's surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO_2), methane (CH_4), ozone, water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate.

Anthropogenic (caused or produced by humans) emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses.

Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO_2 and nitrous oxide (NOx) are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2, where CO_2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean. Table ___, *Description of Greenhouse Gases*, provides a description of each of the greenhouse gases and their global warming potential.

Table 10
Description of Greenhouse Gases

GHG	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (N_20), also known as laughing gas is a colorless gas. It has a lifetime of 114 years. Its global warming potential is 298	Microbial processes in soil and water, fuel combustion, and industrial processes. In addition to agricultural sources, some industrial processes (nylon production, nitric acid production) also emit N_20.
Methane	Methane (CH_4) is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 28-36.	A natural source of CH_4 is from the decay of organic matter. Methane is extracted from geological deposits (natural gas fields). Other sources are from the decay of organic material in landfills, fermentation of manure, and cattle farming.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons	CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). They are gases formed synthetically by replacing all hydrogen atoms in methane or methane with chlorine and/or fluorine atoms. Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone, therefore their production was stopped as required by the Montreal Protocol.
Hydrofluorocarbons	Hydrofluorocarbons (HFCs) are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 14,800.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Sulfur hexafluoride	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 22,800.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Impact Analysis

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

Less Than Significant. On October 17, 2017, the SCAQMD, in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model™ (CalEEMod) v2016.3.2. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOCs, NOX, SOX, CO, PM10, and PM2.5) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures. Accordingly, the latest version of CalEEMod™ has been used for this Project to determine GHG emissions. Construction activities associated with the Project would result in emissions of CO2 and CH4 from construction activities (see Appendix A).

Table 11
Project GHG Emissions

	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Annual construction-related emissions	1,534.32	0.41	0.00	1,544.69
Total CO_2E (All Sources)	**1,544.69**			

In terms of operational GHG emissions, the proposed Project involves upgrading the existing Turnout 6, relocating Turnout 7, and existing pipeline. The proposed Project does not include any substantive new stationary or mobile sources of emissions, and therefore, by its very nature, will not generate quantifiable GHG emissions from Project operations. While it is anticipated that the Project would require intermittent maintenance to be, such maintenance would be minimal requiring a negligible amount of traffic trips on an annual basis. Therefore, there is no significant operational impact.

The City of Victorville has not adopted a numeric significance threshold for determining significant impacts associated with GHG emissions. As such thresholds established by the MDAQMD are utilized.

On May 13, 2010, the EPA finalized the GHG Tailoring Rule. The Tailoring Rule sets major source emissions thresholds that define when federal operating permits under PSD or Title V are required. The Tailoring Rule establishes a threshold of 100,000 tpy or 90,719 MT/yr of GHGs from new sources above which sources are considered major sources requiring a federal operating permit.

As such, the MDAQMD has adopted a significance threshold for GHGs of 100,000 tpy and is thus applied to this project. More specifically, 100,000 tpy of GHG emissions from a single facility constitutes major sources that require a federal operating permit. Similarly, the MDAQMDs NOX significance threshold of 25 tons/year is equal to the major source threshold applicable to areas designated severe non-attainment for ozone. As such, use of the EPAs determination of whether a Project is a major source and consequently establishing a threshold based on that is supported by substantial evidence.

The annual GHG emissions associated with the operation of the proposed Project are estimated to be 1,544.69 MTCO2e per year as summarized in Table 11. As such, the proposed Project would result in a less than significant impact.

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

Less Than Significant. As discussed above, the Project involves construction activity and does not propose a trip-generating land use or facilities that would generate any substantive amount of on-going GHG emissions. As presented in Table 11, the project's short-term GHG emissions are below the 90,719 MT/yr screening threshold. As concluded above, the proposed Project would not generate a significant amount of GHGs emissions. The proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Impacts are less than significant in this regard.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
IX. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		X		
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?		X		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
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?				X
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 for people residing or working in the project area?				X
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?		X		

Environmental Setting

The section was developed by reviewing general and comprehensive plans, county and city websites, querying Federal and State databases, and evaluating aerial imagery.

Regulatory Setting

Hazardous materials and hazardous wastes are heavily regulated by a range of federal, State and local agencies. One of the primary hazardous materials regulatory agencies is the California Environmental Protection Agency (EPA) Department of Toxic Substances Control (DTSC). DTSC is authorized by the U.S. EPA to enforce and implement federal hazardous materials laws and regulations.

Federal and State hazardous materials regulations require all businesses that handle more than a specified amount of hazardous materials or extremely hazardous materials to obtain a hazardous materials permit and submit a business plan to its local Certified Unified Program Agency (CUPA). The CUPA also ensures local compliance

with all applicable hazardous materials regulations. For the Town of Yucca Valley, the CUPA is the San Bernardino County Fire Department, Hazardous Materials Division which also manages the following hazardous waste programs:

- Hazardous Materials Release Response Plans and Inventory
- California Accidental Release Program
- Underground Storage Tanks
- Aboveground Petroleum Storage Act/Spill Prevention, Control, and Countermeasure Plan
- Hazardous Waste Generation and Onsite Treatment
- Hazardous Materials Management Plans and Inventory

Hazardous Waste Sites Near the Project Area

State and Federal databases were reviewed to identify hazardous waste facilities including Federal Superfund sites, State Response sites, Voluntary Cleanup sites, School Cleanup sites, Permitted Operating sites, Corrective Action sites, and Tiered Permit sites within or adjacent to the Project. The database search revealed that there were no sites of concern within the Project area.

Airports

Southern California Logistics Airport, also known as Victorville Airport, is a public airport located in the city Victorville. The facility is located near the Mojave River, approximately 3 miles north of the intersection of Interstate 15 and the Mojave River, and approximately 7 miles northeast of the Project site. Prior to its civil usage, the facility was known as George Air Force Base, from 1941 to 1992 a US Air Force training facility.

The airport is home to Southern California Aviation, a large transitional facility for commercial aircraft. As a logistics airport, it is designed for business, military, and freight use. There are no commercial passenger services at this facility except for freight and charter flights.

Fire Hazard Zones

A wildland fire is an uncontrolled fire in areas of little or no development, but these fires can quickly spread to the urban/wildland interface where development meets expanses of vegetative fuels. The expansive open space areas in and surrounding the Project areas can be susceptible to destructive wildland fires, often exacerbated by dry weather and Santa Ana winds.

The California Department of Forestry and Fire Protection (Cal Fire) adopted updated Fire Hazard Severity Zone maps for each county in 2007. The agency used various types of data to map out these zones, which are ranked either Very High, High, or Moderate Fire Hazard Severity. All of these adopted zones apply to "State Responsibility Areas," which include land under the jurisdiction of state agencies and counties. Soon after, Cal Fire recommended to "Local Responsibility Area" jurisdictions (cities, towns, etc.) maps of Very High Fire Hazard Severity Zones using the same methods.

Areas that are designated as Very High or High Fire Hazard Severity Zones are the most likely to experience wildfire, and structures in these zones can be potentially impacted.

Cal Fire has identified that the Project areas are within a low or no fire hazard severity zone. Moderate potential for wildland fires exist immediately south of the existing Turnout 6/7.

Impact Analysis

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

Less Than Significant With Mitigation Incorporated. Project construction would involve the use of heavy equipment, which would contain fuels, oils, lubricants, solvents, and various other possible contaminants. Temporary storage tanks necessary to store fuel and/or other flammable or combustible liquids required on the Project Site during construction would be regulated through the applicable federal, State, and local regulations as overseen by agencies such as the State Department of Health Services and San Bernardino County. Therefore, impacts related to construction hazards are considered less than significant with mitigation incorporated.

The Proposed Project would involve the removal of existing asphalt. Asphalt is not currently regulated as a hazardous material, but potential contaminants in the asphalt binder require off-site disposal restrictions imposed by the State of California Integrated Waste Management Board. The asphalt removed may be ground on-site and reused in the road base material. Or, the asphalt may be hauled for disposal. Implementation of **Mitigation Measure HAZ – 1** would ensure that all asphalt removed from the Proposed Project would be disposed of in accordance with current regulations at a permitted facility. Mitigation measures are located at the end of this section.

The water that will be directed from Turnout 6 to Turnout 7 will be treated with chlorine through a chlorination system that will be installed in the new Turnout 7 building. The Project's chlorination system combines calcium hypochlorite tablets that are specifically formulated to help prevent scale formation inside the chlorination chamber, especially in hard-water areas. Because the tablets are calcium hypochlorite-based, the system does not require a separate entry building or room as is the case with chlorine gas, and it takes up a fraction of the space required for a similar bleach system. MWA and Adelanto has an existing Spill Prevention Control and Countermeasures Plan (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during water treatment activities and operations. Therefore, there will be less than significant impacts from the use of the chlorination system.

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 With Mitigation Incorporated. The potential exists for localized spills of petroleum-based products or other chemicals during construction. These spills could expose construction workers and the public to hazardous materials either directly, at the site of the spill, or indirectly, by introducing these substances into stormwater runoff. Construction workers are trained to handle general construction-related spills. However, implementation of **Mitigation Measure HAZ-2** will also help reduce impacts from construction spills. Therefore, the impact is 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. There are no schools within one-quarter mile of the Project components. The closest school is Eagle Ranch Elementary School, at 12545 Eagle Ranch Parkway, approximately 1 mile to the east. Therefore, there is no impact.

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. None of the Project components are located on or near sites that are included on a list of hazardous materials sites, according to State databases. Therefore, there is no impact.

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 for people residing or working in the project area?

No Impact. There are no airports within 2 miles of the Project components, and none of the components are within an airport land use plan area. The nearest airport is the Victorville Airport located approximately 7 miles northeast of the Project site.

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

Less Than Significant. The Project pipeline alignment is within an existing roadway. The contractor will provide traffic control during all aspects of the project, and installation of the pipelines will not impede emergency services or emergency evacuation routes. Therefore, there is a less than significant impact.

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

Less Than Significant With Mitigation Incorporated. The Project components are located throughout the less urbanized areas of the Baldy Mesa area of the City of Victorville. Cal Fire has identified that the Project area is not within a high risk area to expose people to wildland fires. However, vegetation and high winds can produce fast moving fires, and the Project components are part of critical water service infrastructure. Therefore, even though there is a low risk of a fire from construction of the new components, **Mitigation Measure HAZ-3** is incorporated to ensure the potential risk is less than significant. Mitigation measures are located at the end of this section.

Mitigation Measures:

HAZ – 1 All asphalt requiring removal from the Project Site shall be disposed of in accordance with current regulatory standards.

HAZ – 2 A hazardous spill prevention plan shall be prepared by the contractor and submitted to the MWA for approval to minimize the likelihood of a spill shall be prepared prior to construction. The plan shall state the actions that would be required if a spill occurs to prevent contamination of surface waters and provide for cleanup of the spill. The plan shall follow Federal, state, and local safety guidelines and standards to avoid increased exposure to these pollutants.

HAZ-3 During construction, all staging areas, welding areas, or areas slated for construction using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Spark arresting equipment shall be in good working order. The MWA shall require all vehicles and crews working at the project site to have access to functional fire extinguishers at all times. In addition, construction crews are required to have a spotter

during welding activities to look out for potentially dangerous situations, including accidental sparks. The contractor also shall provide a safety plan for the implementation of additional protocols when the National Weather Service issues a Red Flag Warning. Such protocols should address smoking and fire rules, storage and parking areas, use of gasoline-powered tools, use of spark arresters on construction equipment, road closures, use of a fire guard, fire suppression tools, fire suppression equipment, and training requirements.

Impact Conclusion:

No significant adverse effects are anticipated with the inclusion of the above mitigation measures.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
X. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			X	
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:			X	
• result in substantial erosion or siltation onsite or offsite;			X	
• substantially increase the rate or amount of surface water runoff in a manner which would result in flooding on or offsite;			X	
• create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			X	
• impede or redirect flood flows?			X	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation??				X
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	

Environmental Setting

The Project is located within the Mojave River Watershed which encompasses approximately 4,700 square miles and is located entirely within San Bernardino County. The primary geographic and surface hydrologic feature of the watershed is the Mojave River. Elevations within the watershed range from 8,500 feet above sea level at Butler Peak in the San Bernardino Mountains to 1,400 feet above sea level at Afton Canyon near the terminus of the Mojave River. Average elevation in the Victor Valley is 2,900 feet above sea level (Comprehensive Planning Services, August 14, 2008).

The Project areas are located in the City of Victorville which draws its groundwater supply from the Alto (or "Upper Mojave") sub-basin of the Mojave River Ground Water Basin. The depth to groundwater ranges from 50 feet near

the Mojave River to approximately 550 in the Project area. Infiltration from precipitation from watersheds in the San Bernardino and San Gabriel Mountains is the source of this regional ground water storage area. Overdrafting began during the late 1950's, resulting in an average annual decline in the water table of 1 to 2 feet.

Groundwater within the City of Victorville is generally of good quality, as evidenced by annual water quality reports produced by the Victorville Water District, which provides service to the City of Victorville. The City of Victorville also receives supplemental water from the existing R³ Project through deliveries from Turnout Nos. 3, 5 and 6.

The MWA is proposing the Adelanto R³ Extension Project (Project) to extend its wholesale water delivery service to the community of Adelanto by extending a new pipeline along Mesa View Drive in the Baldy Mesa area of Victorville to the existing Adelanto pipeline and reservoir located near Mesa View and Olivine Road south of the City of Adelanto. The Project will construct approximately 1 mile of underground pipeline along Mesa View Drive, beginning at MWA's existing turnout located approximately 0.13 mile north of Del Rosa Road on the south to the Adelanto reservoir tanks located on Olivine Road, approximately 0.17 mile west of the intersection with Mesa View Drive (Figure 1 and Figure 2). The Project includes upgrades to MWA's existing Turnout 6/7 by the addition of a booster pump unit, minor piping and electrical modifications, and the relocation of Turnout 7 to the Adelanto reservoir tanks site.

Construction activities would require the storage and use of hazardous materials and other urban pollutants such as gasoline, diesel fuel, oils, solvents, and trash, which could enter drainages and degrade downstream water quality and/or violate applicable water quality standards or waste discharge requirements.

However, the RWQCB requires that dischargers whose construction projects disturb one (1) or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity Construction General Permit Order 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading and disturbances to the ground such as stockpiling, or excavation. The Construction General Permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer (QSD). The SWPPP would include BMPs to be implemented during and after project construction to minimize erosion and sedimentation of downstream watercourses.

The Project components will cumulatively involve 3 acres of soil disturbance. Therefore, a SWPPP will be required.

Impact Analysis

a) Violate any water quality standards or waste discharge requirements?

Less Than Significant With Mitigation Incorporated. The project impacts are anticipated to include:

Potential short-term surface water quality impacts related to Project construction activities include runoff of loose soils and/or construction wastes and fuels that could potentially percolate into the ground. Because the construction disturbance is more than 1 acre, a SWPPP is required. To ensure that the construction related impacts remain at a level of less than significant, **Mitigation Measure HYD-1** is required. Mitigation Measures are located at the end of this section.

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 Project would not result in an increased demand for or use of groundwater. The new turnout building for Turnout 7 and the pipeline construction not create a significant amount of new impervious surfaces that would impede surface water drainage into the soil, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level, and impacts are therefore considered less than significant.

The Project is also consistent with MWA's R^3 Project which includes groundwater recharge and water delivery. Implementation of this Project will not prevent MWA from implementing the groundwater recharge portions of the R^3 Project. Therefore, the impact is 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:

- *result in substantial erosion or siltation onsite or offsite;*
- *substantially increase the rate or amount of surface water runoff in a manner which would result in flooding on or offsite;*
- *create or contribute to runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or*
- *impede or redirect flood flows?*

Less Than Significant. No stream or river exists on the Project sites. The existing site drainage involves sheet flow into the adjacent areas and will percolate into the ground. :The post-project conditions will be similar to the existing conditions. No new impacts will occur, and the impacts will be less than significant.

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

No Impact. All components of the Project are identified by Federal Emergency Management Agency (FEMA) as Flood Zone X, or "Area of Minimal Flood Hazard" (FEMA, 8/28/2008). The Project area is not near a lake or the coast, therefore, there is no impact to this criterion.

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

Less Than Significant. According to the MWA's 2015 Urban Water Management plan, the historical local water demand has decreased throughout the service area in the last several years due to drought conditions, economic factors, conservation programs, land use changes, community awareness and local water restriction ordinances. Adelanto is within the Alto Subbasin, which contains the more densely populated areas of the MWA service area.

The purpose of MWA's overall R^3 project is to allow MWA to become less dependent on supplies from the SWP during drought periods or when the Sacramento Delta is under increased stress. While the R^3 Project will allow MWA to manage overall water supplies within its territory, the delivery system components will also allow MWA to build a sustainable water delivery system that provides long-term benefits to the local area.

This project will enable Adelanto to receive the R^3 water as a supplemental water source. The Project will allow the MWA to initially deliver 3,000 AFY to the City of Adelanto, with ultimate delivery planned at 7,900 AFY. Currently, the City of Victorville provides water to Adelanto on a limited basis via an existing pipeline interconnection.

The proposed R^3 project is in agreement with the California Department of Water Resources (DWR) water management goals. DWR recognizes, in its California Water Plan Update 2005, the benefits from conjunctive water management, which include improving water supply reliability, reducing groundwater overdraft, and protecting water quality and environmental conditions (RBF, October 2009).

Therefore, there is a less than significant impact.

Mitigation Measures:

HYD-1 **Prepare and Implement Storm Water Pollution Prevention Plan (SWPPP**). Prior to start of construction, and as part of the Project's compliance with the NPDES requirements, a Notice of Intent shall be prepared and submitted to the Lahontan Regional Water Quality Control Board (RWQCB) providing notification and intent to comply with the State of California General Construction Permit. Also, a SWPPP shall be reviewed and approved by the MWA for water quality construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction site to the "maximum extent practicable." All recommendations in the Plan shall be implemented during area demolition/preparation, grading, and construction. The Project shall comply with each of the recommendations detailed in the Plan, and other such measure(s) as the MWA deems necessary to mitigate potential storm water runoff impacts.

Impact Conclusions:

No significant adverse effects are anticipated with the inclusion of the above mitigation measure.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XI. LAND USE AND PLANNING: Would the project:				
a) Physically divide an established community?				X
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?				X

Environmental Setting

The proposed Project lies within the City limits of the City of Victorville in San Bernardino County. The Project is designed to install a permanent water transmission to the City of Adelanto.

The water system pipeline will be installed underground, following the Mesa View road alignment and turnout facilities will be installed within existing water delivery system infrastructure. Immediately to the east of the Mesa View Road, two residential tracts have been laid out in recent years, but most home lots in those neighborhoods remain to be built upon. All construction will follow the City of Victorville's Development Code, and there will be no changes to Land Use as a result of the Project.

Impact Analysis

a) Physically divide an established community?

No Impact. The Project involves installation of an underground water delivery system within an existing roadway and turnout infrastructure within existing turnout facilities to support the water delivery system. Therefore, the Project will not divide the community, and there will be no impact.

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 proposed Project will follow all Development Code Ordinances in the City of Victorville. Therefore, there will be no impact.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XII. MINERAL RESOURCES: 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?			X	
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?			X	

Environmental Setting

Mineral extraction is an important component of San Bernardino County's economy.

The State of California Department of Conservation classifies areas of important minerals:

MRZ-1: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

MRZ-2: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.

MRZ-3: Areas containing mineral deposits, the significance of which cannot be evaluated from available data.

MRZ-4: Areas of no known mineral occurrences where geologic information does not rule out the presence or absence of significant mineral resources.

The Project area has been classified as MRZ-3a, which "may continue significant aggregate deposit." Neither the Department of Conservation nor the Victorville General Plan has identified any important mineral resources in the Project area.

Trenching for the project is anticipated not to exceed 15 feet deep, and excavated soils are anticipated to be reused as backfill. Imported material would be used for backfill if the existing soils are not found to be suitable. The greatest quantity anticipated for import of fill would be the pipeline backfill, approximately 3,354 cubic yards. Imported material would come from a local source, within the Victorville area.

Impact Analysis

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. The Project occurs within the Baldy Mesa area of the City of Victorville, which may contain significant aggregate deposits but has not been identified has having important mineral resources of value to the region or state. Materials excavated will be reused where appropriate or imported from a local source.

Materials not suitable for backfill will be hauled to a soil material supplier for processing. Therefore, there will not be a loss of any materials that could be considered significant. There will be a less than significant impact.

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?

Less Than Significant. Soils in the Project area have not been identified in the City of Victorville's General Plan as being locally important. Materials excavated will be reused where appropriate or imported from a local source. Materials not suitable for backfill will be hauled to a soil material supplier for processing. Therefore, there will not be a loss of any materials that could be considered significant. There will be a less than significant impact.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusion:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIII. NOISE: Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project site in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
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?				X

Environmental Setting

Noise Fundamentals

Noise is generally described as unwanted sound. Sound is a physical disturbance in a medium, such as air, that is capable of being detected by the human ear. Sound waves in air are caused by variations in pressure above and below the static value of atmospheric pressure. The unit of sound pressure ratio to the faintest sound detectable to a person with normal hearing is called a decibel (dB) on a logarithmic scale. The "pitch" (high or low) of the sound is a description of the frequency, which is measured in Hertz (Hz). Most common environmental sounds are a composite of frequencies. A normal human ear can usually detect sounds within frequencies from 20 to 20,000 Hz. However, humans are most sensitive to frequencies in the range of 500 to 4,000 Hz.

Certain frequencies are given more "weight" during assessment because human hearing is not equally sensitive to all frequencies of sound. The A-weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of 3 dBA or less is barely perceptible to average human hearing. However, a 5 dBA change in noise level is clearly noticeable. A 10 dBA change is perceived as a doubling or halving of noise loudness, while a 20 dBA change is considered a "dramatic change" in loudness.

Sound from a source spreads out as it travels away from the source, and the sound pressure level diminishes with distance. Individual sound sources are considered "point sources" when the distance from the source is large compared to the size of the source (e.g., construction equipment, and turbines). Sound from a point source radiates hemispherically, which yields a 6 dB sound level reduction for each doubling of the distance from the source. If the sound source is long in one dimension, the source is considered a "line source," (i.e., roadways and railroads). Sound from a line source radiates cylindrically, which typically yields a 3 dB sound level reduction for each doubling of the distance from the source.

The metrics for evaluating the community noise environment are based on measurements of the noise levels over a period of time. These metrics are used in order to characterize and evaluate the cumulative noise impacts. The Community Noise Equivalent Level (CNEL) represents a 24-hour A-weighted sound level average from midnight to midnight, where sound levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. Table 12 identifies typical acceptable and unacceptable noise levels.

Table 12
Land Use Compatibility for Community Noise Environments
City of Victorville

Table 5.11-3
Victorville Land Use Compatibility Standards

	Community Noise Exposure Ldn or CNEL, dB						
Land Use Categories	55	60	65	70	75	80+	
Residential - Low Density, Single Family, Duplex, Multi-family, Mobile Home	1	1	2	2	3	4	4
Transient Lodging - Motels, Hotels	1	1	2	2	3	3	4
Schools, Libraries, Churches, Hospitals, Nursing Homes	1	1	2	3	3	4	4
Auditoriums, Concert Halls, Amphitheaters	2	2	3	3	4	4	4
Sports Arena, Outdoor Spectator Sports	2	2	2	2	3	3	3
Playgrounds, Neighborhood Parks	1	1	1	2	3	3	3
Golf Courses, Riding Stables, Water Recreation, Cemeteries	1	1	1	2	2	4	4
Office Buildings, Business Commercial, Retail Commercial and Professional	1	1	1	2	2	3	3
Industrial, Manufacturing, Utilities	1	1	1	1	2	2	2
Agriculture	1	1	1	1	1	1	1

Legend:
1. NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
2. CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and Schools, Libraries, Churches, Hospitals, Nursing Homes 1 needed noise insulation features included in the design. Conventional construction, with closed windows and fresh air supply systems or air conditioning will normally suffice.
3. NORMALLY UNACCEPTABLE: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4. CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.

Noise standards typically apply to permanent activities. The recommended noise exposure levels are established for permanent noise sources and receptors where noise can be generated over a 24-hour period with penalties applied for permanent noise generated during the night time hours. Construction related noise is short-term and generally considered a nuisance. Construction noise is temporary and generally not of sufficient magnitude that is considered health threatening. Table 13 identifies typical construction noise levels.

Table 13
Typical Construction Equipment Noise Levels

Equipment	Noise Level (dBA) at 50 feet
Backhoe	80
Concrete mixer	85
Pump truck	82
Crane, Mobile	85
Dozer	85
Excavator	85
Generator	82
Grader	85
Main lift	85
Loader	80
Paver	85
Roller	85
Scraper	85
Trucks	80-84

Source: FHWA 2009

Ground Borne Vibration Fundamentals

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable.

Sources of vibration the Project may generate would typically include geotech drill rigs, excavators, dump trucks, backhoes, and other general construction equipment. According to the FTA guidelines, a vibration level (VdB) of 65 VdB is the threshold of perceptibility for humans. The FTA guidelines also state that, for a significant impact to occur, vibration levels must exceed 80 VdB during infrequent events (FTA 2006). Based on the approach set forth in the FTA guidelines, (Table 14) this analysis adopts a threshold of significance of 80 VdB for groundborne vibration impacts.

Table 14
Vibration Sources for Typical Construction Equipment

Equipment	Vibration Level at 25 feet (VdB)
Large bulldozer	87
Caisson drilling	87
Loaded Trucks	86
Jackhammer	79
Small bulldozer	58

Source: FTA, 2011

Impact Analysis

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

Less Than Significant. The Project will be installed in existing roadways and within existing MWA or Adelanto site facilities. The relocated Turnout 7 and associated infrastructure will be installed within a building on the existing site of the Adelanto water reservoir. The new pump for Turnout 6 will be installed within the existing building for Turnout 6. The Project area is relatively vacant with no homes or businesses in the vicinity. The Project may increase temporary noise levels, but the impacts will be intermittent and short-term in nature. Permanent noise is not anticipated to exceed standards in the City of Victorville General Plan. The relocated Turnout 7 will be located within a building on an existing site and is not anticipated to exceed the ambient noise levels in the vicinity of the Project site, currently, or upon build out of the Project area.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant. Sources of vibration can include geotechnical drill rigs, excavators, dump trucks, backhoes, and other general construction equipment. According to the Federal Transportation Administration (FTA) guidelines, a vibration level of 65 decibel notation (VdB) is the threshold of perceptibility for humans. The FTA guidelines also state that, for a significant impact to occur, vibration levels must exceed 80 VdB during infrequent events (FTA 2006). Based on the approach set forth in the FTA guidelines, this analysis adopts a threshold of significance of 80 VdB for groundborne vibration impacts.

Is anticipated that the proposed Project would not involve pile-driving activities typically associated with ground-borne vibration. There are no sensitive receptors including residences that are located between 25 and 50 feet from the roadways or the new facilities. Some noise or vibration may occur during excavation for the pipeline and turnout facility. However, given the rural nature and low density of the residential areas where the pipeline and turnout will be installed, as well as the temporary nature of the vibration, a less than significant impact is anticipated.

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 Project is not located within the vicinity of a private airstrip or land use plan. The closest airport, the Victorville Airport, is located approximately 7 miles to the northeast of the Project area. Therefore, there is no impact.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusion:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIV. POPULATION AND HOUSING: Would the project:				
a) Induce substantial 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)?			X	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X

Environmental Setting

The MWA manages groundwater in portions of the Mojave Basin and Morongo Basin, has a service area of over 4,900 miles and has as its primary function the utilization of available water supplies in a manner consistent with California Water Code Section 79562.5(b). The Agency holds a State Water Project contract and utilizes various facilities to import and distribute water to replenish groundwater basins and to meet the obligations of the Mojave Basin Area and Warren Valley judgments related to groundwater supply.

MWA manages six major basins within its service area, of which five are sub-basins of the larger Mojave River Basin. The MWA operates under the Mojave Basin Area Judgment, which sets limits on the amount of groundwater production that can occur in each of the Mojave Basin's subareas without incurring an obligation to purchase imported water.

The MWA also operates under a RWMP, which was revised in 2004, adopted on February 24, 2005 and identifies a variety of potential facilities that might be developed to balance future water demands with available supplies and to maximize the overall beneficial use of water throughout the MWA's service area.

Since the development of the RWMP, the MWA, and its stakeholders created a phased implementation plan designed to address the MWA's previously identified facilities storage, recharge, and funding issues. The phases are now collectively identified as the Regional Recharge and Recovery Project (the "R³ Project"). The R³ Project is a conjunctive use project that stores State Water Project (SWP) water underground in the local aquifer and later recover and distribute the water to local retail water purveyors. The R³ Project utilizes unused aquifer storage capacity in the Mojave Basin to enhance the regional supply of water by recharging the aquifer with inflow from the State Water Project aqueduct. The stored recharged water is then extracted by well facilities for delivery to purveyor turnout locations.

The 2010 R³ EIR Addendum 2 Exhibit 2-7 identified a number of facilities that would be required to meet the delivery requirements, including the Adelanto R³ Extension Project (Figure 3).

The Adelanto pipeline extension will convey R³ water from the existing Turnout 6/7 facility to the Adelanto reservoir site in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto. Included with this project is the construction of a new Turnout 7 facility. This project will deliver the R³ water on an average annual flow basis, with no significant peaking capacity provided (Kennedy-Jenks, July 2019).

According to the MWA's 2015 Urban Water Management plan, the historical local water demand has decreased throughout the service area in the last several years due to drought conditions, economic factors, conservation programs, land use changes, community awareness and local water restriction ordinances. Future projections indicate that population in the region is anticipated to grow 33 percent by 2040 at a rate of 1.6 percent per year, but per capita water use is projected to continue to decrease in the future (Table 15 and Table 16). This projected decrease is due to active water savings, such as the 2014 State mandate for mandatory conservation, and passive water savings, such as building code requirements to utilize low-flow fixtures in indoor plumbing (Kennedy-Jenks, 2016).

Table 2 identifies water demand projected through 2040, including within the Morongo Basin.

The Project is to designed to ensure the City of Adelanto, located within the Este Subbasin has a consistent and reliable water supply.

Table 15
Service Area Population Projections by Subarea

Subarea	2015	2020	2025	2030	2035	2040
Alto	346,665	371,356	407,344	449,520	493,686	535,002
Alto Transition Zone	24,364	26,132	28,465	31,413	34,616	37,663
Baja	4,762	4,812	4,872	4,933	4,989	5,036
Centro	35,524	36,393	37,322	38,248	39,125	39,943
Este	*7,646*	*8,073*	*8,615*	*9,196*	*9,753*	*10,244*
Oeste	11,299	12,406	13,864	15,504	17,152	18,667
Mojave Basin Area (MBA) Subtotal	430,260	459,172	500,482	548,814	599,321	646,555
Morongo	39,291	40,795	42,783	44,995	47,168	49,092
Total MWA Service Area	***469,551***	***499,967***	***543,265***	***593,809***	***646,489***	***695,647***

Source: 2015 Urban Water Management Plan

Table 16
MWA Projected Water Demands by Subarea (AFY)

Subarea	2015	2020	2025	2030	2035	2040
Alto	71,300	80,346	84,767	90,163	95,747	100,823
Baja	29,700	29,700	29,700	29,700	29,700	29,700
Centro	20,100	20,576	20,555	20,551	20,557	20,549
Este	*6,800*	*6,800*	*6,800*	*6,800*	*6,800*	*6,800*
Oeste	3,600	4,002	4,236	4,517	4,796	5,061
MBA Subtotal	131,500	141,424	146,058	151,731	157,600	162,933
Morongo	6,509	6,942	7,128	7,349	7,564	7,767
Total	**138,009**	**148,366**	**153,186**	**159,079**	**165,164**	**170,700**

Source: 2015 Urban Water Management Plan

Impact Analysis

a) Induce substantial 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)?

Less Than Significant. The Project involves construction and installation of water service facilities, which are intended to improve the reliability for water service for the City of Adelanto. The MWA's responsibility is to ensure that its customers have adequate water supply for its existing and projected service needs. And while adequate water supplies to support growth is a factor in substantial population growth of a community, the MWA's role is a supplier of water through the SWP and groundwater recharge. It is up to the individual jurisdictions to control their growth based on infrastructure, such as water, sewer, etc. The Adelanto pipeline extension will convey R^3 water from the existing Turnout 6/7 facility to the Adelanto reservoir site in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto. Ultimately, the type and density of development in Adelanto is controlled by the City of Adelanto. As such, this Project is considered growth-accommodating, not growth-inducing, in that it will help provide reliable water service to development that is approved or allowed by the City of Adelanto.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. The Project involves water transmission pipelines and infrastructure in existing roadways or existing utility-owned property. The Project would not result in displacement of residential land uses; therefore, no impact would occur.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XV. PUBLIC SERVICES: a) 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:				
Fire protection?			X	
Police protection?			X	
Schools?				X
Recreation/Parks?				X
Other public facilities?				X

Environmental Setting

Fire and Police Services are provided for the Project Area by the County of San Bernardino:

San Bernardino County Fire Station 16, 11855 E Street, Victorville, CA (within 3 miles of the Project area)
San Bernardino County Sheriff's Station, 11613 Bartlett Avenue, Adelanto, CA (within 4 miles of the Project area)

The Project area is served by the Victor Elementary School District and the Victor Valley Union High School District.

Impact Analysis

a) 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: Fire Protection, Police Protection, Schools, Recreation/Parks, or Other Public Facilities.

Less Than Significant. The Proposed project may utilize public services of Fire and Police in the event of an emergency such as a worker injury or theft. However, the needs of the proposed Project can be handled with the existing public services and will not result in the need for any of the public service facilities to expand facilities. The proposed Project will not utilize schools or public parks, nor will the proposed Project increase the need for these facilities in a manner that would exceed existing capacity.

Additionally, existing traffic within the construction areas will be accommodated during project construction pursuant to a Traffic Control Plan to be prepared by the contractor. The Project is not expected to require a complete closure of any roadway. The proposed Traffic Control Plan may have the potential to temporarily impact fire and/or police protection emergency service response times during construction. However, the Project would not result in significant threats of deterioration to the existing levels of service at public service facilities nor the need to build

additional public service facilities. A less than significant impact to public services would occur as a result of the Project.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusion:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVI. RECREATION:				
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?				X
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?				X

Environmental Setting

Existing outdoor recreation resources in the City of Victorville include public parks, public golf courses, public access lakes, bicycle paths, pedestrian trails and linkages between recreation areas and urbanized places. There are no recreation facilities in the Project area.

Impact Analysis

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 is to install public water transmission facilities. The proposed Project does not include the construction of recreational facilities and does not include a housing component that would result in population growth. There are no components of the project that would require the construction or expansion of new parks or recreational facilities, nor would development of the Proposed Project result in residential or commercial land uses generating population growth, facilitating increased use of existing facilities which would cause or accelerate substantial physical deterioration of existing facilities. Therefore, there is no impact.

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. See answer to subsection a), above

Mitigation Measures:

No mitigation measures are required.

Impact Conclusion:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVII. TRANSPORTATION / TRAFFIC: Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3,subdivision (b)?			X	
c) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

Environmental Setting

Mesa View Drive, between Olivine Road (northern end of the Project with the Adelanto Reservoir and Turnout 7) and to approximately 500 feet south of the intersection of Bear Valley Road (SR-18) is a paved, two-lane roadway. Mesa View Drive south of the unpaved portion, to the existing MWA Turnout 6/7 facility is unpaved. The City of Victorville General Plan identifies Mesa View Drive and Olivine Road as collector streets.

The efficiency of a roadway is generally determined by assessing the roadway's capacity, level-of service, and average daily traffic volume. Public agencies typically assign Levels of Service (LOS) of roadways as between "A" and "F" with LOS A representing the best, free flow conditions, and LOS F indicates the worst conditions, and system failure. In general, the following descriptions apply to the qualitative levels described above: "A" – free flow; "B" – reasonably free flow; "C" – stable flow; "D" – approaching unstable flow; "E" – unstable flow; and "F" – forced or breakdown flow ("gridlock").

The City of Victorville General Plan policies seek to maintain LOS C or better on all roadways.

As part of its General Plan, the City of Victorville studied various roadways. Mesa View Drive, between Olivine Road and Bear Valley Road was identified as having a level of service "A" Mesa View Drive, between Bear Valley Road and its terminus at Eucalyptus Street was identified as having a level of service "B", most likely due to the non-paved condition of the roadway reduces speed and maneuverability.

Public Transit

Public transportation is provided by Victor Valley Transit Authority, the regional Public Transit operator between San Bernardino, Victorville, Phelan, Hesperia, Barstow, Fort Irwin, and Needles.

Bike and Pedestrian Trails

The Town of Yucca Valley has adopted a Trails Master Plan (adopted March 20, 2005). The trails include riding, pedestrian and bike, multi-use, Class III bike routes and bike lanes.

Aviation

Southern California Logistics Airport (SCLA), also known as the Victorville Airport, is located in the northwest corner of the City of Victorville, north of Air Expressway and west of Interstate 15. SCLA has two existing runways, with one runway being 15,050 feet in length to accommodate international flights during the summer heat. The SCLA Specific Plan (2,300 acres) was adopted by the City to implement related policies of the General Plan Land Use, Noise and Safety Elements relative to growth of SCLA and its compatibility with surrounding areas. The Victorville Airport is located approximately 7 miles northeast of the Project site.

Impact Analysis

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

Less Than Significant. The San Bernardino *County Congestion Management Program* monitors traffic levels in the County based on traffic volumes at roadway intersections. The *Congestion Management Program* (CMP) was created statewide as a result of Proposition 111 and has been implemented locally by the San Bernardino County Metropolitan Transportation Authority (SBCMTA). The CMP for San Bernardino County requires that the traffic impact of individual development projects of potentially regional significance be analyzed. A project is classified by the CMP as regionally significant if it would increase traffic at a CMP intersection by 50 or more two-way trips during either AM or PM peak hours (Comprehensive Planning Services, August 14, 2008).

The Project is anticipated to generate minimal construction traffic to deliver equipment and construct the pipeline along Mesa View Drive, Bear Valley Road, and US Hwy 395. These roadways generally flow in a C or better condition, according to the General Plan. Equipment and material transportation is short-term, usually less than two to four trips per truck. Less than 20 construction workers will be utilizing the project roadways to travel to and from the Project construction site. Due to the short-term nature of the project, and the few numbers of equipment, materials, and personnel needed during construction, the impacts are anticipated to be less than significant.

b) Conflict or be inconsistent with CEQA Guidelines § 15064.3,subdivision (b)?

Less Than Significant. Prior to January 2019, traffic impacts were assessed using the LOS methodology. Senate Bill 743 (SB 743, 2013) required that the analysis be examined, and an alternative method adopted. In December 2018, the California Governor's Office of Planning and Research issued revised CEQA Guidelines Section 15064.3(b) which sets forth the criteria for analyzing transportation impacts. Specifically, this section of the Guidelines focuses on assessing land use projects and transportation projects through associated vehicle miles traveled (VMT), and not LOS. Subsection (b)(4) and subsection (c) allows a lead agency to chose the most appropriate method to evaluate VMT, but all agencies must have their methodology adopted by July 1, 2020, in accordance with SB 743.

The City of Victorville has not yet adopted a VMT standard. However, equipment and materials are readily available in the Victorville area, and the Project is not anticipated to generate a high number of trips. Therefore, there is a less than significant impact.

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

Less Than Significant. The new pipeline will be installed within Mesa View Drive and Olivine Road. Once the pipeline is installed, the roadway will be restored to its pre-construction condition. All other Project components are off-road within existing water facilities. Therefore, the project will not increase hazards due to a design feature.

d) Result in inadequate emergency access?

Less Than Significant. The new pipeline will be installed within the roadway in a manner that will allow at least one lane of traffic to pass, in accordance with a standard traffic control plan. The existing turnout and reservoir facilities have sufficient emergency access, and the Project components will be placed below ground, or above-ground, in a manner that will maintain adequate emergency access. Therefore, there is a less than significant impact.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusions:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XVIII. TRIBAL CULTURAL RESOURCES: 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:				
a) 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), or		X		
b) 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		

Environmental Setting

On June 12, 2019, CRM TECH submitted a written request to the State of California's Native American Heritage Commission (NAHC) for a records search in the commission's sacred lands file (Appendix C) Following the NAHC's recommendations and previously established consultation protocol, CRM TECH further contacted a total of five Native American representatives in the region in writing on June 27, 2019, for additional information on potential Native American cultural resources in the APE vicinity. Follow-up telephone solicitations were then carried out between July 15 and July 19, 2019.

As a result of CRM Tech's outreach, four of the tribes have responded either in writing or by telephone, and all of them requested to participate in further consultation with the lead agencies. Jessica Mauck, Cultural Resources Analyst for the San Manuel Band, confirmed the APE to be a part of the Serrano ancestral territory but stated that the tribe did not consider this area to be particularly sensitive for Native American cultural resources. Ms. Mauck and Travis Armstrong of the Morongo Band both indicated that their respective tribes had no additional information to provide at this time.

Donna Yocum of the San Fernando Band found the project vicinity to be culturally sensitive to the tribe due to the presence of a recorded village site known as Turner Springs, which is located in the northwestern portion of the City of Victorville. In addition to further consultation, Mark Cochrane of the Serrano Nation also requested immediate notification if any cultural resources or human remains were discovered during ground-disturbing activities associated with the undertaking.

In compliance with AB 52 regarding consultation with Native American Tribes and per the request received during the CRM Tech Native American inquiries, the District sent letters to potentially affected tribes describing the proposed Project and its location, and requested a response regarding the potential for impacts to Tribal Cultural Resources to occur. As a result of the tribal dialogue, mitigation measures were developed to ensure no or less than significant impacts to undetermined potential Native American resources.

Impact Analysis

a) 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),

Less Than Significant Impact With Mitigation Incorporated. There are no resources that have been identified as eligible for listing to the California Register of Historic Places within or near the Project alignment. However, based on tribal consultation and information, **Mitigation Measure TCR-1** and **TCR-2** are included to reduce potential impacts to potential yet unidentified Native American resources.

b) 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less Than Significant Impact With Mitigation Incorporated. There are no resources supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. However, based on tribal consultation and information, **Mitigation Measure TCR-1** and **TCR-2** are included to reduce potential impacts to potential yet unidentified Native American resources.

Mitigation Measures:

TCR-1 The San Manuel Band of Mission Indians Cultural Resources Department (SMBMI) shall be contacted, as detailed in CR-1, of any pre-contact cultural resources discovered during project implementation, and be provided information regarding the nature of the find, so as to provide Tribal input with regards to significance and treatment. Should the find be deemed significant, as defined by CEQA (as amended, 2015), a cultural resources Monitoring and Treatment Plan shall be created by the archaeologist, in coordination with SMBMI, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents SMBMI for the remainder of the project, should SMBMI elect to place a monitor on-site. This mitigation measure does not preclude notification to other tribes or treatment plans in accordance with other tribal entities.

TCR-2 Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the applicant and Lead Agency for dissemination to SMBMI. The Lead Agency and/or applicant shall, in good faith, consult with SMBMI, and other tribes as applicable, throughout the life of the project.

Impact Conclusions:

No significant adverse effects are anticipated with the inclusion of the above mitigation measures.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XIX. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			X	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
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?			X	
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?			X	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?				X

Environmental Setting

The MWA is proposing the Adelanto R^3 Extension Project to extend its wholesale water delivery service to the community of Adelanto by extending a new pipeline along Mesa View Drive in the Baldy Mesa area of Victorville to the existing Adelanto pipeline and reservoir located near Mesa View and Olivine Road south of the City of Adelanto and upgrading and relocating two existing turnouts.

Water service within the Project area is currently provided by the Victorville Water District (VWD).

The City of Victorville maintains the areas network of storm drains. The City has determined that its existing network of storm drains does not currently meet regional demand (Comprehensive Planning Services, August 14, 2008). The City recently completed a sewer system master plan (SMP) that describes the City's plans for developing its trunk and interceptor systems.

Southern California Edison (SCE) provides electrical utility service, and Southwest Gas provides natural gas.

Non-hazardous solid and liquid waste generated in the Project Area is currently deposited in the Victorville Landfill, 17080 Stoddard Wells Road, Victorville, which is operated by the County of San Bernardino Public Works Department, Solid Waste Management Division (SWMD). The SWMD is responsible for the operation and management of the solid waste disposal system which consists of six regional landfills, eight transfer stations and five community collection centers throughout the County.

Impact Analysis

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

Less Than Significant. The MWA is proposing the Adelanto R^3 Extension Project to extend its wholesale water delivery service to the community of Adelanto by extending a new pipeline along Mesa View Drive in the Baldy Mesa area of Victorville to the existing Adelanto pipeline and reservoir located near Mesa View and Olivine Road south of the City of Adelanto and relocating an existing turnout.

Wastewater services for construction workers will be provided at the site, by "porta potties" that will be brought in by the contractor. Therefore, there is a less than significant impact.

Stormwater runoff from the roadways and existing facilities where the Project will occur typically sheet flows to the surrounding ground, where it percolates in the ground. The Project will not change existing stormwater patterns. New impervious surfaces added by the Project will be minimal, and stormwater runoff after construction will continue in the same manner as prior to the Project.

The electrical utility needs for the Project will be served by the existing utility grid infrastructure, and there will be no need to add electrical lines. The Project does include additional electrical switches and other mechanical devices on site to control the new equipment. The impact is not significant.

Water will be used for construction, primarily for dust control, and the MWA or City of Victorville has ample rights and supplies to service the Project needs. These impacts are less than significant.

Therefore, the overall impact to this criterion is 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. The Project will only require water during construction. No additional water beyond what is currently used for operations is anticipated to be needed once the Project is operational. The MWA or the City of Victorville has ample water rights and supplies to support the water needs in the reasonably foreseeable future, during normal dry and multiple dry years. Therefore, the impact is 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?

Less Than Significant. The Project will not require the use of wastewater treatment services beyond providing wastewater for construction workers during construction. Therefore, the impact is less than significant.

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. Construction activities may generate small quantities of solid waste, inert materials, and green waste. All waste would be properly disposed of in accordance with all local statutes and regulations. The Victorville Landfill, where waste would be disposed, is permitted to accept up to 3,000 tons per day, and has a remaining capacity of approximately 81.5 million cubic yards as of July 2019 (CalRecycle, September 3, 2019). Therefore, the impact is less than significant.

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

No Impact. The small quantities of solid waste generated by the Project during construction activities would be handled in accordance with all applicable Federal, State, and local statutes and regulations. No impacts would occur under this criterion.

Mitigation Measures:

No mitigation measures are required.

Impact Conclusion:

No significant adverse impacts are identified or anticipated, and no mitigation measures are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XX. WILDFIRE: 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?			X	
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 wildfire?		X		
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?			X	
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?				X

Environmental Setting

Within the Project area, low level brush (such as Russian Thistle or tumbleweeds) and other weeds have the potential of growing on developed lots, vacant lots, and in the urban interface. The accumulation of brush and weeds, in general, has the potential to result in fire that can spread, especially during high wind conditions. In urban areas, fires can quickly jump to developed property and structures. The occurrence of brush and weeds presents a greater potential for wildland fire in the urban interface, as maintenance of such vegetation usually occurs in the urban areas (Comprehensive Planning Services, August 14, 2008).

Impact Analysis

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less Than Significant. All construction will occur within an existing roadways or existing MWA or Adelanto site facilities. No aspect of the Project will impair any emergency response plan or evacuation plan. The new pipeline will be installed within the roadway in a manner that will allow at least one lane of traffic to pass, in accordance with a standard traffic control plan. The existing turnout and reservoir facilities have sufficient emergency access, and the Project components will be placed below ground, or above-ground, in a manner that will maintain adequate emergency access. Therefore, there is a less than significant impact.

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 wildfire?

Less Than Significant With Mitigation Incorporated. The Project area is not identified as being within a high fire area as designated by the City of Victorville. However, low level brush (such as Russian Thistle or tumbleweeds) and other weeds are within the Project area. The accumulation of brush and weeds, in general, has the potential to result in fire that can spread, especially during high wind conditions. The Project is located in an area of the desert that has consistent wind. And though there is a low risk of a fire, sparks from equipment during construction may ignite vegetation in the area of construction during extremely high winds. Therefore, **Mitigation Measure FIRE-1** is incorporated to ensure the potential risk is less than significant. The mitigation measure is located at the end of this section.

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?

Less Than Significant. The relocated Turnout 7 will require a new connection to the existing SCE power grid via standard utility equipment and the Turnout 6 modifications will require an upgraded connection to the existing SCE power grid via standard utility equipment. No other components require installation or maintenance of associated infrastructure that could exacerbate a fire risk. The new and upgraded electrical connection to the SCE power grid is a standard commercial connection that requires no special equipment, nor does the connection require the installation or maintenance of infrastructure that could exacerbate a fire risk. There is a less than significant impact.

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?

No Impact. None of the Project components are within an area that is subject to downstream flooding or landslides, nor is the Project area located along the foothills where post-fire instability or drainage changes could impact the Project. Therefore, there is no impact.

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Mitigation Measures:

FIRE-1 During construction, all staging areas, welding areas, or areas slated for construction using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Spark arresting equipment shall be in good working order. The MWA and/or its contractor shall require all vehicles and crews working at the project site to have access to functional fire extinguishers at all times. In addition, construction crews are required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks. The contractor also shall provide a safety plan for the implementation of additional protocols when the National Weather Service issues a Red Flag Warning. Such protocols should address smoking and fire rules, storage and parking areas, use of gasoline-powered tools, use of spark arresters on construction equipment, road closures, use of a fire guard, fire suppression tools, fire suppression equipment, and training requirements.

Impact Conclusion:

No significant adverse effects are anticipated with the inclusion of the above mitigation measure.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact or Does Not Apply
XXI. MANDATORY FINDINGS OF SIGNIFICANCE:				
a) Does the project have the potential to 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, 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?		X		
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)?		X		
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

SUBSTANTIATION:

a) *Does the project have the potential to 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, 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?*

The MWA is proposing the Adelanto R³ Extension Project to extend its wholesale water delivery service to the community of Adelanto by extending a new pipeline along Mesa View Drive in the Baldy Mesa area of Victorville to the existing Adelanto pipeline and reservoir located near Mesa View and Olivine Road south of the City of Adelanto. The Project will construct approximately 1 mile of underground pipeline along Mesa View Drive, beginning at MWA's existing turnout located approximately 0.13 mile north of Del Rosa Road on the south to the Adelanto reservoir tanks located on Olivine Road, approximately 0.17 mile west of the intersection with Mesa View Drive (Figure 1 and Figure 2). The Project includes upgrades to MWA's existing Turnout 6/7 by the addition of a booster pump unit, minor piping and electrical modifications, and the relocation of Turnout 7 to the Adelanto reservoir tanks site.

Temporary impacts during Project activities are anticipated, but most were found to be less than significant or less than significant with the implementation of mitigation and/or standard best management practices.

A July 2019 biological resources field survey (Appendix B) identified that habitat adjacent to each Project component consists of Joshua Tree (*Yucca brevifolia*) woodland with an understory of the creosote bush (*Larrea tridentata*), sticky lessingia (*Lessingia glandulifera*), rubber rabbitbrush (*Ericameria nauseosa*), silver cholla (*Cylindropuntia echinocarpa*), and *Schismus ssp*. Joshua Trees, which are protected under the City of Victorville, are within the Project area. While it is anticipated that the Project construction and components will not be within

areas that will disturb Joshua Trees, a mitigation measure has been incorporated to ensure less than significant impacts.

The biological resources study (Appendix B) identified the following species that have been documented in the project vicinity (within approximately 3 miles) of the Project site:

- Desert tortoise (DT)
- Mohave ground squirrel (MGS)
- burrowing owl (BUOW)

The results of the biological resource study (Appendix B) identified that the proposed Project will not affect State or federally listed endangered, threatened species because there is no habitat to support these species within, adjacent to, or in the broader vicinity of the Project area. In addition, the proposed Project will not adversely affect Critical Habitat as none exists within the Project area, nor will it impact sensitive species as none exists in the Project area.

There are no established native resident or migratory wildlife corridors or wildlife nursery sites. However, vegetation bordering and within the Project area has the potential to support nesting birds and migratory birds protected under the MBTA. Therefore, to reduce potential impacts to nesting birds a mitigation measure has been recommended.

Mitigation measures are included in this document to address the potential impacts and reduce them to a less than significant impact level. With implementation of these measures, no significant adverse impacts to biological resources will result from project implementation.

Similarly, no cultural resources with significant values were found in the project footprint. However, a potential exists to accidentally expose subsurface cultural resources during construction. Contingency mitigation measures are included in this document to address this potential impact and reduce it to a less than significant impact level. With implementation of the cultural resources mitigation measures (including paleontological impacts), no significant adverse impacts to cultural resources will result from project implementation.

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)?

The Victorville area is anticipated to experience some growth over the life of the Project, although no major developments have been identified that will occur during the same time as the MWA project. Impacts are not anticipated to be cumulatively considerable. Local roadways operate at or just below free-flow conditions. This Project will not have a cumulative impact even if other projects are on-going in the area. Impacts were identified in the areas of Biological Resources, Cultural Resources, and Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality, and Wildfire. However, mitigation measures have been identified that, when implemented, will result in less than significant impacts.

The analysis of the data provided in this document concludes that implementation of the proposed Project will not result in impacts that are either individually or cumulatively considerable or significant when viewed in relation to past, present or probable future projects.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

The proposed project will not result in any identifiable substantial adverse effects on humans either directly or indirectly. The goal of the proposed Project is to provide a reliable water source for the City of Adelanto. Mitigation measures have been identified in areas of geology and soils, hydrology, hazards and hazardous materials and wildfire, to ensure potential impacts to humans would be less than significant.

9 FEDERAL CROSS-CUTTER CRITERIA

The State Water Board, Division of Financial Assistance administers the CWSRF program. Due to the federal nexus with USEPA, federal laws and regulations (e.g. federal cross-cutters) apply to all projects pursuing CWSRF financing. Under the CWSRF Program, the Division under the State Water Board uses the CEQA document plus the federal cross-cutting documentation in place of a National Environmental Policy Act (NEPA) document in what is termed "CEQA-Plus" documentation. The State Board does not complete a NEPA review process, but rather completes the "NEPA-like" process of CEQA-Plus.

This section of the document contains the analysis consistent federal regulations, specifically, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Sections 1500–1508) issued by the Council on Environmental Quality (CEQ) (1970, as amended), the *Environmental Review Guide for Special Appropriation Grants* (EPA 2008), and the *Environmental Review Process Guidelines for State Revolving Fund Applicants* (SWRCB 2004).

9.1 Archaeological and Historic Preservation Act (APHA)

Passed and signed into law in 1974, this act amended and expanded the Reservoir Salvage Act of 1960. The AHPA required that Federal agencies provide for "...the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of...any alteration of the terrain caused as a result of any Federal construction project of federally licensed activity or program (Section 1)." This greatly expanded the number and range of Federal agencies that had to take archeological resources into account when executing, funding, or licensing projects. The Reservoir Salvage Act had required such attention only of Federal agencies, mainly the Corps of Engineers and the Bureau of Reclamation, that constructed reservoirs and related structures.

The AHPA built upon the national policy, set out in the Historic Sites Act of 1935, "...to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance...". The AHPA expanded the policy by focusing attention on significant resources and data, but does not require that they be shown to be of "national" significance. The connection between the 1935 statute and the AHPA is mentioned explicitly in the first section of the statute.

The statute is in the tradition of "salvage archaeology" as developed extensively in the River Basin Salvage Program from the late 1940s onwards. The impetus for AHPA was the destruction of archaeological sites throughout the country, frequently by actions funded or otherwise supported by Federal agencies, but not covered by the Reservoir Salvage Act, which required archeological salvage as part of dam projects (Davis 1972). The chief archaeological instigators of the statute were Carl Chapman of the University of Missouri and Charles R. McGimsey of the Arkansas Archeological Survey. The aim of the proponents of the act was to require all agencies of the Federal government to undertake archeology as part of their actions that would result in the destruction of archeological sites.

Determination of Effect

The Project components occur within existing disturbed facilities and roadways. There are no archaeological features within the Project areas that would qualify under this Act, therefore, there is no impact.

9.2 Federal Clean Air Act

The Clean Air Act (CAA), 42 U.S.C. §7401 et seq. (1970), is the comprehensive federal law that regulates air emissions from stationary and mobile sources.

For CWSRF program compliance, the following applies:

- *Attainment Areas- If the Project is located in attainment areas for federal criteria pollutants, then the applicant has satisfied the requirements.*

- *Nonattainment/Maintenance Areas- If the Project is located in nonattainment and/or maintenance areas for federal criteria pollutants, the applicant must conduct a Clean Air Act General Conformity Analysis:*

    - *Project conforms: Total emissions are below de minimis levels*

    - *Project does not conform and requires a general conformity determination: Total emissions are above de minimis levels will require the State Water Board to coordinate with the USEPA to develop a general conformity determination and complete a public review/comment process.*

Determination of Effect

The EPA has established national ambient air quality standards (NAAQS) for six of the most common air pollutants: carbon monoxide, lead, ozone, particulate matter, nitrogen dioxide, and sulfur dioxide which are known as criteria pollutants. The MDAQMD monitors levels of various criteria pollutants throughout the air district.

The California Air Resource Board (CARB) established the California Ambient Air Quality Standards (CAAQS) for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride.

Currently, the NAAQS and CAAQS are exceeded in most parts of the MDAB. In response, the MDAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards. AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy.

The Air Quality Impact Assessment (Appendix A) indicates that emissions resulting from the Project construction will not exceed criteria pollutant thresholds established by the SCAQMD for emissions of any criteria pollutant. Therefore, the SCAB is a non-attainment basin for federal criteria pollutants, but the total emissions are below de minimis levels (Appendix A).

9.3 Coastal Barriers Resources Act Resources

The Coastal Barrier Resources Act (CBRA) was passed by Congress in 1982 to encourage conservation of hurricane-prone, biologically rich Coastal Barrier Resources System, which is a collection of undeveloped and

ecologically sensitive barrier formations along the Atlantic and Gulf Coasts of the US, and the shore areas of the Great Lakes.. CBRA prohibits most new federal expenditures that encourage development or modification of coastal barriers and the adjacent wetlands, marshes, estuaries, inlets and near-shore waters. CBRS boundaries are shown on maps that were originally adopted by Congress and are maintained by the USFWS.

As of 2019, there are no designated Coastal Barrier Resource Systems in California.

Determination of Effect

There are no designated Coastal Barrier Resource Systems in California, nor does the Project occur within or near any coastal region. Therefore, there is no impact.

9.4 Coastal Zone Management Act

Coastal Zone Management Act was passed by Congress in 1972 and is administered by National Oceanic and Atmospheric Administration, (NOAA). It provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

Federal agencies must ensure that projects in coastal areas are consistent with the state coastal zone management plans approved by the United States Department of Commerce.

For CWSRF program compliance, the following applies:

- *Applicants must consult early with the state Coastal Zone Management Agency (California Coastal Commission, the San Francisco Bay Conservation and Development Commission) to ensure consistency with the state coastal zone management plan, including identifying appropriate project locations, and provide SWRCB with all documentation.*

- *State Water Board required to consult with the California Coastal Commission and/or the San Francisco Bay Conservation and Development Commission, to obtain a consistency determination (if the applicant has not yet completed the process).*

Determination of Effect

No aspect of the Project occurs within or near a coastal area. There is no impact.

9.5 Federal Endangered Species Act (ESA)

The USFWS administers the federal ESA of 1973. The ESA provides a legal mechanism for listing species as either threatened or endangered, and a process of protection for those species listed. Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any portion of its life history. Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act. Take authorization can be obtained under Section 7 or Section 10 of the act.

For CWSRF Program compliance, the following criteria apply:

Biological Assessment - *Applicant must submit a biological assessment to determine any direct/indirect effects to federally listed (threatened or endangered) species or critical habitat*

- *Required to review current lists of species (less than one year old) expected to be in the project area and type of suitable habitat:*
    - *U.S. Fish and Wildlife Service (USFWS) species list*
    - *California Department of Fish and Wildlife, California Native Diversity Database (CNDDB)*
    - *California Native Plant Survey*
- *Biological survey (less than one year old) must include:*
    - *Results of site surveys and surrounding area stating if any species were observed*
    - *Identification of designation critical habitat and known species range*
    - *Analysis of potential impact to species*
    - *Determinations for effect on listed species*
    - *Identification of measures to reduce, avoid and minimize impacts*

Determination of Effect

A Biological Resources Assessment was prepared for this Project (Jericho, July 2019 and is located in Appendix B). Section IV of this document represents the findings and analysis under CEQA.

No federally listed species were not observed during the field survey nor are any expected to occur. No impact to federally protected species or habitats will result from implementation of the proposed Project.

9.6 Environmental Justice

In July 1964 Congress passed the Civil Rights Act of 1964. Title VI of the Civil Rights Act states that *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."*

In February 1994, President Clinton issued Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." In a separate memorandum, President Clinton identified Title VI as one of several federal laws already in existence that can help "to prevent minority communities and low-income communities from being subject to disproportionately high and adverse environmental effects."

For CWSRF Program compliance, the following criteria apply:

Will the Project:

- *Create new disproportionate impacts on minority, low- income, or indigenous populations;*
- *Exacerbate existing disproportionate impacts on minority, low-income, or indigenous populations; or*
- *Present opportunities to address existing disproportionate impacts on minority, low-income, or indigenous populations that are addressable through the project.*

Determination of Effect

Households in Adelanto, CA have a median annual income of $34,446, which is less than the median annual income of $60,336 across the entire United States. This is in comparison to a median income of $29,647 in 2016, which represents a 16.2% annual growth, according to the US Census.

The purpose of the R³ project is to allow MWA's stakeholders to become less dependent on supplies from the SWP during drought periods or when the Sacramento Delta is under increased stress. While the R³ Project will allow MWA to manage overall water supplies within its territory, the delivery system components will also allow MWA to build a sustainable water delivery system that provides long-term benefits to the local area.

This project will enable Adelanto to receive the R³ water as a supplemental water source to its current groundwater supplies. The MWA's responsibility is to ensure that its customers have adequate water supply for its existing and projected service needs. Therefore, the Project will not create disproportionate impacts to minority, low-income, or indigenous populations. The Project's ability to ensure Adelanto has an adequate water supply enables the low-income population of Adelanto to be serviced.

9.7 Farmland Protection Policy Act

Congress enacted the Farmland Protection Policy Act (FPPA) as a subtitle of the 1981 Farm Bill. The purpose of the law is to "...minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses..." (P.L. 97-98, Sec. 1539-1549; 7 U.S.C. 4201, et seq.). The FPPA also stipulates that federal programs be compatible with state, local and private efforts to protect farmland. For the purposes of the law, federal programs include construction projects—such as highways, airports, dams and federal buildings—sponsored or financed in whole or part by the federal government, and the management of federal lands. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) is charged with oversight of the FPPA.

Federal agencies must consider a project's effect on agricultural land and take alternative/mitigating measures to ensure valuable farmland is preserved.

Important farmland includes:

- Unique and Prime farmland
- Farmland of local and statewide importance
- Farmland under a Williamson Act Contract (important farmland)

For CWSRF Program compliance, the following criteria apply:

- *Determine if important farmland is located within project area, and if the project will result in a temporary or permanent conversion of important farmland to non-agricultural use.*
- *Notify (via letter) the United States Department of Agriculture, local and state soil conservationist representatives, of the project and proposed measures identified to avoid, minimize, or mitigate farmland impacts.*

Determination of Effect

The Project Area is identified as "Grazing Land," according to the California Department of Conservation, California Important Farmland Finder mapping (CA Dept of Conservation, 2016). No land under Williamson Act Contract occurs at the Project areas, and there are no farmlands in the Project areas. Therefore, there is no impact.

9.8 Fish and Wildlife Coordination Act (FWCA)

The FWCA requires coordination with the USFWS and the California Department of Fish and Wildlife when a project will impact a body of water.

Determination of Effect

The Project occurs within the boundaries of an existing wastewater treatment facility which is not located on or surrounded by bodies of water, nor will the Project components propose changes to any body of water. Therefore, there is no impact and no coordination is required.

9.9 Flood Plain Management

Floodplain management is the operation of a community program of preventive and corrective measures to reduce the risk of current and future flooding, resulting in a more resilient community, according to the Federal Emergency Management Agency (FEMA). These measures take a variety of forms, are carried out by multiple stakeholders with a vested interest in responsible floodplain management and generally include requirements for zoning, subdivision or building, building codes and special-purpose floodplain ordinances.

For CWSRF Program compliance, the following criteria apply:

- *Evaluate and determine project location with respect to 100-year floodplain (FEMA maps).*
    - *If project is located in a flood plain, the applicant must prepare:*
    - *A flood plain assessment, including assessing flooding impacts, alternative locations, and measures/design modifications to reduce flooding impacts; and*
    - *And publicly notify reasons for proposing the project in a flood plain.*
- *CWSRF Program staff makes a finding on the Executive Order No. 11988 compliance and must notify FEMA (FEMA may provide additional measures) via letter.*

Determination of Effect

The Project does not occur within the boundaries of a 100-year floodplain as identified on FEMA mapping.

9.10 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary law governing marine fisheries management in U.S. federal waters. First passed in 1976, the Magnuson-Stevens Act

fosters long-term biological and economic sustainability of our nation's marine fisheries out to 200 nautical miles from shore. The goals of the act include: prevent overfishing; rebuild overfished stocks; increase long-term economic and social benefits; use reliable data and sound science; conserve essential fish habitat; ensure a safe and sustainable supply of seafood.

For CWSRF Program compliance, the following criteria apply:

- *Applicants must provide Essential Fish Habitat (EFH) Assessment and maps (from the National Marine Fisheries Service [NMFS]) to identify designated EFH in their project areas and assess if the project will have the potential to adversely impact EFH.*

- *Must consult with NMFS for any adverse impacts to EFH.*

- *If EFH may be adversely impacted, ERU must prepare a letter and enclose any applicable surveys (EFH Assessment) documents for USEPA to initiate EFH consultation with the NMFS.*

- *NMFS must provide concurrence (informally or written) and may provide EFH Conservation recommendations, which will be included as a special condition of the applicant's CWSRF financing agreement*

Determination of Effect

The Project does not involve fisheries or occur within 200 nautical miles out from shore. Therefore, there is no impact.

9.11 Migratory Bird Treaty Act (MBTA)

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711) provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA prohibits take of nearly all native birds. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. The USFWS, in coordination with the CDFW administers the MBTA. CDFW's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

For CWSRF Program compliance, the following criteria apply:

- *Applicants must address potential impacts to migratory, raptor and fully protected species in their Biological Assessment or CEQA document. A survey must be completed to determine the presence of nests and impacts from construction noise, vibration, modification of habitat (tree removal, riparian vegetation) must be addressed.*

- *Must consult with the USFWS (as well as the Department of Fish and Wildlife under Fish and Game codes 3511 and 3513) to identify appropriate measures for mitigating/avoiding impacts to species.*

Determination of Effect

According to the Biological Resources Report in Appendix B, there are no established native resident or migratory wildlife corridors or wildlife nursery sites. However, vegetation bordering and within the Project area has the potential to support nesting birds and migratory birds protected under the MBTA. Therefore, to reduce potential impacts to nesting birds **Mitigation Measure BIO-1** is recommended to reduce impacts.

9.12 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies, to consider the effects of Federally funded projects on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on such projects prior to the expenditure of any Federal funds.

For CWSRF Program compliance, the following criteria apply:

- *Applicant must submit a Section 106 report including:*
    - *Identifying the area of potential effects (APE)*
    - *Current records search (no more than one year old & ½ mile radius)*
    - *Native American consultation*
    - *Draft consultation letter for State Historic Preservation Officer (SHPO)*
- *Cultural Resources Officer for the State Water Board reviews the cultural documents submitted by applicants to see if sufficient information has been provided to support Section 106 findings.*
- *May initiate Section 106 NHPA consultation with the SHPO if "no effect" finding can not be made*

Determination of Effect

In August 2019, CRM Tech studied the potential Cultural Resources for the MWA Adelanto R3 Project (Appendix C.

CRM Tech evaluated records from the South Central Coastal Information Center (SCCIC) that identified that two linear features from the early historic period have been recorded as crossing the northern half of the Area of Potential Effect (APE). Designated as Site 36-004203 (CA-SBR-4203H) and Site 36-004411 (CA-SBR-4411H) in the California Historical Resources Inventory, the two linear features represent the former routes of the Tejon Road-Palmdale Cutoff, a branch of the Old Spanish Trail/Mormon Trail system, and the entire length of the Mormon Trail in San Bernardino County, respectively. The CRM Tech survey identified that the segment of Site 36-004203/36-004411 within the APE boundaries, however, has been largely destroyed by past construction activities along the Mesa View Drive corridor. The surviving portion of the trail is now a nondescript dirt road marked by an abundance of recent motor vehicle tire tracks. It is essentially a working component of the modern transportation - and probably recreation - infrastructure and demonstrates no distinctively historical character. As such, the existing road retains little historic integrity - other than the aspect of location - to relate to its heydays between the mid-19th century and the early 20th century, or to the historic period in general.

Based on these considerations, the CRM Tech study concluded that the portion of Site 36-004203/36-004411 in and near the APE does not appear eligible for listing in the National Register or the California Register, and does not qualify as a "historic property" or a "historical resource." Furthermore, as the proposed undertaking at this location consists solely of trenching within the paved roadbed of Mesa View Drive for pipeline installation, it has

no potential to affect the current condition and appearance of the remaining segments of the road. The CRM Tech 2019 study concluded that no "historic properties" or "historical resources" as defined by either Section 106 or CEQA are present within the APE

9.13 Protection of Wetlands – Executive Order 11990

Protection of Wetlands – Executive Order 11990: The purpose of Executive Order (EO) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The procedures require the determination of whether or not the proposed project will be in or will affect wetlands. If so, a wetlands assessment must be prepared that describes the alternatives considered. The procedures include a requirement for public review of assessments. The evaluation process follows the same 8 steps as for EO 11988, Floodplain Management.

Wetlands are the at transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. In general, wetlands have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) soils are hydric meaning undrained; and 3) the substrate is saturated with water or covered by shallow water at some time during the growing season of each year. Under current guidelines, a jurisdictional wetland under the CWA's Section 404, must display all three wetland characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology. In California however, a jurisdictional wetland needs to meet only one of these parameters.

For CWSRF Program compliance, the following criteria apply:

- *U.S. Army Corps of Engineers (USACE) has a "no net loss of wetlands" policy. Therefore, applicants must comply by completing and submitting:*
    - *Biological surveys which addresses potential impacts to wetlands*
    - *Potential affects to wetlands requires:*
        - *A Preliminary Wetland Delineation Report*
        - *Field verification report done by the USACE*
        - *Section 401 WQ Certification (Regional Water Board) approval*
        - *USACE Permit application for CWA Section 404 permits (only need 401 if 404 required)*
- *If consultation with the USACE and USFWS is required, CWSRF Program staff must initiate consultation via letter and forward all supporting documentation, including information on alternative sites and measures to reduce or avoid impacts to wetlands, other waters and waters of the US.*

Determination of Effect

A Biological Resources Assessment was prepared for the site that addressed the potential for waters and wetlands to be present on-site, and is provided in Appendix B. However, no wetlands were found; therefore, there is no impact.

9.14 Rivers and Harbors Act, Section 10

This section identifies that the creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is hereby prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in

any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines, or where no harbor lines have been established, except on plans recommended by the Chief of Engineers and authorized by the Secretary of War; and it shall not be lawful to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of, any port, roadstead, haven, harbor, canal, lake, harbor of refuge, or enclosure within the limits of any breakwater, or of the channel of any navigable water of the United States, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning the same.

Determination of Effect

The Project does not involve the construction of any structure in navigable waters. All project components occur within existing facilities or roadways. Therefore, there is no impact.

9.15 Safe Drinking Water Act, Sole Source Aquifer Protection

EPA defines a sole source aquifer (SSA) as one where:

- The aquifer supplies at least 50 percent of the drinking water for its service area
- There are no reasonably available alternative drinking water sources should the aquifer become contaminated.

The Sole Source Aquifer program enables EPA to designate an aquifer as a sole source of drinking water and establish a review area. EPA then reviews proposed projects that will both:

- Be located within the review area
- Receive federal funding

The review area includes the area overlying the SSA. It may also include the source areas of streams that flow into the SSA's recharge zone. EPA's review is intended to ensure that the projects do not contaminate the SSA.

For CWSRF Program compliance, the following criteria apply:

- *All applicants must determine if the project is located in a USEPA designated sole source aquifer (SSA).*
    - *If is located in SSA, the Applicant must provide documentation of surveys done to determine if a project could contaminate a sole source aquifer (normally done in consultation with the Department of Public Health).*
    - *In consultation with DPH and USEPA, applicant must identify alternative site(s) or identify adequate mitigation measures. Those measures and/or alternative sites must be integrated into the project design.*

Determination of Effect

Based on a review of the USEPA Database for the Pacific Southwest, Region 9, the Project is not located in a SSA, nor is it near an SSA. Therefore, there is no impact.

9.16 Wild and Scenic Rivers Act

Wild and Scenic Rivers Act. The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. Rivers may be designated either a federal or state agency.

This Act prohibits federal assistance (including financing) for water resource projects that would have a direct and adverse effects on, invade, or unreasonably diminish, the special values of a designated wild and scenic river. The Act also requires consultation with state (California State Parks) and federal authorities (National Park Service, US Forest Service, Bureau of Land Management) with jurisdiction over the rivers in the project area, and evaluate alternatives.

As of 2019, there were 22 water body sections have a wild and scenic river designation in California.

For CWSRF Program compliance, the following criteria apply:

- *Alternatives that will result in adverse effect on the wild and scenic designation of the river, must be eliminated. Applicant must identify other alternatives.*

Determination of Effect

The Project area is not near or within any of the water bodies that have a wild and scenic river designation. Therefore, there is no impact.

10 FINDINGS

Therefore, based on the findings in this Initial Study, the Mojave Water Agency, acting as the CEQA lead agency for this proposed project, will process a Mitigated Negative Declaration (MND) as the appropriate CEQA environmental determination for the proposed project. The District will issue a Notice of Intent to Adopt a Mitigated Negative Declaration and circulate the MND package for review for the required 30-day period. Following receipt of comments, the District will compile responses to any comments and prepare a final MND package for consideration by District. Based on the final MND package, the District will consider whether implementation of the proposed project as defined in this document can proceed as determined by the District at the completion of the review process.

If you or your agency comments on this proposed MND, you or your agency will be provided responses to comments and notified of the date of the District's final review and decision. A decision by the District to approve the MND would be based on all of the information available in the whole of the record before the District at the conclusion of the CEQA environmental review process for this proposed project. Completion of the CEQA review process would allow implementation of the proposed project in accordance with any approved mitigation measures and conditions of approval for the project.

11 SUMMARY OF MITIGATION MEASURES

The following mitigation measures were identified to reduce impacts to less than significant:

BIOLOGICAL RESOURCES

BIO-1 Bird nesting season generally extends from February 1 through September 15 in southern California and specifically, April 15 through August 31 for migratory passerine birds. To avoid impacts to nesting birds (common and special status) during the nesting season, a qualified Avian Biologist will conduct pre-construction Nesting Bird Surveys (NBS) prior to project-related disturbance to nestable vegetation to identify any active nests. If no active nests are found, no further action will be required. If an active nest is found, the biologist will set appropriate no-work buffers around the nest which will be based upon the nesting species, its sensitivity to disturbance, nesting stage and expected types, intensity and duration of disturbance. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved no-work buffer zone shall be clearly marked in the field, within which no disturbance activity shall commence until the qualified biologist has determined the young birds have successfully fledged and the nest is inactive.

BIO-2 The Project should be designed to avoid sensitive desert plants such as Joshua Trees and California juniper, as described by the City of Victorville Joshua Tree and Native Vegetation Preservation Ordinance (City of Victorville, Chapter 14.04). This includes equipment staging and storage. In the event said sensitive desert plants cannot be avoided, the MWA shall prepare a relocation plan and obtain all permits through the City of Victorville as required.

CULTURAL RESOURCES

CUL-1 In the event that pre-contact cultural resources are discovered during project activities, all work in the immediate vicinity of the find (within a 60-foot buffer) shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the other portions of the project outside of the buffered area may continue during this assessment period. Additionally, the San Manuel Band of Mission Indians Cultural Resources Department (SMBMI), and any other affiliated Tribes, as decided by the Lead Agency, shall be contacted, as detailed within Mitigation Measure TCR-1, if any such find occurs and be provided information after the archaeologist makes his/her initial assessment of the nature of the find, so as to provide Tribal input with regards to significance and treatment.

CUL-2 If significant cultural resources, as defined by CEQA (as amended, 2015), are discovered and avoidance cannot be ensured, the archaeologist shall develop a Monitoring and Treatment Plan, the drafts of which shall be provided to SMBMI for review and comment, but not precluding other tribes as the Most Likely Descendent, as detailed within Mitigation Measure TCR-1. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly.

CUL-3 If human remains or funerary objects are encountered during any activities associated with the project, work in the immediate vicinity (within a 100-foot buffer of the find) shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5 and Public Resources Code Section 5097.98, and enforced for the duration of the project. These code provisions require notification of the County Coroner and the Native American Heritage Commission, who in turn must notify those persons believed to be most likely descended from the deceased Native American, the Most Likely Descendant (MLD), for appropriate disposition of the

remains. Excavation or disturbance may continue in other areas of the project site that are not reasonably suspected to overlie adjacent remains or archaeological resources.

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GEOLOGY AND SOILS

GEO-1 The contactor will provide to the MWA an Erosion Control Report (ECR) that will identify the Best Management Practices (BMPs) for managing any excavated or stockpiled materials. The BMPs may include but not be limited to the following:

- Prevent mud and debris from entering roadways, including the main entry road by providing trackout measures.
- Locate stockpiles away from drainage courses, drain inlets or concentrated flows of storm water.
- For wind erosion control, apply water or other dust palliative to stockpiles. Smaller stockpiles may be covered as an alternative.
- Place bagged materials on pallets under cover.
- During the rainy season, non-active soil stockpiles will be covered with heavy plastic and the stockpile contained within a temporary perimeter sediment barrier, such as berms, dikes, silt fences, or sandbag barriers. A soil stabilization measure may be used in lieu of cover.
- During the non-rainy season prior to the onset of rain, the stockpile should either be covered or protect them with temporary perimeter sediment barriers.
- Year-round, active soil stockpiles will be protected with temporary linear sediment barriers prior to the onset of rain.
- Pipelines placed within unpaved roadways will be graded and watered at least once per day, or as often as necessary to control dust.
- Trenches will remain open for as short a time as possible.
- The Plan will identify proper compaction for all pipelines and lift station facilities.

GEO-2 **Paleontological Resources**. The MWA staff and/or its contractor performing the work will be required to receive a Worker Environmental Awareness Training that will train workers on various environmental subjects including the potential for paleontological resources. Additionally, any substantial excavations (i.e. over 5 feet in depth) should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development.

HAZARDS AND HAZARDOUS MATERIALS

HAZ – 1 All asphalt requiring removal from the Project Site shall be disposed of in accordance with current regulatory standards

HAZ – 2 A hazardous spill prevention plan shall be prepared by the Applicant and submitted to the MWA for approval to minimize the likelihood of a spill shall be prepared prior to construction. The plan shall state the actions that would be required if a spill occurs to prevent contamination of surface waters and provide for cleanup of the spill. The plan shall follow Federal, state, and local safety guidelines and standards to avoid increased exposure to these pollutants.

HAZ-3 During construction, all staging areas, welding areas, or areas slated for construction using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Spark arresting equipment shall be in good working order. The MWA shall require all vehicles and crews working at the project site to have access to functional fire extinguishers at all times. In addition, construction crews are required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks. The contractor also shall provide a safety plan for the implementation of additional protocols when the National Weather Service issues a Red Flag Warning. Such protocols should address smoking and fire rules, storage and parking areas, use of gasoline-powered tools, use of spark arresters on construction equipment, road closures, use of a fire guard, fire suppression tools, fire suppression equipment, and training requirements.

HYDROLOGY AND WATER QUALITY

HYD-1 **Prepare and Implement Storm Water Pollution Prevention Plan (SWPPP)**. Prior to start of construction, and as part of the Project's compliance with the NPDES requirements, a Notice of Intent shall be prepared and submitted to the Lahontan Regional Water Quality Control Board (RWQCB) providing notification and intent to comply with the State of California General Construction Permit. Also, a SWPPP shall be reviewed and approved by the MWA for water quality construction activities on-site. A copy of the SWPPP shall be available and implemented at the construction site at all times. The SWPPP shall outline the source control and/or treatment control BMPs to avoid or mitigate runoff pollutants at the construction site to the "maximum extent practicable." All recommendations in the Plan shall be implemented during area demolition/preparation, grading, and construction. The Project shall comply with each of the recommendations detailed in the Plan, and other such measure(s) as the MWA deems necessary to mitigate potential storm water runoff impacts.

TRIBAL CULTURAL RESOUCES

TCR-1 The San Manuel Band of Mission Indians Cultural Resources Department (SMBMI) shall be contacted, as detailed in CR-1, of any pre-contact cultural resources discovered during project implementation, and be provided information regarding the nature of the find, so as to provide Tribal input with regards to significance and treatment. Should the find be deemed significant, as defined by CEQA (as amended, 2015), a cultural resources Monitoring and Treatment Plan shall be created by the archaeologist, in coordination with SMBMI, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents SMBMI for the remainder of the project, should SMBMI elect to place a monitor on-site. This mitigation measure does not preclude notification to other tribes or treatment plans in accordance with other tribal entities.

TCR-2 Any and all archaeological/cultural documents created as a part of the project (isolate records, site records, survey reports, testing reports, etc.) shall be supplied to the applicant and Lead Agency for dissemination to SMBMI. The Lead Agency and/or applicant shall, in good faith, consult with SMBMI, and other tribes as applicable, throughout the life of the project.

WILDFIRE

FIRE-1 During construction, all staging areas, welding areas, or areas slated for construction using spark-producing equipment will be cleared of dried vegetation or other material that could ignite. Spark arresting equipment shall be in good working order. The MWA and/or its contractor shall require all vehicles and crews working at the project site to have access to functional fire extinguishers at all times. In addition, construction crews are required to have a spotter during welding activities to look out for potentially dangerous situations, including accidental sparks. The contractor also shall provide a safety plan for the implementation of additional protocols when the National Weather Service issues a Red Flag Warning. Such protocols should address smoking and fire rules, storage and parking areas, use of gasoline-powered tools, use of spark arresters on construction equipment, road closures, use of a fire guard, fire suppression tools, fire suppression equipment, and training requirements.

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APPENDICES

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Appendix A
Air Quality Resources Assessment

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Adelanto R^3 Extension Project

AIR QUALITY IMPACT ANALYSIS

MOJAVE WATER AGENCY

Baldy Mesa area, City of Victorville, San Bernardino County

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LIST OF ABBREVIATED TERMS

(1)	Reference
µg/m^3	Microgram per Cubic Meter
AQ	Air Quality
AQIA	Air Quality Impact Analysis
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practices
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CALEPA	California Environmental Protection Agency
CalEEMod	California Emissions Estimator Model
CALGreen	California Green Building Standards Code
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CITY	City of Adelanto
CO	Carbon Monoxide
COHB	Carboxyhemoglobin
CY	Cubic Yards
EIR	Environmental Impact Reports
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
LBS/DAY	Pounds Per Day
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
O_3	Ozone
Pb	Lead
PM_{10}	Particulate Matter 10 microns in diameter or less

$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
PROJECT	Adelanto R^3 Extension Project
ROG	Reactive Organic Gases
SCAQMD	South Coast Air Quality Management District
SF	Square Feet
SIP	State Implementation Plans
SO_2	Sulfur Dioxide
SO_4	Sulfates
SO_X	Sulfur Oxides
TAC	Toxic Air Contaminant
U.S.	United States
VOC	Volatile Organic Compounds
VPH	Vehicles Per Hour

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this *Adelanto R³ Extension Project Air Quality Impact Analysis (*AQIA) are summarized below based on the significance criteria in Section 3 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for each potential air quality impact under CEQA before and after any required mitigation measures described below.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Regional Construction Emissions	3.4	*Less Than Significant*	*n/a*
Regional Operational Emissions	3.5	*Less Than Significant*	*n/a*
CO "Hot Spot" Analysis	3.6	*Less Than Significant*	*n/a*
Air Quality Management Plan	3.7	*Less Than Significant*	*n/a*
Sensitive Receptors	3.8	*Less Than Significant*	*n/a*
Odors	3.9	*Less Than Significant*	*n/a*
Cumulative Impacts	3.10	*Less Than Significant*	*n/a*

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1 INTRODUCTION

This report presents the results of the AQIA prepared by Urban Crossroads, Inc., for the proposed Adelanto R^3 Extension Project (Project).

The purpose of this AQIA is to evaluate the potential impacts to air quality associated with construction and operation of the proposed Project and recommend measures to mitigate impacts considered potentially significant in comparison to thresholds established by the Mojave Desert Air Quality Management District (MDAQMD).

1.1 SITE LOCATION

The proposed Adelanto R^3 Extension Project is located in the Baldy area of the City of Victorville, in San Bernardino County.

There are no commercial developments adjacent to the Project. Adjacent residential developments are located approximately 100 feet to the north of the intersection of Mesa View Drive and Olivine Road and along Mesa View Drive, south of Bear Valley Road.

1.2 PROJECT DESCRIPTION

The Project includes the following components:

Existing Turnout 6 Modifications

The existing Turnout 6 and Turnout 7 facility will be modified into a dedicated Turnout 6 facility to solely provide water supply to the City of Victorville. Modifications will include adding a pumping unit, modifying the turnout piping and related electrical and instrumentation improvements.

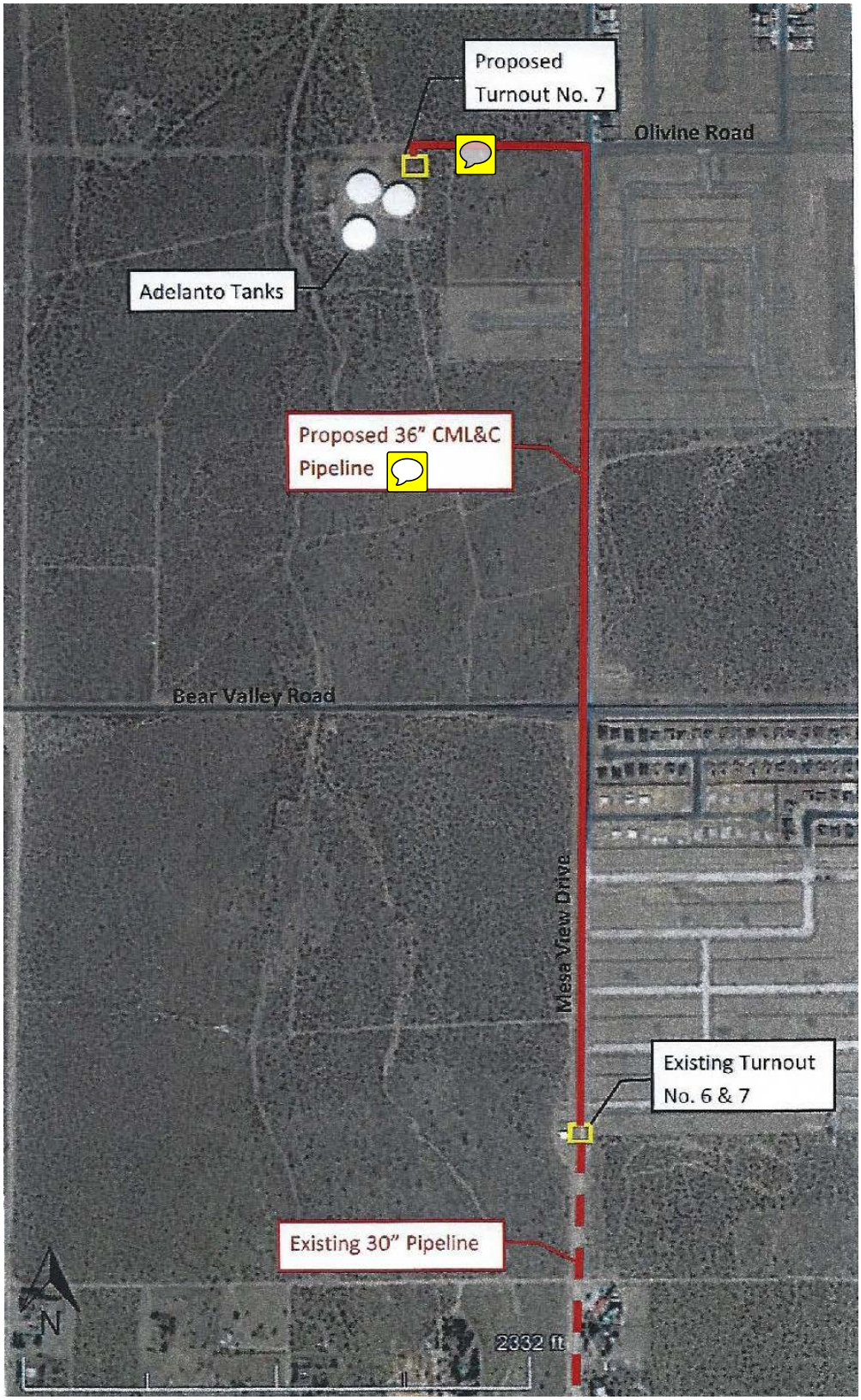
Relocated Turnout 7

The existing Turnout 7, currently located within Turnout 6 facility, will be relocated to within the boundaries of the existing Adelanto reservoir facility. Improvements to Turnout 7 will include the construction of a turnout structure enclosed within an 18 x 46 x 16-foot building and a steel pipeline which will support the future on-site reservoir pipeline distribution system. The relocated Turnout 7 will be re-sized to convey the full volume of the R^3 water delivery to the City of Adelanto.

New Pipeline

The Project will also include installation of pipeline between Turnout 6 and Turnout 7.

EXHIBIT 1-A: PROJECT CONCEPT SKETCH



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2 AIR QUALITY SETTING

This section provides an overview of the existing air quality conditions in the Project area and region.

2.1 MOJAVE DESERT AIR BASIN

The Project site is located in the portion of the County of San Bernardino, California, that is part of the Mojave Desert Air Basin (MDAB) and is under the jurisdiction of the MDAQMD. The air quality assessment for the proposed Project includes estimating emissions associated with short-term construction and long-term operation of the proposed Project. A number of air quality modeling tools are available to assess the air quality impacts of projects. In addition, certain air districts, such as the MDAQMD, have created guidelines and requirements to conduct air quality analyses. The MDAQMD's current guidelines, included in its *California Environmental Quality Act and Federal Conformity Guidelines* (August 2016), were adhered to in the assessment of air quality impacts for the proposed Project.

2.2 REGIONAL CLIMATE

Air quality in the Project area is not only affected by various emissions sources (mobile, industry, etc.) but is also affected by atmospheric conditions such as wind speed, wind direction, temperature, and rainfall.

The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains within the vast terrain rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are out of the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north; air masses pushed onshore in Southern California by differential heating are channeled through the MDAB. The MDAB is separated from the Southern California coastal and Central California valley regions by mountains (highest elevation is approximately 10,000 feet), whose passes form the main channels for these air masses. The Mojave Desert is bordered on the southwest by the San Bernardino Mountains, separated from the San Gabriel Mountains by the Cajon Pass (4,200 feet). A lesser pass lies between the San Bernardino Mountains and the Little San Bernardino Mountains in the Morongo Valley. The Palo Verde Valley portion of the Mojave Desert lies in the low desert, at the eastern end of a series of valleys (notably the Coachella Valley), whose primary channel is the San Gorgonio Pass (2,300 feet) between the San Bernardino and San Jacinto Mountains.

During the summer, the MDAB is generally influenced by a Pacific subtropical high cell that sits off the coast, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist, and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inch of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified

as dry-very hot desert, to indicate that at least three months have maximum average temperatures over 100.4° F.

Snow is common above 5,000 feet in elevation, resulting in moderate snowpack and limited spring runoff. Below 5,000 feet, any precipitation normally occurs as rainfall. Pacific storm fronts normally move into the area from the west, driven by prevailing winds from the west and southwest. During late summer, moist high-pressure systems from the Pacific collide with rising heated air from desert areas, resulting in brief, high-intensity thunderstorms that can cause high winds and localized flash flooding.

2.3 CRITERIA POLLUTANTS

Criteria pollutants are pollutants that are regulated through the development of human health based and/or environmentally based criteria for setting permissible levels. Criteria pollutants, their typical sources, and health effects are identified below (2):

TABLE 2-1: CRITERIA POLLUTANTS

Criteria Pollutant	Description	Sources	Health Effects
Ozone (O_3)	O_3 is a highly reactive and unstable gas that is formed when volatile organic compounds (VOCs) and nitrogen oxides (NO_X), both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. O_3 concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.	Formed when reactive organic gases (ROG) and NO_X react in the presence of sunlight. ROG sources include any source that burns fuels, (e.g., gasoline, natural gas, wood, oil) solvents, petroleum processing and storage and pesticides.	Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible sub-groups for O_3 effects. Short-term exposure (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated O_3 levels are associated with increased school absences. In recent years, a correlation between elevated ambient O_3 levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple outdoor sports and

Criteria Pollutant	Description	Sources	Health Effects
			live in communities with high O_3 levels. O_3 exposure under exercising conditions is known to increase the severity of the responses described above. Animal studies suggest that exposure to a combination of pollutants that includes O_3 may be more toxic than exposure to O_3 alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.
CO	CO is a colorless, odorless gas produced by the incomplete combustion of carbon-containing fuels, such as gasoline or wood. CO concentrations tend to be the highest during the winter morning, when little to no wind and surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, unlike O_3, motor vehicles operating at slow speeds are the primary source of CO in the MDAB. The highest ambient CO concentrations are generally found near congested transportation corridors and intersections.	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.	Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs but exerts its effect on tissues by interfering with oxygen transport and competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia

Criteria Pollutant	Description	Sources	Health Effects
			(oxygen deficiency) as seen at high altitudes.
Sulfur Dioxide (SO_2)	SO_2 is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal and from chemical processes occurring at chemical plants and refineries. When SO_2 oxidizes in the atmosphere, it forms sulfates (SO_4). Collectively, these pollutants are referred to as sulfur oxides (SO_X).	Coal or oil burning power plants and industries, refineries, diesel engines	A few minutes of exposure to low levels of SO_2 can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2. Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically, or one pollutant alone is the predominant factor.

Criteria Pollutant	Description	Sources	Health Effects
NO_X	NO_X consist of nitric oxide (NO), nitrogen dioxide (NO_2) and nitrous oxide (N_2O) and are formed when nitrogen (N_2) combines with oxygen (O_2). Their lifespan in the atmosphere ranges from one to seven days for NO and NO_2, to 170 years for N_2O. NO_X are typically created during combustion processes and are major contributors to smog formation and acid deposition. NO_2 is a criteria air pollutant and may result in numerous adverse health effects; it absorbs blue light, resulting in a brownish-red cast to the atmosphere and reduced visibility. Of the seven types of nitrogen oxide compounds, NO_2 is the most abundant in the atmosphere. As ambient concentrations of NO_2 are related to traffic density, commuters in heavy traffic may be exposed to higher concentrations of NO_2 than those indicated by regional monitoring station.	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.	Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposure to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. In animals, exposure to levels of NO_2 considerably higher than ambient concentrations result in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of O_3 exposure increases when animals are exposed to a combination of O_3 and NO_2.
Particulate Matter	PM_{10} (Particulate Matter less than 10 microns): A major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. Particulate matter pollution is a major cause of reduce visibility (haze) which is caused by the scattering of light and	Sources of PM_{10} include road dust, windblown dust and construction. Also formed from other pollutants (acid rain, NO_X, SO_X, organics). Incomplete	A consistent correlation between elevated ambient fine particulate matter (PM_{10} and $PM_{2.5}$) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital

Criteria Pollutant	Description	Sources	Health Effects
	consequently the significant reduction air clarity. The size of the particles (10 microns or smaller, about 0.0004 inches or less) allows them to easily enter the lungs where they may be deposited, resulting in adverse health effects. Additionally, it should be noted that PM_{10} is considered a criteria air pollutant. $PM_{2.5}$ (Particulate Matter less than 2.5 microns): A similar air pollutant to PM_{10} consisting of tiny solid or liquid particles which are 2.5 microns or smaller (which is often referred to as fine particles). These particles are formed in the atmosphere from primary gaseous emissions that include sulfates formed from SO_2 release from power plants and industrial facilities and nitrates that are formed from NO_X release from power plants, automobiles and other types of combustion sources. The chemical composition of fine particles highly depends on location, time of year, and weather conditions. $PM_{2.5}$ is a criteria air pollutant.	combustion of any fuel. $PM_{2.5}$ comes from fuel combustion in motor vehicles, equipment and industrial sources, residential and agricultural burning. Also formed from reaction of other pollutants (acid rain, NO_X, SO_X, organics).	admissions has been observed in different parts of the United States (U.S.) and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in lifespan, and an increased mortality from lung cancer. Daily fluctuations in $PM_{2.5}$ concentration levels have also been related to hospital admissions for acute respiratory conditions in children, to school and kindergarten absences, to a decrease in respiratory lung volumes in normal children, and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long term exposure to particulate matter. The elderly, people with pre-existing respiratory or cardiovascular disease, and children appear to be more susceptible to the effects of high levels of PM_{10} and $PM_{2.5}$.
VOC	VOCs are hydrocarbon compounds (any compound containing various combinations of hydrogen and carbon atoms) that exist in the ambient air. VOCs contribute to the formation of smog through atmospheric photochemical reactions and/or may be toxic. Compounds of carbon (also known as organic compounds) have different levels of reactivity; that is, they do not react at the same speed or do not form O_3 to the same extent when	Organic chemicals are widely used as ingredients in household products. Paints, varnishes and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing and hobby products. Fuels are made up	Breathing VOCs can irritate the eyes, nose and throat, can cause difficulty breathing and nausea, and can damage the central nervous system as well as other organs. Some VOCs can cause cancer. Not all VOCs have all these health effects, though many have several.

Criteria Pollutant	Description	Sources	Health Effects
	exposed to photochemical processes. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. Exceptions to the VOC designation include carbon monoxide (CO), CO_2, carbonic acid (H_2CO_3), metallic carbides or carbonates, and ammonium carbonate. VOCs are a criteria pollutant since they are a precursor to O_3, which is a criteria pollutant. The terms VOC and ROG (see below) interchangeably.	of organic chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored.	
ROG	Similar to VOC, ROGs are also precursors in forming O_3 and consist of compounds containing methane, ethane, propane, butane, and longer chain hydrocarbons, which are typically the result of some type of combustion/decomposition process. Smog is formed when ROG and NO_X react in the presence of sunlight. ROGs are a criteria pollutant since they are a precursor to O_3, which is a criteria pollutant. The terms ROG and VOC (see previous) interchangeably.	Sources similar to VOCs.	Health effects similar to VOCs.
Lead (Pb)	Pb is a heavy metal that is highly persistent in the environment and is considered a criteria pollutant. In the past, the primary source of Pb in the air was emissions from vehicles burning leaded gasoline. The major sources of Pb emissions are ore and metals processing, particularly lead smelters, and piston-engine aircraft operating on leaded aviation gasoline. Other stationary sources include waste incinerators, utilities, and lead-acid battery manufacturers. It should be noted that the Project does not include	Metal smelters, resource recovery, leaded gasoline, deterioration of lead paint.	Fetuses, infants, and children are more sensitive than others to the adverse effects of Pb exposure. Exposure to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased Pb levels are associated with increased blood pressure.

Criteria Pollutant	Description	Sources	Health Effects
	operational activities such as metal processing or lead acid battery manufacturing. As such, the Project is not anticipated to generate a quantifiable amount of Pb emissions.		Pb poisoning can cause anemia, lethargy, seizures, and death; although it appears that there are no direct effects of Pb on the respiratory system. Pb can be stored in the bone from early age environmental exposure, and elevated blood Pb levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland) and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of Pb because of previous environmental Pb exposure of their mothers.
Odor	Odor means the perception experienced by a person when one or more chemical substances in the air come into contact with the human olfactory nerves (3).	Odors can come from many sources including animals, human activities, industry, natures, and vehicles.	Offensive odors can potentially affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, studies have shown that the VOCs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects such as stress.

2.4 EXISTING AIR QUALITY

Existing air quality is measured at established MDAQMD air quality monitoring stations. Monitored air quality is evaluated in the context of ambient air quality standards. These standards are the levels of air quality that are considered safe, with an adequate margin of safety, to protect the public health and welfare. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) currently in effect are shown in Table 2-2 (4).

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to the state and federal standards. At the time of this AQIA, the most recent state and federal standards were updated by the California Air Resources Board (CARB) on May 4, 2016 and are presented in Table 2-2. The air quality in a region is considered to be in attainment by the state if the measured ambient air pollutant levels for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, PM_{10}, and $PM_{2.5}$ are not to be exceeded. All others are not to be equaled or exceeded. It should be noted that the three-year period is presented for informational purposes and is not the basis for how the State assigns attainment status. Attainment status for a pollutant means that the Air District meets the standards set by the United State Environmental Protection Agency (EPA) or the California Environmental Protection Agency (CalEPA). Conversely, nonattainment means that an area has monitored air quality that does not meet the NAAQS or CAAQS standards. In order to improve air quality in nonattainment areas, a State Implementation Plan (SIP) is drafted. The SIP outlines the measures that the state will take to improve air quality. Once nonattainment areas meet the standards and additional redesignation requirements, the EPA will designate the area as a maintenance area (5).

TABLE 2-2: AMBIENT AIR QUALITY STANDARDS (1 OF 2)

Ambient Air Quality Standards						
Pollutant	**Averaging Time**	**California Standards** [1]		**National Standards** [2]		
		Concentration [3]	**Method** [4]	**Primary** [3,5]	**Secondary** [3,6]	**Method** [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	12.0 µg/m³	15 µg/m³	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m³)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m³)		9 ppm (10 mg/m³)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m³)	Gas Phase Chemiluminescence	100 ppb (188 µg/m³)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)		0.053 ppm (100 µg/m³)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m³)	Ultraviolet Fluorescence	75 ppb (196 µg/m³)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m³)	
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m³	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m³ (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m³		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

See footnotes on next page …

For more information please call ARB-PIO at (916) 322-2990 **California Air Resources Board (5/4/16)**

TABLE 2-2: AMBIENT AIR QUALITY STANDARDS (2 OF 2)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

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2.5 REGIONAL AIR QUALITY

Air pollution contributes to a wide variety of adverse health effects. The EPA has established NAAQS for seven of the most common air pollutants: O_3, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2 and Pb which are known as criteria pollutants. The MDAQMD monitors levels of various criteria pollutants at 6 permanent monitoring stations throughout the air district (6). On February 20, 2019, CARB posted the 2018 amendments to the state and national area designations. See Table 2-3 for attainment designations for the MDAB and the Southeast Desert Air Basin (SDAB) (7). Appendix 2.1 provides geographic representation of the state and federal attainment status for applicable criteria pollutants within the MDAB and SDAB.

TABLE 2-3: ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE MDAB

Criteria Pollutant	State Designation	Federal Designation
O_3 – 1-hour standard	Nonattainment	--
O_3 – 8-hour standard	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Nonattainment
$PM_{2.5}$	Attainment	Unclassifiable/Attainment
CO	Attainment	Unclassifiable/Attainment
NO_2	Attainment	Unclassifiable/Attainment
SO_2	Unclassifiable/Attainment	Unclassifiable/Attainment
Pb	Attainment	Unclassifiable/Attainment

Note: See Appendix 2.1 for a detailed map of State/National Area Designations within the MDAB and SDAB
"-" = The national 1-hour O_3 standard was revoked effective June 15, 2005.

2.6 LOCAL AIR QUALITY

Relative to the Project site, the nearest long-term air quality monitoring site for O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$ was obtained from the MDAQMD Victorville-Park Avenue station, located approximately 5.62 miles northeast of the project site in Victorville.

The most recent three (3) years of data available is shown on Table 2-4 and identifies the number of days ambient air quality standards were exceeded for the study area, which is considered to be representative of the local air quality at the Project site. Data for O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$ was obtained using the CARB iADAM: Air Quality and Data Statistics and the Air Quality and Meteorological Information System (AQMIS) (8) (9). Data for SO_2 has been omitted as attainment is regularly met and few monitoring stations measure SO_2 concentrations. It should be noted that the table below is provided for informational purposes.

TABLE 2-4: PROJECT AREA AIR QUALITY MONITORING SUMMARY 2016-2018

POLLUTANT	STANDARD	YEAR		
		2016	2017	2018
O_3				
Maximum Federal 1-Hour Concentration (ppm)		0.132	0.156	0.126
Maximum Federal 8-Hour Concentration (ppm)		0.109	0.118	0.107
Number of Days Exceeding Federal 1-Hour Standard	>0.07 ppm	3	4	1
Number of Days Exceeding State 1-Hour Standard	> 0.09 ppm	34	47	34
Number of Days Exceeding Federal 8-Hour Standard	> 0.070 ppm	98	99	123
Number of Days Exceeding State 8-Hour Standard	> 0.070 ppm	103	103	129
CO				
Maximum Federal 1-Hour Concentration	> 35 ppm	11.57	1.52	1.42
NO_2				
Maximum Federal 1-Hour Concentration	> 0.100 ppm	223.1	61.3	59.2
Annual Federal Standard Design Value		14	15	15
PM_{10}				
Maximum Federal 24-Hour Concentration (µg/m³)	> 150 µg/m³	246.9	262.3	165.2
Annual Federal Arithmetic Mean (µg/m³)		29.2	30.1	29.8
Number of Days Exceeding Federal 24-Hour Standard	> 150 µg/m³	2	2	1
Number of Days Exceeding State 24-Hour Standard	> 50 µg/m³	18	10	19
$PM_{2.5}$				
Maximum Federal 24-Hour Concentration (µg/m³)	> 35 µg/m³	64.8	27.2	40.4
Annual Federal Arithmetic Mean (µg/m³)	> 12 µg/m³	20	17	21
Number of Days Exceeding Federal 24-Hour Standard	> 35 µg/m³	3	0	3

Source: California Air Resource Board iADAM: Air Quality Data Statistics and AQMIS
Note: µg/m³ – microgram per cubic meter
-- = data not available

2.7 REGULATORY BACKGROUND

2.7.1 FEDERAL REGULATIONS

The EPA is responsible for setting and enforcing the NAAQS for O_3, CO, NO_X, SO_2, PM_{10}, and Pb (10). The EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Federal Clean Air Act (CAA) was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance (11). The

CAA also mandates that states submit and implement SIPs for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the CAA most directly applicable to the development of the Project site include Title I (Non-Attainment Provisions) and Title II (Mobile Source Provisions) (12) (13). Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants O_3, NO_2, SO_2, PM_{10}, CO, $PM_{2.5}$, and Pb. The NAAQS were amended in July 1997 to include an additional standard for O_3 and to adopt a NAAQS for $PM_{2.5}$. Table 2-3 (previously presented) provides the NAAQS within the MDAB.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and NO_X. NO_X is a collective term that includes all forms of nitrogen oxides (NO, NO_2, NO_3) which are emitted as byproducts of the combustion process.

2.7.2 CALIFORNIA REGULATIONS

California Air Resource Board. The CARB, which became part of the CalEPA in 1991, is responsible for ensuring implementation of the California Clean Air Act (AB 2595), responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. AB 2595 mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date. The CARB established the CAAQS for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride. However, at this time, hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the MDAB because they are not considered to be a regional air quality problem. Generally, the CAAQS are more stringent than the NAAQS (14) (10).

Local air quality management districts, such as the MDAQMD, regulate air emissions from stationary sources such as commercial and industrial facilities. All air pollution control districts have been formally designated as attainment or non-attainment for each CAAQS.

Serious non-attainment areas are required to prepare air quality management plans that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources;
- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g. motor vehicle use generated by residential and commercial development);
- A District permitting system designed to allow no net increase in emissions from any new or modified permitted sources of emissions;

- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled;
- Significant use of low emissions vehicles by fleet operators;
- Sufficient control strategies to achieve a five percent or more annual reduction in emissions or 15 percent or more in a period of three years for ROGs, NO_X, CO and PM_{10}. However, air basins may use alternative emission reduction strategy that achieves a reduction of less than five percent per year under certain circumstances.

Title 24 Energy Efficiency Standards and California Green Building Standards. California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. CCR, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect on January 1, 2011, and is administered by the California Building Standards Commission. CALGreen is updated on a regular basis, with the most recent approved update consisting of the 2019 CALGreen that will be effective January 1, 2020. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction and demolition ordinances and defers to them as the ruling guidance provided, they establish a minimum 65 percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State Building Code provides the minimum standard that buildings must meet in order to be certified for occupancy, which is generally enforced by the local building official.

Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas (GHG) emissions. The 2019 version of Title 24 was adopted by the California Energy Commission (CEC) and will become effective on January 1, 2020. It should be noted that the analysis herein assumes compliance with the 2019 Title 24 Standards because the Project will be constructed after January 1, 2020.

The 2019 Title 24 standards will result in less energy use, thereby reducing air pollutant emissions associated with energy consumption in the MDAB and across the State of California. For example, the 2019 Title 24 standards will require solar photovoltaic systems for new homes, establish requirements for newly constructed healthcare facilities, encourage demand responsive technologies for residential buildings, and update indoor and outdoor lighting requirements for nonresidential buildings. The CEC anticipates that single-family homes built with the 2019 standards will use approximately 7 percent less energy compared to the residential homes built under the 2016 standards. Additionally, after implementation of solar photovoltaic systems, homes built under the 2019 standards will use about 53 percent less energy than homes built under the 2016 standards. Nonresidential buildings (such as the proposed Project) will use approximately 30 percent less energy due to lighting upgrade requirements (15).

Because the Project will be constructed after January 1,2019, the 2019 CALGreen standards are applicable to the Project and require, among other items (16):

- Short-term bicycle parking. If the new project or an additional alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility (5.106.4.1.2).
- Designated parking. In new projects or additions to alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- Construction waste management. Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1. 5.405.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent (5.408.1).
- Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed (5.408.3).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive (5.410.1).
- Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:
    - Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush (5.303.3.1)
    - Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush (5.303.3.2.1). The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush (5.303.3.2.2).
    - Showerheads. Single showerheads shall have a minimum flow rate of not more than 1.8 gallons per minute and 80 psi (5.303.3.3.1). When a shower is served by more than one showerhead, the combine flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi (5.303.3.3.2).
    - Faucets and fountains. Nonresidential lavatory faucets shall have a maximum flow rate of note more than 0.5 gallons per minute at 60 psi (5.303.3.4.1). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute of 60 psi (5.303.3.4.2). Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute (5.303.3.4.3). Metering faucets shall not deliver more than 0.20 gallons per cycle (5.303.3.4.4). Metering faucets for wash fountains shall have a maximum flow rate not more than 0.20 gallons per cycle (5.303.3.4.5).

- Outdoor portable water use in landscaped areas. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient (MWELO), whichever is more stringent (5.304.1).
- Water meters. Separate submeters or metering devices shall be installed for new buildings or additions in excess of 50,000 square feet (sf) or for excess consumption where any tenant within a new building or within an addition that is project to consume more than 1,000 gal/day (5.303.1.1 and 5.303.1.2).
- Outdoor water use in rehabilitated landscape projects equal or greater than 2,500 sf. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sf requiring a building or landscape permit (5.304.3).
- Commissioning. For new buildings 10,000 sf and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements (5.410.2).

2.7.3 AIR QUALITY MANAGEMENT PLANNING

Currently, the NAAQS and CAAQS are exceeded in most parts of the MDAB. The NAAQS, the Project region within the MDAB is in nonattainment for O_3 (8-hour) and PM_{10}. For the CAAQS, the Project region within the MDAB is in nonattainment for O_3 (1-hour and 8-hour) and PM_{10}. In response, the MDAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards (17). AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy. A detailed discussion on the AQMP and Project consistency with the AQMP is provided in Section 3.7.

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3 PROJECT AIR QUALITY IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will violate an air quality standard or contribute to an existing or projected air quality violation. Additionally, the Project has been evaluated to determine if it will result in a cumulatively considerable net increase of a criteria pollutant for which the MDAB is non-attainment under an applicable federal or state ambient air quality standard. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related air quality impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 CCR §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to air quality if it would (18):

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. affecting a substantial number of people.

The MDAQMD has developed regional significance thresholds for regulated pollutants, shown below in Table 3-1. The MDAQMD's *Guidelines* indicate that any projects in the MDAB with daily regional emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact (19).

TABLE 3-1: MAXIMUM REGIONAL DAILY EMISSIONS THRESHOLDS

Pollutant	Daily Threshold (lbs./day)
CO	548 lbs/day
NO_X	137 lbs/day
VOC	137 lbs/day
SO_X	137 lbs/day
PM_{10}	82 lbs/day
$PM_{2.5}$	65 lbs/day

Note: lbs/day – pounds per day

3.3 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ EMPLOYED TO ESTIMATE AQ EMISSIONS

Land uses such as the Project affect air quality through construction-source and operational-source emissions.

On October 17, 2017, the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model (CalEEMod) v2016.3.2. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (20). Accordingly, the latest version of CalEEMod has been used for this Project to determine construction and operational air quality emissions. Output from the model runs for construction activity is provided in Appendix 3.1.

3.4 CONSTRUCTION EMISSIONS

Construction activities associated with the Project will result in emissions of VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$. Construction related emissions are expected from earthwork (excavation, compaction, soil import/export, slope grading and filling), delivery of structural materials, and pouring of concrete and paving activities.

Grading Activities

Dust is typically a major concern during grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions". Fugitive dust emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). CalEEMod was utilized to calculate fugitive dust emissions resulting from this phase of activity. Based on information provided by the Project applicant, the Project is expected to require 3,354 cubic yards (CY) of import. For purposes of analysis the CalEEMod default trip length for hauling activities of 20 miles is has been used.

Construction Worker Vehicle Trips

Construction emissions for construction worker vehicles traveling to and from the Project site, as well as vendor trips (construction materials delivered to the Project site) were estimated based on information from CalEEMod defaults.

3.4.1 CONSTRUCTION DURATION

Construction is expected to occur in 2020 and will last for a duration of approximately one (1) year. For purposes of analysis, construction is expected to commence in March 2020 and will last through March 2021. Construction duration utilized in the analysis represents a "worst-case" analysis scenario should construction occur any time after the respective dates since emission

factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent.[1]

3.4.2 CONSTRUCTION EQUIPMENT

The associated construction equipment is shown on Table 3-2 and is based on information provided by the Project applicant.

TABLE 3-2: CONSTRUCTION EQUIPMENT

Equipment	Equipment Name in CalEEMod	Amount	Duration
Backhoe Loader	Tractor/Loader/Backhoe	1	6 months
Excavator	Excavator	1	6 months
Dump Truck/Hauling Truck	Dumper/Tender	10	6 months
Delivery Truck	Off-Highway Truck	1	6 months
Asphalt Paver	Paver	1	5 days
Steel Wheel Roller	Roller	1	10 days
Concrete Mixers Truck	Cement and Mortar Mixer	3	20 days
Concrete Boom Pump Truck	Other Construction Equipment	1	10 days
Truck Mounted Boom Crane	Crane	1	20 days
Dozer	Rubber Tired Dozer	1	6 months
Water Truck	Off-Highway Truck	1	6 months
Welding Truck	Off-Highway Truck	1	6 months
Electric Generator	Generator Set	1	6 months

It should be noted that site specific construction fleet may vary due to specific project needs at the time of construction. As a conservative measure, the construction equipment was modeled under the assumption that each equipment would operate for up to 8 hours per day during an approximate 12-month construction period (21).

The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per CEQA Guidelines. The duration of construction activity was based on information provided by the Project applicant and the 2021 opening year.

[1] As shown in the CalEEMod User's Guide Version 2016.3.2, Section 4.3 "OFFROAD Equipment" as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

3.4.3 CONSTRUCTION EMISSIONS SUMMARY

Impacts without Mitigation

CalEEMod calculates maximum daily emissions for summer and winter periods. The estimated maximum daily construction emissions without mitigation are summarized on Table 3-3. Detailed construction model outputs are presented in Appendix 3.1. Under the assumed scenarios, emissions resulting from the Project construction will not exceed criteria pollutant thresholds established by the MDAQMD for emissions of any criteria pollutant.

TABLE 3-3: OVERALL CONSTRUCTION EMISSIONS SUMMARY (WITHOUT MITIGATION)

Year	Emissions (lbs/day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Summer						
2020	6.52	60.02	41.37	0.10	9.98	6.03
2021	6.07	53.88	40.26	0.10	9.76	5.77
Winter						
2020	6.52	60.03	41.04	0.10	9.98	6.03
2021	6.07	53.89	39.09	0.10	9.76	5.77
Maximum Daily Emissions	**6.52**	**60.03**	**41.37**	**0.10**	**9.98**	**6.03**
MDAQMD Regional Threshold	137	137	548	1377	82	65
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: CalEEMod construction-source (unmitigated) emissions are presented in Appendix 3.1.

3.5 OPERATIONAL EMISSIONS

Long-term air quality impacts occur from mobile source emission generated from Project-related traffic and from stationary source emissions generated from natural gas. The proposed Project primarily involves construction activity. For on-going operations, mobile emissions would be generated by the motor vehicles traveling to and from the Project sites during on-going maintenance. However, the Project would generate a nominal number of traffic trips for periodic maintenance and inspections and would not result in any substantive new long-term emissions sources. Stationary area source emissions are typically generated by the consumption of natural gas for space and water heating devices and the use of consumer products. As this Project involves upgrading the existing turnout 6, relocating turnout 7, and existing pipeline, heating and consumer products would not be used. Stationary energy emissions would result from energy consumption associated with the proposed Project. All operational equipment associated with the Project would be electrically powered and would not directly generate air emissions.

The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment. As Project operations would not exceed MDAQMD thresholds, the Project would not violate an air quality standard or contribute to an

existing violation. Therefore, Project operations would not result in a cumulatively considerable net increase of any criteria pollutant and impacts would be less than significant.

3.6 CO "HOT SPOT" ANALYSIS

As discussed below, the Project would not result in potentially adverse CO concentrations or "hot spots." Further, detailed modeling of Project-specific CO "hot spots" is not needed to reach this conclusion. An adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm were to occur. At the time of the 1993 Handbook, the air basin was designated nonattainment under the CAAQS and NAAQS for CO (22).

It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last twenty years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the air basin is now designated as attainment, as previously noted in Table 2-3. Also, CO concentrations in the Project vicinity have steadily declined, as indicated by historical emissions data presented previously at Table 2-4.

To establish a more accurate record of baseline CO concentrations affecting the basin, a CO "hot spot" analysis was conducted in 2003 for four busy intersections in Los Angeles at the peak morning and afternoon time periods. This 2003 hot spot analysis did not predict any violation of CO standards, as shown on Table 3-4.

TABLE 3-4: CO MODEL RESULTS

Intersection Location	CO Concentrations (ppm)		
	Morning 1-hour	Afternoon 1-hour	8-hour
Wilshire/Veteran	4.6	3.5	3.7
Sunset/Highland	4	4.5	3.5
La Cienega/Century	3.7	3.1	5.2
Long Beach/Imperial	3	3.1	8.4

Source: 2003 AQMP, Appendix V: Modeling and Attainment Demonstrations
Notes: Federal 1-hour standard is 35 ppm and the deferral 8-hour standard is 9.0 ppm.

It should be noted that MDAQMD has not established its own guidelines for CO hotspots analysis. Since the MDAQMD guidelines are based on SCAQMD methodology, it is appropriate to apply the SCAQMD criteria when analyzing CO hotspots within the MDAQMD. As identified within SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the basin were a result of unusual meteorological and topographical conditions and not a result of traffic volumes and congestion at a particular intersection. As evidence of this, for example, 8.4 ppm CO concentration measured at the Long

Beach Blvd. and Imperial Hwy. intersection (highest CO generating intersection within the "hot spot" analysis), only 0.7 ppm was attributable to the traffic volumes and congestion at this intersection; the remaining 7.7 ppm were due to the ambient air measurements at the time the 2003 AQMP was prepared (22). Therefore, even if the traffic volumes for the proposed Project were double or even triple of the traffic volumes generated at the Long Beach Blvd. and Imperial Hwy. intersection, coupled with the on-going improvements in ambient air quality, the Project would not be capable of resulting in a CO "hot spot" at any study area intersections.

Similar considerations are also employed by other Air Districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD) concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (23).

Traffic volumes generating the CO concentrations for the "hot spot" analysis, shown on Table 3-5. The busiest intersection evaluated was that at Wilshire Blvd. and Veteran Ave., which has a daily traffic volume of approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 ppm; this indicates that, should the daily traffic volume increase four times to 400,000 vehicles per day, CO concentrations (4.6 ppm x 4= 18.4 ppm) would still not likely exceed the most stringent 1-hour CO standard (20.0 ppm).[2] At buildout of the Project, the highest daily traffic volumes generated at the roadways within the vicinity of the Project are expected to generate less than the highest daily traffic volumes generated at the busiest intersection in the CO "hot spot" analysis. As such, the Project would not likely exceed the most stringent 1-hour CO standard.

TABLE 3-5: TRAFFIC VOLUMES

Intersection Location	Peak Traffic Volumes (vph)				
	Eastbound (AM/PM)	Westbound (AM/PM)	Southbound (AM/PM)	Northbound (AM/PM)	Total (AM/PM)
Wilshire/Veteran	4,954/2,069	1,830/3,317	721/1,400	560/933	8,062/7,719
Sunset/Highland	1,417/1,764	1,342/1,540	2,304/1,832	1,551/2,238	6,614/5,374
La Cienega/Century	2,540/2,243	1,890/2,728	1,384/2,029	821/1,674	6,634/8,674
Long Beach/Imperial	1,217/2,020	1,760/1,400	479/944	756/1,150	4,212/5,514

vph – Vehicles Per Hour
Source: 2003 AQMP

3.7 AIR QUALITY MANAGEMENT PLANNING

The Federal Particulate Matter Attainment Plan and Ozone Attainment Plan for the Mojave Desert set forth a comprehensive set of programs that will lead the MDAB into compliance with federal and state air quality standards. The control measures and related emission reduction

2 Based on the ratio of the CO standard (20.0 ppm) and the modeled value (4.6 ppm).

estimates within the Federal Particulate Matter Attainment Plan and Ozone Attainment Plan are based upon emissions projections for a future development scenario derived from land use, population, and employment characteristics defined in consultation with local governments. Accordingly, conformance with these attainment plans for development projects is determined by demonstrating compliance the indicators discussed below (19):

Consistency Criterion No. 1: Local land use plans and/or population projections

The Project's does not propose a land use development but rather involves pipeline and associated improvements.

Consistency Criterion No. 2: All MDAQMD Rules and Regulations

The Project would be required to comply with all applicable MDAQMD Rules and Regulations, including, but not limited to Rules 401 (Visibile Emissions), 402 (Nuisance), and 403 (Fugitive Dust).

Consistency Criterion No. 3: Demonstrating that the project will not increase the frequency or severity of a violation in the federal or state ambient air quality standards

As substantiated herein, Project construction-source emissions would not exceed applicable MDAQMD regional thresholds. As such, Project emissions are considered to a have less than significant impact and would not have the potential to increase the frequency or severity of a violation in NAAQS and CAAQS.

AQMP Consistency Conclusion

The Project would conform to local land use plans, comply with all applicable all MDAQMD Rules and Regulations, and would not have the potential to increase the frequency or severity of a violation in NAAQS and CAAQS. On this basis, the Project is considered to consistent with the Federal Particulate Matter Attainment Plan and Ozone Attainment Plan for the Mojave Desert. The Project is therefore considered to be consistent with the AQMP.

3.8 POTENTIAL IMPACTS TO SENSITIVE RECEPTORS

The potential impact of Project-generated air pollutant emissions at sensitive receptors has also been considered. Sensitive receptors can include uses such as long-term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, childcare centers, and athletic facilities can also be considered as sensitive receptors. The nearest sensitive receptor is a residential community located adjacent to the Project site east of Mesa View Drive.

As per the MDAQMD's *Guidelines*, the following project types located within a specified distance to an existing or planned sensitive receptor land use must be evaluated to determine exposure of substantial pollutant concentrations to sensitive receptors (19):

- Any industrial project within 1,000 feet;
- A distribution center (40 or more trucks per day) within 1,000 feet;
- A major transportation project (50,000 or more vehicles per day) within 1,000 feet;

- A dry cleaner using perchloroethylene within 500 feet;
- A gasoline dispensing facility within 300 feet.

The proposed Project's land uses do not include the above uses. As such, no analysis for sensitive receptors is required. Additionally. results of the regional analysis indicate that the Project will not exceed the MDAQMD significance thresholds during construction or operations. Therefore, sensitive receptors would not be subject to a significant air quality impact during Project construction and operational activities.

The proposed Project would not result in a CO "hotspot" as a result of Project related traffic during ongoing operations, nor would the Project result in a significant adverse health impact as discussed in Section 3.6. Thus, a less than significant impact to sensitive receptors during operational activity is expected.

3.9 ODORS

The potential for the Project to generate objectionable odors has also been considered. Land uses generally associated with odor complaints include:

- Agricultural uses (livestock and farming)
- Wastewater treatment plants
- Food processing plants
- Chemical plants
- Composting operations
- Refineries
- Landfills
- Dairies
- Fiberglass molding facilities

The Project does not propose or require land uses that would be substantive sources of objectionable odors. Potential temporary and intermittent odors may result from construction equipment exhaust, the application of asphalt and architectural coatings, Temporary and intermittent construction-source emissions are controlled through existing requirements and industry Best Management Practices (BMPs) addressing proper storage of and application construction materials.

Over the life of the Project, odors may result from storage of municipal solid waste pending its transport to area landfills. . Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the City's solid waste regulations.

The proposed Project would also be required to comply with MDAQMD Rule 402. Rule 402 provides that "[a] person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause,

injury or damage to business or property." (24). Based on the preceding, the potential for the Project to create objectionable odors affecting a substantial number of people is considered less-than-significant.

3.10 CUMULATIVE IMPACTS

The MDAQMD relies on the SCAQMD guidance for determining cumulative impacts. The SCAQMD has recognized that there is typically insufficient information to quantitatively evaluate the cumulative contributions of multiple projects because each project applicant has no control over nearby projects.

The SCAQMD published a report on how to address cumulative impacts from air pollution: *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution* (25). In this report the Air Quality Management District (AQMD) clearly states (Page D-3):

> *"…the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or Environmental Impact Report (EIR). The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant (TAC) emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.*
>
> *Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."*

Individual projects that do not generate construction or operational emissions that exceed the MDAQMD's recommended daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the MDAB is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. As previously noted, the Project construction and operational-source would not exceed applicable MDAQMD regional thresholds. As such, the Project will not result in a cumulatively significant impact for construction or operational activity.

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5 CERTIFICATIONS

The contents of this air study report represent an accurate depiction of the environmental impacts associated with the proposed Adelanto R³ Extension Project. The information contained in this air quality impact assessment report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
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ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 2.1:

STATE/FEDERAL ATTAINMENT STATUS OF CRITERIA POLLUTANTS

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APPENDIX C

MAPS AND TABLES OF AREA DESIGNATIONS FOR STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

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APPENDIX C

MAPS AND TABLES OF AREA DESIGNATIONS FOR STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

This attachment fulfills the requirement of Health and Safety Code section 40718 for CARB to publish maps that identify areas where one or more violations of any State ambient air quality standard (State standard) or national ambient air quality standard (national standard) have been measured. The national standards are those promulgated under section 109 of the federal Clean Air Act (42 U.S.C. 7409).

This attachment is divided into three parts. The first part comprises a table showing the levels, averaging times, and measurement methods for each of the State and national standards. This is followed by a section containing maps and tables showing the area designations for each pollutant for which there is a State standard in the California Code of Regulations, title 17, section 70200. The last section contains maps and tables showing the most current area designations for the national standards.

Ambient Air Quality Standards

(Updated 5/4/16)

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	12.0 µg/m³	15 µg/m³	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m³)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m³)		9 ppm (10 mg/m³)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m³)	Gas Phase Chemiluminescence	100 ppb (188 µg/m³)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)		0.053 ppm (100 µg/m³)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m³)	Ultraviolet Fluorescence	75 ppb (196 µg/m³)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m³)	
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m³	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m³ (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m³		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

See footnotes on next page …

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA.

8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

14. In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

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Area Designations for the State Ambient Air Quality Standards

The following maps and tables show the area designations for each pollutant with a State standard set forth in the California Code of Regulations, title 17, section 60200. Each area is identified as attainment, nonattainment, nonattainment-transitional, or unclassified for each pollutant, as shown below:

Attainment	A
Nonattainment	N
Nonattainment-Transitional	NA-T
Unclassified	U

In general, CARB designates areas by air basin for pollutants with a regional impact and by county for pollutants with a more local impact. However, when there are areas within an air basin or county with distinctly different air quality deriving from sources and conditions not affecting the entire air basin or county, CARB may designate a smaller area. Generally, when boundaries of the designated area differ from the air basin or county boundaries, the description of the specific area is referenced at the bottom of the summary table.

FIGURE 1



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 1

California Ambient Air Quality Standards
Area Designations for Ozone [1]

	N	NA-T	U	A		N	NA-T	U	A
GREAT BASIN VALLEYS AIR BASIN					NORTHEAST PLATEAU AIR BASIN				X
Alpine County			X		SACRAMENTO VALLEY AIR BASIN				
Inyo County	X				Colusa and Glenn Counties				X
Mono County	X				Sutter/Yuba Counties				
LAKE COUNTY AIR BASIN				X	Sutter Buttes	X			
LAKE TAHOE AIR BASIN				X	Remainder of Sutter County				X
MOJAVE DESERT AIR BASIN	X				Yuba County				X
MOUNTAIN COUNTIES AIR BASIN					Yolo/Solano Counties		X		
Amador County	X				Remainder of Air Basin	X			
Calaveras County	X				SALTON SEA AIR BASIN	X			
El Dorado County (portion)	X				SAN DIEGO AIR BASIN	X			
Mariposa County	X				SAN FRANCISCO BAY AREA AIR BASIN	X			
Nevada County	X				SAN JOAQUIN VALLEY AIR BASIN	X			
Placer County (portion)	X				SOUTH CENTRAL COAST AIR BASIN				
Plumas County			X		San Luis Obispo County	X			
Sierra County			X		Santa Barbara County		X		
Tuolumne County	X				Ventura County	X			
NORTH CENTRAL COAST AIR BASIN		X			SOUTH COAST AIR BASIN	X			
NORTH COAST AIR BASIN				X					

(1) AB 3048 (Olberg) and AB 2525 (Miller) signed into law in 1996, made changes to Health and Safety Code, section 40925.5. One of the changes allows nonattainment districts to become nonattainment-transitional for ozone by operation of law.

FIGURE 2



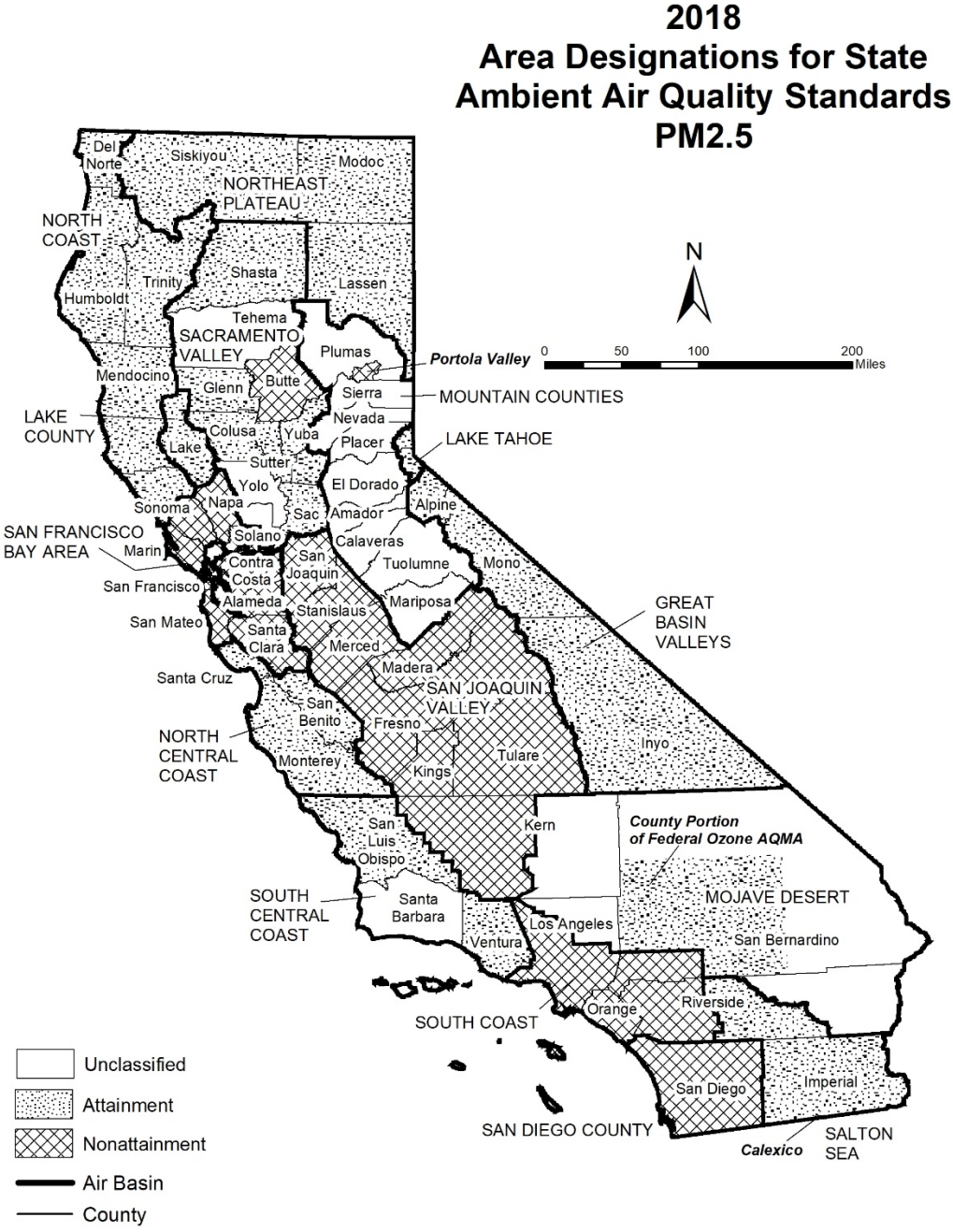
Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 2

California Ambient Air Quality Standards
Area Designation for Suspended Particulate Matter (PM10)

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN	X			NORTH CENTRAL COAST AIR BASIN	X		
LAKE COUNTY AIR BASIN			X	NORTH COAST AIR BASIN			
LAKE TAHOE AIR BASIN	X			Del Norte, Sonoma (portion) and Trinity Counties			X
MOJAVE DESERT AIR BASIN	X			Remainder of Air Basin	X		
MOUNTAIN COUNTIES AIR BASIN				NORTHEAST PLATEAU AIR BASIN			
Amador County		X		Siskiyou County			X
Calaveras County	X			Remainder of Air Basin		X	
El Dorado County (portion)	X			SACRAMENTO VALLEY AIR BASIN			
Mariposa County				Shasta County			X
- Yosemite National Park	X			Remainder of Air Basin	X		
- Remainder of County		X		SALTON SEA AIR BASIN	X		
Nevada County	X			SAN DIEGO AIR BASIN	X		
Placer County (portion)	X			SAN FRANCISCO BAY AREA AIR BASIN	X		
Plumas County	X			SAN JOAQUIN VALLEY AIR BASIN	X		
Sierra County	X			SOUTH CENTRAL COAST AIR BASIN	X		
Tuolumne County		X		SOUTH COAST AIR BASIN	X		

FIGURE 3



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 3

California Ambient Air Quality Standards
Area Designations for Fine Particulate Matter (PM2.5)

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN			X	SALTON SEA AIR BASIN			
LAKE COUNTY AIR BASIN			X	Imperial County			
LAKE TAHOE AIR BASIN			X	- City of Calexico (3)	X		
MOJAVE DESERT AIR BASIN				Remainder of Air Basin			X
San Bernardino County				SAN DIEGO AIR BASIN	X		
- County portion of federal Southeast Desert Modified AQMA for Ozone (1)			X	SAN FRANCISCO BAY AREA AIR BASIN	X		
				SAN JOAQUIN VALLEY AIR BASIN	X		
Remainder of Air Basin		X		SOUTH CENTRAL COAST AIR BASIN			
MOUNTAIN COUNTIES AIR BASIN				San Luis Obispo County			X
Plumas County				Santa Barbara County		X	
- Portola Valley (2)	X			Ventura County			X
Remainder of Air Basin		X		SOUTH COAST AIR BASIN	X		
NORTH CENTRAL COAST AIR BASIN			X				
NORTH COAST AIR BASIN			X				
NORTHEAST PLATEAU AIR BASIN			X				
SACRAMENTO VALLEY AIR BASIN							
Butte County	X						
Colusa County			X				
Glenn County			X				
Placer County (portion)			X				
Sacramento County			X				
Shasta County			X				
Sutter and Yuba Counties			X				
Remainder of Air Basin		X					

(1) California Code of Regulations, title 17, section 60200(b)

(2) California Code of Regulations, title 17, section 60200(c)

(3) California Code of Regulations, title 17, section 60200(a)

FIGURE 4

2018
Area Designations for State Ambient Air Quality Standards
CARBON MONOXIDE



Source Date:
October 2018
Air Quality Planning and Science Division

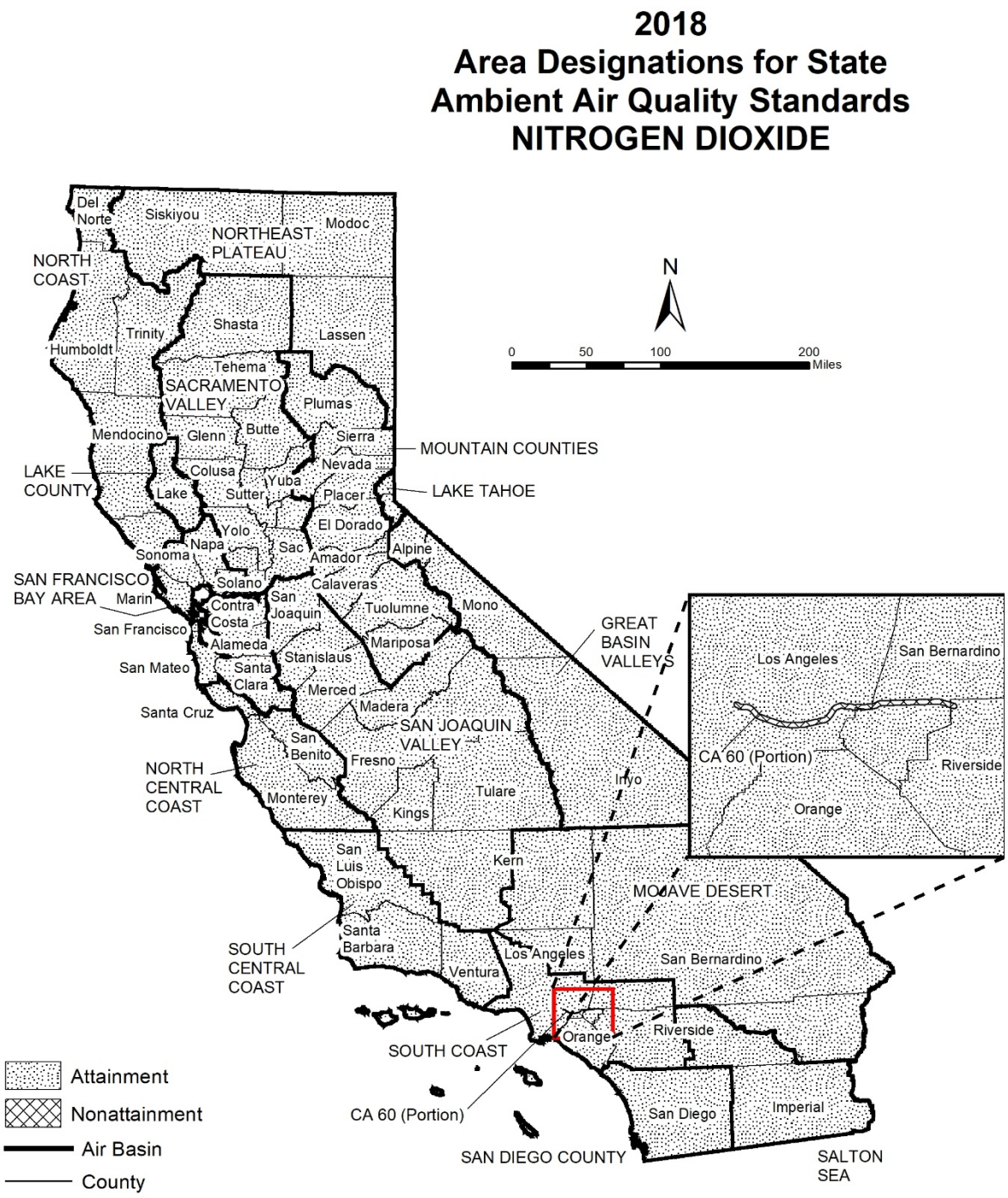
TABLE 4

California Ambient Air Quality Standards
Area Designation for Carbon Monoxide*

	N	NA-T	U	A		N	NA-T	U	A
GREAT BASIN VALLEYS AIR BASIN					SACRAMENTO VALLEY AIR BASIN				
Alpine County			X		Butte County				X
Inyo County				X	Colusa County			X	
Mono County				X	Glenn County			X	
LAKE COUNTY AIR BASIN				X	Placer County (portion)				X
LAKE TAHOE AIR BASIN				X	Sacramento County				X
MOJAVE DESERT AIR BASIN					Shasta County			X	
Kern County (portion)			X		Solano County (portion)				X
Los Angeles County (portion)				X	Sutter County				X
Riverside County (portion)			X		Tehama County			X	
San Bernardino County (portion)				X	Yolo County				X
MOUNTAIN COUNTIES AIR BASIN					Yuba County			X	
Amador County			X		SALTON SEA AIR BASIN				X
Calaveras County			X		SAN DIEGO AIR BASIN				X
El Dorado County (portion)			X		SAN FRANCISCO BAY AREA AIR BASIN				X
Mariposa County			X		SAN JOAQUIN VALLEY AIR BASIN				
Nevada County			X		Fresno County				X
Placer County (portion)			X		Kern County (portion)				X
Plumas County				X	Kings County			X	
Sierra County			X		Madera County			X	
Tuolumne County				X	Merced County			X	
NORTH CENTRAL COAST AIR BASIN					San Joaquin County				X
Monterey County				X	Stanislaus County				X
San Benito County			X		Tulare County				X
Santa Cruz County			X		SOUTH CENTRAL COAST AIR BASIN				X
NORTH COAST AIR BASIN					SOUTH COAST AIR BASIN				X
Del Norte County			X						
Humboldt County				X					
Mendocino County				X					
Sonoma County (portion)			X						
Trinity County			X						
NORTHEAST PLATEAU AIR BASIN			X						

* The area designated for carbon monoxide is a county or portion of a county

FIGURE 5



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 5

California Ambient Air Quality Standards
Area Designation for Nitrogen Dioxide

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN			X	SACRAMENTO VALLEY AIR BASIN			X
LAKE COUNTY AIR BASIN			X	SALTON SEA AIR BASIN			X
LAKE TAHOE AIR BASIN			X	SAN DIEGO AIR BASIN			X
MOJAVE DESERT AIR BASIN			X	SAN FRANCISCO BAY AREA AIR BASIN			X
MOUNTAIN COUNTIES AIR BASIN			X	SAN JOAQUIN VALLEY AIR BASIN			X
NORTH CENTRAL COAST AIR BASIN			X	SOUTH CENTRAL COAST AIR BASIN			X
NORTH COAST AIR BASIN			X	SOUTH COAST AIR BASIN			
NORTHEAST PLATEAU AIR BASIN			X	CA 60 Near-road Portion of San Bernardino, Riverside, and Los Angeles Counties	X		
				Remainder of Air Basin			X

FIGURE 6



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 6

California Ambient Air Quality Standards
Area Designation for Sulfur Dioxide*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN		X
LAKE COUNTY AIR BASIN		X	SALTON SEA AIR BASIN		X
LAKE TAHOE AIR BASIN		X	SAN DIEGO AIR BASIN		X
MOJAVE DESERT AIR BASIN		X	SAN FRANCISCO BAY AREA AIR BASIN		X
MOUNTAIN COUNTIES AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN		X
NORTH CENTRAL COAST AIR BASIN		X	SOUTH CENTRAL COAST AIR BASIN		X
NORTH COAST AIR BASIN		X	SOUTH COAST AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X			

* The area designated for sulfur dioxide is a county or portion of a county

FIGURE 7



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 7

California Ambient Air Quality Standards
Area Designation for Sulfates

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN			X	SACRAMENTO VALLEY AIR BASIN			X
LAKE COUNTY AIR BASIN			X	SALTON SEA AIR BASIN			X
LAKE TAHOE AIR BASIN			X	SAN DIEGO AIR BASIN			X
MOJAVE DESERT AIR BASIN			X	SAN FRANCISCO BAY AREA AIR BASIN			X
MOUNTAIN COUNTIES AIR BASIN			X	SAN JOAQUIN VALLEY AIR BASIN			X
NORTH CENTRAL COAST AIR BASIN			X	SOUTH CENTRAL COAST AIR BASIN			X
NORTH COAST AIR BASIN			X	SOUTH COAST AIR BASIN			X
NORTHEAST PLATEAU AIR BASIN			X				

FIGURE 8

2018
Area Designations for State Ambient Air Quality Standards
LEAD



Source Date:
October 2018
Air Quality Planning and Science Division

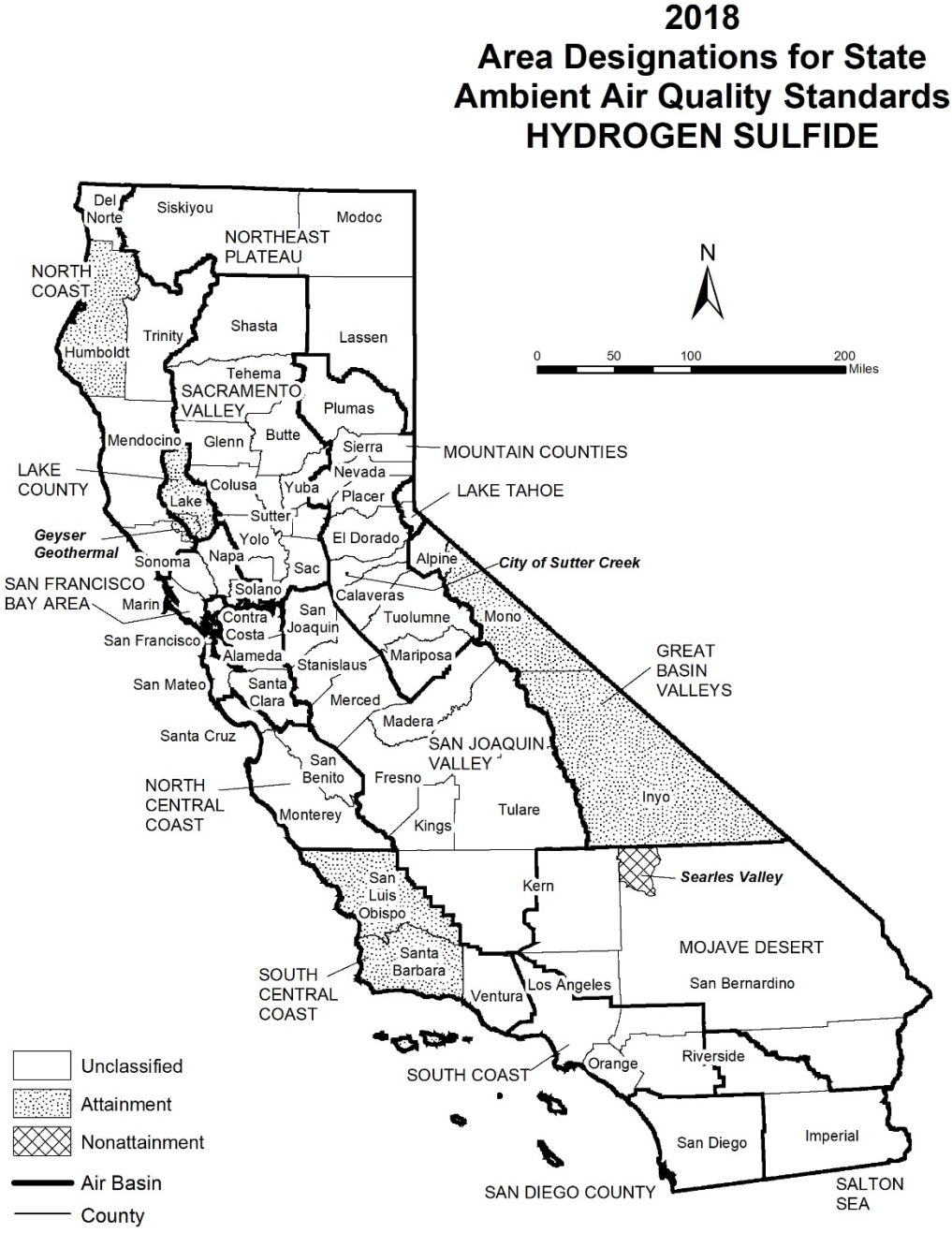
TABLE 8

California Ambient Air Quality Standards
Area Designations for Lead (particulate)*

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN			X	SALTON SEA AIR BASIN			X
LAKE COUNTY AIR BASIN			X	SAN DIEGO AIR BASIN			X
LAKE TAHOE AIR BASIN			X	SAN FRANCISCO BAY AREA AIR BASIN			X
MOJAVE DESERT AIR BASIN			X	SAN JOAQUIN VALLEY AIR BASIN			X
MOUNTAIN COUNTIES AIR BASIN			X	SOUTH CENTRAL COAST AIR BASIN			X
NORTH CENTRAL COAST AIR BASIN			X	SOUTH COAST AIR BASIN			X
NORTH COAST AIR BASIN			X				
NORTHEAST PLATEAU AIR BASIN			X				
SACRAMENTO VALLEY AIR BASIN			X				

* The area designated for lead is a county or portion of a county. Since all areas in the State are in attainment for this standard, air basins are indicated here for simplicity.

FIGURE 9



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 9

California Ambient Air Quality Standards
Area Designation for Hydrogen Sulfide*

	N	NA-T	U	A		N	NA-T	U	A
GREAT BASIN VALLEYS AIR BASIN					NORTH CENTRAL COAST AIR BASIN			X	
Alpine County			X		NORTH COAST AIR BASIN				
Inyo County				X	Del Norte County			X	
Mono County				X	Humboldt County				X
LAKE COUNTY AIR BASIN				X	Mendocino County			X	
LAKE TAHOE AIR BASIN			X		Sonoma County (portion)				
MOJAVE DESERT AIR BASIN					- Geyser Geothermal Area (2)				X
Kern County (portion)			X		- Remainder of County			X	
Los Angeles County (portion)			X		Trinity County			X	
Riverside County (portion)			X		NORTHEAST PLATEAU AIR BASIN			X	
San Bernardino County (portion)					SACRAMENTO VALLEY AIR BASIN			X	
- Searles Valley Planning Area (1)	X				SALTON SEA AIR BASIN			X	
- Remainder of County			X		SAN DIEGO AIR BASIN			X	
MOUNTAIN COUNTIES AIR BASIN					SAN FRANCISCO BAY AREA AIR BASIN			X	
Amador County					SAN JOAQUIN VALLEY AIR BASIN			X	
- City of Sutter Creek	X				SOUTH CENTRAL COAST AIR BASIN				
- Remainder of County			X		San Luis Obispo County				X
Calaveras County			X		Santa Barbara County				X
El Dorado County (portion)			X		Ventura County			X	
Mariposa County			X		SOUTH COAST AIR BASIN			X	
Nevada County			X						
Placer County (portion)			X						
Plumas County			X						
Sierra County			X						
Tuolumne County			X						

* The area designated for hydrogen sulfide is a county or portion of a county

(1) 52 Federal Register 29384 (August 7, 1987)

(2) California Code of Regulations, title 17, section 60200(d)

FIGURE 10

2018
Area Designations for State Ambient Air Quality Standards
VISIBILITY REDUCING PARTICLES



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 10

California Ambient Air Quality Standards
Area Designation for Visibility Reducing Particles

	N	NA-T	U	A		N	NA-T	U	A
GREAT BASIN VALLEYS AIR BASIN			X		SACRAMENTO VALLEY AIR BASIN			X	
LAKE COUNTY AIR BASIN				X	SALTON SEA AIR BASIN			X	
LAKE TAHOE AIR BASIN			X		SAN DIEGO AIR BASIN			X	
MOJAVE DESERT AIR BASIN			X		SAN FRANCISCO BAY AREA AIR BASIN			X	
MOUNTAIN COUNTIES AIR BASIN			X		SAN JOAQUIN VALLEY AIR BASIN			X	
NORTH CENTRAL COAST AIR BASIN			X		SOUTH CENTRAL COAST AIR BASIN			X	
NORTH COAST AIR BASIN			X		SOUTH COAST AIR BASIN			X	
NORTHEAST PLATEAU AIR BASIN			X						

Area Designations for the National Ambient Air Quality Standards

The following maps and tables show the area designations for each pollutant with a national ambient air quality standard. Additional information about the federal area designations is available on the U.S. EPA website:

https://www.epa.gov/green-book

Over the last several years, U.S. EPA has been reviewing the levels of the various national standards. The agency has already promulgated new standard levels for some pollutants and is considering revising the levels for others. Information about the status of these reviews is available on the U.S. EPA website:

https://www.epa.gov/criteria-air-pollutants

Designation Categories

Suspended Particulate Matter (PM_{10}). The U.S. EPA uses three categories to designate areas with respect to PM_{10}:

- Attainment
- Nonattainment
- Unclassifiable

Ozone, Fine Suspended Particulate Matter ($PM_{2.5}$), Carbon Monoxide (CO), and Nitrogen Dioxide (NO_2). The U.S. EPA uses two categories to designate areas with respect to these standards:

- Nonattainment
- Unclassifiable/Attainment

The national 1-hour ozone standard was revoked effective June 15, 2005, and the area designations map reflects the 2015 national 8-hour ozone standard of 0.070 ppm. Original designations were finalized on August 3, 2018.

On December 14, 2012, the U.S. EPA established a new national annual primary $PM_{2.5}$ standard of 12.0 $\mu g/m^3$. New area designations reflecting this revised standard became final in December 2014. The current designation map reflects the most recently revised (2012) annual average standard of 12.0 $\mu g/m^3$ as well as the 24-hour standard of 35 $\mu g/m^3$, revised in 2006.

On January 22, 2010, the U.S. EPA established a new national 1-hour NO_2 standard of 100 parts per billion (ppb) and retained the annual average standard of 53 ppb. Designations for the primary NO_2 standard became effective on February 29, 2012. All areas of California meet this standard.

Sulfur Dioxide (SO_2). The U.S. EPA uses three categories to designate areas with respect to the 24-hour and annual average sulfur dioxide standards. These designation categories are:

- Nonattainment,
- Unclassifiable, and
- Attainment/Unclassifiable.

On June 2, 2010, the U.S. EPA established a new primary 1-hour SO_2 standard of 75 parts per billion (ppb). At the same time, U.S. EPA revoked the 24-hour and annual

average standards. Area designations for the 1-hour SO_2 standard were finalized on December 21, 2017 and are reflected in the area designations map.

Lead (particulate). The U.S. EPA promulgated a new rolling 3-month average lead standard in October 2008 of 0.15 µg/m^3. Designations were made for this standard in November 2010.

Designation Areas

From time to time, the boundaries of the California air basins have been changed to facilitate the planning process. CARB generally initiates these changes, and they are not always reflected in the U.S. EPA's area designations. For purposes of consistency, the maps in this attachment reflect area designation boundaries and nomenclature as promulgated by the U.S. EPA. In some cases, these may not be the same as those adopted by CARB. For example, the national area designations reflect the former Southeast Desert Air Basin. In accordance with Health and Safety Code section 39606.1, CARB redefined this area in 1996 to be the Mojave Desert Air Basin and Salton Sea Air Basin. The definitions and boundaries for all areas designated for the national standards can be found in Title 40, Code of Federal Regulations (CFR), Chapter I, Subchapter C, Part 81.305. They are available on the web at:

https://ecfr.io/Title-40/se40.20.81_1305

FIGURE 11

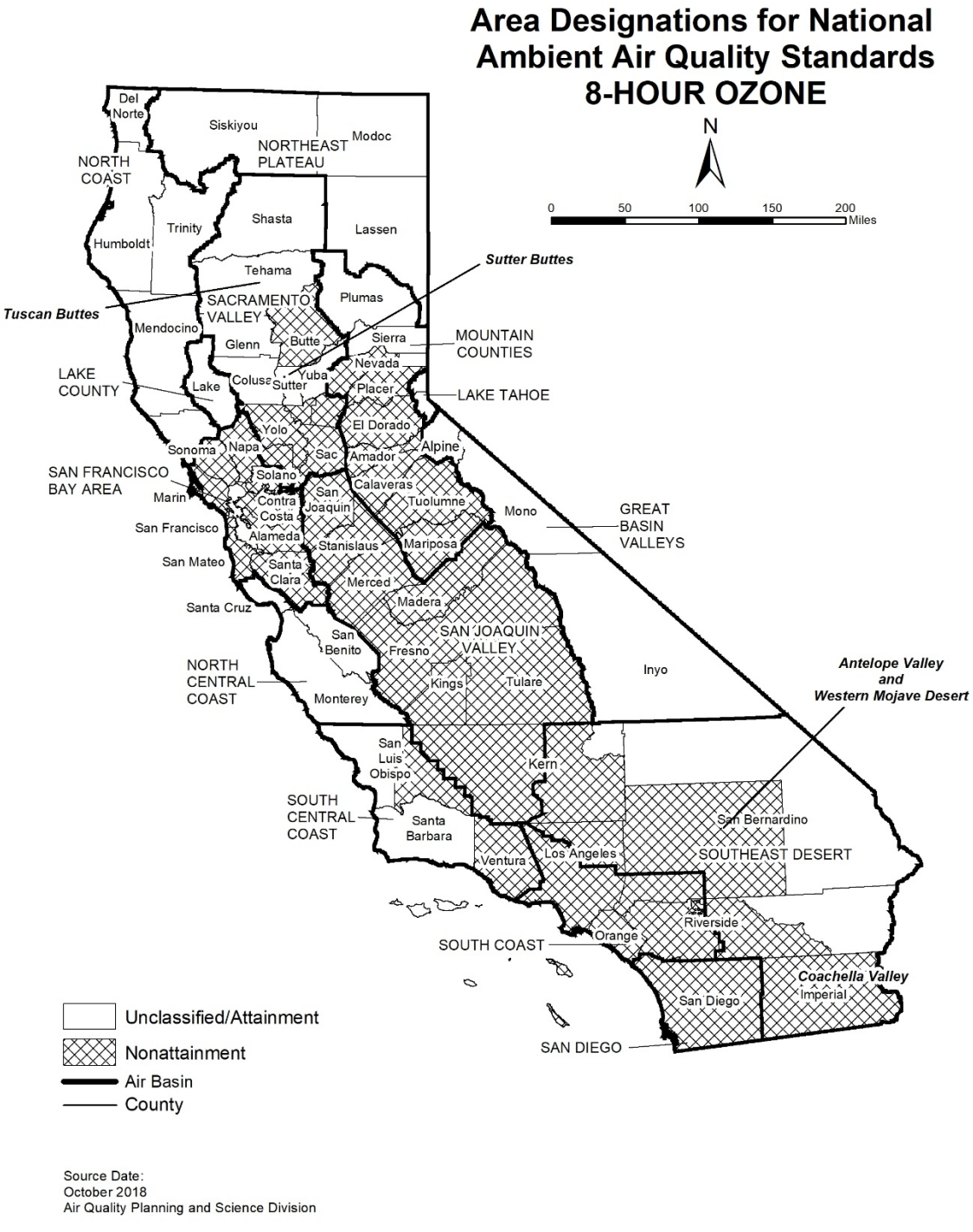

Area Designations for National Ambient Air Quality Standards
8-HOUR OZONE
N
0 50 100 150 200 Miles
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Trinity
Shasta
Lassen
Humboldt
Tehama
Sutter Buttes
Tuscan Buttes
SACRAMENTO VALLEY
Plumas
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
Nevada
LAKE COUNTY
Lake
Colusa
Sutter
Yuba
Placer
LAKE TAHOE
Yolo
El Dorado
Sonoma
Napa
Sac
Amador
Alpine
SAN FRANCISCO BAY AREA
Solano
Marin
Contra Costa
San Joaquin
Calaveras
Tuolumne
Mono
GREAT BASIN VALLEYS
San Francisco
Alameda
Stanislaus
Mariposa
San Mateo
Santa Clara
Merced
Santa Cruz
Madera
San Benito
SAN JOAQUIN VALLEY
Fresno
NORTH CENTRAL COAST
Kings
Tulare
Inyo
Antelope Valley and Western Mojave Desert
Monterey
San Luis Obispo
Kern
SOUTH CENTRAL COAST
Santa Barbara
San Bernardino
Ventura
Los Angeles
SOUTHEAST DESERT
Riverside
Orange
SOUTH COAST
Coachella Valley
Imperial
San Diego
SAN DIEGO
Unclassified/Attainment
Nonattainment
Air Basin
County
Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 11

National Ambient Air Quality Standards
Area Designations for 8-Hour Ozone*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN (cont.)		
LAKE COUNTY AIR BASIN		X	Yolo County (2)	X	
LAKE TAHOE AIR BASIN		X	Yuba County		X
MOUNTAIN COUNTIES AIR BASIN			SAN DIEGO COUNTY	X	
Amador County	X		SAN FRANCISCO BAY AREA AIR BASIN	X	
Calaveras County	X		SAN JOAQUIN VALLEY AIR BASIN	X	
El Dorado County (portion) (2)	X		SOUTH CENTRAL COAST AIR BASIN (1)		
Mariposa County	X		San Luis Obispo County		
Nevada County			- Eastern San Luis Obispo County	X	
- Western Nevada County	X		- Remainder of County		X
- Remainder of County		X	Santa Barbara County		X
Placer County (portion) (2)	X		Ventura County		
Plumas County		X	- Area excluding Anacapa and San Nicolas Islands	X	
Sierra County		X	- Channel Islands (1)		X
Tuolumne County	X		SOUTH COAST AIR BASIN (1)	X	
NORTH CENTRAL COAST AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		
NORTH COAST AIR BASIN		X	Kern County (portion)	X	
NORTHEAST PLATEAU AIR BASIN		X	- Indian Wells Valley		X
SACRAMENTO VALLEY AIR BASIN			Imperial County	X	
Butte County	X		Los Angeles County (portion)	X	
Colusa County		X	Riverside County (portion)		
Glenn County		X	- Coachella Valley	X	
Sacramento Metro Area (2)	X		- Non-AQMA portion		X
Shasta County		X	San Bernardino County		
Sutter County			- Western portion (AQMA)	X	
- Sutter Buttes	X		- Eastern portion (non-AQMA)		X
- Southern portion of Sutter County (2)	X				
- Remainder of Sutter County		X			
Tehama County					
- Tuscan Buttes	X				
- Remainder of Tehama County		X			

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.

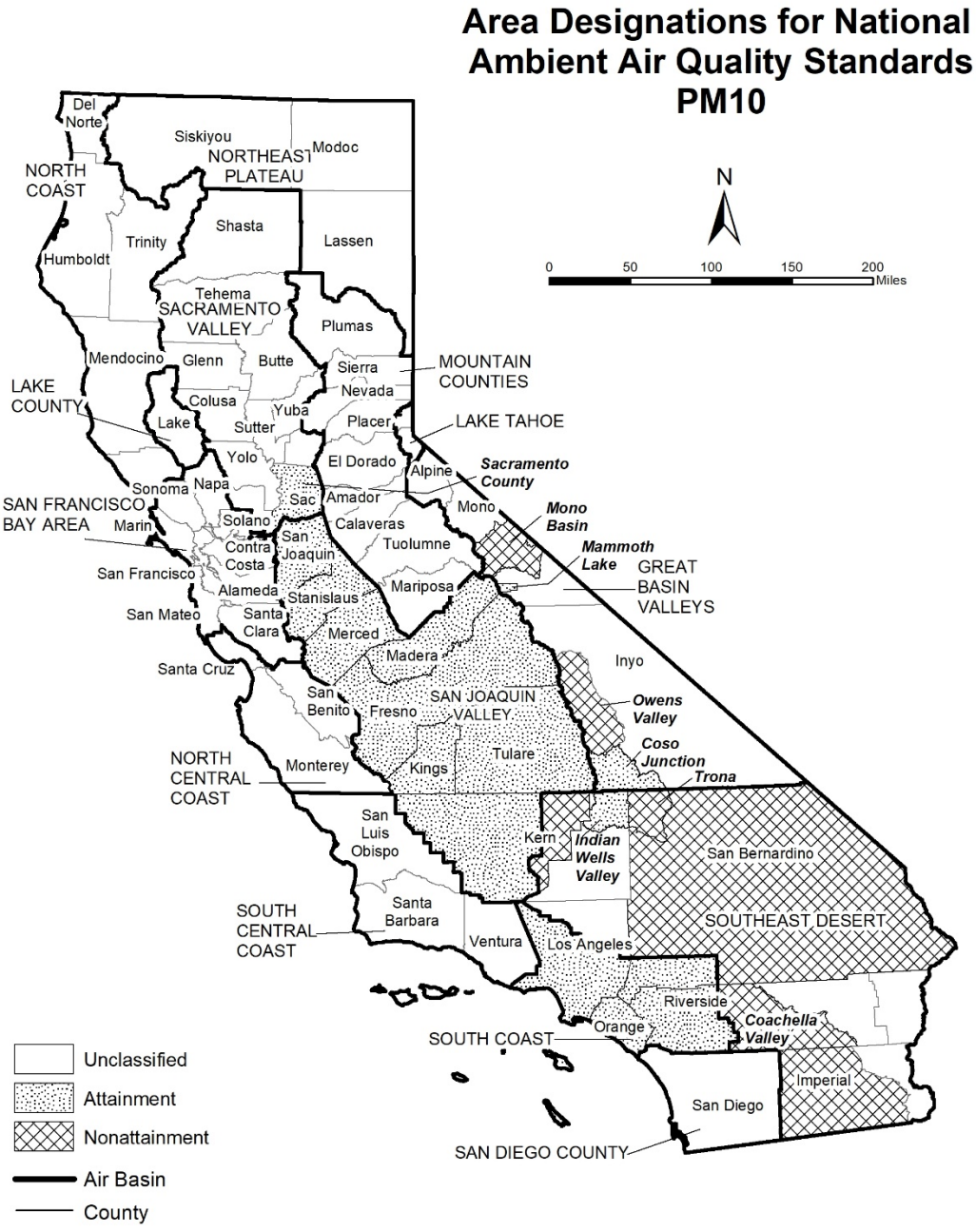
NOTE: This map and table reflect the 2015 8-hour ozone standard of 0.070 ppm.

(1) South Central Coast Air Basin Channel Islands:
Santa Barbara County includes Santa Cruz, San Miguel, Santa Rosa, and Santa Barbara Islands.
Ventura County includes Anacapa and San Nicolas Islands.

South Coast Air Basin:
Los Angeles County includes San Clemente and Santa Catalina Islands.

(2) For this purpose, the Sacramento Metro Area comprises all of Sacramento and Yolo Counties, the Sacramento Valley Air Basin portion of Solano County, the southern portion of Sutter County, and the Sacramento Valley and Mountain Counties Air Basins portions of Placer and El Dorado counties.

FIGURE 12



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 12

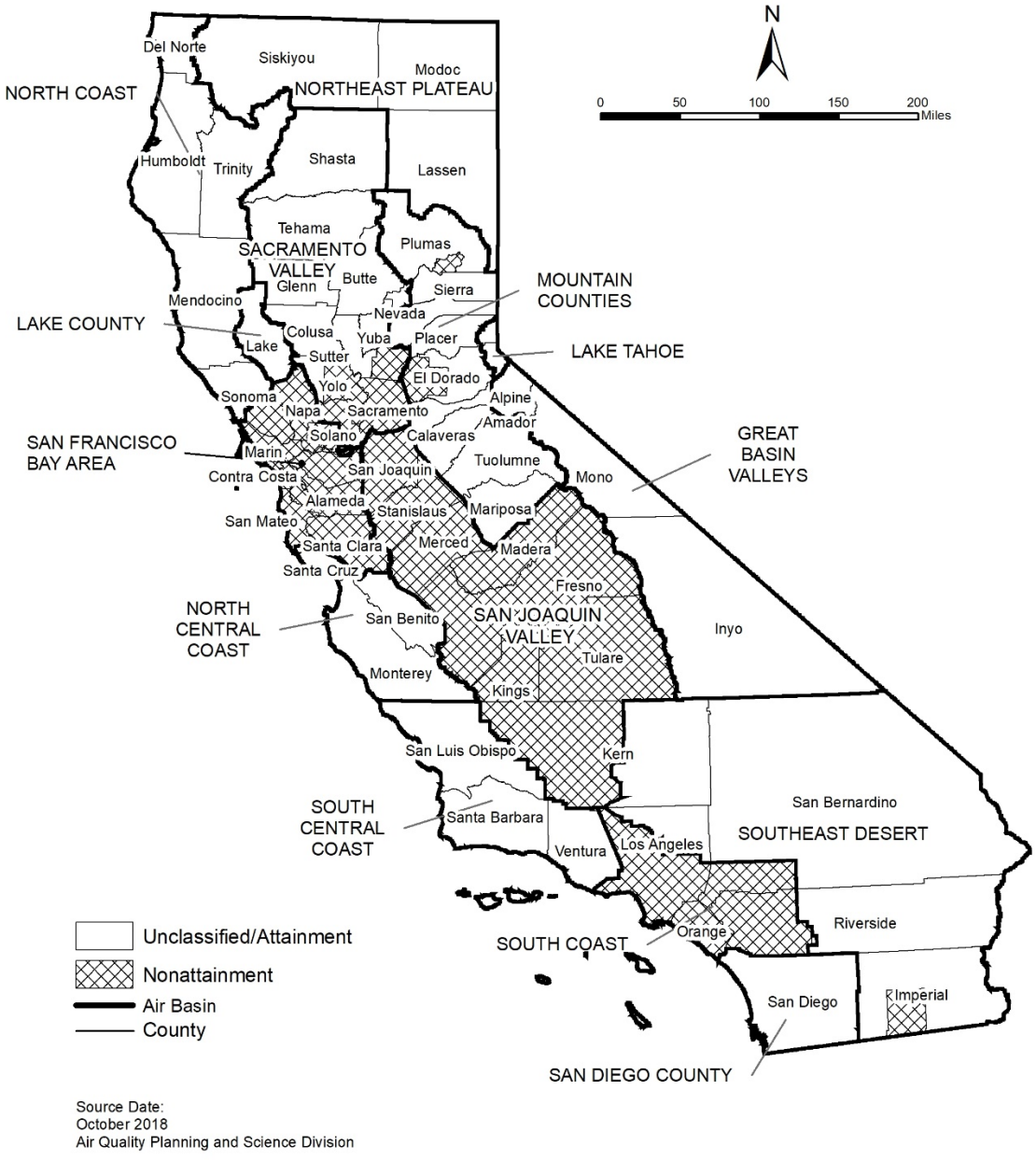
National Ambient Air Quality Standards
Area Designations for Suspended Particulate Matter (PM10)*

	N	U	A		N	U	A
GREAT BASIN VALLEYS AIR BASIN				SAN DIEGO COUNTY		X	
Alpine County		X		SAN FRANCISCO BAY AREA AIR BASIN		X	
Inyo County				SAN JOAQUIN VALLEY AIR BASIN			X
- Owens Valley Planning Area	X			SOUTH CENTRAL COAST AIR BASIN		X	
- Coso Junction			X	SOUTH COAST AIR BASIN			X
- Remainder of County		X		SOUTHEAST DESERT AIR BASIN			
Mono County				Eastern Kern County			
- Mammoth Lake Planning Area			X	- Indian Wells Valley			X
- Mono Lake Basin	X			- Portion within San Joaquin Valley Planning Area	X		
- Remainder of County		X		- Remainder of County		X	
LAKE COUNTY AIR BASIN		X		Imperial County			
LAKE TAHOE AIR BASIN		X		- Imperial Valley Planning Area	X		
MOUNTAIN COUNTIES AIR BASIN				- Remainder of County		X	
Placer County (portion) (2)		X		Los Angeles County (portion)		X	
Remainder of Air Basin		X		Riverside County (portion)			
NORTH CENTRAL COAST AIR BASIN		X		- Coachella Valley (3)	X		
NORTH COAST AIR BASIN		X		- Non-AQMA portion		X	
NORTHEAST PLATEAU AIR BASIN		X		San Bernardino County			
SACRAMENTO VALLEY AIR BASIN				- Trona	X		
Butte County		X		- Remainder of County	X		
Colusa County		X					
Glenn County		X					
Placer County (portion) (2)		X					
Sacramento County (1)			X				
Shasta County		X					
Solano County (portion)		X					
Sutter County		X					
Tehama County		X					
Yolo County		X					
Yuba County		X					

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.
(1) Air quality in Sacramento County meets the national PM10 standards. The request for redesignation to attainment was approved by U.S. EPA in September 2013.
(2) U.S. EPA designation puts the Sacramento Valley Air Basin portion of Placer County in the Mountain Counties Air Basin.
(3) Air quality in Coachella Valley meets the national PM10 standards. A request for redesignation to attainment has been submitted to U.S. EPA.

FIGURE 13

Area Designations for National Ambient Air Quality Standards PM2.5



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 13

National Ambient Air Quality Standards
Area Designations for Fine Particulate Matter (PM2.5)*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SAN DIEGO COUNTY		X
LAKE COUNTY AIR BASIN		X	SAN FRANCISCO BAY AREA AIR BASIN (2)	X	
LAKE TAHOE AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN	X	
MOUNTAIN COUNTIES AIR BASIN			SOUTH CENTRAL COAST AIR BASIN		X
Plumas County			SOUTH COAST AIR BASIN (3)	X	
- Portola Valley Portion of Plumas	X		SOUTHEAST DESERT AIR BASIN		
- Remainder of Plumas County		X	Imperial County (portion) (4)	X	
Remainder of Air Basin		X	Remainder of Air Basin		X
NORTH CENTRAL COAST AIR BASIN		X			
NORTH COAST AIR BASIN		X			
NORTHEAST PLATEAU AIR BASIN		X			
SACRAMENTO VALLEY AIR BASIN					
Sacramento Metro Area (1)	X				
Sutter County		X			
Yuba County (portion)		X			
Remainder of Air Basin		X			

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305. This map reflects the 2006 24-hour PM2.5 standard as well as the 1997 and 2012 PM2.5 annual standards.

(1) For this purpose, Sacramento Metro Area comprises all of Sacramento and portions of El Dorado, Placer, Solano, and Yolo Counties. Air quality in this area meets the national PM2.5 standards. A Determination of Attainment for the 2006 24-hour PM2.5 standard was made by U.S. EPA in June 2017.

(2) Air quality in this area meets the national PM2.5 standards. A Determination of Attainment for the 2006 24-hour PM2.5 standard was made by U.S. EPA in June 2017.

(3) Those lands of the Santa Rosa Band of Cahulla Mission Indians in Riverside County are designated Unclassifiable/Attainment.

(4) That portion of Imperial County encompassing the urban and surrounding areas of Brawley, Calexico, El Centro, Heber, Holtville, Imperial, Seeley, and Westmorland. Air quality in this area meets the national PM2.5 standards. A Determination of Attainment for the 2006 24-hour PM2.5 standard was made by U.S. EPA in June 2017.

FIGURE 14



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 14

National Ambient Air Quality Standards
Area Designations for Carbon Monoxide*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN		X
LAKE COUNTY AIR BASIN		X	SAN DIEGO COUNTY		X
LAKE TAHOE AIR BASIN		X	SAN FRANCISCO BAY AREA AIR BASIN		X
MOUNTAIN COUNTIES AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN		X
NORTH CENTRAL COAST AIR BASIN		X	SOUTH CENTRAL COAST AIR BASIN		X
NORTH COAST AIR BASIN		X	SOUTH COAST AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		X

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.

FIGURE 15



Source Date:
October 2018
Air Quality Planning and Science Division

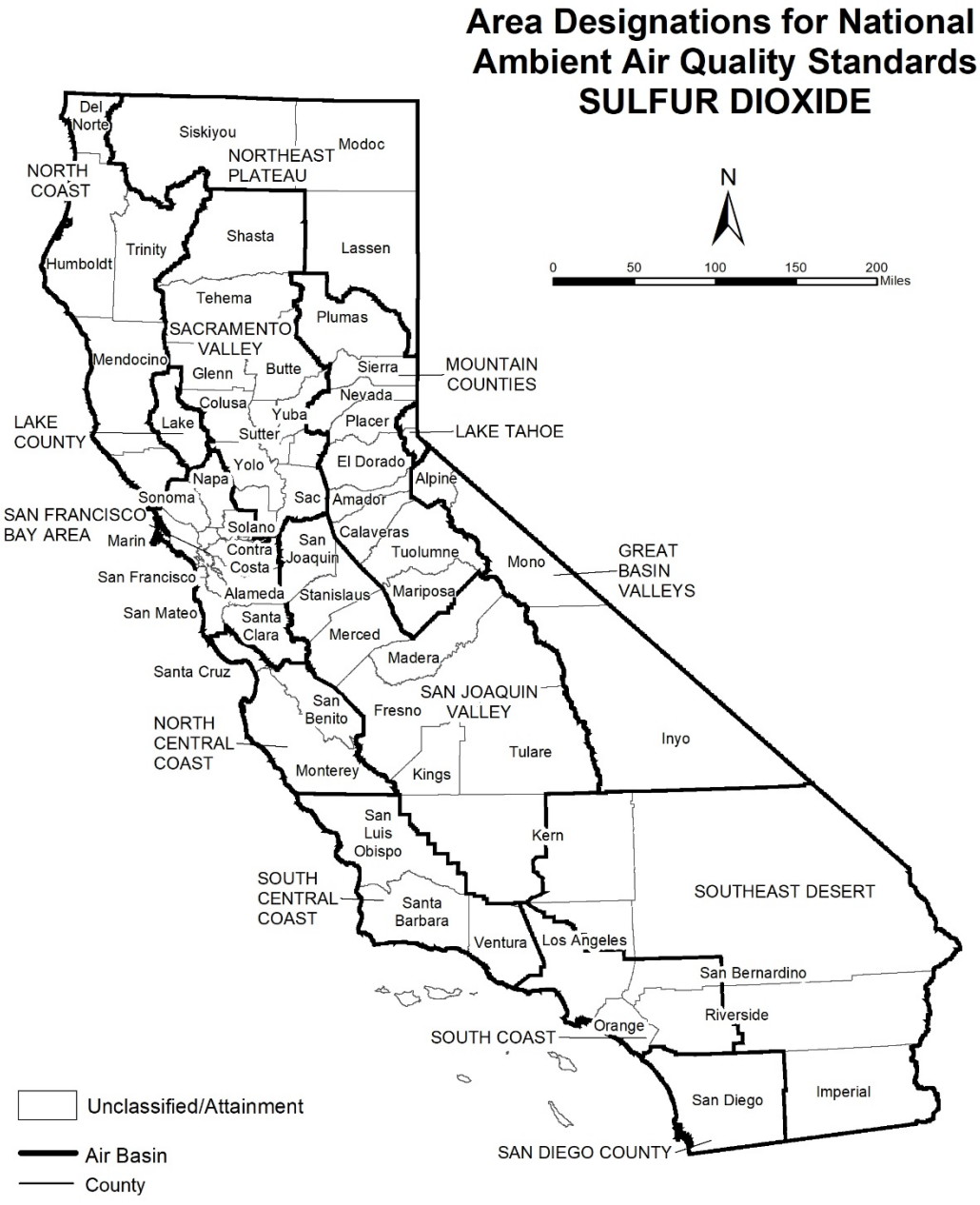
TABLE 15

National Ambient Air Quality Standards
Area Designations for Nitrogen Dioxide*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN		X
LAKE COUNTY AIR BASIN		X	SAN DIEGO COUNTY		X
LAKE TAHOE AIR BASIN		X	SAN FRANCISCO BAY AREA AIR BASIN		X
MOUNTAIN COUNTIES AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN		X
NORTH CENTRAL COAST AIR BASIN		X	SOUTH CENTRAL COAST AIR BASIN		X
NORTH COAST AIR BASIN		X	SOUTH COAST AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		X

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.

FIGURE 16



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 16

National Ambient Air Quality Standards
Area Designations for Sulfur Dioxide*

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SOUTH CENTRAL COAST AIR BASIN		
LAKE COUNTY AIR BASIN		X	San Luis Obispo County		X
LAKE TAHOE AIR BASIN		X	Santa Barbara County		X
MOUNTAIN COUNTIES AIR BASIN		X	Ventura County		X
NORTH CENTRAL COAST AIR BASIN		X	Channel Islands (1)		X
NORTH COAST AIR BASIN		X	SOUTH COAST AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		
SACRAMENTO VALLEY AIR BASIN		X	Imperial County		X
SAN DIEGO COUNTY		X	Remainder of Air Basin		X
SAN FRANCISCO BAY AREA AIR BASIN		X			
SAN JOAQUIN VALLEY AIR BASIN					
Fresno County		X			
Kern County (portion)		X			
Kings County		X			
Madera County		X			
Merced County		X			
San Joaquin County		X			
Stanislaus County		X			
Tulare County		X			

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.

NOTE: This map and table reflect the 2010 1-hour SO_2 standard of 75 ppb.

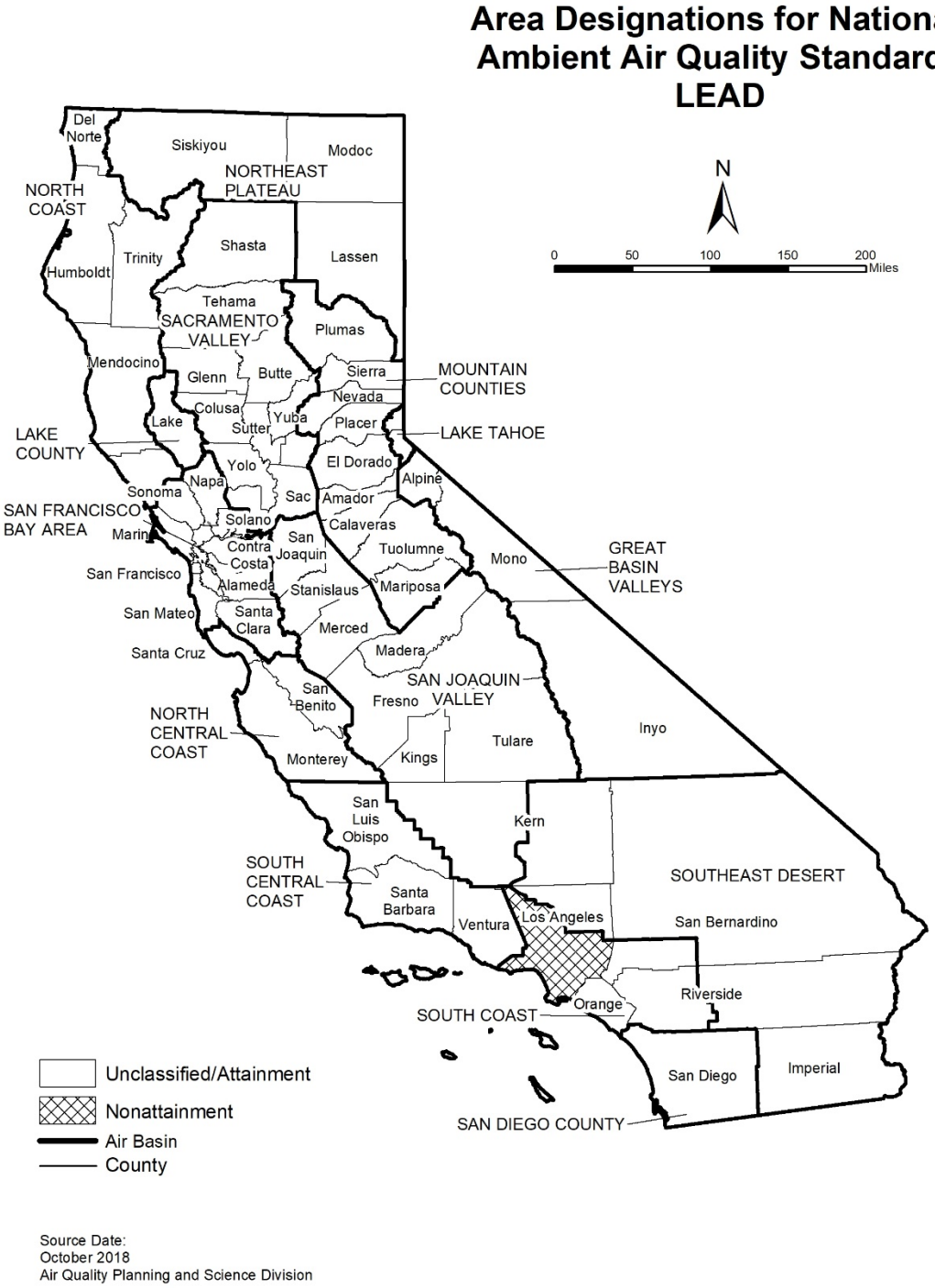
(1) South Central Coast Air Basin Channel Islands:

Santa Barbara County includes Santa Cruz, San Miguel, Santa Rosa, and Santa Barbara Islands.

Ventura County includes Anacapa and San Nicolas Islands.

Note that the San Clemente and Santa Catalina Islands are considered part of Los Angeles County, and therefore, are included as part of the South Coast Air Basin.

FIGURE 17



Source Date:
October 2018
Air Quality Planning and Science Division

TABLE 17

National Ambient Air Quality Standards
Area Designations for Lead (particulate)

	N	U/A		N	U/A
GREAT BASIN VALLEYS AIR BASIN		X	SAN DIEGO COUNTY		X
LAKE COUNTY AIR BASIN		X	SAN FRANCISCO BAY AREA AIR BASIN		X
LAKE TAHOE AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN		X
MOUNTAIN COUNTIES AIR BASIN		X	SOUTH CENTRAL COAST AIR BASIN		X
NORTH CENTRAL COAST AIR BASIN		X	SOUTH COAST AIR BASIN		
NORTH COAST AIR BASIN		X	Los Angeles County (portion) (1)	X	
NORTHEAST PLATEAU AIR BASIN		X	Remainder of Air Basin		X
SACRAMENTO VALLEY AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		X

(1) Portion of County in Air Basin, not including Channel Islands

APPENDIX 3.1:

CALEEMOD CONSTRUCTION UNMITIGATED EMISSIONS MODEL OUTPUTS

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Adelanto R3 Extension Project (Construction - Unmitigated)

San Bernardino-Mojave Desert County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	0.84	1000sqft	0.02	844.00	0
Other Asphalt Surfaces	13.75	1000sqft	0.32	13,750.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Summer

Project Characteristics -

Land Use - The General Light Industrial land use will be used to model the Building and Pre-Cast Concrete Vault at Turnout 7 and the Other Asphalt Surfaces will be used to model the Pipeline.

Construction Phase - Duration of construction activity is anticipated to take place over the course of 1 year (365 days)

Off-road Equipment - Construction Equipment based on information provided by the Project Applicant.

Grading - For purposes of analysis, total acres graded per day is based on the equipment specific grading rates (CalEEMod Appendix A) and the equipment list.

Trips and VMT - Haul Trips based on the CalEEMod assumption of a 16 CY haul capacity.

Vehicle Trips - Construction Run Only.

Energy Use - Construction Run Only.

Water And Wastewater - Construction Run Only.

Solid Waste - Construction Run Only.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	365.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	3/18/2020	3/1/2021
tblConstructionPhase	PhaseStartDate	3/17/2020	3/2/2020
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24NG	15.36	0.00
tblGrading	AcresOfGrading	0.00	261.00
tblGrading	MaterialImported	0.00	3,354.00
tblLandUse	LandUseSquareFeet	840.00	844.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Summer

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblSolidWaste	SolidWasteGenerationRate	1.04	0.00
tblTripsAndVMT	HaulingTripNumber	419.00	420.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00

tblVehicleTrips	WD_TR	6.97	0.00
tblWater	IndoorWaterUseRate	194,250.00	0.00

2.0 Emissions Summary

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					
2020	6.5248	60.0167	41.3749	0.0979	7.2977	2.6843	9.9821	3.5293	2.5029	6.0322	0.0000	9,312.6620	9,312.6620	2.5080	0.0000	9,375.3621
2021	6.0718	53.8832	40.2553	0.0977	7.3721	2.3863	9.7584	3.5475	2.2263	5.7738	0.0000	9,295.2132	9,295.2132	2.5029	0.0000	9,357.7860
Maximum	**6.5248**	**60.0167**	**41.3749**	**0.0979**	**7.3721**	**2.6843**	**9.9821**	**3.5475**	**2.5029**	**6.0322**	**0.0000**	**9,312.6620**	**9,312.6620**	**2.5080**	**0.0000**	**9,375.3621**

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					
2020	6.5248	60.0167	41.3749	0.0979	7.2977	2.6843	9.9821	3.5293	2.5029	6.0322	0.0000	9,312.6620	9,312.6620	2.5080	0.0000	9,375.3621
2021	6.0718	53.8832	40.2553	0.0977	7.3721	2.3863	9.7584	3.5475	2.2263	5.7738	0.0000	9,295.2132	9,295.2132	2.5029	0.0000	9,357.7860
Maximum	**6.5248**	**60.0167**	**41.3749**	**0.0979**	**7.3721**	**2.6843**	**9.9821**	**3.5475**	**2.5029**	**6.0322**	**0.0000**	**9,312.6620**	**9,312.6620**	**2.5080**	**0.0000**	**9,375.3621**

	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**

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	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
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
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**	**0.0000**	**3.4100e-003**

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	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
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
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**	**0.0000**	**3.4100e-003**

	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	Project Construction	Grading	3/2/2020	3/1/2021	7	365	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.32

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
Project Construction	Excavators	1	8.00	158	0.38
Project Construction	Dumpers/Tenders	10	8.00	16	0.38
Project Construction	Off-Highway Trucks	3	8.00	402	0.38
Project Construction	Concrete/Industrial Saws	0	8.00	81	0.73
Project Construction	Pavers	1	8.00	130	0.42
Project Construction	Cement and Mortar Mixers	3	8.00	9	0.56
Project Construction	Other Construction Equipment	1	8.00	172	0.42
Project Construction	Cranes	1	8.00	231	0.29
Project Construction	Generator Sets	1	8.00	84	0.74
Project Construction	Rollers	1	8.00	80	0.38
Project Construction	Rubber Tired Dozers	1	8.00	247	0.40
Project Construction	Tractors/Loaders/Backhoes	1	8.00	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
Project Construction	24	60.00	0.00	420.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Project Construction - 2020

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	6.2514	59.5731	39.2776	0.0919		2.6802	2.6802		2.4990	2.4990		8,715.0144	8,715.0144	2.4872		8,777.1951
Total	**6.2514**	**59.5731**	**39.2776**	**0.0919**	**6.7817**	**2.6802**	**9.4619**	**3.3923**	**2.4990**	**5.8913**		**8,715.0144**	**8,715.0144**	**2.4872**		**8,777.1951**

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	7.1500e-003	0.2835	0.0418	9.0000e-004	0.0231	8.4000e-004	0.0240	6.2600e-003	8.1000e-004	7.0600e-003		95.8185	95.8185	5.1700e-003		95.9477
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
Worker	0.2663	0.1601	2.0555	5.0400e-003	0.4929	3.3300e-003	0.4962	0.1307	3.0700e-003	0.1338		501.8292	501.8292	0.0156		502.2192
Total	**0.2734**	**0.4436**	**2.0973**	**5.9400e-003**	**0.5160**	**4.1700e-003**	**0.5202**	**0.1370**	**3.8800e-003**	**0.1409**		**597.6476**	**597.6476**	**0.0208**		**598.1670**

3.2 Project Construction - 2020

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	6.2514	59.5731	39.2776	0.0919		2.6802	2.6802		2.4990	2.4990	0.0000	8,715.0144	8,715.0144	2.4872		8,777.1951
Total	**6.2514**	**59.5731**	**39.2776**	**0.0919**	**6.7817**	**2.6802**	**9.4619**	**3.3923**	**2.4990**	**5.8913**	**0.0000**	**8,715.0144**	**8,715.0144**	**2.4872**		**8,777.1951**

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	7.1500e-003	0.2835	0.0418	9.0000e-004	0.0231	8.4000e-004	0.0240	6.2600e-003	8.1000e-004	7.0600e-003		95.8185	95.8185	5.1700e-003		95.9477
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
Worker	0.2663	0.1601	2.0555	5.0400e-003	0.4929	3.3300e-003	0.4962	0.1307	3.0700e-003	0.1338		501.8292	501.8292	0.0156		502.2192
Total	**0.2734**	**0.4436**	**2.0973**	**5.9400e-003**	**0.5160**	**4.1700e-003**	**0.5202**	**0.1370**	**3.8800e-003**	**0.1409**		**597.6476**	**597.6476**	**0.0208**		**598.1670**

3.2 Project Construction - 2021

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	5.8173	53.4773	38.3240	0.0919		2.3823	2.3823		2.2226	2.2226		8,714.4129	8,714.4129	2.4838		8,776.5066
Total	**5.8173**	**53.4773**	**38.3240**	**0.0919**	**6.7817**	**2.3823**	**9.1640**	**3.3923**	**2.2226**	**5.6149**		**8,714.4129**	**8,714.4129**	**2.4838**		**8,776.5066**

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	6.8400e-003	0.2625	0.0407	8.9000e-004	0.0975	7.4000e-004	0.0982	0.0245	7.1000e-004	0.0252		94.9533	94.9533	5.0900e-003		95.0806
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
Worker	0.2477	0.1435	1.8906	4.8800e-003	0.4929	3.2500e-003	0.4961	0.1307	3.0000e-003	0.1337		485.8470	485.8470	0.0141		486.1989
Total	**0.2545**	**0.4059**	**1.9312**	**5.7700e-003**	**0.5904**	**3.9900e-003**	**0.5944**	**0.1552**	**3.7100e-003**	**0.1589**		**580.8003**	**580.8003**	**0.0192**		**581.2794**

3.2 Project Construction - 2021

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	5.8173	53.4773	38.3240	0.0919		2.3823	2.3823		2.2226	2.2226	0.0000	8,714.4129	8,714.4129	2.4838		8,776.5065
Total	**5.8173**	**53.4773**	**38.3240**	**0.0919**	**6.7817**	**2.3823**	**9.1640**	**3.3923**	**2.2226**	**5.6149**	**0.0000**	**8,714.4129**	**8,714.4129**	**2.4838**		**8,776.5065**

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	6.8400e-003	0.2625	0.0407	8.9000e-004	0.0975	7.4000e-004	0.0982	0.0245	7.1000e-004	0.0252		94.9533	94.9533	5.0900e-003		95.0806
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
Worker	0.2477	0.1435	1.8906	4.8800e-003	0.4929	3.2500e-003	0.4961	0.1307	3.0000e-003	0.1337		485.8470	485.8470	0.0141		486.1989
Total	**0.2545**	**0.4059**	**1.9312**	**5.7700e-003**	**0.5904**	**3.9900e-003**	**0.5944**	**0.1552**	**3.7100e-003**	**0.1589**		**580.8003**	**580.8003**	**0.0192**		**581.2794**

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
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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Other Asphalt Surfaces	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 Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010
Other Asphalt Surfaces	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010

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 Light 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
Other Asphalt Surfaces	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**

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 Light 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
Other Asphalt Surfaces	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	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
Unmitigated	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003

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	7.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0229					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4000e-004	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**		**3.4100e-003**

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	7.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0229					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4000e-004	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**		**3.4100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

Adelanto R3 Extension Project (Construction - Unmitigated)

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 Light Industry	0.84	1000sqft	0.02	844.00	0
Other Asphalt Surfaces	13.75	1000sqft	0.32	13,750.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Winter

Project Characteristics -

Land Use - The General Light Industrial land use will be used to model the Building and Pre-Cast Concrete Vault at Turnout 7 and the Other Asphalt Surfaces will be used to model the Pipeline.

Construction Phase - Duration of construction activity is anticipated to take place over the course of 1 year (365 days)

Off-road Equipment - Construction Equipment based on information provided by the Project Applicant.

Grading - For purposes of analysis, total acres graded per day is based on the equipment specific grading rates (CalEEMod Appendix A) and the equipment list.

Trips and VMT - Haul Trips based on the CalEEMod assumption of a 16 CY haul capacity.

Vehicle Trips - Construction Run Only.

Energy Use - Construction Run Only.

Water And Wastewater - Construction Run Only.

Solid Waste - Construction Run Only.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	365.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	3/18/2020	3/1/2021
tblConstructionPhase	PhaseStartDate	3/17/2020	3/2/2020
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24NG	15.36	0.00
tblGrading	AcresOfGrading	0.00	261.00
tblGrading	MaterialImported	0.00	3,354.00
tblLandUse	LandUseSquareFeet	840.00	844.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Winter

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblSolidWaste	SolidWasteGenerationRate	1.04	0.00
tblTripsAndVMT	HaulingTripNumber	419.00	420.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00

tblVehicleTrips	WD_TR	6.97	0.00
tblWater	IndoorWaterUseRate	194,250.00	0.00

2.0 Emissions Summary

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					
2020	6.5193	60.0266	41.0400	0.0973	7.2977	2.6843	9.9821	3.5293	2.5029	6.0322	0.0000	9,258.7564	9,258.7564	2.5066	0.0000	9,321.4224
2021	6.0669	53.8917	39.9439	0.0972	7.3721	2.3863	9.7584	3.5475	2.2263	5.7738	0.0000	9,242.9753	9,242.9753	2.5017	0.0000	9,305.5184
Maximum	**6.5193**	**60.0266**	**41.0400**	**0.0973**	**7.3721**	**2.6843**	**9.9821**	**3.5475**	**2.5029**	**6.0322**	**0.0000**	**9,258.7564**	**9,258.7564**	**2.5066**	**0.0000**	**9,321.4224**

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					
2020	6.5193	60.0266	41.0400	0.0973	7.2977	2.6843	9.9821	3.5293	2.5029	6.0322	0.0000	9,258.7564	9,258.7564	2.5066	0.0000	9,321.4224
2021	6.0669	53.8917	39.9439	0.0972	7.3721	2.3863	9.7584	3.5475	2.2263	5.7738	0.0000	9,242.9753	9,242.9753	2.5017	0.0000	9,305.5183
Maximum	**6.5193**	**60.0266**	**41.0400**	**0.0973**	**7.3721**	**2.6843**	**9.9821**	**3.5475**	**2.5029**	**6.0322**	**0.0000**	**9,258.7564**	**9,258.7564**	**2.5066**	**0.0000**	**9,321.4224**

	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**

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	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
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
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**	**0.0000**	**3.4100e-003**

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	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
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
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**	**0.0000**	**3.4100e-003**

	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	Project Construction	Grading	3/2/2020	3/1/2021	7	365	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.32

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
Project Construction	Excavators	1	8.00	158	0.38
Project Construction	Dumpers/Tenders	10	8.00	16	0.38
Project Construction	Off-Highway Trucks	3	8.00	402	0.38
Project Construction	Concrete/Industrial Saws	0	8.00	81	0.73
Project Construction	Pavers	1	8.00	130	0.42
Project Construction	Cement and Mortar Mixers	3	8.00	9	0.56
Project Construction	Other Construction Equipment	1	8.00	172	0.42
Project Construction	Cranes	1	8.00	231	0.29
Project Construction	Generator Sets	1	8.00	84	0.74
Project Construction	Rollers	1	8.00	80	0.38
Project Construction	Rubber Tired Dozers	1	8.00	247	0.40
Project Construction	Tractors/Loaders/Backhoes	1	8.00	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
Project Construction	24	60.00	0.00	420.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Project Construction - 2020

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	6.2514	59.5731	39.2776	0.0919		2.6802	2.6802		2.4990	2.4990		8,715.0144	8,715.0144	2.4872		8,777.1951
Total	**6.2514**	**59.5731**	**39.2776**	**0.0919**	**6.7817**	**2.6802**	**9.4619**	**3.3923**	**2.4990**	**5.8913**		**8,715.0144**	**8,715.0144**	**2.4872**		**8,777.1951**

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	7.4700e-003	0.2850	0.0479	8.8000e-004	0.0231	8.6000e-004	0.0240	6.2600e-003	8.2000e-004	7.0700e-003		93.3201	93.3201	5.6100e-003		93.4603
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
Worker	0.2604	0.1685	1.7146	4.5200e-003	0.4929	3.3300e-003	0.4962	0.1307	3.0700e-003	0.1338		450.4220	450.4220	0.0138		450.7669
Total	**0.2679**	**0.4535**	**1.7625**	**5.4000e-003**	**0.5160**	**4.1900e-003**	**0.5202**	**0.1370**	**3.8900e-003**	**0.1409**		**543.7420**	**543.7420**	**0.0194**		**544.2273**

3.2 Project Construction - 2020

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	6.2514	59.5731	39.2776	0.0919		2.6802	2.6802		2.4990	2.4990	0.0000	8,715.0144	8,715.0144	2.4872		8,777.1951
Total	**6.2514**	**59.5731**	**39.2776**	**0.0919**	**6.7817**	**2.6802**	**9.4619**	**3.3923**	**2.4990**	**5.8913**	**0.0000**	**8,715.0144**	**8,715.0144**	**2.4872**		**8,777.1951**

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	7.4700e-003	0.2850	0.0479	8.8000e-004	0.0231	8.6000e-004	0.0240	6.2600e-003	8.2000e-004	7.0700e-003		93.3201	93.3201	5.6100e-003		93.4603
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
Worker	0.2604	0.1685	1.7146	4.5200e-003	0.4929	3.3300e-003	0.4962	0.1307	3.0700e-003	0.1338		450.4220	450.4220	0.0138		450.7669
Total	**0.2679**	**0.4535**	**1.7625**	**5.4000e-003**	**0.5160**	**4.1900e-003**	**0.5202**	**0.1370**	**3.8900e-003**	**0.1409**		**543.7420**	**543.7420**	**0.0194**		**544.2273**

3.2 Project Construction - 2021

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	5.8173	53.4773	38.3240	0.0919		2.3823	2.3823		2.2226	2.2226		8,714.4129	8,714.4129	2.4838		8,776.5066
Total	**5.8173**	**53.4773**	**38.3240**	**0.0919**	**6.7817**	**2.3823**	**9.1640**	**3.3923**	**2.2226**	**5.6149**		**8,714.4129**	**8,714.4129**	**2.4838**		**8,776.5066**

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	7.1500e-003	0.2634	0.0464	8.7000e-004	0.0975	7.5000e-004	0.0982	0.0245	7.2000e-004	0.0252		92.4649	92.4649	5.5300e-003		92.6031
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
Worker	0.2425	0.1510	1.5735	4.3800e-003	0.4929	3.2500e-003	0.4961	0.1307	3.0000e-003	0.1337		436.0975	436.0975	0.0125		436.4087
Total	**0.2497**	**0.4144**	**1.6199**	**5.2500e-003**	**0.5904**	**4.0000e-003**	**0.5944**	**0.1552**	**3.7200e-003**	**0.1590**		**528.5624**	**528.5624**	**0.0180**		**529.0118**

3.2 Project Construction - 2021

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					6.7817	0.0000	6.7817	3.3923	0.0000	3.3923			0.0000			0.0000
Off-Road	5.8173	53.4773	38.3240	0.0919		2.3823	2.3823		2.2226	2.2226	0.0000	8,714.4129	8,714.4129	2.4838		8,776.5065
Total	**5.8173**	**53.4773**	**38.3240**	**0.0919**	**6.7817**	**2.3823**	**9.1640**	**3.3923**	**2.2226**	**5.6149**	**0.0000**	**8,714.4129**	**8,714.4129**	**2.4838**		**8,776.5065**

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	7.1500e-003	0.2634	0.0464	8.7000e-004	0.0975	7.5000e-004	0.0982	0.0245	7.2000e-004	0.0252		92.4649	92.4649	5.5300e-003		92.6031
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
Worker	0.2425	0.1510	1.5735	4.3800e-003	0.4929	3.2500e-003	0.4961	0.1307	3.0000e-003	0.1337		436.0975	436.0975	0.0125		436.4087
Total	**0.2497**	**0.4144**	**1.6199**	**5.2500e-003**	**0.5904**	**4.0000e-003**	**0.5944**	**0.1552**	**3.7200e-003**	**0.1590**		**528.5624**	**528.5624**	**0.0180**		**529.0118**

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
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

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Other Asphalt Surfaces	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 Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010
Other Asphalt Surfaces	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010

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 Light 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
Other Asphalt Surfaces	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**

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 Light 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
Other Asphalt Surfaces	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	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
Unmitigated	0.0311	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003

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	7.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0229					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4000e-004	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**		**3.4100e-003**

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	7.9800e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0229					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.4000e-004	1.0000e-005	1.5000e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.1900e-003	3.1900e-003	1.0000e-005		3.4100e-003
Total	**0.0311**	**1.0000e-005**	**1.5000e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.1900e-003**	**3.1900e-003**	**1.0000e-005**		**3.4100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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

Appendix B
Biological Resources Report

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47 1st Street, Suite 1
Redlands, CA 92373-4601
(909) 915-5900

July 15, 2019

Ryan M. Huston, P.E., Principal Engineer
Kennedy-Jenks
38977 Sky Canyon Drive, Suite 100
Murrieta, CA 92563

RE: BIOLOGICAL RESOURCES ASSESSMENT & JURISDICTIONAL DELINEATION
ADELANTO R3 EXTENSION PROJECT – MOJAVE WATER AGENCY
VICTORVILLE, CA

Dear Mr. Huston,

Jericho Systems, Inc. (Jericho) is pleased to provide Kennedy-Jenks with this 2019 biological resources assessment (BRA) and jurisdictional delineation (JD) for the Mojave Water Agency's (MWA's) proposed Adelanto R³ Extension Project (Project) which will extend wholesale water delivery service to the community of Adelanto by extending a new pipeline along Mesa View Drive in Baldy Mesa to the existing Adelanto pipeline and reservoir located near Mesa View Drive and Olivine Road south of the City of Adelanto. The Project will construct approximately 1 mile of underground pipeline along Mesa View Drive, beginning at MWA's existing turnout located approximately 0.13 mile north of Del Rosa Road and ending at the Adelanto reservoir tanks located on Olivine Road, approximately 0.17 mile west of the intersection with Mesa View Drive. The Project includes upgrades to MWA's existing Turnout 6/7 by the addition of a booster pump unit and minor piping and electrical modifications (Figure 1 and Figure 2).

The Project will be partially funded by the US Bureau of Reclamation (BOR). As such, this report addresses both State and Federal requirements.

This report addresses potential project-related effects to designated Critical Habitats and/or any species currently listed or formally proposed for listing as endangered or threatened under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA), or species designated as sensitive by the California Department of Fish and Wildlife (CDFW), or the California Native Plant Society (CNPS). Attention was focused on sensitive biological resources known to occur locally (within a 3-mile radius of the Project area boundaries including the State- and federally-listed as threatened desert tortoise (*Gopherus agassizii*) [DT] and the State-listed as threatened Mohave ground squirrel (*Xerospermophilus mohavensis*) [MGS] as well as burrowing owl (*Athene cunicularia*) [BUOW], which is a State and federal Species of Special Concern (SSC).

This report also addresses resources protected under the federal Clean Water Act (CWA) regulated by the U.S. Army Corps of Engineers (USACE) and Regional Water Quality Control Board (RWQCB) respectively; and Section 1602 of the California Fish and Game Code (FCG) administered by the CDFW as well as the Coastal Barriers Resources Act, Coastal Zone Management Act, Magnuson-Stevens Fishery Conservation and Management Act, the Protection of Wetlands – Executive Order 11990, Migratory Bird Treaty Act and Wild and Scenic Rivers Act.

BACKGROUND

The MWA was formed in 1959 by an act of the California Legislature. The MWA manages groundwater in portions of the Mojave Basin and Morongo Basin, has a service area of over 4,900 miles and has as its primary function the utilization of available water supplies in a manner consistent with California Water Code Section 79562.5(b). The Agency holds a State Water Project contract and utilizes various facilities to import and distribute water to replenish groundwater basins and to meet the obligations of the Mojave Basin Area and Warren Valley judgments related to groundwater supply. As a state water contractor, MWA is entitled to receive an annual allotment of up to 85,800 acre-feet (AF) of water from the State Water Project via the California Aqueduct.

MWA manages six major basins within its service area, of which five are sub-basins of the larger Mojave River Basin. The MWA operates under the Mojave Basin Area Judgment, which sets limits on the amount of groundwater production that can occur in each of the Mojave Basin's subareas without incurring an obligation to purchase imported water.

The MWA also operates under a Regional Water Management Plan (RWMP), which was revised in 2004, adopted on February 24, 2005, and defines the MWA's overall water management objectives for the period of 2004 through 2020. The adopted RWMP projected that groundwater overdraft, combined with expected growth and associated increasing demand for water, were projected to result in a substantial groundwater recharge requirement by 2020.

Since the development of the RWMP, the MWA, and its stakeholders created a phased implementation plan designed to address the MWA's previously identified facilities storage, recharge, and funding issues. The phases are now collective identified as the Regional Recharge and Recovery Project (the "R³ Project"). The R³ Project is a conjunctive use project that stores State Water Project (SWP) water underground in the local aquifer and later recover and distribute the water to local retail water purveyors. The R³ Project utilizes unused aquifer storage capacity in the Mojave Basin to enhance the regional supply of water by recharging the aquifer with inflow from the State Water Project aqueduct. The stored recharged water is then extracted by well facilities for delivery to purveyor turnout locations.

PROJECT LOCATION

The proposed Project is located in the City of Victorville, in an area known as Baldy Mesa.. Pipeline improvements will occur within the right-of-way of Mesa View Drive, beginning at MWA's existing Turnout 6/7 located approximately 650 feet north of 5th Street/del Rosa Road and extend north to the Adelanto reservoir tanks located on Olivine Road, approximately 930 feet west of the intersection with Mesa View Drive (northern end of the Project). Improvements will also occur within the disturbed, previously developed turnout and reservoir site facilities. The Project site can be found on *Baldy Mesa* USGS 7.5' quadrangle, Township 5 North, Range 5 West, Section 33 approximately latitude 34.47181, longitude -117.40739.

PROJECT DESCRIPTION

The proposed Project contains the following components:

Existing Turnout 6 Modifications

The existing Turnout 6/7 facility will be modified into a dedicated Turnout 6 facility to solely provide water supply to the City of Victorville. Modifications will include adding a pumping unit, modifying the turnout piping and related electrical and instrumentation improvements (Figure 4). This project also includes upgrading the existing electrical service from 240V to 480V.

The piping modifications will consist of modifying the above-ground portion of the 16-inch diameter pipeline for the installation of a booster pump, check valve and isolation valve.

Relocated Turnout 7

The existing Turnout 7, currently located within Turnout 6 facility, will be relocated to within the boundaries of the existing Adelanto reservoir facility (Figure 2). The relocated Turnout 7 will be sized to convey the full volume of the R³ water delivery to the City of Adelanto.

The turnout structure will be constructed within an approximate 18-foot wide by 46-foot long by 16-foot-high concrete block building with galvanized metal roof decking. The concrete block building with be surrounded by a 20-foot wide gravel base and a 15-wide gravel road and a new driveway gate and manway gate will be installed to provide access to the Turnout 7 building from Olivine Road.

Equipment to be installed within the turnout facility building include a 16-inch diameter steel piping (epoxy-lined), magnetic flow meter, electronic flow control valve, isolation valves, air release valves, calcium hypochlorite tablet chlorination system, chlorine residual analyzers, eye wash station, radio antennae, lighting panel and two control panels.

Outside of the turnout building, two, 4-foot by 4-foot pre-cast concrete vaults will be installed underground. One vault will be used for pipeline water quality sampling and the other vault will be used as a drainage chamber with piping to a proposed drainage basin.

The newly relocated Turnout 7 will also require the installation of a new 120/240V electrical service and related utility infrastructure such as a utility transformer, meters and underground conduit. The existing underground utility conduit, owned by Southern California Edison (SCE), will need to be extended approximately 800 lineal feet underground from the intersection of Mesa View Drive and Olivine Road to the new service connection. This typically involves excavation approximately 30 inches deep and up to 12 inches wide for installation of the underground cable.

The relocated Turnout 7 will connect to the City of Adelanto's existing water conveyance system located at the reservoir facility, with approximately 300 lineal feet of a 20-inch or 24-inch diameter steel pipeline which will support the future on-site reservoir pipeline distribution system. Access to Turnout 7 will be from the existing reservoir site access, or from a new access entrance from Olivine Road that will be provided. Within the reservoir site, a separate 15-foot-wide road will be graded over the pipeline alignment to the connection.

New Pipeline

The Project will install approximately 5,800 lineal feet of a 20-inch and 30-inch diameter pipeline between Turnout 6 and Turnout 7 (Figure 2). The 30-inch pipeline will connect to the existing terminus of the 30-inch diameter pipeline at Turnout 6, located on Mesa View Drive, approximately 650 feet north of 5th Street/del Rosa Road. The Victorville pipeline improvements, shown on Figure 3, will facilitate the future construction of the 36-inch diameter pipeline from the Le Panto Reservoir to Turnout 6. The 30-inch pipeline will continue north (approximately 4,650 lineal feet) on Mesa View Drive until the intersection of Olivine Road.

At the intersection of Mesa View Drive and Olivine Road, the pipeline facility will include a cross fitting with partial valving which will accommodate the potential extension of the R³ pipeline to the City Adelanto

in the future. From the intersection of Mesa View Drive and Olivine Road, a 20-inch diameter will continue west on Olivine Road (approximately 900 lineal feet) until the terminus at the re-located Turnout 7 at the Adelanto reservoir facility.

The preliminary pipeline alignment is estimated to located on the west side of Mesa View Drive and south side of Olivine Road. The pipeline alignment will be finalized after completion of the project survey and evaluation of the underground utilities and future road improvements. During final design, the pipeline alignment analysis will evaluate the potential opportunity to avoid the existing paved roadway section. The pipeline facility will be constructed completely by open cut construction methods.

It is anticipated that after construction of Turnout 7, the existing pipeline inter-tie between the City of Adelanto and the City of Victorville would remain in place at the existing reservoir site and would be used only for emergency purposes.

ENVIRONMENTAL SETTING

The local vicinity of Project area occurs in southwestern portion of the high desert in the County of San Bernardino within the Mojave Basin and Range Ecoregion. An Ecoregion is a regional area that has similar ecosystems in terms of type, quality, and quantity of environmental resources. The Mojave Basin and Range Ecoregion consists of broad basins and scattered mountains that are relatively low, warm, and dry. Creosote bush, white bursage, Joshua tree and other yuccas, and blackbrush are typical in the basin are and at the higher elevations, sagebrush, juniper, and single leaf pinyon are typical.

Hydrologically, the Project site is located within the Upper Mojave hydrologic area, in an undefined 556821-acre hydrologic sub-area (HSA 628.20) within the Bell Mountain Wash-Mojave River watershed(HUC 180902080706). Soils in this area consist of Cajon sand with 0 to 2 percent slopes and 9 to 15 percent slopes (Figure 4).

The climate and environment of the area is typical of southern California “high desert” country, so-called because of its higher elevation than the Colorado Desert to the southeast. The climate is marked by extremes in temperature and aridity, with summer highs reaching well over 110ºF and winter lows dipping below freezing. Average annual precipitation is less than 5 inches.

The immediate vicinity of the Project area consists of adjacent residential developments located approximately 100 feet to the north of the intersection of Mesa View Drive and Olivine Road and along Mesa View Drive, south of Bear Valley Road. Mesa View Drive is an unpaved roadway between MWA’s Turnout 6/7 to approximately 1,300 feet north, near the intersection with Bear Valley Road. The remainder of Mesa View Drive between approximately Bear Valley Road and Olivine Road is a paved, two-lane roadway. Olivine Road, from the intersection of Mesa View Drive and the reservoir site is an unimproved dirt roadway.

METHODS

As stated above, the objective of this document is to determine whether the Project area supports special status or otherwise sensitive species and/ or their habitat, and to address the potential effects associated with the Project on those resources. The species and habitats addressed in this document are based on database information and field investigation.

Sensitive Biological Resources

Prior to conducting the field study, species and habitat information was gathered from the reports related to the specific project and relevant databases for the *Baldy Mesa* USGS quadrangle to determine which species and/or habitats would be expected to occur on site. These sources include:

- U.S. Fish and Wildlife (USFWS) threatened and endangered species occurrence GIS overlay;
- USFWS Information for Planning and Consultation System (IPaC);
- California Natural Diversity Database (CNDDB) *Rarefind 5*);
- CNDDB Biogeographic Information and Observation System (BIOS);
- California Native Plant Society Electronic Inventory (CNPSEI) database;
- Calflora Database;
- USDA Natural Resources Conservation Service (NRCS) Web Soil Survey;
- USFWS National Wetland Inventory;
- Environmental Protection Agency (EPA) Water Program "My Waters" data layers
- USFWS Designated Critical Habitat Maps
- Mohave Ground squirrel Range maps

Other available technical information on the biological resources of the area was also reviewed including previous surveys and recent findings.

On June 20 and 25, 2019, Jericho Biologist Christian Nordal conducted field surveys of the Project area. Mr. Nordal is a qualified biologist with advanced degrees in Biology and several years of experience surveying for the sensitive species known to in California. Mr. Nordal conducted the surveys by walking transects spaced approximately 10 feet apart, which provided 100 percent visual coverage of the ground. Weather conditions were sunny with clear skies. Survey hours of spanned from 8:00 a.m. to 11:00 a.m. with temperatures ranging from 78 degrees Fahrenheit (° F) to 85° F and no wind. The survey encompassed the Project site boundaries plus a 300-foot survey buffer where accessible and appropriate.

Surveys were conducted with special attention focused toward species known to occur locally, including burrowing owl (BUOW), Mohave ground squirrel (MGS), and desert tortoise (DT) and the habitat elements specifically required by these species. The assessment included a review of reported occurrences of the BUOW, MGS and DT within 3 miles of the site (CNDDB 2019). During the site assessment, Mr. Nordal examined natural and non-natural substrates for burrows to determine size, shape, and aspect as well as if any animal sign (for example, scat, feathers, cast pellets, prey remains, and white wash) was present. The area was also assessed for soil type and level of friability as well as habitat type and habitat structure.

Desert tortoise surveys were conducted in accordance with the protocols described in the USFWS's 2009 *"Desert Tortoise (Mojave Population) Field Manual: (Gopherus agassizii),"* the 2010 *"Pre-Project Field Survey Protocol for Potential Desert Tortoise Habitats,"* and the August 31, 2017 survey protocol update, *"Preparing for Any Action That May Occur Within the Range of The Mojave Desert Tortoise (Gopherus agassizii)"*. Per the USFWS survey protocol, 100 percent visual coverage of the survey area was achieved by walking belt transects over the entire Project site wherever there was potentially suitable desert tortoise habitat present (i.e. creosote bush scrub and/or allscale scrub habitats), to provide sufficient coverage to find signs of desert tortoise use (e.g., scat, burrows, carcasses, courtship rings, drinking depressions, etc. in addition to live tortoises). It should be noted that these "zone of influence" transects are no longer required as of the 2017 updated protocol. However, to provide additional sampling of the areas adjacent the Project site, the 300-foot survey buffer around perimeter of the Project site was included in the survey when and where feasible.

Wildlife species were detected during field surveys by sight, calls, tracks, scat, or other signs. In addition to species observed, expected wildlife usage of the site was determined according to known habitat preferences of regional wildlife species and knowledge of their relative distributions in the area. Regarding jurisdictional waters, Mr. Nordal looked for indicators of active surface flow and corresponding physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris. Suspected jurisdictional areas were checked for the presence of definable channels, soils, and hydrology. Evaluation of potential federal jurisdiction followed the regulations set forth in 33CFR part 328 and the USACE guidance documents and evaluation of potential State jurisdiction followed guidance in the Fish and Game Code and A Review of Stream Processes and Forms in Dryland Watersheds (CDFW, 2010).

RESULTS

Habitat

Habitat adjacent to each Project component consists of Joshua Tree (*Yucca brevifolia*) woodland with an understory of the creosote bush (*Larrea tridentata*), sticky lessingia (*Lessingia glandulifera*), rubber rabbitbrush (*Ericameria nauseosa*), silver cholla (*Cylindropuntia echinocarpa*), and *Schismus ssp*.

Joshua Trees

There are 53 Joshua Trees within the fence line surrounding the existing water reservoir tanks. Turnout 7 will be constructed within the northeast corner of the fence line. Several Joshua Trees have the potential to be impacted here depending on construction envelope and staging areas.

Further, numerous Joshua Trees occur adjacent to west side of Mesa View Dr. Figure 2 depicts the locations of the Joshua Trees within the fence line and within 50' of the roadside as these trees may potentially be impacted by the project construction. Only one Joshua Tree occurs within 25' of the roadside. The remaining Joshua Tres are >50' from the roadside and were excluded from further analysis because impacts to them will be avoided.

Joshua tree and cacti are protected under specific sections of the Codes of Regulations for the Cities of Hesperia, Apple Valley, and Adelanto and County of San Bernardino. If the Joshua trees on site cannot be avoided, a Relocation-Protected Plant Plan will need to be prepared and approved prior to construction.

Wildlife

No amphibian species were observed or otherwise detected within the Project area and none are expected to occur. Reptile species observed within the Project area include desert spiny lizard *(Sceloporus magister*) and western side-blotched lizard (*Uta stansburiana elegans*). Although not observed, other common reptile species expected to occur within the Project area include desert glossy snake (*Arizona elegans eburnata*), Mohave shovel-nosed snake (*Chionactis occipitalis*), desert banded gecko (*Coleonyx variegatus variegatus*), and northern Mohave rattlesnake (*C. scutulatus scutulatus*).

Avian species observed in the Project area include verdin, greater roadrunner, red-tailed hawk, American kestrel, turkey vulture, common raven, rock wren, loggerhead shrike, black-tailed gnatcatcher, LeConte's thrasher, house sparrow, lesser goldfinch, black phoebe, and house finch.

Identification of mammals within the Project area was generally determined by physical evidence rather than direct visual identification. This is because: 1) many of the mammal species that potentially occur onsite are nocturnal and would not have been active during the survey; and, 2) no mammal trapping was

performed. Mammal species observed or otherwise detected on site included desert cottontail (*Sylvilagus audubonii*) and Merriams' kangaroo rat (*Dipodomys merriami*). Mammal sign consisted primarily of scat and fossorial mammal burrows or dens. Numerous small mammal burrows were observed on site.

Special Status Species and Habitats

According to the database queries, 13 sensitive species (7 vertebrates and 6 plant species) have been documented in the *Baldy Mesa* USGS quadrangle (Figure 3).

Table 1, located at the end of the document, represents a compiled list of results from the IPaC, CNDDB and CNPSEI databases of species which have been documented within 3 miles of the Project site and/or have the potential to occur based potentially suitable habitat adjacent to, or within, the Project site. Table 1 also provides a potential to occur assessment based on the field investigation and surveyor's knowledge of the species and local ecology and considers the habitat requirements for each species and the potential for their occurrence on the site, based on required habitat elements relative to the current site conditions and species' range.

This list of sensitive species includes any State- and/or federally listed threatened or endangered species, CDFW designated Species of Special Concern (SSC), and otherwise Special Animals. "Special Animals" is a general term that refers to all the taxa the CNDDB is interested in tracking, regardless of their legal or protection status. This list is also referred to as the list of "species at risk" or "special status species." The CDFW considers the taxa on this list to be those of greatest conservation need.

No State- and/or federally listed threatened or endangered species, or other sensitive species were observed on site during the field surveys. However, there is some marginally suitable habitat in the undisturbed areas adjacent the site for sensitive species identified in the literature review (Table 1). These species include.

- Desert tortoise (DT)
- Mohave ground squirrel (MGS)
- burrowing owl (BUOW)

Desert Tortoise (*Gopherus agassizii) – State and Federal threatened*

The DT is a State- and federally listed threatened species typically found in creosote bush scrub. They are most often found on level or sloped ground where the substrate is firm but not too rocky. Tortoise burrows are typically found at the base of shrubs, in the sides of washes and in hillsides. Because a single tortoise may have many burrows distributed throughout its home range, it is not possible to predict exact numbers of individuals on a site based upon burrow numbers.

In 1992 the BLM issued the *California Statewide Desert Tortoise Management Policy* which included categorizing habitat into three levels of classification. The management goal for Category I areas is to maintain stable, viable populations and to increase the population where possible. The management goal for Category II areas is to maintain stable, viable populations. The management goal for Category III areas is to limit population declines to the extent feasible. In April 1993, the BLM amended the CDCA plan to delineate these three categories of desert tortoise habitat on public lands. With the adoption of the West Mojave Plan (BLM 2005), all lands that are outside Desert Wildlife Management Areas are characterized as Category 3 Habitat, which is the lowest priority management area for viable populations of the desert tortoise.

> *Findings*: Per the USFWS desert tortoise Critical Habitat overlay, the project site is not within any USFWS designated desert tortoise Critical Habitat. Furthermore, the project site is not within a

BLM designated Desert Wildlife Management Area (USFWS 2011). Therefore, the habitat surrounding the site would be characterized as Category 3 Habitat, per the BLM categorization of desert tortoise habitat on public lands.

DT are documented to occur approximately 5 miles northeast of the Project site. There are no DT occurrences documented within 5 miles of the Project site. The surrounding habitat is considered marginal at best for DT. The result of the survey was that no evidence of desert tortoise was found in the survey area. No desert tortoise individuals or sign including burrows or scat were observed. Therefore, desert tortoise are currently considered absent from the Project site and adjacent areas surveyed.

Mohave Ground Squirrel – (*Xerospermophilus mohavensis*) – State threatened

The MGS is a State-listed threatened species that typically inhabits sandy soils of alkali sink and creosote bush scrub habitat. The Mohave ground squirrel forages on leaves and seeds and aestivate/hibernate for long periods of the year. Plants documented as forage for this species include: fiddleneck (*Amsinckia tessellata*), allscale (*Atriplex canescens* and *A. polycarpa*), desert holly (*A. hymenelytra*), coreopsis (*Coreopsis* sp.), spiny hopsage (*Grayia spinosa*), winterfat (*Krascheninnikovia lanata*), wolfberry (*Lycium andersonii*), Joshua tree (*Yucca brevifolia*) and the seeds of Joshua tree. It is suspected that Mohave ground squirrel forage on the plant species with the highest water content available at the time.

MGS emerge from hibernation in February and begin pair bonding and mating during March. If rainfall is adequate, MGS will reproduce. If rainfall levels do not provide sufficient rainfall to support significant annual plant growth, then MGS will merely forage on herbaceous perennials and shrubs in order to gain enough body mass to survive another prolonged period of dormancy and will not reproduce in that year. The adult males can enter dormancy as early as late May. Juveniles will remain above-ground until August in order to gain sufficient fat reserves prior to entering dormancy.

MGS occur in the western half of the Mojave Desert. Its historical range encompasses an area between Antelope Valley and Lucerne Valley, in the south. However, MGS occurrences in the southern portion of its range are very rare. The northern limits of the range are near Owens Dry Lakebed, in the north, and through China Lake Naval Weapons Station and Fort Irwin Military Base, in the east. The eastern limits extend to Barstow and south along the Mojave River. The western limits loosely follow Highway 14 and the foothills of the southern Sierra Nevada escarpment.

Findings: Although a focused MGS trapping survey was not performed, Jericho conducted a MSG habitat suitability assessment of the Project site and adjacent habitat. The habitat assessment included a pedestrian field assessment, review of reported occurrences of the MGS in the region (CNDDB 2019), and adherence to CDFW's criteria for assessing potential impacts to the Mohave ground squirrel. The criteria questions are as follows:

1. *Is the site within the range of the Mohave ground squirrel?;*
2. *Is there native habitat with a relatively diverse shrub component?; and*
3. *Is the site surrounded by development and therefore isolated from potentially occupied habitat?*

An occurrence of MSG is documented within 3 miles of the Project site to the south. The habitat on site is does not consist of diverse shrub cover or plant species typically associated with this species and the habitat is in a degraded state and would not be considered suitable to support this species. Further investigation is not warranted for this Project.

Burrowing Owl - *(Athene cunicularia)* – State and Federal Species of Special Concern

The BUOW is a ground dwelling owl typically found in arid prairies, fields, and open areas where vegetation is sparse and low to the ground. The BUOW is heavily dependent upon the presence of mammal burrows, with ground squirrel burrows being a common choice, in its habitat to provide shelter from predators, inclement weather and to provide a nesting place (Coulombe 1971). They are also known to make use of human-created structures, such as cement culverts and pipes, for burrows. BUOW spend a great deal of time standing on dirt mounds at the entrance to a burrow or perched on a fence post or other low to the ground perch from which they hunt for prey. They feed primarily on insects such as grasshoppers, June beetles and moths, but will also take small rodents, birds, and reptiles. They are active during the day and night but are considered a crepuscular owl; generally observed in the early morning hours or at twilight. The breeding season for BUOW is February 1 through August 31.

The BUOW is not listed under the State or federal ESA but is considered both a State and federal SSC. The BUOW is a migratory bird protected by the international treaty under the Migratory Bird Treaty Act of 1918 and by State law under the California FGC (FGC #3513 & #3503.5).

> *Findings*: BUOW are documented within a 3–mile radius of the Project site. The result of the survey was that no evidence of BUOW was found in the survey area. No BUOW individuals or sign including pellets, feathers or whitewash were observed.
>
> Per the definition provided in the *2012 CDFG Staff Report on Burrowing Owl Mitigation*, "Burrowing owl habitat generally includes, but is not limited to, short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey." The habitat adjacent to all aspects of the Project site is characterized as marginally suitable for this BUOW.

Nesting Birds

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711) provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered a take under federal law. The USFWS, in coordination with the CDFW administers the MBTA. CDFW's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.

Vegetation suitable for nesting birds does exist within and adjacent to the Project area. Most birds are protected by the MBTA. In general, impacts to all bird species (common and special status) can be avoided by conducting work outside of the nesting season, which is generally January/February to August/September or conducting pre-construction nesting bird surveys.

Waters of the U.S.

The USACE has authority to permit the discharge of dredged or fill material in waters of the U.S. under Section 404 CWA. WoUS are defined as: "All waters used in interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including intermittent and ephemeral streams), mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows,

playa lakes or natural ponds, where the use, degradation, or destruction of which could affect interstate commerce; impoundments of these waters; tributaries of these waters; or wetlands adjacent to these waters" (Section 404 of the CWA; 33 CFR 328.3 (a). CWA jurisdiction exists over the following:

1. all traditional navigable waters (TNWs);
2. all wetlands adjacent to TNWs;
3. non-navigable tributaries of TNWs that are relatively permanent waters (RPWs) i.e., tributaries that typically flow year-round or have continuous flow at least seasonally; and
4. every water body determined to have a significant nexus with TNWs.

No drainage areas are identified within or adjacent to any component of the Project activities, therefore no WoUS occur that would be subject to the CWA (Figure 5).

Wetlands

No hydrophitic vegetation, hydric soils and/or wetland hydrology, are present within or adjacent to any of the Project components. Wetlands that would be subject to the CWA do not occur within the Project alignment or within the Project facility areas.

State Lake/Streambed

The Project areas showed no signs of surface flow, banks, beds, or channels that would be subject to the FGC. Streambed waters do not occur on any of the sites or within any portion of the pipeline alignment or within the Project facility areas (Figure 5).

EFFECTS ANALYSIS

Federal Endangered Species Act (ESA)

The USFWS administers the federal ESA of 1973. The ESA provides a legal mechanism for listing species as either threatened or endangered, and a process of protection for those species listed. Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. "Take" can include adverse modification of habitats used by a threatened or endangered species during any portion of its life history. Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act. Take authorization can be obtained under Section 7 or Section 10 of the act.

No federally listed species were observed during the field survey nor are any expected to occur. No impact to federally protected species or habitats will result from implementation of the proposed Project.

California Endangered Species Act (CESA)

The CDFW administers the State CESA. The State of California considers an endangered species one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is one present in such small numbers throughout its range that it is likely to become an endangered species soon, in the absence of special protection or management. And a rare species is one present in such small numbers throughout its range that it may become endangered if its present environment worsens. Rare species applies to California native plants. Further, all raptors and their nests are protected under Section 3503.5 of the California Fish and Game Code (FGC). Species of Special Concern (SSC) is an informal designation used

by CDFW for some declining wildlife species that are not proposed for listing as threatened or endangered. This designation does not provide legal protection but signifies that these species are recognized as sensitive by CDFW.

No State listed species, or other sensitive species were observed during the field survey nor are any expected to occur. No impact to species protected by the State will result from implementation of the proposed Project.

Coastal Barriers Resources Act Resources

The Coastal Barrier Resources Act (CBRA) was passed by Congress in 1982 to encourage conservation of hurricane-prone, biologically rich coastal barriers. CBRA prohibits most new federal expenditures that encourage development or modification of coastal barriers. CBRS boundaries are shown on maps that were originally adopted by Congress and are maintained by the USFWS. Currently, the coastal barrier resource systems are located along the Atlantic and Gulf Coasts of the United States and the shore areas of the Great Lakes. Therefore, the Project is not located in a Coastal Barriers Resources Act area.

Coastal Zone Management Act Resources

Coastal Zone Management Act was passed by Congress in 1972 and is administered by National Oceanic and Atmospheric Administration, (NOAA). It provides for the management of the nation's coastal resources, including the Great Lakes. The goal is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

The Project is not located in a Coastal Zone that where the provisions of this Act would be applicable.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) is the primary law governing marine fisheries management in U.S. federal waters. First passed in 1976, the Magnuson-Stevens Act fosters long-term biological and economic sustainability of our nation's marine fisheries out to 200 nautical miles from shore. The goals of the act include: prevent overfishing; rebuild overfished stocks; increase long-term economic and social benefits; use reliable data and sound science; conserve essential fish habitat; ensure a safe and sustainable supply of seafood.

The Project is not located 200 nautical miles from shore, nor does it impact any essential fish habitat that would impact regulated areas 200 nautical miles from shore.

Protection of Wetlands – Executive Order 11990

Protection of Wetlands – Executive Order 11990: The purpose of Executive Order (EO) 11990 is to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". To meet these objectives, the Order requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. The procedures require the determination of whether or not the proposed project will be in or will affect wetlands. If so, a wetlands assessment must be prepared that describes the alternatives considered. The procedures include a requirement for public review of assessments. The evaluation process follows the same 8 steps as for EO 11988, Floodplain Management.

Wetlands are the at transition between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. In general, wetlands have one or more of the following three attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) soils are hydric meaning undrained; and 3) the substrate is saturated with water or covered by shallow water at some time during the growing season of each year. Under current guidelines, a jurisdictional wetland under the CWA's Section 404, must display all three wetland characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology. In California however, a jurisdictional wetland needs to meet only one of these parameters.

No drainages or indications of wetlands, hydric soils, naturally occurring indicator plant species were observed during the field survey nor are any expected to occur. There are no jurisdictional wetlands within or immediately adjacent to any of the Project components identified in the Project description. No impact to protected wetland areas will result from implementation of the proposed Project.

Migratory Bird Treaty Act (MBTA)

The federal Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C 703-711) provides protection for nesting birds that are both residents and migrants whether or not they are considered sensitive by resource agencies. The MBTA prohibits take of nearly all native birds. The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed under 50 CFR 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). The direct injury or death of a migratory bird, due to construction activities or other construction-related disturbance that causes nest abandonment, nestling abandonment, or forced fledging would be considered take under federal law. The USFWS, in coordination with the CDFW administers the MBTA. CDFW's authoritative nexus to MBTA is provided in FGC Sections 3503.5 which protects all birds of prey and their nests and FGC Section 3800 which protects all non-game birds that occur naturally in the State.
Vegetation suitable for nesting birds does exist adjacent to the Project area. As discussed, most birds are protected by the MBTA. In general, impacts to all bird species (common and special status) can be avoided by conducting work outside of the nesting season, which is generally January/February to August/September, and by conducting a worker environmental awareness training. However, if all work cannot be conducted outside of nesting season, pre-construction nesting bird surveys and a Project-specific Nesting Bird Management Plan can be prepared to determine suitable buffers if nesting birds are identified.

Bird nesting season generally extends in southern California from March 1 through September 1 for migratory birds.

Wild and Scenic Rivers Act

Wild and Scenic Rivers Act. The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. Rivers may be designated either a federal or state agency. As of 2019, there were 22 water body sections have a wild and scenic river designation in California.

The Project site is not near any designated wild and scenic river and no impact will result.

CONCLUSIONS AND RECOMMENDATIONS

The proposed Project will not affect State or federally listed endangered, threatened species because there is no habitat to support these species within, adjacent to, or in the broader vicinity of the Project area. In addition, the proposed Project will not adversely affect Critical Habitat as none exists within the Project area.

Vegetation bordering Project area has the potential to support nesting birds and migratory birds protected under the MBTA. To avoid impacts to nesting birds (common and special status) during the nesting season, the following recommendations are made:

- **Nesting Birds:** Bird nesting season generally extends from February 1 through September 15 in southern California and specifically, April 15 through August 31 for migratory passerine birds. To avoid impacts to nesting birds (common and special status) during the nesting season, a qualified Avian Biologist will conduct pre-construction Nesting Bird Surveys (NBS) prior to project-related disturbance to nestable vegetation to identify any active nests. If no active nests are found, no further action will be required. If an active nest is found, the biologist will set appropriate no-work buffers around the nest which will be based upon the nesting species, its sensitivity to disturbance, nesting stage and expected types, intensity and duration of disturbance. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved no-work buffer zone shall be clearly marked in the field, within which no disturbance activity shall commence until the qualified biologist has determined the young birds have successfully fledged and the nest is inactive.

- **BUOW Pre-Construction Surveys.** A preconstruction survey by a qualified biologist shall be conducted within 30 days prior to ground disturbance of any Project component to avoid direct take of burrowing owls. If the results of the survey indicate that no burrowing owls are present on-site, then grading can continue. If burrowing owls are found to be present or nesting within any portion of the Project components during the preconstruction survey, then the following recommendations must be adhered to: Exclusion and relocation activities may not occur during the breeding season, which is defined as March 1 through August 31, with the following exception: From March 1 through March 15 and from August 1 through August 31 exclusion and relocation activities should be in accordance with the California Department of Fish and Wildlife (CDFW) recommendations. This determination must be made by a qualified biologist.

- **Joshua Tree Preservation.** The Project should be designed to avoid sensitive desert plants such as Joshua Trees and California juniper, as described by the City of Victorville Joshua Tree and Native Vegetation Preservation Ordinance (City of Victorville, Chapter 14.04). This includes equipment staging and storage. In the event said sensitive desert plants cannot be avoided, the MWA shall prepare a relocation plan and obtain all permits through the City of Victorville as required.

Should you have any questions or require further information, please contact me at (909) 915-5900 or shay@jericho-systems.com should you have any questions or require further information.

Sincerely,



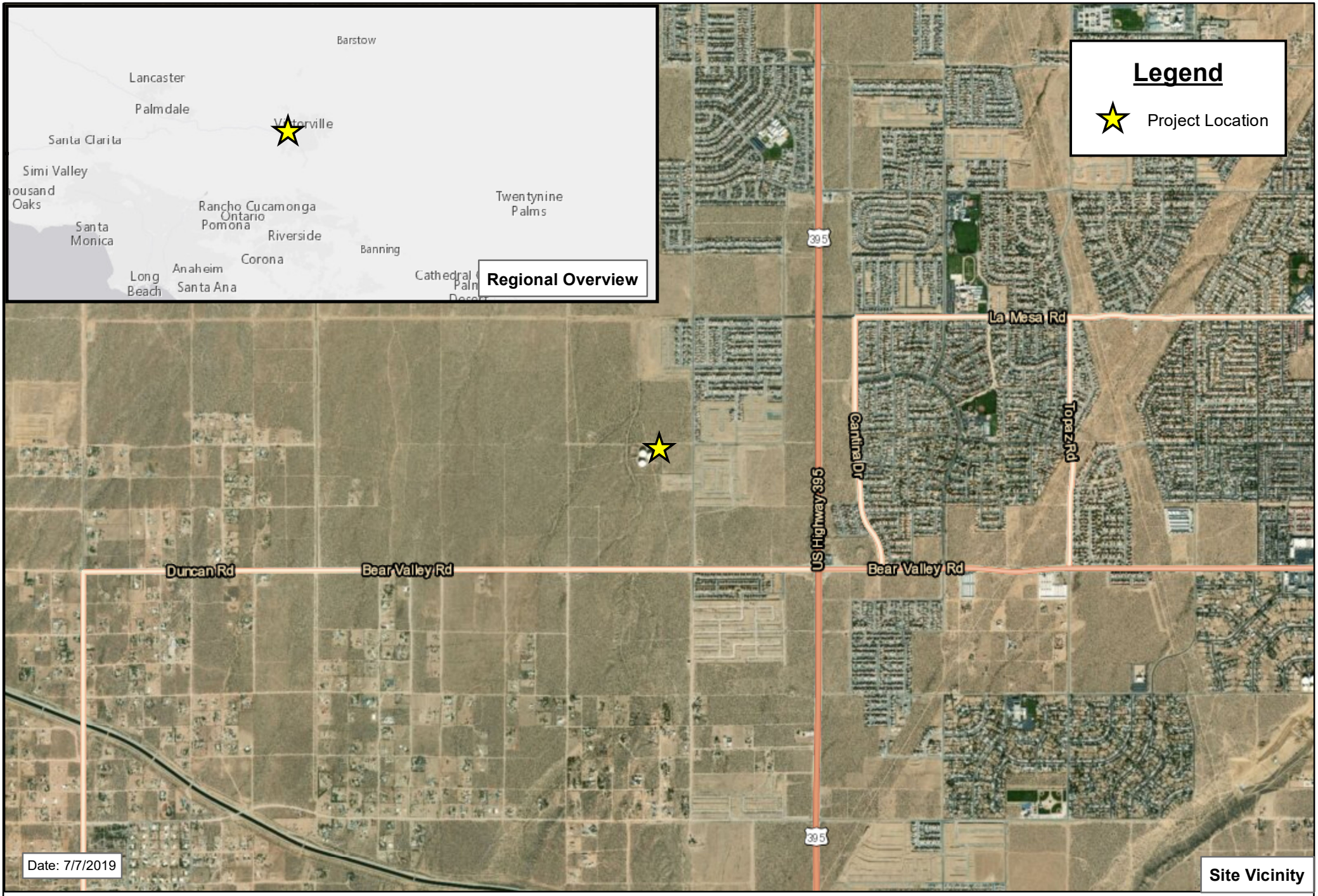
Shay Lawrey, President

Attachments:

A. *Figures*
   1 – Regional Vicinity
   2 – Site Location
   3 – CNDDB Results
   4 – Soils
   5 – Blueline Streams
B. *Photos*
C. *Table 1: Sensitive Species Potential to Occur*

ATTACHMENT A – FIGURES

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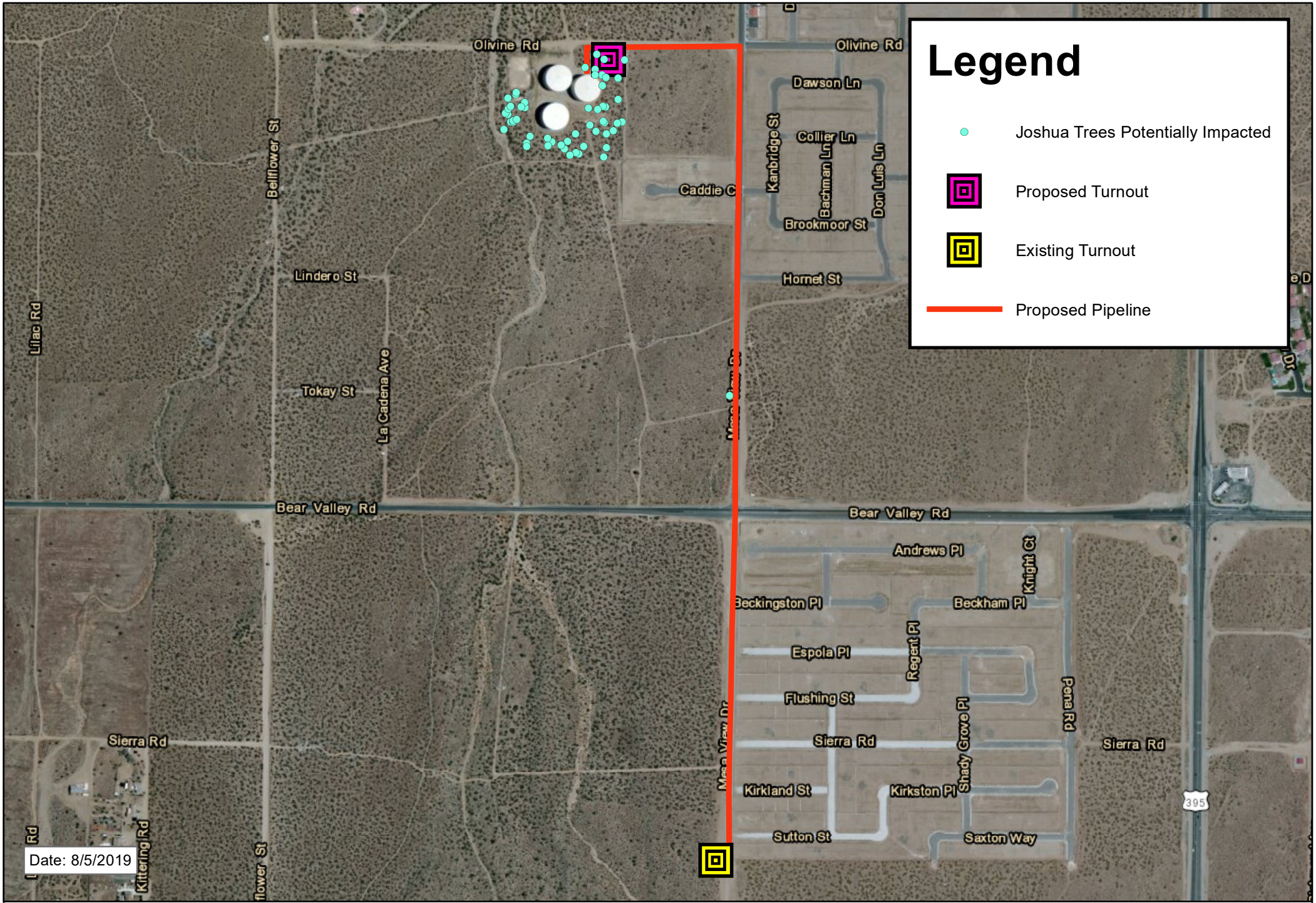
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
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JERICHO SYSTEMS INCORPORATED

Figure 1 - Regional Overview
Site Vicinity

MWA Adelanto R^3 Extension Project
Victorville, CA

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0 0.05 0.1 0.2 0.3 0.4 Miles

1 inch = 685 feet

Imagery Date: 8/6/2017

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,

Figure 2
Project & Joshua Tree Locations

MWA Adelanto R^3 Extension Project
Victorville, CA

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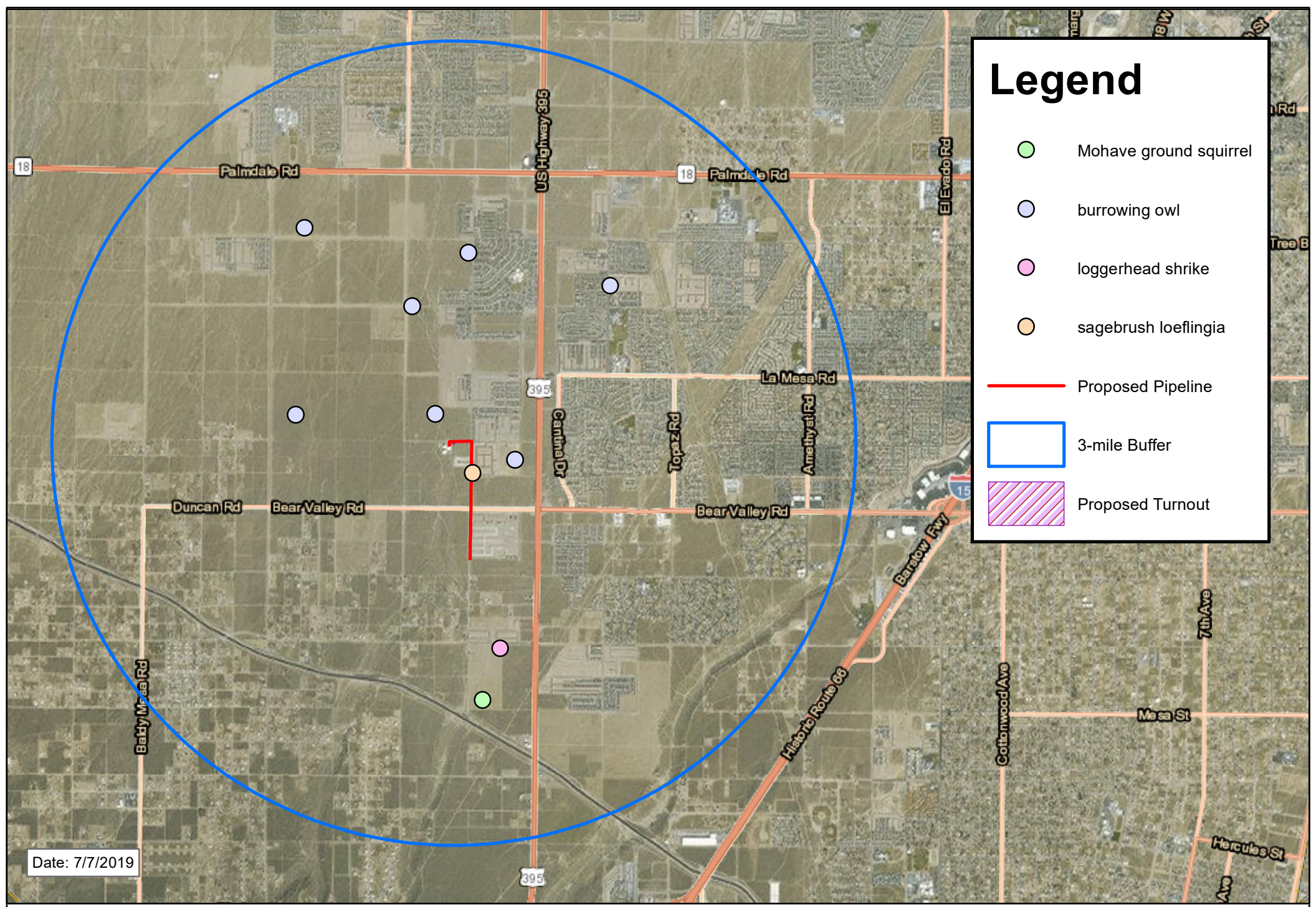


Figure 3
3-mile CNDDB Occurences

MWA Adelanto R^3 Extension Project
Victorville, CA

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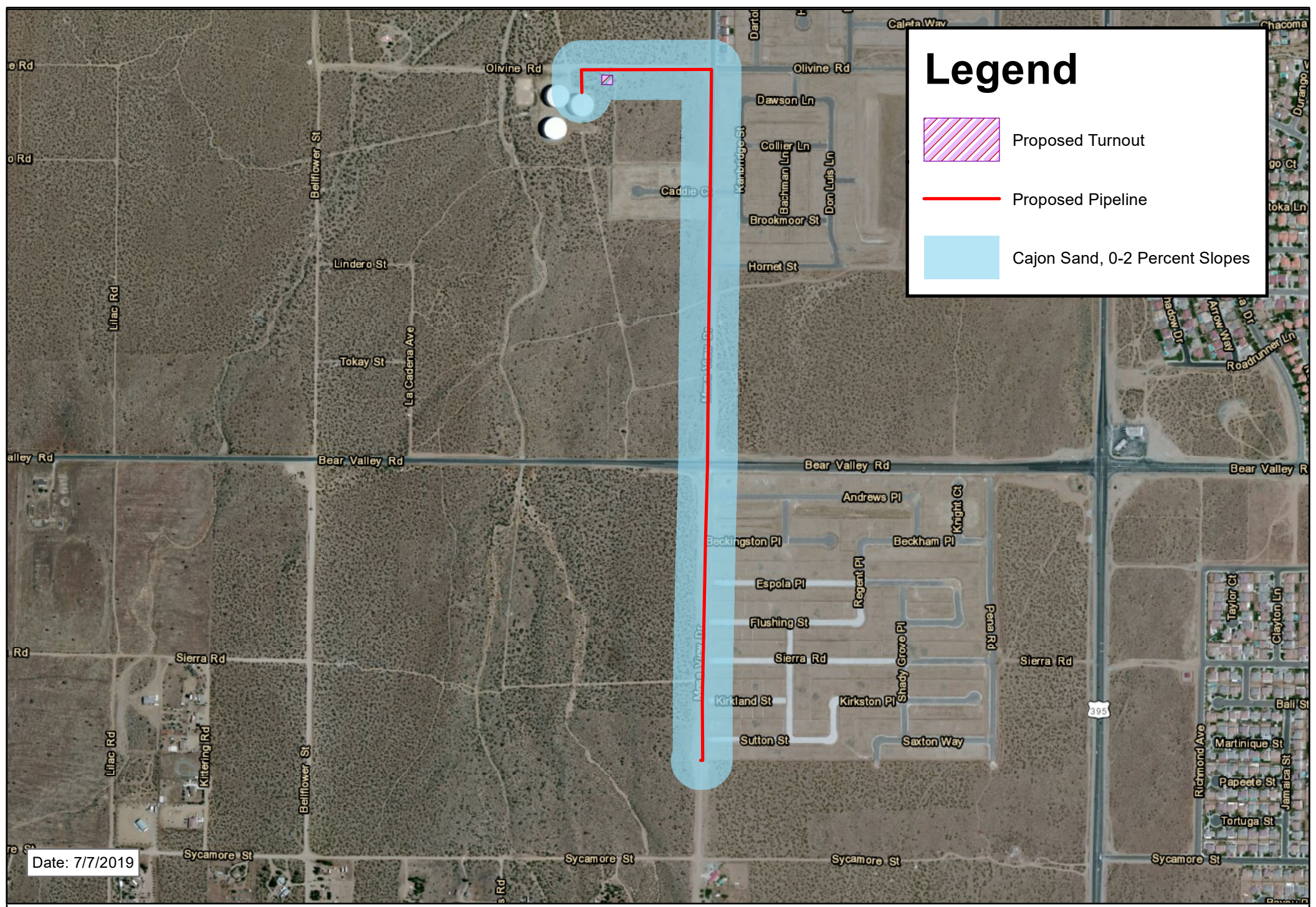
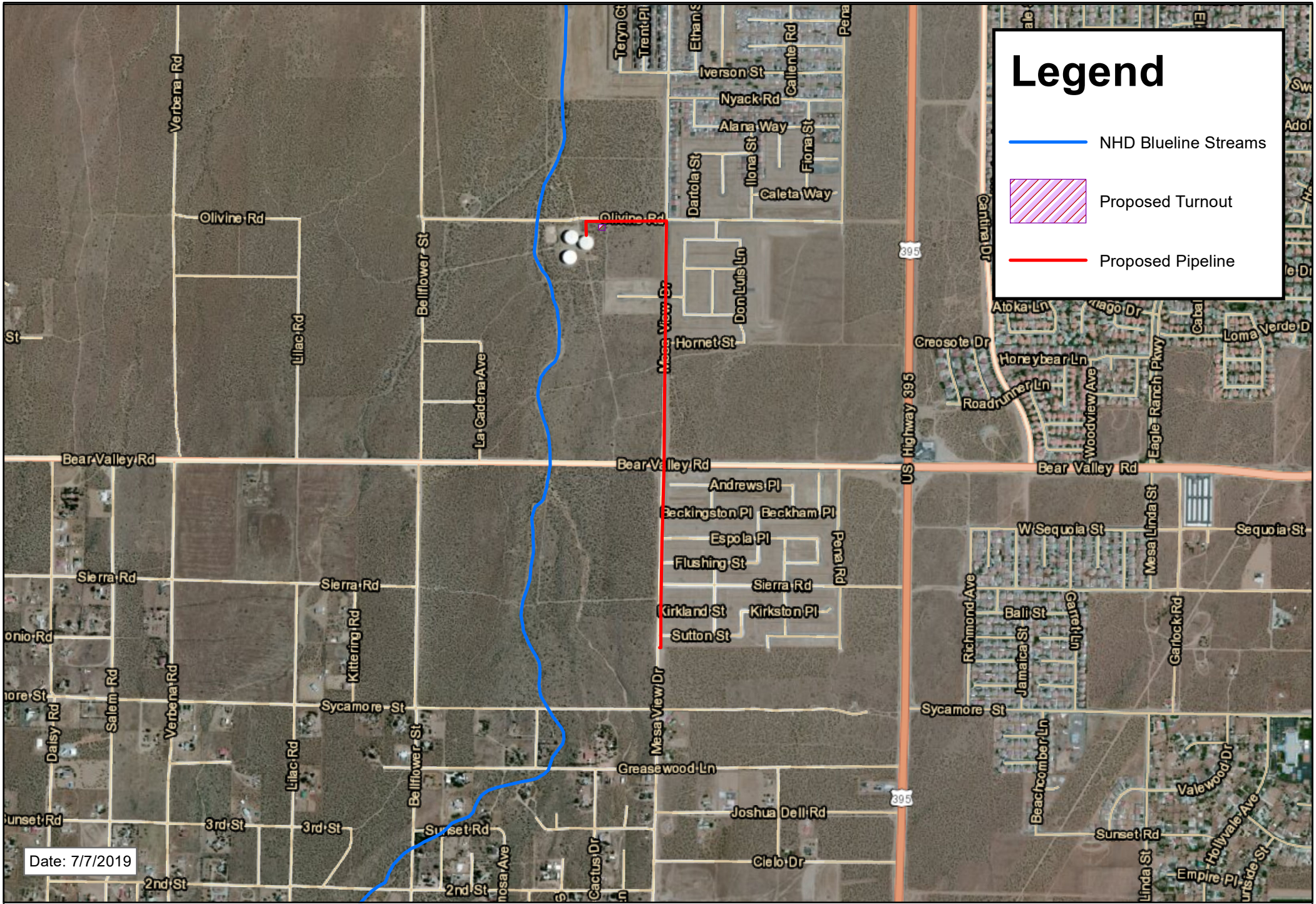


Figure 4
Soils

MWA Adelanto R^3 Extension Project
Victorville, CA

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Legend
NHD Blueline Streams
Proposed Turnout
Proposed Pipeline
Olivine Rd
Bear Valley Rd
Sierra Rd
Sycamore St
Greasewood Ln
Joshua Dell Rd
Sunset Rd
Cielo Dr
Hornet St
Andrews Pl
Beckingston Pl
Beckham Pl
Espola Pl
Flushing St
Kirkland St
Kirkston Pl
Sutton St
Iverson St
Nyack Rd
Alana Way
Caleta Way
Creosote Dr
Honeybear Ln
Roadrunner Ln
Atoka Ln
Bali St
W Sequoia St
Sequoia St
Valewood Dr
Empire Pl
Verbena Rd
Bellflower St
Lilac Rd
La Cadena Ave
Mesa View Dr
Don Luis Ln
Daffola St
Ilona St
Fiona St
Callente Rd
Pera Rd
Kittering Rd
Salem Rd
Daisy Rd
Cactus Dr
Mesa Linda St
Richmond Ave
Jamaica St
Garlock Rd
Beachcomber Ln
Hollyvale Ave
Woodview Ave
Eagle Ranch Pkwy
US Highway 395
395
Date: 7/7/2019
0 0.125 0.25 0.5 0.75 1 Miles
Imagery Date: 8/6/2017
Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,
1 inch = 1,307 feet
Figure 5
NHD Blueline Streams
MWA Adelanto R3 Extension Project
Victorville, CA

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ATTACHMENT B – PHOTOS

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Photo 1: South-facing shot of the Adelanto reservoir from Olivine Rd.



Photo 2: Reservoir site, looking south from Olivine Road, northeast end of property. Note the Creosote scrub (to be disturbed), and Joshua tree woodland (to remain undisturbed) in the background.



Photo 3: South-facing photo inside Reservoir site, conceptual area for new Turnout 7, looking southeast at the existing maintenance road and water tanks.



Photo 4: Northwest-facing photo from Mesa View Dr. looking at the existing water tanks on Olivine Rd.



Photo 5: West-facing photo on Mesa View Dr. showing Joshua tree adjacent to the road.



Photo 6: East-facing photo on Mesa Dr. showing rabbit brush scrub.



Photo 7: Existing turnout 6 located at the southern end of the proposed project.

ATTACHMENT C – POTENTIAL TO OCCUR

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Table 1
Sensitive Species Potential to Occur

Scientific Name	Common Name	Federal Listing	State Listing	Other Statuses	Habitats	Potential To Occur
Plants						
Canbya candida	white pygmy-poppy	None	None	CNPS 4.2	Joshua tree woodland, Mojavean desert scrub, Pinyon and juniper woodland in gravelly, sandy, or granitic soils. 600-1460 m	Sandy, course soil within Joshua tree woodland is on site. Species has potential to occur.
Castilleja plagiotoma	Mojave paintbrush	None	None	CNPS 4.3	Great Basin scrub (alluvial), Joshua tree woodland, Lower montane coniferous forest, Pinyon and juniper woodland. 300-2500 m	Joshua tree woodland is on site. Species has potential to occur.
Loeflingia squarrosa var. *artemisiarum*	sagebrush loeflingia	None	None	CNPS 2B.2 | BLM Sensitive	Great Basin scrub, Sonoran desert scrub, desert dunes. Sandy flats and dunes. Sandy areas around clay slicks w/Sarcobatus, Atriplex, Tetradymia, etc. 700-1615 m.	Sand dunes are not present on site. Potential to occur is low.
Muilla coronata	crowned muilla	None	None	CNPS 4.2	Chenopod scrub, Joshua tree woodland, Mojavean desert scrub, Pinyon and juniper woodland. 670-1960 m	Joshua tree woodland is on site. Species has potential to occur.
Opuntia basilaris var. *brachyclada*	short-joint beavertail	None	None	CNPS 1B.2 | BLM Sensitive | USF Sensitive	Chaparral, Joshua tree woodland, Mojavean desert scrub, pinyon-juniper woodland. Sandy soil or coarse, granitic loam. 425-1800 m.	Sandy, course soil within Joshua tree woodland is on site. Species has potential to occur.
Quercus turbinella	shrub live oak	None	None	CNPS 4.3	Chaparral, Cismontane woodland, Lower montane coniferous forest, Pinyon and juniper woodland. 1200-2000 m	Elevation at project site does not exceed 1100 m. Potential to occur is low.
Mammals						
Xerospermophilus mohavensis	Mohave ground squirrel	None	Threatened	BLM Sensitive | IUCN Vulnerable	Open desert scrub, alkali scrub & Joshua tree woodland. Also feeds in annual grasslands. Restricted to Mojave Desert. Prefers sandy to gravelly soils, avoids rocky areas. Uses burrows at base of shrubs for cover. Nests are in burrows.	Sandy, course soil within Joshua tree woodland is on site. Species has potential to occur.
Birds						
Athene cunicularia	burrowing owl	None	None	BLM Sensitive | CDFW Species of Special Concern |	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean	No appropriate-sized burrows on site. Potential to occur is low.

Scientific Name	Common Name	Federal Listing	State Listing	Other Statuses	Habitats	Potential To Occur
				IUCN Least Concern | USFWS Birds of Conservation Concern	nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	
Gymnogyps californianus	California condor	Endangered	Endangered	CDF Sensitive | CDFW Fully Protected | IUCN Critically Endangered | NACBI Red Watch List	Require vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude.	Mountain habitat is not on site. Potential to occur is low.
Lanius ludovicianus	loggerhead shrike	None	None	CDFW Species of Special Concern | IUCN Least Concern | USFWS Birds of Conservation Concern	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub & washes. Prefers open country for hunting, with perches.for scanning, and fairly dense shrubs and brush for nesting.	Joshua tree woodland with fences and other perches are on site. Species has potential to occur.
Setophaga petechia	yellow warbler	None	None	CDFW Species of Special Concern | USFWS Birds of Conservation Concern	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	Riparian habitat is not on site. Potential to occur is low.
Reptiles						
Gopherus agassizii	desert tortoise	Threatened	Threatened	IUCN Vulnerable	Most common in desert scrub, desert wash, and Joshua tree habitats; occurs in almost every desert habitat. Require friable soil for burrow and nest construction. Creosote bush habitat with large annual wildflower blooms preferred.	Creosote scrub is on site; however, the project is in a fenced location and no large burrows were on site. Potential to occur is low.
Phrynosoma blainvillii	coast horned lizard	None	None	BLM Sensitive | CDFW Species of Special Concern | IUCN Least Concern	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Open areas for sunning and scrub for cover are on site. Species has potential to occur.

Coding and Terms

E = Endangered T = Threatened C = Candidate FP = Fully Protected SSC = Species of Special Concern R = Rare

State Species of Special Concern: An administrative designation given to vertebrate species that appear to be vulnerable to extinction because of declining populations, limited acreages, and/or continuing threats. Raptor and owls are protected under section 3502.5 of the California Fish and Game code: "It is unlawful to take, possess or destroy any birds in the orders Falconiformes or Strigiformes or to take, possess or destroy the nest or eggs of any such bird."

Global Rankings (Species or Natural Community Level):

G1 = Critically Imperiled – At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2 = Imperiled – At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 = Vulnerable – At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4 = Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure – Common; widespread and abundant.

Subspecies Level: Taxa which are subspecies or varieties receive a taxon rank (T-rank**)** attached to their G-rank. Where the G-rank reflects the condition of the entire species, the T-rank reflects the global situation of just the subspecies. For example: the Point Reyes mountain beaver, *Aplodontia rufa* ssp. *phaea* is ranked G5T2. The G-rank refers to the whole species range i.e., *Aplodontia rufa.* The T-rank refers only to the global condition of ssp. *phaea*.

State Ranking:

S1 = Critically Imperiled – Critically imperiled in the State because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the State.
S2 = Imperiled – Imperiled in the State because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the State.
S3 = Vulnerable – Vulnerable in the State due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the State.
S4 = Apparently Secure – Uncommon but not rare in the State; some cause for long-term concern due to declines or other factors.
S5 = Secure – Common, widespread, and abundant in the State.

California Rare Plant Rankings (CNPS List):

1A = Plants presumed extirpated in California and either rare or extinct elsewhere.
1B = Plants rare, threatened, or endangered in California and elsewhere.
2A = Plants presumed extirpated in California, but common elsewhere.
2B = Plants rare, threatened, or endangered in California, but more common elsewhere.
3 = Plants about which more information is needed; a review list.
4 = Plants of limited distribution; a watch list.

Threat Ranks:

.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
.3 = Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

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Appendix C
Cultural Resources Report

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IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

ADELANTO R³ EXTENSION PROJECT

City of Victorville
San Bernardino County, California

For Submittal to:

Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307
and
United States Bureau of Reclamation
Southern California Area Office
27226 Via Industria, Suite A
Temecula, CA 92590

Prepared for:

Jericho Systems, Inc.
47 North 1st Street
Redlands, CA 92373

Prepared by:

CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324

Bai "Tom" Tang, Principal Investigator
Michael Hogan, Principal Investigator

August 17, 2019
CRM TECH Contract No. 3503

Title: Identification and Evaluation of Historic Properties: Adelanto R^3 Extension Project, City of Victorville, San Bernardino County, California

Author(s): Bai "Tom" Tang, Principal Investigator/Historian
Deirdre Encarnación, Archaeologist/Report Writer
Ben Kerridge, Archaeologist
Hunter O'Donnell, Archaeologist

Affiliation: CRM TECH
1016 East Cooley Drive, Suite A/B
Colton, CA 92324
(909) 824-6400

Date: August 17, 2019

For Submittal to: Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307
(760) 946-7000
and
United States Bureau of Reclamation
Southern California Area Office
27226 Via Industria, Suite A
Temecula, CA 92590
(951) 695-5310

Prepared for: Shay Lawrey
Jericho Systems, Inc.
47 North 1st Street
Redlands, CA 92373
(909) 307-5633

USGS Quadrangle: Baldy Mesa, Calif., 7.5' quadrangle (Section 4 of T4N R5W and Section 33 of T5N R5W, San Bernardino Baseline and Meridian)

Project Size: Approximately 1.08 linear miles

Keywords: Victor Valley, southern Mojave Desert; Phase I historical/archaeological resources survey; Site 36-004203/36-004411: Tejon branch of Mormon Trail; Site 3503-1H (temporary designation): historic-period refuse scatter; no "historic properties" or "historical resources" affected

EXECUTIVE SUMMARY

Between June and August 2019, at the request of Jericho Systems, Inc., CRM TECH performed a cultural resources study on the Area of Potential Effects (APE) for the proposed Adelanto R³ Extension Project in the City of Victorville, San Bernardino County, California. The undertaking entails primarily the installation of approximately 1.08 linear miles of 30-inch-diameter underground pipeline between two existing facilities, namely the Adelanto reservoir tanks on the south side of Olivine Road and Turnout 6/7 near the intersection of Mesa View Drive and 5th Street/Del Rosa Road, for the purpose of extending the Mojave Water Agency's (MWA) wholesale water delivery service to the City of Adelanto.

The APE for this undertaking is delineated to encompass the maximum extent of ground disturbance required during construction. Except where the project alignment turns into the grounds of the two existing facilities, the APE coincides with the public rights-of-way for the segments of Mesa View Drive and Olivine Road where the pipeline will be installed. It lies across the north half of Section 4, T4N R5W, and the south half of Section 33, T5N R5W, San Bernardino Baseline and Meridian. The vertical extent of the APE, represented by the maximum depth of trenching for pipeline installation, will not exceed 12 feet below surface. Since no historic buildings are located in the immediate vicinity of the undertaking, no additional APE is required for visual, atmospheric, or other indirect effects.

The study is a part of the environmental review process for the proposed undertaking, as required by the MWA pursuant to the California Environmental Quality Act and by the United States Bureau of Reclamation (BOR), as the federal lead agency, pursuant to Section 106 of the National Historic Preservation Act. The purpose of the study is to provide the MWA and the BOR with the necessary information and analysis to determine whether the undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(l), or "historical resources," as defined by Title 14 CCR §15064.5(a)(1)-(3), that may exist in or near the APE.

In order to accomplish this objective, CRM TECH conducted a historical/archaeological resources records search, pursued historical and geoarchaeological background research, consulted with Native American representatives, and carried out an intensive-level field survey of the entire APE. The results of the records search and the historical research suggest that a branch of the historic Mormon Trail leading to the Tejon Pass, which crossed the northern portion of the APE, was previously recorded as a component of both Site 36-004203 and Site 36-004411 in the California Historical Resources Inventory.

The field survey confirmed the presence of a nondescript dirt road along a similar alignment to that depicted for Site 36-004203/36-004411 in historic maps and the existing site records, but the portion of the road within the APE has been largely destroyed by the construction of Mesa View Drive, a paved road at this location. Despite its early age and association with the Mormon Trail, a California Historical Landmark, the small segment of the road within and adjacent to the APE lacks sufficient historic integrity to be considered eligible for listing in the National Register of Historic Places or the California Register of Historical Resources. Therefore, this portion of Site 36-004203/36-004411 does not appear to qualify as a "historic property" or a "historical resource."

During the field survey, a previously unknown archaeological site of historical origin was identified and recorded outside but in close proximity to the APE and was temporarily designated as Site 3503-1H. Located approximately 50 feet west of Mesa View Drive, the small site consists of a total of four rusted steel cans found on the ground surface. As a minor refuse scatter of unknown but likely incidental origin, the site does not demonstrate a documented association, let alone a close association, with any person or event of recognized historic significance, nor does it hold the potential for any important archaeological data. Therefore, Site 3503H does not appear to meet any of the criteria for the National Register or the California Register, and does not constitute a "historic property" or a "historical resource."

No other potential "historic properties" or "historical resources" were encountered within or immediately adjacent to the APE, and the geoarchaeological analysis suggests that the subsurface sediments in the vertical APE are relatively low in sensitivity for potentially significant archaeological remains. Based on these findings, and pursuant to 36 CFR 800.4(d)(1) and Calif. PRC §21084.1, CRM TECH recommends to the MWA and the BOR a conclusion that *no "historic properties" or "historical resources" will be affected by the proposed undertaking*. No further cultural resources investigation is recommended for the undertaking unless project plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are encountered during earth-moving operations associated with the undertaking, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

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INTRODUCTION

Between June and August 2019, at the request of Jericho Systems, Inc., CRM TECH performed a cultural resources study on the Area of Potential Effects (APE) for the proposed Adelanto R³ Extension Project in the City of Victorville, San Bernardino County, California (Fig. 1). The undertaking entails primarily the installation of approximately 1.08 linear miles of 30-inch-diameter underground pipeline between two existing facilities, namely the Adelanto reservoir tanks on the south side of Olivine Road and Turnout 6/7 near the intersection of Mesa View Drive and 5th Street/Del Rosa Road, for the purpose of extending the Mojave Water Agency's (MWA) wholesale water delivery service to the City of Adelanto.

The APE for this undertaking is delineated to encompass the maximum extent of ground disturbance required during construction. Except where the project alignment turns into the grounds of the two existing facilities, the APE coincides with the public rights-of-way for the segments of Mesa View Drive and Olivine Road where the pipeline will be installed (Figs. 2, 3). It lies across the north half of Section 4, T4N R5W, and the south half of Section 33, T5N R5W, San Bernardino Baseline and Meridian (Fig. 2). The vertical extent of the APE, represented by the maximum depth of trenching for pipeline installation, will not exceed 12 feet below surface. Since no historic buildings are located in the immediate vicinity of the undertaking, no additional APE is required for visual, atmospheric, or other indirect effects.

The study is a part of the environmental review process for the proposed undertaking, as required by the MWA pursuant to the California Environmental Quality Act and by the United States Bureau of

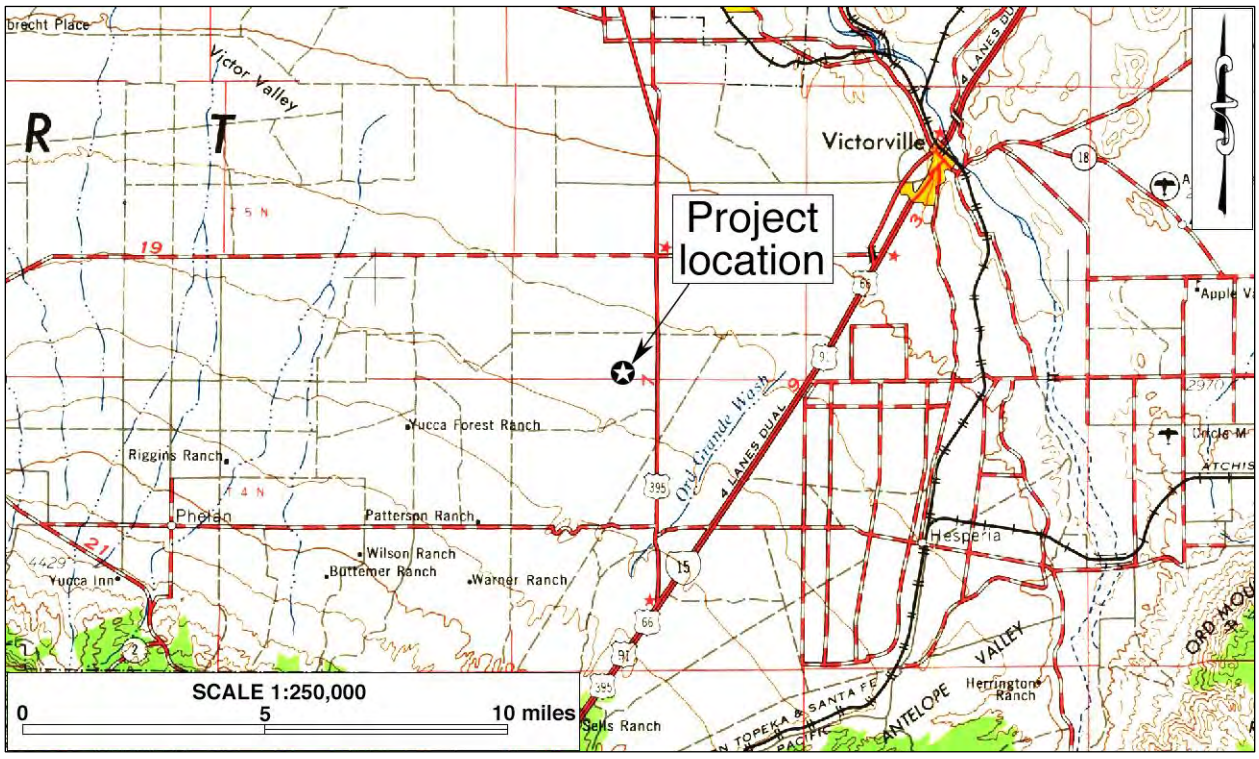


Figure 1. Project vicinity. (Based on USGS San Bernardino, Calif., 60'x30' quadrangle [USGS 1969])

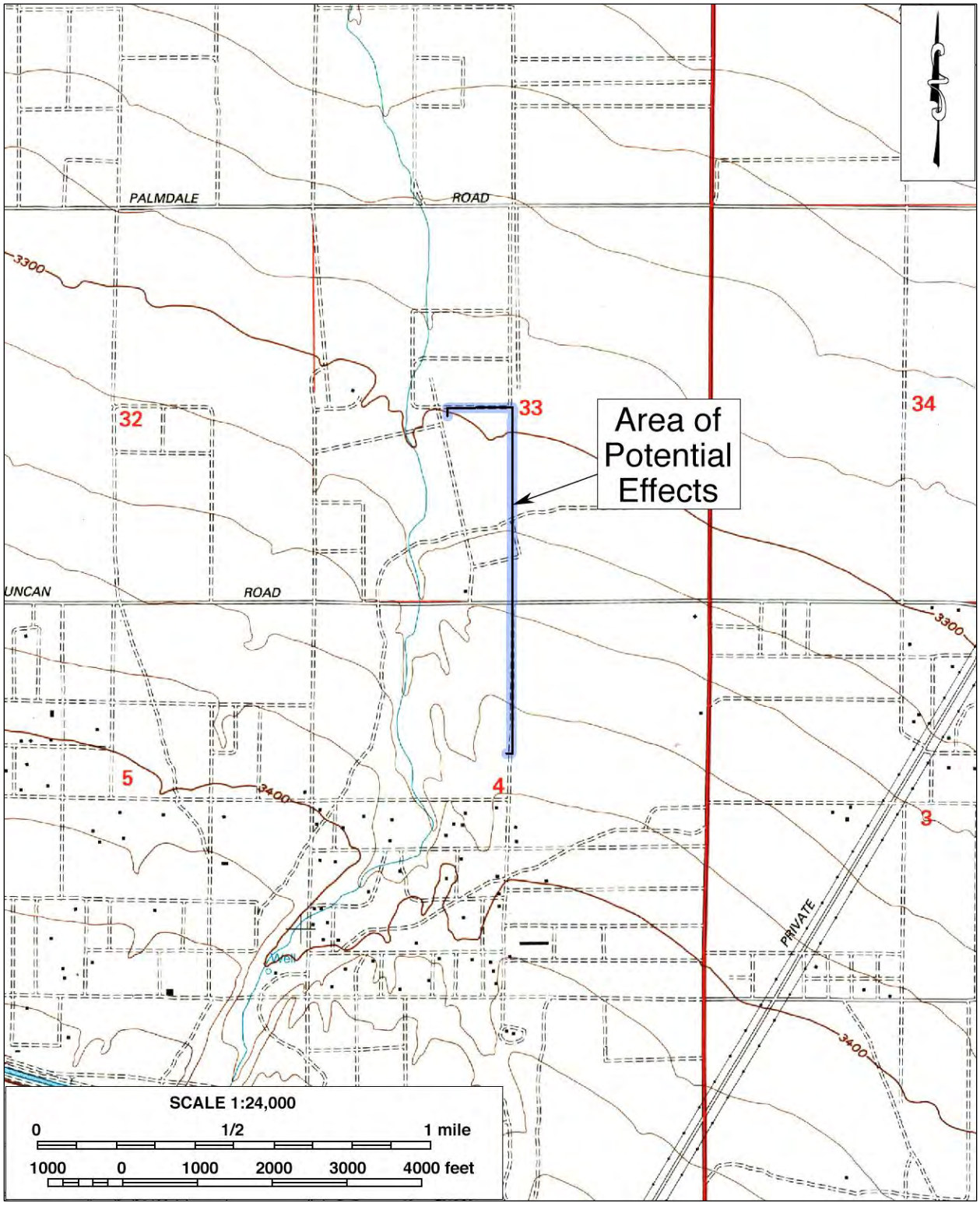


Figure 2. Project location. (Based on USGS Baldy Mesa, Calif., 7.5' quadrangle [USGS 1996])

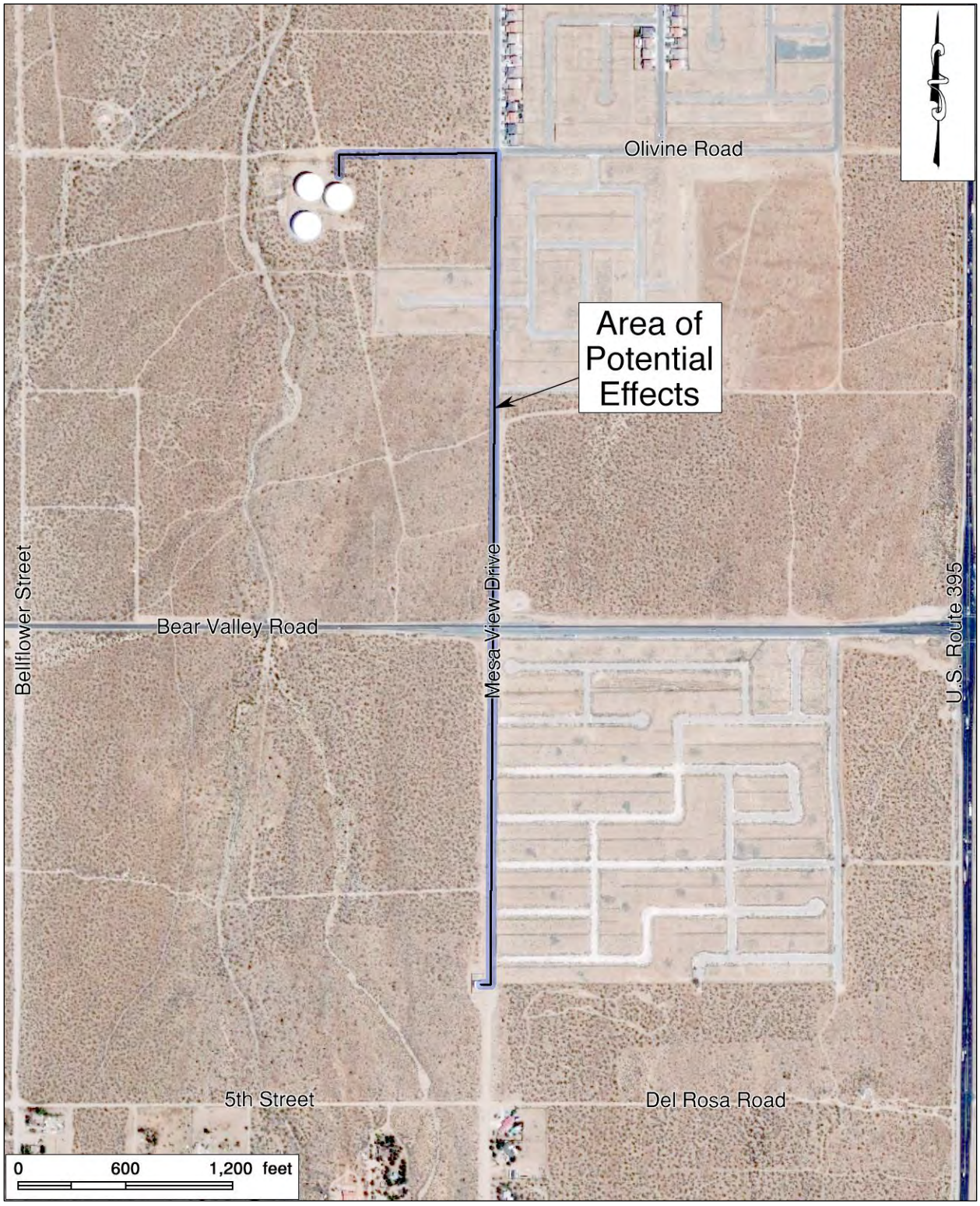


Figure 3. Aerial image of the APE. (Based on Google Earth imagery [Google Earth 2018])

Reclamation (BOR), as the federal lead agency, pursuant to Section 106 of the National Historic Preservation Act. The purpose of the study is to provide the MWA and the BOR with the necessary information and analysis to determine whether the undertaking would have an effect on any "historic properties," as defined by 36 CFR 800.16(l), or "historical resources," as defined by Title 14 CCR §15064.5(a)(1)-(3), that may exist in or near the APE.

In order to accomplish this objective, CRM TECH conducted a historical/archaeological resources records search, pursued historical and geoarchaeological background research, consulted with Native American representatives, and carried out an intensive-level field survey of the entire APE. The following report is a complete account of the methods, results, and final conclusion of the study. Personnel who participated in the study are named in the appropriate sections below, and their qualifications are provided in Appendix 1.

SETTING

CURRENT NATURAL SETTING

The Victor Valley, in which the APE is situated, lies on the southern rim of the Mojave Desert and immediately to the north of the San Bernardino-San Gabriel mountain ranges. The climate and environment of the area is typical of southern California "high desert" country, so-called because of its higher elevation than the Colorado Desert to the southeast. The climate is marked by extremes in temperature and aridity, with summer highs reaching well over 110ºF and winter lows dipping below freezing. Average annual precipitation is less than five inches.

More specifically, the APE is located on the southwestern outskirts of the City of Victorville, surrounded mostly by undeveloped desert land (Fig. 3). Immediately to the east of the APE, two residential tracts have been laid out in recent years, but most of the home lots in the neighborhoods remain to be built upon (Fig. 3). The terrain along the project alignment is relatively level, with a gradual incline to the south, and the elevations range approximately from 3,300 feet to 3,370 feet above mean sea level. Naturally occurring quartz fragments were observed throughout.

The project vicinity is a part of the Joshua Tree Woodland Plant Community, which is characterized by a sparse growth of Joshua tree (*Yucca brevifolia*), buckwheat (*Eriogonum* species), Apache plume (*Fallugia paradoxa*), desert alyssum (*Lepidium fremontii*), juniper (*Juniperus* spp.), Mormon tea (*Ephedra* spp.), various types of cacti, and assorted other grasses and shrubs (Fig. 4). Animals common to the area include small mammals (jackrabbits, desert cottontails, squirrels, rats, and mice), reptiles (lizards, snakes, and desert tortoise), native birds (doves, vultures, raptors, and quail), and arthropods (beetles, desert tarantula and scorpions).

The Victor Valley is a part of the Mojave River watershed. During the Late Pleistocene and early Holocene periods, the region experienced four separate high stands of Lake Mojave and other pluvial lakes. These episodes afforded greater access to water by aboriginal groups in the region, while the desiccation of the lakes forced them to move closer to the Mojave River, which provided not only a dependable water source and subsistence resources but also a major route for interregional trade. Many of the Native American archaeological sites identified in and around the Victor Valley



Figure 4. Typical landscapes along the project route. *Left*: view to the north along Mesa View Drive; *right*: view to the south towards the Adelanto tanks. (Photographs taken on June 25, 2019)

consist of ancient habitation debris such as middens, groundstone fragments, chipped-stone pieces, fire-affected rocks, and faunal remains. Rock shelters, bedrock milling features, and rock art panels have also been found in the region. As expected, most of these sites occur along the banks of the Mojave River.

CULTURAL SETTING

Prehistoric Context

In order to understand the progress of Native American cultures prior to European contact, archaeologists have devised chronological frameworks on the basis of artifacts and site types that date back some 12,000 years. Currently, the chronology most frequently applied in the Mojave Desert divides the region's prehistory into five periods marked by changes in archaeological remains, reflecting different ways in which Native peoples adapted to their surroundings. According to Warren (1984) and Warren and Crabtree (1986), the five periods are as follows: the Lake Mojave Period, 12,000 years to 7,000 years ago; the Pinto Period, 7,000 years to 4,000 years ago; the Gypsum Period, 4,000 years to 1,500 years ago; the Saratoga Springs Period, 1,500 years to 800 years ago; and the Protohistoric Period, 800 years ago to European contact.

More recently, Hall (2000) presented a slightly different chronology for the region, also with five periods: Lake Mojave (ca. 8000-5500 B.C.), Pinto (ca. 5500-2500 B.C.), Newberry (ca. 1500 B.C.-500 A.D.), Saratoga (ca. 500-1200 A.D.), and Tecopa (ca. 1200-1770s A.D.). According to Hall (*ibid*.:14), small mobile groups of hunters and gatherers inhabited the Mojave Desert during the Lake Mojave sequence. Their material culture is represented by the Great Basin Stemmed points and flaked stone crescents. These small, highly mobile groups continued to inhabit the region during the Pinto Period, which saw an increased reliance on ground foods, small and large game animals, and the collection of vegetal resources, suggesting that "subsistence patterns were those of broad-based foragers" (*ibid*.:15). Artifact types found in association with this period include the Pinto points and *Olivella* sp. spire-lopped beads.

Distinct cultural changes occurred during the Newberry Period, in comparison to the earlier periods, including "geographically expansive land-use pattern…involving small residential groups moving between select localities," long-distance trade, and diffusion of trait characteristics (Hall 2000:16).

Typical artifacts from this period are the Elko and Gypsum Contracting Stem points and Split Oval beads. The two ensuing periods, Saratoga and Tecopa, are characterized by seasonal group settlements near accessible food resources and the intensification of the exploitation of plant foods, as evidenced by groundstone artifacts (*ibid*.:16).

Hall (2000:16) states that "late prehistoric foraging patterns were more restricted in geographic routine and range, a consequence of increasing population density" and other variables. Saratoga Period artifact types include Rose Spring and Eastgate points as well as Anasazi grayware pottery. Artifacts from the Tecopa Period include Desert Side-notched and Cottonwood Triangular points, buffware and brownware pottery, and beads of the Thin Lipped, Tiny Saucer, Cupped, Cylinder, steatite, and glass types (*ibid*.).

Ethnohistoric Context

The Victor Valley area is situated near the vaguely delineated "boundary" between the traditional territories of the Serrano and the Vanyume peoples. The basic written sources on Serrano and Vanyume cultures are Kroeber (1925), Strong (1929), and Bean and Smith (1978), and the following ethnographic discussion of the Serrano and Vanyume peoples is based on these sources. Linguistically the Vanyume were probably related to the Serrano, their southern neighbor, although politically they seem to have differed from the Serrano proper. The number of Vanyumes, never large, dwindled rapidly between 1820 and 1834, when southern California Indians were removed to the various missions and their *asistencias*, and the group virtually disappeared well before 1900. As a result, very little is known about the Vanyume today.

The Serrano's territory is centered at the San Bernardino Mountains, but also includes part of the San Gabriel Mountains, much of the San Bernardino Valley, and the Mojave River valley in the southern portion of the Mojave Desert, reaching as far east as the Cady, Bullion, Sheep Hole, and Coxcomb Mountains. However, it is nearly impossible to assign definitive boundaries for the Serrano territory due to the nature of the tribe's clan-based organization as well as the lack of reliable data. The name of the group, Serrano, was derived from a Spanish term meaning "mountaineer" or "highlander."

Prior to European contact, the Serrano were primarily hunter-gatherers and occasionally fishers, and settled mostly on elevated terraces, hills, and finger ridges near where flowing water emerged from the mountains. They were loosely organized into exogamous clans, which were led by hereditary heads, and the clans in turn were affiliated with one of two exogamous moieties. The clans were patrilineal, but their exact structure, function, and number are unknown, except that the clans were the largest autonomous political and landholding units. There was no pan-tribal political union among the clans, but they shared strong trade, ceremonial, and marital connections that sometimes also extended to other surrounding nations, such as the Kitanemuk, the Tataviam, and the Cahuilla.

Although contact with Europeans may have occurred as early as 1771 or 1772, Spanish influence on Serrano lifeways was negligible until the 1810s, when a mission *asistencia* was established on the southern edge of Serrano territory. Between then and the end of the mission era in 1834, most of the Serrano in the western portion of their traditional territory were removed to the nearby missions. In the eastern portion, a series of punitive expeditions in 1866-1870 resulted in the death or displacement of almost all remaining Serrano population in the San Bernardino Mountains. Today,

most Serrano descendants are affiliated with the San Manuel Band of Mission Indians, the Morongo Band of Mission Indians, or the Serrano Nation of Indians.

Historic Context

The first European visitor known to have arrived in the present-day Victor Valley area was the famed Spanish explorer Francisco Garcés, who traveled through the valley in 1776, shortly after the beginning of Spanish colonization Alta California in 1769 (Beck and Haas 1974:15). The earliest Euroamerican settlements appeared in the Victor Valley as early as 1860 (Peirson 1970:128). Despite these "early starts," due to its harsh environment, development in the arid high desert country of southern California was slow and limited for much of the historic period, and the Victor Valley remained only sparsely populated until the second half of the 20th century.

Garcés traveled through the Victor Valley along an ancient Indian trading route known today as the Mojave Trail (Beck and Haase 1974:15). In the early 1830s, part of this trail was incorporated into the Old Spanish Trail, an important pack-train road that extended between southern California and Santa Fe, New Mexico (Warren 2004). Some 20 years later, when the historic wagon road known as the Mormon Trail or Salt Lake Trail was established between Utah and southern California, it followed essentially the same route across the Mojave Desert (NPS 2001:5). Since then, the Victor Valley has always served as a crucial link on a succession of major transportation arteries, where the heritage of the ancient Mojave Trail was carried on by the Santa Fe Railroad since the 1880s, by the legendary U.S. Route 66 during the early and mid-20th century, and finally by today's I-15.

The City of Victorville traces its roots to a station on the Santa Fe Railroad, which was completed by the California Southern Railway Company, a Santa Fe subsidiary, in 1885. The station was initially named Victor, after Jacob Nash Victor, general manager of the California Southern Railway Company (Richards 1966). With the coming of the railroad, settlement activities began in earnest in the Victor Valley in the 1880s, and reached a peak in the 1910s. The townsite was laid out in 1886, and by 1890, Victor had become a settlement of approximately 100 residents. In 1901, the name of the town was changed to Victorville to avoid confusion with Victor, Colorado (*ibid.*).

Thanks to the availability of fertile lands and the abundance of ground water, agriculture played a dominant role in the early development of the Victor Valley area (City of Victorville n.d.[a]). During the late 19th and early 20th centuries, settlers in the valley attempted to raise a number of money-making staples, such as alfalfa, deciduous fruits, and poultry, with only limited success. Around the turn of the century, large deposits of limestone and granite were discovered, prompting cement manufacturing to become the leading industry in the valley (*ibid.*). During and after WWII, George Air Force Base, established in 1941, added a new driving force in the local economy with its 6,000 military and civilian employees. After being deactivated in 1992, the former base was converted for civilian use as the Southern California Logistics Airport.

In 1962, the City of Victorville was incorporated with a population of approximately 8,110 and an area of 9.7 square miles (City of Victorville n.d.[a]). Over the 55 years since then, it has become one of the fastest growing cities in California, largely as a "bedroom community" in support of the industrial and commercial centers in the Greater Los Angeles area. At the present, the city has expanded to more than 73 square miles, with an estimated population of more than 120,000 (City of Victorville n.d.[b]).

RESEARCH METHODS

RECORDS SEARCH

On June 18, 2019, CRM TECH archaeologist Ben Kerridge completed the records search at the South Central Coastal Information Center (SCCIC), California State University, Fullerton, which is the State of California's official cultural resource records repository for San Bernardino County. During the records search, Kerridge examined maps and records on file at the SCCIC for previously identified cultural resources and existing cultural resources reports within a one-mile radius of the APE. Previously identified cultural resources include properties designated as California Historical Landmarks, Points of Historical Interest, or San Bernardino County Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

GEOARCHAEOLOGICAL ANALYSIS

As part of the research procedures, CRM TECH archaeologist Deirdre Encarnación pursued geoarchaeological analysis to assess the APE's potential for the deposition and preservation of subsurface cultural deposits from the prehistoric period, which cannot be detected through a standard surface archaeological survey. Sources consulted for this purpose included primarily topographic and geologic maps and reports pertaining to the surrounding area. Findings from these sources were used to develop a geomorphologic history of the APE and address geoarchaeological sensitivity of the vertical APE.

HISTORICAL BACKGROUND RESEARCH

Historical background research for this study was conducted by CRM TECH principal investigator/ historian Bai "Tom" Tang. In addition to published literature in local and regional history, sources consulted during the research included the U.S. General Land Office (GLO) land survey plat maps dated 1856, U.S. Geological Survey (USGS) topographic maps dated 1902-1996, and aerial photographs taken in 1952-2018. The historic maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, located in Moreno Valley. The aerial photographs are available at the Nationwide Environmental Title Research (NETR) Online website and through the Google Earth software.

NATIVE AMERICAN PARTICIPATION

On June 12, 2019, CRM TECH submitted a written request to the State of California's Native American Heritage Commission (NAHC) for a records search in the commission's sacred lands file. Following the NAHC's recommendations and previously established consultation protocol, CRM TECH further contacted a total of five Native American representatives in the region in writing on June 27, 2019, for additional information on potential Native American cultural resources in the APE vicinity. Follow-up telephone solicitations were then carried out between July 15 and July 19, 2019. Correspondence between CRM TECH and the Native American representatives is summarized below and attached to this report in Appendix 2.

FIELD SURVEY

On June 25, 2019, CRM TECH archaeologist Hunter O'Donnell carried out the field survey of the APE. The survey was completed at an intensive level by walking one parallel transect on each side of the project alignment, placed 15 meters (approximately 50 feet) from the edge of the existing roadways. In this way, the ground surface in and near the APE was systematically and carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 50 years ago or older). Ground visibility was good to excellent due to the sparsity of the vegetation growth.

RESULTS AND FINDINGS

RECORDS SEARCH

According to SCCIC records, portions of the current project alignment have been included in five previous cultural resources studies. Among these were a large-scale overview completed in 1980, a linear survey along the intersecting Bear Valley Road in 1987 and, more recently, three linear studies completed in 2011-2012 for the existing MWA water supply system, which covered the southernmost portion of the APE (Fig. 5). The APE as a whole, however, had not been surveyed systematically for cultural resources prior to this study.

Maps maintained by the SCCIC further indicate that as a result of these previous studies, particularly the 1980 overview, two linear features from the early historic period have been recorded as crossing the northern half of the APE (see App. 3). Designated as Site 36-004203 (CA-SBR-4203H) and Site 36-004411 (CA-SBR-4411H) in the California Historical Resources Inventory, the two linear features represent the former routes of the Tejon Road-Palmdale Cutoff, a branch of the Old Spanish Trail/Mormon Trail system, and the entire length of the Mormon Trail in San Bernardino County, respectively.

While the SCCIC's maps show the two sites at slightly different locations across the APE, a closer examination of the existing site records reveals that both sites in this area embody the same road depicted in GLO and USGS maps from the mid- and late 19th century (Reynolds 1980; 1981a; 1981b; see App. 3). In the Cajon Pass area south of the Victor Valley, two monuments were established along different segments of the Mormon Trail in 1917 and 1937, and both have since been designated California Historical Landmarks (Nos. 576 and 577; OHP 1990:178-179).

Within a one-mile radius of the APE, SCCIC records show at least 15 other previous studies on various tracts of land and linear features, including an 88-acre property adjacent to the APE on the east (Fig. 5). In all, roughly half of the land within the scope of the records search has been surveyed at different levels of intensity, resulting in the identification of five additional historical/ archaeological sites and three isolates—i.e., localities with fewer than three artifacts—within the one-mile radius, as listed in Table 1.

As Table 1 shows, none of these known cultural resources was of prehistoric—i.e., Native American—origin. All of them dated to the historic era, with three of the five sites representing linear infrastructure features, including two other early roads such as the Old Spanish Trail. The

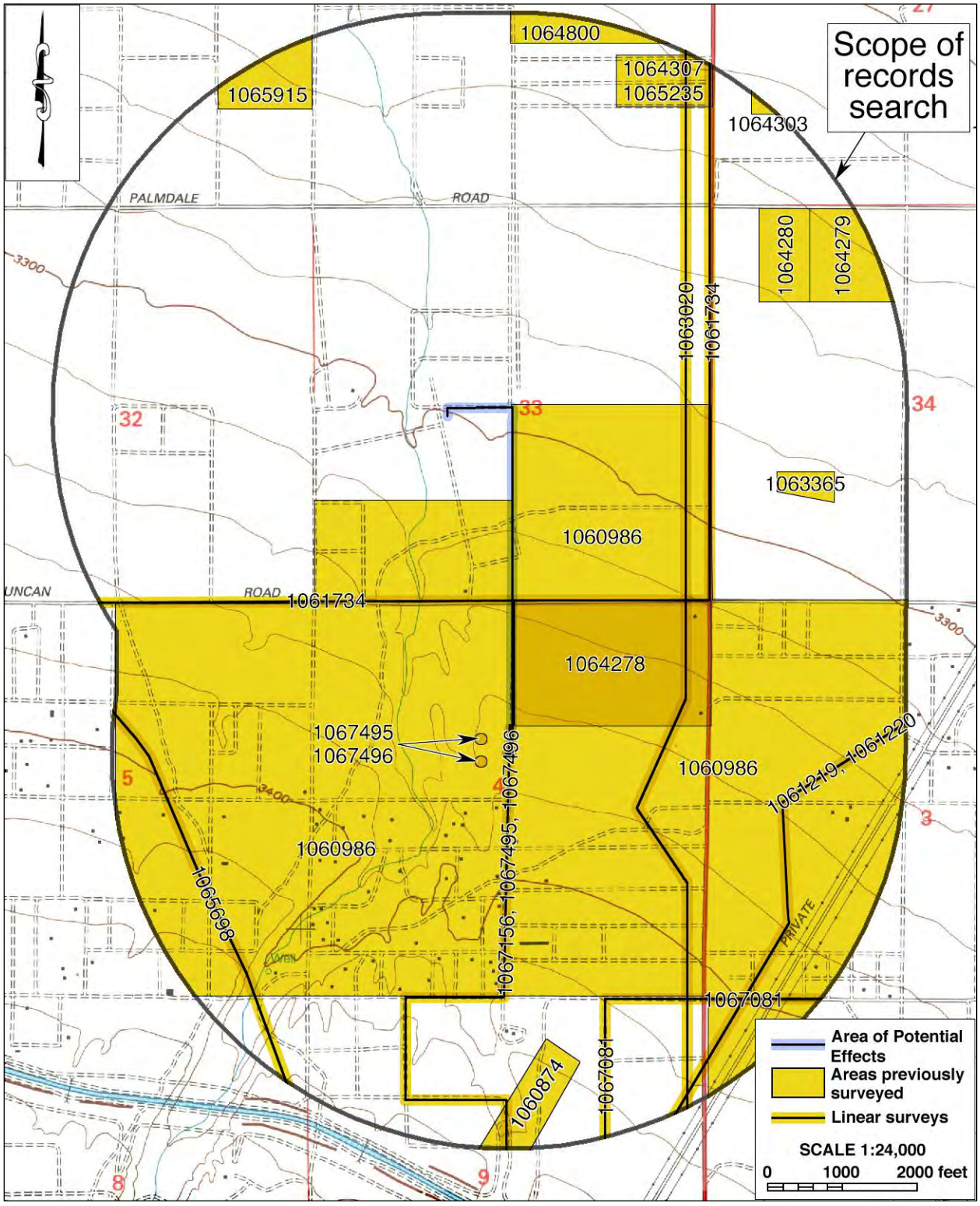


Figure 5. Previous cultural resources studies in the vicinity of the APE, listed by SCCIC file number. (See App. 3 for locations of known historical/archaeological resources)

Table 1. Previously Recorded Cultural Resources within the Scope of the Records Search		
Primary No.	**Trinomial**	**Description**
36-004179	CA-SBR-4179H	Segment of Lane's Crossing Toll Road
36-004180	CA-SBR-4180H	Homestead site with historic-period refuse
36-004203*	CA-SBR-4203H	Tejon Road-Palmdale Cutoff
36-004272	CA-SBR-4272H	Old Spanish Trail
36-004411*	CA-SBR-4411H	Mormon Trail/Mormon Road
36-007694	CA-SBR-7694H	LADWP Boulder Transmission Lines 1, 2, and 3
36-010504	CA-SBR-10504H	Historic-period fence line
36-020314	N/A	Isolate: bucket made from fuel can
36-020315	N/A	Isolate: matchstick filler condensed milk can
36-020316	N/A	Isolate: two condensed milk cans

* Recorded as lying across the APE

other two sites and the isolates consisted of typical remnants of homesteads and discarded refuse items. None of these sites or isolates was found in the immediate vicinity of the APE. Therefore, none of them requires further consideration during this study.

GEOARCHAEOLOGICAL ANALYSIS

Geographically, the APE is located on relatively level, open terrain on the Victor Valley floor. Surface soils in the vicinity have been mapped as part of the Cajon Series, which were developed on alluvial fans and derived from granitic sources (USDA 2019). Morton and Miller (2006) identify the surface sediments along most of the project alignment as alluvial deposits of Mid-Holocene age and those around the northwestern end of the APE, near an intermittent drainage, as fluvial deposits from the Early Holocene Epoch.

Existing prehistoric hunter-gatherer settlement-subsistence models for inland southern California suggest that long-term settlements were more likely to occur on elevated terraces, hills, and finger ridges near permanent or reliable sources of water, while the open valley floor was used mainly for resource procurement and travel routes. The area around the APE has no elevated geographic features, nor a permanent or reliable water source, but may be subject to flooding during the occasional heavy rains. Generally speaking, this geographic setting would not have been favorable for long-term habitation by the aboriginal population in prehistoric times, although the area could have been utilized for hunting, gathering, and temporary camping.

Almost the entire APE is located within the rights-of-way of existing public roadways, including paved as well as unpaved roads, where the surface and near-surface soils have been extensively disturbed by construction activities associated with both the roads themselves and the accompanying underground utility lines. Based on these considerations, the subsurface component of the APE appears to be relatively low in sensitivity for buried deposits of intact, potentially significant archaeological remains, especially those of prehistoric origin.

HISTORICAL RESEARCH

Historical sources consulted for this study demonstrate that other than the winding dirt road previously recorded across this area as a part of Site 36-004203 and Site 36-004411, no other man-made features were noted within or adjacent to the APE throughout the 1850s-1950s era (Figs. 6-9;

NETR Online 1952). The road was known to be present at least by the 1850s, and was clearly a branch of the Old Spanish Trail/Mormon Trail system (GLO 1856a; 1856b; USGS 1902; 1903). However, based on the historic maps and past studies on this historic trail system, it was evidently not one of the main branches of the Old Spanish Trail or the Mormon Trail, which traversed instead to the east and the south of the project location along more direct routes to the Cajon Pass (USGS 1902; BLM n.d.; NPS n.d.).

By the early 1940s, a number of automobile highways had been constructed in the surrounding area, including U.S. Routes 66 and 395, State Route 138, Palmdale Road, and Phelan Road (USGS 1942). As a result, the components of the original Old Spanish Trail/Mormon Trail system no longer served their original function and had often been obliterated by later development (*ibid.*). The branch of the trail across the APE was evidently truncated roughly a mile southwest of the project location, but the segment closer to the APE has survived to the present time (USGS 1942-1996 [Figs. 2, 8, 9]; NETR Online 1952-2016; Google Earth 1994-2018).

During the 1950s-1960s, Bear Valley Road/Duncan Road, then an unpaved road at this location, and a few other dirt roads came into being in the project vicinity (NETR Online 1968; Fig. 2). Two of the three water tanks at the Adelanto reservoir site were built between 1968 and 1994, followed by the third between 2006 and 2009 (NETR Online 1968; 1994; Google Earth 2006; 2009). Also in the early 2000s, the residential tracts to the east and northeast of the APE, with a small portion extending to the opposite side of Mesa View Drive, were laid out and some of the homes were built, but the development went into hiatus after 2009 and little further construction occurred until late 2017 (Google Earth 2005-2018).

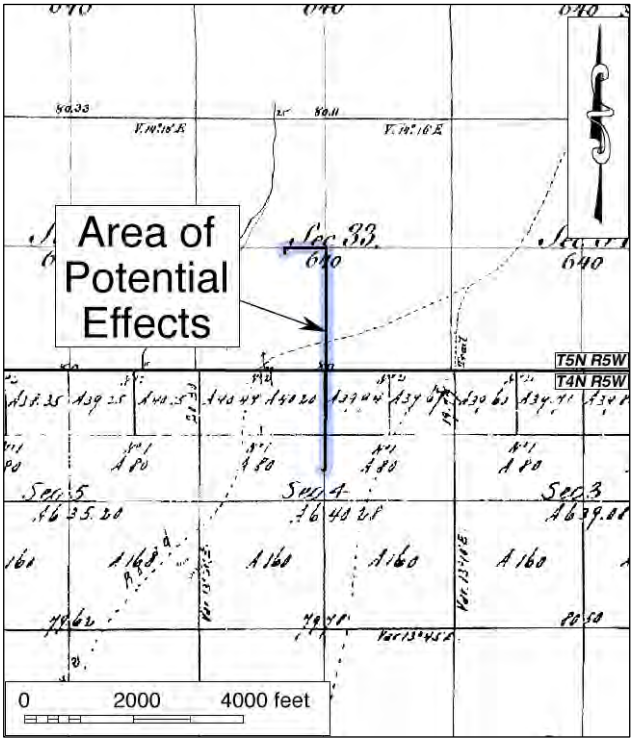


Figure 6. The APE and vicinity in 1853-1856. (Source: GLO 1856a; 1856b)

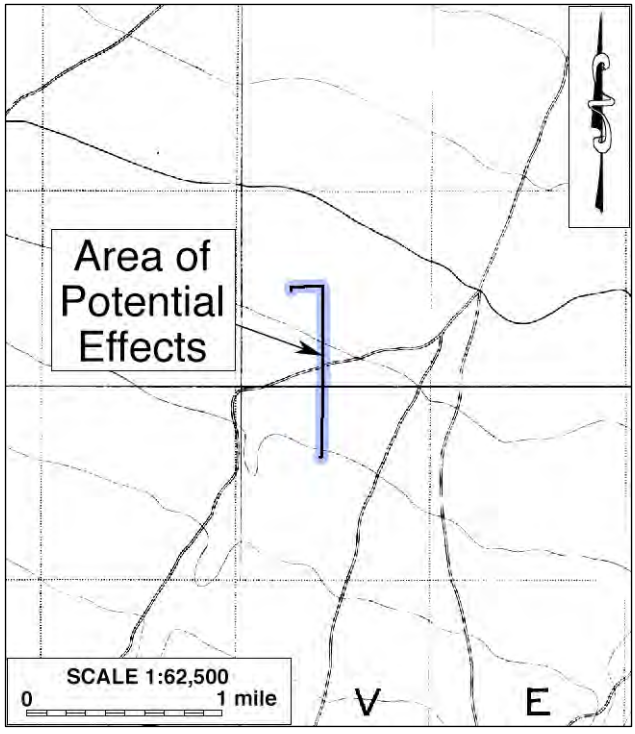


Figure 7. The APE and vicinity in 1898-1899. (Source: USGS 1902)

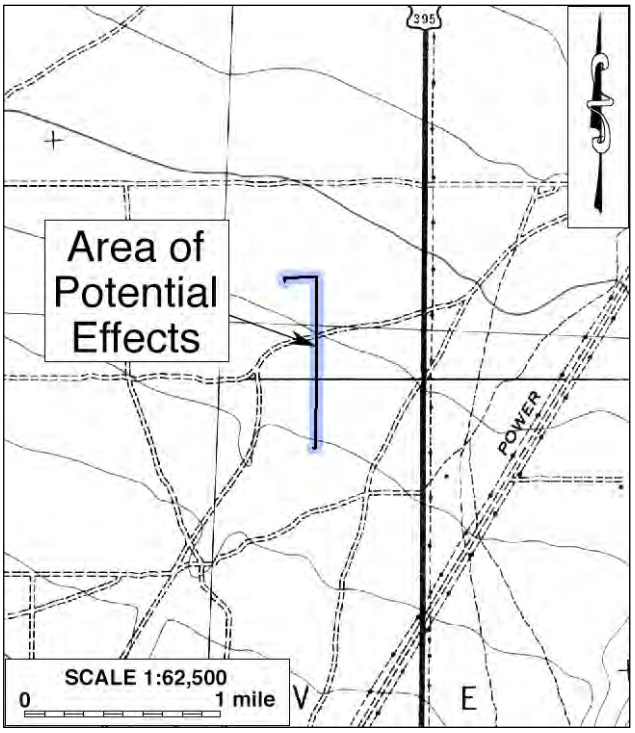


Figure 8. The APE and vicinity in 1940-1941. (Source: USGS 1942)

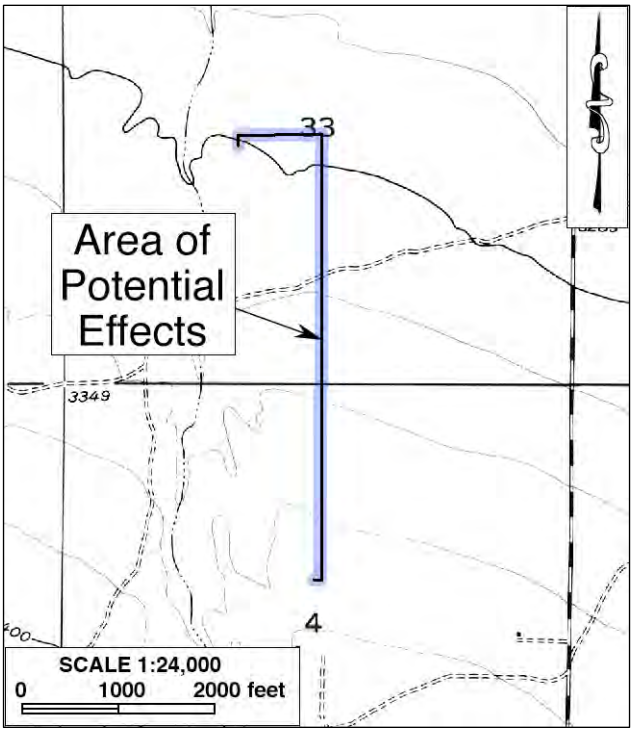


Figure 9. The APE and vicinity in 1952-1956. (Source: USGS 1956)

Within the APE itself, Olivine Road and the southern portion of Mesa View Drive first appeared between 1968 and 1994 (NETR Online 1968; 1994). The northern portion of Mesa View Drive, between Bear Valley Road and Olivine Road, did not come into being in its current configuration until 2003-2005, but it soon became a paved road in 2006-2009 while the southern portion has remained unpaved to the present time, as has Olivine Road (Google Earth 2003-2009).

NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, the NAHC reports in a letter dated June 25, 2019, that the sacred lands record search yielded negative results for Native American cultural resources within the APE but recommends that local Native American groups be contacted for further information. For that purpose, the NAHC provided a list of potential contacts in the region (see App. 2). Upon receiving the NAHC's reply, CRM TECH sent written requests for comments to representatives of the four tribes of Serrano heritage on the referral list (see App. 2). For the Morongo Band of Mission Indians, the designated spokesperson on cultural resources issues was contacted in lieu of the individuals on the referral list, as recommended in the past by the tribal government staff. In all, five individuals were contacted at the four tribal organization, as listed below:

- Travis Armstrong, Tribal Historic Preservation Officer, Morongo Band of Mission Indians;
- Donna Yocum, Chairperson, San Fernando Band of Mission Indians;
- Lee Clauss, Director of Cultural Resources, San Manual Band of Mission Indians;
- Mark Cochrane, Co-Chairperson, Serrano Nation of Indians;
- Wayne Walker, Co-Chairperson, Serrano Nation of Indians.

As of this time, all four of the tribes have responded either in writing or by telephone, and all of them requested to participate in further consultation with the lead agencies (see App. 2). Jessica Mauck, Cultural Resources Analyst for the San Manuel Band, confirmed the APE to be a part of the Serrano ancestral territory but stated that the tribe did not consider this area to be particularly sensitive for Native American cultural resources. Ms. Mauck and Travis Armstrong of the Morongo Band both indicated that their respective tribes had no additional information to provide at this time.

Donna Yocum of the San Fernando Band found the project vicinity to be culturally sensitive to the tribe due to the presence of a recorded village site known as Turner Springs, which is located in the northwestern portion of the City of Victorville. In addition to further consultation, Mark Cochrane of the Serrano Nation also requested immediate notification if any cultural resources or human remains were discovered during ground-disturbing activities associated with the undertaking.

FIELD SURVEY

The field survey confirmed the continued presence of the dirt road previously recorded as a part of Site 36-004203/36-004411 and identified a previously unknown archaeological site of historical origin, which was temporarily designated Site 3503-1H. No other potential historical/ archaeological resources were encountered within or adjacent to the APE. Modern refuse was observed over much of the APE, mainly household trash and discarded furniture, but none of the items is of any historical/archaeological interest. The two sites examined during the field survey are discussed further below.

Site 36-004203/36-004411

As stated above, Site 36-004203 and Site 36-004411 in the California Historical Resources Inventory refer to the same winding dirt road in the project vicinity, which was in use during the mid- to late 19th century—and likely well into the early 20th century—as a branch of the historic Old Spanish Trail/Mormon Trail system. This branch road evidently led primarily to the Tejon Pass area north of Los Angeles instead of the main passage across the San Bernardino-San Gabriel mountain ranges for the trail system, namely the Cajon Pass south of the Victor Valley (USGS 1902; 1903; BLM n.d.; NPS n.d.).

During the field survey, the road was observed crossing the project alignment in a generally northeast-southwest direction, but the segment within the APE boundaries, or the roughly 70-foot-wide public right-of-way, has been mostly destroyed by the construction of the paved roadbed of Mesa View Drive, leaving only a roughly 10-foot length remaining on the west side (Fig. 10). Beyond the APE boundaries, the road measured approximately 20 feet in width on the east side and 10 feet in width on the west side. The abundant tire marks along the road suggest that it remains in frequent local use. As a result, the nondescript dirt road lacks any distinctively historical character in or near the APE (Fig. 10).

Site 3503-1H

Site 3503-1H is located on the Mesa View Drive right-of-way and approximately a quarter-mile north of Bear Valley Road, outside but in close proximity to the APE boundary (see App. 3). It



Figure 10. Dirt road across the APE (Site 36-004203/36-004411). *Clockwise from top left*: view to the northeast, taken on June 25, 2019; aerial imagine from Google Earth, August 2018 (cf. Fig. 3); Google image from July 2012, view to the east; Google image from July 2012, view to the west.

consists of a small scatter of historic-period refuse with a total of four steel cans. Three of them are beverage cans that were opened with church keys, while the fourth is a screw top box that likely contained a solvent or other industrial chemical. Two of the beverage cans have interlocking seams, and the other two cans have lapped seams. No archaeological features or other artifacts were found nearby, suggesting that the site is the result of incidental trash dumping.

MANAGEMENT CONSIDERATIONS

APPLICABLE STATUTORY/REGULATORY FRAMEWORK

The purpose of this study is to identify any "historic properties" or "historical resources" that may exist within or adjacent to the APE. "Historic properties," as defined by the Advisory Council on Historic Preservation, include "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior" (36 CFR 800.16(l)). The eligibility for inclusion in the National Register is determined by applying the following criteria, developed by the National Park Service as per provision of the National Historic Preservation Act:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) that are associated with the lives of persons significant in our past; or
(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

For CEQA-compliance considerations, the State of California's Public Resources Code (PRC) establishes the definitions and criteria for "historical resources," which require similar protection to what NHPA Section 106 mandates for "historic properties." "Historical resources," according to PRC §5020.1(j), "includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California."

More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the lead agency (Title 14 CCR §15064.5(a)(1)-(3)). Regarding the proper criteria of historical significance, CEQA guidelines mandate that "generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(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.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

DISCUSSION

In summary of the research results presented in this report, a short segment of a dirt road that was previously recorded as a part of two separate sites, 36-004203 and 36-004411, lies across the APE for this undertaking, and a newly discovered archaeological site, 3503-1H, was recorded during this study outside but in close proximity to the APE. These sites, the only potential "historic properties"/ "historical resources" located within or adjacent to the APE, were evaluated against the criteria listed above, and the results are discussed below.

Site 36-004203/36-004411

Site 36-004411 represents the entire length of the historic Mormon Trail in San Bernardino County, and Site 36-004203 represents Tejon Road-Palmdale Cutoff, a branch of the trail, both of which date to the mid-19th century and remained in use until the early 20th century. The Mormon Trail, itself a part of the Old Spanish National Historic Trail system, played a crucial role in the early settlement and growth of southern California after the U.S. annexation of the territory in 1848. The overall historic significance of the Mormon Trail as a whole is beyond any question, as demonstrated by the designation of two monuments along other segments of the trail in the Cajon Pass area as California Historical Landmarks Nos. 576 and 577, which were then automatically included in the California Register.

The segment of Site 36-004203/36-004411 within the APE boundaries, however, has been largely destroyed by past construction activities along the Mesa View Drive corridor. The surviving portion of the trail is now a nondescript dirt road marked by an abundance of recent motor vehicle tire tracks. It is essentially a working component of the modern transportation—and probably recreation—infrastructure and demonstrates no distinctively historical character. As such, the existing road retains little historic integrity—other than the aspect of location—to relate to its heydays between the mid-19th century and the early 20th century, or to the historic period in general.

Based on these considerations, the present study concludes that the portion of Site 36-004203/36-004411 in and near the APE does not appear eligible for listing in the National Register or the California Register, and does not qualify as a "historic property" or a "historical resource." Furthermore, as the proposed undertaking at this location consists solely of trenching within the paved roadbed of Mesa View Drive for pipeline installation, it has no potential to affect the current condition and appearance of the remaining segments of the road.

Site 3503-1H

Site 3503-1H consists of a small surface scatter of common refuse items of unknown but likely incidental origin, which represents the most proliferate type of historic-period sites in the southern California desert region. This minor site does not demonstrate a documented association, let alone a close association, with any person or event of recognized historic significance. In the absence of an exceptional quantity or quality of the artifacts, the site does not hold the potential for any important archaeological data, and what little data potential it may have is largely exhausted through its recordation into the California Historical Resources Inventory. Therefore, Site 3503H does not appear to meet any of the criteria for the National Register or the California Register, and does not constitute a "historic property" or a "historical resource."

CONCLUSION AND RECOMMENDATIONS

Section 106 of the National Historic Preservation Act mandates that federal agencies take into account the effects of their undertakings on historic properties and seek ways to avoid, minimize, or

mitigate any adverse effects on such properties (36 CFR 800.1(a)). Similarly, CEQA establishes that a project that may cause a substantial adverse change in the significance of a "historical resource" is a project that may have a significant effect on the environment (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired."

In conclusion, the current study did not encounter any "historic properties" or "historical resources" within or immediately adjacent to the APE, and the subsurface sediments in the vertical APE are relatively low in sensitivity for potentially significant archaeological remains. Accordingly, CRM TECH presents the following recommendations to the MWA and the BOR:

- No "historic properties" or "historical resources" will be affected by the proposed undertaking.
- No further cultural resources investigation will be necessary for the undertaking unless construction plans undergo such changes as to include areas not covered by this study.
- If buried cultural materials are inadvertently discovered during the undertaking, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the find.

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City of Victorville
n.d.[a] City History. http://www.ci.victorville.ca.us/Site/AboutVictorville.aspx?id=64.
n.d.[b] Demographics. http://www.ci.victorville.ca.us/Site/AboutVictorville.aspx?id=68.

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1856a Plat Map: Township No. IV North Range No. V West, SBBM; surveyed in 1855-1856.
1856b Plat Map: Township No. V North Range No. V West, SBBM; surveyed in 1853-1855.

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Peirson, Erma
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1981a California Historical Resources Inventory record forms: Site 36-004203/CA-SBR-4203H (update). On file, South Central Coastal Information Center, California State University, Fullerton.
1981b California Historical Resources Inventory record forms: Site 36-004411/CA-SBR-4411H (update). On file, South Central Coastal Information Center, California State University, Fullerton.
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USGS (United States Geological Survey, U.S. Department of the Interior)
1902 Map: Hesperia, Calif. (15', 1:62,500); surveyed in 1898-1899.
1903 Map: San Antonio, Calif. (15', 1:62,500); surveyed in 1899-1900.
1942 Map: Hesperia, Calif. (15', 1:62,500); aerial photographs taken in 1940-1941.
1956 Map: Baldy Mesa, Calif. (7.5', 1:24,000); aerial photographs taken in 1952, field-checked in 1956.
1969 Map: San Bernardino, Calif. (1:250,000); 1958 edition revised.
1996 Map: Baldy Mesa, Calif. (7.5', 1:24,000); 1956 edition photorevised in 1985 and 1994.

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APPENDIX 1
PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR/HISTORIAN
Bai "Tom" Tang, M.A.

Education

1988-1993	Graduate Program in Public History/Historic Preservation, UC Riverside.
1987	M.A., American History, Yale University, New Haven, Connecticut.
1982	B.A., History, Northwestern University, Xi'an, China.
2000	"Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1993-2002	Project Historian/Architectural Historian, CRM TECH, Riverside, California.
1993-1997	Project Historian, Greenwood and Associates, Pacific Palisades, California.
1991-1993	Project Historian, Archaeological Research Unit, UC Riverside.
1990	Intern Researcher, California State Office of Historic Preservation, Sacramento.
1990-1992	Teaching Assistant, History of Modern World, UC Riverside.
1988-1993	Research Assistant, American Social History, UC Riverside.
1985-1988	Research Assistant, Modern Chinese History, Yale University.
1985-1986	Teaching Assistant, Modern Chinese History, Yale University.
1982-1985	Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China.

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (with Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST
Michael Hogan, Ph.D., RPA*

Education

1991	Ph.D., Anthropology, University of California, Riverside.
1981	B.S., Anthropology, University of California, Riverside; with honors.
1980-1981	Education Abroad Program, Lima, Peru.
2002	Section 106—National Historic Preservation Act: Federal Law at the Local Level. UCLA Extension Course #888.
2002	"Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist.
2002	"Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals.
1992	"Southern California Ceramics Workshop," presented by Jerry Schaefer.
1992	"Historic Artifact Workshop," presented by Anne Duffield-Stoll.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist/Field Director, CRM TECH, Riverside.
1996-1998	Project Director and Ethnographer, Statistical Research, Inc., Redlands.
1992-1998	Assistant Research Anthropologist, University of California, Riverside
1992-1995	Project Director, Archaeological Research Unit, U. C. Riverside.
1993-1994	Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College.
1991-1992	Crew Chief, Archaeological Research Unit, U. C. Riverside.
1984-1998	Archaeological Technician, Field Director, and Project Director for various southern California cultural resources management firms.

Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

Cultural Resources Management Reports

Author and co-author of, contributor to, and principal investigator for numerous cultural resources management study reports since 1986.

Memberships

* Register of Professional Archaeologists; Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

PROJECT ARCHAEOLOGIST/REPORT WRITER
Deirdre Encarnación, M.A.

Education

2003	M.A., Anthropology, San Diego State University, California.
2000	B.A., Anthropology, minor in Biology, with honors; San Diego State University, California.
1993	A.A., Communications, Nassau Community College, Garden City, N.Y.
2001	Archaeological Field School, San Diego State University.
2000	Archaeological Field School, San Diego State University.

Professional Experience

2004-	Project Archaeologist/Report Writer, CRM TECH, Riverside/Colton, California.
2001-2003	Part-time Lecturer, San Diego State University, California.
2001	Research Assistant for Dr. Lynn Gamble, San Diego State University.
2001	Archaeological Collection Catalog, SDSU Foundation.

Memberships

Society for California Archaeology; Society for Hawaiian Archaeology; California Native Plant Society.

PROJECT ARCHAEOLOGIST
Ben Kerridge, M.A.

Education

2014	Archaeological Field School, Institute for Field Research, Kephallenia, Greece.
2010	M.A., Anthropology, California State University, Fullerton.
2009	Project Management Training, Project Management Institute/CH2M HILL, Santa Ana, California.
2004	B.A., Anthropology, California State University, Fullerton.

Professional Experience

2015-	Project Archaeologist/Report Writer, CRM TECH, Colton, California.
2015	Teaching Assistant, Institute for Field Research, Kephallenia, Greece.
2009-2014	Publications Delivery Manager, CH2M HILL, Santa Ana, California.
2010-	Naturalist, Newport Bay Conservancy, Newport Beach, California.
2006-2009	Technical Publishing Specialist, CH2M HILL, Santa Ana, California.

PROJECT ARCHAEOLOGIST
Hunter C. O'Donnell, B.A.

Education

2016-	M.A. Program, Applied Archaeology, California State University, San Bernardino.
2015	B.A. (*cum laude*), Anthropology, California State University, San Bernardino.
2012	A.A., Social and Behavioral Sciences, Mt. San Antonio College, Walnut, California.
2011	A.A., Natural Sciences and Mathematics, Mt. San Antonio College, Walnut, California.

Professional Experience

2016-	Graduate Research Assistant, Applied Archaeology, California State University, San Bernardino.
2016-2017	Cultural Intern, Cultural Department, Pechanga Band of Luiseño Indians, Temecula, California.
2015	Archaeological Intern, U.S. Bureau of Land Management, Barstow, California.
2015	Peer Research Consultant: African Archaeology, California State University, San Bernardino.

APPENDIX 2

CORRESPONDENCE WITH NATIVE AMERICAN REPRESENTATIVES*

* Five local Native American representatives were contacted; a sample letter is included in this report.

SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

NATIVE AMERICAN HERITAGE COMMISSION
915 Capitol Mall, RM 364
Sacramento, CA 95814
(916) 653-4082
(916) 657-5390 (fax)
nahc@pacbell.net

Project: Proposed Mojave Water Agency R3 Phase I Improvements Project (CRM TECH No. 3503)

County: San Bernardino

USGS Quadrangle Name: Baldy Mesa, Calif.

Township 4 North **Range** 5 West SB **BM; Section(s)**: 4

Township 5 North **Range** 5 West SB **BM; Section(s)**: 33

Company/Firm/Agency: CRM TECH

Contact Person: Nina Gallardo

Street Address: 1016 E. Cooley Drive, Suite A/B

City: Colton, CA **Zip:** 92324

Phone: (909) 824-6400 **Fax:** (909) 824-6405

Email: ngallardo@crmtech.us

Project Description: The primary component of the project is to install 1.08 miles of 30" pipeline from the Adelanto Tanks eastward along Olivine Road and then southward along Mesa View Drive, terminating at existing Turnout Nos. 6 and 7. The Area of Potential Effects (APE) is located mainly within the rights-of-way of Olivine Road and Mesa View Drive, in the City of Victorville, San Bernardino County, California.

June 12, 2019

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

June 25, 2019

Nina Gallardo
CRM Tech

VIA Email to: ngallardo@crmtech.us

RE: Proposed Mojave Water Agency R3 Phase I Improvements Project, San Bernardino County

Dear Ms. Gallardo:

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 the NAHC. 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: steven.quinn@nahc.ca.gov.

Sincerely,

Steven Quinn
Associate Governmental Program Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
6/25/2019

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla, Serrano
Banning, CA, 92220
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

Morongo Band of Mission Indians
Denisa Torres, Cultural Resources Manager
12700 Pumarra Rroad — Cahuilla, Serrano
Banning, CA, 92220
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

San Fernando Band of Mission Indians
Donna Yocum, Chairperson
P.O. Box 221838 — Kitanemuk, Vanyume, Tataviam
Newhall, CA, 91322
Phone: (503) 539 - 0933
Fax: (503) 574-3308
ddyocum@comcast.net

San Manuel Band of Mission Indians
Lee Clauss, Director of Cultural Resources
26569 Community Center Drive — Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
Fax: (909) 864-3370
lclauss@sanmanuel-nsn.gov

Serrano Nation of Mission Indians
Wayne Walker, Co-Chairperson
P. O. Box 343 — Serrano
Patton, CA, 92369
Phone: (253) 370 - 0167
serranonation1@gmail.com

Serrano Nation of Mission Indians
Mark Cochrane, Co-Chairperson
P. O. Box 343 — Serrano
Patton, CA, 92369
Phone: (909) 528 - 9032
serranonation1@gmail.com

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 Proposed Mojave Water Agency R3 Phase I Improvements Project, San Bernardino County.

June 27, 2019

Travis Armstrong, Tribal Historic Preservation Officer
Morongo Band of Mission Indians
12700 Pumarra Road
Banning, CA 92220

RE: Proposed Mojave Water Agency R3 Phase I Improvements Project
1.08 Linear Miles in the City of Victorville
San Bernardino County, California
CRM TECH Contract #3503

Dear Mr. Armstrong:

I am writing to bring your attention to an ongoing CEQA- and Section 106-compliance study for the proposed project referenced above. The undertaking entails primarily the installation of approximately 1.08 linear miles of 30" water pipeline from the Adelanto Tanks eastward along Olivine Road and then southward along Mesa View Drive, terminating at existing Turnout Nos. 6 and 7. The Area of Potential Effects (APE) is located mainly within the rights-of-way of Olivine Road and Mesa View Drive, in the City of Victorville. The accompanying map, based on the USGS Baldy Mesa, Calif., 7.5' quadrangle, depicts the location of the APE in Section 4, T4N R5W; and in Section 33, T5N R5W, SBBM.

In a letter dated June 25, 2019, the Native American Heritage Commission reports that the sacred lands record search identified no Native American cultural resources within the APE but recommends that local Native American groups be contacted for further information (see attached). Therefore, as part of the cultural resources study for this project, I am writing to request your input on potential Native American cultural resources in or near the APE.

Please respond at your earliest convenience if you have any specific knowledge of sacred/religious places or other sites of Native American traditional cultural value in or near the APE, or any other information to consider during the cultural resources investigations. Any information or concerns may be forwarded to CRM TECH by telephone, e-mail, facsimile, or standard mail. Requests for documentation or information we cannot provide will be forwarded to our client and/or the lead agencies, namely the Mojave Water Agency and U.S. Bureau of Reclamation.

We would also like to clarify that, as the cultural resources consultant for the project, CRM TECH is not involved in the AB 52-compliance process or in government-to-government consultations. The purpose of this letter is to seek any information that you may have to help us determine if there are cultural resources in or near the APE that we should be aware of and to help us assess the sensitivity of the APE. Thank you for your time and effort in addressing this important matter.

Respectfully,

Nina Gallardo
Project Archaeologist/Native American liaison
CRM TECH
Email: ngallardo@crmtech.us

Encl.: NAHC response letter and APE location map

From: Tribal Historic Preservation Office <thpo@morongo-nsn.gov>
Sent: Mon 7/1/2019 3:55 PM
To: ngallardo@crmtech.us
Subject: Proposed Mojave Water Agency Project, CRM TECH Contract #3503

Hello,

Regarding the above referenced project, we have no additional information to provide at this time but may provide other information to the lead agency during the AB 52 consultation process.

Thank you for reaching out to our office.

Sincerely,

Travis Armstrong
Tribal Historic Preservation Officer
Morongo Band of Mission Indians
951-755-5259

From: Jessica Mauck <JMauck@sanmanuel-nsn.gov>
Sent: Mon 7/1/2019 4:00 PM
To: ngallardo@crmtech.us
Subject: RE: NA Scoping Letter for the Proposed Mojave Water Agency R3 Phase I Improvements Project in the City of Victorville, San Bernardino County (CRM TECH No. 3503)

Hi Nina,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation, which was received by our Cultural Resources Management Department on 27 June 2019. While the project is located within Serrano ancestral territory, and therefore is of interest to the Tribe, the project area in particular is not one of the more sensitive portions of Victorville. SMBMI is currently only aware of a few isolates in the area – the nearest is just over 1 mile away – and therefore does not have much information to provide for report. As is customary, SMBMI will request information for a more thorough review during consultation with the Lead Agency.

Thank you,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive
Highland California 92346

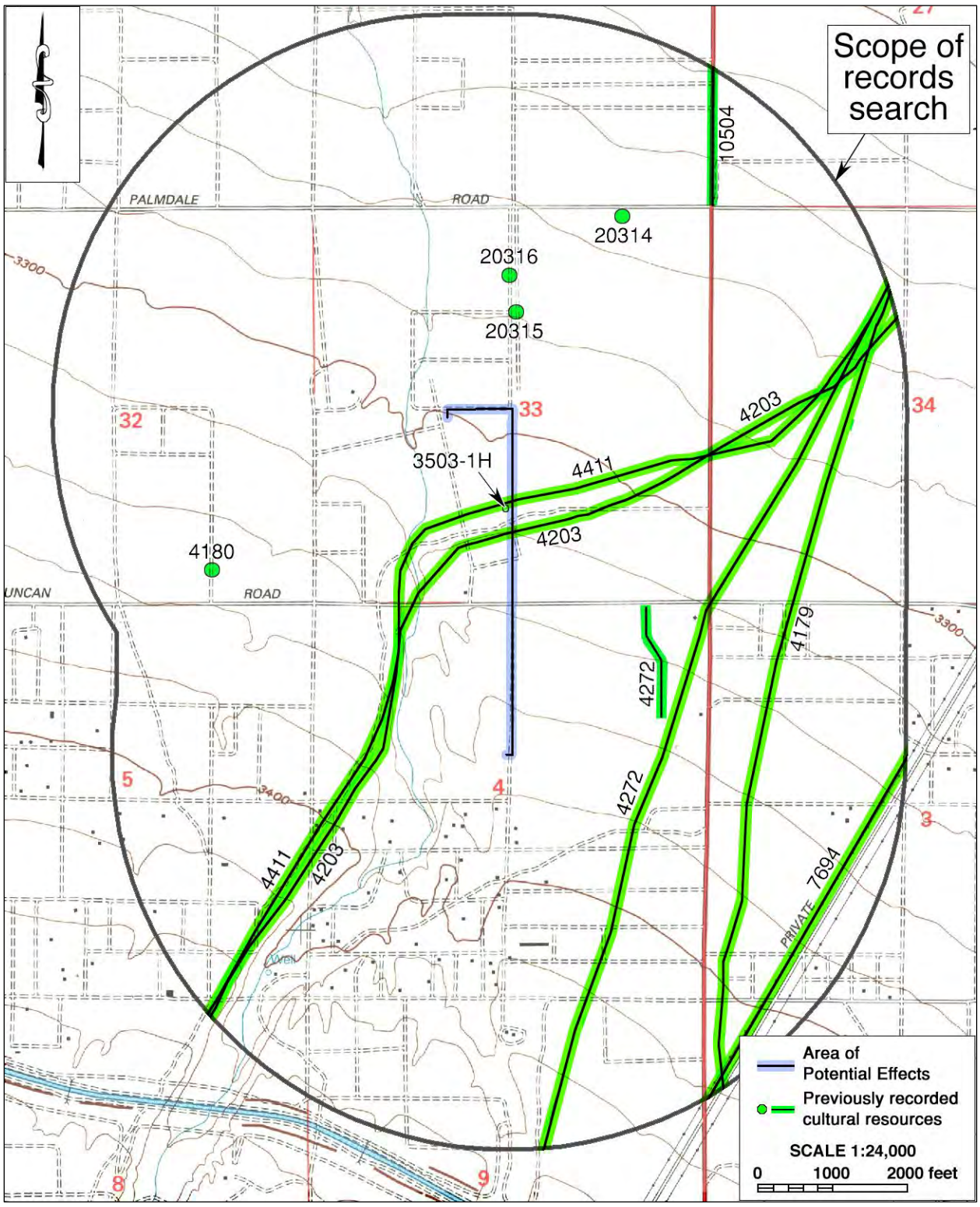
TELEPHONE LOG

Name	Tribe/Affiliation	Telephone Contacts	Note
Travis Armstrong, Tribal Historic Preservation Officer	Morongo Band of Mission Indians	None	Mr. Armstrong responded by e-mail on July 1, 2019 (copy attached).
Donna Yocum, Chairperson	San Fernando Band of Mission Indians	12:04 pm, July 15, 2019 8:57 am, July 19, 2019	Ms. Yocum stated that a recorded village site, Turner Springs, was located near the APE, making the area culturally sensitive. The tribe requests to participate in further consultation with the lead agencies.
Lee Clauss, Director of Cultural Resources	San Manuel Band of Mission Indians	None	Jessica Mauck, Cultural Resources Analyst, responded on behalf of tribe by e-mail on July 1, 2019 (copy attached).
Mark Cochrane, Co-Chairperson	Serrano Nation of Mission Indians	12:06 pm, July 15, 2019; 9:18 am, July 19, 2019	Mr. Cochrane requested further consultation with the lead agencies and immediate notification if any cultural resources or human remains were found during ground-disturbing activities.
Wayne Walker, Co-Chairperson	Serrano Nation of Mission Indians	12:11 pm, July 15, 2019	Mark Cochrane responded on behalf of the tribe (see above).

APPENDIX 3

CULTURAL RESOURCES RECORDED IN OR NEAR THE APE

(Confidential)


Scope of records search
PALMDALE
ROAD
UNCAN
ROAD
10504
20314
20316
20315
3503-1H
4180
4203
4411
4272
4179
7694
PRIVATE
32
33
34
5
4
3
8
9
3300
3400
Area of Potential Effects
Previously recorded cultural resources
SCALE 1:24,000
0 1000 2000 feet

SAN BERNARDINO COUNTY MUSEUM
Archaeological Site Record Form

SBCM # 4601

Smithsonian # 4SBr 4203-H
update

Site name Tejon Road-Palmdale Cutoff County San Bernardino

USGS quad maps: San Antonio (1903) 15', Hesperia (1902) Baldy Mesa, Phelan 7½'
sec 33,34,T5N R5W, sec.4,5,8,17,18,T4N R5W, sec 13,14,15,16,19,20,21,22 T4N R6W
____ of ____ of ____ of ____ of ____ of ____ of ____ of section ____

Twp. ____, Rng. ____, SB Base Meridian. Elevation 4140-3280'

Distance _____ along bearing _____ from _____

UTM grid #s or lat. and long. ~~455400~~ ~~3809400~~ ~~449550~~ ME 449550 ME
zone 11, ~~3814790~~ MN to 3808070 MN

Site dimensions: area 9 miles in length depth _____

Site description, features, artifacts, owner, etc. This road leaves the Salt Lake-Santa Fe Trail and runs southwesterly to sec. 15, 22 T.4N R.6W, where the Mormon Road (4SBr 4411) branches southerly. It continues SW to intersect the Tejon Road (4SBr 4415) almost one mile W of the S trending Sanford Road (4SBr 4413). It was used by Zalvidea in 1806, by Williamson and Whipple in the 1850s railroad surveys, and by Beale delivering camels to Fort Tejon in 1857.

Possibility of destruction _____

Other references _____

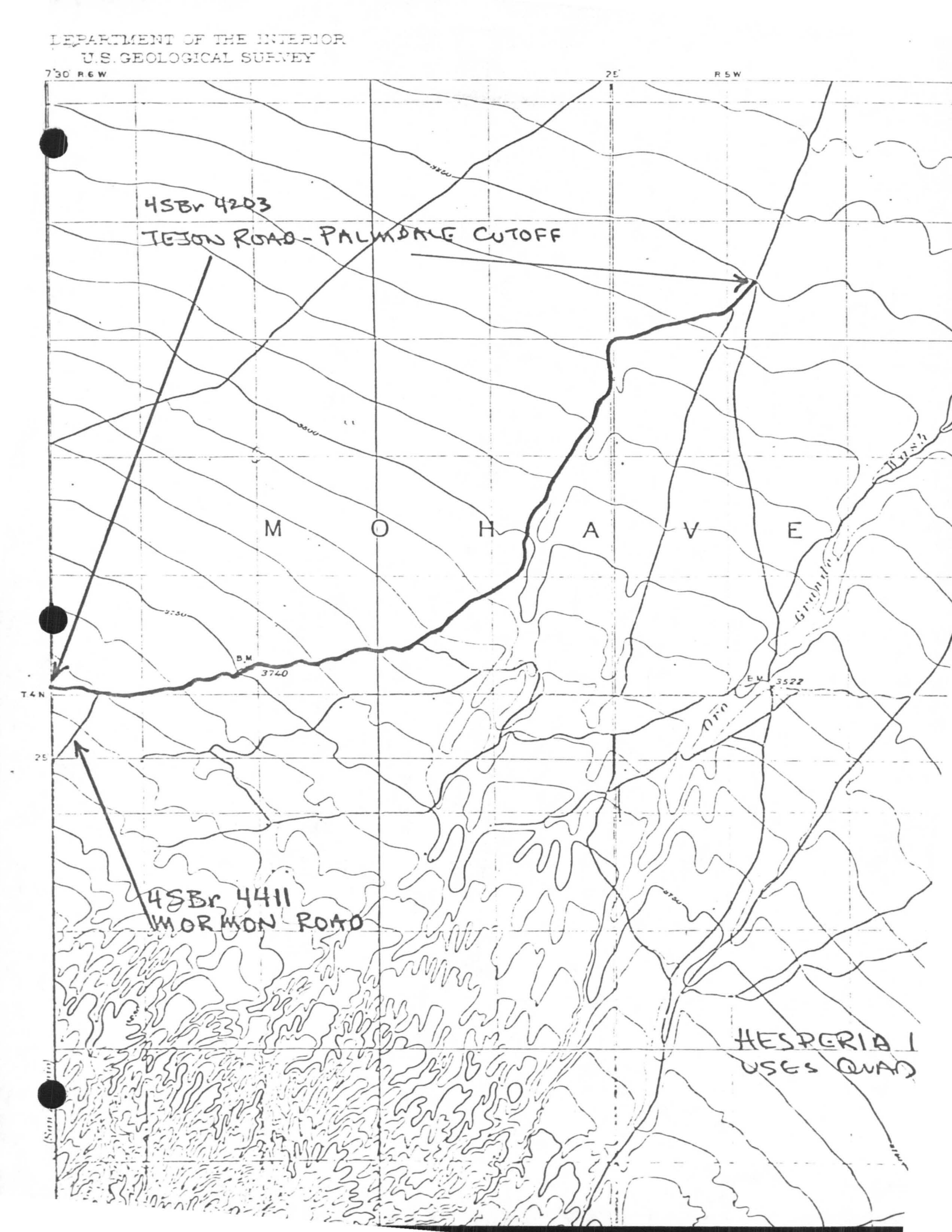
Informant _____ Address _____

Recorded by Robert E. Reynolds Date Jan. 1981

Address SBCM

Remarks

Sketch artifacts, site location, and features on back


DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
7'30" R6W
25
R5W
4SBr 4203
TEJON ROAD - PALMDALE CUTOFF
M O H A V E
B.M. 3740
E.M. 3522
T4N
25
4SBr 4411
MORMON ROAD
HESPERIA I
USGS QUAD

AN BERNARDINO COUNTY MUSEUM
rchaeological Site Record Form

SBCM # ~~4754-H~~ 4601
SBr- 4203-H
Smithsonian # ~~4407-H~~

Site name Tejon Road-Palmdale Cutoff County San Bernardino

USGS quad maps: Hesperia (1902) San Antonio (1902) 15', PHELAN 7.5 Baldy Mesa 7½'
sec 34, 33 T5N R5W, sec 4, 5, 8, 17, 18 T4N R5W, sec 13, 14, 22 T4N R6W
____ of ____ of ____ of ____ of ____ of ____ of ____ of section ____

Twp. ____, Rng. ____, SB Base Meridian. Elevation 4000-3280

Distance _____ along bearing _____ from _____

UTM grid #s or lat. and long. 463680 ME, 3814790 MN, To
Zone 11, 454040 ME, 3808280 MN

Site dimensions: area 7 miles plus depth approx. 1'

Site description, features, artifacts, owner, etc. This road leaves the Salt Lake-Santa Fe Trail south-southwesterly in SW¼ sec 34, runs past a well in SE¼ sec. 5, then runs WSW towards the Mormon Road and Sanfords Pass in West Cajon Pass. It then runs northwesterly toward Tejon. It was used by Zalvidea in 1806, by Williamson and Whipple in the 1850s railroad surveys, and by Beale delivering camels to Fort Tejon in 1857; its use continues today.

Possibility of destruction will be crossed by Zone J waterlines

Other references Beattie and Beattie Heritage, et al

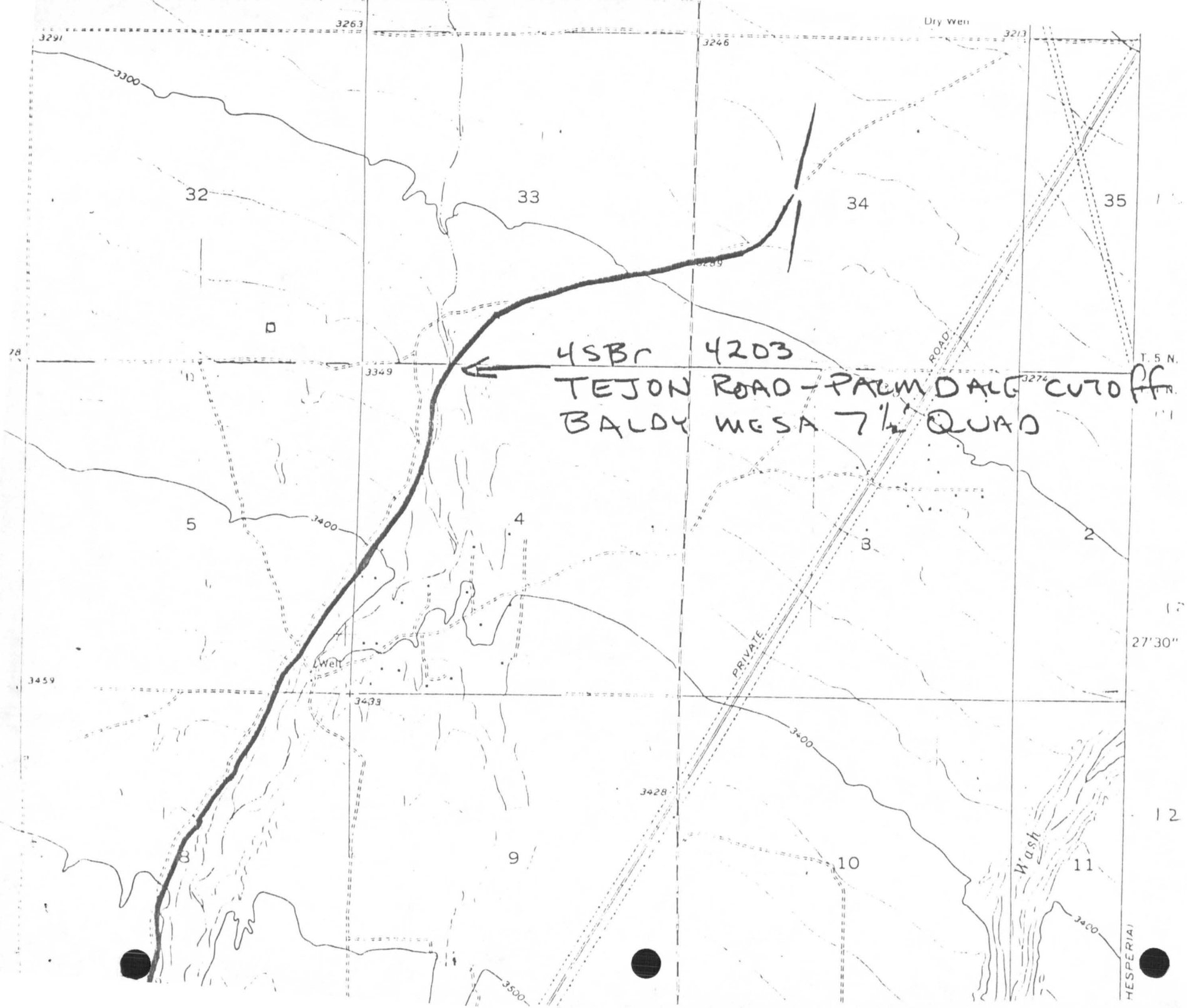
Informant _____ Address _____

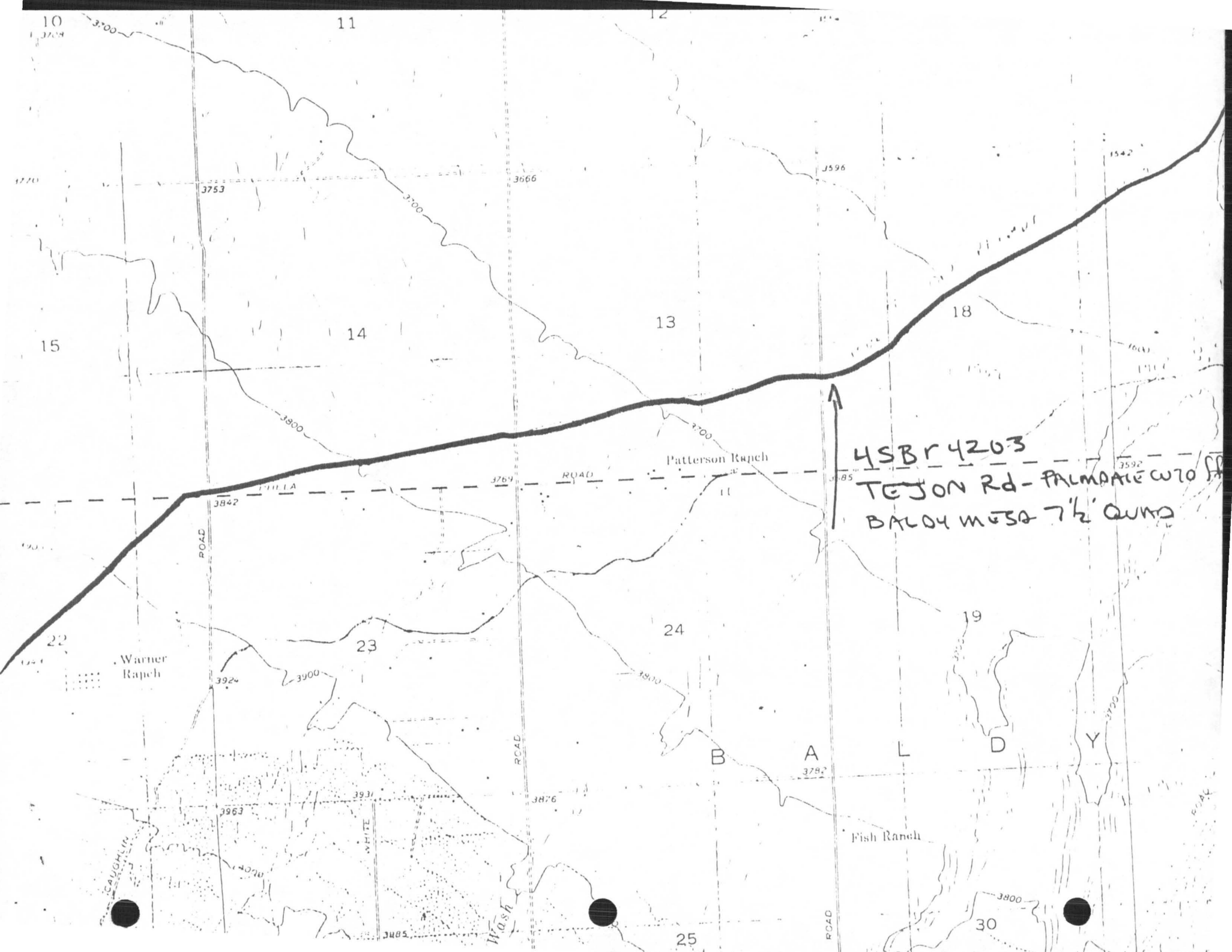
Recorded by Robert E. Reynolds Date Sept 1980

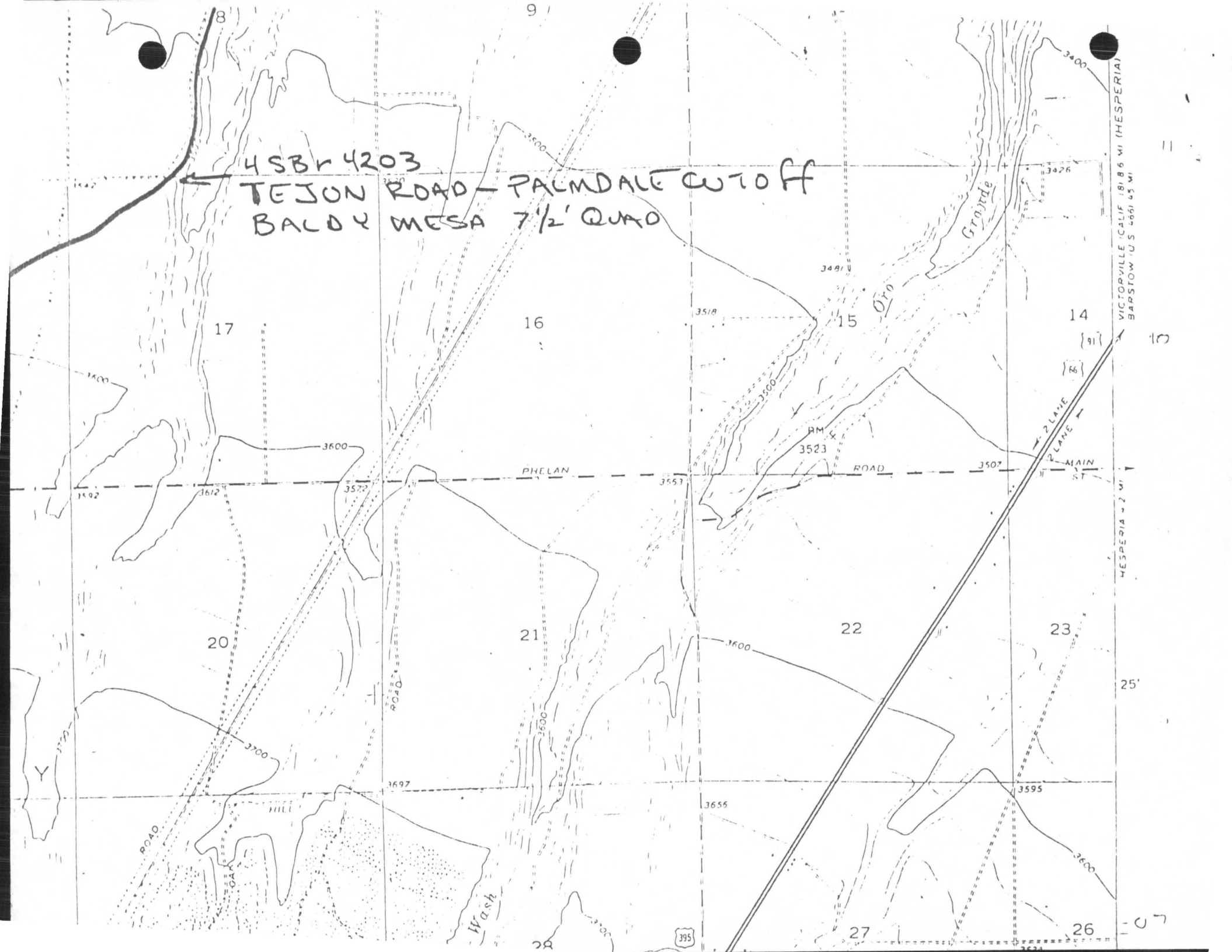
Address SBCM

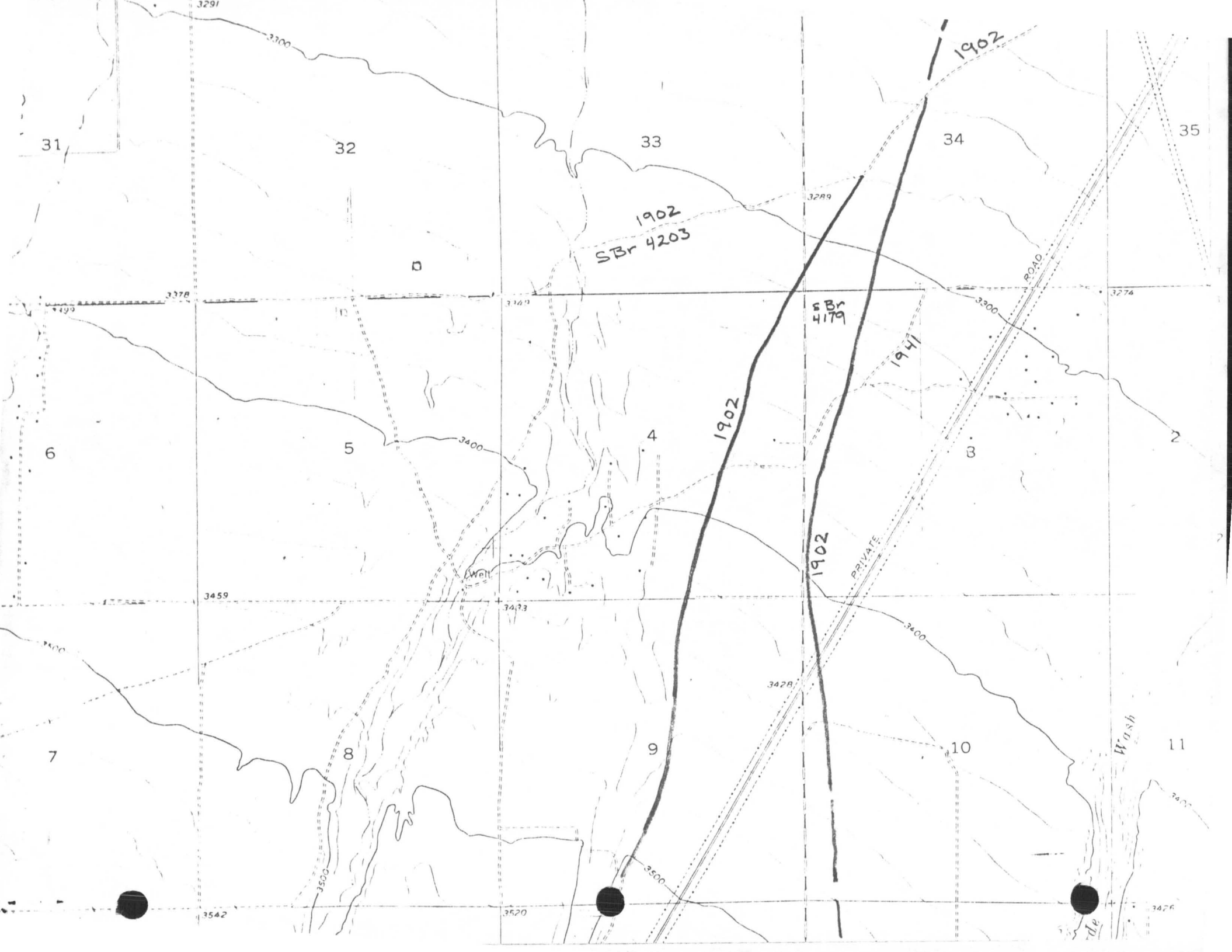
Remarks

Sketch artifacts, site location, and features on back

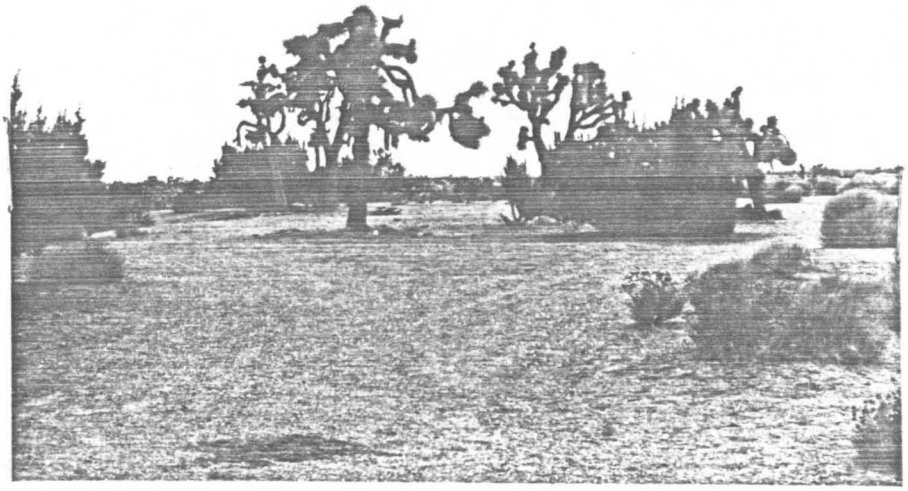

Dry Well
3263
3213
3291
3246
3300
32
33
34
35
3289
4SBr 4203
TEJON ROAD - PALMDALE CUTOFF
BALDY MESA 7½' QUAD
T. 5 N.
R.
3349
3274
ROAD
5
4
3
2
3400
27'30"
3459
3433
Well
PRIVATE
3428
9
10
11
12
Wash
3500
HESPERIA


10
11
12
13
14
15
18
19
22
23
24
25
30
Patterson Ranch
Warner Ranch
Fish Ranch
ROAD
B A L D Y
Wash
WHITE
CAUGHLIN
3753
3666
3596
3842
3764
3685
3592
3924
3900
3876
3931
3963
3485
3782
4SBr4203
TEJON Rd - PALMDALE QUAD
BALDY MESA 7½' QUAD


4SBr 4203
TEJON ROAD – PALMDALE CUTOFF
BALDY MESA 7½' QUAD
8
9
17
16
15
14
20
21
22
23
25
26
27
28
PHELAN ROAD
MAIN ST
2 LANE
2 LANE
Grande
Oro
Wash
ROAD
3600
3700
3697
3655
3595
3572
3553
3523
3518
3507
3612
3592
3481
3426
3400
VICTORVILLE (CALIF.) 15 MI
BARSTOW 70 S 66 45 MI
HESPERIA 2 MI
395


1902
SBr 4203
1902
SBr 4179
1941
1902
1902
PRIVATE ROAD
Well
31
32
33
34
35
6
5
4
3
2
7
8
9
10
11
3291
3300
3289
3274
3378
3400
3459
3433
3428
3500
3542
3520

4SBr 4203
Tejon Road-Palmdale Cutoff

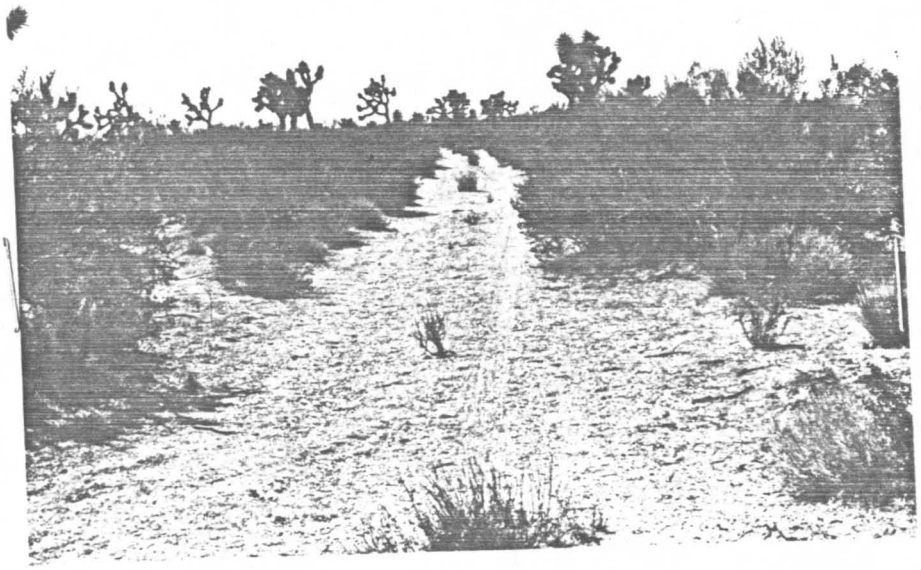


View south of Tejon Road from north edge of section 17



View north of Tejon Road from north edge of section 17

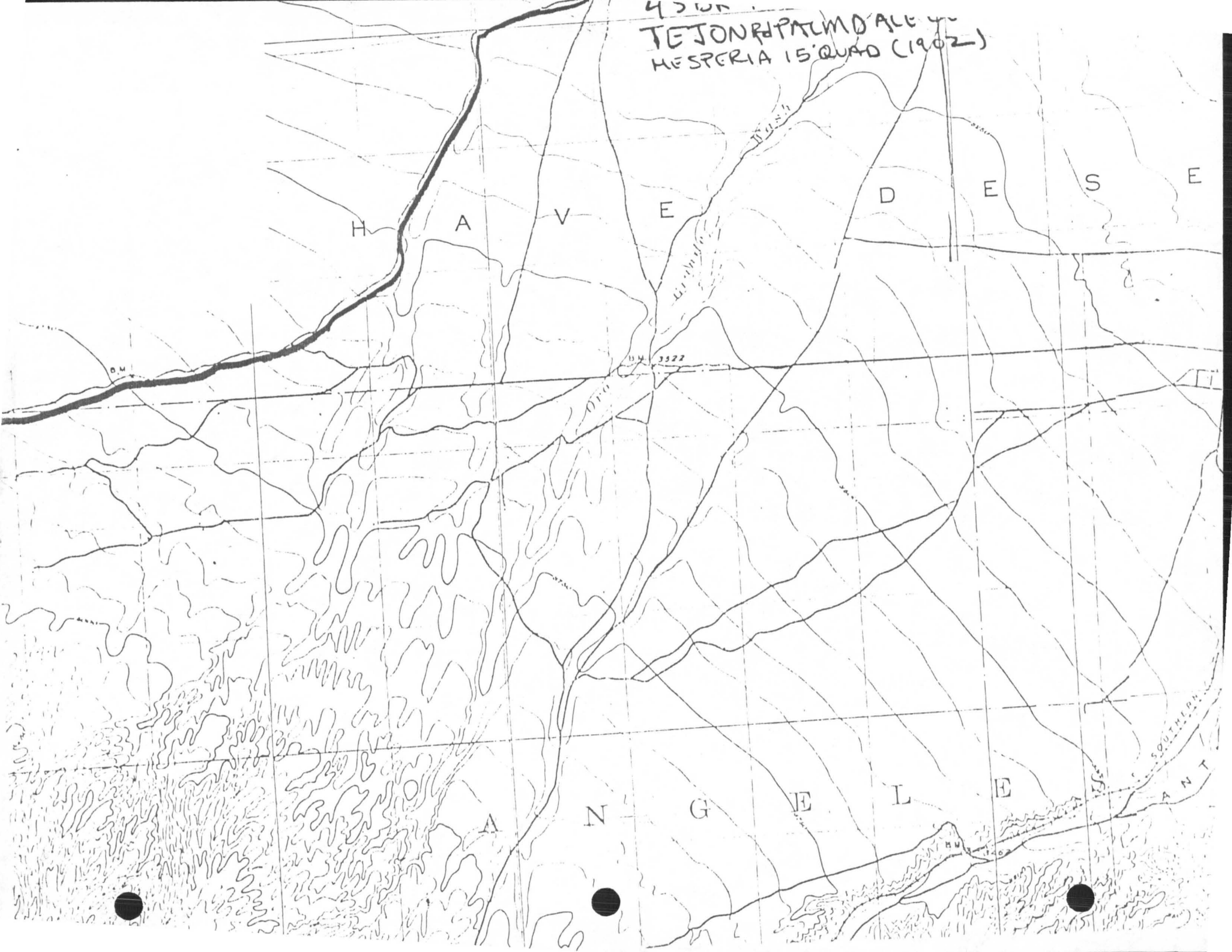
4SBr 4203
Tejon Road-Palmdale Cutoff

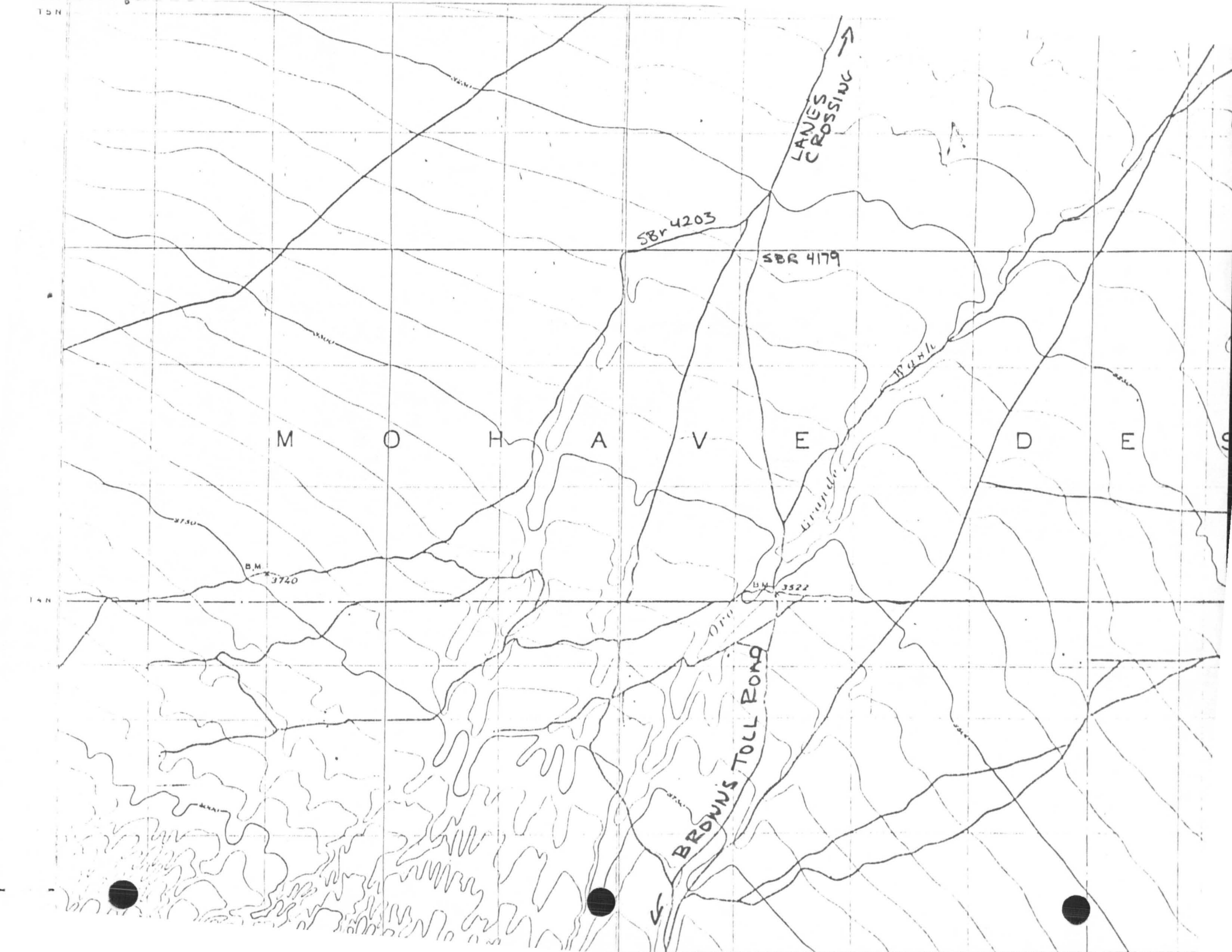


View north along Tejon Road from section 8



View north along Tejon Road from SE¼ section 5


TEJON RANCH
PALMDALE
HESPERIA 15' QUAD (1902)
H A V E
D E S E
A N G E L E S
SOUTHERN
3322


LANES CROSSING
SBr 4203
SBR 4179
M O H A V E D E
B.M. 3740
B.M. 3522
BROWNS TOLL ROAD

SAN BERNARDINO COUNTY MUSEUM
Archaeological Site Record Form

SBCM # 4601

Smithsonian # SBr-4203-H

Site name Palmdale-Lanes Cutoff Historic Road County San Bernardino

USGS quad maps: Hesperia (1902) '36 15', Baldy Mesa (1956) 7½'

____ of ____ of ____ of ____ of ____ of ____ of S½ of section 33

Twp. 5N, Rng. 5W, SB Base Meridian. Elevation 3349-3289'

Distance 1800' along bearing north from jct. Bear Valley Rd&Hwy 395

UTM grid #s or lat. and long. zone 11, 462050 ME 3814200 MN to 463400 ME 3814700 MN

Site dimensions: area 4600' SW to NE depth 5"

Site description, features, artifacts, owner, etc. Historic road shown on the Hesperia (1902) 1:62,500 quad, on the Hesperia (1941)(A.M.S.) quad and on the Baldy Mesa (1956) 1:24,000 7½' quad. This road is the southerly of two which ran west from Brown's toll road cutoff toward Lane's Crossing near Oro Grande. This road intersects the road from West Cajon Canyon to Palmdale, north of Sanford Pass in West Cajon Pass.

Possibility of destruction will be crossed by water line

Other references

Informant Address

Recorded by R.E. Reynolds Date July 1980

Address SBCM

Remarks

Sketch artifacts, site location, and features on back

P36-004411
CA-SBR-4411-H
CHL

SURVEY
of
California Registered Historical Landmarks

Name MORMON TRAIL MONUMENT Number 577

County San Bernardino

Location West Cajon Canyon, State Highway 138 (p.m. 10.7), 3.6 miles west of I-15.

Type of Plaque ERECTED BY SONS OF MORMON PIONEERS, MAY 15, 1937.

Condition of Plaque Good -- needs to be straightened and cleaned

Condution of Base Excellent, but in dire need of remortaring

Condition of Surroundings Excellent

Wording on Plaque IN JUNE 1851, 500 MORMON PIONEERS CAME THROUGH THIS PASS TO ENTER THE SAN BERNARDINO VALLEY WHERE THEY COLONIZED AND ESTABLISHED A PROSPEROUS COMMUNITY.

Are there Highway Directional Signs? Yes

If so, where? One westbound which needs replacing and none eastbound and at I-15.

Remarks:

Private plaque on CALTRANS right of way.

Someone has stolen the wagon wheel from top of base.

Submitted by Jim Arbuckle Date October 3, 1979
I-8820C

CHR-577

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

1. County San Bernardino

Site _____ *(State Use Only)*

2. Common Name MORMON TRAIL MONUMENT

3. Location A monument marks the route of the 1851 Mormon journey from Utah to San Bernardino. The monument, topped by a wagon wheel stands beside Calif. Hwy 18 approximately four miles from the Palmdale freeway off-ramp in Cajon Pass .

4. Date of Inventory August, 1974

5. Status: Occupied ____ Unoccupied ____ Preservation Work in Progress ____

6. Accessible to Public: Yes, Restricted ____ Yes, Unrestricted x Not Accessible to Public ____

7. Owner of Property: Name _____ Address _____
City _____ State _____ Zip _____ Phone _____

8. Approximate Acreage _____ or Approximate Lot Size _____

9. Representation in existing historic or prehistoric survey (see instructions): Yes x No ____ Unknown ____
Name of Survey California History Plan - Inventory

10. Depository for Records: Name _____
Address _____ City _____ State _____ Unknown ____

11. Representation on current Historic Landmark Registery programs: Yes x No ____ Unknown ____
Which Program California State Historical Landmark (# 977)

12. Description (multiple choice): Altered ___ Unaltered ___ Condition Excellent ___ Good ___ Fair ___
Deteriorated x Ruins ___ Unexposed (archeological site) ___ (refers to the road not the monument)

13. Briefly describe the present and original physical appearance of site or structure and note any major alterations:
The monument is dedicated to a "new route" which ran through West Cajon Canyon. The Baldy Mesa Ridge and the areas surrounding it were so steep that the Mormon pioneers were forced to unload their wagons, dismantle them partially, and lower them with ropes down the slopes. The monument is aligned with Baldy Mesa Ridge. It is a tribute to the courage and endurance of those who crossed the route through West Cajon.

14. Event of Historical Importance: None ____ Local x State x National ____ Unknown ____ Describe briefly (see instructions for architectural exceptions): 1851 journey of the Mormons - (should be noted that road through West Cajon was a new route worked out by Captain William T. B. Sanford to handle freight wagons.)

15. Person of historical importance: Name William T. B. Sanford, Phineas Banning
Local X State X National ____ Unknown ____ None ____

16. Statement of Significance: The new route was about seven miles longer than the Santa Fe-Salt Lake Trail (sometimes called Old Spanish Trail). The Santa Fe-Salt Lake Trail which had been previously used was actually suitable only for pack trains. With the appearance of the new route, Mormon wagon freighters, pioneers, and government railroad survey parties used it as it ran through West Cajon and over the hogback leading down the Baldy Mesa Ridge.

17. Documents and Books (bibliography): "San Bernardino County Registered State Historical Landmarks", SBCM Quarterly Vol. XVII, No. 1. See also: Chapter III of Century Annals Of San Bernardino County.

18. Photographs of site or structure: Yes ____ No ____ (see instructions)

APPLICATION FOR REGISTRATION OF HISTORICAL POINT OF INTEREST

Name of Historical Point Mormon Trail Monument

Location West Cajon Canyon, beside California State Highway 138

Name of Owner Division of Highways, State of California

Street District VIII, P. O. Box 231

City San Bernardino, Calif.

HISTORY AND DESCRIPTION

The monument marks the second Mormon road to San Bernardino Valley, laid out because the earlier East Cajon road was usable only by pack trains. This second road was supposed to be usable by freight wagons, though there was one steep pitch over the ridge which was extremely difficult to negotiate. There was some disagreement among pioneers and their descendants, but the most reliable sources seem to indicate that this West Cajon route was the one used by the Mormon colonizers of San Bernardino in 1851.

The monument has the following inscription: "In June 1851, 500 Mormon pioneers came through this pass to enter the San Bernardino Valley where they colonized and established a prosperous community. Erected by Sons of Mormon Pioneers May 15, 1937." (This is a Boy Scout troop of the Latter Day Saints church in San Bernardino.)

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # CA-00441
HRI #
Trinomial CA-SBR-4411
NRHP Status Code
Other Listings
Review Code _____ Reviewer _____ Date _____

 *Resource Name or #: DANI-09H

P1. Other Identifier: Daggett Road (1932), Cape Gloucester Ave/Stoddard Valley Road/ BLM Route 7387 (modern names)

* **P2. Location:** ☑ Not for Publication ☐ Unrestricted *a. County: San Bernardino

* **USGS Quad(s):** Daggett (1971)
Sec. 15, T9N R1W SBB&M
Sec. 22, T9N R1W SBB&M

c. Address:

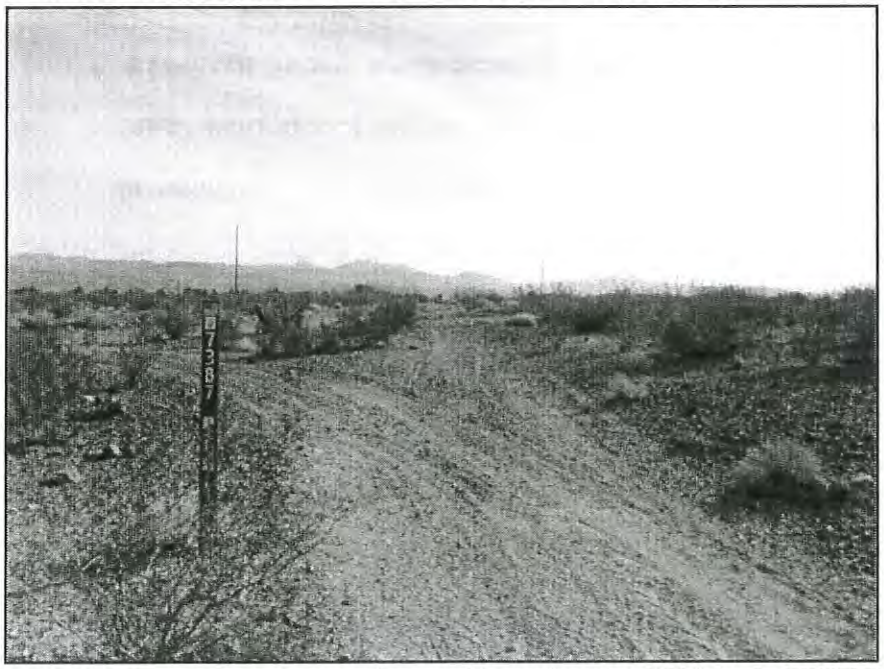
d. UTM (NAD 83): Zone 11; 502795 mE 3857563 mN (Begin)
Zone 11; 502995 mE 3857828 mN (End)

e. Other Locational Data:
This linear resource courses to the south from the PG&E Line 300A pipeline. From the town of Barstow, travel south on Barstow Road to the intersection Pipeline Road (just south of Stanford Drive). Turn left and travel down the access road for 3.2 miles. The dirt road is located behind the Marine's Logistics Base and courses south from the pipeline right-of-way.

* **P3a. Description:**
This resource includes a segment of road depicted as "Daggett Road" on the Barstow 1932 30-minute topographic map and a "Jeep Trail" on the Daggett 1956 15-minute topographic map. This road was encountered within the right-of-way of PG&E's gas Line 300A and was surveyed a quarter-mile south of the pipeline corridor. No discernible alignment was identified north of the pipeline where Marine housing is located. The road becomes BLM route 7387 when it crosses over from military lands to BLM ownership. The recorded segment is composed of a unimproved dirt road with a small segment of pavement located near the pipeline. A single, crushed hole-in-cap can with a soldered side-seam was observed south of the pipeline along the west side of the road.

* **P3b. Resource Attributes:** AH07 (Roads/trails/railroad grades)

* **P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☑ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)



***P5b. Description of Photo:**
Overview of road with BLM sign. View to the northeast

***P6. Date Constructed/Age & Sources:**
☑ Historic ☐ Prehistoric ☐ Both
pre-1932, based on topographic map data

***P7. Owner and Address:**
Bureau of Land Management, Department of Defense, Marine Corps (Nebo)

***P8. Recorded by:**
D. Martinez and C. Connolly, Far Western, 2727 Del Rio Place Suite A, Davis CA 95618

***P9. Date Recorded:** 4/24/2013

***P10. Survey Type:**
Intensive

* **P11. Citation:** An Archaeological Survey of Approximately 5,300 Acres for PG&E Pipelines 300 A and B, San Bernardino and Kern Counties, California

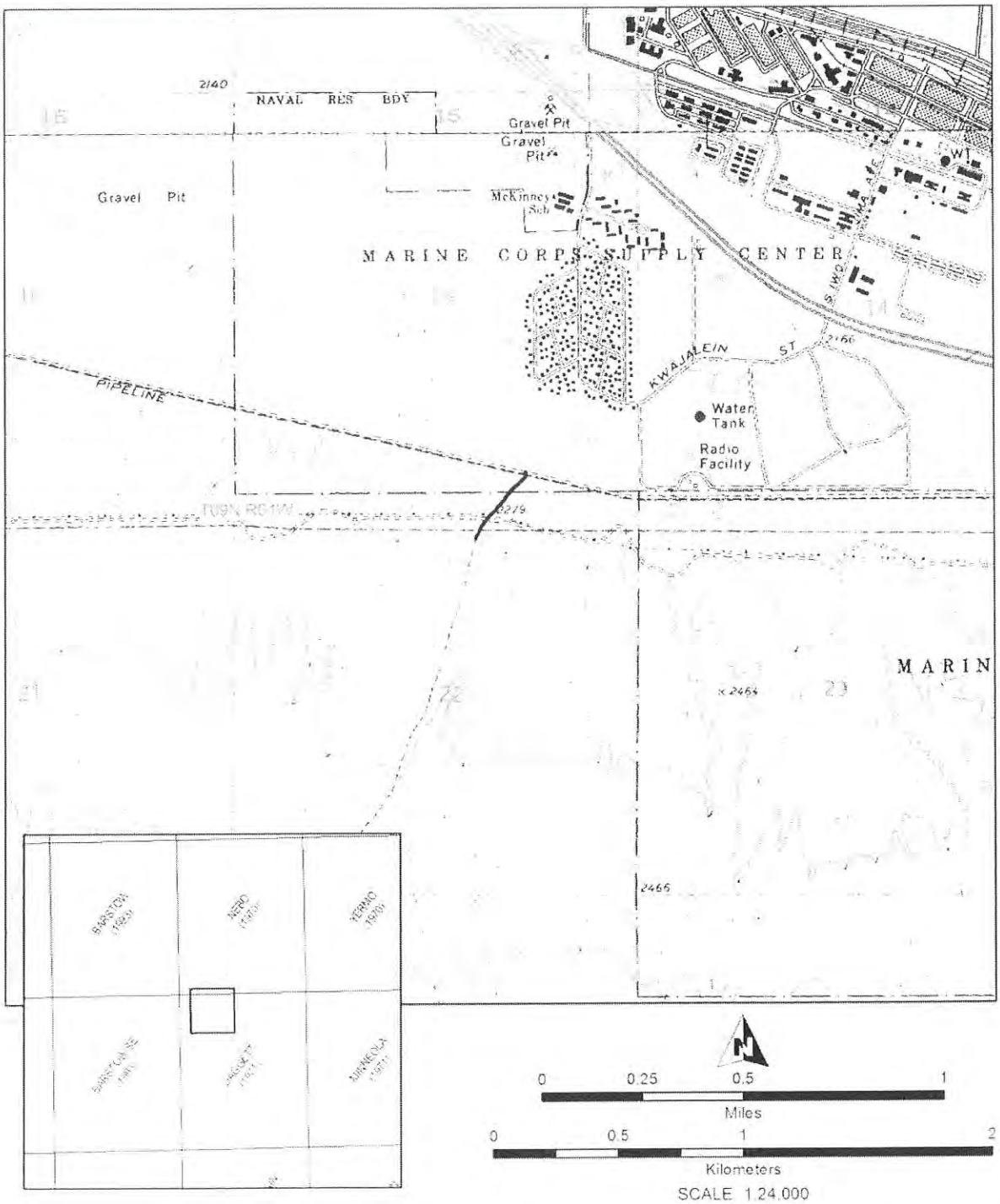
* **Attachments:** ☐ None ☑ Location Map ☑ Sketch Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # 36-026465
HRI #
Trinomial

*Resource Name or #: DANI-09H



darla 7/22/2013 8:23:32 AM

*Required Information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # P-36-004411
HRI #
Trinomial CA-SBR-4411 A
NRHP Status Code
Other Listings
Review Code _____ Reviewer _____ Date _____

*Resource Name or #: SRI-4007 (UPDATE)

P1. Other Identifier: SRI-4007
*P2. Location: ☑ Not for Publication ☐ Unrestricted *a. County: San Bernardino
*b. USGS Quad: 7.5' BARSTOW SE (2009); T8N R1W, SE¼ of NE¼ of Sec. 18; SBBM
c. Address:
d. UTM: Zone 11; 498529 mE/ 3848814 mN NAD27 GPS
e. Other Locational Data:
The road crosses Highway 247 south of Barstow at postmile 70.6.

*P3a. Description:
The only feature associated with this site is a segment of a historical-period road. The site consists of a two-track dirt road that runs northeast/southwest and crosses Highway 247. The road is part of the Mormon road, used by Mormons on their journey from Utah to San Bernardino in 1851, and was previously recorded (P-36-004411); this is a site record update for a segment of the road. The road is still in use today as an OHV recreational trail. A marker shows the road is Bureau of Land Management road 7387. The road was identified on the 1956 Barstow 15-minute USGS topographic quad. Five crushed steel cans, likely dating to the historical period, were found in the road segment within the Caltrans right-of-way. One coffee can was found on the northeast segment and four crushed church-key-opened beverage cans were found on the southeastern segment.

*P3b. Resource Attributes: AH7 Historical-period road, HP37 Historical-period road, AH4 trash scatter
*P4. Resources Present: ☐ Building ☐ Structure ☐ Object ☑ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)



*P5b. Description of Photo:
Facing NW; 1/1/2005; road

*P6. Date Constructed/Age & Sources:
☑ Historic ☐ Prehistoric ☐ Both

*P7. Owner and Address:
GOVERNMENT PROPERTY,
ADDRESS UNKNOWN

*P8. Recorded by:
S. Kremkau, SRI

*P9. Date Recorded: 3/24/2011
*P10. Survey Type:
Reconnaissance survey of highway right-of-way

*P11. Citation: Report forthcoming

*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:

*Required Information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
ARCHAEOLOGICAL SITE RECORD

Primary # P-36-004411
Trinomial

 *Resource Name or #: SRI-4007 (UPDATE)

*A1. Dimensions: a. Length 75 m (N/S) x b. Width 8 m (E/W)
Method of Measurement: Paced Taped Visual estimate ✓ GPS Other:
Method of Determination: ✓ Artifacts ✓ Features Soil Vegetation Topography Cut bank Animal burrow Excavation Property boundary ✓ Other: The site boundary is determined in part by the right-of-way established ...
Reliability of determination: High Medium ✓ Low
Explain: The current project only examines the first 15 meters from the edge of pavement corresponding to ...
Limitations: ✓ Restricted access Paved/built over ✓ Site limits incompletely defined Disturbances Vegetation Other:

A2. Depth: None ✓ None Unknown Method of determination: None

*A3. Human Remains: Present ✓ Absent Possible Unknown

*A4. Features:
Feature 4791 is a segment of a historical-period road. The site consists of a two-track dirt road that runs northeast/southwest and crosses Highway 247. The road is part of the Mormon road, used by Mormons on their journey from Utah to San Bernardino in 1851, and was previously recorded (P-36-004411). The road is still in use today as an OHV recreational trail. A marker shows the road is Bureau of Land Management road 7387. The road was identified on the 1956 Barstow 15-minute USGS topographic quad.

*A5. Cultural Constituents:
Five crushed steel cans, likely dating from the historical period, were found in the road segment within the Caltrans right-of-way. One coffee can was found on the northeast segment and four crushed church-key-opened beverage cans were found on the southeastern segment.

*A6. Were Specimens Collected? ✓ No Yes

*A7. Site Condition ✓ Good Fair Poor
The road is in good condition and still in use.

*A8. Nearest Water: A dry wash crosses the road where it intersects Highway 247.

*A9. Elevation: 842 m amsl

A10. Environmental Setting:
The site is located in a creosote scrub community, with abundant creosote bushes, along with small grasses and plants. The site is located in the valley bottom, in flat terrain.

A11. Historical Information:
The road was originally built in 1850 and used by Mormon settlers in 1851 on their journey from Utah to San Bernardino.

*A12. Age: Prehistoric Protohistoric 1542-1769 1769-1848 ✓ 1848-1880 ✓ 1880-1914 ✓ 1914-1945 ✓ Post-1945 Undetermined

A13. Interpretations:
None

A14. Remarks:
None

A15. References:
None

A16. Photographs: See photograph record
Original Media/Negatives Kept At: 21 W. Stuart Ave, Redlands, CA 92373

*A17. Form Prepared By: S. Kremkau Date: 3/24/2011
Affiliation and Address: Statistical Research, Inc., 21 W. Stuart Ave, Redlands, CA 92373

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LINEAR FEATURE RECORD

Primary # P-36-004411
HRI #
Trinomial

 *Resource Name or #: SRI-4007 (UPDATE)

L1. Historic and/or Common Name: Mormon Road
L2a. Portion Described: Entire Resource ☑ Segment Point Observation **Designation:** Feature 4791
L2b. Location of Point or Segment:
Zone 11; 498516 mE/ 3848783 mN NAD27 GPS
Zone 11; 498541 mE/ 3848845 mN NAD27 GPS

L3. Description:
Feature 4791 is a segment of a historical-period road. The site consists of a two-track dirt road that runs northeast/southwest and crosses Highway 247. The road is part of the Mormon road, used by Mormons on their journey from Utah to San Bernardino in 1851, and was previously recorded (P-36-004411). The road is still in use today as an OHV recreational trail. A marker shows the road is Bureau of Land Management road 7387. The road was identified on the 1956 Barstow 15-minute USGS topographic quad.

L4. Dimensions:
a. Top Width: 2.00 m
b. Bottom Width: N/A
c. Height or Depth: None
d. Length of Segment: 45.00 m
L5. Associated Resources:
None

L4e. Sketch of Cross-Section: **Facing:**

L6. Setting:
The site is located in a creosote scrub community, with abundant creosote bushes, along with small grasses and plants. The site is located in the valley bottom, in flat terrain.

L7. Integrity Considerations:
The road is in good condition and still in use.

L8b. Description of Photo, Map, or Drawing
See sketch map

L9. Remarks:
None

L10. Form Prepared By:
S. Kremkau

L11. Date: 3/24/2011

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary # P-36-004411
HRI #
Trinomial

***Resource Name or #:** SRI-4007 (UPDATE)

Camera Format:
Lens Size:
Film Type and Speed: Digital
Negatives Kept At: 21 W. Stuart Ave, Redlands, CA 92373

Date	Time	Exp/ Frame	Subject/Description	View Toward	Accession #
4/4/2011		57	view of rd from 247	ENE	
4/4/2011		58	view of rd from 247	WSW	
4/4/2011		59	coffee can	Down	
1/1/2005		7	road	NW	

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

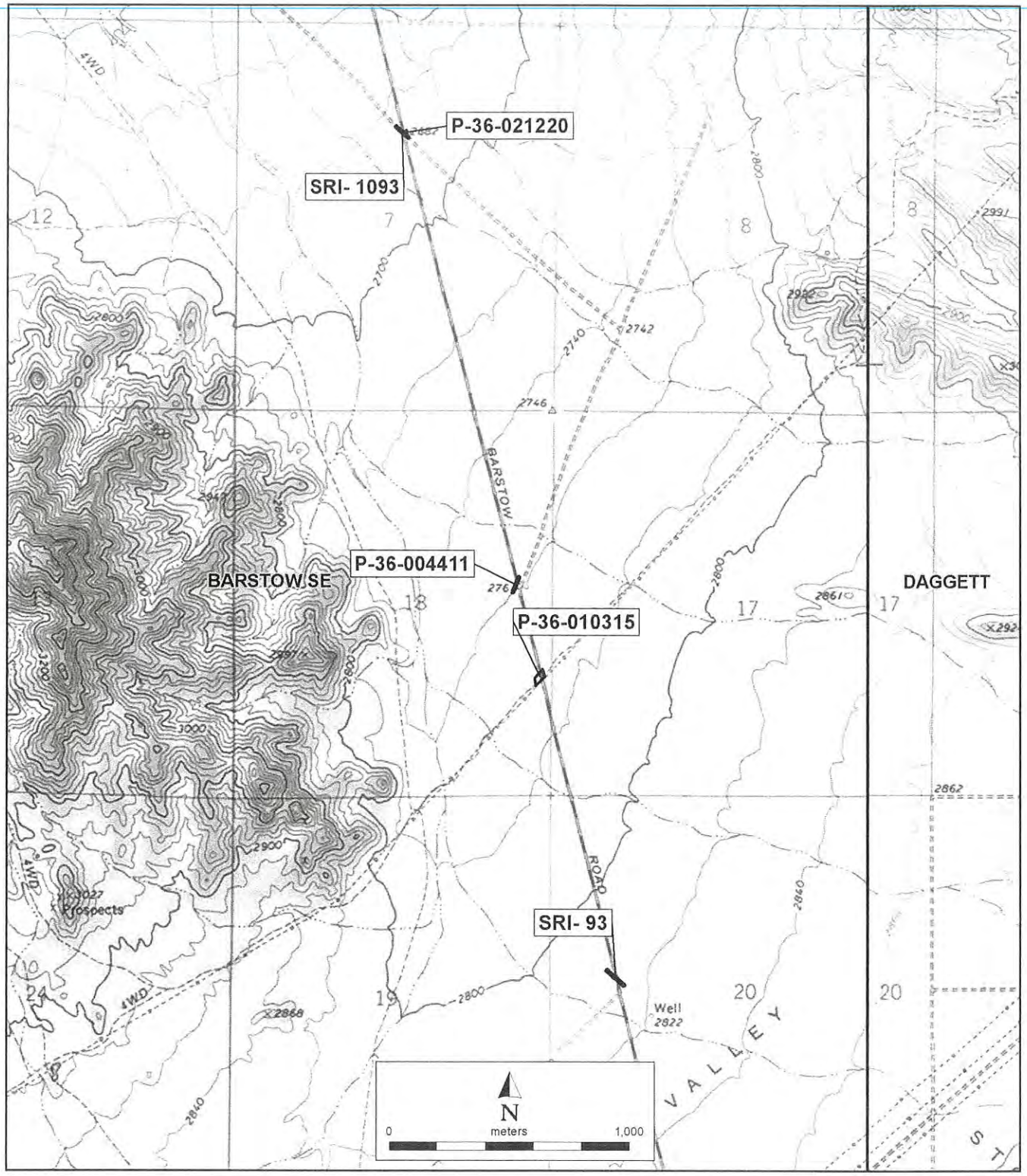
LOCATION MAP

Primary # P-36-004411
HRI #
Trinomial

*Resource Name or #: SRI-4007 (UPDATE)

*Map Name: 7.5' BARSTOW SE USGS Topographic Quad Scale: 1:24,000

*Year: 2009



*Required Information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

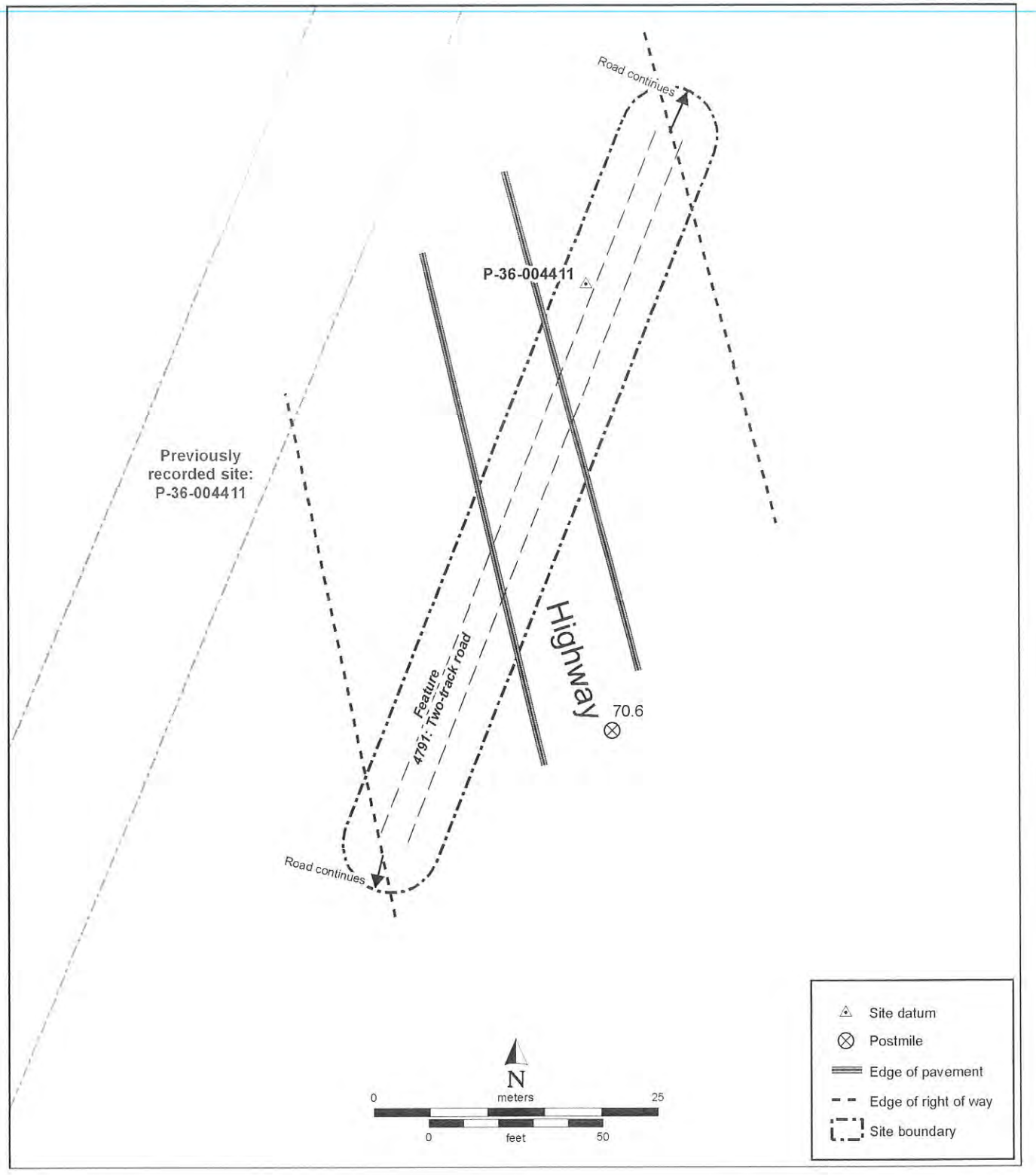
SKETCH MAP

Primary # P-36-004411
HRI #
Trinomial

*Resource Name or #: SRI-4007 (UPDATE)

*Drawn By: S. Kremkau

*Date: 03/24/2011



*Required Information

P2d. UTM
Zone 11; 498541 mE/ 3848845 mN NAD27 GPS

P4. Resources Present
[X] Other (linear)

A1. Method of determination
by Caltrans. The right-of-way extends 15 m from the edge of the pavement. The site continues beyond the right-of-way, but these portions were not recorded. The road was identified on the 1956 Barstow 15-minute USGS topographic quad.

A1. Reliability of determination
the Caltrans right-of-way. The site continues beyond the right-of-way, but these portions were not recorded.

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # 36-004411 (Update)
HRI #
Trinomial CA-SBR-4411H (Update)

Page 1 of 2 Resource name or # (Assigned by recorder)

Recorded by Daniel Ballester *Date March, 2007 ___Continuation √ Update
Affiliation: CRM TECH, Riverside Project No: CRM TECH 1949A

Three segments of Site CA-SBR-4411H were re-visited in March 2007, during a historical/archaeological resources survey for a proposed road realignment project (see p. 2). No physical remnants of the Mormon Trail were observed at these locations.

Report Citation:

Smallwood, Josh, Daniel Ballester, and Laura H. Shaker
2007 Historical/Archaeological Resources Survey Report, U.S. Highway 395 Realignment EIR, Victor Valley Area, San Bernardino County, California. On file, Archaeological Information Center, San Bernardino County Museum, Redlands.

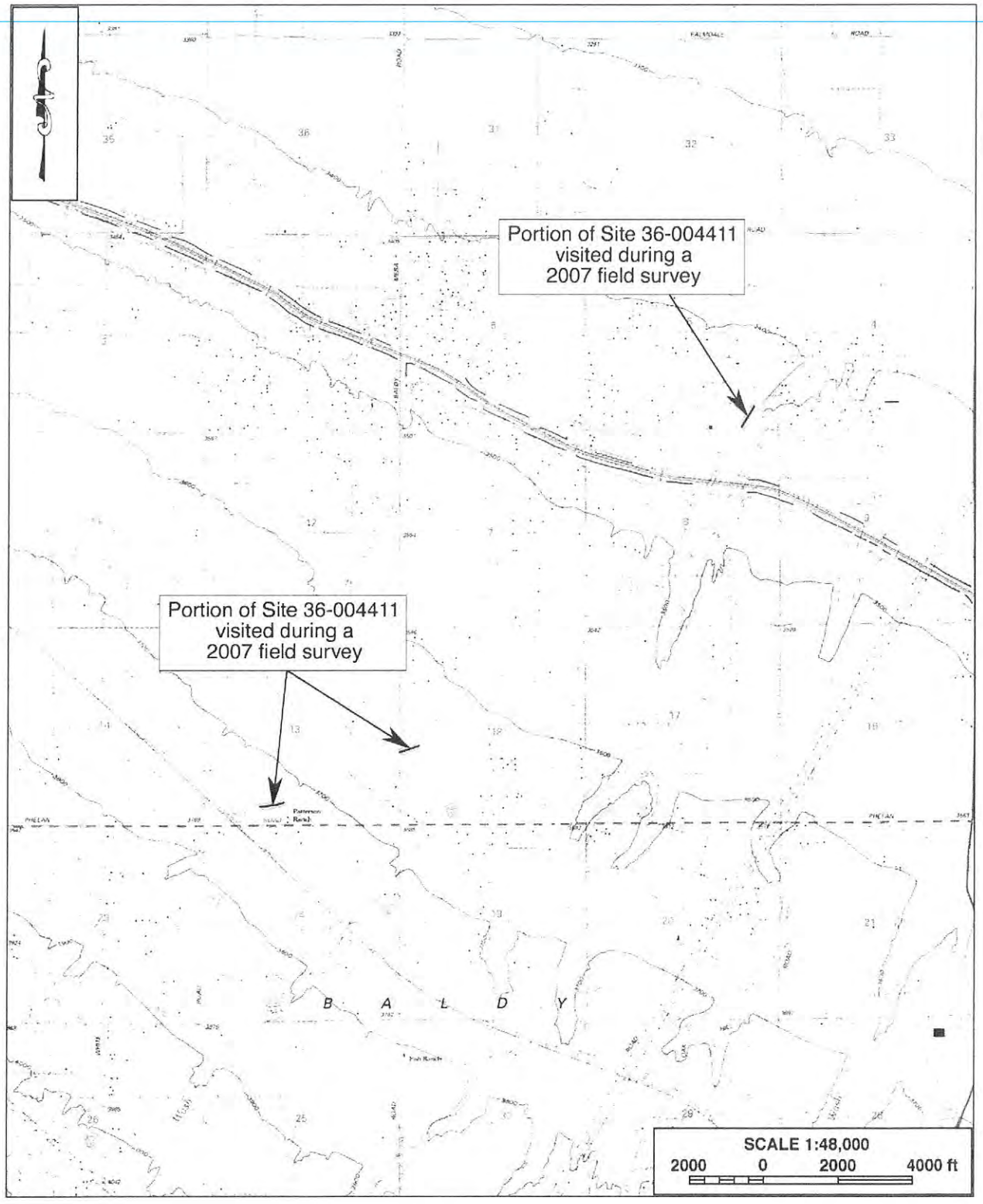
State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # 36-004411 (Update)
HRI #
Trinomial CA-SBR-4411H (Update)

Page 2 of 2 *Resource Name or # (Assigned by recorder)

*Map Name: Baldy Mesa, Calif. *Scale: 1:24,000 (reduced) *Date of Map: 1996



DPR 523J (1/95)

*Required information

10-7255

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial CA-SBR-4272H UPDATE
CA-SBR-4411H

Page 1 of 1 *Resource Name or #: SBR-4272H/4411H (UPDATE)

*Recorded By: Brian Byrd *Date: 3/17/2005 ☐ Continuation ☑ Update

Site SBR-4272H/SBR-4411H, the Old Spanish Trial / Mormon Trail, is generally agreed to have run from Dry Lake at the southern end of the Silurian Valley, south and then west across Red Pass, and then on to Bitter Spring (Steiner 1999: 176-182). This portion was considered one of the more difficult sections along the OST/MT, given that it was a day and a half journey from Salt Springs (which had very poor quality water) to Bitter Springs up and through a difficult pass.

Segments of site SBR-12099H, the two-track historic road from Salt Spring to Bitter Spring via Red Pass, extend across this area between Red Pass and the Silurian Valley and, in places; historic-era debris lies adjacent to it. It seems most likely that this is the same route that the initial historic trail took as well.

Definitive evidence of the OST / MT are currently lacking although a number of elements recorded associated with site SBR-12099H and site SBR-847/H may have been the result of or partially the result of the OST/MT. These include short segments of possible footpaths/trails adjacent to the road (SBR-847/H trail features 2, 3, and 4; as well as a short trail segment next to site SBR-12099H Segment 1); an isolated mounded linear feature / possible burial (SBR-847/H Feature 13); a horse shoe from a historic trash scatter (site B-06 Artifact Concentration 1); and an isolated mule shoe with cut nails (SBR-847/H Artifact 1). In addition, isolate IA-336 (569737 m E/ 3913357 m N NAD 83), recorded less than 200 m northwest of the southwest end of historic road SBR-12099H Segment 6 may be associated with the OST/MT. This isolate is a metal loose ring snaffle bit. Recent updating of SBR-4272H/SBR-4411H by Smith (2004) suggested that a 1.2 km stretch labeled Segment 17) was well-preserved east of Red Pass - this appears to be part of the double-rutted Old Salt Spring to Bitter Spring motorized road (now designated site SBR-12099H).

Although temporally diagnostic items are not present that would demonstrate Old Spanish Trail / Mormon Trail use, the presence of these multiple, overlapping trail / road segments heading to Red Pass strongly indicate the presence a long sequence of human activities is preserved, in places superimposed over each other on fragile desert pavement.

NRHP EVALUATION

☑ Eligible -- Criterion: ☐ A ☐ B ☐ C ☐ D
☐ Not Eligible

Justification:
Definitive well-dated evidence of the trail site SBR-4272H/4411H, the Old Spanish Trail/Mormon Road is currently lacking within survey units of this project. It is possible that several structural features and artifacts recorded associated with sites SBR-12099H and SBR-847/H may have been the result of, or partially the result of, the Old Spanish Trail/Mormon Road but none of these items has morphological features that would allow them to be assigned to the portion of the nineteenth century when the trail was most active. Currently, however, it remains indeterminate whether this short segment a contributing element to the Old Spanish National Historic Trial within the survey units of this project, and a more detailed study building a more detailed and broader historical context is needed prior to making a recommendation.

Over 2 itself

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

CONTINUATION SHEET

Primary # 36-04411
HRI#
Trinomial CA-SBR-4411H

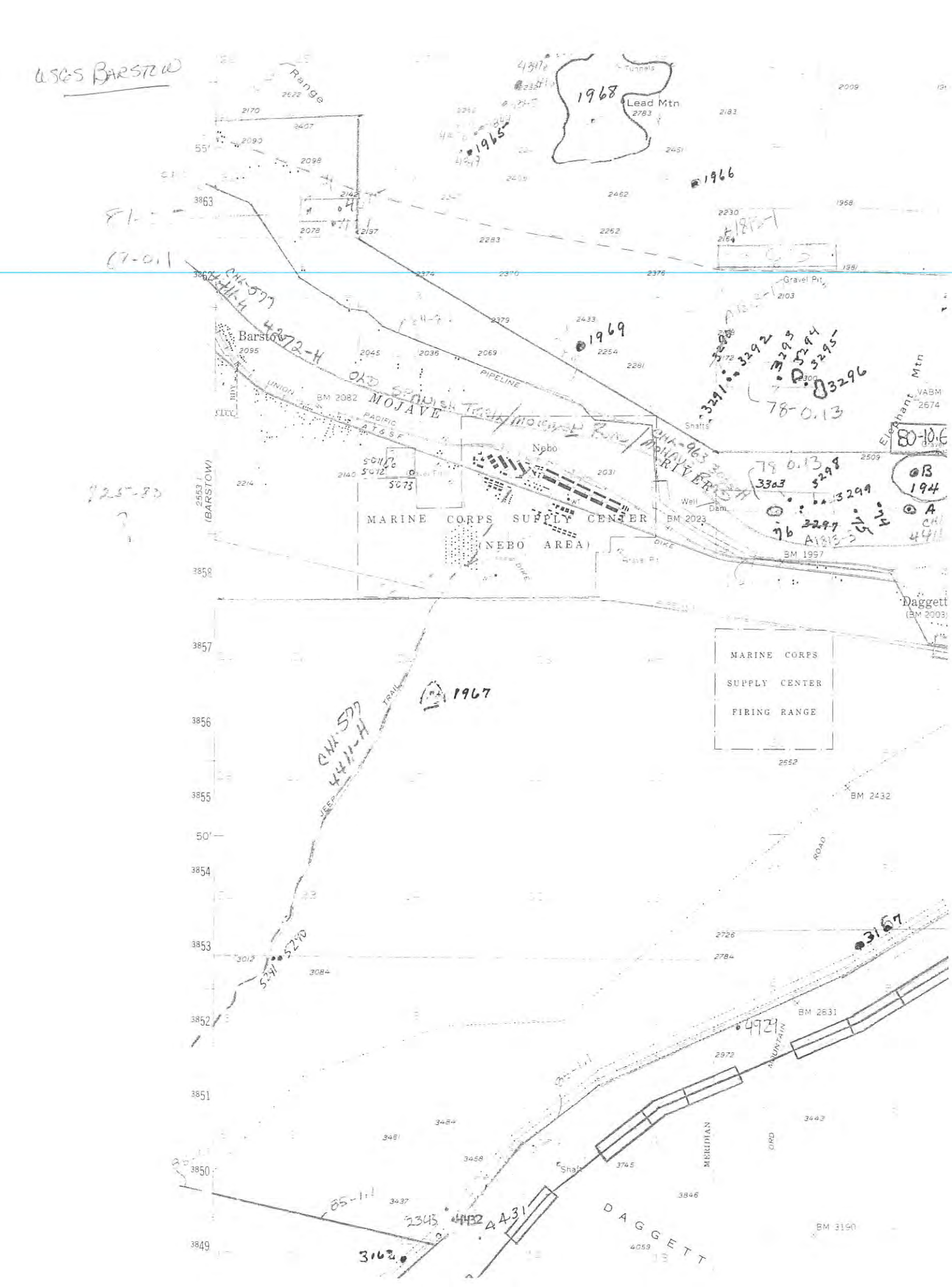
Page 1 **of** 1 ***Resource Name or #** Mormon Trail

***Updated by:** Stephen Pappas, Robert Cunningham ***Date:** 11/19/2009 ☐ Continuation ☒ Update

A portion of site CA-SBR-4411H was revisited by ECORP archaeologists Stephen Pappas and Robert Cunningham on November 19, 2009 while surveying transmission alignments in support of the Seaggett to Tortilla Fiber Optic Line project. The trail was first registered as a Point of Historical Interest in 1957, and initially recorded in 1979 by G. Taliaferro. Since then, numerous portions of the trail have been updated and recorded. A +/-100-foot long stretch of the trail was surveyed and updated by ECORP archaeologists. The segment of trail is currently represented by a dirt road heading northeast/southwest. No evidence of historical resources were observed at the studied segment. The resource has been severely impacted by vehicle use and may have been moved since its original use.



Overview of the Mormon Trail, view southeast, 11/19/2009.


USGS BARSTOW
Lead Mtn
Elephant Mtn
Barstow
Nebo
MOJAVE
RIVER
MARINE CORPS SUPPLY CENTER
(NEBO AREA)
MARINE CORPS
SUPPLY CENTER
FIRING RANGE
Daggett
(BM 2003)
BM 2082
BM 2023
BM 1997
BM 2432
BM 2631
BM 3190
Gravel Pit
Shafts
Well
Dam
DIKE
PIPELINE
UNION
PACIFIC
A T & S F
MOJAVE
RIVER
DAGGETT
ROAD
MERIDIAN
ORD
MOUNTAIN
JEEP
TRAIL
CWA-577
4411-H
4372-H
1965
1966
1967
1968
1969
78-0.13
80-10.6
85-1.1
125-83

T8S-C4411

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE RECORD

Permanent Trinomial: CA-SBR-4411 H Supplement [X]

Other Designations: HJ-34

Page 1 of 5 .

1. County: San Bernardino

2. USGS Quad: Alvord Mountain East (7.5') X (15') Photorevised 1986

3. UTM Coordinates: Zone | | | | | | m Easting | | | | | | m Northing ( )

4. Township 12N Range 4E ; ¼ of ¼ of NW ¼ of NW ¼ of Section 20 Base Mer. SBM ( )

5. Map Coordinates: mmS mmE (from NW corner of map) 6. Elevation 3080 Feet ( )

7. Location: At the top of Spanish Canyon, Where the main wash gets up to the last little pitch up. The wagon road goes stright up the last little pitch up and the mule trail is on the east side. Now the wagon tracks are eroded down to a depth of 3 to 4 feet. ( )

8. Prehistoric ____ Historic ____ Protohistoric ____ 9. Site Description The site is the part of the old Mormon Wagon Road, that went to Salt Lake, that went over the rim of Spanish Canyon. It became known as Impassable Pass. ( )

10. Area m( )x m( ) m². ( )

Method of Determination: ( )

11. Depth: Surface cm Method of Determination: Judged ( )

12. Features: Boy Scouts have built a rock monument at the summit that is dedicated to the wagon road and the mule trail. SBR-4411 H SBR-4372 H ( )

13. Artifacts: None ( )

14. Non-Artifactual Constituents and Faunal Remains: None ( )

15. Date Recorded. April 25, 1990 16. Recorded By: E. Henry James ( )

17. Affiliation and Address SBCM, ASA, MRCM. ( )

See Continuation Sheet (X)

P26-004

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Permanent Trinomial: SBr-4411H ____ Mo. ____ Yr.

ARCHEOLOGICAL SITE RECORD

Other Designations: HJ-34

18. Human Remains: None ( )

19. Site Disturbances: There has been and continues to be a great deal of off-road vehicle traffic in the area. The old road is now used vehicles on both sides of the pass. ( )

20. Nearest Water (type, distance and direction): None ( )

21. Vegetation Community (site vicinity): Creosote Plant List ( )

22. Vegetation (on site): Same ( )

23. Site Soil: From a hard rocky soil to a sandy rocky soil. ( )

24. Surrounding Soil: Same ( )

25. Geology: The very top of Spanish Canyon where the wash starts. ( )

26. Landform: The start of the gravelly wash that is Spanish Canyon. ( )

27. Slope: South ( ) 28. Exposure: Open ( )

29. Landowner(s) (and/or tenants) and Address: BLM ( )

30. Remarks: See continuation sheet ( )

31. References: None ( )

32. Name of Project: Trail Survey ( )

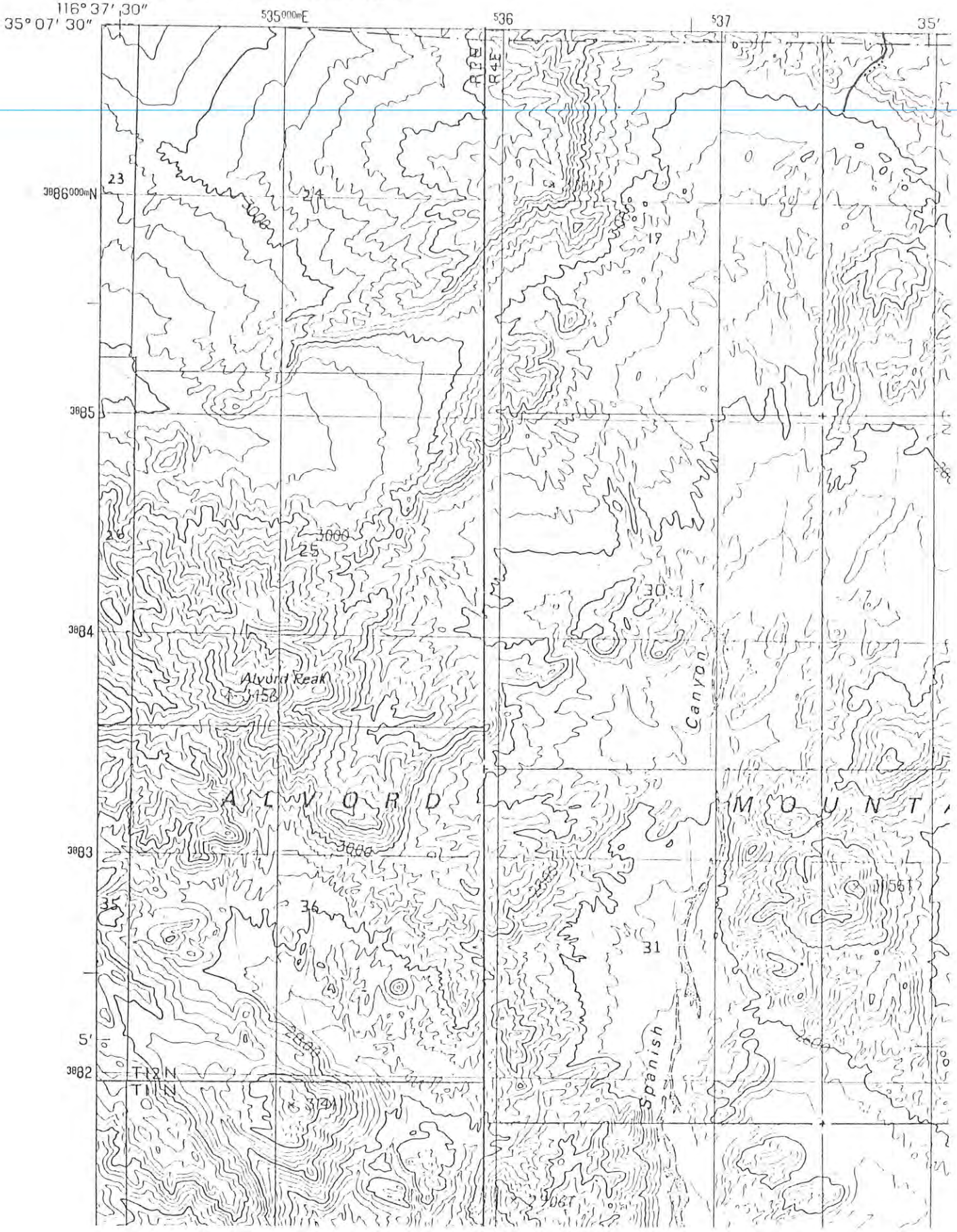
33. Type of Investigation: Surface ( )

34. Site Accession Number: ____ Curated At: ____ ( )

35. Photos: ____ ( )

P86-004
SBC-4411H

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SBr-004

My site report CA-SBr-4411H and CA-SBr-4272H were on the wagon road ~~the~~ THAT became known as the Mormon Road and the Mule Trail that became known as the Old Spanish Trail. When they get to the top of Spanish Canyon they are side by side. They go over the rim of Spanish Canyon about 50 feet apart. There are now large rocks in the old wagon tracks. I guessed that the mule skinners went around the rocks and the wagon drivers had to move them. Thats why they were apart. I was wrong. The rocks were put there in 1969 when the Boy Scouts built the monument, at the summit, to stop the off-road vehicles from using the old road. The old road is now rutted 3 to 4 feet deep. If the off-road vehicles had used the old road, it would now be torn up mess, and that piece of history would have been gone for ever. I do not know enough about wagons and mules to know why they didn't go over the rim at the same place. There is a reason, but we probably never will know it.

E Henry James

E. Henry James

5/24/90

PB6004411
SBC-4411 H

SBC-4273 H & SBC-4411 H

These two sites are so close together physically and historically, that they have to be reported together. The mule trail came first. In 1830 the first traders came west from Santa Fe to Los Angeles. When they started they didn't know where the water was, so they had to find it. They would find water, then fan out and look for the next water. When they found it they would move to it and do it all over again. When they got to Bitter Springs they must have known that that foot trail going away would go to water. They were frontiersman and would know these things. Where I can find them they are right close together. When the mule skinners got to the top of Spanish Canyon they moved to the west about 250 feet and went over at a place that was eaiser for them. They were close to the trail on the north side and on it on the south side. Then when the Mormon Battalion was released after the Mexican War They bought a light wagon and took a load of things they needed back to Utah with them. They put the first wagon over the mule trail and it went from west to east. Where they could they followed the mule trail. The track that they made became a road and a great many wagons went over it. It was used until about 1872 when the first railroad crossed the desert.

At the top of Spanish Canyon or Impassable Pass as it came to be known, the two trails separate for about 500 to 600 feet. The mules used a little ridge to drop down from the top of the canyon and the wagons moved west about 50 feet and used a slope. The slope was the only way for the wagon, but the last little pitch went right up. It was a short climb, maybe 100 feet. To look back down, to the south, it is easy to see why it was called impassable pass. At that place Spanish Canyon is climbing fast to go up to the rim. It must climb more than 200 feet in less then half a mile. With that the bottom of the wash is a rather soft decomposed rock. It takes a 4 wheel drive to make it now, so they probably had to double team the wagons in the old days. The last little pitch must have been a heartbreaker, so impassable pass. There is a question as to, why the mules and the wagons didn't go over the rim in the same place, instead of 50 feet apart. The only reason I can see now is that there are some large rocks in what are the old wagon tracks. The mule skinners went around them and used the ridge. The wagon drivers had to roll them out of the way, probably to the west side. A few years ago a path, maybe 20 feet wide was made up to the rim just west of the wagon tracks, so off-road vehicles could go over it. At this time the rocks must have been moved back into the wagon tracks, now ruts. The ruts are now 3 to 4 feet deep, cut by erosion. Where the surface is disturbed like that one was, water will erode it rapidly. That is why the ruts are now 3 to 4 feet deep where the wagons went. Some of those rocks were probably uncovered by the erosion, but enough of them were there to make the mule skinners go around them. About 300 feet north of the summit the mule trail leaves the wagon road and angles to

P86-00444

SBr-4411 H

the east. It runs out to the little ridge and goes down it. Some of the mules went down a steeper ridge just before the main ridge but most of them used the gentler ridge.

A monument was erected by a troop of Boy Scouts right on the rim of the summit. It was built of rocks and in it there is a wooden plaque that reads: Alvord Summit-Mojave River Trail-Portion of Old Spanish Trail and Mormon Wagon Road-Troop 64 Lennwood Calif. 1969. The part that says,"Mojave River Trail" is not quite right. The Mojave River Trail ran along the Mojave River. Here the river is 12 miles straight south. They all came together, but that was in the river bed below Yermo.

Spanish Canyon is about 4 miles long. The first 2 miles of it are between ridges so there is no getting out of it. Then the canyon begins to open up. Side washes go off and run up toward the rim. Tracks go up most of these washes. To make absolutely certain that I went up the one that I had marked on the map, I dropped back south one mile, from the summit. There is a bench mark there on the topo map at the intersections of sections 19, 20, 29, 30, T12N R4E. Sitting in my truck I located where it was by terrain, then I got out of the truck and walked over to it. It was there. There was no mistake, I had the right wash marked.

V

·064440 Update 1/04

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P36-004411
HRI #
Trinomial CA-SBR-4411H

Page 1 of 4 *Resource Name or #: (Assigned by recorder) Mormon Trail

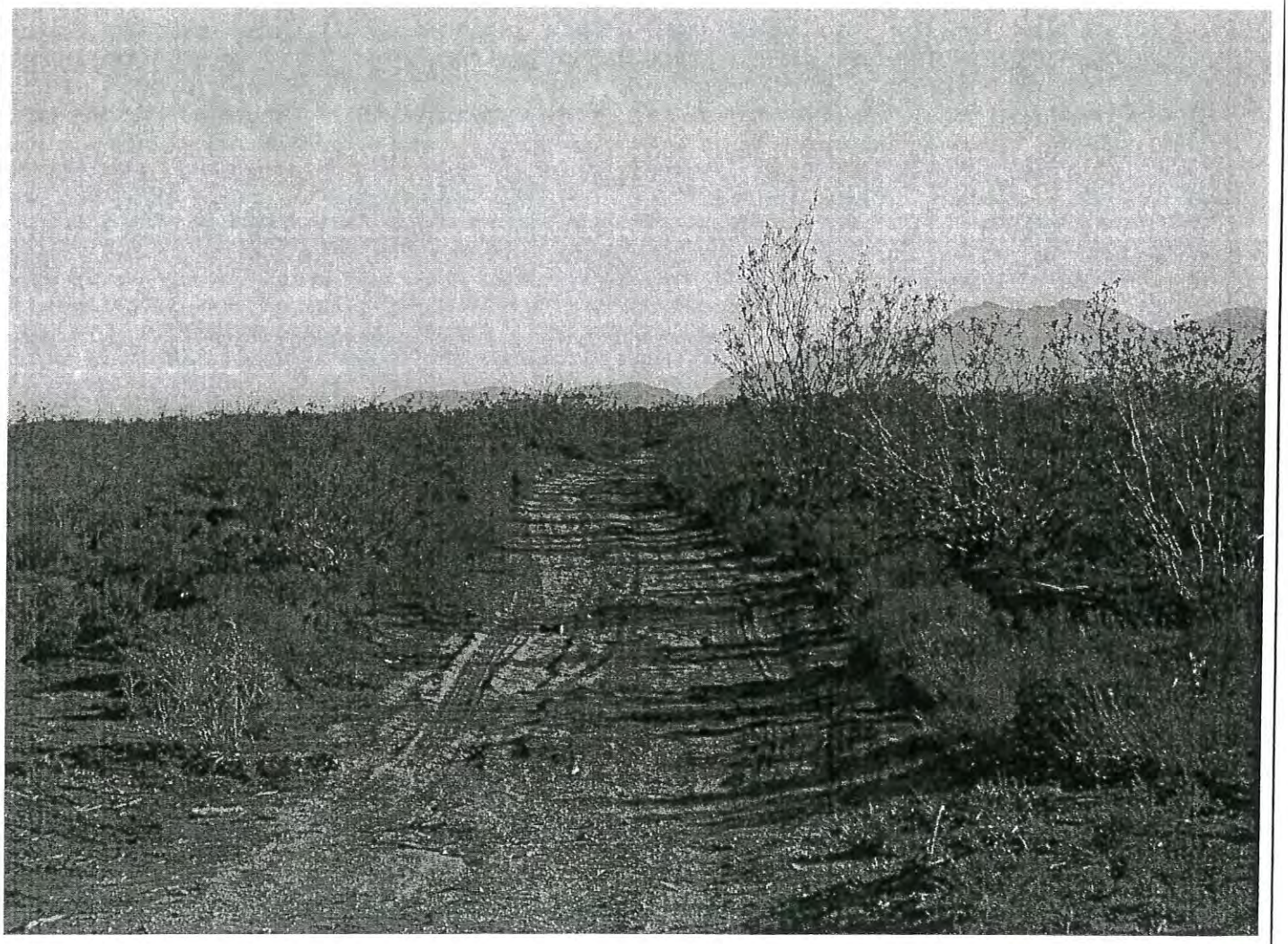
*Recorded by R. Goodwin, LSA Assoc, Inc. 1650 Spruce St., 5th Floor, Riverside, CA 92507 *Date 3/18/03 ☐ Continuation ☒ Updat

This is a remnant segment of the Mormon Trail route running northeast through the eastern half of Section 14 in western Victorville; it may continue to the northeast in the western half of Section 12. It varies between 12 and 15 feet in width. Although the trail is a State Historic Landmark (No. 577) and meets CRHR Criteria A (Mormon settlement in Southern California) and B (Jefferson Hunt), it retains little or no integrity: it lacks any associated artifacts or features from its period of significance(1850s) and the setting of this segment has been severely impacted by dumping. Therefore, it does not appear eligible for the California Register of Historic Resources.

Quad: Victorville 7.5'
T5N R5W SW/NE Sec 14

Refernces

Arbuckle, Jim
1979 California Registered Historical Landmarks Survey form for Mormon Trail monument, No. 577.



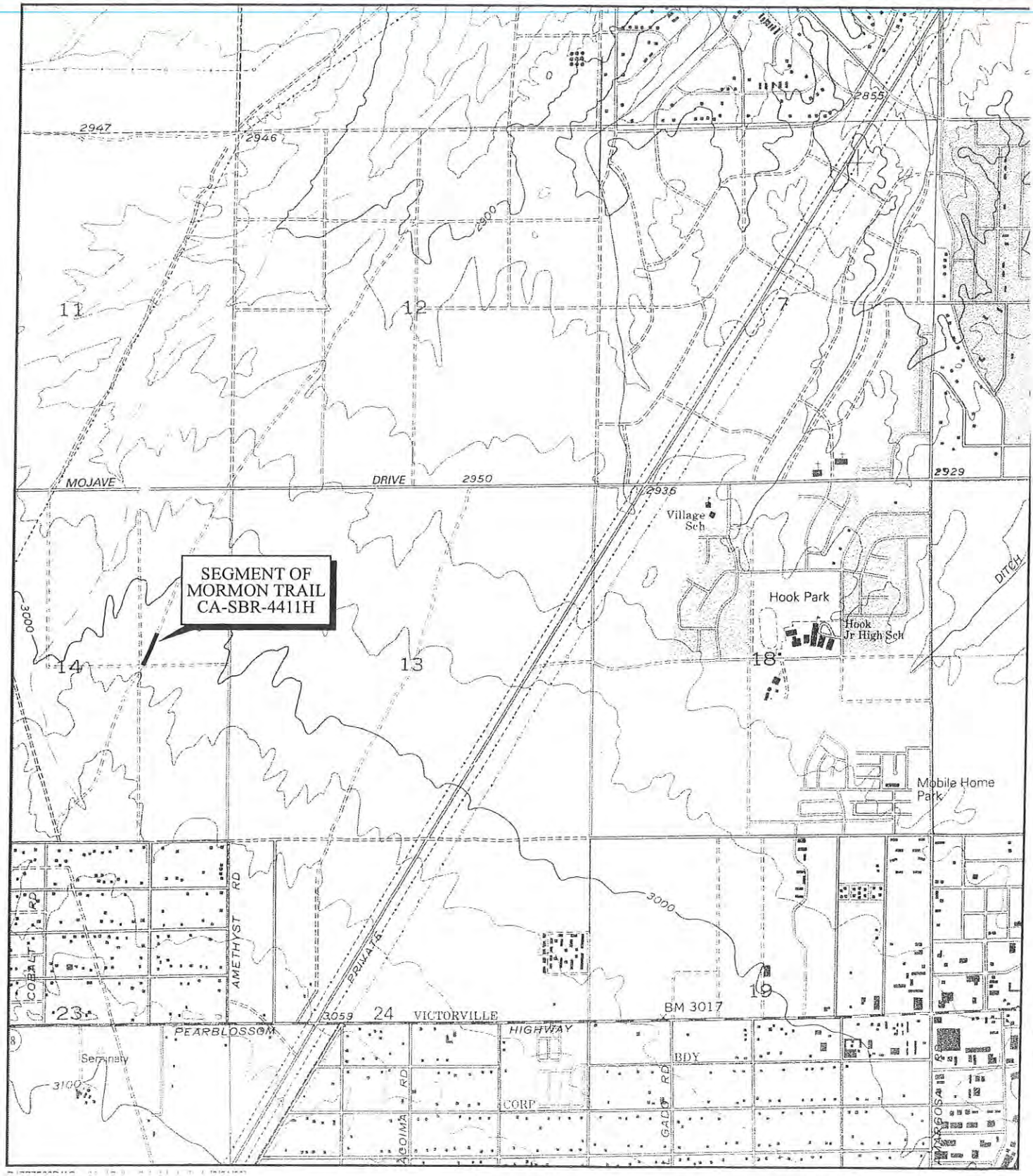
View south-southwest of the remnant route of the Mormon Trail, CA-SBR-4411H

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P36-004411
HRI #
Trinomial CA-SBR-4411H

Page 2 of 4 ***Resource Name or #** (Assigned by recorder) Mormon Trail

*Map Name: VICTORVILLE 7.5' USGS QUADRANGLE *Scale: *Date of Map: 1956 PR 1981



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # P36-004411
HRI #
Trinomial CA-SBR-4411H

*Resource Name or #: (Assigned by recorder)

L1. Historic and/or Common Name: Mormon Trail

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map) North end: 466320 mE / 3820000 mN; South end: 466250 mE / 3819680 mN

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)
Dirt track remnant of Mormon Trail route.

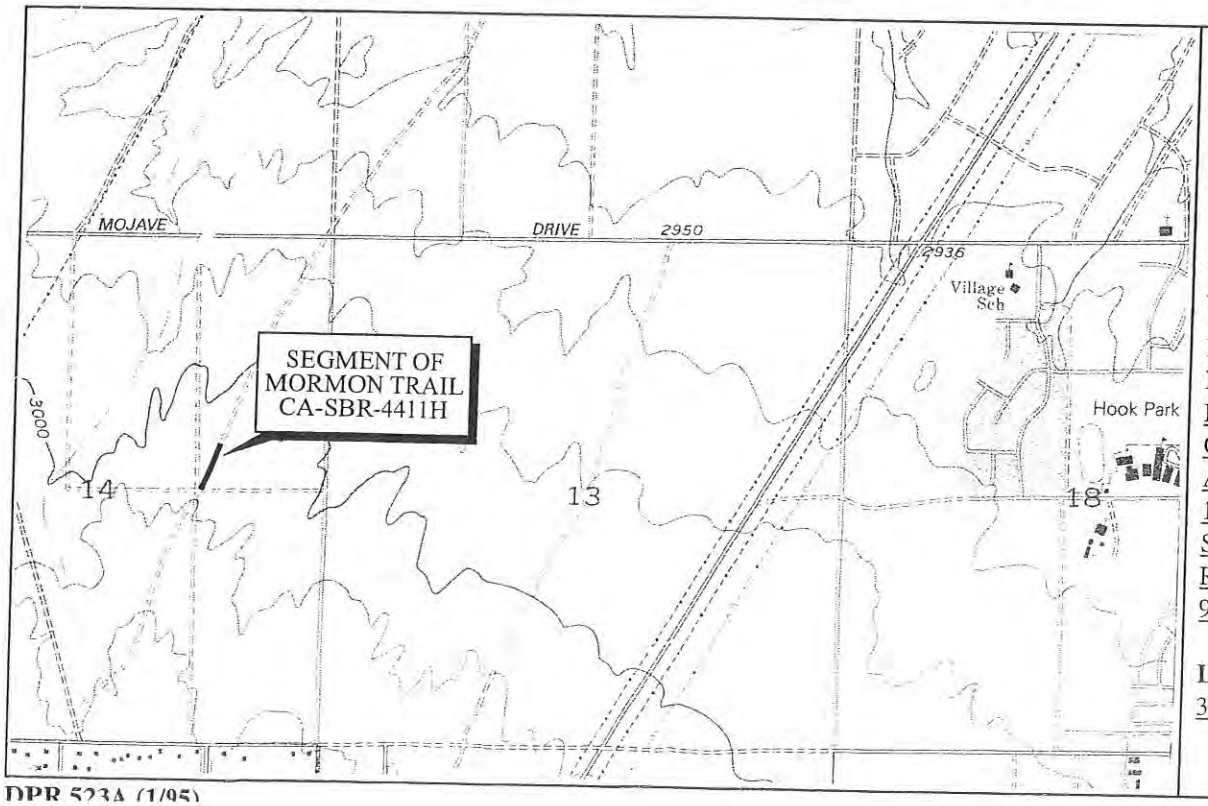
L4. Dimensions: (In feet for historic features and meters for prehistoric features)
- **a. Top Width** 12'-15' 0.5m
- **b. Bottom Width** N/A
- **c. Height or Depth** N/A
- **d. Length of Segment** ~600' 183m

L4e. Sketch of Cross Section (include scale) **Facing:**

L5. Associated Resources:

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.) This segment of the Mormon Trail is on an almost flat degraded alluvial fan covered by creosote scrub.

L7. Integrity Considerations: Although thetrack is well defined, it lacks any appurtenances from its period of significance and its setting has been severely impacted by off-road, excavtion, soil stockpiling and dumping activities.



L8b. Description of Photo, Map, or Drawing (view, scale, etc.)
USGS 7.5' quad 1:24000

L9. Remarks:

L10 Form Prepared by:
Riordan Goodwin LSA Associates Inc.
1650 Spruce Street, 5th Floor
Riverside, CA 92507

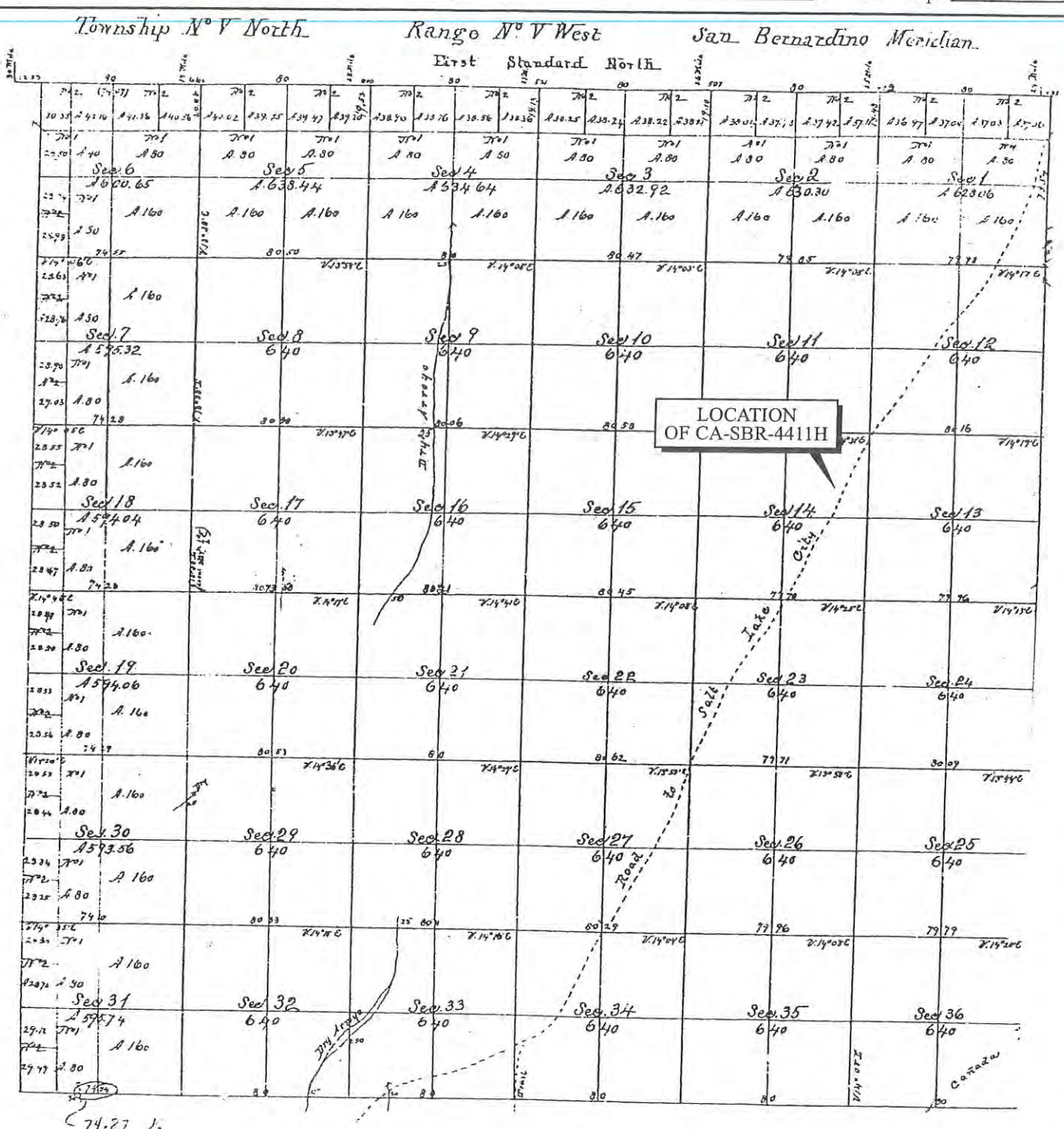
L11. Date:
3/25/03

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P36-004411
HRI #
Trinomial CA-SBR-4411H

Page 4 of 4 *Resource Name or # (Assigned by recorder) Mormon Trail

*Map Name: General Land Office Map, 1906 *Scale: *Date of Map: 1906



Surveys Designated	By Whom Surveyed	Date of Contract	Amount of Surveys Miles Chs. Lks	When Surveyed
North boundary Township	Ralph W Norris	October 12th 1853	5 72 32	1853
Part of Township lines	Surveyor General's	February 15th 1855	17 75 06	1855
Subdivision lines	" " "	" " "	54 52 08	"

The above Map of Township N° 5 North, Range 5 of the Surveys thereof on file in this Office, Surveyor General's Office, San Francisco California, March 19th 1856

R:\777583D1\Graphics\Culturalsketch_1906map.cdr (3/25/03)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial CA-SBR-4411-H
NRHP Status Code 6Z (At This location Only)

Other Listings
Review Code Reviewer Date

Page 1 of 9 *Resource Name or #: ~~Old Spanish Trail~~, Mormon Road, Road to Salt Lake, Mormon Trail

P1. Other Identifier: California Historical Landmark #577

*P2. Location: ☐ Not for Publication × Unrestricted *a. County: San Bernardino

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

*b. USGS 7.5' Quad: Victorville, CA Date: Rev. 1993 T6N; R4W; Por. of Secs 23, 24, 26, 27 and 34; ~~M.D.~~ SB B.M. (As shown on Site Location Maps provided by the County AIC)

c. Address: N/A Zip: N/A

d. UTM: Zone: 11; mE mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

The exact location of this historic alignment is unknown. As shown on maps provided by the County of San Bernardino Archaeological Information Center (AIC), the Mormon Trail would appear to travel along the same alignment as that of the existing Stoddard Wells Road alignment within the present study area. This would appear to be more conjecture than fact. According to Archaeological Information Center staff, the alignment maps were prepared by professionals following consultation of historic maps. However, it is clear that the historic 1855 GLO map does not show any road/trail alignment at this location, or even within several miles of Section 26 T6N, R4W. It is, therefore, highly doubtful that the historic Mormon Trail followed the alignment shown on

the AIC Historical Resources Records Search "Site Record" location maps.

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Does Not Exist at This Location

SEE ATTACHED CONTINUATION SHEETS

*P3b. Resource Attributes: (List attributes and codes) HP37. Highways/Trail: Historic Road Alignment

*P4. Resources Present: ☐Building ☐Structure ☐Object ×Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

NO PHOTOGRAPHS ATTACHED

THIS SITE: CALIFORNIA HISTORICAL LANDMARK #577
DOES NOT EXIST AT THIS LOCATION
(SECTIONS 23, 24, 26, 34, 25: T6N R4W)

P5b. Description of Photo: (View, date, accession #)
No Photographs Attached

*P6. Date Constructed/Age and Sources: N/A ×Historic ☐Prehistoric ☐Both
See Bibliography

*P7. Owner and Address:
Various Owners
Including Both Private and Public
Location of Alignment Unknown
Note: Property surveyed in escrow

*P8. Recorded by: (Name, affiliation, and address)
Roger Hatheway
Principal Investigator
Hatheway & Associates
Post Office Box 3246
Crestline, CA 92325

*P9. Date Recorded: 8/31/06

*P10. Survey Type: (Describe) CEQA Compliance and Local Compliance: Town of Apple Valley & City of Victorville, California.

*P11. Report Citation: (Cite survey report and other sources, or enter "none.") *"Due Diligence" Summary of Findings Report: An Historical and Archaeological Survey of Krumsick Subject Property #2(B), County of San Bernardino, California.* See also FINAL REPORT: *Historical and Archaeological Survey of Krumsick Subject Property #2(B).*

Note: See Also Due Diligence Report and FINAL REPORT for Krumsick Subject Property #1.

*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): Historic GLO Map, Photocopies of Text/Maps from History of Road

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #
Trinomial

 Resource Name or #: Old Spanish Trail, Mormon Road, Road to Salt Lake, Mormon Trail

L1. Historic and/or Common Name: One or more of above

L2a. Portion Described: ☐Entire Resource × Segment ☐ Point Observation **Designation:** UTM

b. Location of point or segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map)

T6N; R4W; Por. **of Secs** 23, 24, 26, 27 and 34; ~~M.D.~~ SB **B.M.**

L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)

SEE ATTACHED CONTINUATION SHEETS Section P3a: Description

L4e. Sketch of Cross-Section (include scale) Facing):

N/A (Does Not Exist at this Location or as Shown on AIC Maps)

L4. Dimensions: (In feet for historic features and meters for prehistoric features)

a. Top Width: N/A (Does Not Exist at this Location or as Shown on AIC Maps)

b. Bottom Width: N/A (Does Not Exist at this Location or as Shown on AIC Maps)

c. Height or Depth: N/A (Does Not Exist at this Location or as Shown on AIC Maps)

d. Length of Segment: N/A (Does Not Exist at this Location or as Shown on AIC Maps)

L5. Associated Resources: N/A (Does Not Exist at this Location or as Shown on AIC Maps)

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.)

N/A (Does Not Exist at this Location or as Shown on AIC Maps)

L7. Integrity Considerations: N/A (Does Not Exist At This Location)

L8b. Description of Photo, Map, or Drawing (View, scale, etc.)

N/A (Does Not Exist at this Location or as Shown on AIC Maps)

L9. Remarks: SEE ATTACHED CONTINUATION SHEETS (Background History w/Copies Maps)

L10. Form Prepared by: Roger Hatheway, Principal Investigator, Hatheway & Associates

L11. Date: 8/31/06

L8a. Photograph, Map or Drawing

SEE ATTACHED LOCATION MAP
SHOWING AREA WHERE
THIS FEATURE DOES NOT EXIST

Section P3a: Description (Continued)

GENERAL DESCRIPTION OF SURVEY FEATURE
Resource Name: *Old Spanish Trail, Mormon Road, Road to Salt Lake, Mormon Trail*
Address/Location: T6N; R4W; Por. **of Secs** 23, 24, 26, 27; M. D. SB **B.M.** (As shown on Site Location Maps provided by the County AIC)
Historic Name(s): Old Spanish Trail, Mormon Road, Road to Salt Lake, Mormon Trail
APN#: N/A
Present Use: Does Not Exist at This Location
Original Use: Prehistoric transportation corridor. Later as emigrant trail and wagon road.
Integrity: Does not exist at this location. Integrity is unknown at other locations.
Associated Features: N/A
Year Built: Prehistoric to early 1880s.

Note: The following conclusions represent a site-specific evaluation within a narrowly defined survey/study area. No conclusions regarding any other potential location of the Old Spanish Trail, Mormon Road, Road to Salt Lake, Mormon Trail, etc. (including integrity of the alignment or potential NR or CR significance of) are here made.

DETAILED DESCRIPTION OF SURVEY FEATURE
(Site-Specific Evaluation Only Within a Narrowly Defined Survey/Study Area)
The exact location of this historic alignment as it crosses the Mojave Desert is generally unknown. However, as shown on Historical Resources Records Search maps provided by the County of San Bernardino Archaeological Information Center (AIC), the Mormon Trail would appear to travel along the same alignment as that of the existing Stoddard Wells Road alignment within the present study area. This is in error. According to Archaeological Information Center staff, the alignment maps were prepared at some point in the past by professionals following consultation of historic maps. However, it is clear that the historic 1855 GLO map does not show any road/trail alignment at this location, or even within several miles of Section 26 T6N, R4W. In addition, no recently published credible history of the "Old Spanish Trail" shows the general route alignment as being located along Stoddard Wells Road. Finally, the construction history of Stoddard Wells Road is very well known. It was built circa 1867 by Lafayette Mecham as a means of transporting hay under contract to Camp Cady. Clearly, the Old Spanish Trail, Mormon Road, Road to Salt Lake, Mormon Trail does not exist at the location shown on the AIC Historical Resources Records Search maps in the vicinity of Stoddard Wells Road.

Section L9: Remarks: (Background History/Eligibility + Bibliography)

Mormon Road (CA-SBR-4411-H): Old Spanish Trail, Road to Salt Lake, Mormon Trail

The following information is taken from the book, *California Historical Landmarks*, published in 1979 (revised 1981) by the Department of Parks and Recreation, State of California.

#577 MORMON TRAIL MONUMENT
In June 1851, 500 Mormon pioneers came through this pass to enter the San Bernardino Valley, where they established a prosperous community. *Hwy 138, West Cajon Canyon (San Bernardino)*

The following information is taken from *The Old Spanish Trail Across the Mojave Desert,* by Harold Steiner:

During all its varied existence, the Old Spanish Trail was never static; it was always a dynamic entity, and like other old trails it followed the route of least resistance. It was never a single, clearly defined route, but was a composite of traces that separated and converged according to the dictates of terrain and potable water. Horses and pack mules could go where ox-drawn wagons dared not follow. Ox-drawn wagons could carry extra water and fodder and wagon masters could be more daring in finding easier but perhaps longer legs between watering places.

There are those who will argue that the Trail across the Mojave Desert should not be identified as "The Old Spanish Trail" because by the time the trail became traceable the Spanish no longer controlled the land and Spanish-speaking people played only a brief role in its history.

Instead, it is argued the route should be called the *"Mormon Road"* because the Mormons adapted that segment of the Rail from central Utah to California to satisfy their need for a reliable all-year communication and trade route. Others will argue that destinations should dictate the name and it should be called *"The Salt Lake-California Road."*

Pursuit of consistency is a worthy cause, but as Emerson so aptly noted, *"A foolish consistency is the hobgoblin of little minds."* In this narrative, it is deemed that any attempt to resolve the arguments about what to call the trail from Santa Fe to Los Angeles would be facetious and a useless exercise in semantics. We reconcile the differences by acknowledging that when we speak of the Old Spanish Trail or the Mormon Road or the California Road we are in essence referring to the same thing. The only variable is time.

It is *true* the Mexicans were sojourners on the Trail during the Spanish Period that lasted from before 1776 until the end of the Mexican War. Their time was brief but that time was important. The language they spoke gave the Trail a name. It is *true* that, during the American Period, the Mormons refined the trace of the Trail to satisfy their specific needs. It is *true* that by the turn of the century the proven route was being used regularly by travelers between Utah and California and in many places the modern highways that were developed parallel or overlie the original historic trace of the Old Spanish Trail.

Historically, a consistency does permeate much of the literature. In 1844, John C. Fremont traveled the route across the Mojave Desert and his journal publicized the name and concept of an *"Old Spanish Trail."* The diaries of Mormons who traveled the Trail perpetuated the name with numerous references to being on *". . . the known and comparatively safe Old Spanish Trail."* Many cartographers, who mapped the early West, identified the overland route from central Utah to southern California as the *Old Spanish Trail.* Adhering to this consistency, throughout this narrative, we will use the more popular and more romantic nomenclature – *The Old Spanish Trail.* (Steiner 1999: Preface ix and x)

From the Forks of the Road, southbound travelers followed the Mojave River to a site near present Barstow where the Mojave River once came to the surface and formed a large basin that was reported to contain fish. Historically, this became known as the Fish Pond. It was located on the south side of the Mojave River near the area where the USMC Supply Center (Nebo Annex) now stands. Major folds have changed the landscape and draw down of groundwater has erased evidence that surface water once collected there.

From the Fish Pond the Trail continued southward. The author of the Guardian letters describes this segment of the Trail in the reverse direction as to the route in this narrative:

On leaving this station [Fish Pond], we crossed the river, the road on leaving the river rises over a very steep hill, covered with broken rock, the little mounds of broken rock are of all colors, deep black, red and white,

the colors being very positive. This place resembles the crater of an extinct volcano, in fact the whole country around here is covered with lava and other evidence of volcanic origin. On rising the crest of the hill our road was smooth and level for about a mile, thence descending through a succession of rolling hills to a sandy wash thence to what is called "dry lake" . . .On leaving the "dry lake" we struck a fair road, the last mile or two being sandy, before we reach the Forks of the Road Station which is on the banks of the Mojave . . .

This excerpt from the Guardian describes how the Trail crossed to the north side of the river near the Fish Pond and passed south of the foothills east of Barstow. The "steep hill" described above is now known as Elephant Mountain because the profile resembles the head and back of an elephant. The "bright-colored" rocks are now mined for roofing material and landscaping. It is interesting to note that in the contemporary vernacular the traveler referred to the Forks of the Road Station. Undoubtedly, this was later known as Hawley's Station.

The next excerpt from the Guardian describes the northbound journey over the Old Spanish Trail from Cottonwood [Hodge] to the Fish Pond [Barstow] and on to the Forks of the Road.

. . . we slept soundly [at Cottonwood] until five o'clock AM, when called, after which we hooked up again enroute to Camp Cady, distance about 38 miles via Fish Pond and Forks of the Road stations . . . On leaving the Cottonwood the road is sandy and uphill for about ten miles, then a gradual descent to the river. The road averages very fair. The station at this point known as the Fish Pond takes its name from several pools of water said to contain fish. They were filled up and destroyed by the flood of '61. The station is kept by Mr. John Rittner . . .

For orientation, we can reverse this description for southbound travel. After the Trail crossed the river at the Fish Ponds [Barstow] it continued southwest. On the first part of this segment the Mojave River is underground and there was no reason for the Trail to follow the dry riverbed. As described in the 1871 Guardian letter, the Trail gradually climbed from the Fish Pond [Barstow] to the rise near present Johnston's Corner then descended to rejoin the river near Cottonwood [Hodge].

Up to this point, the traces of the Old Spanish Trail across the Mojave Desert have been identified with a high degree of confidence. It is frustrating that this cannot be done more thoroughly along the Mojave River. Almost the entire river valley from the Point of Rocks [Helendale] south is extensively cultivated and urbanized and traces of the original road are rare to non-existent.

Modern road building techniques have eliminated the twists and turns of the original trace of the Old Spanish Trail but today's explorers, who wish to follow the trace through this region, have to be content with traveling on historic U. S. Highway-66. This historic route between Barstow and Victorville essentially followed the footsteps of those who trod the Old Spanish Trail along this stretch of the Mojave River.

From Cottonwood, the southbound trace continued along the Mojave River to the vicinity of present Victorville. In the reverse description mode, the letters to the Guardian illustrate this segment of the Trail.

. . . [near Victorville] we hitched up and started on to our next stopping place for the night being the Cottonwoods [Hodge] distance 18 miles.

After crossing the river [NW of Victorville] we struck a rolling sandy road running parallel with the river six or eight miles; we then reached Capt. Lane's ranch . . . about four miles above Capt. Lane's the Brooks brothers have about one hundred acres under fence for a stock ranch. We drove by their house but all hands were away and we proceed to the next ranch or station known as the Point of Rocks [Helendale] kept by C. Saunders about seven miles from Lane's, arrived about five o'clock P. M. Found the old gentleman and his lady at home . . . But time was speeding on and we had to make nine miles to the Cottonwoods. The road here leaves the river and turns to the right [east] and turns up a sandy wash through heavy sand . . . We left the wash rose upon a bench found a hard road and coaxing our animals into a trot we proceeded on our way to the Cottonwoods, which we

could perceive by the land marks so well known and so welcome to travelers either way on the Mojave river . . . [a family named Lightfoot owned the ranch at Cottonwood].

In essence, this excerpt identifies the point near present Victorville where the wagon version of the Old Spanish Trail along the Mojave River starts or ends depending on the direction of travel. The Guardian letters refers to distances between checkpoints but does not tell how these distances were determined. However, when the distances and descriptions of the route are translated to a modern topographic map there is a surprisingly good fit. Most remarkable is how close historic U. S. Highway-66 followed the trace of the old Trail. Just east of Point of Rocks [near present Helendale] the old highway does make the turn away from the river, goes through a small wash and then climbs to the benchland and descends toward Barstow just like the Guardian letter says. (Steiner 1999: 199 – 202)

The following excerpt is from the book, *In Search of the Spanish Trail Santa Fe to Los Angeles, 1829 – 1848*, by C. Gregory Crampton and Steven K. Madsen.

MOJAVE RIVER

From Barstow, the Spanish Trail follows up the Mojave River close to the right, or east, bank, to a point near Oro Grande, where it crosses the river and heads for Cajon Pass.

A typical desert river, the Mojave rises in the high San Bernardino Mountains and, as it flows out onto the desert plain, much of the water sinks into its sandy bed so that, in its lower reaches, it is dry much of the time. During extreme floods, the bed may fill with water and even reach the "sink of the Mojave" many miles to the east of Barstow. However, the river's water seldom reaches the surface at Barstow.

Following the Spanish Trail, Fremont describes the stream some distance below the crossing at Oro Grande, northwest of Victorville. He found the river to be a "clear bold stream, 60 feet wide, and several feet deep." It ran between "perfectly naked banks of sand. The eye, however, is somewhat relieved by willows, and the beautiful green of the sweet cottonwoods with which it is well wooded." Fremont gave us the name "Mohahve River," a spelling which happily has been lost to time.

We get some idea about the road up the Mojave from Lieutenant A. W. Whipple's account in March 1854. The stream was flowing where he crossed it and for 20 miles the land was fertile, but grass was scarce. The road, he said, was excellent, and as he continued the ascent, the river grew larger and cottonwood and mesquite trees were more abundant.

At the Spanish Trail crossing of the Mojave River, G. H. Heap observed on August 20, 1853, that the river was "a rapid stream, twenty-five yards in breadth and one foot in depth, but its water was too warm to be drinkable. Passed several fine meadows near the river, and saw bands of antelope, also hares and partridges."

Posted signs along this stretch tell us now that this was once part of the National Old Trails Highway, one of those "national" highways marked out after World War I. The Arrowhead Trail, which was coterminous with the Spanish Trail in sections of California, Nevada, and Utah, also passed through here. And, let us not forget that this was a part of the fabled federal Route 66, "America's Main Street," a highway for many of those hurt by the Great Depression who sought better times in California.

From the Fork of Roads to the crossing at Oro Grande, the Spanish Trail follows along the Mojave River for approximately 50 miles. The crossing was utilized for years by later travelers. A. G. Lane established a store at "Lane's Crossing," about 1861, to serve wagon traffic. Atlas Sheet No. 73 of the Wheeler Survey, published in 1883, shows a road (essentially the Spanish Trail) all the way from the Fork of Roads to the crossing at "Lanes." (Crampton/Madsen 1994: 114 – 116)

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2006 *"Due Diligence" Summary of Findings Report(s): An Historical and Archaeological Survey of Krumsick Subject Property #1, # 2(A) and #2(B), County of San Bernardino, California.*

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Skinner, Byron R.
1983 *Black Origins in the Inland Empire*, Book Attic Press, San Bernardino, California.

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1999 *The Old Spanish Trail Across the Mojave Desert*, The Haldor Company, Las Vegas, Nevada, 1999.

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1921 *Routes to Desert Watering Places in the Mohave Desert Region, California,* Water Supply Paper 490-B. Department of the Interior, United States Geological Survey, Washington, D. C., 1921.

Warren, Elizabeth Von Till, and Ralph J. Roske
1981 Cultural Resources of the California Desert 1776-1980. Historic Trails and Wagon Roads Riverside: Bureau of Land Management.

Guidelines, Bulletins, Rules and Regulations

California Environmental Quality Act (provisions regarding historical resources)
Public Resources Code 21083.2; 21084(e); 21084.1; California Code of Regulations (title 14) CEQA Guidelines 15064.5; 15126.4; 15325; 15331

California Office of Historic Preservation. Technical Assistance Series #1, *California Environmental Quality Act and Historical Resources: Questions and Answers*. Sacramento, California

California Office of Historic Preservation. Technical Assistance Series #4, *California Register of Historical Resources Q&A for Local Governments*. Sacramento, California

California Office of Historic Preservation. Technical Assistance Series #6, *California Register and National Register: A Comparison*. Sacramento, California

California Office of Historic Preservation. Technical Assistance Series #10,

California State Law and Historic Preservation: Statutes, Regulations and Administrative Policies Regarding Historic Preservation and Protection of Cultural and Historical Resources. May 23, 2001

California Register of Historical Resources
Public Resources Code 5020.1(a); 5020.4(a)(8); 5024.1; 5024.6(b)(m); 5028; 5029; 5079.20(a); 21084.1; Executive Order W-26-92

Libraries

City of San Bernardino Feldheym Library (California Room and Microfilm)
City of Barstow County Library
City of Victorville County Library
San Bernardino County Library, San Bernardino
Smiley Library, Redlands
University of California, Rivera Library, Riverside

Maps

BLM Master Plats/MT PLAT MAPS and (GLO) Survey Maps
Township 6 North Range 4 West SBM

United States Geological Survey
7.5 Minute Quadrangle, Victorville, California, Revised 1993.
15 Minute Quadrangle, Victorville, California, 1958

Museums

San Bernardino County Museum, Redlands, California
Mojave River Valley Museum, Barstow, California
Route 66 Museum, Barstow, California
Route 66 Museum, Victorville, California

Public Records

Bureau of Land Management
BLM Microfiche GLO Maps
BLM Surveyors Notes
BLM Master Plats

San Bernardino County Archaeological Information Center Records
In addition to the Center's historical resources files, the following publications, manuscripts or correspondence also were consulted:

American Association for State and Local History
1989 National Register of Historic Places, 1966-1988. Nashville, TN.
California Office of Historic Preservation
1986 Survey of Surveys: A Summary of California's Historical and Architectural Resource Surveys.
1988 Five Views: An Ethnic Sites Survey for California.
1997 California Historical Landmarks.
1992 California Points of Historical Interest.
2005 Listing of National Register Properties--Records entered into the OHP computer file--received quarterly.
2005 Inventory of Historic Structures--Records entered into the OHP computer file of historic resources-received quarterly.
San Bernardino County Museum
1980 Historical Landmarks of San Bernardino County. Quarterly of the San Bernardino County Museum Association 28(1-2).

Respondents

Robin Laska, County of San Bernardino Archaeological Information Center
Mehdi Mostaedi, Lee & Associates, Victorville, California

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

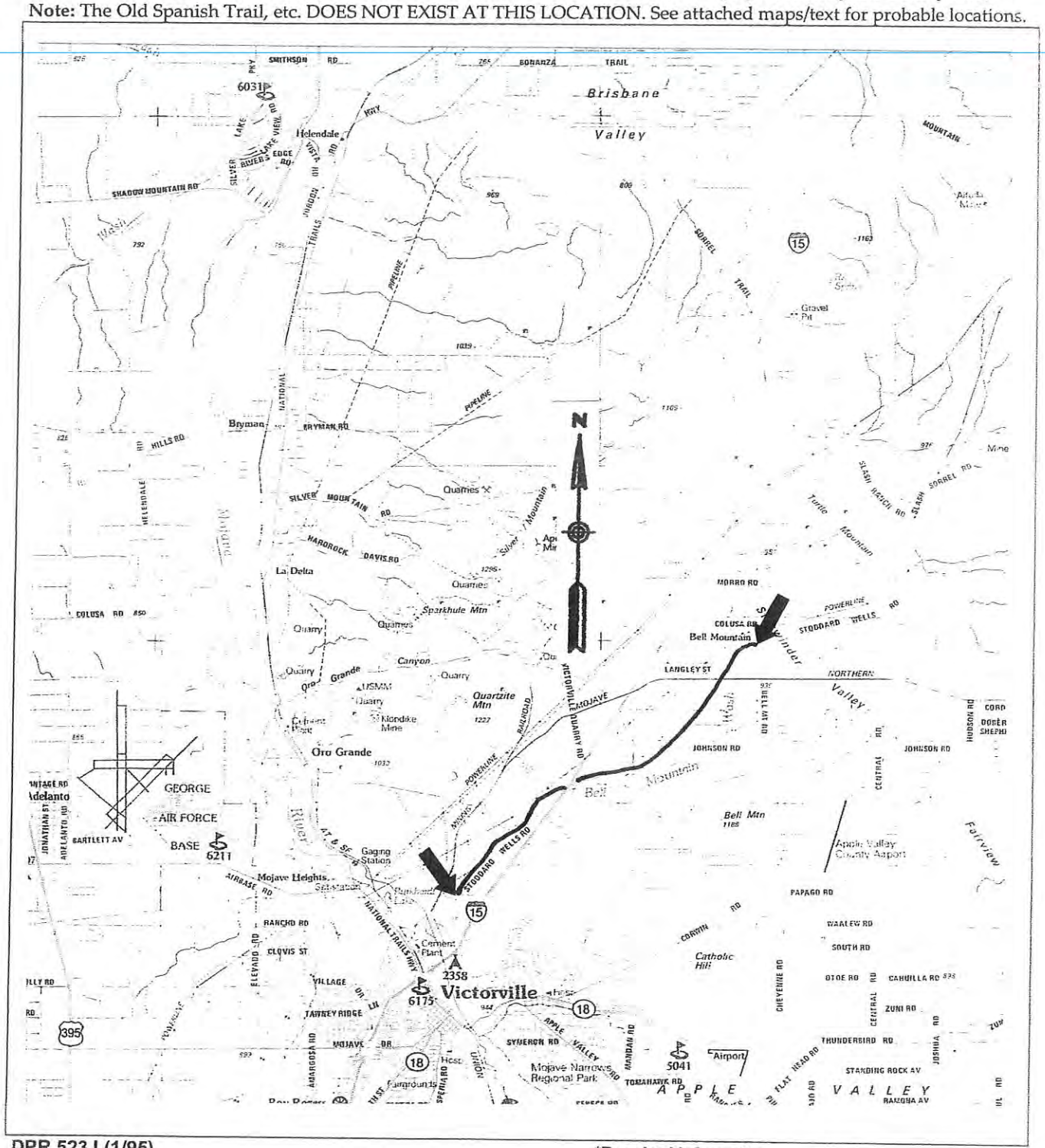
 ***Resource Name:** Old Spanish Trail, Mormon Road, Road to Salt Lake, Mormon Trail

***Map Name:** Topographic Map, *California Atlas & Gazetteer*, Delorme ***Scale:** 1:150,000

***Date of Map:** 1993 **Reduced to Present Scale:** Original Scale (Reproduced at 100%- -North Arrow Added)

T6N; R4W; Por. of Secs 23, 24, 26, 27 and 34; M. D. SB B.M. **(As shown on Maps provided by the County AIC)**

Note: The Old Spanish Trail, etc. DOES NOT EXIST AT THIS LOCATION. See attached maps/text for probable locations.



DPR 523J (1/95)

*Required information

P36-000

MACKO
ARCHAEOLOGICAL
CONSULTING

Permanent Trinomial: CA-SBr-4272H &
Supplement X CA-SBr-4411H
Other Designations: Mormon/Santa Fe Trail/ CHL-577

Archaeological Site Record **Page 1 of 4**

1. County: San Bernardino

2. USGS Quad: Victorville (7.5') **Photorevised:** 1968

3. UTM Coordinates--Zone:11;
North: 468795m **Easting** 3824955m **Northing**
South: 468665m **Easting** 3824680m **Northing**

4. Township 6N **Range** 4W; SE **1/4 of** NW **1/4 of Section** 31 **Base Mer.** SBBM

5. Map Coordinates 267 **mmS** 123mmE **6. Elev.** 2740

7. Location: From intersection of National Trails Highway and Adelanto Road in Victorville, travel west on Adelanto Road for 0.4 mile to west side of broad wash.

8. Prehistoric ___ **Historic** X **Protohistoric** ___ **9. Site Description:**

10. Area: 300m (N-S) X 3m (E-W) ; **How Determined:** Map Data

11. Depth: 0 cm; **How Determined:** N/A

12. Features: Possible old grade of Mormon/Santa Fe Trail.

13. Artifacts: None in Association

14. Non-Artifactual Constituents & Faunal Remains: None

15. Date Recorded: March 11, 1993 **16. Recorded By:** M. Macko

17. Affiliation and Address: Macko Archaeological Consulting 9701 Allison Circle, Huntington Beach, California (714) 965-3294.

18. Human Remains: No

19. Site Disturbances: There has been extensive off-road vehicle use in the area, and it is only speculated that the identified section is a remnant of the Mormon/Santa Fe Trail.

20. Nearest Water: Road parallels wash.

P36-000

21. Vegetation Site Vicinity: Saltbush Scrub/ Joshua Tree

22. Vegetation On-Site: Same

23. Site Soil: Sandy Silt **24. Surrounding Soil:** Same

25. Geology: Alluvium

26. Landform: Valley Bottom

27. Slope: 0 **Exposure:** 360

29. Landowner Name & Address: AT&T Easement

30. Remarks: The recording of the Mormon/ Santa Fe Trail at this location is based solely on its having been plotted from historic maps by the Archaeological Information Center at this location. No additional corroborating evidence was noted.

31. References: Macko (1993) Cultural Resources Investigation of the Proposed AT&T Lightguide System, Victorville to Bakersfield, California.

32. Name of Project: AT&T Lightguide Project (Fiber Optic) -- Victorville-Bakersfield

33. Type of Investigation: Intensive Survey

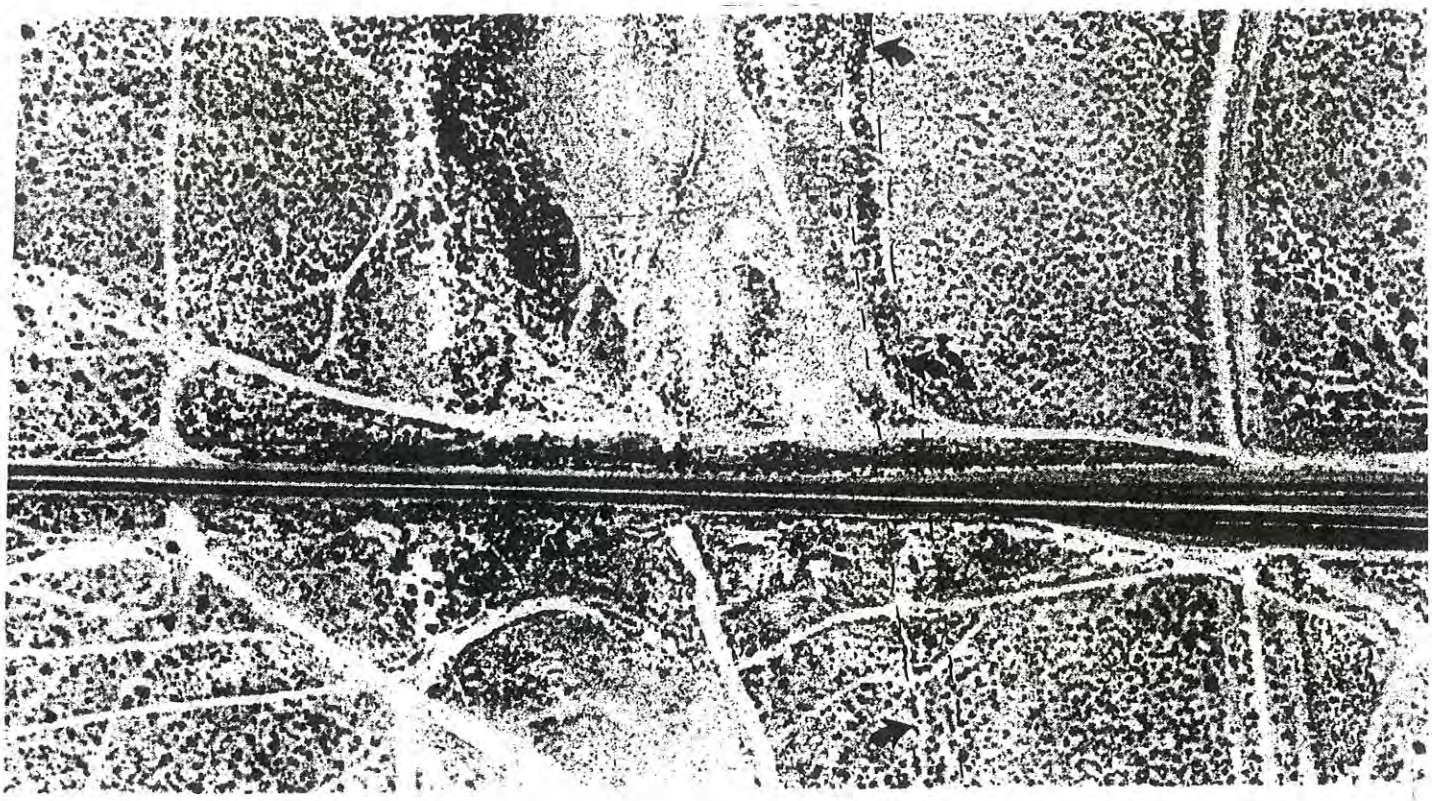
34. Site Accession No. N/A **Curated At:** N/A **35. Photos:** Yes

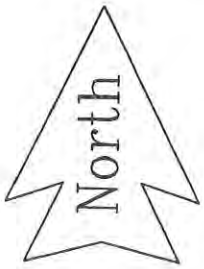
FB-CC4411

MACKO
ARCHAEOLOGICAL
CONSULTING

Permanent Trinomial: CA-SBr-4272H & CA-SBr-4411H
Other Designations: Mormon/Santa Fe Trail/ CHL-577

Archaeological Site Map







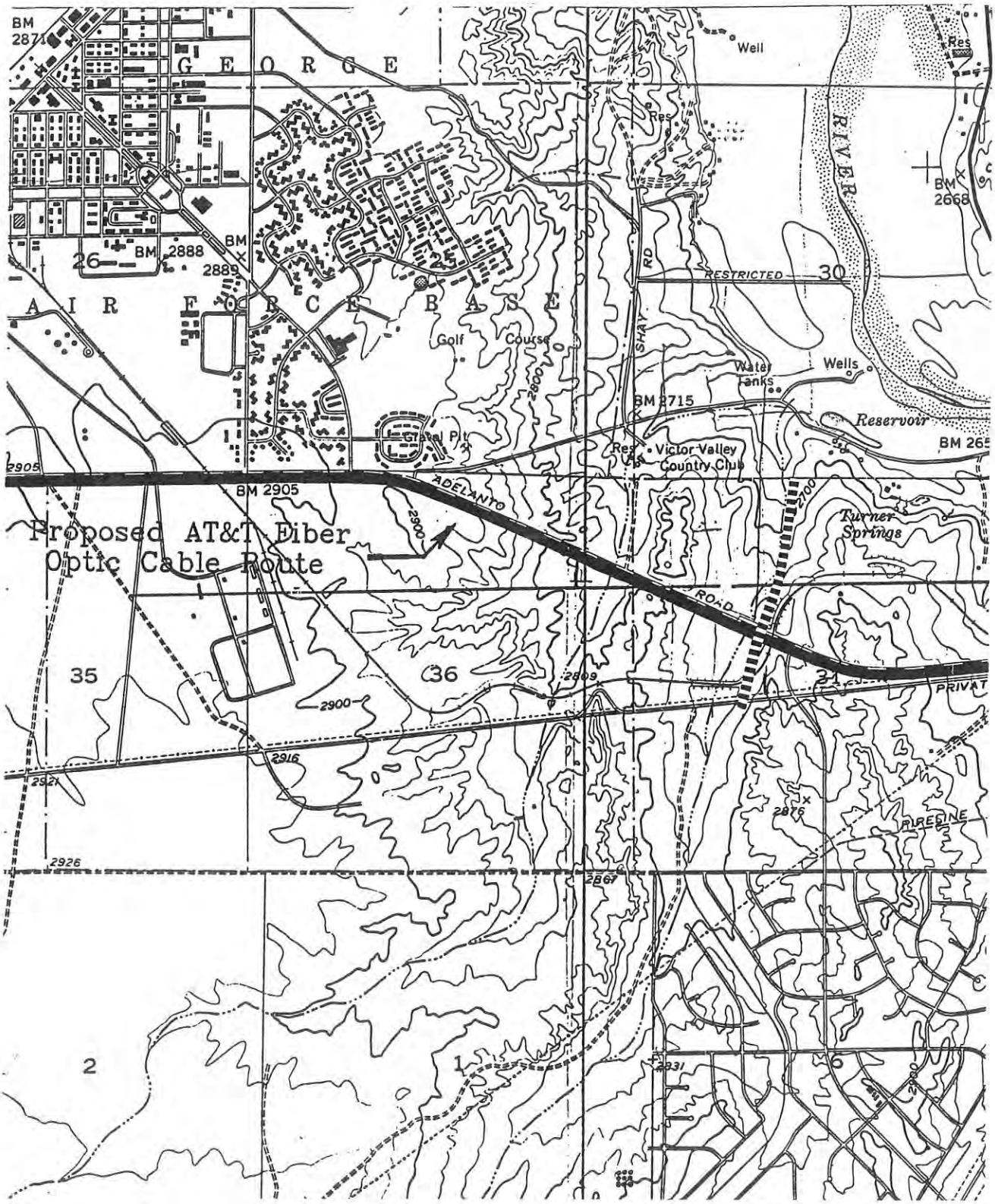
P36-0014

MACKO ARCHAEOLOGICAL CONSULTING

Permanent Trinomial: CA-SBr-4272H & CA-SBr-4411H

Other Designations: Mormon/Santa Fe Trail/ CHL-577

Archaeological Site Location Map **Page 4 of 4**



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-36- 004272 / P36-004411
HRI#
Trinomial CA-SBR-4272H/CA-SBR-4411H
NRHP Status Code

Other Listings
Review Code _____ Reviewer _____ Date _____

Page 1 of 4 *Resource Name or #: (Assigned by recorder) MA02409-Spanish Trail
P1. Other Identifier: Mormon Trail-Salt Lake Road
*P2. Location: ☒ Not for Publication ☐ Unrestricted
*a. County San Bernardino and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
*b. USGS 7.5' Quad Red Pass Lake Date 1996 T 14N ; R 7E NW ¼ of Sec 7 ; S. B. P.M.
c. Address City Zip
d. UTM (NAD 1983): Zone 11
Begin: 565910 m E 3909546 m N End: 565783 m E 3909406 m N
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Project Area: ☐ Superior ☒ Avawatz Parcel(s): 17

*P3a. **Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) Site CA-SBR-4272H/4411H is the combined Spanish Trail and Mormon Trail-Salt Lake Road. Segment 17 lies within and just east of Red Pass, which is broad alluvial wash situated between two mountaintops that forms a wide passage through and over the mountain range along the west side of Silurian Valley. The historic segment is a defined swale that is about 1,200 feet long and lies along the south side of a bladed road that traverses the pass. The swale has a line of creosote along the center of the swale, and the wash is primarily barren slope-washed sand and gravel bars with sparse creosote and sagebrush.

*P3b. **Resource Attributes:** (List attributes and codes) AH7 Historic Road
*P4. **Resources Present:** ☐ Building ☐ Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)



P5b. Description of Photo: (view, date, accession #) Overview, Seg. 17 Northeast (9-11-2002), SBR-4272H-02091111

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both

***P7. Owner and Address:**
☒ Ft. Irwin NTC
☐ State of California
☐ Private

***P8. Recorded by:** (Name, affiliation, and address)
Nathan Fleming
TRC Mariah Associates Inc.
136 East South Temple, Suite 1825
Salt Lake City, UT 84111

***P9. Date Recorded:** 9-11-2002

***P10. Survey Type:** (Describe) Block; intensive pedestrian inventory; 15-m intervals

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Survey report in preparation by TRC Mariah: *Archaeological Sample Inventory and Geoarchaeological Investigations, Proposed Superior, Avawatz, and Powerline Expansion Areas, Fort Irwin National Training Center, California.*

***Attachments:** ☐ NONE ☒ Location Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☒ Linear Feature Form ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☒ Photograph Record ☐ Other (List):

*Required information

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LINEAR FEATURE RECORD

Primary # P-36-
HRI#
Trinomial CA-SBR-4272H/4411H

 *Resource Name or # (Assigned by recorder) MA02409-Spanish Trail

L1. **Historic and/or Common Name:** Mormon Trail/Salt Lake Road

L2a. **Portion Described:** ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:** Segment 17

b. **Location of point or segment:** (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.)
Parcel: 17 USGS 7.5' Quad Red Pass Lake Date: 1996
UTM (NAD 1983): Zone 11
Begin: 565910 m E 3909546 m N End: 565783 m E 3909406 m N
T 14N ; R 7E ; Sec 7 ; S. B. P.M.

L3. **Description:** (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.) Segment 17 is a trail swale that lies along the south side of a bladed road adjacent to a broad alluvial wash at the eastern end of Red Pass. The trail is nonexistent farther west up near the head of the pass where the narrow wash has erased any evidence of the trail, and the bladed road is nonexistent in this area as well. Farther east the descending bladed road and the trail appear on a terrace south of the wash. The trail has been impacted somewhat by periodic alluvial activity.

L4. **Dimensions:** (In feet for historic features and meters for prehistoric features)
a. **Top Width** 13 feet 6 inches
b. **Bottom Width** 7 feet 6 inches
c. **Height or Depth** 12 inches deep
d. **Length of Segment** 1,200

L4e. **Sketch of Cross Section** (include scale) Facing: N/A

L5. **Associated Resources:** None

L6. **Setting:** (Describe natural features, landscape characteristics, slope, etc., as appropriate.) Segment 17 lies within the eastern portion of Red Pass, a broad alluvial wash situated between two mountaintops that forms a wide passage through and over the mountain range along the west side of Silurian Valley. The swale has a line of creosote along the center of the swale, and the wash is primarily barren slope-washed sand and gravel bars with sparse creosote and sagebrush. The view shed in this area is largely unimpeded except for a distant power line to the southeast and the bladed road adjacent to Segment 17.

L7. **Integrity Considerations:** Segment 17 possesses good to fair physical integrity for its entire length. The view shed is not significantly compromised by the power line, nor does the adjacent bladed road compromise the trail segment to the extent that it would preclude its contribution to the site's NRHP eligibility.

L8b. **Description of Photo, Map, or Drawing:** (View, scale, etc.)

L9. **Remarks:** Site CA-SBR-4272H/4411H is recommended as eligible for listing on the NRHP. It was an important eighteenth and nineteenth-century trade and emigration route through the southwestern desert to the southern California coast, and it facilitated Mormon settlement in the San Bernardino region from the Salt Lake Valley in the mid nineteenth century. Segment 17 is recommended as contributing to the site's overall eligibility because it exhibits sufficient physical integrity and the view shed retains good overall integrity of location, setting, feeling, and association.

L10. **Form Prepared by:** (Name, affiliation, and address)
James Lowe, TRC Mariah Associates Inc., 136 East South Temple, Suite 1825, Salt Lake City, UT 84111

L11. **Date:** 2-26-2003

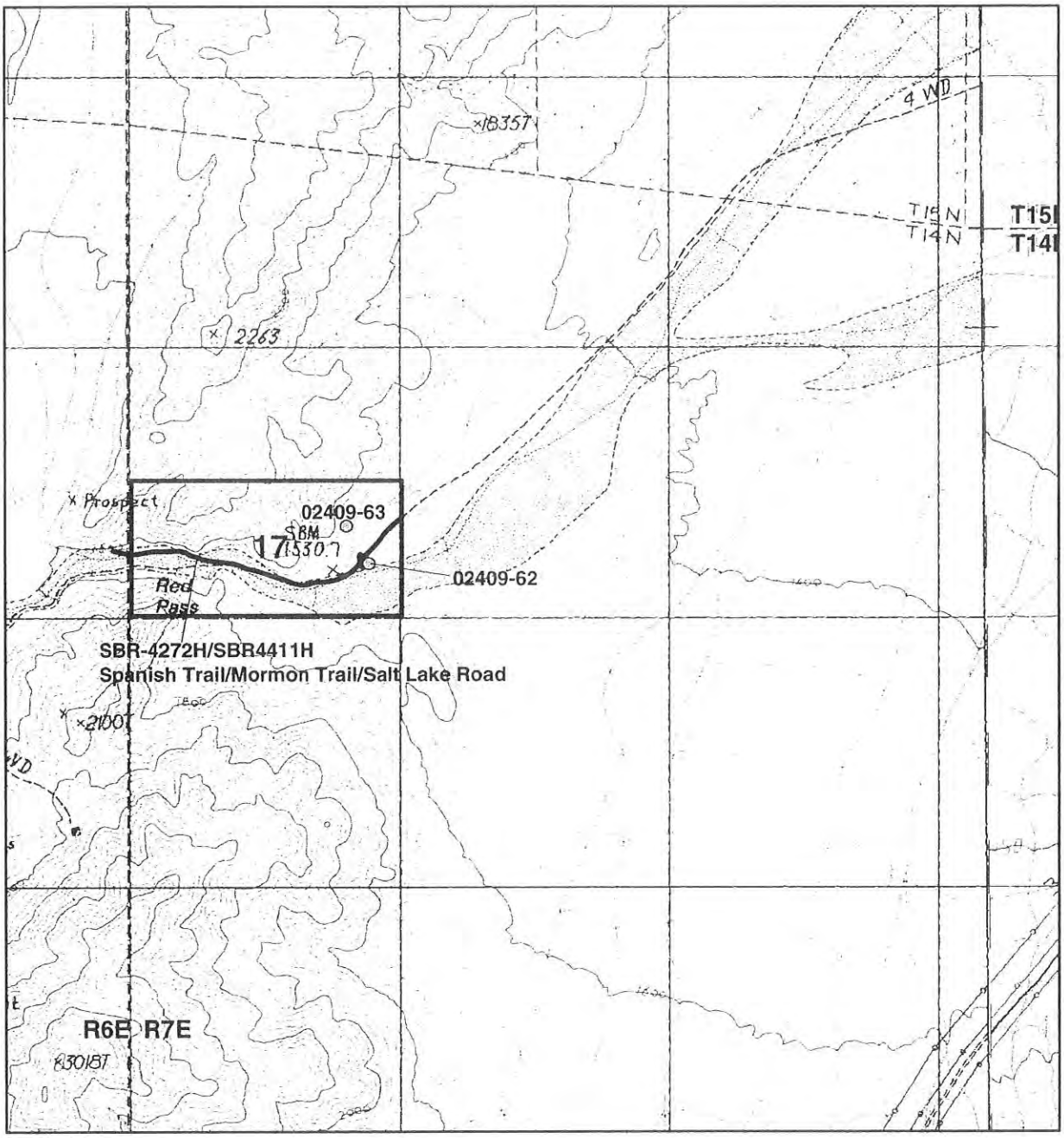
State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # P-36-
HRI#
Trinomial CA-SBR-4272H/4411H

Page 3 of 4 *Resource Name or # (Assigned by recorder) MA02409-Spanish Trail/Mormon Trail-Salt Lake Road

*Map Name: Red Pass Lake *Scale: 1:24,000 *Date of map: 1996



State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary # P-36-
HRI#
Trinomial CA-SBR-4272H/4411H

Page 4 **of** 4 **Project Name:** Fort Irwin Land Expansion **Year** 2002
Camera Format: Fuji Fine Pix 2600 Lens Size:
Film Type and Speed: Digital 2.2 Megapixel **Negatives Kept at:** TRC Mariah, Salt Lake City

Mo.	Day	Subject/Description	View Toward	Accession #
9	11	Overview of Red Pass Road, West End	East	SBR-4272-02091101
9	11	Valley Wash, North End	North	SBR-4272-02091102
9	11	Valley Wash, South End	South	SBR-4272-02091103
9	11	Red Pass, Up Slope, at West End	West	SBR-4272-02091104
9	11	Overview of Silurian Valley from East End of Red Pass	North	SBR-4272-02091105
9	11	Wash and Silurian Valley from East End of Parcel 17	South	SBR-4272-02091106
9	11	West End of Wash from East End of Parcel 17	West	SBR-4272-02091107
9	11	Overview of Silurian Valley from East End of Parcel 17	East	SBR-4272-02091108
9	11	Segment 17, Adjacent to Bladed Road	Northeast	SBR-4272-02091109
9	11	Segment 17, Adjacent to Bladed Road	Northeast	SBR-4272-02091110
9	11	Segment 17, Creosote Along Top of Swale	Northeast	SBR-4272-02091111
9	11	East End of Segment 17 Adjacent to Bladed Road	Southwest	SBR-4272-02091112
9	11	Segment 17, Trace Continuing East from East End of Parcel 17	Northeast	SBR-4272-02091113

PRIMARY RECORD **UPDATE**

Primary #: P-36-004411H
HRI #:
Trinomial: CA-SBR-4411H
NRHP Status Code: 3S
Other Listings: FS No. -05-12-53-012
Review Code Reviewer Date

***Resource Name or #:** Sanford Wagon Road # 1/"Mormon Trail"

P1. Other Identifier:

***P2. Location:** ■ **Not for Publication** □ **Unrestricted**

***a. County**: San Bernardino

***b. USGS 7.5' Quads:** Telegraph Peak, Calif. **Date:** 1996
T. 3N.; **R** 6W.; NW 1/4 of NW 1/4 NW 1/4 **of Sec.** 9 (; SW 1/4 of SW 1/4 **of Sec.** 4; **B.M.** San Bernardino Base Meridian (SBM)

c. Address: N/a City: Zip:

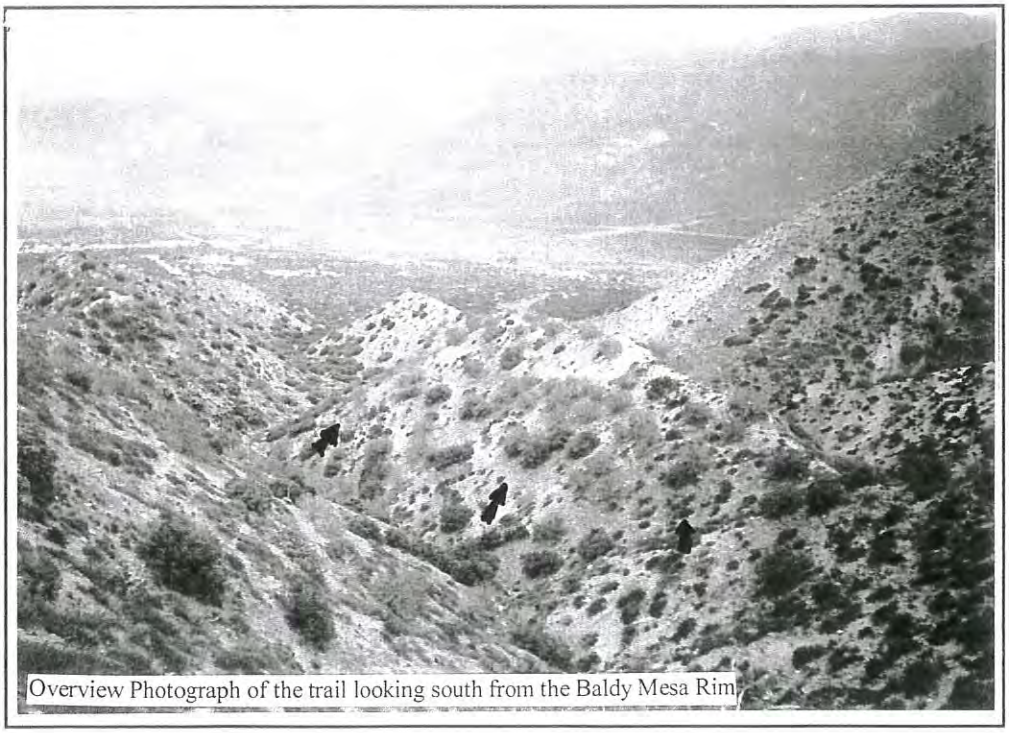
d. UTM: 1. **Zone 11**, 452290**mE**/3802760**mN** (southern end in A.P.E.)
2. **Zone 11,** 452499**mE**/3803360**mN** (northern end in A.P.E.)

e. Other Locational Data: Only a portion of the remnant trail was inspected within the A.P.E . (in the extreme northwest corner of Section 9 and in the southwest corner of Section 4). Portions of the trail continue to the south. The trail could not be located to the north; thick brush and colluvial debris has obscured the trail to the north of Forest Service Road 3N24. Additional locational data is in the attached Linear Feature Record.

***P3a. Description:** This record is submitted to supplement the other records on this site. Supplementary data on this linear site/remnant trail is in the attached Linear Feature Record.

***P3b. Resource Attributes:** HP37 (Highway/trail; AH7 (Roads, trails, railroad grades)

***P4. Resources Present:** □ Building □ Structure □ Object ■ Site □ District □ Element of District □ Other (Isolates, etc.)



Overview Photograph of the trail looking south from the Baldy Mesa Rim

P5b. Description of Photo: Southwest view of trail from the Baldy Mesa Rim

***P6. Date Constructed/Age and Sources:**
■Historic
❑Prehistoric
□Both

***P7. Owner and Address:**
San Bernardino National Forest
1824 S. Commercenter Circle, San Bernardino, CA 92408

*P8. **Recorded by:** John D. Goodman II, Melinda S. Benton, and Sharon L. Rushing

*P9. **Date Recorded**: 15 September 2000

*P10. **Survey Type**: intensive pedestrian survey of only the portion of the trail within the A.P.E.

*P11. **Report Citation**: A report on the project area regarding the Baldy Mesa Off-Road Vehicle Plan (actual title of report is not known by this author) is currently in progress.

*Attachments:
☐ NONE ■ Continuation Sheet ☐ District Record
❑ Rock Art Record ■ **Linear Feature Record**
■ **Location Map** ☐ **Building, Structure, and Object Record** ☐ **Artifact Record**
■ **Sketch Map** ❑ **Archaeological Record**
☐ **Milling Station Record** ☐ **Photograph Record**

***Resource Name or #:** Sanford Wagon Road # 1/"Mormon Trail"

L1. Historic and/or Common Name: Sanford Wagon Road/"Mormon Trail

L2a. Portion Described: __ Entire Resource ✓ Segment __ Point Observation **Designation:**

b. Location of point or segment: USGS 7.5' Quad: Telegraph Peak, Calif. **Date:** 1996 **T.** 3N.; **R** 6W.; NW 1/4 of NW 1/4 NW 1/4 **of Sec.** 9; SW 1/4 of SW 1/4 **of Sec.** 4; **B.M.** San Bernardino Base Meridian (SBM)

Situated in the very northwest corner of Section 9 and the southwest corner of Section 4, this remnant road/trail is visible by walking southward from Forest Service Road 3N24 to the Baldy Mesa rim and then peering over the rim to the south. A small footpath is obvious in the central area of a prominent ridge, and to the east and downhill from the footpath is the contoured remnant trail that was cut into the hillside. The site may be reached by vehicle from the intersection of I-15/Highway 138 by driving north on 3N21 (Baldy Mesa Road) to the intersection of 3N24. Go west on 3N24 past Manzanita Wash for approximately 1.5 mile and then walk for a short distance to the rim and look southward.

L3. Description: A segment of the trail is very visible on the ridges to the south of the Baldy Mesa rim. The trail, or portions of the trail, continue southwestward across the desert floor where it merges with SR 138. An historic marker for the trail (California State Historic Landmarks - San Bernardino #977) is somewhat south of where the trail merges with SR. 138. From the Baldy Mesa rim the trail is not visible across the desert floor. The engineered trail becomes very visible on the ridges up to the Baldy Mesa Rim where the hillside was cut to make the trail; the trail in this area has an average width of 7 feet. On the upper ridge top above the trail is a narrow footpath. Very close to the rim the trail is less visible due to erosion; this upper rim hill is loose sand, which is why the trail is less visible in the upper area (being less consolidated soil than on the more consolidated lower slopes). In this upper area before crossing the rim the remnant trail swings to the northwest and along the hill-slope contour and it would then have crossed the rim (and FS road 3N24) and continued downhill/northward on the west side of the drainage. The trail is not visible to the north of the road due to plant growth and erosion. The trail probably was not in the bottom of the drainage in this area but continued along the western side of the drainage following the hillside contours. To the west of the trail on a hill above FS road 3N24 is a small concrete foundation pad (Primary Number P36-064,356) that probably was a base for constructing another marker for the trail; construction of this marker appears to have been aborted. This trail segment was out of the current A.P.E., therefore only a preliminary survey of this trail was conducted.

L4. Dimensions: (In feet for historic features and meters for prehistoric features)

a. Top Width: an average of 7 feet **b. Bottom Width:** an average of 7 feet

c. Height or Depth: the hillside was cut on the uphill side to make the trail. The height of the cut averages about 10-feet high.

d. **Length of Segment**: The length of this segment is about 600 m. This segment may be all that remains of the trail in this area; areas both to the north and south of the segment have been obliterated by plant growth, erosion, off-road vehicles, and other constructions further to the north and south.

L5. Associated Resources: on the lower portion of the trail is a small mortared stone retaining wall constructed on the uphill slope to hold soil from washing onto the trail. Detailed recording of this wall was not conducted, although it was described as having a length of about 5 feet and a height of about 3 feet. There may be several cairns close to SR 138 and the Historic Marker that were interpreted as "graves" on early site forms.

L6. Setting: The intact portion of this trail is on the steep slopes to the south of the Baldy Mesa Rim. The vegetation is a mixed upper desert scrub and Pinyon-Juniper woodland. Joshua trees and other xeric plants are in the locality as well as some conifers. The Baldy Mesa rim is an area that collects well-sorted aeolian sand.

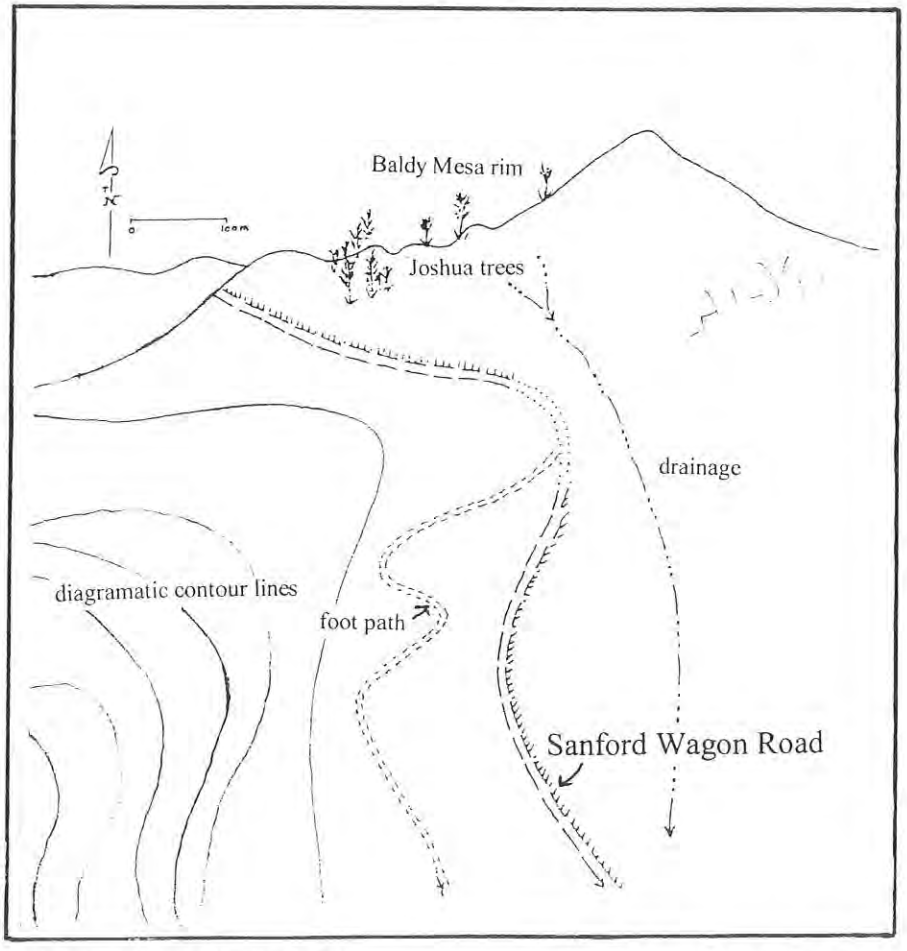
L7. Integrity Considerations: The segment of intact trail on the hill slopes is in relatively good condition and it maintains high integrity.

L8b. Description of Photo, Map, or Drawing: Attached maps include a small sketch of the trail, a plan map of the trail, an early 1856 map that shows the trail, and a location map.

L9. Remarks: Additional road/trail segments could perhaps be found by following refuse scatters and using a metal detector for finding nails and other metal objects along the trail. The drainage to the north of the trail has dense shrubs, many decades of repeated grass cover has obscured the (soil) ground surface, and OHV trails occur in the bottom of the drainage.

L10. Form Prepared by: John D. Goodman II, Heritage Program Archaeologist, San Bernardino National Forest. 1824 Commercenter Circle, San Bernardino, CA 92408

L11. Date: 1-10-2001



Schematic illustration of the upper Sanford Pass Wagon Road portion as it approaches the Baldy Mesa rim area.

Additional site background and historical data:

Old routes through Cajon canyon and pass included the Spanish Trail up Coyote/Crowder Canyon to the southeast, the rough 1850-1855 Sanford Wagon Road/"Mormon Trail" (CA-SBR-4411H), the subject of this record, and the second 1855-1861 Sanford Pass Road (CA-SBR-4413H) approximately 1.5 mile to the west of the first Sanford Wagon Road. After the discoveries of gold in Holcomb Valley in 1860 and the construction of the John Brown Toll Road in 1861, most freighters and travelers again began traversing the pass in the east Cajon area (see Beattie and Beattie 1951; Carrico et al. 1982; Ingersol 1904; La Fuze 1971:1; Leadabrand 1964; and Reynolds 1976).

The first (1850-1855) remnant Sandford Wagon Road/Mormon Trail (Site FS No. 05-12-53-012 [CA-SBR-4411H]) in Sections 4 and 9 was initially recorded in 1979 by Gene Taliaferro, a Cajon District Lands & Recreation Officer with the Forest Service. The site record is brief with many single-line entries such as "the old road bed is 5 to 10 feet wide . . . .[there are] three possible graves [that have the potential to be destroyed]." Attached to the Archaeological Site Survey Record are numerous photographs of the trail and the Historic Monument for the Mormon Trail (California Historical Landmark No. 977), some 1885 survey records, an 1856 survey map that has the two Sanford roads plotted (on this map the Sanford Wagon Road is called "Old Road," and a 1938 areal photograph that shows portions of the trail recorded in this study. Robert Reynolds of the San Bernardino County Museum filled out a site record for the road in 1981 on a brief San Bernardino County Museum Archaeological Site Record Form; Reynolds recorded a six-mile-long segment of the road from the Tejon-Palmdale Cutoff (4SBr 4203) from Lane's Crossing to the Tejon Road (4SBr 4415). Reynolds mentioned that the road "was laid out by William Sanford in 1850 . . . [and a portion of it] is shown in part of the San Antonio 15' quad (1903) and the Hesperia 15' quad (1902)." A notation on this form in the section for "Remarks," perhaps written by Lester Ross of the San Bernardino Information Center, says that the road traveled from Cajon Pass to the California-Nevada border through San Bernardino County. Attached to this site record is a handwritten note with "Stone Cairns; possible burials (historic?); reported by Mike Heartless 11-3-88" and a map showing the plotted burials as being close to SR 138 and the Mormon Trail Monument (California Historical Landmark No. 977). Robin Laska of the San Bernardino Information Center (personal communications, 1-11-01) mentioned that there may have been three rock cairns that were assumed to be human graves, although no work was ever conducted on them. The location and assessments of the "graves" or cairns were not determined by J. Goodman II and associates of the San Bernardino National Forest during the current work.

Following the Turtle fire in July 25-28, 1999, Doug Milburn of the Angeles National Forest recorded a number of sites in the footprint of the fire, including an update of the second historic wagon road in the nearby area that was referred to as the "(1855-1861) Sanford Pass Road" (Site CA-SBR-4413H). In the San Bernardino National Forest Primary Record compiled by Milburn (2000) is a discussion of the early trails and roads that is relevant to Site CA-SBR-4411H; this data was compiled primarily from Reynolds (1976) and Carrico et al. (1982):

> The Sanford Pass Wagon Road site is a remnant of the 1855-1861 historic freight wagon trail which is located on the north side of a small canyon which runs along the floor of West Cajon Valley to the rim of Baldy Mesa. . . .The first road (CA-SBR-4411H) through west Cajon Canyon and up into the Mojave Desert was established in 1850 by Captain William T.B. Sanford and hid brother-in-law, Phineas Banning, both wagon freighters. Earlier travel through the Cajon was through east Cajon Pass along the Old Spanish Trail, which was suitable only for foot travel and pack animals. Sanford's road was seven miles longer but, despite grades of 70%, was suitable for freight wagons. The first Mormon wagon trains entering San Bernardino Valley in 1851 used this route and Sanford's road became known to some as the "Mormon Trail.' Due to steepness on this "old" road, wagons descending from Baldy Mesa were forced to lock their wheels into a controlled skid while men and oxen slowed the descent with ropes. To avoid these problems, in 1855, Sanford developed a new road which crossed baldy

Additional historical data (continued):

Mesa ridge at a natural pass about 1.5 miles west of the old road. This route, which became known as the "Sanford Pass Road," had grades of only 30% and was used as the primary freight wagon route from San Bernardino Valley to the Mojave Desert from 1851 to 1861. When gold was discovered in Holcomb Valley in 1860, the demand for a shorter freight hauling route led to the construction of the John Brown Toll Road in 1861.

Robinson (1989:19) compiled a thorough history on the Mormons that entered the San Bernardino Valley; the following is an excerpt from that discussion:

"A company of almost 500 Mormons under the command of Apostle Amasa Lyman and Charles Rich left Salt Lake City in March 1851, 150 wagons bound for Southern California. Accompanying the wagon train was Jefferson Hunt, trail guide who knew the Salt Lake-to-Los Angeles route probably better than anyone else. The caravan followed the Old Spanish Trail . . . [in] early June 1851, they crossed Cajon Pass [on the Sanford Wagon Road] and set up camp in a sycamore grove, about two miles west of present -day Devore, in lower Cajon Canyon. . . . The Lugos agreed to sell a large portion of the ranch to the Mormon Colony . . . The Mormons chose a mile-square inclined plain two miles east of lower Cajon Creek for their town, which they named San Bernardino [at the present-day area where 3rd and 4th Streets intersect with "C"Street]. . . .Warned of a possible Indian attack, They hurriedly built a [quarter-mile square log stockade with two large gates] stockade with stout log buildings inside to house the families (Robinson 1989:19).

The Mormon Settlement was prosperous with its lumbering activities in Mill Creek Canyon and elsewhere, and they developed prosperous agricultural fields and irrigation networks. The Mormon colonists remained in the valley for only six years. Disputes over water rights and other problems between Mormons and non-Mormons eventually occurred around San Bernardino as increasingly larger numbers of people settled in the valley. Problems between Federal authorities and the Mormon government in Utah initiated Brigham Young to call for the return of the faithful in the San Bernardino Valley (and elsewhere) to help defend their Mormon Zion, and most of the Mormons in the valley left in the winter of 1857-1858; their industrious and stabilizing presence no longer permeated valley existence (Vickery 1984:65). The discovery of gold in Bear Valley (1858) and in Holcomb Valley (1860) lured miners and opportunists into the area bringing a new breed of Anglos into the region. San Bernardino gained the reputation of being a wild town full of saloons, brothels, and lawlessness (Beattie and Beattie 1951:308-309).

Additional historical data (continued)

References

Beattie, G. W., and H; P. Beattie
1951 *Heritage of the Valley: San Bernardino's First Century.* Oakland: Biobooks.

Carrico, Richard L., Frank Norris, Allan Schilz, Dr. Richard Minnich.
1982 *Cultural Resource Overview San Bernardino National Forest, California,* Volume I, pp. 4-33 - 4-35. WESTEC Services, Inc. San Diego, California.

Ingersol, Luther A.
1904 *Century Annals of San Bernardino County. 1769-1904.* Los Angeles: privately published.

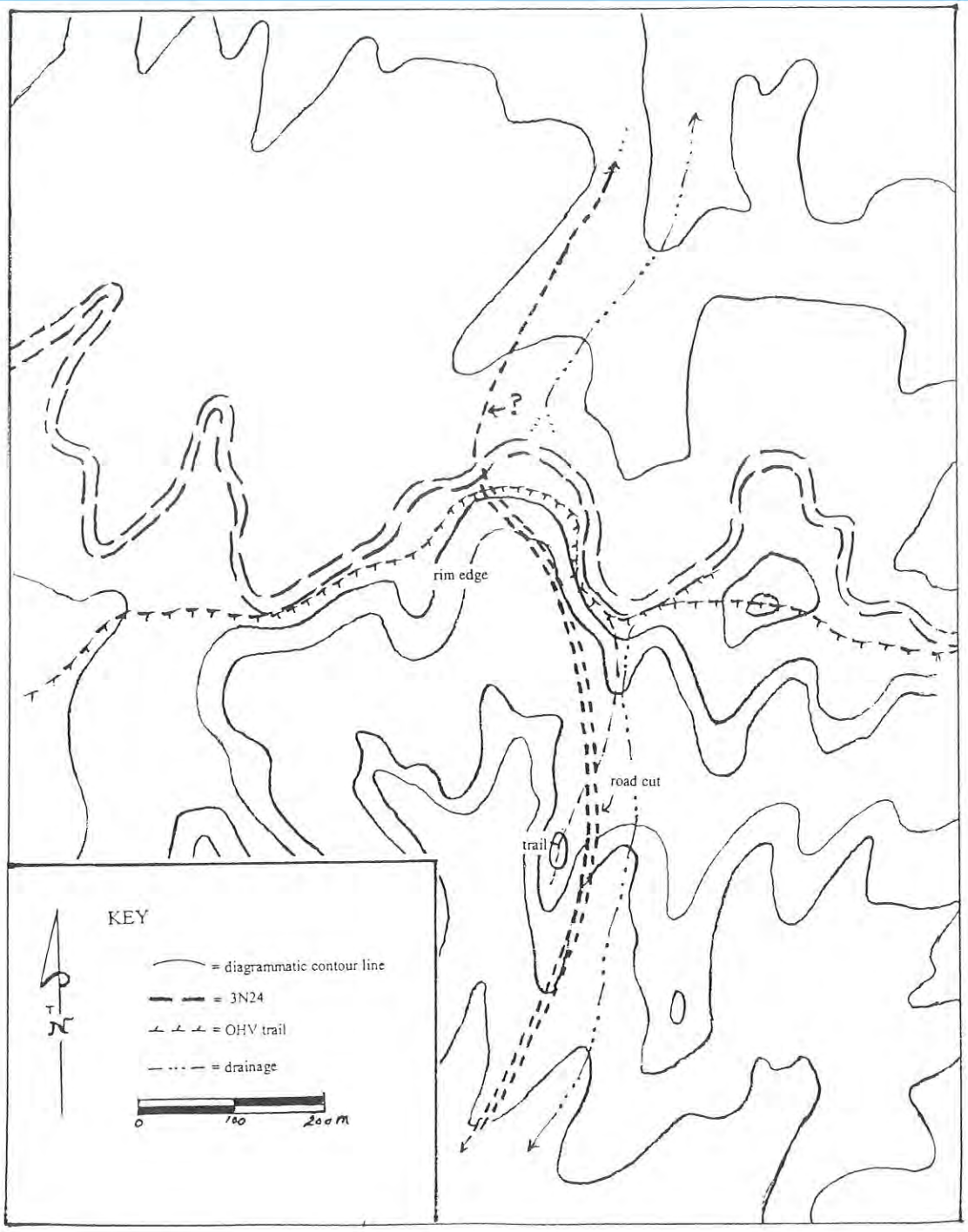
La Fuze, Paulina
1971 *Saga of the San Bernardinos*, 2 vols. San Bernardino County Museum Association.

Leadabrand, Russ
1965 *A Guidebook to the San Bernardino Mountains of California.* Ward Ritchie, Los Angeles.

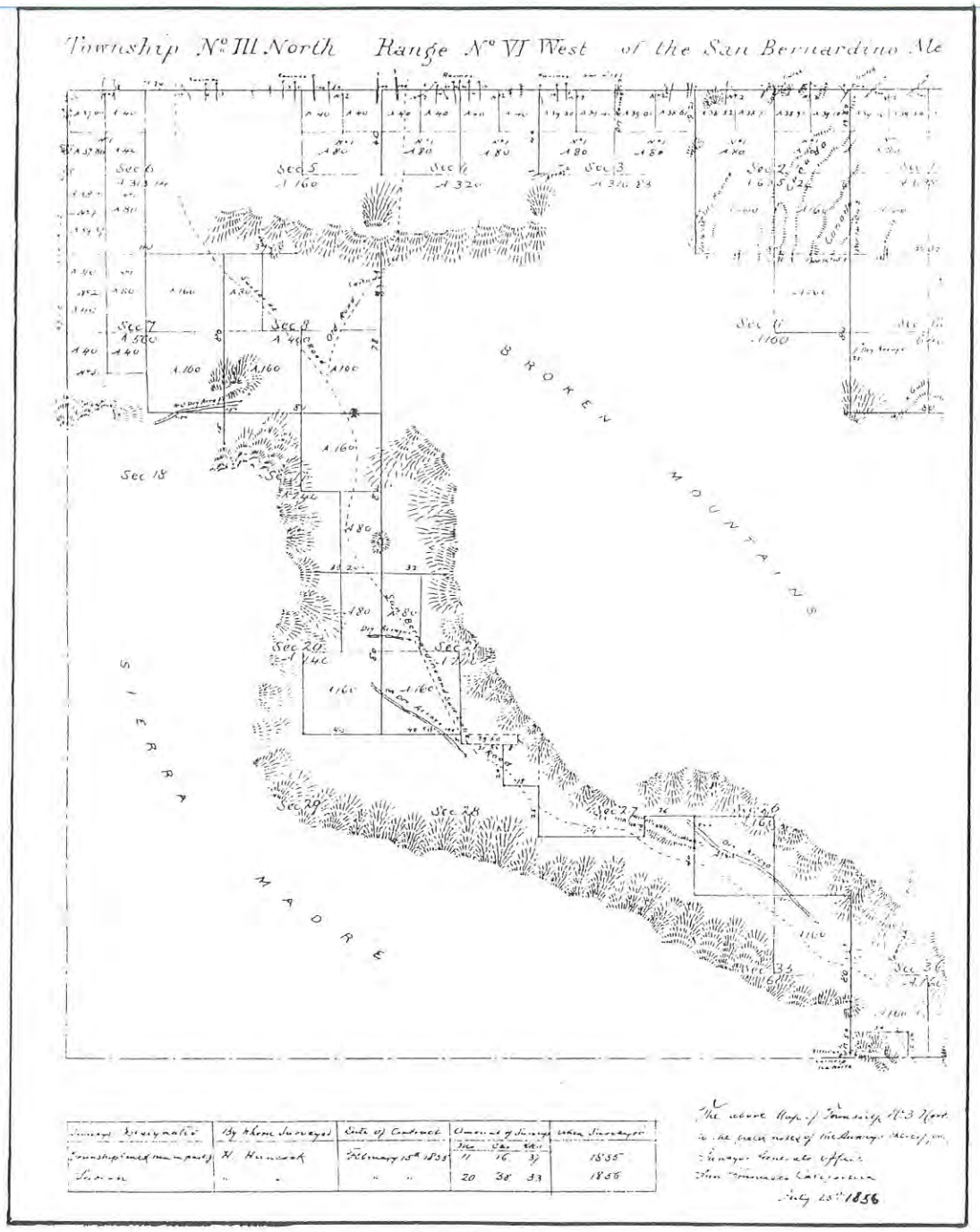
Reynolds, Robert E.
1976 *Baldy Mesa Off-Road Vehicle Open Area Archaeological Reconnaissance Report (05-12-CA-08).* On file USDA - Forest Service, San Bernardino National Forest, San Bernardino, California.

Robinson, John w.
1989 *The San Bernardino Mountains: The Mountain Country from Cajon Pass to Oak Glen, Two Centuries of Changing Use.* Big Santa Anita Historical Society.

Vickery, J. C.
1984 *Defending Eden: New Mexican Pioneers in the San Bernardino Valley.* Riverside: Riverside Museum Press.



Plan Map of the Sandford Wagon Road ("Number 1")/"Mormon Trail" crossing the Baldy Mesa rim area.



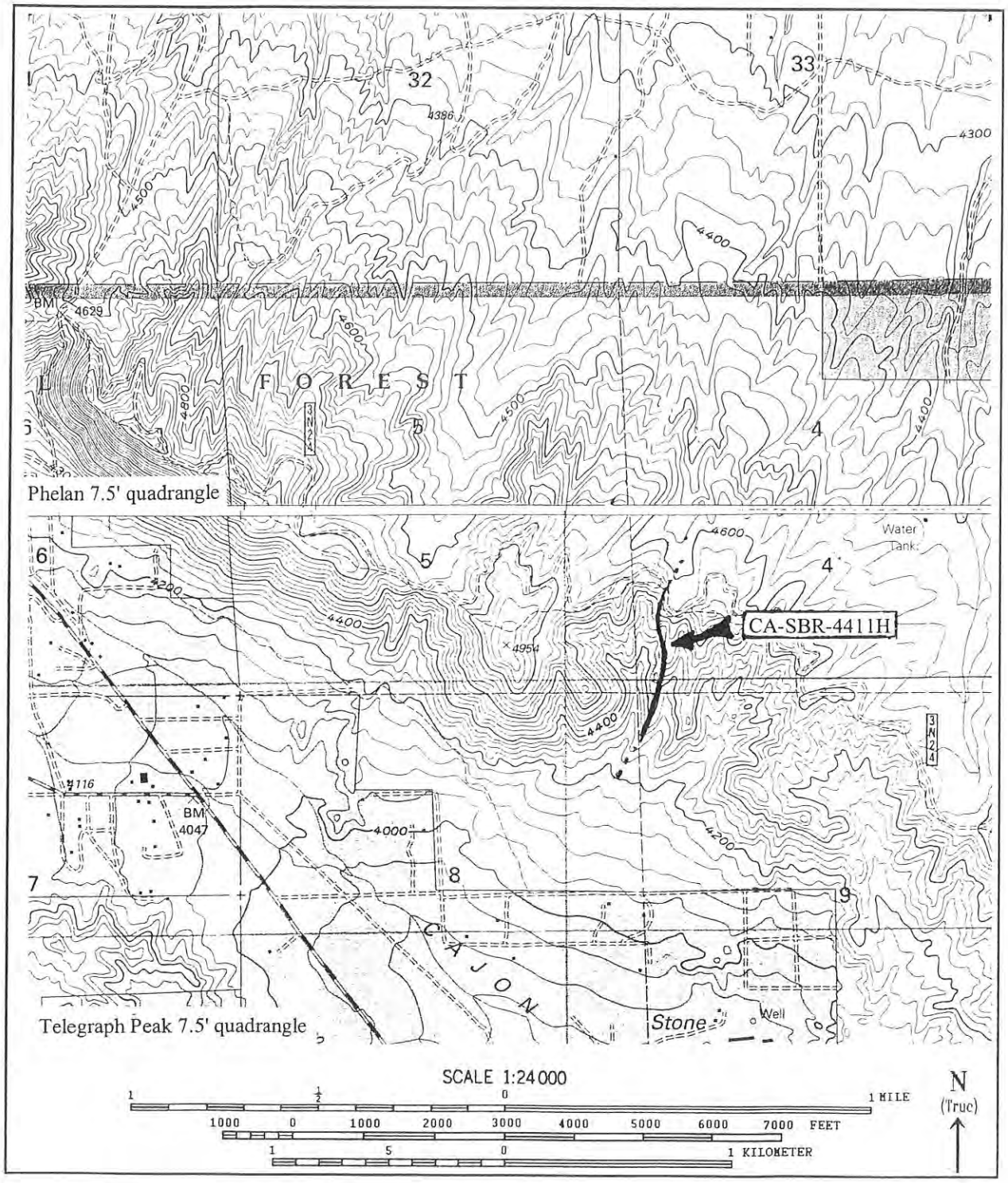
Historical 1856 map of Township 3N, Range 6 W, of public lands and plotted roads in the area (the "Old Road" is the 1850-1855 Sanford Wagon Road/"Mormon Trail, and the "Sanford Road" is the 1855-1861 road).

LOCATION MAP
State of California — The Resources Agency

Page 10 of 10

Primary #: P-36-004411H
HRS#
Triniomial: CA-SBR-4411H
***NRHP Status Code**: 3S

Resource Name or #: Sanford Pass Wagon Road #1/"Mormon Trail"
Map Name: USGS Telegrah Peak, Calif. **Scale:** 7.5"quadrangle, 1996 **Date:** 1996



P36-004

SAN BERNARDINO COUNTY MUSEUM
Archaeological Site Record Form

SBCM # 4786

Smithsonian # 4SBr 441

Site name Mormon Road County San Bernardino

USGS quad maps: 15', Phelan, Baldy Mesa, and Telegraph Peak 7½'

sec 21,22,28,33, T4N R6W; sec 4,8,9, T3N R6W
____ of ____ of ____ of ____ of ____ of ____ of ____ of ____ of section ____

Twp. ____, Rng. ____, SB Base Meridian. Elevation 3850-4600'

Distance ____ along bearing ____ from 451250

UTM grid #s or lat. and long. ~~626000~~ ~~3961000~~ 455000 ME ~~452000~~ ME
zone 11, 3809500 MN to ~~3802000~~ 3801500 MN

Site dimensions: area 6 miles depth ____

Site description, features, artifacts, owner, etc. The Mormon Road (laid out by William Sanford in 1850) is shown in part of the San Antonio 15' quad (19 and the Hesperia 15' quad (1902). It runs southwest from the Tejon-Palmdale Cutoff (4SBr 4203) from Lane's Crossing to the Tejon Road (4SBr 4415) then southerly through the center of the SW¼ SW¼ sec. 4, T.3N R.6W, SBBM, then southerly into West Cajon Canyon where it intersected (from 1854) the Sanfor Road at the approximate location of Highway 138.

Possibility of destruction ____

Other references ____

Informant ____ Address ____

Recorded by Robert E. Reynolds Date January 1981

Address SBCM

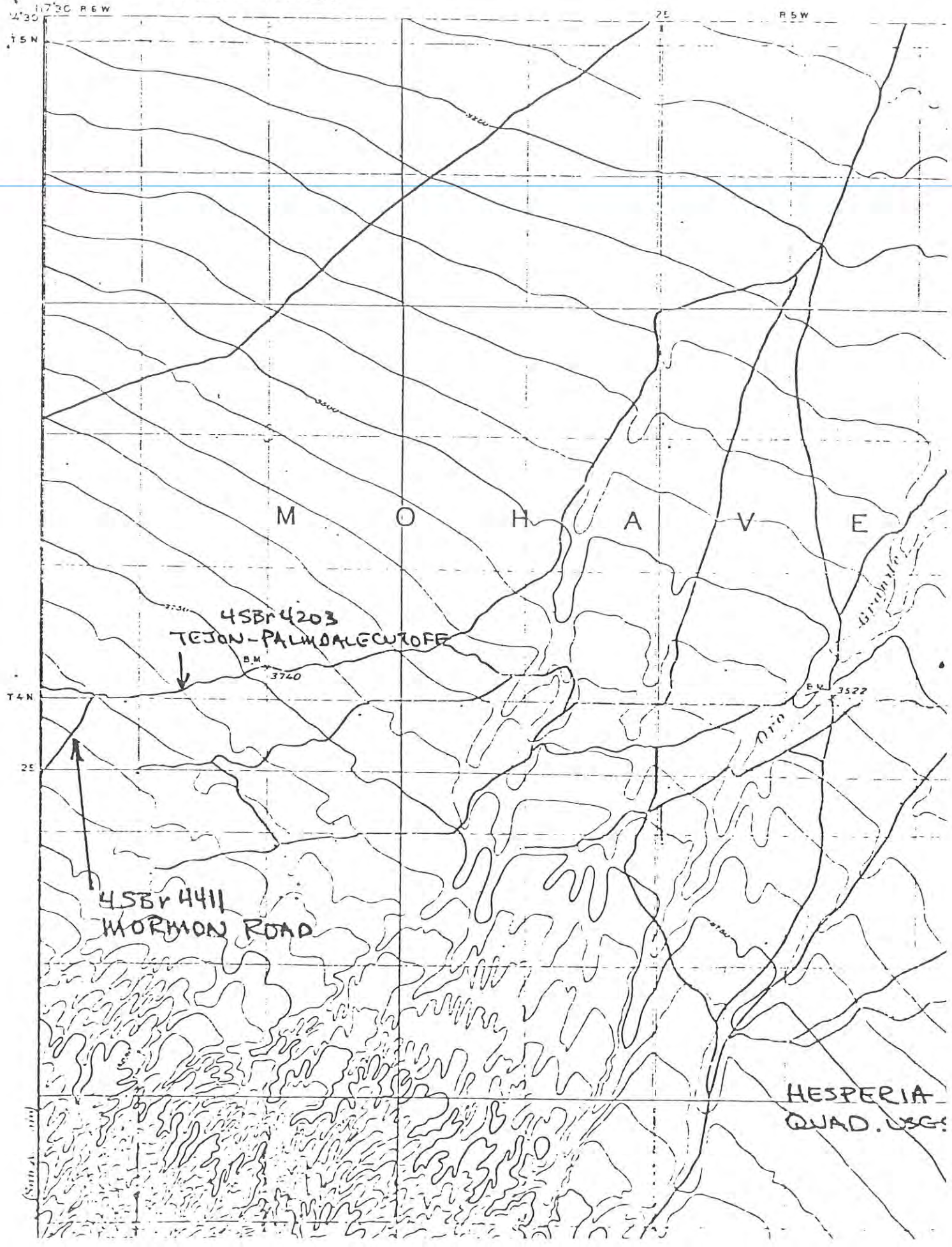
Remarks

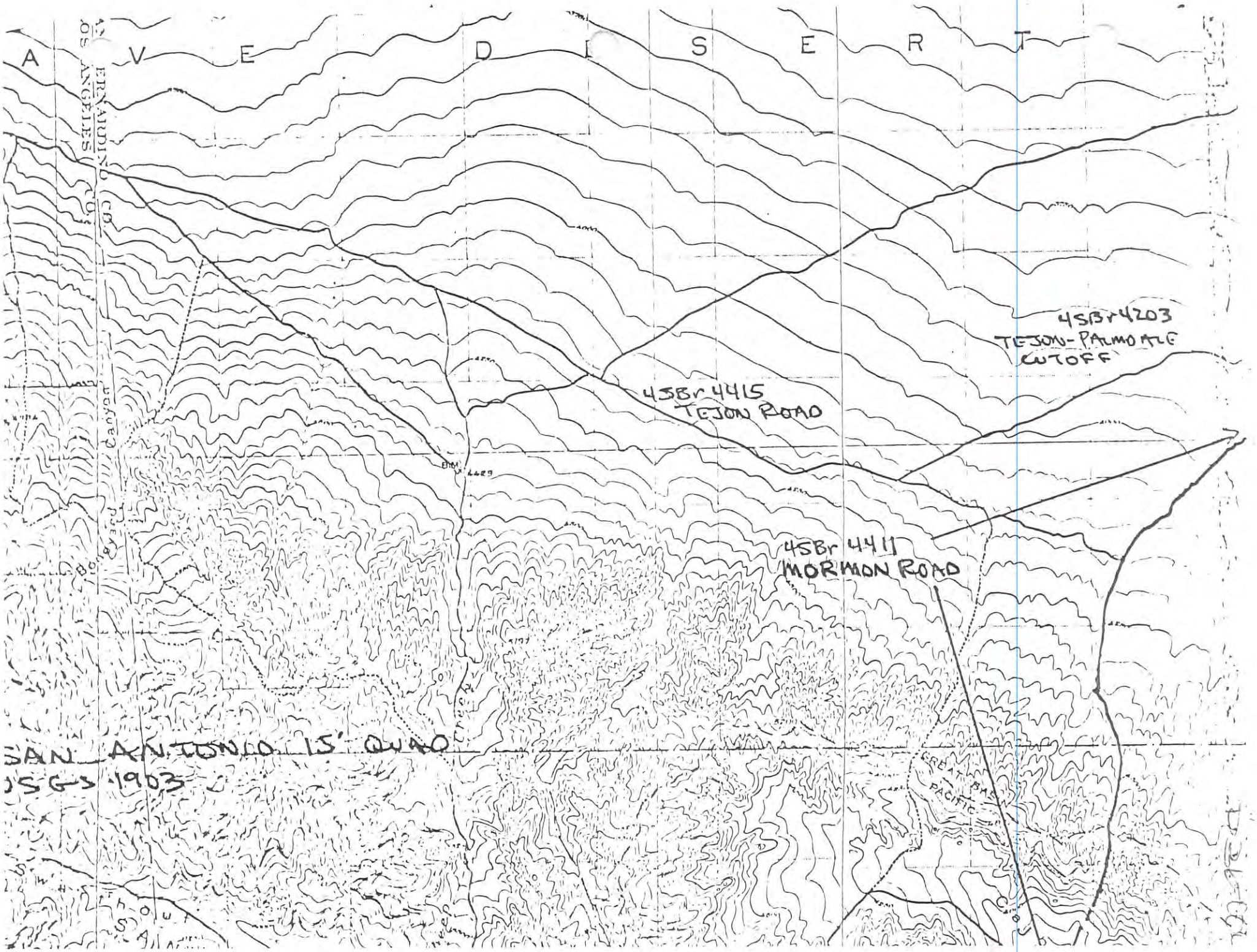
* ENTIRE ROUTE FROM CAJON PASS TO CAL-NEV BORDER THROUGH S.B. Co.

Sketch artifacts, site location, and features on back

P86-1004

DEPARTMENT OF THE INTERIOR
U S GEOLOGICAL SURVEY




A V E D I S E R T
SAN BERNARDINO CO.
LOS ANGELES CO.
45Br4203
TEJON-PALMDALE
CUTOFF
45Br4415
TEJON ROAD
45Br 441
MORMON ROAD
SAN ANTONIO 15' QUAD
USGS 1903
PACIFIC

P36-000441

4SBr 4411: Mormon Road



View northeasterly along faint trace of Mormon Road, looking toward Phelan Road where it intersects with 4SBr 4203, the Tejon Road-Palmdale Cutoff.

44/1

P.18d

USDA-FOREST SERVICE
CALIFORNIA REGION

FS No. 05- 12-53-V2 012

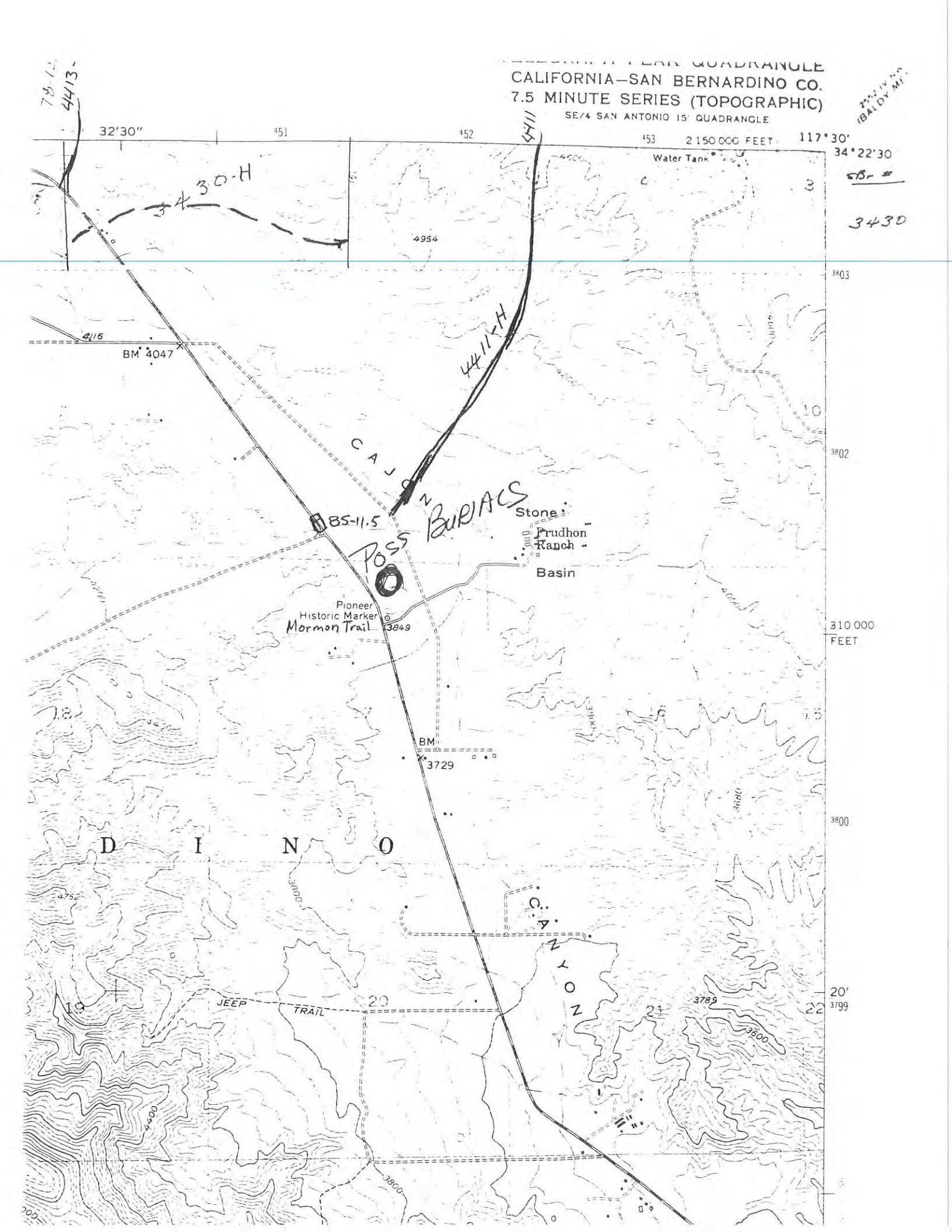
ARCHAEOLOGICAL SITE SURVEY RECORD

1. Site Old Sanford Road used 1850-1855 (Mormon Road) off Baldy Mesa & three ~~possible grave sites.~~	2. Map USGS, Telegraph 7½' Quad
3. County San Bernardino	4. Township 3N Range 6W, NW ¼ of NW ¼ of Section 9, SW ¼ of SW ¼ of Section 4
5. UTM Grid or Long & Lat. 452, 450 ME & 3,803,000 MN/Lat. 34° 22' 29" N & Long 117031" W	
6. Location Almost due north of the Stone Basin Turkey Ranch buildings (N3°W), running from valley floor to rim of Baldy Mesa.	
7. Contour Elevation 4200 to 4600' MSL	8. Previous site designation Also called "Old Road" & "Mormon Road"
9. Owner National Forest Public Land, San Bernardino National Forest	10. Address Lytle Creek Ranger Station, Star Rt. Box 100, Fontana, CA 92335
11. Present tenant 92335 is Cajon R.D. office our Supervisors Office is at 144 N.Mt. View, San Bernardino, CA	
12. Description of site Old road bed, about 5 to 10 feet wide, runs up the east side of a small ridge and then traverses to west as it reaches the Baldy Mesa Rim.	
13. Area est. ½ mile length x 10' wide = .6 acre	14. Depth Existing surface
15. Vegetation Chapparral, chamise, manzanita, yucca, grasses	
16. Nearest water Residence wells to south	17. Soil of site Fine to course sand, gravel
18. Surrounding soil type Same	
19. Previous excavation None known of. Found on 7/5/1938 Aerial photo. #AXL-62-89	
20. Cultivation-logging None known of.	
21. Buildings, roads, etc. No building but old road bed is still fairly visible.	
22. Erosion yes in places	23. Possibility of destruction Yes to the three possible graves.
24. Features (burials, house pits, etc.) In 1851 Mormon (Church of Jesus Christ of Latter-Day Saints) used this roadbed when colony came from Salt Lake City to San Bernardino	
25. Artifacts	
26. Remarks See the attached original survey maps and field notes by GLO surveyors	
27. Published references Navy (ElR Hills) Oil Pipeline ARR. See list that is attached & brief history from proposed.	
28. Sketch map See attached maps	29. Photos Taken & attached
30. Recorded by Gene Taliaferro, Cajon District Lands & Recreation Officer	31. Date 11/19/79
32. Continuation Sheet Yes ☐ No ☒	

FOR OFFICIAL USE ONLY

R5-2(10)-31
(5/79)

012
05-12-53-V2


CALIFORNIA—SAN BERNARDINO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE/4 SAN ANTONIO 15' QUADRANGLE
32'30"
451
452
453
2 150 000 FEET
117°30'
34°22'30
Water Tank
4954
4116
BM 4047
4411-H
CAJON
BS-11.5
POSS BURIALS
Stone
Prudhon Ranch
Basin
Pioneer Historic Marker
Mormon Trail
3849
BM
3729
DINO
JEEP TRAIL
3789
3500
3800
4400
4752
3680
3803
3802
3800
3799
310 000 FEET
20'
3430

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # 36-004411
HRI #
Trinomial CA-SBR-4411H; Update
NRHP Status Code

Other Listings
Review Code Reviewer Date

*Resource Name or #: (Assigned by recorder)

P1. Other Identifier: Mormon Road

*P2. Location: *a. County San Bernardino, CA ☒ Not for Publication ☐ Unrestricted

*b. USGS 7.5' Quad ~~Adelanto and Victorville,~~ CA 1956 Date 1956 (Photorevised 1993)

T 5 N; R 5 W; NE ¼ of SE ¼ of Sec 33; S.B.B.M.

c. Address: City Zip

d. Zone 11 463358 mE/ 3814707 mN (west end at edge of project area)
463433 mE/ 3814724 mN (east end at edge of project area)

e. Other Locational Data (e.g., parcel #, legal description, directions to resource, additional UTMs, etc., when appropriate): CA-SBR-4411H crosses US-395 just south of Milepost 9.0, placing it within the Area of Potential Effect (APE) of the current US-395 Widening Project. The section within the project area trends in a northeast-southwest direction. Access: From the intersection of US-395 and Phelan Road, travel north approximately 3.3 mi to the road, which is easily identifiable by two wooden fence posts bordering the road entrance on the west side of US-395.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries): Originally recorded in 1981 by Robert Reynolds, CA-SBR-4411H consists of the historical Mormon Road, established in 1850 (Arbuckle 1979). Originally used by Mormon pioneers, then others, to enter and colonize the San Bernardino Valley, this road is still visible today, although continued use has obliterated original features such as wagon wheel ruts within the area examined. What remains is a dirt road approximately 8 ft wide, 253 linear feet of which crosses the current project area. Numerous tire tracks attest to its continued use by automobiles and off-road vehicles. No associated artifacts were observed within the segment examined during the current survey.

Reference: Arbuckle, Jim, 1979. Survey Report of California Registered Historical Landmarks.

*P3b. Resource Attributes (List all attributes and codes): AH 7: Road.

*P4. Resources Present: ☐ Building ☐ Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other:

P5. Photograph or Drawing: (Photograph required for buildings, structures, and objects.)

*P6. Date Constructed/Age and Source: ☐ Prehistoric ☒ Historic ☐ Both

*P7. Owner and Address: Unknown.

*P8. Recorded by (Name, affiliation, address): M. Linder, C. Cisneros, D. Largo, L. Burgos, Applied EarthWorks, Inc., 3292 E. Florida Ave., Suite A, Hemet, CA 92544.

P9. Date Recorded: June 5, 2007

*P10. Type of Survey: ☒ Intensive ☐ Reconnaissance ☐ Other
Describe: Maximum 15 m pedestrian transects.

*P11. Report Citation (Provide full citation or enter "none"): None yet.

Attachments: ☐ None ☒ Location Map ☐ Site Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Site Record ☐ District Record ☒ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☒ Photograph Record Other:

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LINEAR FEATURE RECORD

Primary # SBR
Trinomial CA-~~RIV~~-4411H; Update

 ***Resource Name or #** (Assigned by recorder)

L1. **Historic and/or Common Name:** Mormon Road

L2a. **Portion Described:** □ Entire Resource ☒ Segment □ Point Observation **Designation:**

b. **Location of point or segment** (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map): This resource crosses US-395 in a northeast-southwest direction approximately 3.3 mi north of Phelan Road. Approximately 253 linear feet of the resource (the portion crossing the current project area) was examined during the current survey. UTM coordinates for that segment of the road within the project area are: 463358 mE/3814707 mN (west end); 463433 mE/3814724 mN (east end).

L3. **Description** (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate): The Mormon Road, laid out by William Stanford in 1850, runs northeast-southwest within the current project area. Originally used by Mormon Pioneers, and later by others, to enter and colonize the San Bernardino Valley, this road is currently used by automobiles and off-road vehicles. This dirt road measures approximately 8 ft wide. Approximately 253 linear feet of this road traverses the project area. The only features observed are two wooden fence posts (former railroad ties) bordering the road entrance on the west side of US-395. No other associated features or artifacts were noted within the segment examined.

L4. **Dimensions** (In feet for historic features and meters for prehistoric features):
- a. **Top width** 8 ft
- b. **Bottom width** N/A
- c. **Height or Depth** N/A
- d. **Length of Segment** 253 ft

L4e. Sketch of Cross-Section

L5. **Associated Resources:** None within segment recorded herein.

L6. **Setting** (Describe natural features, landscape characteristics, slope, etc., as appropriate): The segment recorded herein is situated within a relatively flat valley floor. Joshua trees, creosote, rabbit brush, and salt brush are common in the area. Exposure is open/360°.

L7. **Integrity Considerations:** Integrity is somewhat impaired by continued use of this road by automobiles and off-road vehicles; however, the alignment of the route appears intact and is consistent with GIS data.

L8a. **Photograph, Map, or Drawing:**



L8b. **Description of Photo, Map, or Drawing** (View, scale, etc.): Road entrance bordered by railroad ties on west side of US-395, looking west.

L9. **Remarks:** The site will be impacted by the US-395 Widening Project. However, site integrity is already compromised in the vicinity of US-395.

L10. **Form Prepared by** (Name, affiliation, and address): M. Linder, Applied EarthWorks, Inc., 3292 E. Florida Ave., Suite A, Hemet, CA 92544.

L11. **Date:** 6/5/07.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPH RECORD

Primary #
Trinomial CA-SBR-4411H; Update

 *Resource Name or # (Assigned by recorder)

Temporary Number/Resource Name:
Project Name: Caltrans: SR395 Survey **Photographer:** D. Largo
Image Type: □ (**bw**) 35mm B&W film □ (**cp**) 35mm Color Print film □ (**cs**) 35mm Color Slide film
□ (**df**) Digital-Floppy disk ☒ (**dm**) Digital-Memory flash card
Camera Type and Model: Nikon Coolpix 4300
Film Type and Speed: Flash card **Roll Number:** SR395-2-dm
Year: 2007

Mo.	Day	Time	Frame/ File Name	Subject/Description	Facing
6	5	1305	DSCN0068	CA-SBR-4411; sight overview, west side of Hwy. 395.	W
6	5		DSCN0069	CA-SBR-4411; sight overview, west side of Hwy. 395.	E
6	5	1315	DSCN0070	CA-SBR-4411; sight overview on east side of Hwy. 395.	E
6	5		DSCN0071	CA-SBR-4411; sight overview on east side of Hwy. 395.	W

State of Calfornia — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

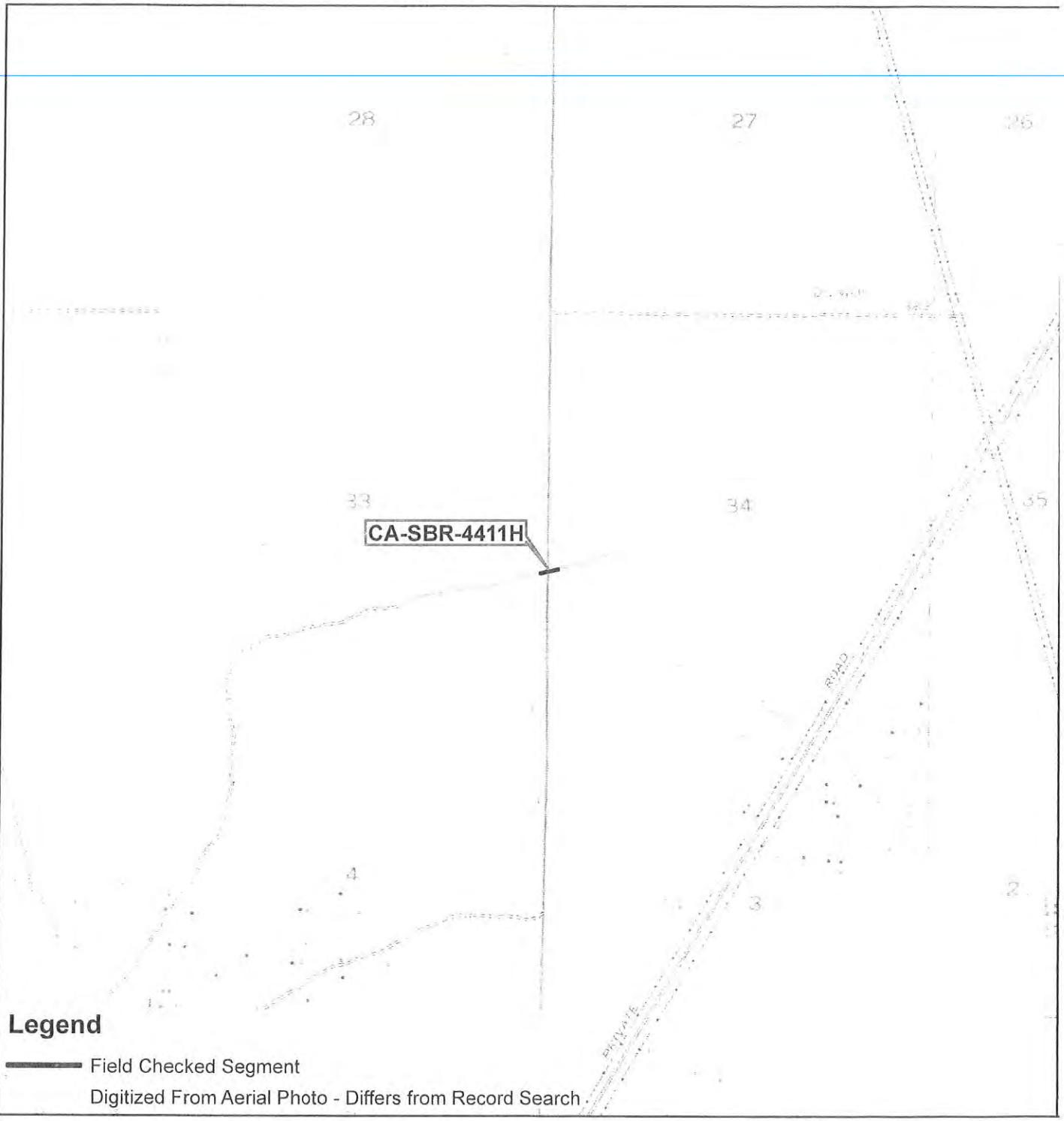
Primary # 36-004411
HRI#
Trinomial CA-SBR-4411H

*Resource Name or #: Mormon Road

*Map Name: ~~Adelanto, CA~~ BALDY MESA

*Scale: 1:24,000

*Date: 1956 (1993)



Legend

Field Checked Segment

Digitized From Aerial Photo - Differs from Record Search

1,000 500 0 1,000 Meters

0.5 0.25 0 0.5 Miles

2,000 0 2,000 Feet

TRUE NORTH

*Required information

P86-0044

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE RECORD

Permanent Trinomial: ~~SBR-847~~ SBR-4411-H Supplement ☐

Temporary Number: ISR 31/01/87

Page 1 of ____ .

Agency Designation: _____

1. County: San Bernardino, CA Site Name: Lower Red Pass, Northwest Side

2. USGS Quad: Red Pass Lake, CA (7.5') 1986 (15') _____ Photorevised _____

3. UTM Coordinates: Zone 11 / _____ Easting / _____ Northing (X)

4. Township 14/15N Range 7E ¼ of ____ ¼ of ____ ¼ of ____ ¼ of Section ____ Base (Mer.) SBM (X)

5. Map Coordinates: 172 mmS 435 mmE (from NW corner of map) (X) 6. Elevation 1360 ft/415 m.

7. Location: Highway #127 north from Baker, CA. 13.5 km to Silver Lake T&T train station (abandoned); turn left (W) across Silver Lake (dry-usually) 4.2 km to Electric power line corridor, thence left to .4 km beyond fenced BLM cairn site; thence right onto bladed road trending SW for (X)

8. Prehistoric X Historic X Protohistoric ____ 9. Site Description: (A) Rock alignments on desert pavement; (B) Prehistoric trail segments; (C) Historic trails segments of 'Old Spanish' trail ~~from~~ SBR-4272-H Santa Fe to Missions of coastal California and segments of the Mormon Road SBR-4411-H from St. George to San Bernardino; (D) US Army abandoned gun emplacements from WW II and Korean (X)

10. Area: 2000 m(length) x 350 m(width) .7KM² m² Method of Determination: Scaling on topo map (X)

11. Depth: Undetermined cm Method of Determination: _____ (X)

12. Features: (A) Two groups of rock alignments are visible on stretches of desert pavement at the northernmost part and in the saddle between the two small hills. Both areas of alignments have been slightly dist- (X)

13. Artifacts: ~~Informants have told this reporter that "arrowheads" had been~~ found in the ares (exact locations not stated).

( )

14. Non-Artifactual Constitutients: _____

( )

15. Date Recorded: 31 Jan 1987 16. Recorded By: James S. Benton ( )

17. Affiliation and Address: SBCM, ASA, ARARA ( )

DPR 422A (Rev. 8/82)

T26-0044

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE RECORD

Permanent Trinomial: _____ / _____ (mo. / yr.)

Temporary Number: JSB 31/01/87

Agency Designation: _____

Site Name: Lower Red Pass, Northwest side

18. Human Remains: None Noted. ( )

19. Site Integrity: Disturbed by : 1) normal erosion; 2) US Army field exercises; 3) ORV enthusiasts; 4) cattle, sheep, horses, & burros; 5) prospectors; users of Spanish and Mormon trails. ( )

20. Nearest Water (type, distance and direction): Red Pass Lake (ephemeral) 11.3 km SW. ( )

21. Largest Body of Water within 1 km (type, distance and direction): NONE ( )

22. Vegetation Community (site vicinity): Creosote scrub [Plant List ( )] ( )

23. Vegetation Community (on site): " [Plant List ( )] ( )

References for above: _____ ( )

24. Site Soil: Desert pavement (X) 25. Surrounding Soil: Volcanic alluvium (X)

26. Geology: Volcanic ( ) 27. Landform: Bajada, eroded & faulted (X)

28. Slope: 3% (X) 29. Exposure: Northeast ( )

30. Landowner(s) (and/or tenants) and Address: BLM (Public domain) with possible mining claims none of which appear to be active as of the date of this report. ( )

31. Remarks: This site was partially reported in 1975. The boundary plotting was determined by the land form as shown on the 7.5' map. It seems (X)

32. References: _____ ( )

33. Name of Project: Surface survey. ( )

34. Type of Investigation: Surface survey. ( )

35. Site Accession Number: _____ Curated At: _____ ( )

36. Photos: 35mm slides available Taken By: James S. Benton ( )

37. Photo Accession Number: _____ On File At: _____ ( )

P36-004411

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE RECORD
Continuation Sheet

Page 3 of ____ .

Permanent Trinomial: _____ / _____ (mo. / yr.)

Temporary Number: JSB 31/01/87

Agency Designation: _____

Item No.	Continuation
3.	The site boundaries begin at the intersection of arroyo stream bed and T14/T15 a few meters E of the 4WD road at 11/56750E/3910565N, (designated as "POINT A"); thence SW 2.0 km. to 11/56000E/3909000N; from here the line runs NW .35 km to Point B on the east facing bajada slope NW of USGS SBM 1530.7 at 11/565600E/3909025N; thence NE to 11/566000E/3910800N; thence SW to point A.
4.	The mismating of the 15' topographic maps (Red Bass Lake, CA 1948 and Baker, CA 1956) by approximately 2,600 feet along longitude 116° 15' was adjusted with the publication of the current 7.5' Red Pass Lake, CA 1986. There are no section shown south of T14/15 and east of Range line 6/7E.
5.	Map coordinates are for point "A".
7.	8.25 kilometers.
8.	The site boundaries contain both prehistoric and historic elements,
9.	Conflict field maneuvers which overflowed from Ft. Irwin; (E) twp stones with evidence of having been used as metates.
10.	and use of odometer on automobiles.
12.	urbed by ORV and US Army activities. (B) Trail segments seem to converge into Red Pass after traversing the open pavement alongside the present road both to the left and the right. (C) the present bladed vehicle road is the deepened travel route for the Spanish road from Santa Fe to the Los Angeles mission area and also the route of the Mormon Trail from St. George and Salt Lake City to the Mormon settlements about San Bernardino, CA. It was abandoned as a main road sometime in the 1930s. (D) The US Army tanks had

P36-0044

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARCHEOLOGICAL SITE RECORD
Continuation Sheet

Page 4 of ____ .

Permanent Trinomial: _____ / _____ (mo. / yr.)

Temporary Number: JSB 31/01/87

Agency Designation: _____

Item No.	Continuation
12.(con/t)	has maintained one of its major tank maneuver areas to the west of Red Pass from which the Salt Creek valley was easily accessible, (and was unchallenged by other legal users.) (E) The two stone metates are three meters east of the rock alignment which is in the saddle between the two small hills.
31.	to contain neatly nearly all of the elements of the site, both historic and prehistoric. The land is desert bajada which can be chnaged by severe sheet erosion and flash flooding, although this seems to be a very remote possibility. The SBM is a substitute for one that had been destroyed by washing or being disturbed.

P26-00

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

FEATURE RECORD

Page 5 of ____.

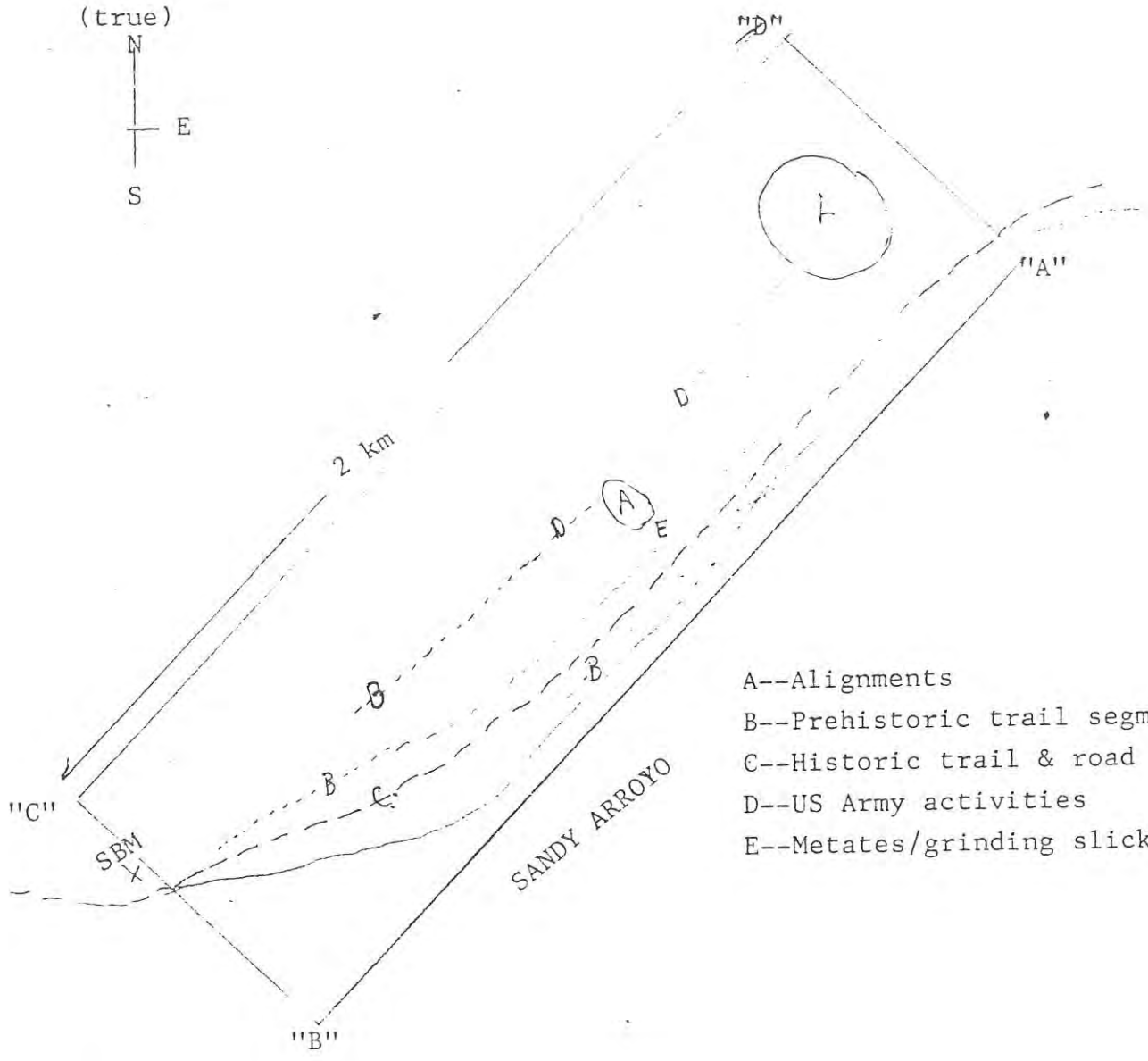
Permanent Trinomial: _____ / _____ (mo. / yr.)

Temporary Number: JSB 01/31/87

Agency Designation: _____

Type of Feature: Road with associated features

NOTE: NOT TO SCALE.

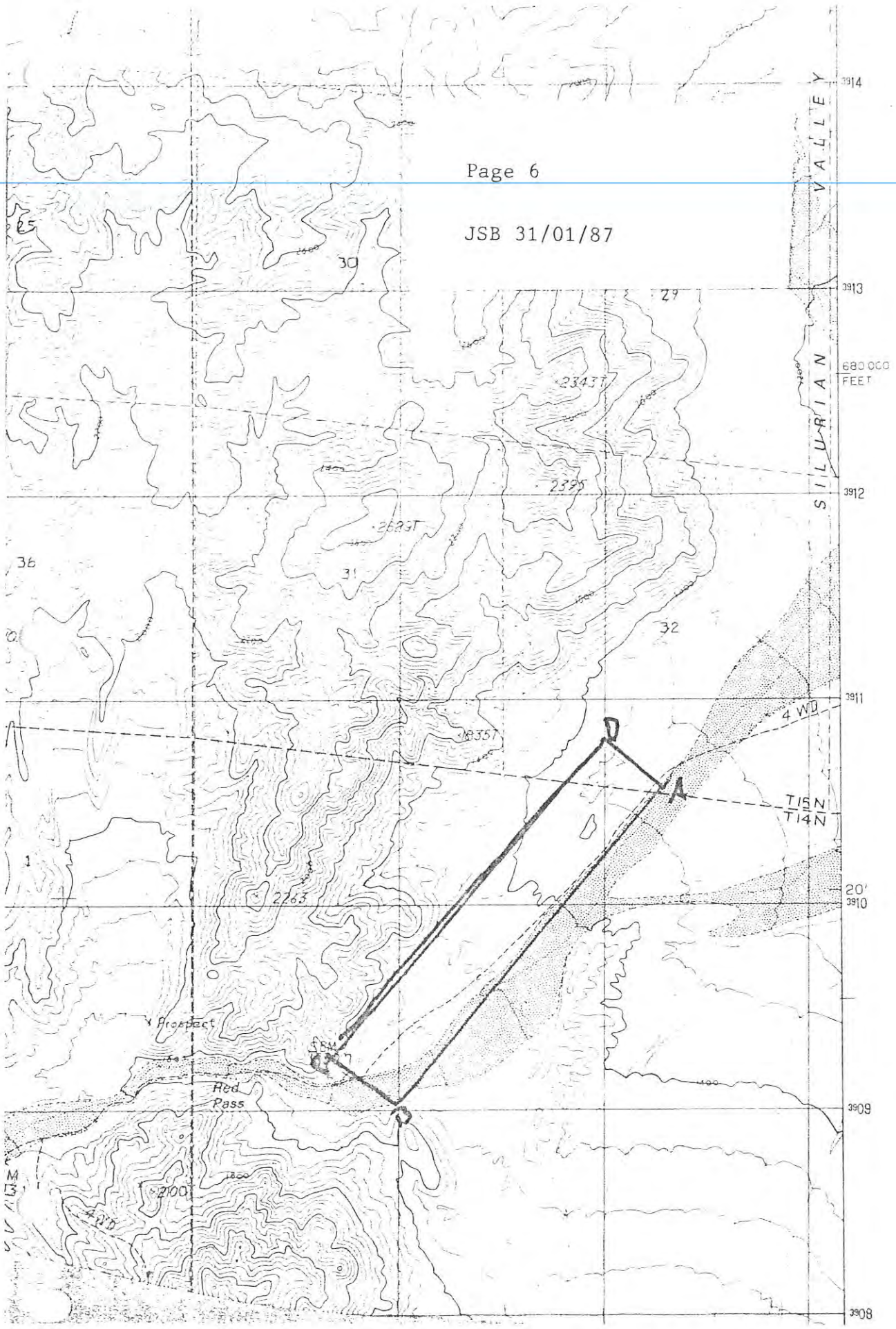


A--Alignments
B--Prehistoric trail segmer
C--Historic trail & road
D--US Army activities
E--Metates/grinding slicks

P36-0044

Page 6

JSB 31/01/87



P36-0044

ARCHAEOLOGICAL SITE SURVEY RECORD
(McKenna et al., Whittier, CA)

PERMANENT TRINOMIAL: CA-SBR-4411-H

TEMPORARY SITE NO.: _____

AGENCY DESIGNATION: _____

(Current Conditions Addendum)

CA-SBR-4411H: The historic Mormon Road (CA-SBR-4411H; and associated Mormon Trail Monument - CHL 577) were recorded by Smith and Suss in 1974. This route was used by early Mormon settlers who traveled from Salt Lake City to the colony at San Bernardino (ca. 1851; Arbuckle 1979). Reference to "road" vs. "trail" appear to suggest personal preferences and not the presence of two different resources. Here, "road" is referenced by Smith and Suss (1974). Therefore, McKenna et al. has used the "road" reference.

In the vicinity of the current project area, the Mormon Road is reported to cross Baldy Mesa Road in an area north of Phelan Road and just north of Patterson Ranch. It supposedly ran on a west/southwest to east/northeast axis through Section 13 of T4N, R6W and Section 18 of T4N, R5W. The exact location of the Mormon Road, however, is unknown in most areas of San Bernardino County.

Between 1974 and 1992, the general area of the Mormon Road (in association wiht the Cajon Pipeline project area) has been undergoing slow but steady development. At the time of the current study no evidence of the Mormon Road was found within the A.P.E. Therefore, McKenna et al. has concluded that, while portions of the Mormon Road may be identifiable elsewhere, there is no evidence of the road within the A.P.E. Having been destroyed (or not truly ever persent) within the A.P.E., the alignment reported in the vicinity of the A.P.E. is considered ineligible for nomination to the National Register of Historic Places, as it represents a "non-contributing" element of the overall site designation. Overall eligibility has been deferred with respect to this resource and this project. Therefore, no mitigation measures are necessary.

Recorded by Hunter O'Donnell Date June 25, 2019 Continuation √ Update
Form Prepared by Bai "Tom" Tang Date August 14, 2019
Affiliation: CRM TECH, Colton Project No: CRM TECH 5303

On June 25, 2019, an intensive-level archaeological field survey was conducted along the segment of Mesa View Drive between Bear Valley Road and Olivine Road, in the south half of Section 33, T5N R5W, San Bernardino Baseline and Meridian, where Site 36-004203 and Site 36-004411 were both recorded previously as crossing the Mesa View Drive right-of-way in a generally northeast-southwest direction. Site 36-004203 represents the former routes of the Tejon Road-Palmdale Cutoff, a branch of the Old Spanish Trail/Mormon Trail system, while Site 36-004411 represents the entire length of the Mormon Trail in San Bernardino County.

While the SCCIC's maps show the two sites at slightly different locations across Mesa View Drive, a closer examination of the existing site records reveals that both sites at this location embody the same road depicted in historic maps from the mid- and late 19th century (Reynolds 1980; 1981a; 1981b). The historic maps demonstrate that the road was present at this location at least by the mid-1850s and was indeed a branch of the Old Spanish Trail/Mormon Trail system (GLO 1856a; 1856b; USGS 1902; 1903). However, based on the same maps and past studies on this historic trail system, it was evidently not one of the main branches of the Old Spanish Trail or the Mormon Trail, which traversed instead to the east and the south of this location along more direct routes to the Cajon Pass (USGS 1902; BLM n.d.; NPS n.d.).

By the early 1940s, a number of automobile highways have been constructed in the surrounding area, including U.S. Routes 66 and 395, State Route 138, Palmdale Road, and Phelan Road (USGS 1942). As a result, the components of the original Old Spanish Trail/Mormon Trail system no longer served their original function and had often been obliterated by later development (*ibid.*). The branch of the trail across Mesa View Drive was evidently truncated roughly a mile to the southwest, but the segment closer to Mesa View Drive has survived to the present time (USGS 1942-1996; NETR Online 1952-2016; Google Earth 1994-2018).

During the field survey, it was observed that the segment of the dirt road within the roughly 70-foot-wide right-of-way of Mesa View Drive, a paved public roadway, has been mostly destroyed, leaving only a roughly 10-foot length remaining on the west side. Beyond the right-of-way boundaries, the dirt road measured approximately 20 feet in width on the east side and 10 feet in width on the west side. The abundant tire marks along the road suggest that it remains in frequent local use. As a result, the nondescript dirt road lacks any distinctively historical character.

The overall historic significance of the Mormon Trail as a whole is beyond any question. However, the surviving portion of the branch in this area is now essentially a working component of the modern transportation—and probably recreation—infrastructure and retains little historic integrity—other than the aspect of location—to relate to its heydays between the mid-19th century and the early 20th century, or to the historic period in general. Therefore, the portion of Site 36-004203/36-004411 within and adjacent to the Mesa View Drive right-of-way does not appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources.



Existing dirt road across the Mesa View Drive right-of-way. *Clockwise from top left*: view to the northeast, taken on June 25, 2019; aerial imagine from Google Earth, August 2018; Google image from July 2012, view to the east; Google image from July 2012, view to the west.

Report Citation:

Tang, Bai "Tom," Deirdre Encarnación, Ben Kerridge, and Hunter O'Donnell
2019 Identification and Evaluation of Historic Properties: Adelanto R³ Extension Project, City of Victorville, San Bernardino County, California

Other References:

BLM (Bureau of Land Management, U.S. Department of the Interior)
n.d. Old Spanish National Historic Trail. https://www.blm.gov/visit/search-details/16455/2.

GLO (General Land Office, U.S. Department of the Interior)
1856a Plat Map: Township No. IV North Range No. V West, SBBM; surveyed in 1855-1856.
1856b Plat Map: Township No. V North Range No. V West, SBBM; surveyed in 1853-1855.

Google Earth
1994-2018 Aerial photographs of the project vicinity; taken in 1994, 2002, 2003, 2005, 2006, 2009, 2013, and 2015-2018. Available through the Google Earth software.

NETR Online
1952-2016 Aerial photographs of the project vicinity; taken in 1952, 1968, 1994, 2002, 2005, 2009, 2010, 2012, 2014, and 2016. http://www.historicaerials.com.

NPS (National Park Service, U.S. Department of the Interior)
n.d. Explore National Historic Trails. https://imgis.nps.gov/html/?viewer=nht.

Reynolds, Robert E.
1980 California Historical Resources Inventory record forms: Site 36-004203/CA-SBR-4203H. On file, South Central Coastal Information Center, California State University, Fullerton.
1981a California Historical Resources Inventory record forms: Site 36-004203/CA-SBR-4203H (update). On file, South Central Coastal Information Center, California State University, Fullerton.
1981b California Historical Resources Inventory record forms: Site 36-004411/CA-SBR-4411H (update). On file, South Central Coastal Information Center, California State University, Fullerton.

USGS (United States Geological Survey, U.S. Department of the Interior)
1902 Map: Hesperia, Calif. (15′, 1:62,500); surveyed in 1898-1899.
1903 Map: San Antonio, Calif. (15′, 1:62,500); surveyed in 1899-1900.
1942 Map: Hesperia, Calif. (15′, 1:62,500); aerial photographs taken in 1940-1941.
1956 Map: Baldy Mesa, Calif. (7.5′, 1:24,000); aerial photographs taken in 1952, field-checked in 1956.
1996 Map: Baldy Mesa, Calif. (7.5′, 1:24,000); 1956 edition photorevised in 1985 and 1994.

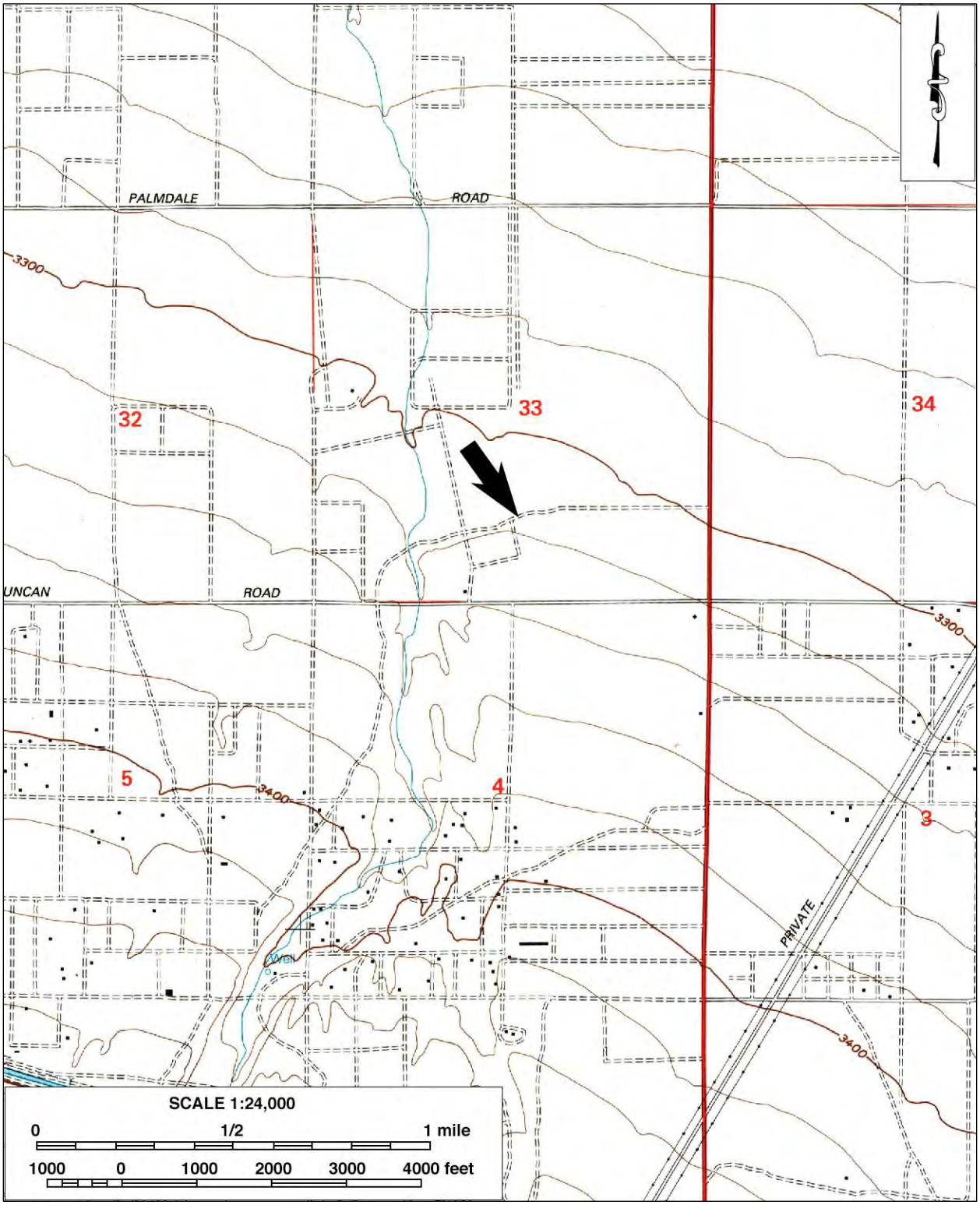
State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # 36-004203/004411 (update)
HRI #
Trinomial CA-SBR-4203H/4411H (update)

Page 4 **of** 4 ***Resource Name or #** (Assigned by recorder)

***Map Name:** Baldy Mesa, Calif. ***Scale:** 1:24,000 ***Date of Map:** 1996



State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z

Other Listings
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 4 ***Resource Name or #** (Assigned by recorder) CRM TECH 3503-1H

P1. Other Identifier: _____

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Bernardino
and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Baldy Mesa, Calif. **Date** 1996
T4N; **R**5W; NE **1/4 of** SE **1/4 of Sec** 33 ; S.B. **B.M.**
c. Address N/A City Victorville Zip _____
d. UTM: (Give more than one for large and/or linear resources) **Zone** 11 ; 462,485 **mE**/ 3,814,790 **mN**
UTM Derivation: ☐ USGS Quad ☒ GIS (NAD 83)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate) The site is located approximately a quarter-mile north of Bear Valley Road, and the easternmost artifact was found approximately 50 feet to the west of Mesa View Drive.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) The site consists of a small refuse scatter containing four steel cans. Three of them are beverage cans that were opened with church keys, while the fourth is a screw top box that likely contained a solvent or other industrial chemical. Two of the beverage cans have interlocking seams, and the other two cans have lapped seams.

***P3b. Resource Attributes:** (List attributes and codes) AH4-trash scatter

***P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☒ Site ☐ District ☐ Element of District ☐ Other (isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of Photo (view, date, accession number): _____

***P6. Date Constructed/Age and Sources:** ☒ Historic ☐ Prehistoric ☐ Both _____

***P7. Owner and Address:** Unknown

***P8. Recorded by** (Name, affiliation, & address)**:** Hunter O'Donnell, CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

***P9. Date Recorded:** June 25, 2019

***P10. Survey Type** (describe)**:** Intensive-level field survey

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Bai "Tom" Tang, Deirdre Encarnación, Ben Kerridge, and Hunter O'Donnell (2019): Identification and Evaluation of Historic Properties: Adelanto R³ Extension Project, City of Victorville, San Bernardino County, California

***Attachments:** ☐None ☒ Location Map ☒Sketch Map ☐Continuation Sheet ☒Building, Structure, and Object Record
☒Archaeological Record ☐District Record ☐Linear Resource Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐Other (List): _____

ARCHAEOLOGICAL SITE RECORD

 ***Resource Name or #** (Assigned by recorder) CRM TECH 3503-1H

***A1.** **Dimensions:** **a. Length** 50 feet (N-S) **b. Width** 25 feet (E-W)
Method of Measurement: ☒Paced ☐Taped ☐Visual estimate Other:
Method of Determination (Check any that apply.): ☒Artifacts ☐Features ☐Soil ☐Vegetation ☐Topography ☐Cut bank ☐Animal burrow ☐Excavation ☐Property boundary ☐Other (Explain):
Reliability of Determination: ☒High ☐Medium ☐Low Explain: Historic-period cans are exposed on the surface of the soil.
Limitations (Check any that apply): ☐Restricted access ☐Paved/built over ☐Site limits incompletely defined ☐Disturbances ☐Vegetation ☐Other (Explain):

A2. Depth: ☒None ☐Unknown Method of Determination: All noted cultural materials were discarded on the surface.

***A3.** **Human Remains:** ☐Present ☒Absent ☐Possible ☐Unknown (Explain):

***A4.** **Features** (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.): None

***A5.** **Cultural Constituents:** (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.): See Item P3a

***A6.** **Were Specimens Collected?** ☒ No ☐ Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)

*A7. **Site Condition:** ☐ Good ☒ Fair ☐ Poor (Describe disturbances.):

***A8.** **Nearest Water** (Type, distance, and direction.): Intermittent drainage approximately 1,000 feet to the west

***A9.** **Elevation:** Approximately 3,325 feet above mean sea level

A10. Environmental Setting: (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.): The site occurs on open desert land on the relatively level floor of the Victor Valley, surrounded mostly by undeveloped land. A housing tract where construction has been suspended since at least 2009 is located to the east and the north. The native vegetation in the site area features a sparse growth of Joshua tree, buckwheat, Apache plume, desert alyssum, juniper, Mormon tea, various types of cacti, and assorted other grasses and shrubs.

A11. Historical Information The site is located near Mesa View Drive, which first appeared as an unpaved road in 2003-2005. It runs roughly along the course of an earlier, winding dirt road that came into being between 1968 and 1994, based on historic aerial photographs.

***A12.** **Age:** ☐ Prehistoric ☐ Protohistoric ☐1542-1769 ☐ 1769-1848 ☐ 1848-1880 ☐1880-1914 ☐1914-1945 ☒ Post 1945 ☐ Undetermined **Describe position in regional prehistoric chronology or factual historic dates if known:**

A13. Interpretations (Discuss data potential, function[s], ethnic affiliation, and other interpretations The location of the site near a dirt road in the late historic period and the small number of artifacts found, with no associated archaeological features nearby, suggest that the refuse scatter likely represents the result of incidental trash dumping.

A14. Remarks: This site does not appear to meet the criteria for listing in the National Register of Historic Places or the California Register of Historical Resources.

A15. References (Documents, informants, maps, and other references.): See Item P11.

A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photograph Record.):
Original Media/Negatives Kept at: CRM TECH, Colton, California

***A17.** **Form Prepared by:** Hunter O'Donnell **Date:** June 27, 2019
Affiliation and Address: CRM TECH, 1016 East Cooley Drive, Suite A/B, Colton, CA 92324

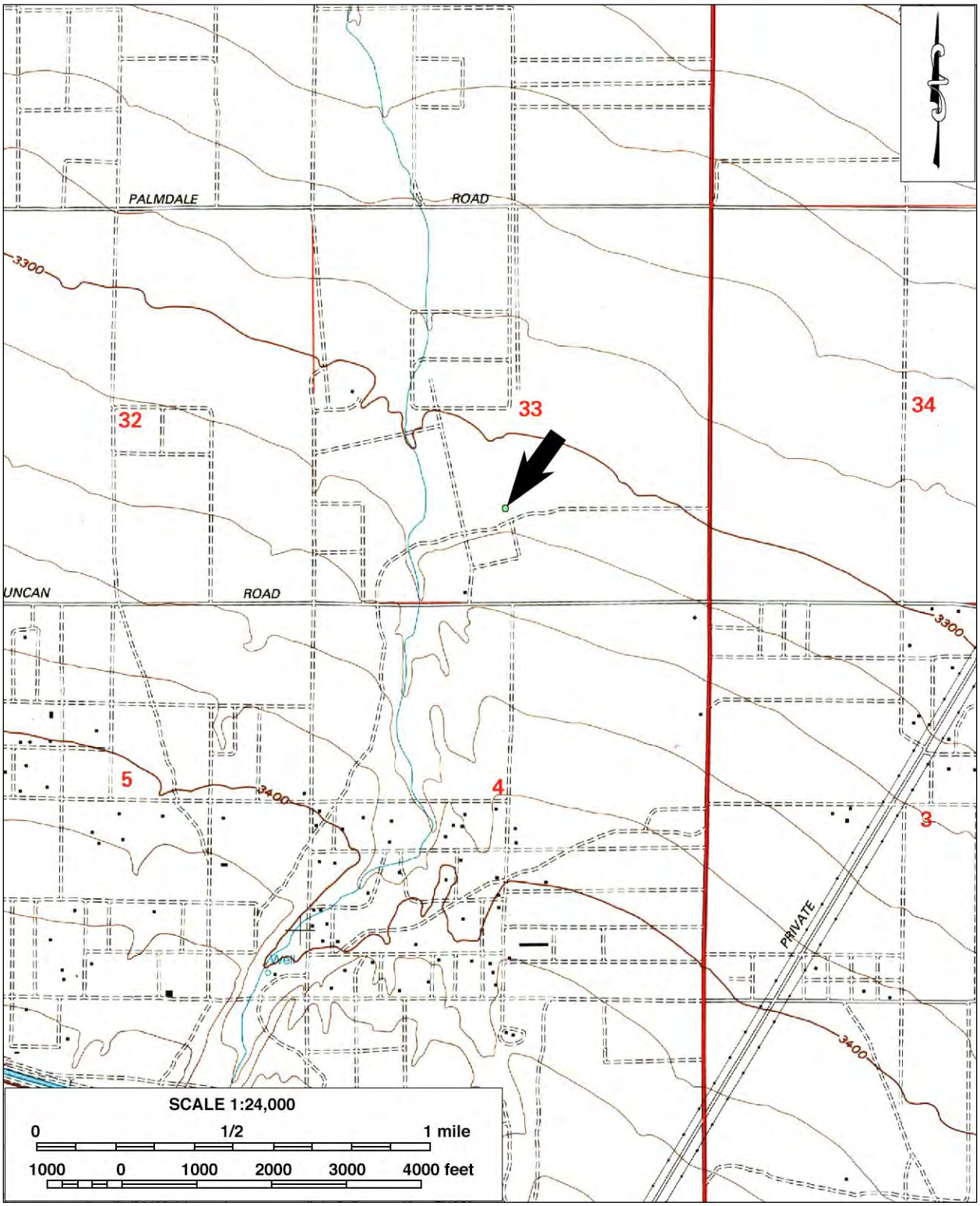
State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary #
HRI#
Trinomial

***Resource Name or #** (Assigned by recorder) CRM TECH 3503-1H

***Map Name:** Baldy Mesa, Calif. ***Scale:** 1:24,000 ***Date of Map:** 1996



* Required information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

SKETCH MAP

Primary #
HRI #
Trinomial

Page 4 **of** 4 ***Resource Name or #** (Assigned by recorder) CRM TECH 3503-1H

***Drawn by:** Daniel Ballester ***Date of map:** June 27, 2019



NOTE: Include bar scale and north arrow

Appendix D
Energy Analysis

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Kennedy Jenks

38977 Sky Canyon Drive, Suite#100
Murrieta, CA 92563
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Adelanto R^3 Extension Project

FINAL

Preliminary Design Report

16 August 2019

Prepared for

Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

KJ Project No.
1944004.00 & 1944004.01

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Section 1: Introduction

1.1 Background

The Mojave Water Agency (MWA) is a regional water management entity created by a special act of the State legislature in 1960. MWA functions as a water wholesaler to multiple local water purveyors within its management area (approximately 4,900 square miles in the high desert in San Bernardino County). As a state water contractor, MWA is entitled to receive an annual allotment of up to 85,800 acre-feet (AF) of water from the State Water Project via the California Aqueduct.

MWA's Regional Recharge and Recovery Project (R^3) utilizes unused aquifer storage capacity in the Mojave Basin to enhance the regional supply of water by recharging the aquifer with inflow from the State Water Project aqueduct. The stored recharged water is then extracted by well facilities for delivery to purveyor turnout locations. Phase 1 of the R^3 Project, as shown on Figure 1, was partly constructed and started delivering water in 2013.

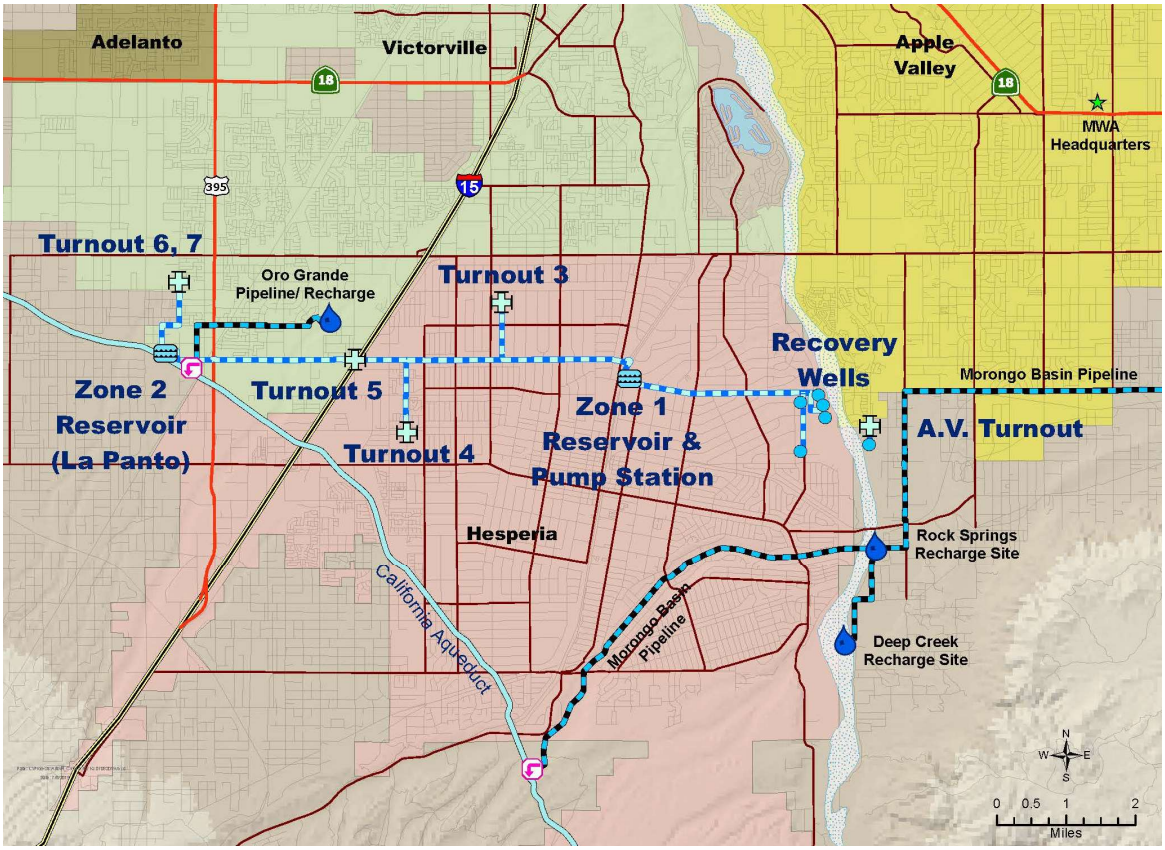


Figure 1: R^3 Project Phase 1 Facilities

The anticipated water deliveries for the R^3 Project, per the May 2008 Phase 1 Upper Mojave River Well Field and Water Supply Pipeline Project - Basis of Design Report, are described in Table 1.

Agency	Phase 1 (AFY)	Ultimate (AFY)
City of Adelanto (Adelanto)	3,000	7,900
City of Hesperia	3,200	8,750
City of Victorville (Victorville)	6,200	14,250
Liberty Utilities/Golden State Water Apple Valley	2,000	4,000
San Bernardino County Service Area 64	0	2,700
Southern California Logistics Airport (SCLA)	600	2,400
Total Water Deliveries	**15,000**	**40,000**

Table 1: R^3 Project Water Deliveries

In 2018, the R^3 Project delivered 4,509 AF of treated water, which consisted of 4,422 AF to Victorville and 87 AF to Liberty Utilities Apple Valley.

The R^3 Project water deliveries will be provided to each agency, as follows:

- City of Adelanto – Turnout 7
- City of Hesperia – Turnout 2 & 4
- City of Victorville – Turnout 3, 5 & 6
- Liberty Utilities/Golden State Water Apple Valley – A.V. Turnout
- San Bernardino County Service Area 64 – Turnout 1
- Southern California Logistics Airport – via the City of Victorville turnouts

Since the Victorville water deliveries are provided by multiple turnouts which also include the SCLA water deliveries, it is assumed that 50% of the SCLA water deliveries are provided by Turnout 6 and that the Victorville water deliveries for Turnout 6 is 2,400 AFY for Phase 1 and 5,500 AFY for the ultimate flows per Table CE-4 of the May 2008 Phase 1 Upper Mojave River Well Field and Water Supply Pipeline Project - Basis of Design Report. Therefore, for the purpose of this Preliminary Design Report (PDR), the flow capacity of Turnout 6 is estimated as follows:

- Phase 1 = 2,700 AFY (2,400 Victorville + 300 SCLA)
- Ultimate = 6,700 AFY (5,500 Victorville + 1,200 SCLA)

The following improvements, as shown on Figure 2, were previously identified by MWA to complete the R^3 Project Phase 1:

1. **Installation of a 30-inch diameter pipeline from Turnout 6 to the Adelanto Reservoir site, including the relocation of Turnout 7.**
2. Installation of a 36-inch diameter pipeline from the Le Panto Reservoir to Turnout 6 (which replaces an existing pipeline currently leased from Victorville).
3. Installation of a five (5) million-gallon storage reservoir (which replaces the existing Le Panto Reservoir currently leased from Victorville).
4. **The addition of booster pumping at Turnout 6 to serve Victorville.**
5. A new conveyance pipeline connecting the existing R^3 pipeline on the west side of the Mojave River at Lemon Street to the east side of the Mojave River, connecting at existing Well 6.

Improvement Nos. 1 & 4 are highlighted in bold above since these two improvements are the primary subject matter for this Adelanto R^3 Extension Project PDR.

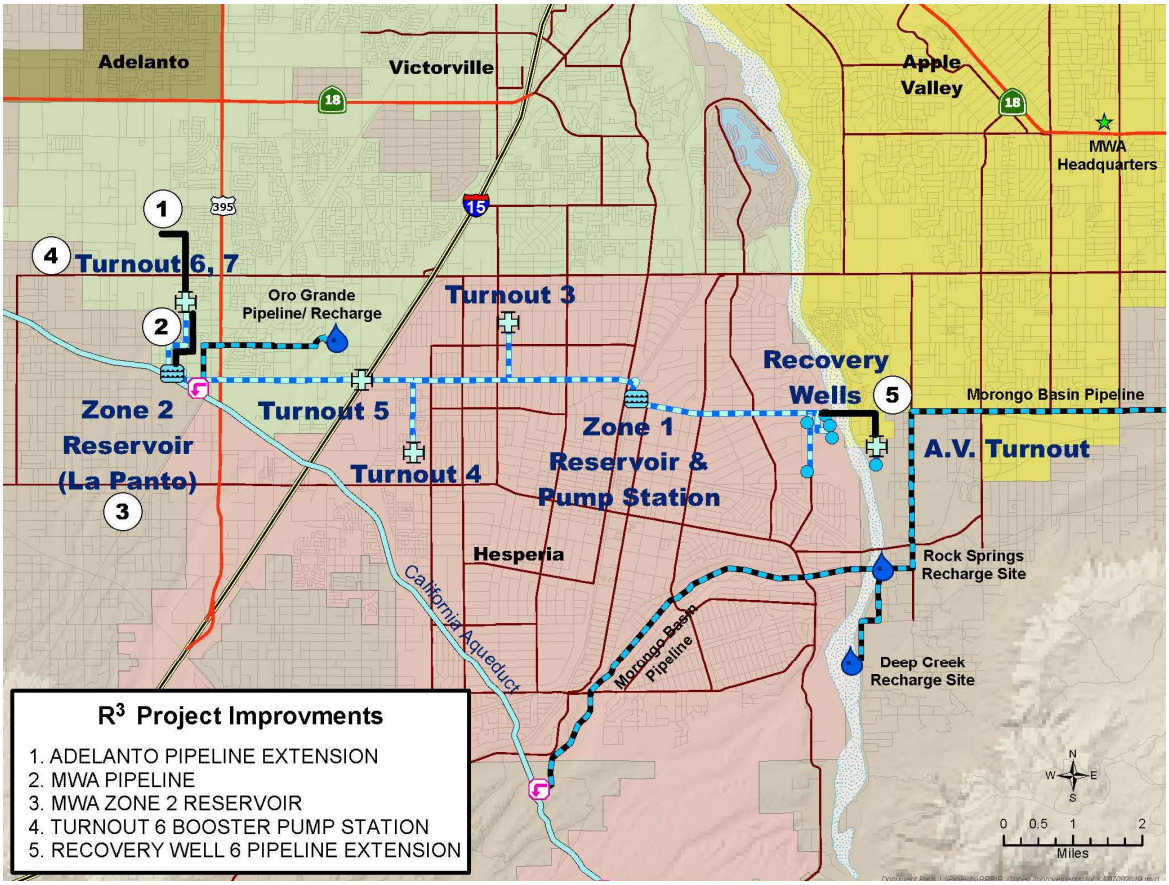


Figure 2: R³ Project Phase 1 Improvements

1.2 Purpose

The purpose of this project is to construct the aforementioned improvements Nos. 1 & 4 for the R^3 Project Phase 1.

The Adelanto pipeline extension will convey R^3 water from the existing Turnout 6/7 facility to Adelanto's 5.0 MG Reservoir site in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto (copy included in Appendix A). Included with this project is the construction of a new Turnout 7 facility. This project will enable Adelanto to receive the R^3 water as a supplemental water source. This project will deliver the R^3 water on an average annual flow basis, with no significant peaking capacity provided.

The Turnout 6 modifications project will add booster pumping capability to Turnout 6 such that the R^3 water provided will exceed the minimum pressure requirement of 40 pounds per square inch (psi) in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 19, 2013, between MWA and the City of Victorville (copy included in Appendix A) as well as providing additional pressure for Victorville to fully utilize their 3485 Pressure Zone reservoir capacity. Current operation of the Turnout 6 facility does not satisfy this pressure requirement. Included in this project will be modifying the existing Turnout 7 facility for consolidated use solely with Turnout 6.

1.3 Report Organization

This Preliminary Design Report is organized into the following sections:

- **Section 1 – Introduction:** This section includes the project's background information, the purpose of the project and the organization of the PDR.
- **Section 2 – Project Description:** This section provides a separate description of each project component; the Adelanto pipeline extension, Turnout 7 and the Turnout 6 modifications.
- **Section 3 – Design Criteria:** This section provides the hydraulic design flow rates, maximum pipeline flow velocity, the minimum design pressure, the Turnout 7 residual pressure analysis and the Turnout 6 pump design parameters.
- **Section 4 – Adelanto Pipeline Extension:** This section provides the design considerations for the Adelanto pipeline extension.
- **Section 5 – Turnout 7:** This section provides the design considerations for Turnout 7.
- **Section 6 – Turnout 6 Modifications:** This section provides the design considerations for the Turnout 6 modifications.
- **Section 7 – CEQA/NEPA Requirements:** This section summarizes the environmental requirements for the project.
- **Section 8 – Property Acquisition & Permit Requirements:** This section provides an evaluation of the property requirements and the permitting required for the project.
- **Section 9 – Project Schedule:** This section discusses the project schedule including the design and construction phases.
- **Section 10 – Opinion of Probable Construction Cost:** This section summarizes the opinion of the probable construction cost for the project.

Section 2: Project Description

2.1 Adelanto Pipeline Extension

This element of the project consists of the construction of approximately 5,800 lineal feet of 20-inch & 30-inch diameter pipeline as shown on Figure 3. The 30-inch pipeline will connect to the proposed 36-inch diameter CML&C steel pipeline at Turnout 6, located in Mesa View Drive, approximately 650 feet north of 5th Street/del Rosa Road, as shown on Figure 3 and Figure 4. The 30-inch pipeline will continue north (approximately 4,650 lineal feet) on Mesa View Drive until the intersection of Olivine Road. At the intersection of Mesa View Drive and Olivine Road, the pipeline will include a cross fitting with partial valving (valves on the south and west branches) which will accommodate the potential extension of the R^3 pipeline to the City Adelanto in the future. From the intersection of Mesa View Drive and Olivine Road, a 20-inch diameter pipeline will continue west on Olivine Road (approximately 900 lineal feet) until the terminus at the re-located Turnout 7 at the Adelanto 5.0 MG Reservoir facility.

The pipeline improvements associated with the connection of the 30-inch diameter Adelanto pipeline at Turnout 6 is shown on Figure 4. The pipeline improvements consist of:

- Approximately 25 lineal feet of 18-inch diameter pipeline to connect the former Turnout 7 pipeline to the proposed Adelanto pipeline extension
- Approximately 55 lineal feet of 30-inch diameter pipeline to connect the existing Victorville 30-inch diameter distribution system pipeline to the existing Victorville 30-inch diameter pipeline (currently leased by MWA)
- Approximately 125 lineal feet of 36-inch diameter pipeline to connect the Turnout 6 supply pipeline to the proposed Adelanto pipeline extension and to extend this pipeline south along Mesa View Drive, just beyond the future intersection of Everett Lane and Mesa View Drive.

These pipeline improvements are necessary to complete the proposed Turnout 6 modifications and to facilitate the future construction of the 36-inch diameter pipeline from the Le Panto Reservoir to Turnout 6 (Improvement No. 2 as shown in Figure 2).

The preliminary pipeline alignment is anticipated to be located on the west side of Mesa View Drive and south side of Olivine Road. The pipeline alignment will be finalized after completion of the project survey and evaluation of the underground utilities and future road improvements. During final design, the pipeline alignment analysis will evaluate the potential opportunity to avoid the existing paved roadway section. The pipeline will be constructed completely by open cut construction methods.

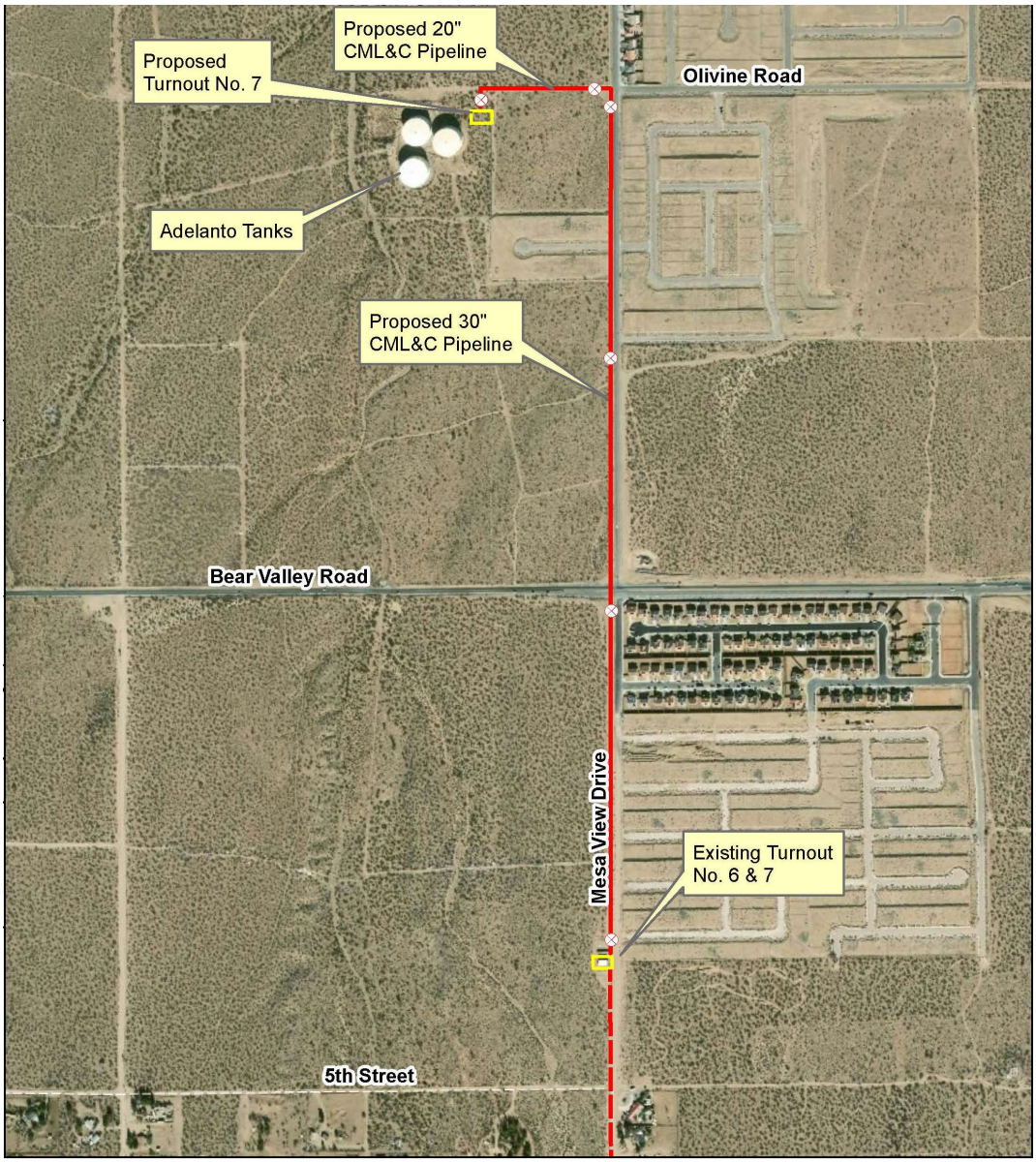


Figure 3: Adelanto R³ Pipeline Extension

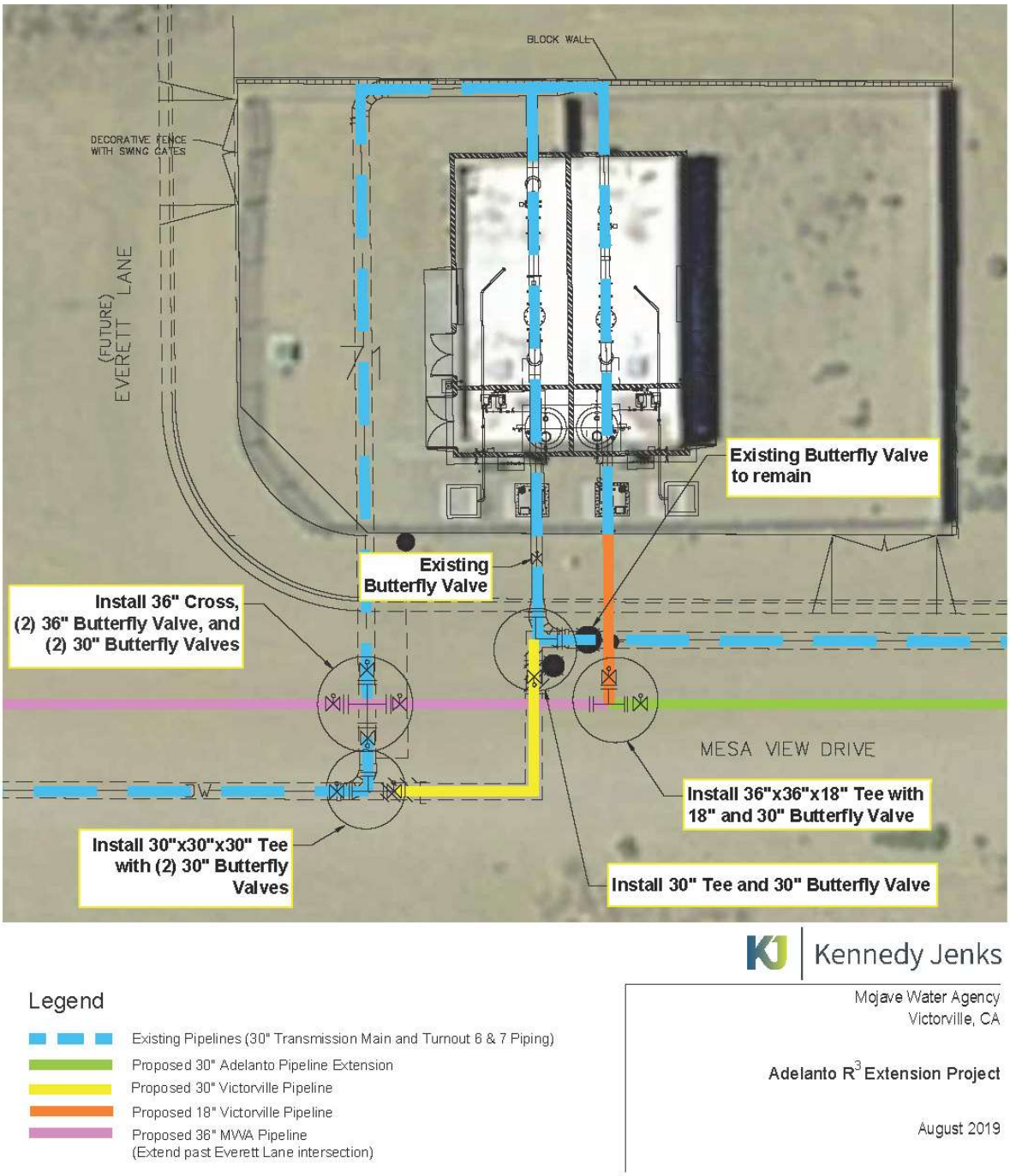


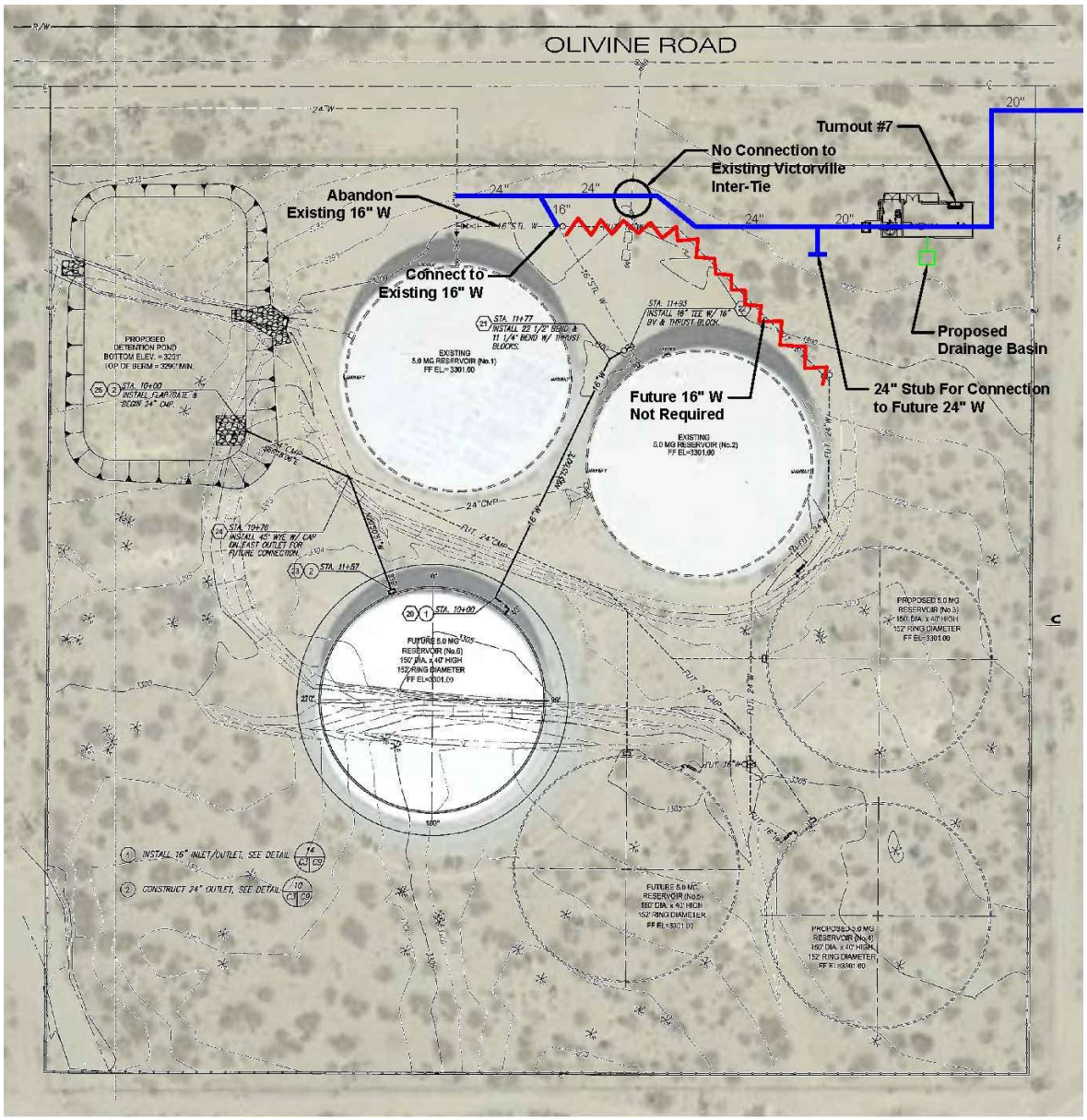
Figure 4: Pipeline Modifications at Turnout 6

2.2 Re-Located Turnout 7

This element of the project consists of constructing a new turnout facility at the Adelanto 5.0 MG Reservoir facility to provide water service to the City of Adelanto as shown on Figure 5. The new turnout facility will be sized to convey the full volume of the R^3 water delivery to the City of Adelanto. The turnout facility will be constructed within an approximate 18-foot by 46-foot concrete block building with galvanized metal roof decking. The turnout facility will consist of 16-inch diameter steel piping (epoxy-lined and coated), magnetic flow meter, electronic flow control valve, isolation valves, air release valves, calcium hypochlorite tablet chlorination system, chlorine residual analyzers, eye wash station, radio antennae, lighting panel and (2) control panels. Located outside of the turnout facility will be (2) 4-foot by 4-foot pre-cast concrete vaults. One vault will be used for pipeline chlorine residual sampling and the other vault will be used as a drainage chamber with piping to a proposed drainage basin.

The turnout facility will connect to the City of Adelanto's water system with approximately 300 lineal feet of a 20-inch or 24-inch diameter steel pipeline which will support the future on-site reservoir pipeline distribution system. A 15-foot wide gravel road will be provided over the installed pipeline within the reservoir site. The concrete block building will be surrounded by a 20-foot wide gravel base and a 15-foot wide gravel road and a new driveway gate and manway gate will be installed to provide access to Turnout 7 from Olivine Road. This project will also include the installation of a new 120/240V single phase electrical service from Southern California Edison (SCE) which will consist of two (2) electrical meters, conduit, utility transformer and approximately 800 lineal feet of underground/overhead line extension by SCE from the intersection of Mesa View Drive and Olivine Road. It is anticipated that after construction of Turnout 7, the existing pipeline inter-tie between the City of Adelanto and the City of Victorville would remain in place and would be used only for emergency purposes.

An alternative site location for Turnout 7 was investigated as provided in Appendix B. This alternative was not selected for final design due to interference with the use of the radio antennae, constrained site location and increased project cost related to the additional length of pipeline required. In addition, the proposed site location and pipeline improvements reduces the City of Adelanto's future capital expenditures for pipeline improvements necessary to distribute water to the future reservoir facilities.



Legend

— Proposed CML&C Steel Pipeline

0 40 80

SCALE: 1"=80'-0"

Kennedy/Jenks Consultants

Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

June 2019

Figure 5: Turnout 7 Proposed Facilities

2.3 Turnout 6 Modifications

This element of the project consists of modifying the existing Turnout 6/7 facility into a dedicated Turnout 6 facility to solely provide water to the City of Victorville. This project will include adding a pumping unit, modifying the turnout piping and related electrical and instrumentation improvements. This project also includes upgrading the existing SCE electrical service from 120/240V single phase to 480V three phase.

During evaluation of the existing piping configuration for the addition of an in-line booster pump for the Turnout 6 piping, it was determined that the existing above-ground pipe length was inadequate to provide accurate meter reading for the magnetic flow meter (minimum distance of 3 times the pipe diameter for straight pipe upstream of the meter and 2 times the pipe diameter downstream of the meter).

A modified piping configuration was prepared to utilize the former Turnout 7 piping to provide the additional above-ground pipe length for the installation of an in-line booster pump, shown in Figure 6 and Figure 7. This modified piping configuration will allow R^3 project water to be delivered to the Victorville distribution system using the former Turnout 7 piping and Turnout 6 piping for pumped flows or just the Turnout 6 piping for non-pumped flows. For either flow scenario, the disinfection system would not be modified and would continue to operate in its current condition.

The modifications to the former Turnout 7 piping will consist of altering the above-ground 16-inch diameter pipeline to accommodate the installation of the in-line booster pump, swing check valve, upstream isolation valve, reducer fittings, pipe spools and couplings. In addition, the existing flow control valve located on the Turnout 6 piping will be modified to add check valve functionality.

An alternative piping configuration for Turnout 6 was investigated as provided in Appendix B. This alternative was not selected for final design due to the additional work required and that above-ground facilities would be located outside of the turnout building.

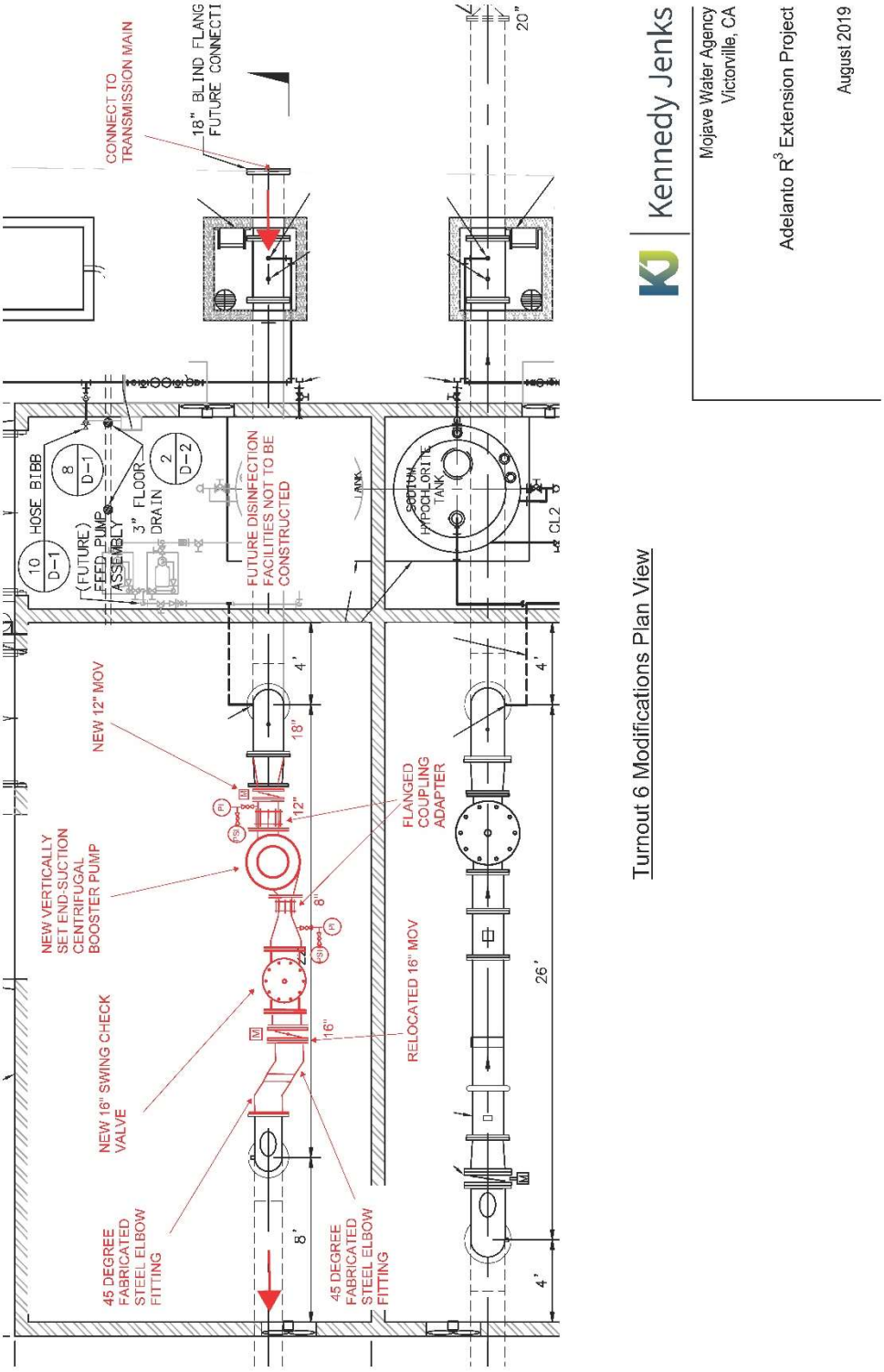


Figure 6: Turnout 6 Modifications – Plan View

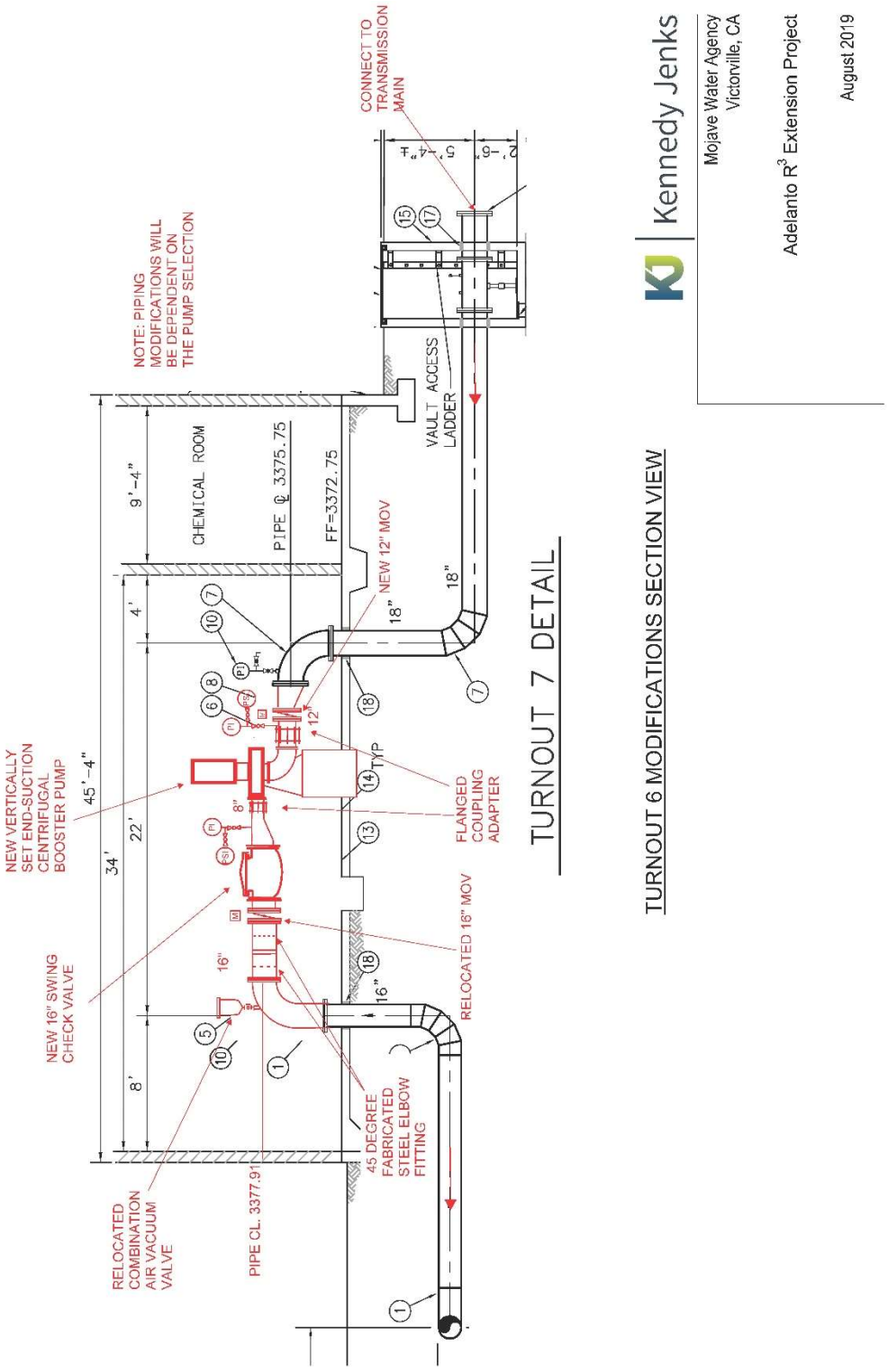


Figure 7: Turnout 6 Modifications – Section View

Section 3: Design Criteria

3.1 Hydraulic Design Flow Rate

The maximum hydraulic design flow rate for the project is based on the turnout's ultimate flow capacity, as noted in Section 1.1, with an applied seasonal flow factor (assuming the annual flow is provided during 300 calendar days of the year per the May 2008 Phase 1 Upper Mojave River Well Field and Water Supply Pipeline Project - Basis of Design Report).

Maximum Design Flow Rate

Turnout 7 = 7,900 AFY*(0.62 GPM/1 AFY)*(365 days/300 days) = 5,960 GPM

Turnout 6 = 6,700 AFY*(0.62 GPM/1 AFY)*(365 days/300 days) = 5,060 GPM

Since the Turnout 6 booster pump design will be based on Phase 1 water deliveries only, the Phase 1 maximum design flow rate is calculated to be 2,040 GPM [2,700 AFY*(0.62 GPM/1 AFY)*(365 days/300 days)] for the Turnout 6 booster pump.

The minimum hydraulic design flow rate for the project is based on the estimated minimum monthly flow to be provided by each turnout. The estimated minimum monthly flow was based upon a review of MWA's 2017 & 2018 monthly flow data. The minimum monthly flow amount is then converted to a corresponding 24-hour per day flow rate.

Minimum Design Flow Rate

Turnout 7 = 100 AF/month*(1 month/43,200 min)*(326,000 gals/1 AF) = 750 GPM

Turnout 6 = 200 AF/month*(1 month/43,200 min)*(326,000 gals/1 AF) = 1,500 GPM

3.2 Pipeline Flow Velocity

For the project pipelines, the maximum design velocity should be less than 5 fps for transmission mains (to minimize head loss) and less than 10 fps for turnout piping with cement lining (to minimize erosion loss to the cement lining) or less than 16 fps for turnout piping with epoxy lining (to minimize erosion loss to the epoxy lining). The calculated flow velocity for various pipeline sizes is shown in Table 2.

	Pipeline Flow Velocity (feet per second)					
Pipeline Diameter (inches)	16	18	20	24	30	36
Turnout 7 - 5,960 GPM	9.51	7.51	6.09	4.23	2.71	1.88
Turnout 6 - 5,060 GPM	8.07	6.38	5.17	3.59	2.30	1.59

Table 2: Calculated Pipeline Flow Velocity by Pipeline Diameter

For the 20-inch diameter size for the Adelanto pipeline extension to Turnout 7, the calculated 6.09 fps pipeline flow velocity is acceptable because the increased head loss does not adversely affect the available pressure at Turnout 7.

3.3 Minimum Design Pressure

For the proposed project, the minimum design pressure should not be less than 150 pounds per square inch (psi).

The calculated static pressure is 94 psi based on the following assumptions:

- High Water Level = 3,498 (based on Le Panto Reservoir, rounded up)
- Lowest Ground Surface = 3,295 (intersection of Olivine Road & Mesa View Drive)
- Deepest Pipeline Invert = 13 feet (10 foot of cover and 3-foot pipe diameter)
- ((3,498 – 3,295) + 13)*0.433 psi/ft = 94 psi

Generally, the minimum design pressure is based on the maximum static pressure times 125%, with the total rounded up to the nearest 25 psi (which equates to 125 psi). Therefore, to meet the minimum design pressure stated above for the project, the minimum design pressure to be used for the project will be 150 psi which also provides an extra measure of safety for unknown pressure surges.

3.4 Turnout 7 Residual Pressure

Three performance head curves were prepared for the west portion of the R^3 system as shown in the Turnout 7 Residual System Pressure Curve in Appendix C. The three curves were developed based on high, average, and low water levels in the Le Panto Reservoir and well as the concurrent operation of Turnout 6 and a full water level for the Adelanto 5.0 MG Reservoir. The flow parameters used were:

- Minimum flow: Turnout 6 = 675 GPM, Turnout 7 = 750 GPM
- Design flow: Turnout 6 = 2,034 GPM, Turnout 7 = 2,260 GPM
- Maximum flow: Turnout 6 = 5,394 GPM, Turnout 7 = 5,960 GPM

The residual pressure was calculated downstream of Turnout 7 at the inlet of Adelanto Reservoir No. 6. Based on the R^3 low head performance curve, the calculated residual pressure at Turnout 7 will therefore be greater than 40 psi for all flow and water level conditions. A summary of the calculated residual pressures based on the performance head curves are shown in Table 3.

Le Panto Reservoir Water Level (feet)	Residual Pressure @ Minimum Flow	Residual Pressure @ Design Flow	Residual Pressure @ Maximum Flow
High Water Level (32 feet)	67 psi	64 psi	51 psi
Average Water Level (15 feet)	61 psi	58 psi	45 psi
Low Water Level (2 feet)	55 psi	52 psi	39 psi

Table 3: Residual Pressure at Adelanto Reservoir 6

Considering the results of Table 3, it is recommended that the proposed pipeline diameter of the Adelanto Pipeline Extension should be 30-inches and not upsized to 36-inches for reduced pipeline friction.

3.5 Turnout 6 Pump Design Parameters

The proposed booster pump for Turnout 6 will deliver water into Victorville's 3485 Pressure Zone. The 3485 Pressure Zone is served by the two (2) Highway 395 Reservoirs:

- Reservoir T-202, 2.0 MG capacity, 3,500 high water level
- Reservoir T-207, 2.7 MG capacity, 3,501 high water level

Due to a significant bottleneck in Victorville's distribution system (12-inch diameter pipeline), separate system head curves were prepared to show the hydraulic changes both before and after the anticipated capital improvements resolve the system constraint. The timing of these improvements is currently undetermined. The system head curves for the Turnout 6 booster pump providing water to Victorville's 3485 Pressure Zone are shown in Appendix C.

The primary objective of the pump design is to provide a single pump that will provide maximum efficiency for the Phase I project flow rates prior to the distribution system improvements to Victorville's distribution system (Phase 1-A) as well as providing maximum efficiency for the Phase I project flow rates after completion of the distribution system improvements to Victorville's distribution system (Phase 1-B). Thus, for both conditions, the pump design parameters for the Turnout 6 booster pump is shown in Table 4.

Parameter	Size (Phase 1-A)	Size (Phase 1-B)
Phase 1 Design Flow (GPM)	2,040	2,040
Total Dynamic Head (feet)	55	28
Pump Efficiency (%)	88	73
Motor Efficiency (%)	85	85
Brake Horsepower	32	19.3
Total Horsepower	40	25

Table 4: Pump Design Parameters

It is anticipated that the maximum shut off head for the pumping unit will be less than 80 feet. Based on our discussion with the pump manufacturer, the largest vertically set end-suction centrifugal pump can produce 3,500 gpm @ 74 TDH (100 hp) with minor piping modifications to install this pump unit.

If Turnout 6 is required to pump the maximum design flow rate of 5,060 GPM (ultimate water delivery), it is anticipated that the Phase 1 pump unit would be replaced with a higher capacity pump unit, likely a horizontal split case pump unit, and the piping and valves connected to the pump unit may need to be upsized also.

Section 4: Adelanto Pipeline Extension

4.1 Facility Design Requirements

Underground pipeline facilities will be designed in conformance with the SWRCB Guidance Memo 2017-01: Separation of Water Mains and Non-Potable Pipelines. When the separation distance between water mains and non-potable pipelines is not in compliance with the California Waterworks Standards, an alternative to this requirement may be requested, provided that the proposed alternative provides at least the same amount of protection to public health. The guidance memo assists with the approval of proposed alternatives. For the proposed project, the underground pipeline facilities will be designed to accommodate future undetermined non-potable pipelines that may affect the separation distance as required by the California Waterworks Standards. The design features will include the following:

- Install the water mains with a minimum cover of 6-feet over the top of the pipeline to facilitate non-potable pipeline service laterals to cross over the top of the pipeline
- Install the water mains using all welded joints to minimize the potential of contamination from joint infiltration
- For steel pipelines, use wire-fabric reinforcement with cement mortar coating of a minimum thickness of ¾-inch to protect the pipeline and to minimize the potential for contamination

For the Adelanto pipeline extension, the below-ground piping will be cement mortar lined and coated steel pipeline. The minimum steel pipe cylinder thickness will be 7 Gage (0.1793 inches) for transmission mains (30” & larger) and 10 Gage (0.1345 inches) for transmission mains (24” & smaller).

The pipeline will be designed to maintain a slope (0.5% minimum, positive or negative slope) to accommodate the release of air from the pipeline and to assist in the draining of the pipeline.

Thrust restraint will be provided by welded joints for steel pipelines, unless concrete thrust blocks are required for special circumstances.

In-line isolation valves will be butterfly valves, spaced apart no greater than 2,000 lineal feet, and located as shown on Figure 3. Normally closed valves will include a locking cap and will be identified by marked valve cover lids.

Combination air and vacuum release valves will be located at high points along the pipeline and spaced a maximum of 2,500 lineal feet on straight pipeline runs. The valve sizing should be a minimum of 2-inches in diameter for 20-inch pipelines and a minimum of 4-inches in diameter for 30-inch pipelines.

Blow-off facilities will be provided at low points of the pipeline, with tangential type outlets, for pipeline draining purposes. The blow-off facilities will have a lateral size of 6-inches and a riser size of 8-inches for pipelines with a diameter of 18-24 inches; while 30-inch and larger pipelines will have a lateral size of 8-inches and a riser size of 12-inches. The riser piping will be capped below grade in a 30-inch diameter manhole. A blow-off assembly will be provided on the 20-inch diameter pipeline prior to entrance to the Turnout 7 facility.

Manways, for 30-inch dimeter and larger pipelines only, will be provided on each side of the (2) in-line isolation valves (4 total), at the connection point for Turnout 6 and prior to cross fitting at the intersection of Mesa View Drive and Olivine Road. The manways will provide internal pipeline access for inspection and maintenance purposes. The manways will consist of a 30-inch dimeter blind flanged tee, located horizontally. Access to the manways will be provided by a 48-inch diameter manhole facility.

All pipeline appurtenances shall be installed a minimum of 24-inches from pipeline joints or fittings and the appurtenances will be constructed at right angles to the pipeline.

4.2 Sole Source Equipment or Material Requirements

For the Adelanto pipeline extension facilities, no specified equipment is proposed for sole source procurement.

4.3 Pressure Surges

A detailed surge analysis will be completed during final design. Anticipated measures to minimize pressure surges for the pipeline will be to evaluate the location and sizing of the air and vacuum release valves.

4.4 Corrosion

A detailed corrosion analysis will be completed during final design. Pipeline protection from corrosion will be provided by the cement mortar coating for below-ground installation or paint coating for above-ground installation.

Active cathodic protection is not anticipated to be required due to the mild to moderate corrosivity levels in the soil (per the previous geotechnical reports), however, installation of cathodic protection test stations is recommended for the proposed pipelines for future corrosion monitoring activities. Cathodic protection test stations are recommended to have a maximum spacing of 1,000 lineal feet.

At Turnout 6, for the connection of the proposed pipeline to the existing R^3 pipeline, the use of an insulating flange kit is recommended to minimize the corrosion potential between the pipeline facilities.

Stray current protection from the existing fuel pipeline in Bear Valley Road is proposed for the pipeline within the Bear Valley intersection. Depending on the final design parameters, stray current protection may be provided by the installation of sacrificial anodes near the intersection.

4.5 Geotechnical

Attached in Appendix D is the Geotechnical Desktop Study for the proposed project. No significant geotechnical issues are anticipated for the proposed pipeline alignment. No active fault zones are located within the project vicinity. Existing trench soil is anticipated to be suitable for trench backfill and imported soil is anticipated for the pipe zone backfill. A detailed geotechnical investigation and report will be completed during final design.

4.6 Facility Operation Strategy

MWA will be responsible for operating and maintaining the Adelanto pipeline extension facilities as necessary to deliver water to Adelanto at the requested flow rate and at a minimum pressure of 40 psi.

4.7 Potential Utility Conflicts

The primary utility conflicts of concern are located within Bear Valley Road. The facilities include the following:

- Fuel pipeline owned by Kinder Morgan Energy
- Transcontinental fiber optic facilities owned by Sprint

During final design, representatives of these utilities will be contacted to review the pipeline drawings. During potholing and construction activities, representatives of these utilities will be notified to allow them to be present for observation and coordination purposes. It is anticipated that no mechanized excavation will be allowed within two feet of these facilities and that the proposed pipeline alignment will avoid these facilities by at least two feet (horizontally and vertically). In addition, no additional surcharge loading will be allowed by the contractor over these facilities.

Section 5: Turnout 7

5.1 Facility Design Requirements

For the Turnout 7 pipelines, the below-ground piping will be cement mortar lined and coated steel pipe and the above-ground piping will be epoxy lined and painted steel pipe. The minimum steel pipe cylinder thickness should be 10 Gage (0.1345 inches) for transmission mains (24" & smaller) and 7 Gage (0.1793 inches) for turnout piping. Thrust restraint will be provided by welded joints for steel pipelines, unless concrete thrust blocks are required for special circumstances. Based on discussions with the City of Adelanto, future blending is not being considered and provisions to add future backflow equipment will not be required.

The Turnout 7 building will be design and constructed similar to MWA's existing Turnout 3 facility and modified as necessary for this project. The location of the doors and ventilation fans will be provided on the north or east side of the turnout building structure to avoid the prevailing wind direction.

5.2 Sole Source Equipment or Material Requirements

For Turnout 7, the following equipment is proposed to be specified for sole source procurement in order to match MWA's existing R^3 project facilities or the City of Adelanto's water facilities in accordance with the California Public Contracting Code:

- Magnetic Flow Meter: Tigermag EP Model FM-656
- Electronic Flow Control Valve: Cal-Val Model 131G or 631G
- Electronic Valve Actuator: EIM Controls
- Tablet Chlorination System: Accu-Tab PowerPro Series 3150
- Chlorine Residual Analyzer: ProMinent Fluid Controls
- Telemetry/Instrumentation: Tesco Controls (MWA facilities)
- Telemetry/Instrumentation: Vertech (Adelanto facilities)

The contract documents will be required to include the findings for the sole source equipment procurement.

5.3 Pressure Surges

A detailed surge analysis will be completed during final design. Anticipated measures to minimize pressure surges will be to specify the minimum required opening and closing times for the flow control valve and the motorized butterfly valve at Turnout 7. In addition, evaluation of the sizing for the air and vacuum release valves and evaluation of pressure/surge relief/anticipator valves will be performed during final design.

5.4 Corrosion

Pipeline protection from corrosion will be provided by the cement mortar coating for below-ground installation or paint coating for above-ground installation.

Active cathodic protection is not anticipated to be required; however, the installation of cathodic protection test stations is recommended for the proposed pipelines for future corrosion monitoring activities. For the connection of the proposed pipeline to the existing Adelanto pipeline, the use of an insulating flange kit is recommended to minimize the corrosion potential between the pipeline facilities. The below-ground pipeline installation prior to entering and after leaving the Turnout 7 building will include the use of insulating flanges.

5.5 Geotechnical

Attached in Appendix D is the Geotechnical Desktop Study for the proposed project. No significant geotechnical issues are anticipated for the proposed pipeline alignment or the turnout location. Over-excavation and re-compaction with structural fill is anticipated for the turnout building foundation. No active fault zones are located within the project vicinity. Existing trench soil is anticipated to be suitable for trench backfill and imported soil is anticipated for the pipe zone backfill. A detailed geotechnical investigation and report will be completed during final design.

5.6 SCADA/Telemetry

Instrumentation and control for Turnout 7 will be provided using radio communication between the radio receiver at Turnout 7 and MWA's and Adelanto's existing SCADA servers. The radio receiver and PLC will be located in a control panel within the Turnout 7 building and an antenna mast will be attached to the Turnout 7 building. A radio survey will be completed during final design to verify the radio signal strength for the proposed antenna location. A separate control panel will be installed to provide SCADA communication and control to Adelanto. Modifications to MWA's SCADA server and programming of the PLC for Turnout 7 will be provided by MWA's systems integrator separate from the construction contractor. Modifications to Adelanto's SCADA server and any required programming will be provided by Adelanto's systems integrator separate from the construction contractor. PLC inputs and outputs will include the following:

- Building intrusion alarm
- UPS or AC power failure
- Pressure transmitters data
- Flow transmitters data
- Flow control valve setpoint
- Motor operated valves (open or closed)
- Calcium hypochlorite low tablet alarm
- Solution tank level
- Chlorine analyzer alarm
- Chlorine residual level

5.7 Facility Operation Strategy

MWA will be responsible for operating and maintaining the conveyance facilities necessary to deliver water to Adelanto at the requested flow rate and at a minimum pressure of 40 psi. MWA's operational responsibility ends at the downstream flange of the flowmeter. MWA will monitor the flowrate at the turnout and will coordinate with Adelanto to schedule and manage the delivery of the water. Adelanto will be responsible for the turnout facilities downstream of the flowmeter. They will control the amount of flow as well as operate and maintain the disinfection facilities. Adelanto will be responsible for the water quality monitoring and reporting for the turnout facility. The turnout will be equipped with a motor operated isolation valve, a flowmeter, a modulating electronic flow control valve, (2) pressure transmitters, and a calcium hypochlorite tablet chlorination system.

The motor operated isolation valve will be used as a shut off valve and will be controlled and monitored by MWA's control panel. This valve will be either open or closed and will be in the open position in normal operation. This valve can also be used by MWA to shut down the flow in the event of a system emergency.

The flowmeter will measure the rate of flow and will be operated by MWA. The 4-20 mA flowmeter signal will be sent to MWA's control panel, Adelanto's control panel and to the controllers for the chlorination system. Since both MWA and Adelanto will receive the same actual flow signal, both entities will be able to monitor the flow for agreement compliance.

The flow control valve will be controlled by Adelanto and will be used to adjust the rate of flow to the flow amount agreed upon by MWA and Adelanto. Adelanto will send the flow set point signal to the flow control valve controller through either the operator interface terminal at the control panel or through the SCADA interface. The flow control valve controller will open or close the flow control valve to the desired flow set point such that the actual measured flow from the flowmeter matches the set point flow.

The pressure transmitters will be used to measure the system pressure at two locations, upstream of the isolation valve (inlet location) and downstream of the flow control valve (outlet location). The inlet pressure transmitter will be sent to both control panels for agreement compliance for the minimum pressure. The outlet pressure transmitter will be sent to only Adelanto's control panel.

The calcium hypochlorite tablet chlorination system will be controlled and monitored by Adelanto's control panel. The chlorinator will be paced from a compound loop pump control unit which will receive the flow signals from the flowmeter and the chlorine residual signals from the chorine residual analyzer. The compound loop control will allow for the accurate trimming of the outlet chlorine residual value independent of the incoming chlorine residual value. The location point of the sampling line will be evaluated to ensure adequate mixing downstream of the turnout piping and an accurate chlorine residual value.

5.8 SCE Electrical Service

Electrical power for Turnout 7 will be provided by Southern California Edison (SCE). Emergency back-up power will not be provided for Turnout 7. The nearest SCE electrical conduit is located approximately 800 lineal feet east of the Adelanto Olivine tank site at the intersection of Olivine Road and Mesa View Drive. It is anticipated that an SCE line extension and new power pole will be required to provide electrical service and meter at Turnout 7. It is also anticipated that a separate electrical meter will be installed for potential future loads allocated for the Adelanto 5.0 MG Reservoir facility. The new electrical service is anticipated to be 120/240V single phase 100A service For Turnout 7 and 120/240V single phase 50A service for the Adelanto 5.0 MG Reservoir facility.

5.9 Potential Utility Conflicts

No significant utility conflicts are anticipated within the existing Adelanto reservoir site.

Section 6: Turnout 6 Modifications

6.1 Facility Design Requirements

The in-line booster pump will be designed as a close coupled, vertically set end-suction centrifugal pump. The electric motor will be 40 horsepower, 1200 rpm constant speed, soft start and rated for premium efficiency. The existing flow control valve will be modified to add check valve functionality to prevent reverse water flow. The existing Turnout 6 building's temperature control system will be evaluated for modifications during final design due to the increased heat caused by the pump's motor and it is anticipated that a redundant air exhaust fan with thermostat control may be required.

Based on the pump design parameters in Section 3.5 for the Phase 1-A flow conditions, a preliminary pump selection was based on a pump curve for a Grundfos 80123 LCV (12.10" impeller) pump unit as shown in the Turnout 6 System Curve (Pre-Bottleneck Improvements) in Appendix C. The Grundfos pump is NSF 61 certified for domestic water use. A comparable pump unit acceptable for bidding purposes is the Cornell 6RB (13" impeller) vertically set end-suction centrifugal pump, although this pump has a lower efficiency rating for the Phase 1-A flow conditions, it has a similar efficiency rating to the Grundfos pump for the Phase 1-B flow conditions. The Cornell pump is also NSF 61 certified.

A third pump unit evaluated, but not recommended for final design, was the Bell & Gossett Series e-80sc (12" impeller) close coupled in-line centrifugal pump. This pump unit was not recommended due to its lower efficiency rating for the Phase 1-A flow conditions and because the pump unit is not NSF 61 certified.

A vertical can turbine pump was also considered but was not evaluated further since this type of pump would require significant structural modifications to the turnout building for roof access to be provided. Consideration of using a pumping unit with a variable frequency drive was also considered but was not evaluated further due to the additional air conditioning required for cooling purposes and the related cost impacts. In addition, the existing flow control valve will be able to satisfactorily modulate the flows as necessary for this application.

It is also noted that upon completion of the distribution system improvements to Victorville's distribution system, the booster pump installed at Turnout 6 would need to be modified with a smaller diameter impeller due to the reduced system head related to the Phase 1-B flow conditions. Under the Phase 1-B flow conditions and the modified pump, this will result in a less efficient pump unit (a reduction of approximately 6-17%). A more costly alternative to increase the pump efficiency would consist of replacing the pump unit with a completely new pump unit. This alternative is not recommended for the Phase 1 flow conditions.

In the future, if Turnout 6 is proposed to be modified to pump the ultimate flow (5,060 GPM @ 74 ft TDH), it is recommended to analyze the replacement of this pump unit with a horizontal split case pump unit. The use of a horizontal split case pump will require evaluation of the space limitations within the former Turnout 7 piping room and the potential relocation of the existing control panel.

6.2 Sole Source Equipment or Material Requirements

For the Turnout 6 modifications, it is presumed that the pump specifications will allow either the Grundfos or Cornell pump unit. However, the following equipment is proposed to be specified for sole source procurement in order to match MWA's existing R^3 project facilities in accordance with the California Public Contracting Code:

- Electronic Valve Actuator: EIM Controls
- Telemetry/Instrumentation: Tesco Controls (MWA facilities)

The contract documents will be required to include the findings for the sole source equipment procurement.

6.3 Pressure Surges

A detailed surge analysis will be completed during final design. Anticipated measures to minimize pressure surges will be to specify the minimum required opening and closing times for the flow control valve and the motorized butterfly valves at Turnout 6. The proposed pumping unit will be evaluated for possible adverse surges caused by pump power failure or start-up of the pumping unit. In addition, evaluation of the sizing for the air and vacuum release valves and evaluation of pressure/surge relief/anticipator valves will be performed during final design.

6.4 Corrosion

Pipeline protection from corrosion will be provided by the cement mortar coating for below-ground installation or paint coating for above-ground installation. For any modifications to the existing piping which will utilize the connection of new steel piping to previously constructed steel piping, the use of an insulating flange kit is recommended to minimize corrosion potential between the pipeline facilities.

6.5 Geotechnical

Attached in Appendix D is the Geotechnical Desktop Study for the proposed project. No significant geotechnical issues are anticipated for the modifications to Turnout 6. A detailed geotechnical investigation and report will be completed during final design.

6.6 SCADA/Telemetry

Existing instrumentation and control for Turnout 6 is provided using radio communication between the radio receiver at Turnout 6 and MWA's and Victorville's existing SCADA servers. Modifications necessary for MWA's SCADA server and programming of the PLC for Turnout 6 will be provided by MWA's systems integrator separate from the construction contractor. Modifications necessary to Victorville's SCADA server and any required programming will be provided by the City of Victorville's systems integrator separate from the construction contractor.

6.7 Facility Operation Strategy

MWA will be responsible for operating and maintaining the conveyance facilities necessary to deliver water to Victorville at the requested flow rate and at a minimum pressure of 40 psi. MWA's operational responsibility ends at the downstream flange of the flowmeter. MWA will monitor the flowrate at the turnout and will coordinate with Victorville to schedule and manage the delivery of the water. Victorville will be responsible for the turnout facilities downstream of the flowmeter. Victorville will control the amount of flow as well as operate and maintain the disinfection facilities. Victorville will be responsible for the water quality monitoring and reporting for the turnout facility. The turnout will continue to operate with the motor operated isolation valves, flowmeter, modulating electronic flow control valve, pressure transmitters and a sodium hypochlorite chlorination system. The turnout will also be re-equipped with a new pumping unit which will be operated and maintained by MWA.

The motor operated isolation valves will be used as a shut off valve and will be controlled and monitored by MWA's control panel. These valves will be either open or closed and will be in the open position in normal operation. These valves will also control whether Turnout 6 is operated in a pumped flow or non-pumped flow mode and they can also be used by MWA to shut down the flow in the event of a system emergency.

The flowmeter will measure the rate of flow and will be operated by MWA. The 4-20 mA flowmeter signal will be sent to MWA's control panel, Victorville's control panel and to the controllers for the (2) sodium hypochlorite metering pumps. Since both MWA and Victorville will receive the same actual flow signal, both entities will be able to monitor the flow for agreement compliance.

The flow control valve will be controlled by Victorville and will be used to adjust the rate of flow to the flow amount agreed upon by MWA and Victorville. Victorville will send the flow set point signal to the flow control valve controller through either the operator interface terminal at the control panel or through the SCADA interface. The flow control valve controller will open or close the flow control valve to the desired flow set point such that the actual measured flow from the flowmeter matches the set point flow.

The pressure transmitters will be used to measure the system pressure at two locations; (1) upstream and downstream of the proposed pump unit installed on the former Turnout 7 piping and (2) continuation of the use of the existing pressure transmitters on the existing Turnout 6 piping. The pressure transmitters for Location No. 1 will be sent to only MWA's control panel to monitor the increased pressure from the pump unit. The pressure transmitters for Location No. 2 will continue to be sent to both MWA and Victorville's control panels for agreement compliance purposes.

The pumping unit will be controlled by MWA and will be used to increase the water pressure to Victorville's distribution system. During pump start-up, MWA will send a signal to start the pump through either the operator interface terminal at the control panel or through the SCADA interface. As the pump ramps up, the flow control valve will slowly open until the measured flow matches the set point flow. The flow control valve will be used to modulate the flow from the pumping unit. During pump shut-down, MWA will send a signal to stop the pump through either the operator interface terminal at the control panel or through the SCADA interface. Upon pump shut down, the flow control valve will be closed and the added check valve functionality will prevent backflow from Victorville's distribution system.

The sodium hypochlorite chlorination system will continue to be controlled and monitored by Victorville's control panel. The chlorine metering pumps will be paced from individual compound loop pump control units which will receive the flow signals from the flowmeter and the chlorine residual signals from the chorine residual analyzer. The compound loop control will allow for the accurate trimming of the outlet chlorine residual value independent of the incoming chlorine residual value.

6.8 SCE Electrical Service

Electrical power for Turnout 6 is currently provided by SCE through a 120/240V single phase 100A service. Emergency back-up power is not provided for Turnout 6. Due to the proposed pump unit installation and the potential for a second pump unit installation, the existing SCE electrical service will be upgraded to a 480V three phase 200A service.

6.9 Potential Utility Conflicts

No potentially significant utility conflicts are anticipated at the Turnout 6 project site.

Section 7: CEQA/NEPA Requirements

7.1 CEQA Requirements

The Final Environmental Impact Report (FEIR) for the Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program SCH No. 2005041103 was approved and adopted by MWA in January 2006. In addition, three (3) subsequent addendums were approved by MWA. The R^3 Project Phase 1 was addressed in the FEIR and addendums, however, due to the age of these documents and changes to the State's California Environmental Quality Act (CEQA) Guidelines, an Initial Study will be prepared for the proposed project which will "tier" off of the FEIR and addendums. Included during the preparation of the Initial Study will be additional technical studies for the following:

- Air Quality/Greenhouse Gas Study
- Biological Resources, Jurisdictional Resources and Joshua Tree Assessment Study
- Cultural Resources Study
- Energy Resources Assessment
- Noise Study
- Traffic Analysis Study

AB52 consultation with Native American tribes will be conducted by MWA this summer. Based on the partial CEQA information prepared during the preparation of the PDR, it is anticipated that a mitigated negative declaration will be the recommended CEQA compliance document for the project and the contract documents for the proposed project will incorporate the adopted mitigation monitoring and reporting program.

7.2 NEPA Requirements

An Environmental Assessment (EA) titled "Upper Mojave River Groundwater Regional Recharge and Recovery including Oro Grande Groundwater Recharge, San Bernardino County, CA" was finalized in December 2009 along with a "Finding of No Significant Impact No. 10-SCAO-002-FONSI". The R^3 Project Phase 1 was addressed in the Environmental Assessment and Finding of No Significant Impact for compliance with the National Environmental Policy Act (NEPA). Included during the preparation of the Initial Study for CEQA, the Cultural Resources Study will be prepared to satisfy Section 106 standards to facilitate SHPO consultation with the Bureau of Reclamation. Based on the partial CEQA/NEPA information prepared during the preparation of the PDR, it is anticipated that the Bureau of Reclamation will prepare a NEPA categorical exclusion for the project.

Section 8: Property Acquisition & Permit Requirements

8.1 Property Acquisition

Based on the preliminary investigation of the existing public right-of-way data, all construction is anticipated to occur within the existing public right-of-way, within the City of Victorville, or within property owned by MWA or the City of Adelanto. For the facilities constructed within the City of Adelanto's property, permission to construct, operate, maintain, replace and access to the site is provided to the MWA for the proposed facilities by the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto.

It is anticipated the contractor will be allowed to string the pipeline along the pipeline alignment during construction. Limited property will be provided for the contractor's staging area and storage yard within the City of Adelanto reservoir property, primarily along the frontage of Olivine Road.

8.2 Permit Requirements

The following permits are anticipated to be required for the proposed project.

8.2.1 City of Victorville Utility & Transportation Permit

A utility permit from the City of Victorville is required as the pipeline will be installed within the City's right-of-way. The contractor will be responsible for complying with all aspects of the City's utility permit process including the preparation of stormwater site inspection report and traffic control plans per the California Manual on Uniform Traffic Control Devices. In addition, the contractor will be responsible to acquire a transportation permit from the City of Victorville to allow the hauling of oversize loads on city streets.

8.2.2 Domestic Water Supply Permit

MWA has an existing domestic water supply permit from the SWRCB for the R^3 Phase 1 project, Operating Permit 05-13-12P-011-R3 Water System, System No. 3610129. An amended domestic water supply permit is required to be submitted to the SRWRB for the Adelanto extension of the R^3 distribution system and the Turnout 6 modifications.

Adelanto has an existing domestic water supply permit from the SWRCB for their water system, Operating Permit 05-13-16PA-006. An amended domestic water supply permit is required to be submitted to the SRWRB for the Adelanto extension of the R^3 distribution system due to the new water supply source provided to Adelanto.

Victorville's existing domestic water supply permit from the SWRCB will be unaffected by the Adelanto extension of the R^3 distribution system or the Turnout 6 modifications.

Prior to the completion of the final design phase, an amended domestic water supply permit for MWA and Adelanto shall be prepared and submitted to:

Amanda Chapman, Water Resource Control Engineer
SWRCB - Division of Drinking Water
464 West 4th Street, Suite 437
San Bernardino, CA 92401

8.2.3 Construction Storm Water Discharge

For construction stormwater permitting, this project will require coverage under Construction General Permit No. CAS000002 (CGP), Water Quality Order 2009-0009-DWQ and will require filing a notice of intent (NOI) and preparing a stormwater pollution prevention plan (SWPPP). The NOI and SWPPP will be prepared during design and incorporated into the contract documents. The contractor will be required to submit the NOI, SWPPP and all other permit documents electronically to the MWA as a submittal for review then upload to the State's Storm Water Multiple Application and Report Tracking System. The MWA shall name a Legally Responsible Person for coverage under the General Permit. The contractor shall install activity-appropriate best management practices (BMPs) for erosion and sediment control during construction and shall implement other requirements for the SWPPP per the General Permit. The contractor shall also implement a monitoring program and reporting plan in accordance with the General Permit's monitoring requirements.

8.2.4 Groundwater/Construction Water Discharge

Discharge of potable or untreated clear water to land from pipeline or hydrant flushing, or pipeline hydrostatic testing, or small temporary groundwater dewatering excavation during construction will be permitted in accordance with the requirements of State Water Resources Control Board Water Quality Order No. 2003-0003-DWQ. The contractor will be required to secure approval from the landowner prior to discharge, in addition to submitting a Notice of Intent and all other documentation for permitting approval by the California Regional Water Quality Control Board, Lahontan Region. The contractor will not be allowed to discharge groundwater or construction water to surface waters within the region. Based on previous geotechnical reports, shallow groundwater is not anticipated during construction for the proposed project.

8.2.5 Other Permits

Other permits to be obtained by the contractor, which will be specified in the construction contract documents, are as follows:

- California Occupational Safety and Health Administration (Cal-OSHA) – The contractor is required to have a Trenching/ Shoring permit for any portion of the project involving trenching, demolition, and excavation greater than 5 feet in depth.
- Mojave Desert Air Quality Management District (MDAQMD) – Implementation of BMPs for dust control and construction equipment emissions is expected to be required by the MDAQMD. Mitigation measures outlined from the approved CEQA document will be incorporated into the construction contract documents.

Section 9: Project Schedule

9.1 Project Schedule

A preliminary project schedule was prepared for the construction of the proposed project and is included in Appendix E. The estimated bid opening date is January 21, 2020 and the estimated construction completion date is September 25, 2020 for the Adelanto pipeline extension and re-located Turnout 7. The estimated project completion date is December 18, 2020 upon construction completion of the Turnout 6 modifications.

It is recommended to solicit bids for construction in a single bid package, not separate bid packages for the pipeline construction and the turnout construction, as this would unnecessarily increase the overall cost of the project (additional project administration cost plus potential for contractor conflicts) without shortening the project schedule.

Project phasing anticipated for the proposed project would consist of requiring the construction completion of the Adelanto pipeline extension and re-located Turnout 7 prior to the removal of Turnout 6 from service. This would avoid Turnout 6 being removed from service during the summer months. Victorville has indicated a preference that Turnout 6 should not be removed from service for construction of the project during the summer months prior to completion of either the re-located Turnout 7 or Victorville's Turnout 5 booster pump station project.

The installation of the 20-inch & 30-inch diameter steel pipeline assumes there will be no restrictions regarding day-time construction. Estimated long lead items for material or equipment procurement are the following items:

- Steel pipe: 8-16 weeks
- Butterfly valves (30" & 36"): 12-16 weeks
- Small diameter valves: 6-8 weeks
- Flow control valve: 8-12 weeks
- Magnetic flow meter: 6-8 weeks
- In-line booster pump: 6-8 weeks
- Chlorination equipment: 6-8 weeks

Options to be evaluated during final design to potentially reduce the project construction schedule will be as follows:

1. Owner purchased equipment/material
2. Owner pre-negotiated pricing of equipment/material, particularly any sole source equipment specified

Section 10: Opinion of Probable Construction Cost

10.1 Opinion of Probable Construction Cost

A Class 3 cost estimate was prepared for the construction of the proposed project and is included in Appendix F. This level of cost estimate, as defined by AACE International, is intended for budgeting, authorization or appropriation purposes for projects at a 10 to 40 percent level of definition. A Class 3 cost estimate has an expected accuracy range of -10 to -20 percent on the low end and +10 to +30 percent on the high end. The construction costs described are based on June 2019 dollars (ENR Construction Cost Index = 11268). The construction cost estimate includes a 20% cost contingency and the following markups:

- Division 1 Costs: 10%
- Contractor's Markup on Subs: 10%
- Taxes (San Bernardino County): 7.75%
- Contractor's Overhead and Profit: 15%
- Escalation to Construction Mid-Point: 3%

A summary of the construction cost estimate is provided in Table 5.

Cost Category	Amount
30" Pipeline (Mesa View Drive)	$2,240,000
20" Pipeline (Olivine Road)	$440,000
Turnout 7	$786,000
Turnout 6 Modifications	$434,000
Total	$3,900,000

Table 5: Opinion of Probable Construction Cost Summary

10.2 Other Project Costs

The construction cost estimate does not include construction services (engineering, surveying, geotechnical testing, SCADA programming, etc.) or construction inspection during construction. The estimated construction services cost is based on 15% of the construction cost, or $585,000. MWA staffing costs during construction is not included in this cost. The design phase costs for the project, excluding MWA staffing costs is estimated to be $577,000.

A summary of the total project cost estimate is provided in Table 6.

Cost Category	Amount
Project Design	$577,000
Construction	$3,900,000
Construction Services	$585,000
Total	$5,062,000

Table 6: Total Project Cost Estimate

Appendix A: Water Supply Connection Agreements

A.1 City of Adelanto Agreement

WATER SUPPLY CONNECTION AGREEMENT
REGIONAL RECHARGE AND RECOVERY PROJECT (R^3)

AGREEMENT made this 10th day of April, 2019, between the MOJAVE WATER AGENCY ("Agency") and the CITY OF ADELANTO ("Customer").

WITNESSETH:

IT IS HEREBY AGREED, in consideration of the mutual covenants of the parties, as follows:

1. Definitions. When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

a. "Agency" as used herein shall mean Mojave Water Agency.

b. "Agency Law" shall mean the Mojave Water Agency Law, Chapter 97 of the Water Code Appendix, Statutes of 1959 of the State of California, as amended and as the same may be hereafter amended, supplemented re-enacted, or codified.

c. "Agreement" as used herein shall mean this agreement for a water connection between Agency and Customer.

d. "Contract" shall mean the contract entitled "Water supply Contract between the State of California Department of Water Resources and the Mojave Water Agency," dated June 22, 1963 as heretofore or hereafter amended.

e. "Customer" as used herein shall mean the City of Adelanto.

f. "Connection Improvements" shall mean those facilities necessary to connect the Customer's water system to the relocated Turnout 7 ("TO 7") of the Regional Recharge and Recovery Project, as depicted and described in Exhibits One, Two, & Three.

g. "General Manager" shall mean the General Manager of the Mojave Water Agency.

h. "Judgment" shall mean the Judgment in City of Barstow, et al. v. City of Adelanto, et al., Superior Court, Riverside County, Case No. 208568.

i. "Ordinance No. 9" as used herein shall mean the Ordinance of the Mojave Water Agency Establishing the Rules and Regulations for the Sale and Delivery of State Project Water.

j. "Point of Connection" as used herein shall mean the outlet flange of the magnetic flow meter shown as item 4 on Exhibit Two, Detail for Turnout 7.

k. "Potable Water" as used herein shall mean water from any source which has been investigated by the State Water Resources Control Board Division of Drinking Water, and which has been approved for human consumption.

l. "R^3 Project" as used herein shall mean the Mojave Water Agency Regional Recharge and Recovery Project, including the Connection Improvements as described herein.

m. "State Water Project" shall mean water made available to the Agency by the State of California pursuant to the terms of the Contract.

n. "Year" means a calendar year.

2. General Purpose and Requirements.

2.1 Customer Connection. The Connection Improvements shall be constructed by the Agency for use solely for the Customer. Customer shall provide a deposit of $500,000 to cover the cost of the relocated TO 7 and connection improvements. Connections will be provided at the relocated TO 7 at the City of Adelanto Reservoir site with pipeline extending from the relocated TO 7 and connecting to the City of Adelanto existing water system Facilities, as shown on Exhibits One, Two ("Point of Connection").

2.2 Environmental Requirements. The Agency is a public agency and is aware of the requirements of the California Environmental Quality Act ("CEQA") and its implementing guidelines, and will comply with the CEQA and its implementing guidelines.

3. Financial Considerations.

3.1 All costs for design, construction, and startup of the relocated Turnout 7 and Connection Improvements will be paid in full by the Agency and paid back by the Customer as a deduction from the deposit required in Section 2.1 above.. All costs incurred for the Customer side of the connection will be deducted from the deposit on a monthly basis and any money remaining at the conclusion of construction and final payment of all costs will be returned to the Customer.

4. Facility Ownership.

4.1 Facilities Included; Ownership by Agency and Customer. The Connection Improvements shall include the facilities for delivery of potable water from the Agency's R^3 Project to the Point of Connection described in paragraph 2.1 herein. The Agency will own, operate, and maintain all portions of the Connection Improvements up to the Point of Connection, as defined herein, including the main turnout structure in its entirety, and will have full un-restricted access to these facilities. The Customer will own, operate, and maintain all piping, equipment, and ancillary facilities related to the turnout on the Customer's side of the Point of Connection.

5. Design Considerations.

5.1 Design and Operating Criteria. The Agency's facilities have been designed and planned in close coordination with the Customer's staff to meet Customer's water service requirements to the maximum extent feasible and to allow for maximum flexibility for use in different modes of operation. The Agency's facilities have been designed to deliver potable water to the Customer's Point of Connection at a reasonably constant minimum water pressure of approximately 40 psi. All deliveries to the Customer will meet the applicable standards of the State Water Resources Control Board Division of Drinking Water.

5.2 Measurement. All water furnished pursuant to this Agreement shall be measured by the Agency at the Point of Connection.

5.3 Back-Flow. Back-flow prevention is not required by the Division of Drinking Water when connecting two approved potable water systems with valid domestic water supply permits, however, the Connection Improvements have been designed and constructed to provide a "check feature" at the Cla-Val electronic control valve (Exhibit Two, Details 3, Item 6) on the Customer's side of the Points of Connection. The Customer shall maintain the control valve such that the check feature remains operable during the term of this Agreement as set forth in Section 8.

However, should the Customer's water supply, practices, or operational procedures pose a water quality concern which may be objectionable and or constitute an unacceptable source of water, a backflow device(s) commensurate to the degree of hazard may be required by the Agency. This may include but not be limited to blending, treatment, non-potable service connections, and other related types of operations. If required, the customer is responsible for the installation, repair, replacement, and maintenance as well as the costs associated with compliance of this requirement. The Agency reserves the right to discontinue service should an unacceptable condition exists until corrected

A cross-connection survey may be required. If a cross-connection survey is required, the Customer agrees to provide access and all applicable information in order to perform a comprehensive cross-connection survey.

5.4 Flow Control Devices and Delivery Rates. The Connection Improvements include an electronic control valve to allow the Customer to control the rate of flow at the Point of Connection. Deliveries of R^3 Project water will be made at flow rates as determined by the Customer, but should not exceed the nominal flow rate shown on Exhibit Three, Schedule of Delivery Capacities for Project Participants, unless approved in advance by the Agency's Director of Operations.

5.5 Pressure Surges (Water Hammer). The R^3 Project has been designed to withstand the effects of pressure surge; however, the Customer shall make every effort to minimize sudden fluctuations in flow rates at the Point of Connection.

6. Operation and Maintenance.

6.1 Maintenance of Connection Improvements. Maintenance of the Connection Improvements will be as described in paragraph 4.1 herein.

6.2 Limits on Agency Responsibility. The Agency has no responsibility in the maintenance and operation of Customer's water system beyond the Point of Connection. Customer shall be responsible and liable for its own water system. Customer agrees to accept and consent to such conditions of pressure and service as may from time to time exist under current operating practices prevailing within the Agency, at the location of the Point of Connection, and Customer agrees to hold Agency harmless from any and all damages caused by or arising out of low, high, or fluctuating pressures or interruption of service which are beyond Agency's reasonable control. Delivery of water pursuant to this Agreement, except as may be specifically provided herein, shall be in accordance with the rules, regulations, and charges of the Agency as they may from time to time exist and apply to all the customers of the Agency. This Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

6.3 Delivery of Water. All facilities in the Connection Improvements up until the Point of Connections necessary to accommodate water delivery are the responsibility of the Agency and shall be operated by Agency employees only. The Agency is required to occasionally flow water in this pipeline during low use times to maintain water quality. This flow of water will be coordinated with Adelanto for delivery to Adelanto. This water will be accounted for and paid for as water delivered to Adelanto.

6.4 Limitations on Service. Due to the nature of the Agency's facilities and the potential modes of service required, the Agency cannot guarantee any specific level of pressure; however, the R^3 Project has been designed to deliver potable water to the Customer's Point of Connection at a reasonably constant minimum water pressure of approximately 40 psi. There are no limits regarding time-of-use, either by time of year or time of day.

6.5 Coordination of Water Deliveries. Water orders must be placed with the Agency Operations Supervisor a minimum of one week in advance of actual delivery. Delivery of water shall continue until the Customer requests the Agency to terminate the flow, and gives the Agency a minimum of one hour in which to do so.

7. Agreement Administration.

7.1 General Terms of Service. All water deliveries made pursuant to Ordinance No. 9 shall be subject to all of the terms and conditions of the Agency's Contract. **CUSTOMER SHOULD USE CAUTION IN THE ISSUANCE OF CAN OR WILL SERVE LETTERS FOR ANY LAND USE ENTITLEMENT BASED UPON STATE WATER PROJECT WATER.**

7.2 Water Flow Measurement and Meter Accuracy. All determinations relative to the measuring of water shall be made by the Agency and, upon request by the Customer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in Ordinance No. 9. The Customer has a right to audit the Agency's measurement determinations. Any error appearing therein will be adjusted pursuant to conditions set forth in Ordinance No. 9. In the event of a disagreement, the Agency and Customer agree to submit the Agency's accuracy tests to a mutually agreed upon third party and to abide by its determination. Customer will ensure that all end-users of water provided under this Agreement are properly metered.

7.3 Water Delivery Subject to Annual Approval and is Interruptible. All water supplied by the Agency is annually determined and shall be served upon an interruptible basis.

7.4 No Rights to Water Vested with Customer. The Customer shall not obtain any vested rights upon the sale and delivery of water apportioned in accordance with Ordinance No. 9, nor are any such rights inferred by virtue of an Agency decision to provide water to Customer in a specific year.

7.5 Water Deliveries required by the Mojave Basin Area Judgment and ID-M Contract. Customer acknowledges that contractual requirements under the Judgment and contractual requirements between the Agency and the Improvement District "M" have priority over the sale of water pursuant to Ordinance 9.

7.6 Water Rates. All water rates for water service made by the Agency shall be established by resolution of the Board of Directors of the Agency pursuant to Ordinance No. 9 and the Mojave Water Agency Act. Such rates for water service may not exceed the estimated cost of providing the service for which the water rate is charged. Such rate will be reasonable, fair, and equitable in nature and proportionately representative of the costs incurred by the Agency.

7.7 Payment of Water Charges. Water charges are due and payable

at the Agency office on the date a bill is mailed to the Customer and shall be delinquent 30 days thereafter. Service may be discontinued without further notice if payment of the water charge is not made prior to the date such charge becomes delinquent.

8. Agreement Term.

8.1 Termination Date. This Agreement shall be for a term of one (1) year, and shall automatically renew each year, if Customer is in compliance with its terms, for a period of thirty (30) years from the date hereof. If Agency reasonably determines Customer is not in compliance, Customer must be given a reasonable opportunity to comply before the Agreement terminates. This Agreement may be terminated by the Customer earlier by providing a written notice at least 30 days prior to the desired date of termination. Upon any termination, the Connection Improvements will remain the property of the Agency, and Customer will have no further responsibility under this Agreement, or for ongoing operations and maintenance of the Connection Improvements.

8.2 Change in Party Status. In the event of dissolution, consolidation, or merger of the Customer or the Agency, all of the terms and conditions of this Agreement shall bind the surviving entity or successor.

9. Indemnity.

9.1 Defense of Agreement. The Customer shall defend, indemnify, and hold harmless Agency and its agents, officers, and employees from any claim, action, or proceeding against Agency or its agents, officers, or employees relating to efforts to attack, set aside, void, or annul this Agreement, including without limitation a CEQA claim. To the extent that Agency uses any of its resources, with the prior approval in writing of Customer, in responding to such claim, action, or proceeding, Customer will reimburse Agency upon demand. Such resources include, but are not limited to staff time, court costs, Agency counsel's time at their regular rate for Agency work, or any other direct or indirect cost associated with responding to the claim, action or proceedings. These obligations shall be binding on Customer's successors and assigns, and Customer shall so obligate all successors and assigns.

9.2 Indemnification for Water Connection and Water Delivery. Except with respect to (1) the Agency's own negligence or willful misconduct and/or (2) an occurrence on the Agency's side of the Point of Connection not resulting from action(s) of the Customer or its agents, contractors, or assigns, and which is/are the direct cause of damage or injury, the Customer shall fully indemnify and hold harmless the Agency and its officers, agents, and employees against liability for damages of any nature whatsoever, including but not limited to, property damage, personal injury, or death, arising from (3) the action(s) of Customer or any person under Customer's control, including without limitation the Customer's agents, contractors, and assigns; (4) claims

made by Customer's own customers and other end users of the water provided by Customer, arising out of, or resulting from, or made in connection with this Water Supply Connection Agreement and the Agency's provision of water to Customer for its use and the use of Customer's own customers; (5) the Customer's control of the rate of flow at the delivery point; or (6) an occurrence on the Customer's side of the Point of Connection not resulting from action(s) of the Agency or its agents, contractors, or assigns.

9.3 Claim Notification. The Agency will, within a reasonable period of time, notify the Customer of any such claim, action, or proceeding covered by this Section 9. If the Agency should fail to cooperate in the defense, the Customer shall not thereafter be responsible to defend, indemnify, and hold harmless the Agency and its agents, officers, and employees pursuant to this Section 9.

9.4 Settlement Approval. The Customer shall not be required to pay or perform any settlement of such claim, action, or proceeding unless the Customer approves the settlement in writing.

9.5 Notices. All notices to the Customer under this Agreement shall be deemed valid and effective five (5) calendar days following deposit in the United States mail, postage prepaid, be certified and/or registered mail, addressed to:

Jesse Flores, City Manager
City of Adelanto
Adelanto, CA 92301

Keith Lemieux, City Counsel
Olivarez, Madruga, Lemieux, O'Neill
4165 E. Thousand Oaks Blvd., Suite 350
Westlake Village, California 91362

All notices to the Agency under this Agreement shall be deemed valid and effective when personally served upon Agency Counsel and General Manager or upon deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to:

William J. Brunick
Brunick, McElhaney & Kennedy
1839 Commercenter West
P O Box 6425
San Bernardino, California 92412

Thomas McCarthy
General Manager

Mojave Water Agency
13846 Conference Center Drive
Apple Valley, California 92307

Except as provided otherwise, all notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Customer by such officers and persons as they may from time to time, authorize in writing to so act.

9.6 Remedies Not Exclusive. Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

9.7 Amendments. This Agreement may be amended or supplemented at any time by mutual written agreement of the Parties in any manner that may be consistent with the applicable law, subject to Paragraph 9.12 of this Agreement. In amending or supplementing this Agreement, the Agency will bear in mind that substantial uniformity of Agreements between its various customers and the desirability to the main contracting concepts and principles that are to be used. The Agency will, therefore, attempt to maintain uniformity between its various customers' Agreements in such respects.

9.8 Opinions and Determinations. Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this Agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

9.9 Waiver of Rights. Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default, or matter.

9.10 Transfer and Assignments. Except as provided in Section 8.2 hereof, the Customer shall not have the right to sell, assign, or transfer this Agreement and any and all of its rights, duties, and obligations hereunder, in whole or in part, to any person or entity at any time during the term of this Agreement, without prior written approval of the Agency.

9.11 Inspection of Books and Records. The proper officers or agents of the Customer shall have full and free access at all reasonable times to the account books and official records of the Agency at the Agency address set forth below insofar as the same pertain to the matters and things provided for in this Agreement, with the right

at any time during office hours to make copies thereof at the Customer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights to inspect the account books and records of the Customer at the Customer's address set forth below as they pertain to the Agency.

Mojave Water Agency	City of Adelanto
13846 Conference Center Drive	
Apple Valley, CA 92307	Adelanto, CA 92301
Telephone: (760) 946-7000	Telephone: (760) 246-2300

9.12 Uniformity of Provisions. It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the Customer and other customers served by the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into will be made to the contracts of all other customers on an equal basis, subject to Customer's approval which shall not be unreasonably withheld. In the event Customer declines to approve subsequent amendments as to the form and content of the Agreement, Agency shall have the right to terminate the Agreement upon giving 30-days written notice to the Customer.

9.13 Controlling Law. If there is any conflict between the provisions of this Agreement and Ordinance No. 9 or the Judgment, Ordinance No. 9 and the Judgment are controlling.

(signature page following)

IN WITNESS WHEREOF, the parties have executed this Agreement.

MOJAVE WATER AGENCY

(SEAL)

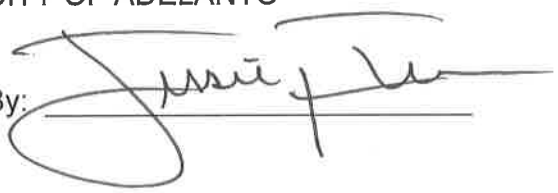
Carl Coleman, President

ATTEST:

Jeanette Hayhurst, Secretary

(SEAL)

CITY OF ADELANTO

By: 

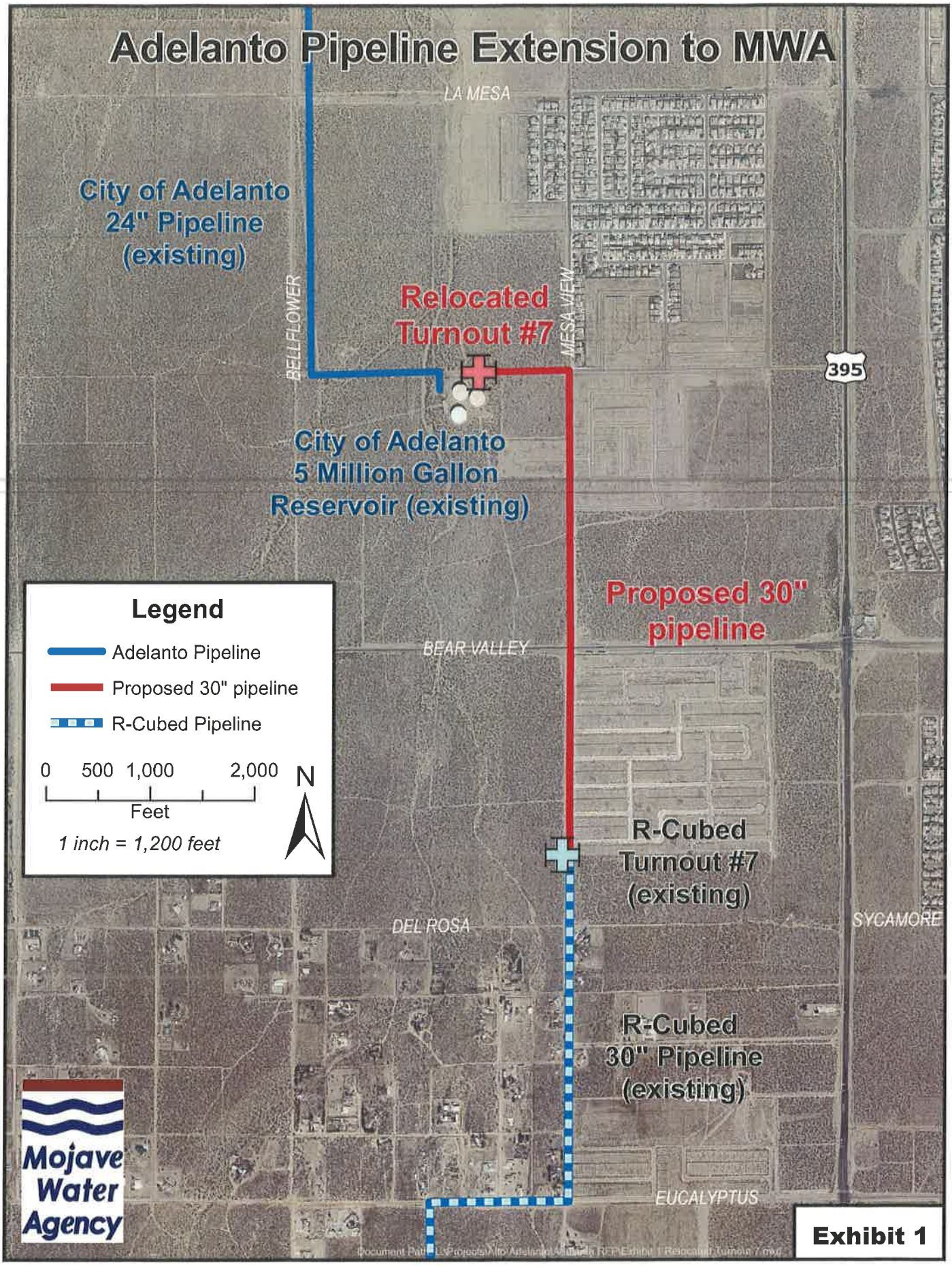
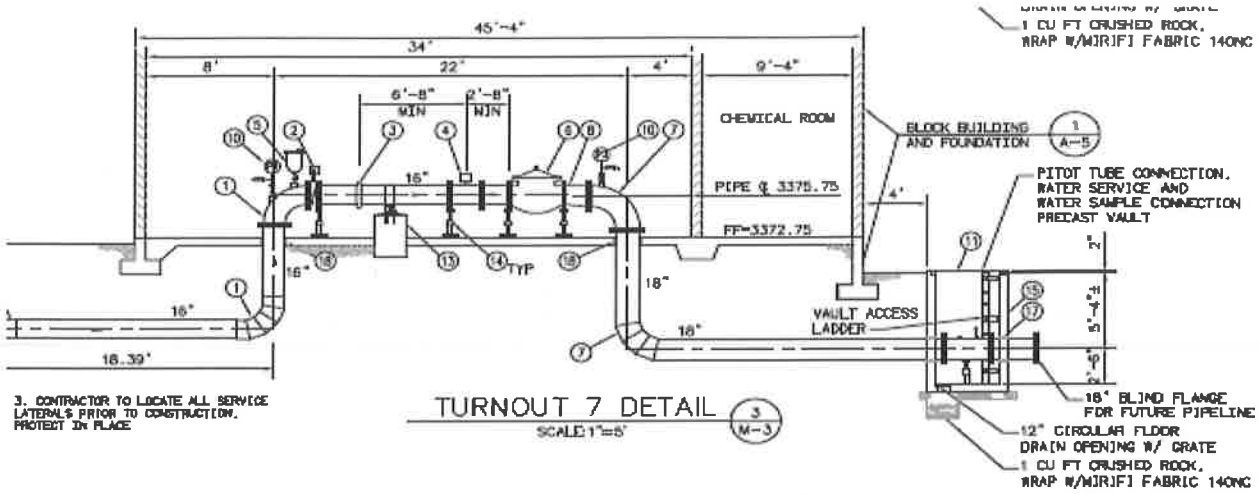
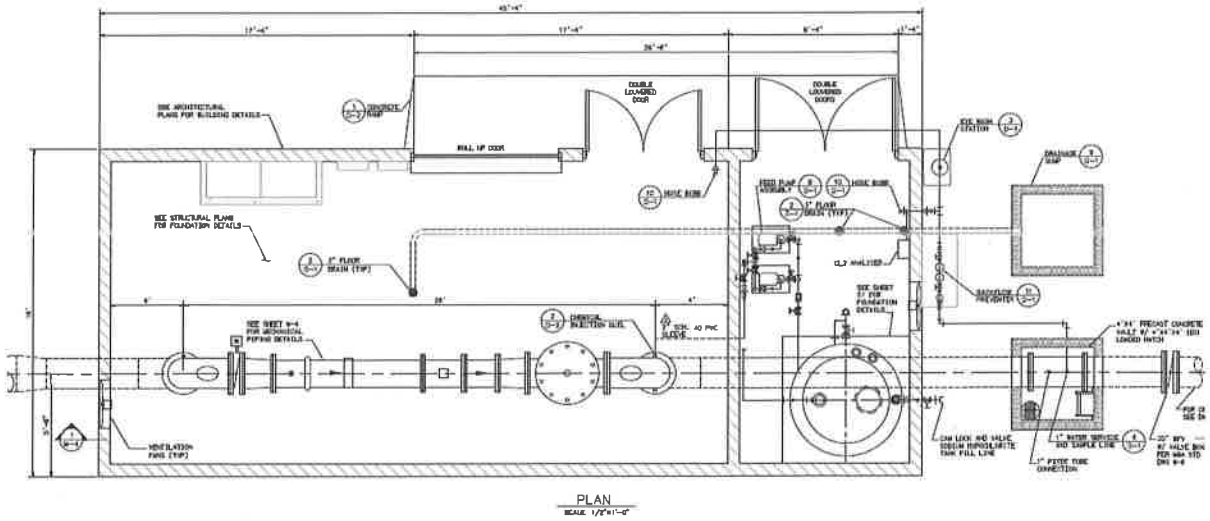

Adelanto Pipeline Extension to MWA
LA MESA
City of Adelanto
24" Pipeline
(existing)
BELLFLOWER
Relocated
Turnout #7
MESA VIEW
395
City of Adelanto
5 Million Gallon
Reservoir (existing)
Proposed 30"
pipeline
BEAR VALLEY
Legend
Adelanto Pipeline
Proposed 30" pipeline
R-Cubed Pipeline
0 500 1,000 2,000
Feet
1 inch = 1,200 feet
N
R-Cubed
Turnout #7
(existing)
DEL ROSA
SYCAMORE
R-Cubed
30" Pipeline
(existing)
Mojave
Water
Agency
EUCALYPTUS
Exhibit 1

Exhibit 2



ITEM	DESCRIPTION	TO-5	TO-6	TO-7
①	90° FULLY RESTRAINED BEND	20"	20"	16"
②	MOTOR OPERATED BUTTERFLY VALVE	20"	20"	16"
③	VICTAULIC COUPLING	18"	18"	16"
④	MAGNETIC TYPE FLOW METER	18"	18"	16"
⑤	COMBINATION AIR VALVE PER DETAIL 1 ON D1	4"	3"	3"
⑥	ELECTRONIC CONTROL VALVE CLA-VAL MODEL 131	20"	18"	16"
⑦	90° FULLY RESTRAINED BEND	20"	20"	16"
⑧	ECCENTRIC REDUCER	20X18	20X18	18X16
⑨	ECCENTRIC REDUCER	-	30X20	-
⑩	PRESSURE INDICATOR / TRANSMITTER WITH SAMPLE STATION PER DETAIL 4 ON DWG D-2			
⑪	48"X48" LOCKABLE H20 ALUMINUM ACCESS HATCH			
⑫	20" BFV W/ VALVE BOX PER DWG M-6			
⑬	THRUST SUPPORT PER MWA STD. PER DETAIL 3 ON DWG D-2			
⑭	PIPE SUPPORT PER DWG M-43			
⑮	48"X48" PRECAST CONCRETE VAULT W/ ACCESS LADDER			
⑯	CHEMICAL INJECTION QUIL PER DETAIL 2 ON DWG D-2			
⑰	PIPE PENETRATION PER DETAIL 7 ON D1 (TYP)			
⑱	FLOOR PENETRATION PER DETAIL 7 ON D2 (TYP)			
⑲	ORIFICE PLATE WITH 11.6"ø BORE			



Conceptual Layout for Relocated Turn Out 7

Exhibit 3

Regional Recharge and Recovery Project
Phase 1 Schedule of Delivery Capacities for Project Participants
June 15, 2012

Annual Amount Approved for Delivery Via W. Conveyance System (acre-feet per year)	Capacity Available to Hesperia Turnout 4		Capacity Available to VWD Turnouts 3 or 6		Capacity Available to Adelanto Turnout 7	
	af per year	cfs	af per year	cfs	af per year	cfs
0	0	0	0	0	0	0
1,000	246	0.41	523	0.88	231	0.39
2,000	492	0.83	1,046	1.76	462	0.78
3,000	738	1.24	1,569	2.64	692	1.16
4,000	985	1.65	2,092	3.52	923	1.55
5,000	1,231	2.07	2,615	4.40	1,154	1.94
6,000	1,477	2.48	3,138	5.27	1,385	2.33
7,000	1,723	2.90	3,662	6.15	1,615	2.71
8,000	1,969	3.31	4,185	7.03	1,846	3.10
9,000	2,215	3.72	4,708	7.91	2,077	3.49
10,000	2,462	4.14	5,231	8.79	2,308	3.88
11,000	2,708	4.55	5,754	9.67	2,538	4.27
12,000	2,954	4.96	6,277	10.55	2,769	4.65
13,000 and above	3,200	5.38	6,800	11.43	3,000	5.04

Note: Capcities at respective turnouts can be interpolated using tabulated values for actual delivery amounts between 0 and 13,000 acre-feet per year.

Mojave Water Agency

APPLICATION FOR THE SALE AND DELIVERY
OF STATE PROJECT WATER OR R3 PROJECT WATER
IN ACCORDANCE WITH MWA ORDINANCE NO. 9

1). APPLICANT NAME: ___ ADELANTO PUBLIC UTILITY AUTHORITY

2). LEGAL CAPACITY:

_____Public Agency (enabling law): _____
_ X _Public Utility (enabling law): ____A010342 LIC#006506
_____Mutual Water Company _____PUC Regulated Water Company
_____Private Water Company _____Partnership _____Individual
_____Corporation (type and State): _____

3). INTENDED USE FOR WATER:

_X_Municipal _____Industrial _____Agriculture _____Recreation
_____Ground Water Recharge _____Other_____

4). CALENDAR YEAR DELIVERY REQUESTED: 2021

STATE WATER PROJECT QUANTITY REQUESTED
BY MONTH FOR EACH INTENDED USE (Acre-Feet)

January	215	July	275
February	215	August	285
March	225	September	275
April	245	October	265
May	255	November	225
June	265	December	215

TOTAL ANNUAL QUANTITY: 2960

R3 WATER QUANTITY REQUESTED
BY MONTH FOR EACH INTENDED USE (Acre-Feet)
(FPA – Free Production Allowance RO – Replacement Obligation)

	FPA	RO		FPA	RO
January	259.1	0	July	259.1	15.9
February	259.1	0	August	259.1	25.9
March	259.1	0	September	259.1	15.9
April	259.1	0	October	259.1	5.9
May	259.1	0	November	259.1	0
June	259.1	5.9	December	259.1	0

TOTAL ANNUAL QUANTITY: 3110

5). DESCRIPTION OF THE PROPOSED USE (attach location map and/or site plan):
At water supply stub named "Turnout 7", with Adelanto connected to the R³ system, Water would be delivered as a domestic potable supply to the customers of the Adelanto Public Utility thereby providing cost saving for additional water supply

6). LOCATION OF THE PROPOSED USE (indicate all that apply):

- Township, Range, Section, ¼ ¼: ___N 1/2, SW 1/4, Sect 33, T5N, R5W_____
- Assessor Parcel Number: __3134-031-020000 _____
- Street Address: ___None_____

7). Describe all physical facilities that will be constructed as a result of this application. Include specific connections to MWA owned facilities: _____
MWA will construct, own, operate and maintain the extended water main to a new, relocated Turnout 7. The city of Adelanto is responsible for financing the relocation of Turnout 7 and connection to city water supply at the 5 mills tank site located on Olivine rd Adelanto CA.

8). Describe the backup water supply capacity the applicant has secured for the intended use (the applicant must demonstrate that water demand for the use can be met by sources other than delivery of State Water Project water by MWA): _____
Backup water supply capacity is approximately 3250 AF produced by 10 potable well sources owned by the Adelanto Public Utility Authority.

9). Describe water treatment facilities (if any) that will be used for the purpose of use intended by the applicant:
SODIUM HYPOCHLORITE / LIQUID CHLORINE FOR DISSINFECTION

10). Describe equipment that the applicant will provide to assure that all end users are metered:
All service connection metered by 3/4" - 4" domestic water meters and recorded on a monthly basis.

11). ACKNOWLEDGMENT BY APPLICANT:

The applicant acknowledges the following by signature below:

- Water service provided under this application will at all times be in accordance with MWA Ordinance 9, and any other rules and regulations as may be amended, adopted or mandated by the MWA Board of Directors or any entity of the State of California. Service provided is wholesale in nature. The MWA will not become subject to the obligations of a retail water purveyor. Water provided is annual and interruptible. Approved applications are valid for one Calendar Year. An application must be filed no later than August 1 for each subsequent Calendar Year the applicant desires to purchase water from MWA. Vested rights are not obtained or inferred to the Customer upon the sale and delivery of water.

- Water service may be reduced or suspended due to conditions on the State Water Project beyond the control of MWA. The MWA makes no representation as to the quantity or quality of water that may be delivered under this application. The Applicant agrees to maintain primary (backup) water delivery systems and supply sufficient to support 100% of the use anticipated by this application in the event water service by MWA is suspended or reduced.

- The Applicant agrees to fund all costs that result from processing this application and/or from construction of facilities required to provide the service requested. Said costs may include, but are not limited to: environmental review; circulation of the application for review by the public; engineering analysis and design; and, construction of related physical facilities (extension pipelines, turnouts, turnout meters, etc.). MWA will work with the applicant to develop an estimate of costs, and the applicant will deposit sufficient funds with the MWA prior to expense being incurred by MWA.

- The Applicant agrees to indemnify and hold harmless the MWA should any legal challenge result from the sale or use of water, or construction and operation of facilities, contemplated by this application.

Raymond Cordero. PERC Water/ City of Adelanto	Superintendent	April-29-2019
APPLICANT	TITLE	DATE

STAFF USE ONLY

First Application _____ Renewal Application _____ Date Received _____

Assigned to _____
Committee Meeting Date _____ Board Hearing Date _____
Staff Recommendation _____
_____
Environmental Finding:
Exempt ___ De Minimus ___ Negative Declaration ___Mitigated Negative Declaration ___ EIR ___

RESOLUTION NO. 1065-19

A RESOLUTION OF THE MOJAVE WATER AGENCY BOARD OF DIRECTORS APPROVING AN ORDINANCE NO. 9 APPLICATION BY THE CITY OF ADELANTO and ADELANTO PUBLIC UTILITY AUTHORITY (ADELANTO) FOR PURCHASE OF WATER FROM THE REGIONAL RECHARGE AND RECOVERY PROJECT

WHEREAS, on May 23, 2019, the City of Adelanto and Adelanto Public Utility Authority (Adelanto) submitted to Mojave Water Agency ("MWA") an Ordinance No. 9 application for the purchase and delivery of water from the Regional Recharge and Recovery (R^3) Project; and,

WHEREAS, a water service connection, once constructed, will be at R^3 Turnout #7, connecting the R^3 project to the Adelanto's municipal water system; and,

WHEREAS, Adelanto and MWA have developed a Water Supply Connection Agreement for the Regional Recharge and Recovery Project ("Connection Agreement") associated with the delivery of said water. The Connection Agreement identifies the duties of the parties, the locations of water service connections to Adelanto's water system, system capacity and water allotments to Adelanto, and other conditions associated with the planning, design, construction, and operation of the water service connection; and,

WHEREAS, compliance with the California Environmental Quality Act (CEQA) was previously completed for the R^3 project under the Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program Final Environmental Impact Report (SCH # 2005041103) adopted January 26, 2006, and a Negative Declaration was subsequently filed on January 31, 2006; and,

WHEREAS, MWA has obtained a Domestic Water Supply Permit from the California Department of Public Health (CDPH) for the operation of R^3 (Permit # 05-13-12P-011),

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Mojave Water Agency ("Board") approves Adelanto's Ordinance No. 9 Application for water service from the Regional Recharge and Recovery Project, subject to the following conditions:

1. Compliance with Connection Agreement. Adelanto shall comply with the terms and provisions of the Connection Agreement.

2. Compliance with Ordinance No. 9. All deliveries made pursuant to this approval are subject to the provisions in the Ordinance of the Mojave Water Agency Establishing Rules and Regulations for the Sale and Delivery of State Project Water ("Ordinance No. 9"), adopted April 25, 1995.

3. Location of Delivery and Use of Water. Deliveries of water shall be made to the Adelanto at R^3 Turnout #7. Water delivered under this approval shall be used solely within the City's municipal water system.

4. Water Delivery Subject to Annual Renewal and is Interruptible. This approval is for the delivery of up to 3,000 acre-feet of water from the R^3 system to Adelanto during a calendar year, and shall be subject to annual renewals. For the purpose of annual renewals, Adelanto shall submit an Ordinance No. 9 Application to MWA, due August 1st of each year, for deliveries requested for the following calendar year. Approval of the sale of any water is temporary and interruptible. No vested rights may be obtained or are inferred by the yearly renewal of water sales.

5. Mojave Basin Area Judgment. All water delivered to Adelanto by MWA via R^3 will be considered Annual Production of Adelanto under City of Barstow et al, v. City of Adelanto et al, Riverside County Superior Court Case No. 208568 ("Judgment"), and will be subject to all assessments and provisions of the Judgment.

6. Payment for Water Delivered. Adelanto shall pay the rate established by MWA and the Watermaster for R^3 water deliveries, according to meter readings at R^3 Turnout #7. MWA will invoice Adelanto on a monthly basis for delivery charges, and the Watermaster will invoice Adelanto annually for Watermaster assessments. As of the date of this Resolution, the MWA monthly delivery charge will include R^3 energy costs only; however MWA will re-assess rates on an annual basis and may include additional charges as appropriate.

7. Water Quality. MWA will comply with the water quality provisions in its Domestic Water Supply Permit from CDPH, but provides no other water quality assurances. MWA assumes no liability for the quality of water that Adelanto delivers to its customers.

ADOPTED this 23rd day of May, 2019.

_____
Carl Coleman, President

ATTEST:

_____
Jeanette Hayhurst, Secretary

A.2 City of Victorville Agreement

WATER SUPPLY CONNECTION AGREEMENT
REGIONAL RECHARGE AND RECOVERY PROJECT (R^3)

AGREEMENT made this 19th day of April, 2013, between the MOJAVE WATER AGENCY ("Agency") and the CITY OF VICTORVILLE ("Customer").

WITNESSETH:

IT IS HEREBY AGREED, in consideration of the mutual covenants of the parties, as follows:

1. Definitions. When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

a. "Agency" as used herein shall mean Mojave Water Agency.

b. "Agency Law" shall mean the Mojave Water Agency Law, Chapter 97 of the Water Code Appendix, Statutes of 1959 of the State of California, as amended and as the same may be hereafter amended, supplemented re-enacted, or codified.

c. "Agreement" as used herein shall mean this agreement for a water connection between Agency and Customer.

d. "Contract" shall mean the contract entitled "Water supply Contract between the State of California Department of Water Resources and the Mojave Water Agency," dated June 22, 1963 as heretofore or hereafter amended.

e. "Customer" as used herein shall mean the City of Victorville.

f. "Connection Improvements" shall mean those facilities necessary to connect the Customer's water system to Turnouts 3 and 6 of the Regional Recharge and Recovery Project, as depicted and described in Exhibits One, Two, Three, Four and Five.

g. "General Manager" shall mean the General Manager of the Mojave Water Agency.

h. "Judgment" shall mean the Judgment in City of Barstow, et al. v. City of Adelanto, et al., Superior Court, Riverside County, Case No. 208568.

i. "Ordinance No. 9" as used herein shall mean the Ordinance of the Mojave Water Agency Establishing the Rules and Regulations for the Sale and Delivery of State Project Water.

j. "Points of Connection" as used herein shall mean the outlet flange of the magnetic flow meter shown as item 4 on Exhibit Five, Details 1 and 2.

k. "Potable Water" as used herein shall mean water from any source which has been investigated by the California Department of Public Health, and which has been approved for human consumption.

l. "R³ Project" as used herein shall mean the Mojave Water Agency Regional Recharge and Recovery Project, including the Connection Improvements as described herein.

m. "State Water Project" shall mean water made available to the Agency by the State of California pursuant to the terms of the Contract.

n. "Year" means a calendar year.

2. General Purpose and Requirements.

2.1 Customer Connection. The Connection Improvements shall be constructed and paid for by the Agency for use solely for the Customer. Connections will be provided at Turnout 3 at Victorville Water District's Plant 10 on Pinon Avenue, as shown on Exhibits One and Three, and at Turnout 6 on Mesa View Drive, as shown on Exhibits Two and Four ("Points of Connection").

2.2 Environmental Requirements. The Agency is a public agency and is aware of the requirements of the California Environmental Quality Act ("CEQA") and its implementing guidelines, and will comply with the CEQA and its implementing guidelines.

3. Financial Considerations.

3.1 All costs for design, construction and startup of the Connection Improvements will be paid in full by the Agency and there will be no cost to the Customer.

4. Facility Ownership.

4.1 Facilities Included; Ownership by Agency and Customer. The Connection Improvements shall include the facilities for delivery of potable water from the Agency's R³ Project to the Points of Connection described in paragraph 2.1 herein.

The Agency will own, operate and maintain all portions of the Connection Improvements up to the Points of Connection, as defined herein, including the main turnout structure in its entirety, and will have full un-restricted access to these facilities. The Customer will own, operate and maintain all piping, equipment and ancillary facilities related to the turnout on the Customer's side of the Points of Connection.

5. Design Considerations.

5.1 Design and Operating Criteria. The Agency's facilities have been designed and planned in close coordination with the Customer's staff to meet Customer's water service requirements to the maximum extent feasible and to allow for maximum flexibility for use in different modes of operation. The Agency's facilities have been designed to deliver potable water to the Customer's Points of Connection at a reasonably constant minimum water pressure of approximately 40 psi. All deliveries to the Customer will meet the applicable standards of the State of California Department of Public Health Drinking Water Services Division.

5.2 Measurement. All water furnished pursuant to this Agreement shall be measured by the Agency at the Points of Connection.

5.3 Back-Flow. Back-flow prevention is not required by the Department of Public Health when connecting two potable water systems with valid domestic water supply permits, however, the Connection Improvements have been designed and constructed to provide a "check feature" at the Cla-Val electronic control valve (Exhibit Five, Details 1 and 2, Item 6) on the Customer's side of the Points of Connection. The Customer shall maintain the control valve such that the check feature remains operable during the life of this Agreement.

5.4 Flow Control Devices and Delivery Rates. The Connection Improvements include an electronic control valve to allow the Customer to control the rate of flow at the Points of Connection. Deliveries of R^3 Project water will be made at flow rates as determined by the Customer, but should not exceed the nominal flow rate shown on Exhibit Six, Schedule of Delivery Capacities for Project Participants, unless approved in advance by the Agency's Director of Operations.

5.5 Pressure Surges (Water Hammer). The R^3 Project has been designed to withstand the effects of pressure surge, however, the Customer shall make every effort to minimize sudden fluctuations in flow rates at the Points of Connection.

6. Operation and Maintenance.

6.1 Maintenance of Connection Improvements. Maintenance of the Connection Improvements will be as described in paragraph 4.1 herein.

6.2 Limits on Agency Responsibility. The Agency has no responsibility in the maintenance and operation of Customer's water system beyond the Points of

Connection. Customer shall be responsible and liable for its own water system. Customer agrees to accept and consent to such conditions of pressure and service as may from time to time exist under current operating practices prevailing within the Agency, at the location of the Points of Connection, and Customer agrees to hold Agency harmless from any and all damages caused by or arising out of low, high, or fluctuating pressures or interruption of service which are beyond Agency's reasonable control. Delivery of water pursuant to this Agreement, except as may be specifically provided herein, shall be in accordance with the rules, regulations and charges of the Agency as they may from time to time exist and apply to all the customers of the Agency. This Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

6.3 Delivery of Water. All facilities in the Connection Improvements up until the Points of Connection necessary to accommodate water delivery are the responsibility of the Agency and shall be operated by Agency employees only.

6.4 Limitations on Service. Due to the nature of the Agency's facilities and the potential modes of service required, the Agency cannot guarantee any specific level of pressure; however, the R^3 Project has been designed to deliver potable water to the Customer's Points of Connection at a reasonably constant minimum water pressure of approximately 40 psi. There are no limits regarding time-of-use, either by time of year or time of day.

6.5 Coordination of Water Deliveries. Water orders must be placed with the Agency Director of Operations a minimum of one week in advance of actual delivery. Delivery of water shall continue until the Customer requests the Agency to terminate the flow, and gives the Agency a minimum of one hour in which to do so.

7. Agreement Administration

7.1 General Terms of Service. All water deliveries made pursuant to Ordinance No. 9 shall be subject to all of the terms and conditions of the Agency's Contract. **CUSTOMER SHOULD USE CAUTION IN THE ISSUANCE OF CAN OR WILL SERVE LETTERS FOR ANY LAND USE ENTITLEMENT BASED UPON STATE WATER PROJECT WATER.**

7.2 Water Flow Measurement and Meter Accuracy. All determinations relative to the measuring of water shall be made by the Agency and, upon request by the Customer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in Ordinance No. 9. The Customer has a right to audit the Agency's measurement determinations. Any error appearing therein will be adjusted pursuant to conditions set forth in Ordinance No. 9. In the event of a disagreement, the Agency and Customer agree to submit the Agency's accuracy tests to a mutually agreed upon third party and to abide by its determination. Customer will ensure that all end-users of water provided under this Agreement are properly metered.

7.3 Water Delivery Subject to Annual Approval and is Interruptible. All water supplied by the Agency is annually determined and shall be served upon an interruptible basis.

7.4 No Rights to Water Vested with Customer. The Customer shall not obtain any vested rights upon the sale and delivery of water apportioned in accordance with Ordinance No. 9, nor are any such rights inferred by virtue of an Agency decision to provide water to Customer in a specific year.

7.5 Water Deliveries required by the Mojave Basin Area Judgment and ID-M Contract. Customer acknowledges that contractual requirements under the Judgment and contractual requirements between the Agency and the Improvement District "M" have priority over the sale of water pursuant to Ordinance 9.

7.6 Water Rates. All water rates for water service made by the Agency shall be established by resolution of the Board of Directors of the Agency pursuant to Ordinance No. 9 and the Mojave Water Agency Act. Such rates for water service may not exceed the estimated cost of providing the service for which the water rate is charged. Such rate will be reasonable, fair and equitable in nature and proportionately representative of the costs incurred by the Agency.

7.7 Payment of Water Charges. Water charges are due and payable at the Agency office on the date a bill is mailed to the Customer and shall be delinquent 30 days thereafter. Service may be discontinued without further notice if payment of the water charge is not made prior to the date such charge becomes delinquent.

8. Agreement Term.

8.1 Termination Date. This Agreement shall be for a term of one (1) year, and shall automatically renew each year, if Customer is in compliance with its terms, for a period of thirty (30) years from the date hereof. If Agency reasonably determines Customer is not in compliance, Customer must be given a reasonable opportunity to comply before the Agreement terminates. This Agreement may be terminated by the Customer earlier by providing a written notice at least 30 days prior to the desired date of termination. Upon any termination, the Connection Improvements will remain the property of the Agency, and Customer will have no further responsibility under this Agreement, or for ongoing operations and maintenance of the Connection Improvements.

8.2 Change in Party Status. In the event of dissolution, consolidation or merger of the Customer or the Agency, all of the terms and conditions of this Agreement shall bind the surviving entity or successor.

9. Indemnity.

9.1 Defense of Agreement. The Customer shall defend, indemnify, and hold harmless Agency and its agents, officers, and employees from any claim, action, or proceeding against Agency or its agents, officers, or employees relating to efforts to attack, set aside, void, or annul this Agreement, including without limitation a CEQA claim. To the extent that Agency uses any of its resources, with the prior approval in writing of Customer, in responding to such claim, action, or proceeding, Customer will reimburse Agency upon demand. Such resources include, but are not limited to staff time, court costs, Agency counsel's time at their regular rate for Agency work, or any other direct or indirect cost associated with responding to the claim, action or proceedings. These obligations shall be binding on Customer's successors and assigns, and Customer shall so obligate all successors and assigns.

9.2 Indemnification for Water Connection and Water Delivery. Except with respect to (1) the Agency's own negligence or willful misconduct and/or (2) an occurrence on the Agency's side of the Points of Connection not resulting from action(s) of the Customer or its agents, contractors or assigns, and which is/are the direct cause of damage or injury, the Customer shall fully indemnify and hold harmless the Agency and its officers, agents and employees against liability for damages of any nature whatsoever, including but not limited to, property damage, personal injury, or death, arising from (3) the action(s) of Customer or any person under Customer's control, including without limitation the Customer's agents, contractors and assigns; (4) claims made by Customer's own customers and other end users of the water provided by Customer, arising out of, or resulting from, or made in connection with this Water Supply Connection Agreement and the Agency's provision of water to Customer for its use and the use of Customer's own customers; (5) the Customer's control of the rate of flow at the delivery point; or (6) an occurrence on the Customer's side of the Points of Connection not resulting from action(s) of the Agency or its agents, contractors or assigns.

9.3 Claim Notification. The Agency will, within a reasonable period of time, notify the Customer of any such claim, action, or proceeding covered by this Section 9. If the Agency should fail to cooperate in the defense, the Customer shall not thereafter be responsible to defend, indemnify, and hold harmless the Agency and its agents, officers, and employees pursuant to this Section 9.

9.4 Settlement Approval. The Customer shall not be required to pay or perform any settlement of such claim, action, or proceeding unless the Customer approves the settlement in writing.

9.5 Notices. All notices to the Customer under this Agreement shall be deemed valid and effective five (5) calendar days following deposit in the United States mail, postage prepaid, be certified and/or registered mail, addressed to:

Doug Robertson, City Manager
City of Victorville
14343 Civic Drive
P O Box 5001
Victorville, CA 92392-5001

Andre de Bortnowsky, Esq.
Green de Bortnowsky & Quintanilla LLP
23801 Calabasas Road, Suite 1015
Calabasas , California 91302-1595

Eric L. Garner
Best Best & Krieger LLP
3750 University Avenue
P O Box 1028
Riverside, California 92502

All notices to the Agency under this Agreement shall be deemed valid and effective when personally served upon Agency Counsel and General Manager or upon deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to:

William J. Brunick
Brunick, McElhaney & Kennedy
1839 Commercenter West
P O Box 6425
San Bernardino, California 92412

Kirby Brill
General Manager
Mojave Water Agency
13846 Conference Center Drive
Apple Valley, California 92307

Except as provided otherwise, all notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Customer by such officers and persons as they may from time to time, authorize in writing to so act.

9.6 Remedies Not Exclusive. Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

9.7 Amendments. This Agreement may be amended or supplemented at any time by mutual written agreement of the Parties in any manner that may be consistent with the applicable law, subject to Paragraph 9.12 of this Agreement. In amending or supplementing this Agreement, the Agency will bear in mind that substantial uniformity of Agreements between its various customers and the desirability to the main contracting concepts and principles that are to be used. The Agency will, therefore, attempt to maintain uniformity between its various customers' Agreements in such respects.

9.8 Opinions and Determinations. Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this Agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

9.9 Waiver of Rights. Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default or matter.

9.10 Transfer and Assignments. Except as provided in Section 8.2 hereof, the Customer shall not have the right to sell, assign or transfer this Agreement and any and all of its rights, duties and obligations hereunder, in whole or in part, to any person or entity at any time during the term of this Agreement, without prior written approval of the Agency.

9.11 Inspection of Books and Records. The proper officers or agents of the Customer shall have full and free access at all reasonable times to the account books and official records of the Agency at the Agency address set forth below insofar as the same pertain to the matters and things provided for in this Agreement, with the right at any time during office hours to make copies thereof at the Customer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights to inspect the account books and records of the Customer at the Customer's address set forth below as they pertain to the Agency.

Mojave Water Agency	City of Victorville
13846 Conference Center Drive	P O Box 5001
Apple Valley, CA 92307	Victorville, CA 92393-5001
Telephone: (760) 946-7000	Telephone: (760) 955-5000

9.12 Uniformity of Provisions. It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the Customer and other customers served by the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into will be made to the contracts of all other customers on an equal basis, subject to Customer's approval which shall not be unreasonably withheld. In the event Customer declines to approve subsequent amendments as to the form and content of the Agreement, Agency shall have the right to terminate the Agreement upon giving 30-days written notice to the Customer.

9.13 Controlling Law. If there is any conflict between the provisions of this Agreement and Ordinance No. 9 or the Judgment, Ordinance No. 9 and the Judgment are controlling.

IN WITNESS WHEREOF, this Agreement has been executed to be effective as of the date and year first above written.

CITY OF VICTORVILLE

Date: April 24, 2013

By: James L. Cox

Title: Mayor

MOJAVE WATER AGENCY

Date: April 19, 2013

By: _____

Title: General Manager

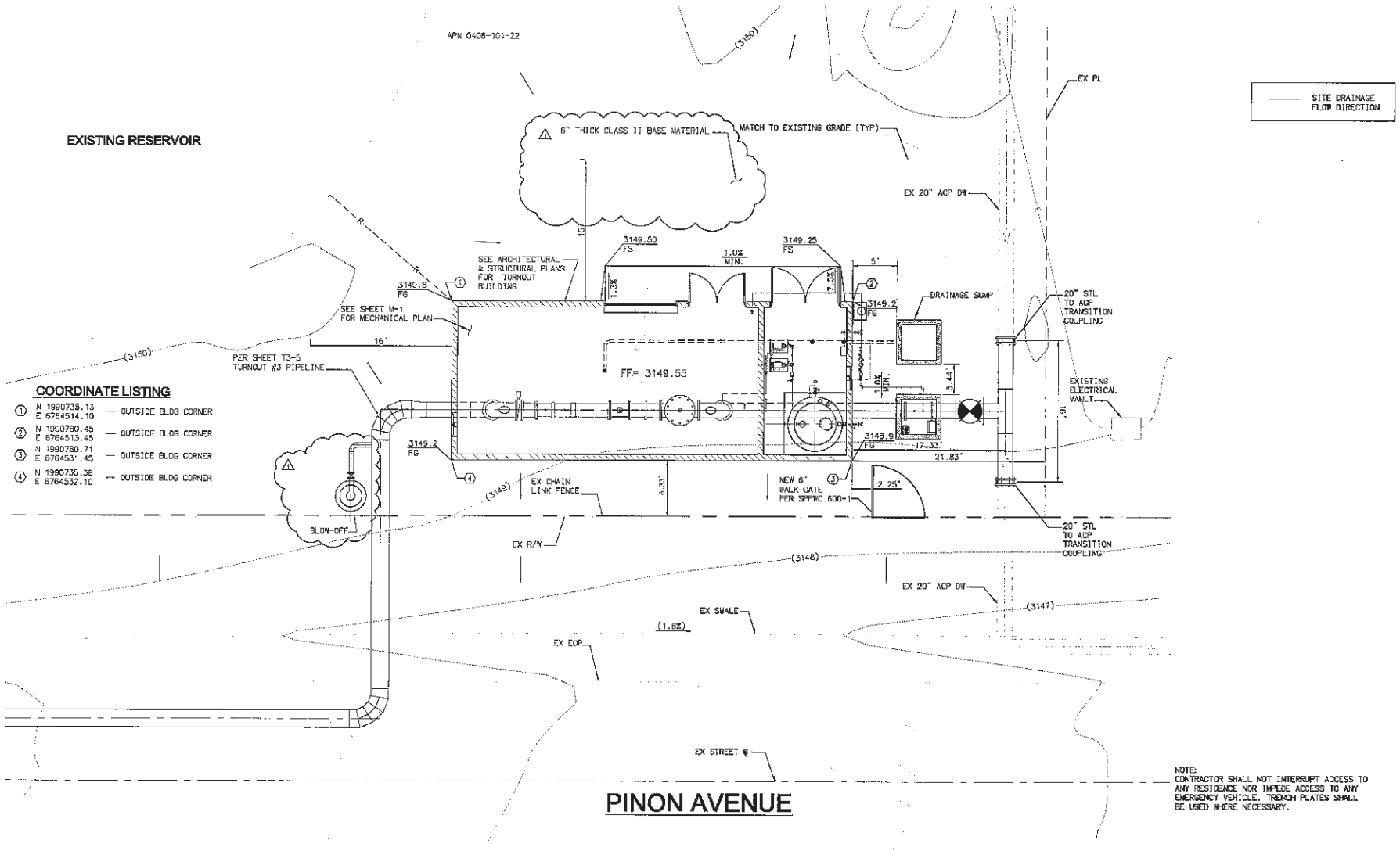
APPROVED AS TO FORM:

GREEN, DE BORTNOWSKY & QUINTANILLA, LLP

By: _____
City Attorney

CHUCK BUQUET

By: _____
Risk Manager



UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

NOTES:
1. CONTACTING DIG ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES
2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE THE CONTRACTOR.
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION, PROTECT IN PLACE

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE
1	8/24/11	JGW	ADDENDUM 1		

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 65100342

PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
GARY MARTIN RCE 31145 DATE

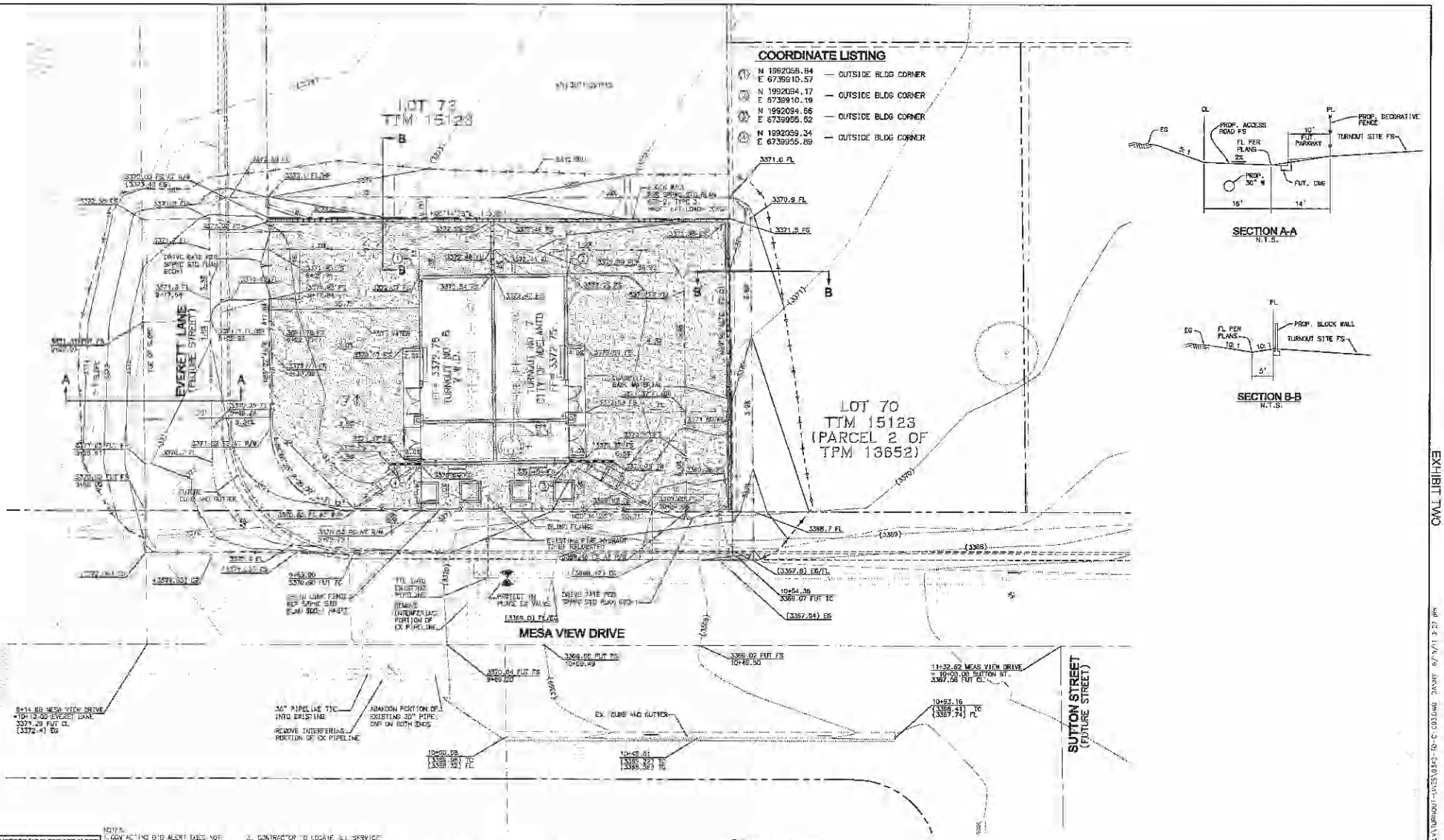
RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
3000 EAST GUASTI ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
909.974.4900 • FAX 909.974.4904 • www.RBF.com

MOJAVE WATER AGENCY
MWA R³ PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
SITE/GRADING PLAN
TURNOUT #3

DRAWING C-1
SHEET 19 OF 80

EXHIBIT ONE

H:\PDATA\Z5100342\CAD\WALKDLV\TURNOUT-JUCSD342 TO C-001.DWG DATAW 8/15/2011 2:36 PM



NOTES:
1. CONTACTING BYD ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES.
2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE PIC CONTRACTOR.
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION AND PROTECT IN PLACE.

NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE PER SITE SURVEY. SITE SURVEY ELEVATIONS ARE 0.11' HIGHER THAT STREET IMPROVEMENT PLANS FOR MESA VIEW DRIVE.

UNDERGROUND SERVICE ALERT
CALL TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

SCALE: 1"=10'

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 69300342

PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58145 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
BARY MARTIN RCE 31145 DATE

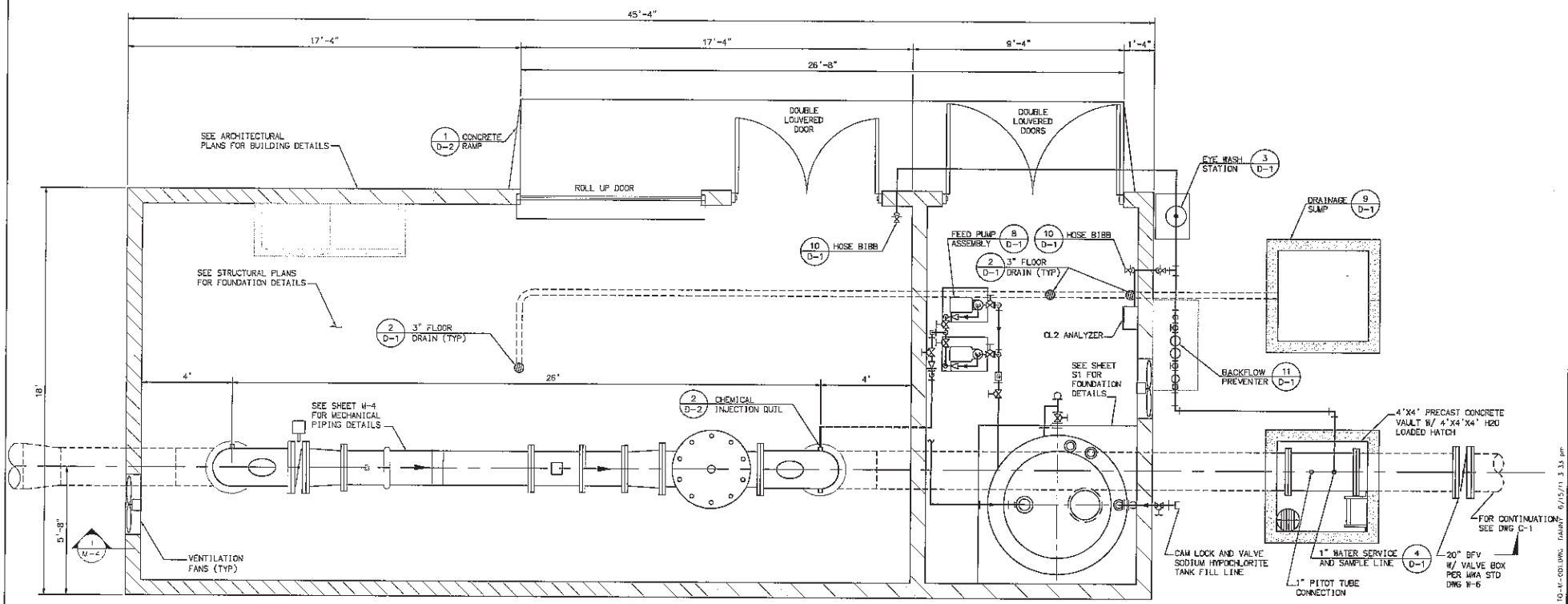
RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
9022 EAST GARVEY ROAD, SUITE 100 ONTARIO, CALIFORNIA 91765
909.974.4900 • FAX 909.974.4910 • www.RBFcon

MOJAVE WATER AGENCY
MWA R³ PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
SITE/GRADING PLAN TURNOUT # 6 & 7

DRAWING C-3
SHEET 21 OF 80

EXHIBIT TWO

H:\PROJECTS\69300342\CADD\WATER\TURNOUT-TM15123-02-C-031.dwg 24x36F 6/15/11 9:23 am



PLAN

SCALE: 1/2"=1'-0"

EXHIBIT THREE

H:\PDATA\PROJDATA\CADD\MAINPIPE-LINES\0342 TO-M-001.DWG 6/15/11 3:35 pm

UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
(TWO WORKING DAYS BEFORE YOU DIG)

NOTES:
1. CONTACTING DIG ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES
2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE CONTRACTOR
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION, PROTECT IN PLACE

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE

DESIGNED CS
DRAWN CS
REVIEWED SMS
JOB NUMBER 85100342

PREPARED UNDER THE SUPERVISION OF:

CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency

22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org

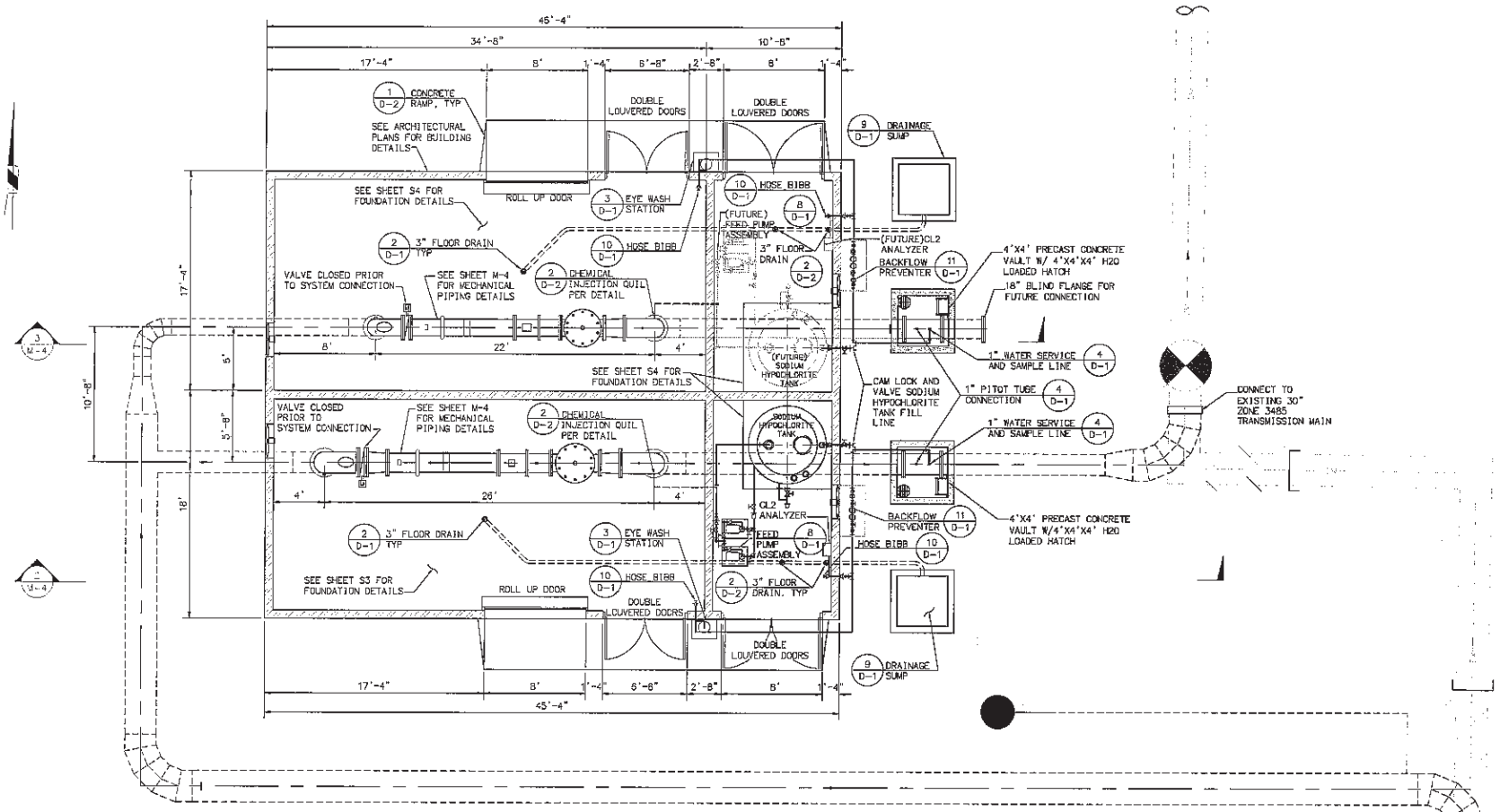
APPROVED

GARY MARTIN RCE 31145 DATE

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
3200 EAST GUASTI ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
909.974.4900 • FAX 909.974.4904 • www.RBF.com

MOJAVE WATER AGENCY
MWA R² PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
MECHANICAL PLAN—TURNOUT 3

DRAWING M-1
SHEET 22 OF 80



PLAN

SCALE: 1/4"=1'-0"

NOTE:
FOR TURNOUT NO. 7, SODIUM HYPOCHLORITE STORAGE TANK, FEED PUMP SYSTEM, CHLORINE ANALYZER AND ABOVE GRADE PIPING WITHIN CHEMICAL ROOM WILL BE CONSTRUCTED UNDER A FUTURE CONTRACT. CONTRACTOR TO STUB AND CAP ALL PIPING WITHIN CHEMICAL ROOM FOR FUTURE CONNECTION.

EXHIBIT FOUR

I:\PROJECTS\651003.14\CADD\WATER\PLN\TURNOUT LINES\651003.14-10-M-003.DWG, DAN M, 6/15/11 3:37 pm

UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

NOTES:
1. CONTACTING DIG ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES
2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE CONTRACTOR.
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION, PROTECT IN PLACE

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 65100342

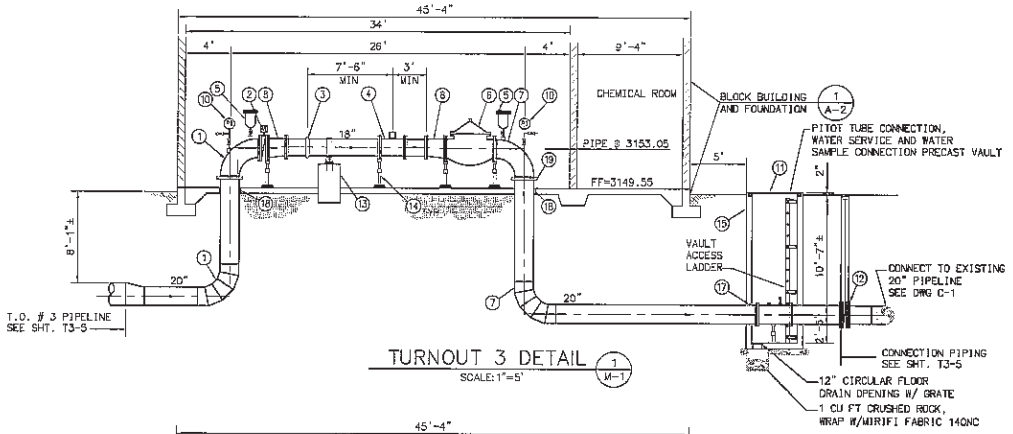
PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
GARY MARTIN RCE 31145 DATE

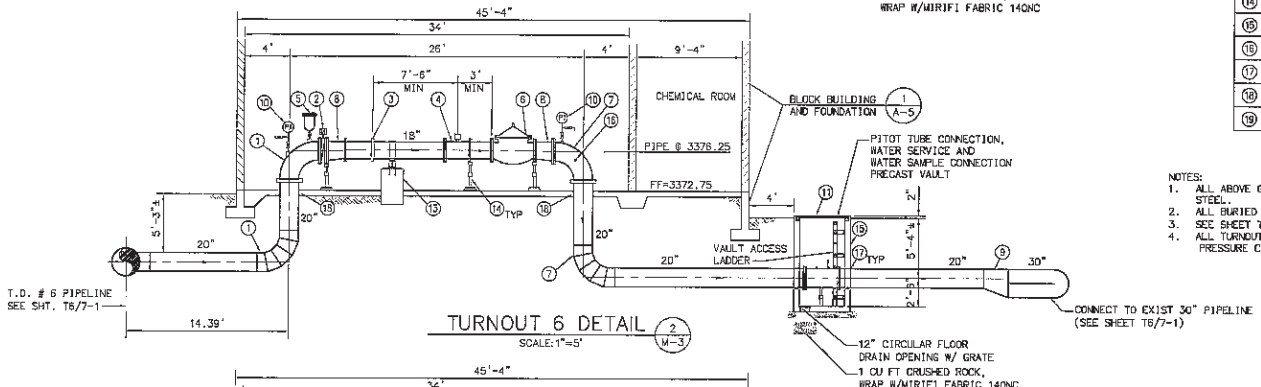
RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
9200 EAST GUASTI ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
909.974.4900 • FAX 909.974.4901 • www.RBF.com

MOJAVE WATER AGENCY
MWA R³ PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
MECHANICAL PLAN—TURNOUTS 6 & 7

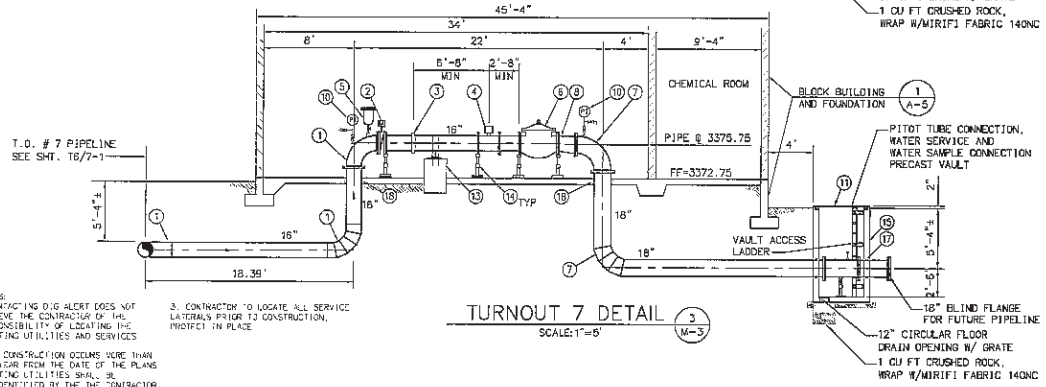
DRAWING M-3
SHEET 24 OF 80



TURNOUT 3 DETAIL
SCALE: 1"=5'
1 M-1



TURNOUT 6 DETAIL
SCALE: 1"=5'
2 M-3



TURNOUT 7 DETAIL
SCALE: 1"=5'
3 M-3

ITEM	DESCRIPTION	TO-3	TO-6	TO-7
1	90° FULLY RESTRAINED BEND	20"	20"	18"
2	MOTOR OPERATED BUTTERFLY VALVE	20"	20"	16"
3	VICTAULIC COUPLING	18"	18"	16"
4	MAGNETIC TYPE FLOW METER	18"	18"	16"
5	COMBINATION AIR VALVE PER DETAIL 1 ON D1	4"	3"	3"
6	ELECTRONIC CONTROL VALVE CLA-VAL MODEL 131	20"	18"	16"
7	90° FULLY RESTRAINED BEND	20"	20"	18"
8	ECCENTRIC REDUCER	20X18	20X18	18X16
9	ECCENTRIC REDUCER	-	30X20	-
10	PRESSURE INDICATOR / TRANSMITTER WITH SAMPLE STATION PER DETAIL 4 ON DWG D-2			
11	48"X48" LOCKABLE H20 ALUMINUM ACCESS HATCH			
12	20" BFV W/ VALVE BOX PER DWG W-6			
13	THRUST SUPPORT PER MWA STD. PER DETAIL 3 ON DWG D-2			
14	PIPE SUPPORT PER DWG W-43			
15	48"X48" PRECAST CONCRETE VAULT W/ ACCESS LADDER			
16	CHEMICAL INJECTION QUIL PER DETAIL 2 ON DWG D-2			
17	PIPE PENTRATION PER DETAIL 7 ON D1 (TYP)			
18	FLOOR PENETRATION PER DETAIL 7 ON D2 (TYP)			
19	ORIFICE PLATE WITH 11.8"ø BORE			

NOTES ABOVE VALID FOR THIS SHEET ONLY

NOTES:
1. ALL ABOVE GROUND PIPE AND FITTINGS TO BE EPOXY LINED AND COATED STEEL.
2. ALL BURIED PIPE AND FITTINGS TO BE CMLAC STEEL.
3. SEE SHEET T3-5 AND T6/7-1 FOR PIPING PROFILE.
4. ALL TURNOUT PIPING, VALVES AND FITTINGS SHALL MATCH AT A MINIMUM PRESSURE CLASS OF UPSTREAM PIPING.

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NOTES:
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3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION, PROTECT IN PLACE

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE
1	9/21/11	JSN	ADDENDUM 1		

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 65100342

PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
BARY MARTIN RCE 37145 DATE

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9755 SANTA GENEVA ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
909.974.4900 FAX 909.974.4904 www.RBF.com

MOJAVE WATER AGENCY
MWA R² PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
MECHANICAL SECTIONS–TURNOUTS 3, 6 & 7

DRAWING M-4
SHEET 25 OF 80

EXHIBIT FIVE

M:\PROJECTS\65100342\LAND\WATER\PLANSET-1\PLOT\65100342 TO M-4 PLOTTING.DWG 6/15/11 3:36 pm

EXHIBIT SIX

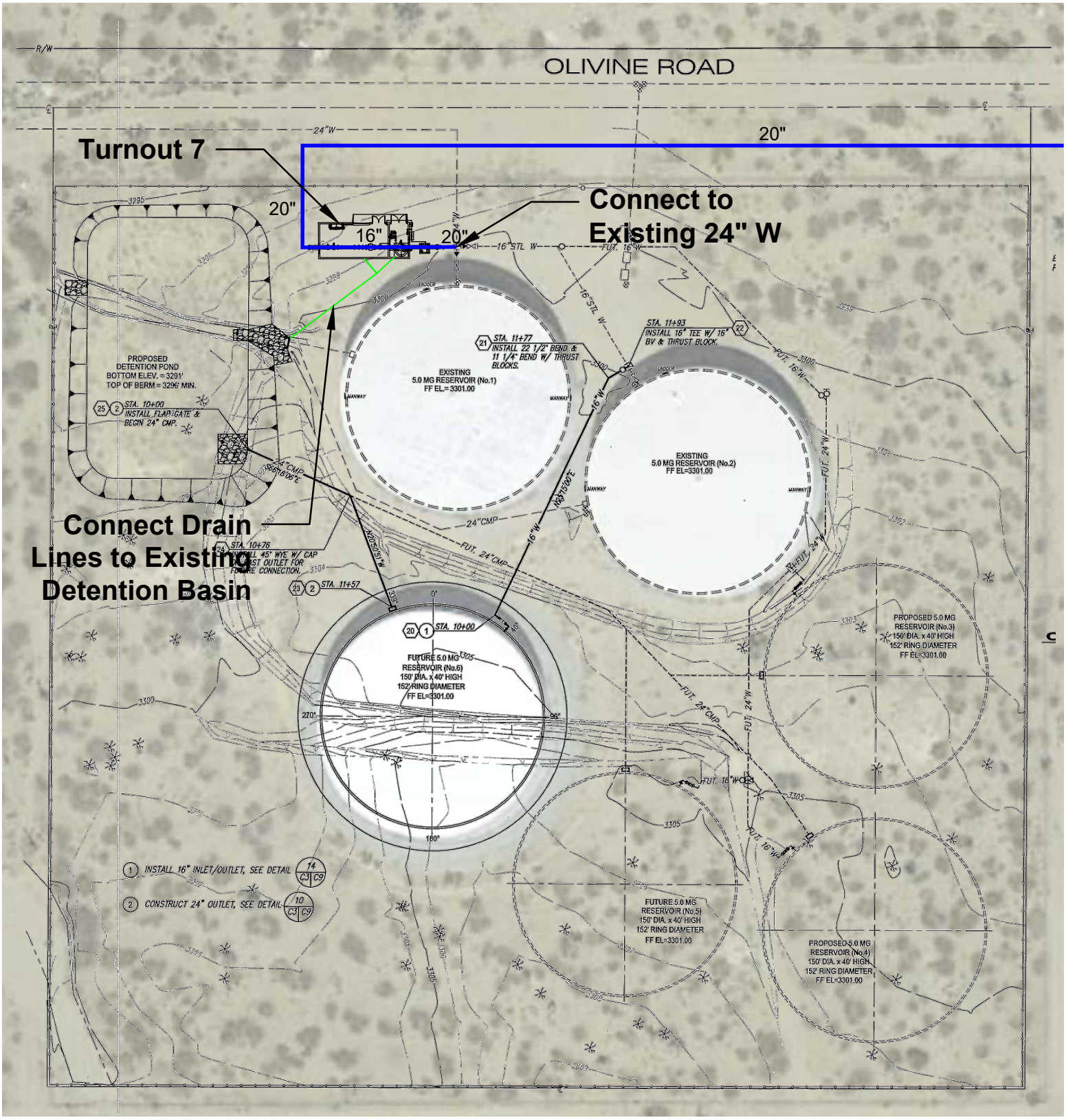
Regional Recharge and Recovery Project
Phase 1 Schedule of Delivery Capacities for Project Participants
June 15, 2012

Annual Amount Approved for Delivery Via W. Conveyance System (acre-feet per year)	Capacity Available to Hesperia Turnout 4		Capacity Available to VWD Turnouts 3 or 6		Capacity Available to Adelanto Turnout 7	
	af per year	cfs	af per year	cfs	af per year	cfs
0	0	0	0	0	0	0
1,000	246	0.41	523	0.88	231	0.39
2,000	492	0.83	1,046	1.76	462	0.78
3,000	738	1.24	1,569	2.64	692	1.16
4,000	985	1.65	2,092	3.52	923	1.55
5,000	1,231	2.07	2,615	4.40	1,154	1.94
6,000	1,477	2.48	3,138	5.27	1,385	2.33
7,000	1,723	2.90	3,662	6.15	1,615	2.71
8,000	1,969	3.31	4,185	7.03	1,846	3.10
9,000	2,215	3.72	4,708	7.91	2,077	3.49
10,000	2,462	4.14	5,231	8.79	2,308	3.88
11,000	2,708	4.55	5,754	9.67	2,538	4.27
12,000	2,954	4.96	6,277	10.55	2,769	4.65
13,000 and above	3,200	5.38	6,800	11.43	3,000	5.04

Note: Capcities at respective turnouts can be interpolated using tabulated values for actual delivery amounts between 0 and 13,000 acre-feet per year.

Appendix B: Project Alternatives

B.1 Turnout 7 Location



Legend

- Proposed CML&C Steel Pipeline

N

0 40 80

SCALE: 1"=80'-0"

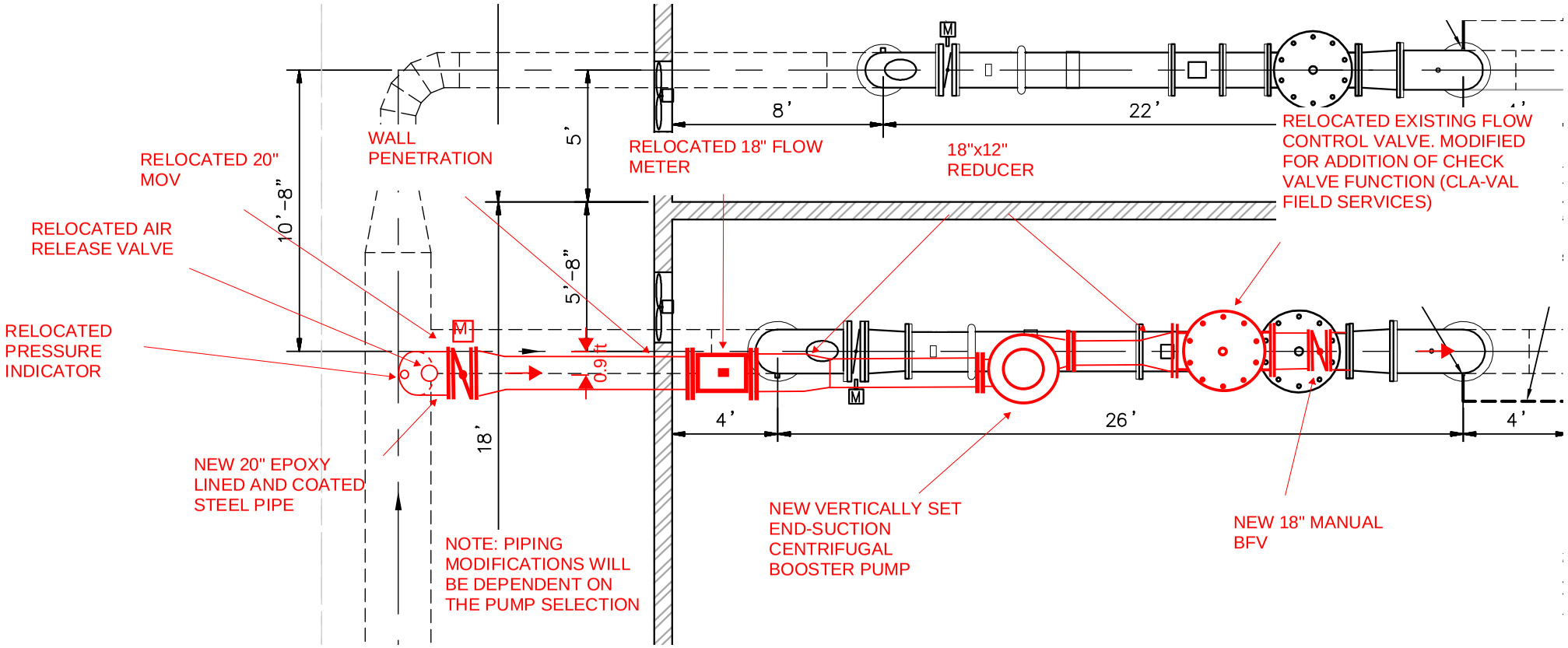
Kennedy/Jenks Consultants

Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

June 2019

B.2 Turnout 6 Modifications



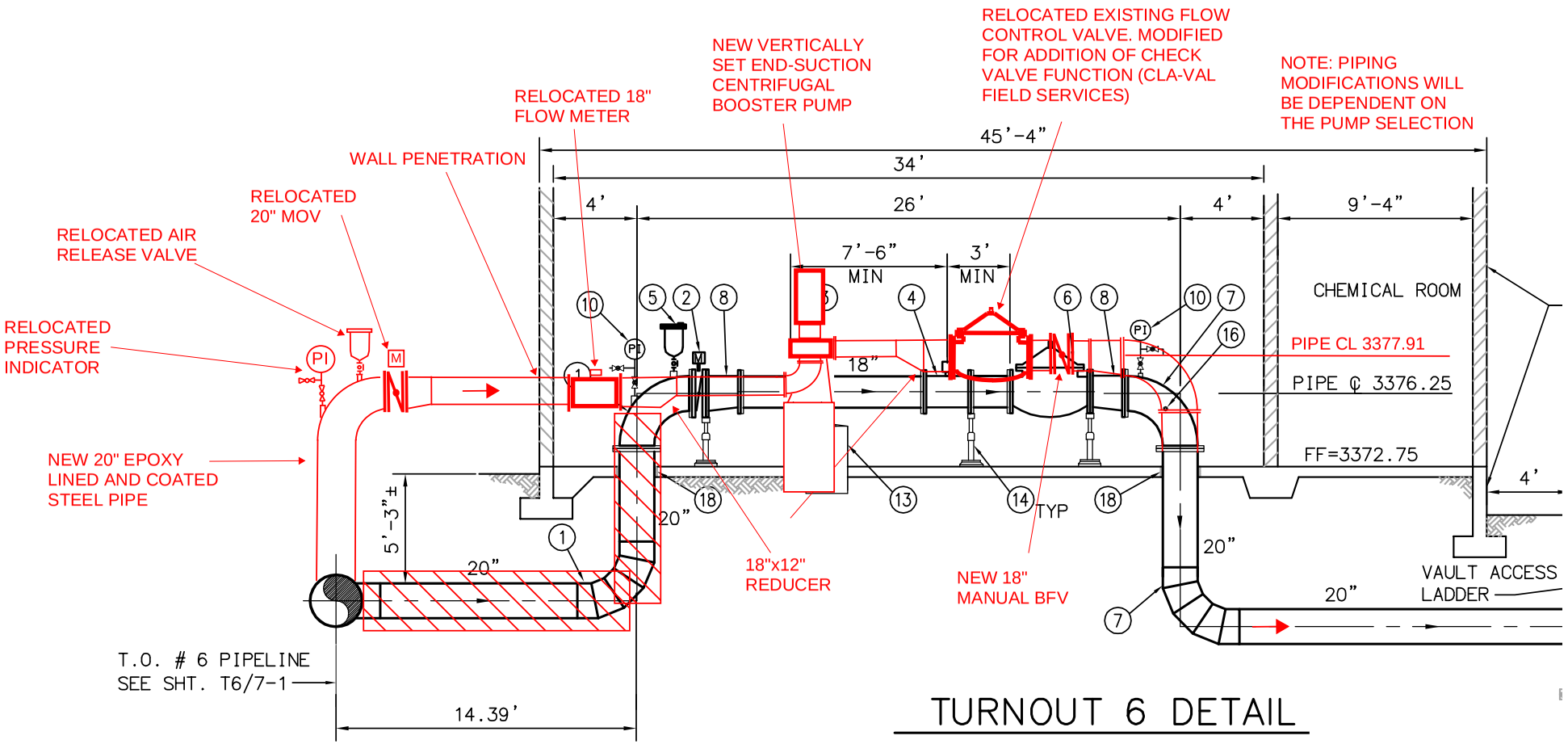
TURNOUT 6 MODIFICATIONS PLAN VIEW ALTERNATIVE

Kennedy Jenks

Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

July 2019



TURNOUT 6 DETAIL

TURNOUT 6 MODIFICATIONS SECTION VIEW ALTERNATIVE

Kennedy Jenks

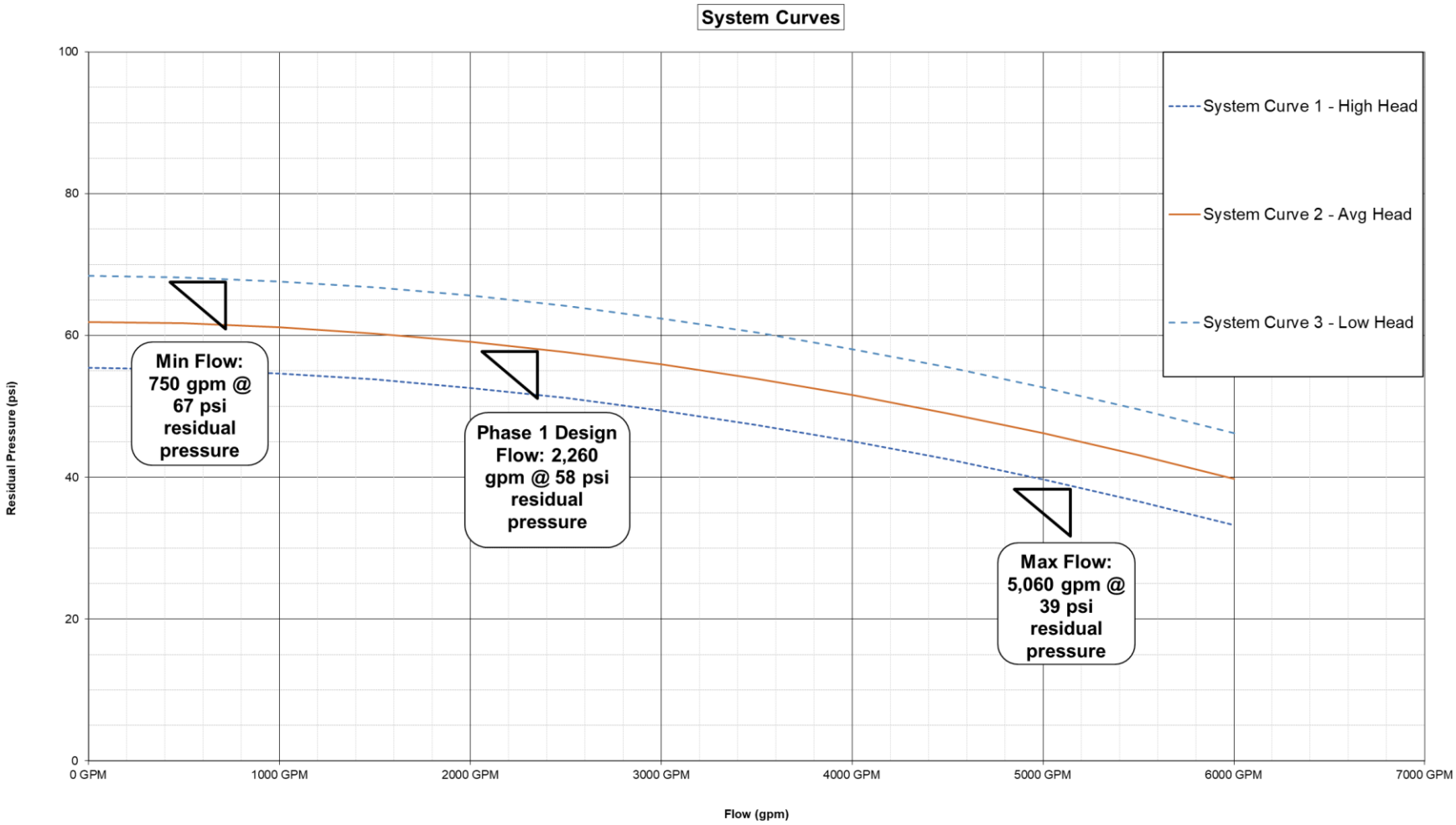
Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

July 2019

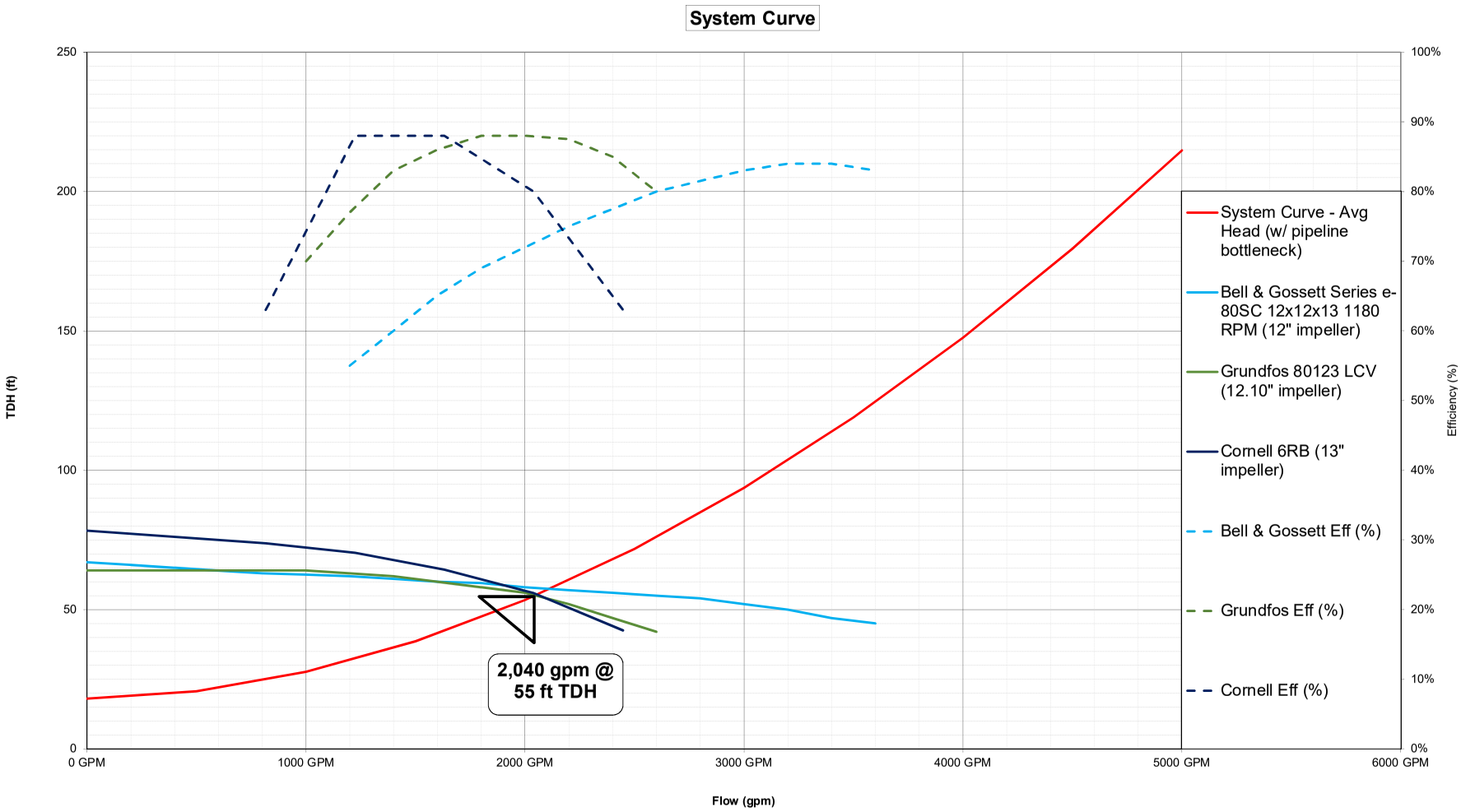
Appendix C: System Curves

C.1 Turnout 7 Residual System Pressure Curve



Turnout 7 Residual Pressure System Head Curves

C.2 Turnout 6 System Curve (Pre-Bottleneck Improvements)



TURNOUT 6 SYSTEM HEAD CURVE
(PRE-BOTTLENECK PIPELINE IMPROVEMENTS)

Manufacturer Pump Selection

Pre-bottleneck

Manuf Pump		
Bell & Gossett Series e-80SC 12x12x13 1180 RPM (12" impeller)		
2040 gpm @ 55 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	67.0	
200	66	
400	65	
600	64	
800	63	
1000	63	
1200	62	55%
1400	61	60%
1600	60	65.1%
1800	59.5	69%
2000	58	72%
2200	57	75%
2400	56	77.5%
2600	55	80%
2800	54	81.5%
3000	52	83%
3200	50	84%
3400	47	84%
3600	45	83%

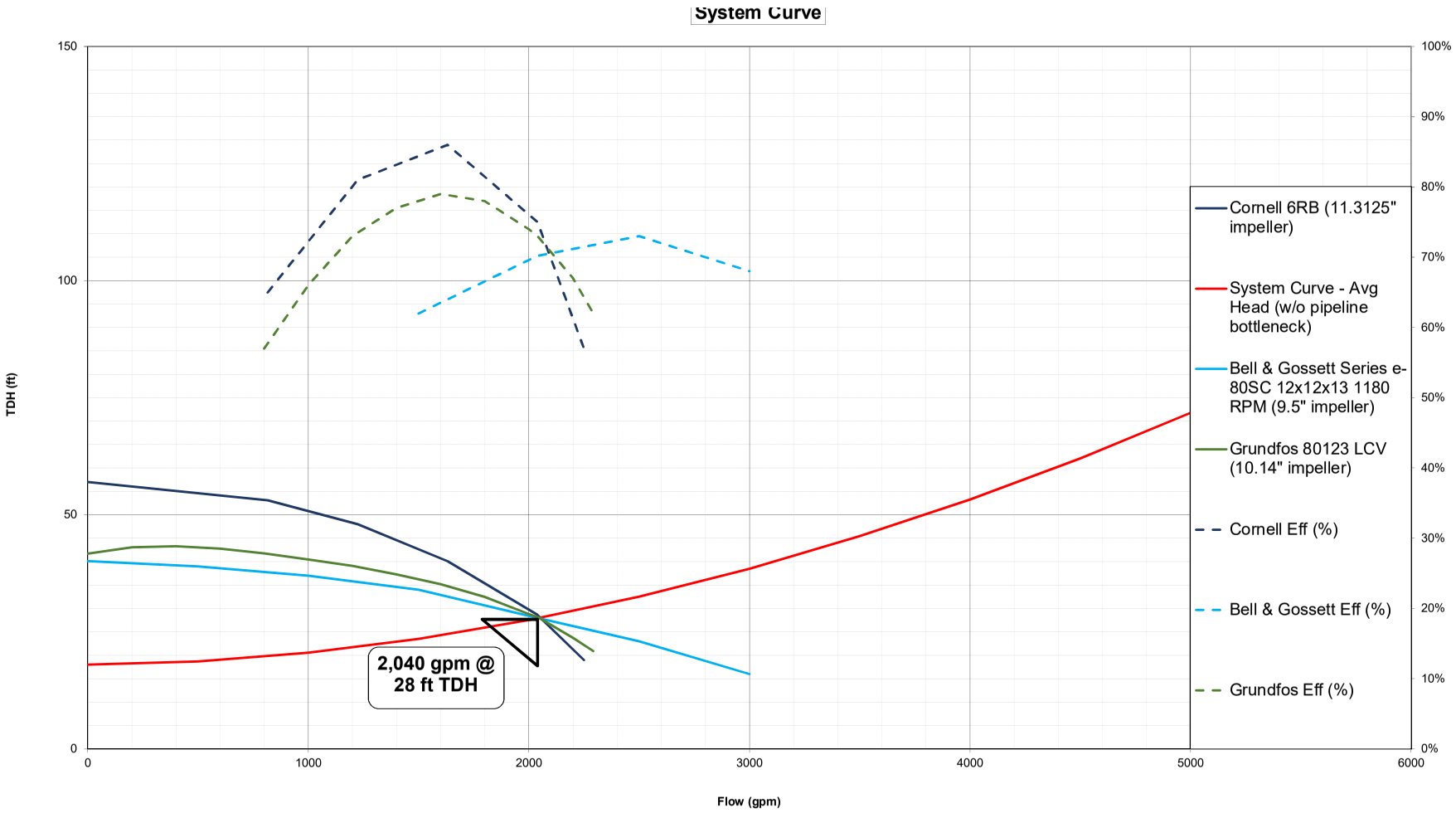
Pre-bottleneck

Manuf Pump		
Grundfos 80123 LCV (12.10" impeller)		
2040 gpm @ 55 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	64.0	
200	64.0	
400	64.0	
600	64.0	
800	64.0	
1000	64.0	70%
1200	63.0	77%
1400	62.0	83%
1600	60.0	86%
1800	58.0	88%
2000	56.0	88%
2200	52.0	87.5%
2400	47.0	85%
2600	42.0	80%
2800		
3000		
3200		
3400		
3600		

Pre-bottleneck

Manuf Pump		
Cornell 6RB (13" impeller)		
2040 gpm @ 55 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	78.3	
816	73.8	63%
1224	70	88%
1632	64	88%
2040	56	80%
2448	43	63%

C.3 Turnout 6 System Curve (Post-Bottleneck Improvements)



TURNOUT 6 SYSTEM HEAD CURVE
(POST-BOTTLENECK PIPELINE IMPROVEMENTS)

Manufacturer Pump Selection

Post-bottleneck

Manuf Pump		
Cornell 6RB (11.3125" impeller)		
2040 gpm @ 28 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	57.0	
816	53.1	65%
1224	48	81%
1632	40	86%
2040	29	75%
2250	19	57%

Post-bottleneck

Manuf Pump		
Bell & Gossett Series e-80SC 12x12x13 1180 RPM (9.5"		
2040 gpm @ 28		
Q (gpm)	TDH (ft)	Eff (%)
0	40.1	
500	39.0	
1000	37	
1500	34	62%
2040	28	70%
2500	23	73%
3000	16	68%

Post-bottleneck

Manuf Pump		
Grundfos 80123 LCV (10.14" impeller)		
2040 gpm @ 28 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	41.7	
200	43.1	
400	43.3	
600	42.8	
800	41.8	57%
1000	40.5	66%
1200	39.1	73%
1400	37.3	77%
1600	35.2	79%
1800	32.5	78%
2000	28.8	74%
2040	28.2	73.0%
2200	23.7	67%
2292	20.9	62%

Appendix D: Geotechnical Desktop Study

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL DESKTOP STUDY REPORT

R3 PHASE I IMPROVEMENTS PROJECT – ADELANTO PIPELINE EXTENSION

CITY OF VICTORVILLE, SAN BERNARDINO COUNTY, CALIFORNIA

CONVERSE PROJECT NO. 19-81-143-01





Prepared For:

KENNEDY-JENKS
38977 Sky Canyon Drive, Suite 100
Murrieta, CA 92563

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

July 3, 2019

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

July 3, 2019

Mr. Ryan Huston, PE
Principal Engineer
Kennedy-Jenks
38977 Sky Canyon Drive, Suite 100
Murrieta, CA 92563

Subject: **GEOTECHNICAL DESKTOP STUDY REPORT**
R^3 Phase I Improvements Project – Adelanto Pipeline Extension
Mesa View Drive and Olivine Road
City of Victorville, San Bernardino County, California
Converse Project No. 19-81-143-01

Dear Mr. Huston:

Converse Consultants (Converse) is pleased to submit this Geotechnical Desktop Study Report to assist with the alignment study for Adelanto Pipeline Extension portion of the R^3 Phase I Improvements Project, located in the City of Victorville, San Bernardino County, California. This report was prepared in accordance with our proposal dated March 25, 2019 and revised March 27, 2019, and your Subcontract Terms and Conditions for Professional Services and Construction Services dated June 14, 2019.

We appreciate the opportunity to be of service to Kennedy-Jenks and Mojave Water Agency. Should you have any questions, please do not hesitate to contact us at 909-796-0544.

CONVERSE CONSULTANTS

REGISTERED PROFESSIONAL ENGINEER
HASHMI S. E. QUAZI
NO. GE 2517
Exp. 06/2021
GEOTECHNICAL
STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST
James Burnham
9621
STATE OF CALIFORNIA

Hashmi S. E. Quazi, PhD, GE, PE
Principal Engineer

James Burnham, PG
Project Geologist

Dist: 1/Addressee (email)
JB//HSQ/kvg

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FIGURES

Following Page No.

Figure No. 1, *Approximate Vicinity Map* 1
Figure No. 2, *Alignment Aerial Photo* 1

APPENDICES

Appendix A ..... Photographs

1.0 INTRODUCTION

This report contains the findings of the geotechnical desktop study performed by Converse for the alignment study for the Adelanto Pipeline Extension portion of the R^3 Phase I Improvements Project, located in the City of Victorville, San Bernardino County, California, as shown in Figure No. 1, *Approximate Vicinity Map*.

The purpose of this study was to utilize existing maps, reports, and databases to characterize the alignment subsurface and identify any geotechnical/geohazards that may impact the project. This report was prepared for the project described herein and is intended for use solely by Kennedy-Jenks and its authorized agents.

2.0 ALIGNMENT AND PROJECT DESCRIPTION

The proposed 30-inch CML&C pipeline begins at the existing Turnout No. 6 & 7 site on Mesa View Drive, approximately 670 feet north of 5th Street/Del Rosa Road. The alignment continues north along Mesa View Drive for approximately 4,660 feet to Olivine Road. The alignment then continues west for approximately 800 feet to the Adelanto tank site. The proposed Adelanto Pipeline Extension alignment is shown on Figure No. 2, *Alignment Aerial Photo,* below.

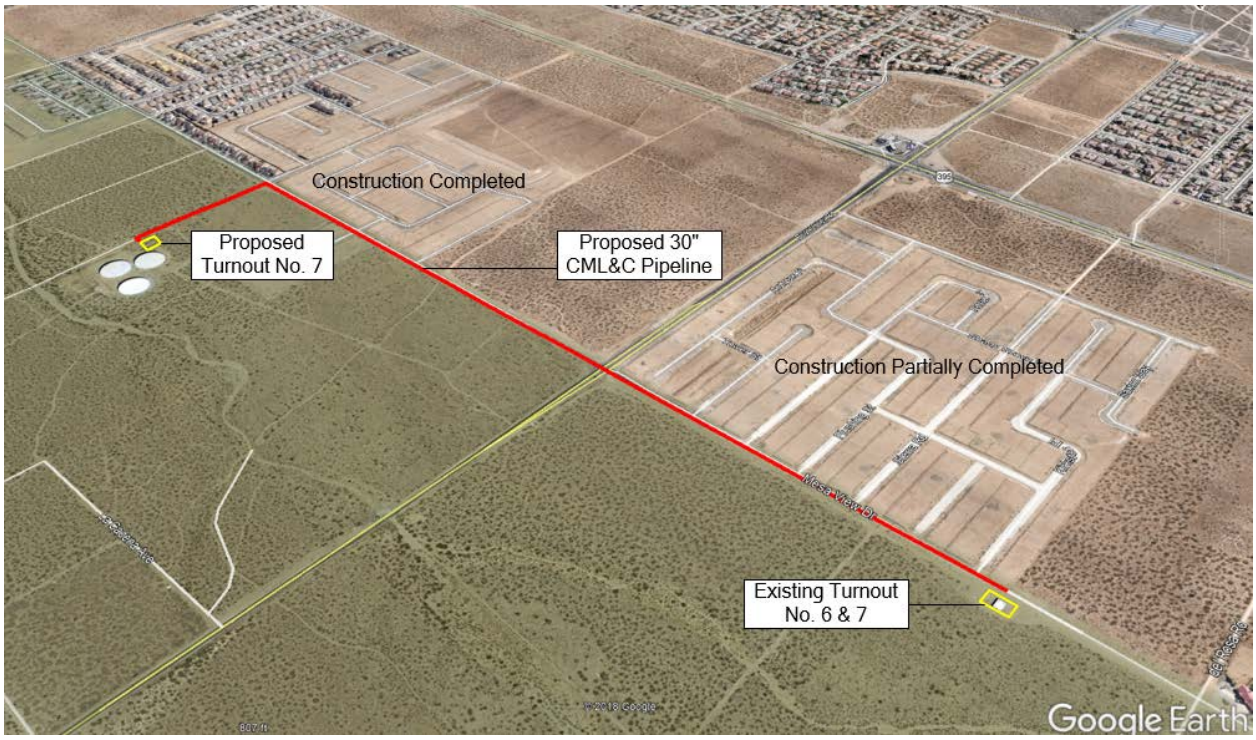
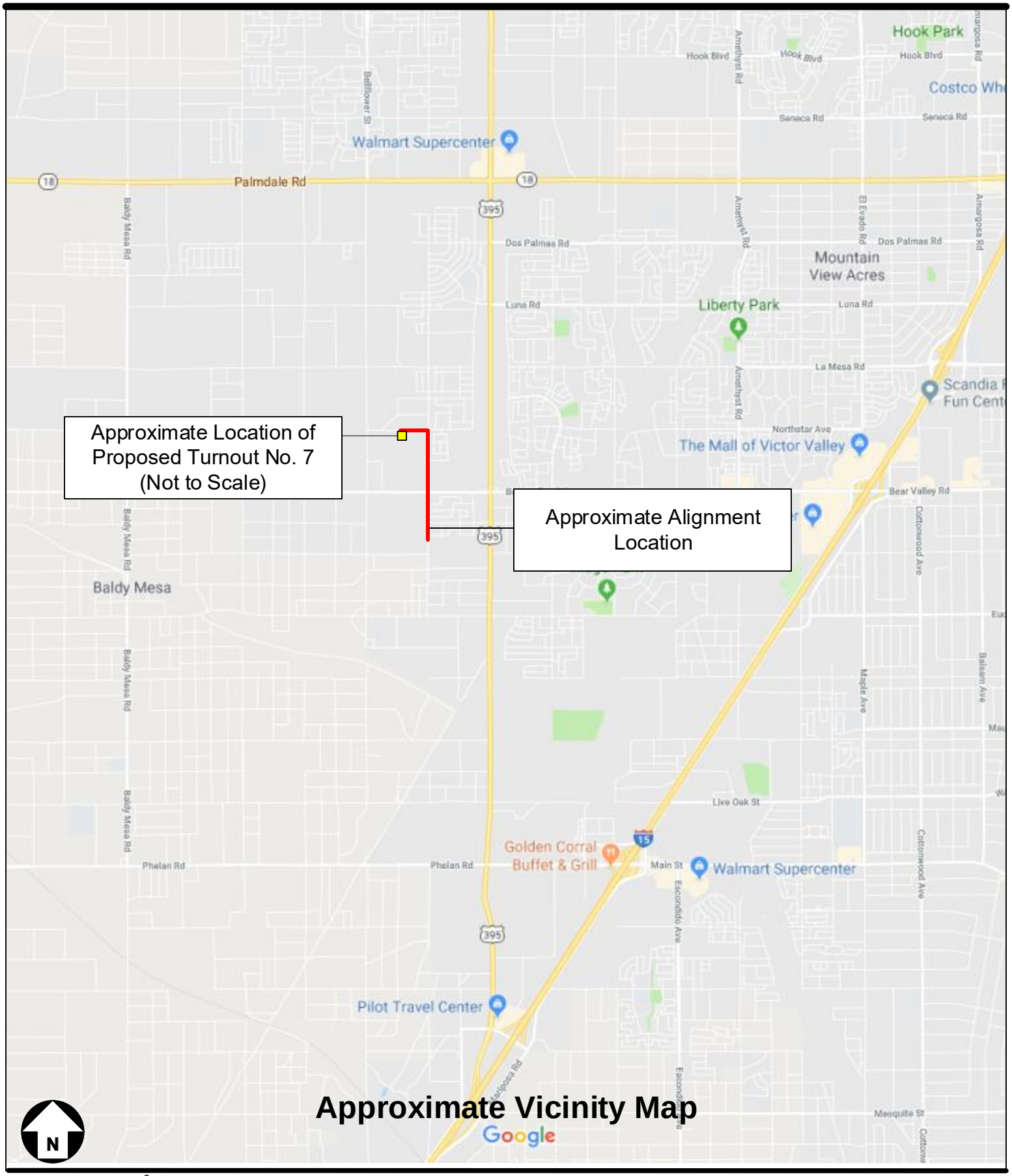


Figure No. 2, Alignment Aerial Photo.

Mesa View Drive is an unpaved, undivided road from the Turnout No. 6 and 7 for approximately 670 feet north to Sierra Road. From Sierra Road to Olivine Road, Mesa



Approximate Vicinity Map

Project: R^3 Phase I Improvements Project – Adelanto Pipeline Extension
Location: Mesa View Drive and Olivine Road
City of Victorville, San Bernardino County, California
For: Kennedy-Jenks

Project No
19-81-143-01

Converse Consultants

Figure No.
1

View Drive is paved with no median and dirt shoulders. Olivine Road from Mesa View Drive to the Adelanto tank site is an unpaved dirt road.

The existing Turnout No. 6 and 7 site is surrounded by a combination of brick wall and fencing. The site contains the Turnout No. 6 structure and associated appurtenances. The ground is unpaved.

The Adelanto tank site is fenced and developed with 3 steel water tanks and associated appurtenances. The location of the proposed Turnout No. 7 is in the vacant northeastern corner of the tank site and is covered in dirt and desert plants.

The proposed alignment is bounded primarily by vacant desert land on the west and a combination of residential tracts and vacant desert land on the east.

Photographs from select locations along the alignment are shown in Appendix A, *Photographs*.

3.0 SCOPE OF WORK

The scope of Converse's study is described in the following sections.

3.1 Desktop Study

The desktop study consisted of the following tasks.

- Field reconnaissance of the proposed alignment and Turnout No. 7 site
- Review of geologic and seismic hazard maps
- Review of aerial photographs
- Review of groundwater databases
- Review of available geotechnical reports in the vicinity

3.2 Analysis and Report Preparation

Data obtained from the field reconnaissance, review of available maps, databases, and reports was assembled and evaluated. This report was prepared to present our findings.

4.0 GROUNDWATER

The State Water Resources Control Board's GeoTracker Database (SWRCB, 2019) was accessed in July 2019 to establish historic groundwater levels, however, no sites with groundwater data were located within a mile of the alignment.

The National Water Information System (USGS, 2019) was also accessed in July 2019 to establish historic groundwater levels. Two sites with historical well measurements were located within approximately one mile of the alignment.

- USGS Site Number 342724117250501, located northwest of the intersection of Eucalyptus Street and Bellflower Street, reported a depth to groundwater of 513 feet bgs in June 1990.
- USGS Site Number 342754117231601, located northeast of the intersection of Sycamore Street and Garlock Road, reported a depth to groundwater of 460 feet bgs in February 1957.

Historical high groundwater at the project site is not known with certainty but is anticipated to be deeper than 400 feet bgs.

Current groundwater conditions, if encountered, will be established with soil borings during the geotechnical investigation. However, based on review of the available groundwater data, groundwater is expected to be deeper than 400 feet bgs. Dewatering during installation of the pipeline and construction of Turnout No. 7 is unlikely to be required. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the site vicinity. Shallow perched groundwater may be present locally, particularly following precipitation.

5.0 GEOLOGIC SETTING

The regional and local geology are discussed in the following subsections.

5.1 Regional Geology

The project alignment is located in the Mojave Desert Geomorphic Province of Southern California. The Mojave Desert is a broad interior region of isolated mountain ranges separated by wide desert plains. The area is roughly triangular shaped and bounded by the Garlock Fault on the north, the San Andreas Fault on the southwest, and the Colorado River on the east. The drainages are primarily closed and terminate in playas within the valley floors.

The province is a seismically active region primarily characterized by a series of northwest-southeast-trending strike-slip faults and east-west trending secondary faults. The most prominent of the nearby fault zones include the Helendale, Lenwood, Landers, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time.

Extension of the region has resulted in exposure of basement rocks dating to the Precambrian age, deposition of young Holocene-aged sedimentary basins, and eruptions of volcanic units.

5.2 Local Geology

Based on review of available geologic mapping and experience in the area, pipeline alignment and Turnout No. 7 location are primarily underlain by young (middle Holocene - aged) alluvial fan deposits. These deposits primarily consist slightly to moderately consolidated silt, sand, and gravel with possible cobbles and boulders.

6.0 FAULTING

Nearby active faults, seismicity, and their impact on the study area are discussed in the following sections.

6.1 Faulting

No portion of the pipeline alignment or Turnout No. 7 is located within a currently designated State of California or San Bernardino County Earthquake Fault Zone (CGS, 2007; San Bernardino County, 2010). The nearest active fault zones are the Apple Valley Fault Zone 12.1 miles east-southeast; the San Andreas Fault Zone 13 miles southwest, and the Helendale-South Lockhart Fault Zone 18.1 miles northeast.

6.2 Secondary Effects of Seismic Activity

Generally, in addition to ground shaking, effects of seismic activity on a project site may include surface fault rupture, soil liquefaction, and settlement due to earthquake shaking, landslides, lateral spreading, tsunamis, seiches, and flooding due to earthquake-induced dam failure. The site-specific potential for each of these seismic hazards is discussed in the following sections.

Surface Fault Rupture*:* No portion of the study area is located within a currently designated State of California Earthquake Fault Zone (CGS, 2007; San Bernardino County, 2010). The potential for surface rupture resulting from the movement of nearby or distant faults is not known with certainty but is considered low.

Dynamic Settlement (Liquefaction and Dry Seismic Settlement): Liquefaction is defined as the phenomenon in which a soil mass within about the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due the development of excess pore pressures. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction occurs during or after strong ground shaking. There are several requirements for liquefaction to occur. They are as follows.

- Soils must be submerged
- Soils must be loose to medium-dense
- Ground motion must be intense

- Duration of shaking must be sufficient for the soils to lose shear resistance

Based on the lack of shallow groundwater, liquefaction is not likely a risk for the pipeline alignment or Turnout No. 7. Dry seismic settlement will be evaluated with data from the soil borings to be conducted during the geotechnical investigation.

7.0 SUBSURFACE PROFILE, EXCAVATABILITY, AND FILL MATERIAL

7.1 Subsurface Profile

The upper 3 to 5 feet of near surface soils along the alignment and at Turnout No. 7 are expected to be relatively loose and potentially compressible if subjected to additional loads. These materials will likely require removal and recompaction prior to foundation construction. The exact removal and recompaction depth will be determined during the geotechnical investigation.

7.2 Excavatability

The subsurface materials along the pipeline alignment are expected to be excavatable with conventional heavy-duty earth moving equipment. The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. Selection of appropriate excavation equipment models should be done by an experienced earthwork contractor. Based on mapped soil types, difficult excavation may be encountered due to the likely presence of gravel and cobbles. This will be verified by field investigation.

7.3 Fill Material

Excavated on-site soils are expected to be suitable for re-use as compacted fill. Prior to re-use, excavated soils should be cleared of all debris, vegetation, rocks larger than 3 inches in maximum dimension, and other deleterious materials. Rocks larger than 1 inch in the largest dimension should not be placed within the upper 12 inches of fill beneath footings and slabs.

7.3.1 Import Soil

Imported soil is anticipated for the pipezone material. Import soil, if used as fill, should be predominantly granular and meet the following criteria.

- Expansion Index less than 20
- Free of all deleterious materials
- Contain no particles larger than 3 inches in the largest dimension

- Contain less than 30 percent by weight retained on ¾-inch sieve
- Have a Plasticity Index of 10 or less
- Corrosivity not greater than the on-site soils

Any imported fill should be tested and approved by geotechnical representative prior to delivery to the site.

7.3.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. Additional pipe bedding material criteria will be provided in the geotechnical investigation report.

8.0 DESIGN CONSIDERATIONS

8.1 Corrosivity, Collapse, and Expansion Potential

Based on the mapped soil types and experience with projects in the area, the young alluvial soils are expected to be slightly corrosive to ferrous metals in contact. Due to grain size and lack of consolidation, the younger alluvial soils may be collapsible and are likely non-expansive.

8.2 Existing Utilities

Residential developments exist on the east side of Mesa View Drive and associated utilities are likely present below the street. Additionally, underground pipelines are present at the Adelanto tanks site. Prior to the start of construction, all existing underground utilities within the vicinity of the pipeline alignment and Turnout No. 7 should be located. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

9.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Kennedy-Jenks, and its authorized agents, to assist in the design and construction of the pipeline and Turnout No. 7 structure. Our findings and opinions were based on generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

10.0 REFERENCES

CALIFORNIA GEOLOGICAL SURVEY (CGS), 2007, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Faulting Zoning Act with Index to Earthquake Fault Zone Maps, Special Publication 42, revised 2007.

CALIFORNIA GEOLOGICAL SURVEY (CGS), 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, dated September 11, 2008.

CATERPILLAR, INC., 2000, Caterpillar Performance Handbook, Edition 31, dated October, 2000.

MORTON, D.M. and MILLER, F.K., 2006, Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California, U.S. Geological Survey Open-File Report 2006-1217, scale 1:100,000.

SAN BERNARDINO COUNTY, 2010, San Bernardino County Land Use Plan, General Plan, Geologic Hazard Overlays, Map Sheet EHFHC, scale 1:115,200, dated March 9, 2010.

Appendix A

Photographs

APPENDIX A

PHOTOGRAPHS



Photograph 1 - South end of pipeline alignment adjacent to existing Turnout No. 6 & 7, facing north.



Photograph 2 - Alignment crossing at Bear Valley Road, facing north.



Photograph 3 - Intersection of Mesa View Drive and Olivine Road. Adelanto tanks site visible on the right.

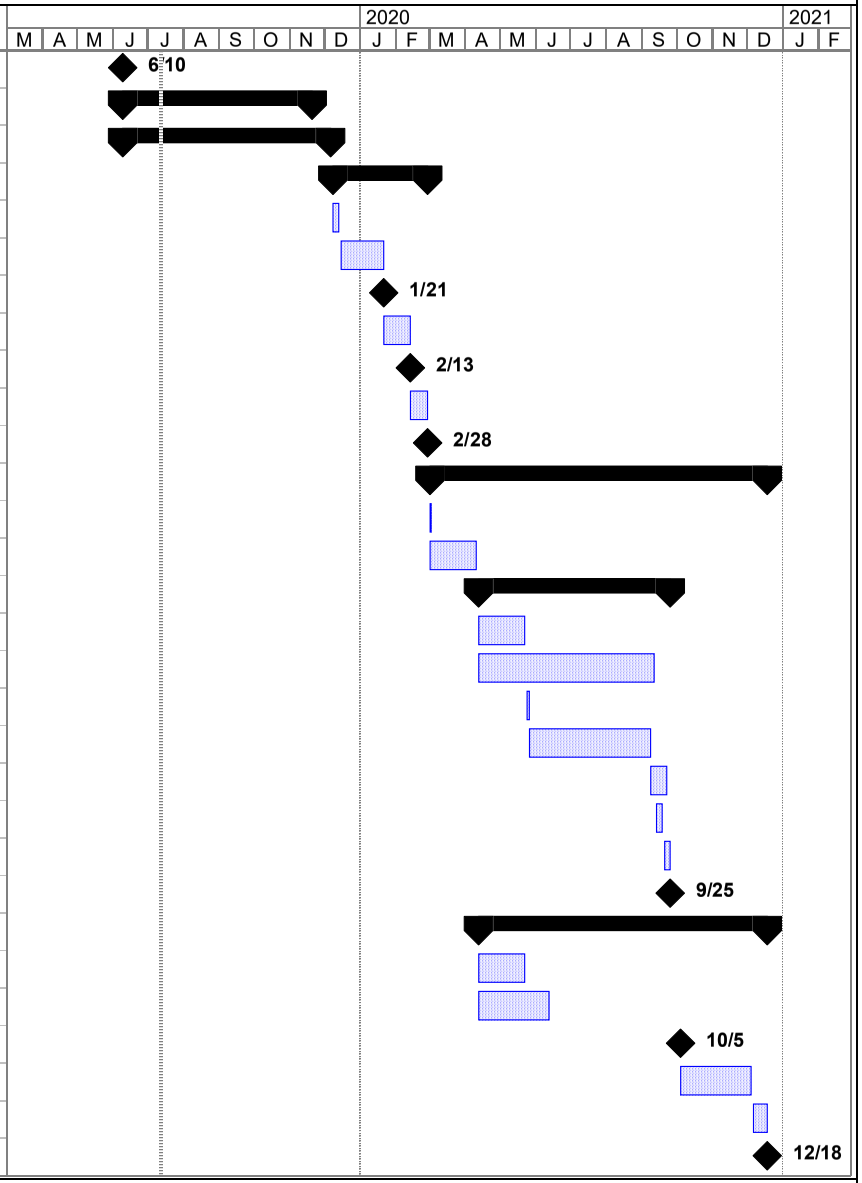


Photograph 4 - Adelanto tanks site. Proposed location of Turnout No. 7 on the left.

Appendix E: Project Schedule

Adelanto R3 Extension Project
Project Schedule

ID	Task Name	Duration	Start	Finish
1	Notice-to-Proceed	0 days	Mon 6/10/19	Mon 6/10/19
2	**Task 1 - Preliminary Design Phase**	**118 days**	**Mon 6/10/19**	**Thu 11/21/19**
16	**Task 2 - Design Phase**	**130 days**	**Mon 6/10/19**	**Fri 12/6/19**
30	**Task 3 - Bid Phase Services**	**60 days**	**Mon 12/9/19**	**Fri 2/28/20**
31	Signatures/Approvals	5 days	Mon 12/9/19	Fri 12/13/19
32	Advertise	27 days	Mon 12/16/19	Tue 1/21/20
33	Bid Opening	0 days	Tue 1/21/20	Tue 1/21/20
34	Bid Evaluation/Board Approval	17 days	Wed 1/22/20	Thu 2/13/20
35	Issue Notice of Award	0 days	Thu 2/13/20	Thu 2/13/20
36	Bonds/Insurance	11 days	Fri 2/14/20	Fri 2/28/20
37	Bid Phase Completion	0 days	Fri 2/28/20	Fri 2/28/20
38	**Construction**	**210 days**	**Mon 3/2/20**	**Fri 12/18/20**
39	Issue NTP	1 day	Mon 3/2/20	Mon 3/2/20
40	Submittals (6 weeks)	30 days	Mon 3/2/20	Fri 4/10/20
41	**Pipeline/Turnout 7 Construction**	**120 days**	**Mon 4/13/20**	**Fri 9/25/20**
42	Pipe Fabrication (6 weeks)	30 days	Mon 4/13/20	Fri 5/22/20
43	New Turnout 7 (5 months)	110 days	Mon 4/13/20	Fri 9/11/20
44	Mobilize (Pipeline)	2 days	Mon 5/25/20	Tue 5/26/20
45	Pipe Installation (5,800'@ 80' day)	75 days	Wed 5/27/20	Tue 9/8/20
46	Pressure Testing/Disinfection	10 days	Wed 9/9/20	Tue 9/22/20
47	Connections	5 days	Mon 9/14/20	Fri 9/18/20
48	Punchlist	5 days	Mon 9/21/20	Fri 9/25/20
49	Completion	0 days	Fri 9/25/20	Fri 9/25/20
50	**Turnout 6 Modifications**	**180 days**	**Mon 4/13/20**	**Fri 12/18/20**
51	Pump Fabrication (6 weeks)	30 days	Mon 4/13/20	Fri 5/22/20
52	SCE Service Upgrade (8 weeks)	45 days	Mon 4/13/20	Fri 6/12/20
53	Shutdown Turnout 6	0 days	Mon 10/5/20	Mon 10/5/20
54	Turnout 6 Modifications (8 weeks)	45 days	Mon 10/5/20	Fri 12/4/20
55	Testing/Controls	10 days	Mon 12/7/20	Fri 12/18/20
56	Project Completion	0 days	Fri 12/18/20	Fri 12/18/20



Project: Mojave R3 Construction Sche
Date: Fri 7/12/19

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

Appendix F: Opinion of Probable Construction Cost

OPINION OF PROBABLE CONSTRUCTION COST

KENNEDY/JENKS CONSULTANTS

Project: 30" Adelanto R3 Extension Project

Prepared By: RJL/JS
Date Prepared: 14-Jun-19
K/J Proj. No. 1944511*00

Building, Area: Adelanto Pipeline Extension

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type:
- [x] **Conceptual**
- [ ] **Preliminary (w/o plans)**
- [ ] **Design Development @**
- [ ] **Construction**
- [ ] **Change Order**
- **% Complete**

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
Adelanto Pipeline Extension											
		30" Pipeline Work									
		30" Pipeline Work									
		30-inch CML&C Steel Pipe	4,650	LF	110.00	511,500	80.00	372,000			883,500
		Excavation	7,363	cy			6.01	44,252			44,252
		Bedding, sand with compaction	2,941	cy	19.00	55,879	13.93	40,968			96,847
		Backfill	3,444	cy			7.82	26,932			26,932
		Spoil	977	cy			9.97	9,741			9,741
		Trench Shield, assume 100'/day	12	wks					577	6,924	6,924
		Pavement Removal - 3" deep (Trench)	2,217	sy			7.35	16,295			16,294.95
		Pavement Disposal (Trench)	185	cy			22.40	4,138			4,138.40
		Pavement Replacement - 4" thick	2,217	sy	15.10	33,477	41.15	91,230			124,706.25
		Aggregate Base Replacement 6"	2,217	sy	5.65	12,526	1.32	2,926			15,452.49
		Sawcut pavement	9,300	LF	0.25	2,325	1.92	17,856			20,181.00
		30-inch Butterfly Valves (max 2000 ft spacing)									
		30-inch Butterfly Valves	4	EA	12,115.00	48,460	455.50	1,822			50,282
		Valve Can and Extension	4	EA	69.50	278	110.00	440			718
		4-inch Combination Air Release	2								
		4-inch CAV	4	EA	1,970.00	7,880	256.00	1,024			8,904
		4-inch Steel piping	50	LF	14.73	737	29.88	1,494			2,231
		4-inch Gate Valves w/ Valve Can	2	EA	585.00	1,170	304.00	608			1,778
		4-inch 90 Degree Elbows	2	EA	53.50	107	256.35	513			620
		Concrete Base	1.0	CY	300.00	300	300.00	300			600
		Bollards	4	EA	460.00	1,840	87.60	350			2,190
		8-inch Blowoff w/ 12-inch Riser	2								
		8-inch Steel Piping	50	LF	66.50	3,325	67.95	3,398			6,723
		8-inch Gate Valve w/ Valve Can	2	EA	1,500.00	3,000	304.00	608			3,608
		8" x 12" Reducer	2	EA	250.00	500	541.50	1,083			1,583
		12" Tee	2	EA	1,225.00	2,450	1,313.00	2,626			5,076
		12" Blind Flange	2	EA	236.00	472	648.85	1,298			1,770
		12" Riser	12	LF	101.00	1,212	103.00	1,236			2,448
		Meter Vault for Riser	2	EA	1,125.00	2,250	1,643.00	3,286			5,536
		4" Camlock for Blowoff	2	EA	45.00	90	45.00	90			180
		48-inch Concrete Manhole	3								
		48-inch Precast Concrete Manhole Rings, 6' deep	3	EA	1,360.00	4,080	856.00	2,568			6,648
		48-inch Precast Concrete Roof with Cast Iron Lid	3	EA	221.00	663	186.50	560			1,223
		Concrete Base for Manhole	7	CY	300.00	2,100	300.00	2,100			4,200
		24-inch Blind Flange for Steel Pipe Riser	3	EA	944.00	2,832	1,107.70	3,323			6,155
		Connection to Existing 30-inch Line									
		Temporary Bulkhead Installation and Removal	2	EA	1,625.00	3,250	2,186.00	4,372			7,622
		30-inch Buttstrap	2	EA	550.00	1,100	400.00	800			1,900
		30-inch Pipe - Final Connection Section	2	LF	550.00	1,100	400.00	800			1,900
		Additional Work									
		Pressure Testing, Air Compressor	1	WK					158	158	158
		Pressure Testing, 3/4" Air hose, 50 ft	1	WK					65	65	65
		Disinfection	1	LS					5,000	5,000	5,000
		Subtotals				704902.25		661035.77		12146.90	1,378,084.92
		Division 1 Costs	@	10%		70490.23		66103.58		1214.69	137,808.49
		Subtotals				775392.48		727139.35		13361.59	1,515,893.41
		Taxes - Materials Costs	@	7.75%		60092.92					60,092.92
		Subtotals				835485.39		727139.35		13361.59	1,575,986.33
		Taxes - Labor Costs									
		Subtotals				835485.39		727139.35		13361.59	1,575,986.33
		Contractor Markup for Sub	@	10%						1336.16	1,336.16
		Subtotals				835485.39		727139.35		14697.75	1,577,322.49
		Contractor OH&P	@	15%		125322.81		109070.90			234,393.71
		Subtotals				960808.20		836210.25		14697.75	1,811,716.20
		Estimate Contingency	@	20%							362,343.24
		Subtotals									2,174,059.44
		Escalate to Midpoint of Construct	@	3%							65,221.78
		Estimated Bid Cost									2,239,281.22
		Total Estimate									2,240,000.00

OPINION OF PROBABLE CONSTRUCTION COST

KENNEDY/JENKS CONSULTANTS

Project: 20" Adelanto R3 Extension Project

Prepared By: RJL/JS
Date Prepared: 14-Jun-19
K/J Proj. No. 1944511*00

Building, Area: Adelanto Pipeline Extension

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type:
- [x] **Conceptual**
- [ ] **Preliminary (w/o plans)**
- [ ] **Design Development @**
- [ ] **Construction**
- [ ] **Change Order**
- **% Complete**

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
Adelanto Pipeline Extension											
		20" Pipeline Work									
		20" Pipeline Work									
		20-inch CML&C Steel Pipe	1,300	LF	70.00	91,000	60.00	78,000			169,000
		Excavation	1,661	cy			6.01	9,983			9,983
		Bedding, sand with combacktion	688	cy	19.00	13,072	13.93	9,584			22,656
		Backfill	843	cy			7.82	6,592			6,592
		Spoil	130	cy			9.97	1,296			1,296
		Trench Shield, assume 100'/day	8	wks					577	4,616	4,616
		Aggregate Base Replacement 6"	400	sy	5.65	2,260	1.32	528			2,788
		20-inch Butterfly Valves (max 2000 ft spacing)									
		20-inch Butterfly Valves	4	EA	4,900.00	19,600	455.50	1,822			21,422
		Valve Can and Extension	4	EA	69.50	278	110.00	440			718
		2-inch Combination Air Release									
		2-inch CAV	2	EA	720.00	1,440	79.00	158			1,598
		2-inch Copper Piping	50	LF	17.55	878	5.55	278			1,155
		2-inch Ball Valves	2	EA	259.00	518	64.50	129			647
		2-inch 90 Degree Elbows	4	EA	252.00	1,008	64.50	258			1,266
		Concrete Base	1.00	CY	300.00	300	300.00	300			600
		Bollards	4	EA	460.00	1,840	87.60	350			2,190
		Valve can or Meter Vault for 2" Valve	2	EA	69.50	139	110.00	220			359
		6-inch Blowoff w/ 8-inch Riser	1								
		6-inch Steel Piping	25	LF	25.18	630	46.20	1,155			1,785
		6-inch Gate Valve w/ Valve Can	1	EA	1,825.00	1,825	620.00	620			2,445
		6" x 8" Reducer	1	EA	116.00	116	391.35	391			507
		8" Tee	1	EA	545.00	545	978.00	978			1,523
		8" Blind Flange	1	EA	495.00	495	159.00	159			654
		8" Riser	6	LF	67.60	406	67.91	407			813
		Meter Vault for Riser	1	EA	1,125.00	1,125	1,643.00	1,643			2,768
		4" Camlock for Blowoff	1	EA	45.00	45	45.00	45			90
		Connection to Existing 20-inch Line									
		Temporary Bulkhead Installation and Removal	2	EA	1,000.00	2,000	1,600.00	3,200			5,200
		20-inch Buttstrap	2	EA	350.00	700	300.00	600			1,300
		20-inch Pipe - Final Connection Section	2	LF	350.00	700	300.00	600			1,300
		Additional Work									
		Pressure Testing, Air Compressor	1	WK					158	158	158
		Pressure Testing, 3/4" Air hose, 50 ft	1	WK					65	65	65
		Disinfection	1	LS					5,000	5,000	5,000
		Subtotals				140918.60		119736.52		9838.90	270,494.02
		Division 1 Costs	@	10%		14091.86		11973.65		983.89	27,049.40
		Subtotals				155010.46		131710.17		10822.79	297,543.42
		Taxes - Materials Costs	@	7.75%		12013.31					12,013.31
		Subtotals				167023.77		131710.17		10822.79	309,556.73
		Taxes - Labor Costs									
		Subtotals				167023.77		131710.17		10822.79	309,556.73
		Contractor Markup for Sub	@	10%						1082.28	1,082.28
		Subtotals				167023.77		131710.17		11905.07	310,639.01
		Contractor OH&P	@	15%		25053.57		19756.53			44,810.09
		Subtotals				192077.34		151466.70		11905.07	355,449.10
		Estimate Contingency	@	20%							71,089.82
		Subtotals									426,538.92
		Escalate to Midpoint of Construct	@	3%							12,796.17
		Estimated Bid Cost									439,335.09
		Total Estimate									440,000.00

OPINION OF PROBABLE CONSTRUCTION COST | **KENNEDY/JENKS CONSULTANTS**

Project: Adelanto R3 Extension Project | **Prepared By:** RJL/JS
Date Prepared: 14-Jun-19
Building, Area: Turnout #6 Modifications | **K/J Proj. No.** 1944511*00

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type: [x] Conceptual [ ] Preliminary (w/o plans) [ ] Design Development @ [ ] Construction [ ] Change Order % Complete

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
Turnout #6 Modifications											
		30" Adelanto Pieline Extension									
		30-inch CML&C Steel Pipe	30	LF	110.00	3,300	80.00	2,400			5,700
		Excavation	48	cy			6.01	288			288
		Bedding, sand with compaction	19	cy	19.00	361	13.93	265			626
		Backfill	22	cy			7.82	172			172
		Spoil	6	cy			9.97	60			60
		Trench Shield	1	wks					577	577	577
		Pavement Removal - 3" deep (Trench)	20	sy			7.35	147			147.00
		Pavement Disposal (Trench)	2	cy			22.40	45			44.80
		Pavement Replacement - 4" thick	20	sy	15.10	302	41.15	823			1,125.00
		Aggregate Base Replacement 6"	20	sy	5.65	113	1.32	26			139.40
		Sawcut pavement	60	LF	0.25	15	1.92	115			130.20
		30-inch Tee	1	EA	7,325.00	7,325	6,538.00	6,538			13,863.00
		30-inch 90 Degree Elbow	1	EA	2,950.00	2,950	4,351.00	4,351			7,301.00
		30-inch Butterfly Valve	1	EA	12,115.00	12,115	455.50	456			12,571
		Valve Can for 30-inch Butterfly Valve	1	EA	69.50	70	110.00	110			180
		30-inch Blind Flange	1	EA	1,200.00	1,200	1,400.00	1,400			2,600
		Modify Existing 30" Line for 36" Transmission Pipeline									
		36-inch x 30-inch Steel Cross	1	EA	10,000.00	10,000	8,000.00	8,000			18,000
		36" x 30" Steel Reducer	1	EA	3,250.00	3,250	5,149.00	5,149			8,399
		36-inch Butterfly Valve	1	Ea	15,000.00	15,000	455.50	456			15,456
		30-inch Butterfly Valve	2	EA	12,115.00	24,230	455.50	911			25,141
		Valve Can for 30-inch Butterfly Valve	3	Ea	69.50	209	110.00	330			539
		Excavation	19	cy			6.01	114			114
		Bedding, sand with compaction	7	cy	19.00	133	13.93	98			231
		Backfill	8	cy			7.82	63			63
		Spoil	3	cy			9.97	30			30
		Trench Shield, assume 100'/day	1	wks					577	577	577
		Modify 30-inch Pipeline for 18-inch Victorvillle Pipeline									
		30-inch x 18-inch steel tee	1	Ea	6,500.00	6,500	5,000.00	5,000			11,500
		18-inch butterfly valve	1	Ea	500.00	500	500.00	500			1,000
		30-inch butterfly valve	1	Ea	12,115.00	12,115	455.50	456			12,571
		Salvage and reuse 30-inch butterfly valve	1	EA	1,000.00	1,000	1,000.00	1,000			2,000
		Valve cans for butterfly valves	3	ea	69.50	209	110.00	330			539
		Excavation	19	cy			6.01	114			114
		Bedding, sand with compaction	7	cy	19.00	133	13.93	98			231
		Backfill	8	cy			7.82	63			63
		Spoil	3	cy			9.97	30			30
		Trench Shield, assume 100'/day	1	wks					577	577	577
		Modify 20-inch pipe inside Turnout 6									
		30-inch x 20-inch steel tee	1	EA	6,750.00	6,750	5,250.00	5,250			12,000
		20-inch CML&EC steel pipe	10	LF	142.00	1,420	217.30	2,173			3,593
		Salvage and relocate 20-inch MOV	1	EA	600.00	600	600.00	600			1,200
		Salvage and relocate pressure indicator	1	EA	150.00	150	150.00	150			300
		Salvage and relocate Air release Valve	1	EA	500.00	500	500.00	500			1,000
		20-inch x 18-inch steel reducer	2	EA	2,000.00	4,000	1,622.50	3,245			7,245
		18-inch CML&EC steel pipe	10	LF	138.00	1,380	178.15	1,782			3,162
		Salvage and relocated 18-inch flowmeter	1	Ea	1,000.00	1,000	1,000.00	1,000			2,000
		18-inch x 12-inch steel reducer	2	Ea	1,000.00	2,000	1,100.00	2,200			4,200
		12-inch CML&EC steel pipe	10	LF	101.00	1,010	103.00	1,030			2,040
		12-inch Flanged coupling Adaptor	1	EA	850.00	850	250.00	250			1,100
		Vertically Set End Suction Booster Pump	1	EA	10,777.84	10,778	2,500.00	2,500			13,278
		Salvage and relocated 18-inch Flow Control Valve	1	Ea	1,500.00	1,500	1,500.00	1,500			3,000
		Modify 18-inch Flow control Valve	1	Ea					5,000	5,000	5,000
		18-inch Butterfly Valve with Handwheel	1	Ea	3,825.00	3,825	455.50	456			4,281
		20-inch 90 degree elbows	2	EA	2,300.00	4,600	1,699.50	3,399			7,999
		12-inch Flanges	2	Ea	236.00	472	648.85	1,298			1,770
		18-inch Flanges	4	Ea	520.00	2,080	1,250.00	5,000			7,080
		20-inch Flanges	2	EA	600.00	1,200	1,500.00	3,000			4,200
		Pipe Supports	4	EA	1,500.00	6,000	500.00	2,000			8,000
		Core Drill /Wall Penetration for 20-inch Pipe	1	Ea					250	250	250
		Electrical Modifications (Conduits, wiring, SCADA)	1	LS					16,601	16,601	16,601
		Upgrade SCE Electrical Service	1	LS					15,000	15,000	15,000
		Subtotals				151143.34		77266.95		38582.15	266,992.44
		Division 1 Costs	@	10%		15114.33		7726.70		3858.22	26,699.24
		Subtotals				166257.67		84993.65		42440.37	293,691.69
		Taxes - Materials Costs	@	7.75%		12884.97					12,884.97
		Subtotals				179142.64		84993.65		42440.37	306,576.66
		Taxes - Labor Costs									
		Subtotals				179142.64		84993.65		42440.37	306,576.66
		Contractor Markup for Sub	@	10%						4244.04	4,244.04
		Subtotals				179142.64		84993.65		46684.40	310,820.69
		Contractor OH&P	@	15%		26871.40		12749.05			39,620.44
		Subtotals				206014.04		97742.69		46684.40	350,441.14
		Estimate Contingency	@	20%							70,088.23
		Subtotals									420,529.36
		Escalate to Midpoint of Construct	@	3%							12,615.88
		Estimated Bid Cost									433,145.25
		Total Estimate									434,000.00

OPINION OF PROBABLE CONSTRUCTION COST | **KENNEDY/JENKS CONSULTANTS**

Project: Adelanto R3 Extension Project

Building, Area: Turnout #7 Relocation

Prepared By: RJL/JS
Date Prepared: 14-Jun-19
K/J Proj. No. 1944511*00

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type:
- ☐ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☒ **Design Development @** x **% Complete**
- ☐ **Construction**
- ☐ **Change Order**

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
		Grading									
		Overexcavation and Compaction for bldg	82	cy			10.51	862			862
		Rough Grading	1.00	LS			830.00	830			830
		Finish Grading	1,333	sf			1.43	1,907			1,907
		3" Thick Aggregate Base Surface	148	sy	1.94	287	1.28	190			477
		CMU Building Work									
		Concrete Footings	17	cy	300.00	5,100	300.00	5,100			10,200
		Concrete Foundation	15	cy	300.00	4,500	300.00	4,500			9,000
		Concrete Pad and Ramp	4	cy	300.00	1,200	300.00	1,200			2,400
		Misc. Concrete Work	4	cy	300.00	1,200	300.00	1,200			2,400
		CMU Split Face	2,315	sf	14.00	32,410	14.00	32,410			64,820
		W-10 Roofing Beams	90	LF	33.50	3,015	8.65	779			3,794
		Roofing, Membrane	816	sf	1.39	1,134	2.01	1,640			2,774
		Roofing, Insulatation	816	sf	1.00	816	1.25	1,020			1,836
		Roof Drains and piping	1	LS	1,000.00	1,000	1,000.00	1,000			2,000
		Roll Up Door	1	EA	3,000.00	3,000	1,500.00	1,500			4,500
		Double Swing Door 8' x 8'	2	EA	350.00	700	150.00	300			1,000
		Hollow Metal Work	3	EA	350.00	1,050	200.00	600			1,650
		Finish Hardwar	3	EA	400.00	1,200	200.00	600			1,800
		Misc. Flashing	1	LS	1,000.00	1,000	1,000.00	1,000			2,000
		HVAC Work									
		Fans, 1000 cfm	2	EA	866.00	1,732	515.00	1,030			2,762
		Louvers	6	EA	38.00	228	28.00	168			396
		Chemical Feed System									
		Chlorine Residual Analyzers	1	Ea	6,063.72	6,064	1,000.00	1,000			7,064
		Packaged Chlorine Dosing System	1	LS					40,000	40,000	40,000
		1" SCH 80 PVC piping (Chem & Sample Lines)	50	LF	11.85	593	15.85	793			1,385
		1" PVC Ball Valves	4	ea	51.50	206	29.00	116			322
		Injection Quill	2	ea	250.00	500	100.00	200			700
		1" PVC CheckValves	2	ea	61.00	122	29.00	58			180
		Pipe Supports	8	EA	20.00	160	10.00	80			240
		Outside Vaults									
		4' x 4' x 4" Precast Vault	2	Ea	1,125.00	2,250	1,600.00	3,200			5,450
		6" thick 3/4" Crushed Rock	5	SY	1.94	10	1.28	6			16
		Piping									
		Backflow Preventer	1	EA	1,000.00	1,000	48.50	49			1,049
		1-inch Copper Piping	30	LF	7.40	222	4.00	120			342
		Hose Bibbs	2	EA	12.90	26	20.00	40			66
		Eyewash Station	1	EA	1,050.00	1,050	305.00	305			1,355
		18-inch CML&C/CML&EC Steel Pipe	200	LF	138.00	27,600	178.15	35,630			63,230
		18-inch steel Elbows	4	EA	1,575.00	6,300	1,545.50	6,182			12,482
		18-inch x 16" Reducers	2	Ea	1,200.00	2,400	1,300.00	2,600			5,000
		16-inch Magmeter	1	Ea	10,000.00	10,000	1,000.00	1,000			11,000
		16-inch MOV BFV	1	EA	10,600.00	10,600	1,000.00	1,000			11,600
		Pressure Transmitters/Gauges	2	EA	20.00	40	42.00	84			124
		2-inch CAV	1	EA	720.00	720	150.00	150			870
		16-inch CML&C.CML&EC Pipe	20	LF	149.00	2,980	146.00	2,920			5,900
		16-inch Electronic Control Valve	1	Ea	18,000.00	18,000	20,000.00	20,000			38,000
		Pipe Supports	3	EA	1,500.00	4,500	500.00	1,500			6,000
		Excavation	255	cy			6.01	1,533			1,533
		Bedding, sand with combacktion	106	cy	19.00	2,014	13.93	1,477			3,491
		Backfill	130	cy			7.82	1,017			1,017
		Spoil	20	cy			9.97	199			199
		Trench Shield, assume 100'/day	3	wks					577	1,731	1,731
		Electrical & Instrumentation									
		Electrical & Instrumentation, Lighting, etc.	1	LS					116,787	116,787	116,787
		SCE underground line extension	1,000	LF					35	34,540	34,540
		Meter Service	1	LS					10,000	10,000	10,000
		Subtotals				156928.21		139092.14		203057.58	499,077.93
		Division 1 Costs	@	10%		15692.82		13909.21		20305.76	49,907.79
		Subtotals				172621.03		153001.35		223363.34	548,985.72
		Taxes - Materials Costs	@	7.75%		13378.13					13,378.13
		Subtotals				185999.16		153001.35		223363.34	562,363.85
		Taxes - Labor Costs									
		Subtotals				185999.16		153001.35		223363.34	562,363.85
		Contractor Markup for Sub	@	10%						22336.33	22,336.33
		Subtotals				185999.16		153001.35		245699.67	584,700.19
		Contractor OH&P	@	15%		27899.87		22950.20			50,850.08
		Subtotals				213899.04		175951.55		245699.67	635,550.27
		Estimate Contingency	@	20%							127,110.05
		Subtotals									762,660.32
		Escalate to Midpoint of Construct	@	3%							22,879.81
		Estimated Bid Cost									785,540.13
		Total Estimate									786,000.00

Appendix E
Project Design Report

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Kennedy Jenks

38977 Sky Canyon Drive, Suite#100
Murrieta, CA 92563
951-375-5570

Adelanto R^3 Extension Project

FINAL

Preliminary Design Report

16 August 2019

Prepared for

Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

KJ Project No.
1944004.00 & 1944004.01

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Section 1: Introduction

1.1 Background

The Mojave Water Agency (MWA) is a regional water management entity created by a special act of the State legislature in 1960. MWA functions as a water wholesaler to multiple local water purveyors within its management area (approximately 4,900 square miles in the high desert in San Bernardino County). As a state water contractor, MWA is entitled to receive an annual allotment of up to 85,800 acre-feet (AF) of water from the State Water Project via the California Aqueduct.

MWA's Regional Recharge and Recovery Project (R^3) utilizes unused aquifer storage capacity in the Mojave Basin to enhance the regional supply of water by recharging the aquifer with inflow from the State Water Project aqueduct. The stored recharged water is then extracted by well facilities for delivery to purveyor turnout locations. Phase 1 of the R^3 Project, as shown on Figure 1, was partly constructed and started delivering water in 2013.

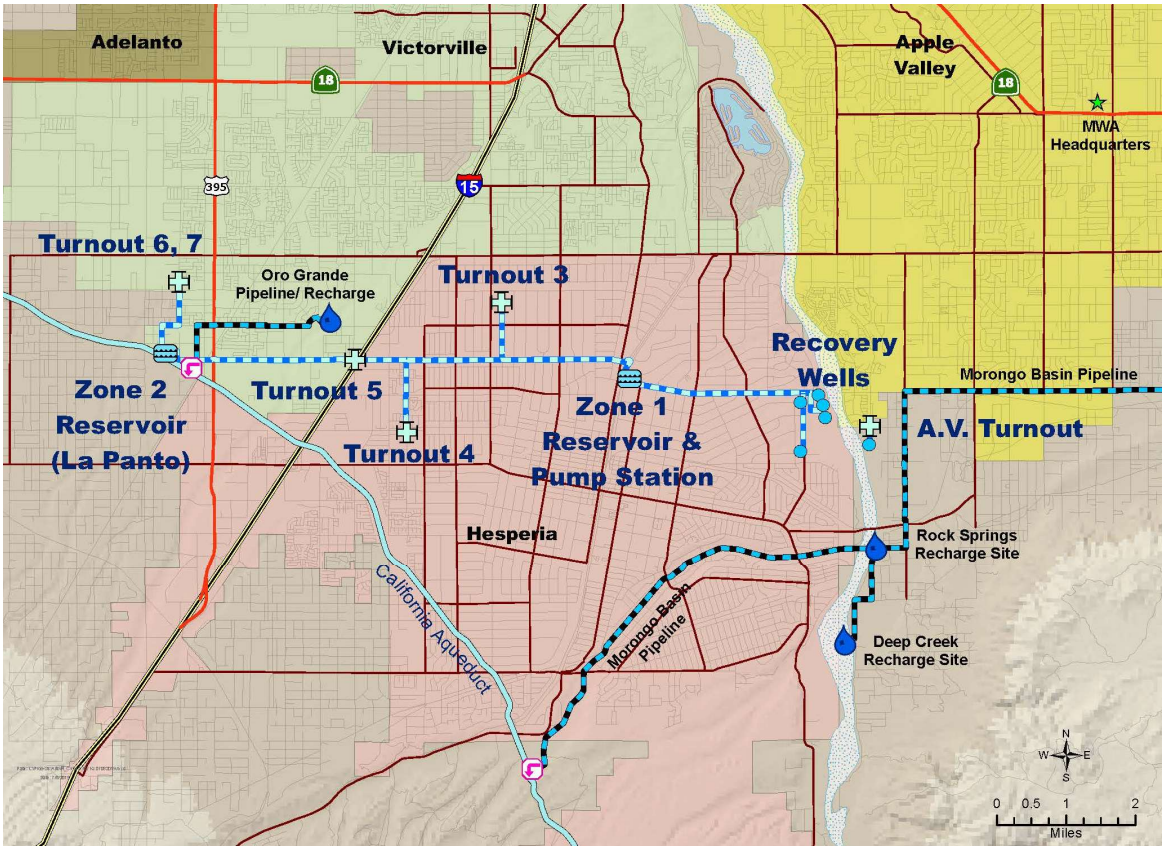


Figure 1: R^3 Project Phase 1 Facilities

The anticipated water deliveries for the R^3 Project, per the May 2008 Phase 1 Upper Mojave River Well Field and Water Supply Pipeline Project - Basis of Design Report, are described in Table 1.

Agency	Phase 1 (AFY)	Ultimate (AFY)
City of Adelanto (Adelanto)	3,000	7,900
City of Hesperia	3,200	8,750
City of Victorville (Victorville)	6,200	14,250
Liberty Utilities/Golden State Water Apple Valley	2,000	4,000
San Bernardino County Service Area 64	0	2,700
Southern California Logistics Airport (SCLA)	600	2,400
Total Water Deliveries	**15,000**	**40,000**

Table 1: R^3 Project Water Deliveries

In 2018, the R^3 Project delivered 4,509 AF of treated water, which consisted of 4,422 AF to Victorville and 87 AF to Liberty Utilities Apple Valley.

The R^3 Project water deliveries will be provided to each agency, as follows:

- City of Adelanto – Turnout 7
- City of Hesperia – Turnout 2 & 4
- City of Victorville – Turnout 3, 5 & 6
- Liberty Utilities/Golden State Water Apple Valley – A.V. Turnout
- San Bernardino County Service Area 64 – Turnout 1
- Southern California Logistics Airport – via the City of Victorville turnouts

Since the Victorville water deliveries are provided by multiple turnouts which also include the SCLA water deliveries, it is assumed that 50% of the SCLA water deliveries are provided by Turnout 6 and that the Victorville water deliveries for Turnout 6 is 2,400 AFY for Phase 1 and 5,500 AFY for the ultimate flows per Table CE-4 of the May 2008 Phase 1 Upper Mojave River Well Field and Water Supply Pipeline Project - Basis of Design Report. Therefore, for the purpose of this Preliminary Design Report (PDR), the flow capacity of Turnout 6 is estimated as follows:

- Phase 1 = 2,700 AFY (2,400 Victorville + 300 SCLA)
- Ultimate = 6,700 AFY (5,500 Victorville + 1,200 SCLA)

The following improvements, as shown on Figure 2, were previously identified by MWA to complete the R^3 Project Phase 1:

1. **Installation of a 30-inch diameter pipeline from Turnout 6 to the Adelanto Reservoir site, including the relocation of Turnout 7.**
2. Installation of a 36-inch diameter pipeline from the Le Panto Reservoir to Turnout 6 (which replaces an existing pipeline currently leased from Victorville).
3. Installation of a five (5) million-gallon storage reservoir (which replaces the existing Le Panto Reservoir currently leased from Victorville).
4. **The addition of booster pumping at Turnout 6 to serve Victorville.**
5. A new conveyance pipeline connecting the existing R^3 pipeline on the west side of the Mojave River at Lemon Street to the east side of the Mojave River, connecting at existing Well 6.

Improvement Nos. 1 & 4 are highlighted in bold above since these two improvements are the primary subject matter for this Adelanto R^3 Extension Project PDR.

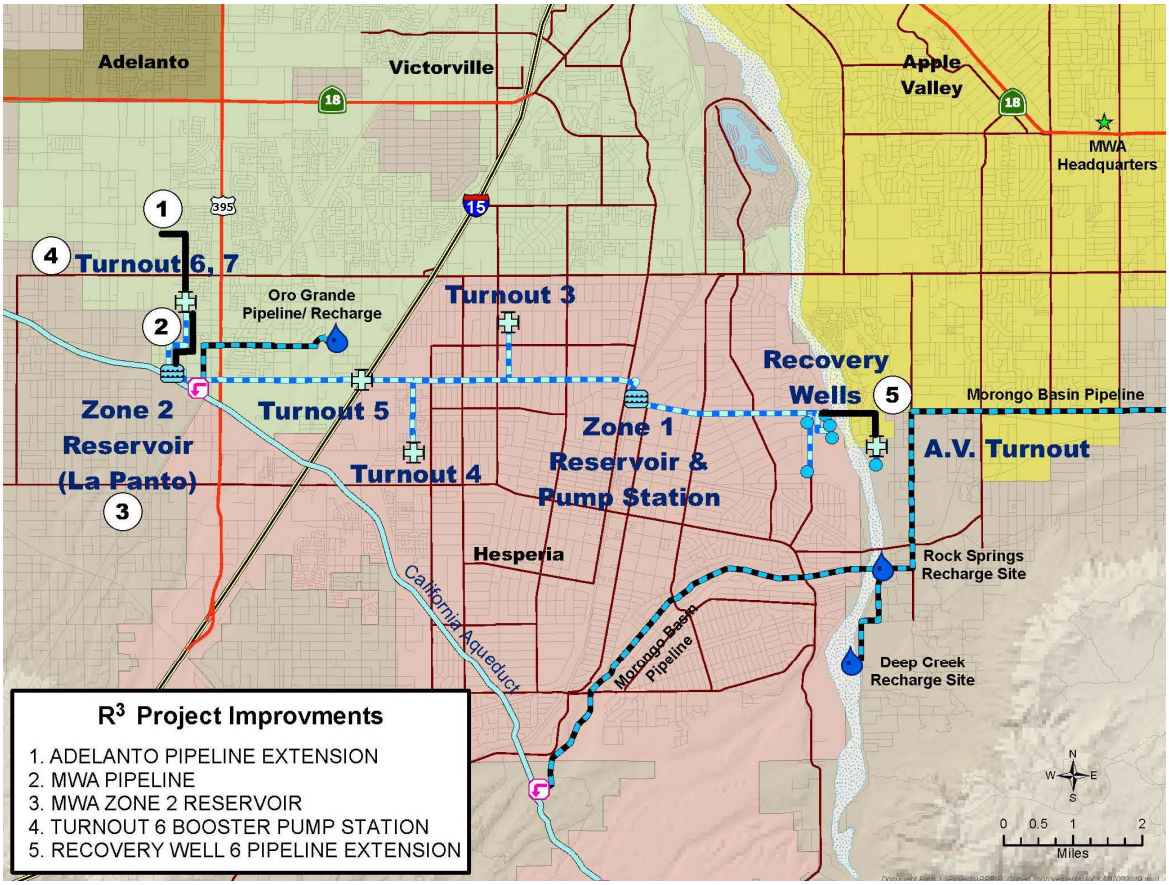


Figure 2: R³ Project Phase 1 Improvements

1.2 Purpose

The purpose of this project is to construct the aforementioned improvements Nos. 1 & 4 for the R^3 Project Phase 1.

The Adelanto pipeline extension will convey R^3 water from the existing Turnout 6/7 facility to Adelanto's 5.0 MG Reservoir site in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto (copy included in Appendix A). Included with this project is the construction of a new Turnout 7 facility. This project will enable Adelanto to receive the R^3 water as a supplemental water source. This project will deliver the R^3 water on an average annual flow basis, with no significant peaking capacity provided.

The Turnout 6 modifications project will add booster pumping capability to Turnout 6 such that the R^3 water provided will exceed the minimum pressure requirement of 40 pounds per square inch (psi) in accordance with the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 19, 2013, between MWA and the City of Victorville (copy included in Appendix A) as well as providing additional pressure for Victorville to fully utilize their 3485 Pressure Zone reservoir capacity. Current operation of the Turnout 6 facility does not satisfy this pressure requirement. Included in this project will be modifying the existing Turnout 7 facility for consolidated use solely with Turnout 6.

1.3 Report Organization

This Preliminary Design Report is organized into the following sections:

- **Section 1 – Introduction:** This section includes the project's background information, the purpose of the project and the organization of the PDR.
- **Section 2 – Project Description:** This section provides a separate description of each project component; the Adelanto pipeline extension, Turnout 7 and the Turnout 6 modifications.
- **Section 3 – Design Criteria:** This section provides the hydraulic design flow rates, maximum pipeline flow velocity, the minimum design pressure, the Turnout 7 residual pressure analysis and the Turnout 6 pump design parameters.
- **Section 4 – Adelanto Pipeline Extension:** This section provides the design considerations for the Adelanto pipeline extension.
- **Section 5 – Turnout 7:** This section provides the design considerations for Turnout 7.
- **Section 6 – Turnout 6 Modifications:** This section provides the design considerations for the Turnout 6 modifications.
- **Section 7 – CEQA/NEPA Requirements:** This section summarizes the environmental requirements for the project.
- **Section 8 – Property Acquisition & Permit Requirements:** This section provides an evaluation of the property requirements and the permitting required for the project.
- **Section 9 – Project Schedule:** This section discusses the project schedule including the design and construction phases.
- **Section 10 – Opinion of Probable Construction Cost:** This section summarizes the opinion of the probable construction cost for the project.

Section 2: Project Description

2.1 Adelanto Pipeline Extension

This element of the project consists of the construction of approximately 5,800 lineal feet of 20-inch & 30-inch diameter pipeline as shown on Figure 3. The 30-inch pipeline will connect to the proposed 36-inch diameter CML&C steel pipeline at Turnout 6, located in Mesa View Drive, approximately 650 feet north of 5th Street/del Rosa Road, as shown on Figure 3 and Figure 4. The 30-inch pipeline will continue north (approximately 4,650 lineal feet) on Mesa View Drive until the intersection of Olivine Road. At the intersection of Mesa View Drive and Olivine Road, the pipeline will include a cross fitting with partial valving (valves on the south and west branches) which will accommodate the potential extension of the R^3 pipeline to the City Adelanto in the future. From the intersection of Mesa View Drive and Olivine Road, a 20-inch diameter pipeline will continue west on Olivine Road (approximately 900 lineal feet) until the terminus at the re-located Turnout 7 at the Adelanto 5.0 MG Reservoir facility.

The pipeline improvements associated with the connection of the 30-inch diameter Adelanto pipeline at Turnout 6 is shown on Figure 4. The pipeline improvements consist of:

- Approximately 25 lineal feet of 18-inch diameter pipeline to connect the former Turnout 7 pipeline to the proposed Adelanto pipeline extension
- Approximately 55 lineal feet of 30-inch diameter pipeline to connect the existing Victorville 30-inch diameter distribution system pipeline to the existing Victorville 30-inch diameter pipeline (currently leased by MWA)
- Approximately 125 lineal feet of 36-inch diameter pipeline to connect the Turnout 6 supply pipeline to the proposed Adelanto pipeline extension and to extend this pipeline south along Mesa View Drive, just beyond the future intersection of Everett Lane and Mesa View Drive.

These pipeline improvements are necessary to complete the proposed Turnout 6 modifications and to facilitate the future construction of the 36-inch diameter pipeline from the Le Panto Reservoir to Turnout 6 (Improvement No. 2 as shown in Figure 2).

The preliminary pipeline alignment is anticipated to be located on the west side of Mesa View Drive and south side of Olivine Road. The pipeline alignment will be finalized after completion of the project survey and evaluation of the underground utilities and future road improvements. During final design, the pipeline alignment analysis will evaluate the potential opportunity to avoid the existing paved roadway section. The pipeline will be constructed completely by open cut construction methods.

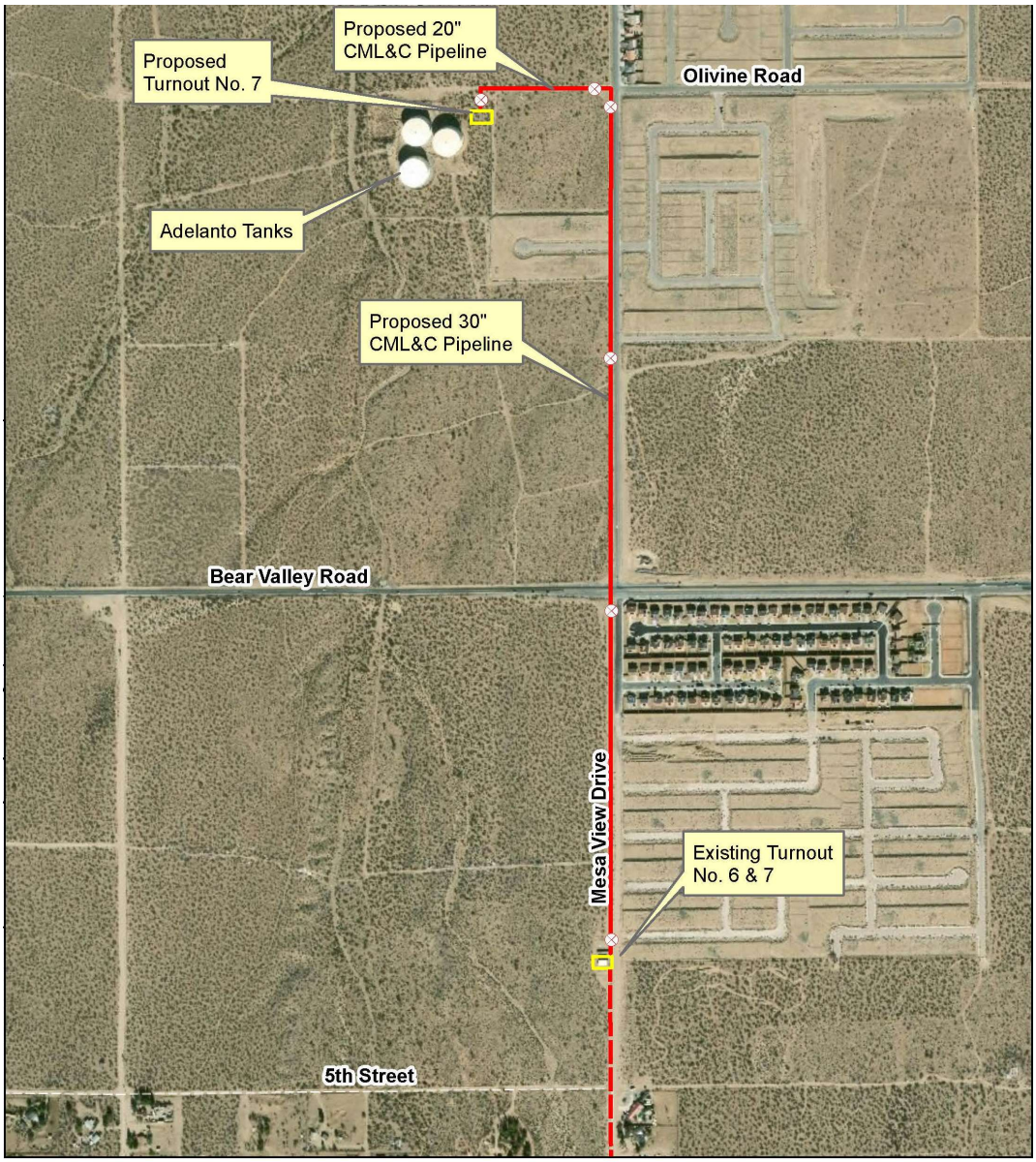


Figure 3: Adelanto R³ Pipeline Extension

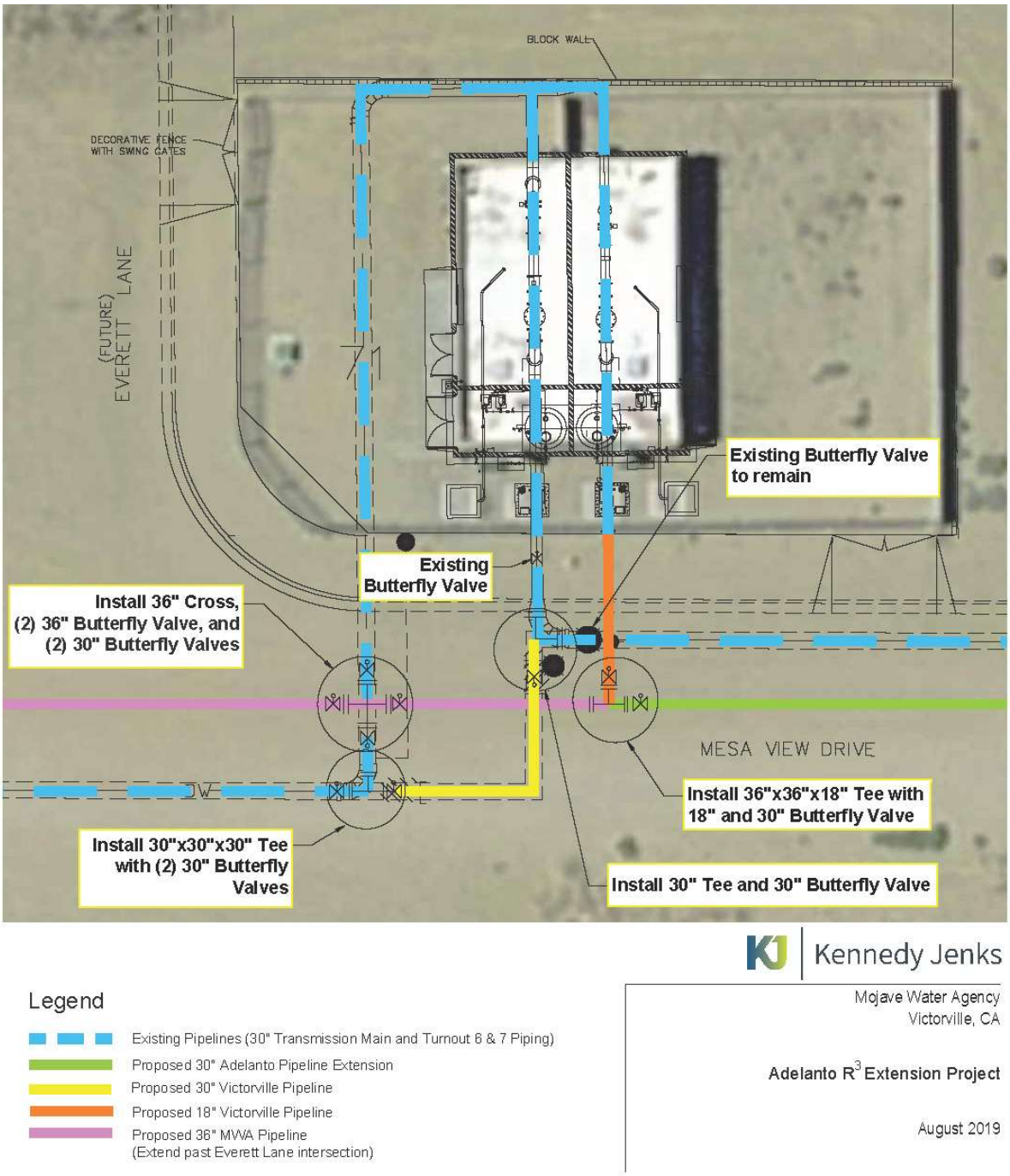


Figure 4: Pipeline Modifications at Turnout 6

2.2 Re-Located Turnout 7

This element of the project consists of constructing a new turnout facility at the Adelanto 5.0 MG Reservoir facility to provide water service to the City of Adelanto as shown on Figure 5. The new turnout facility will be sized to convey the full volume of the R^3 water delivery to the City of Adelanto. The turnout facility will be constructed within an approximate 18-foot by 46-foot concrete block building with galvanized metal roof decking. The turnout facility will consist of 16-inch diameter steel piping (epoxy-lined and coated), magnetic flow meter, electronic flow control valve, isolation valves, air release valves, calcium hypochlorite tablet chlorination system, chlorine residual analyzers, eye wash station, radio antennae, lighting panel and (2) control panels. Located outside of the turnout facility will be (2) 4-foot by 4-foot pre-cast concrete vaults. One vault will be used for pipeline chlorine residual sampling and the other vault will be used as a drainage chamber with piping to a proposed drainage basin.

The turnout facility will connect to the City of Adelanto's water system with approximately 300 lineal feet of a 20-inch or 24-inch diameter steel pipeline which will support the future on-site reservoir pipeline distribution system. A 15-foot wide gravel road will be provided over the installed pipeline within the reservoir site. The concrete block building will be surrounded by a 20-foot wide gravel base and a 15-foot wide gravel road and a new driveway gate and manway gate will be installed to provide access to Turnout 7 from Olivine Road. This project will also include the installation of a new 120/240V single phase electrical service from Southern California Edison (SCE) which will consist of two (2) electrical meters, conduit, utility transformer and approximately 800 lineal feet of underground/overhead line extension by SCE from the intersection of Mesa View Drive and Olivine Road. It is anticipated that after construction of Turnout 7, the existing pipeline inter-tie between the City of Adelanto and the City of Victorville would remain in place and would be used only for emergency purposes.

An alternative site location for Turnout 7 was investigated as provided in Appendix B. This alternative was not selected for final design due to interference with the use of the radio antennae, constrained site location and increased project cost related to the additional length of pipeline required. In addition, the proposed site location and pipeline improvements reduces the City of Adelanto's future capital expenditures for pipeline improvements necessary to distribute water to the future reservoir facilities.

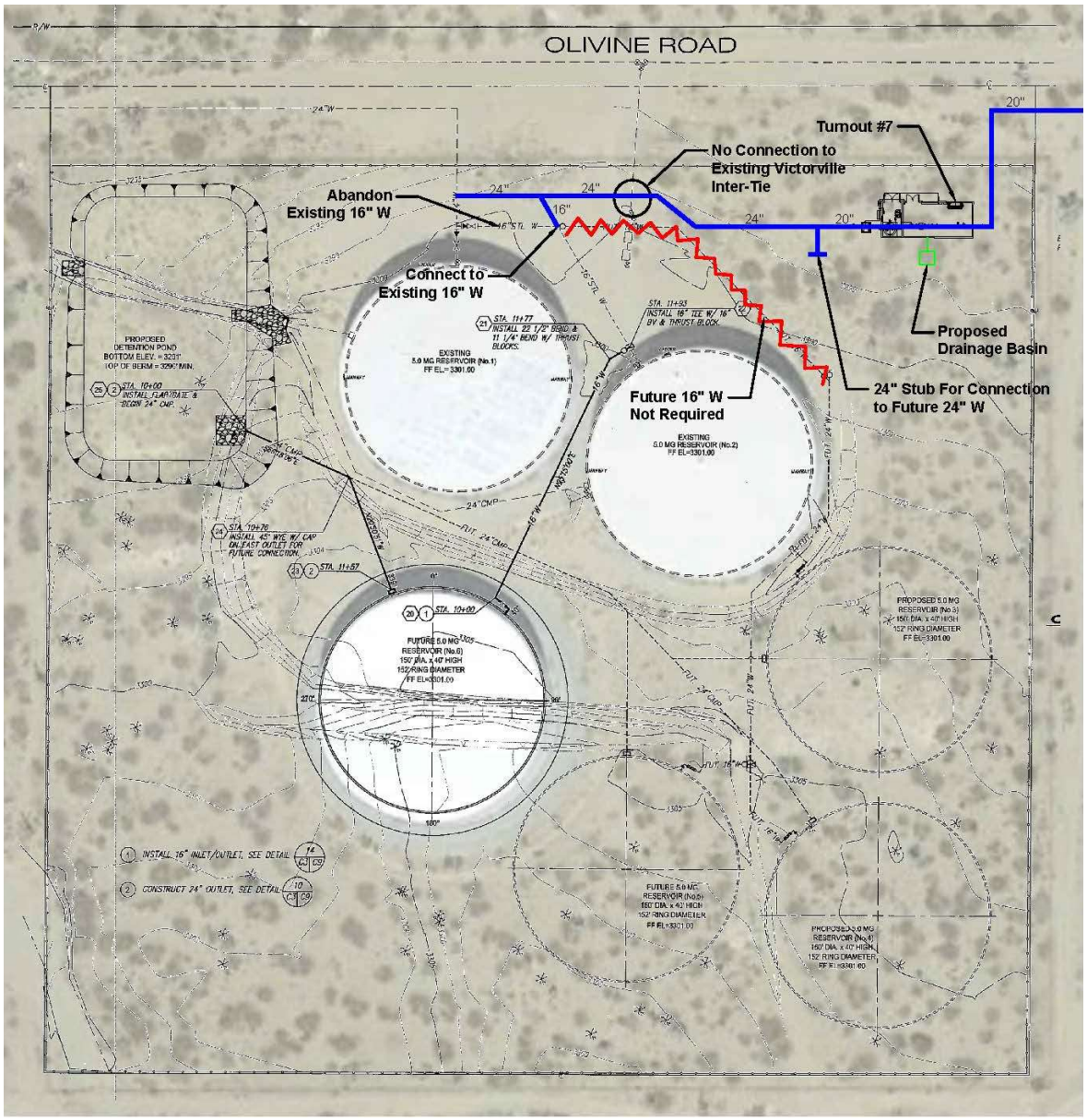


Figure 5: Turnout 7 Proposed Facilities

2.3 Turnout 6 Modifications

This element of the project consists of modifying the existing Turnout 6/7 facility into a dedicated Turnout 6 facility to solely provide water to the City of Victorville. This project will include adding a pumping unit, modifying the turnout piping and related electrical and instrumentation improvements. This project also includes upgrading the existing SCE electrical service from 120/240V single phase to 480V three phase.

During evaluation of the existing piping configuration for the addition of an in-line booster pump for the Turnout 6 piping, it was determined that the existing above-ground pipe length was inadequate to provide accurate meter reading for the magnetic flow meter (minimum distance of 3 times the pipe diameter for straight pipe upstream of the meter and 2 times the pipe diameter downstream of the meter).

A modified piping configuration was prepared to utilize the former Turnout 7 piping to provide the additional above-ground pipe length for the installation of an in-line booster pump, shown in Figure 6 and Figure 7. This modified piping configuration will allow R^3 project water to be delivered to the Victorville distribution system using the former Turnout 7 piping and Turnout 6 piping for pumped flows or just the Turnout 6 piping for non-pumped flows. For either flow scenario, the disinfection system would not be modified and would continue to operate in its current condition.

The modifications to the former Turnout 7 piping will consist of altering the above-ground 16-inch diameter pipeline to accommodate the installation of the in-line booster pump, swing check valve, upstream isolation valve, reducer fittings, pipe spools and couplings. In addition, the existing flow control valve located on the Turnout 6 piping will be modified to add check valve functionality.

An alternative piping configuration for Turnout 6 was investigated as provided in Appendix B. This alternative was not selected for final design due to the additional work required and that above-ground facilities would be located outside of the turnout building.

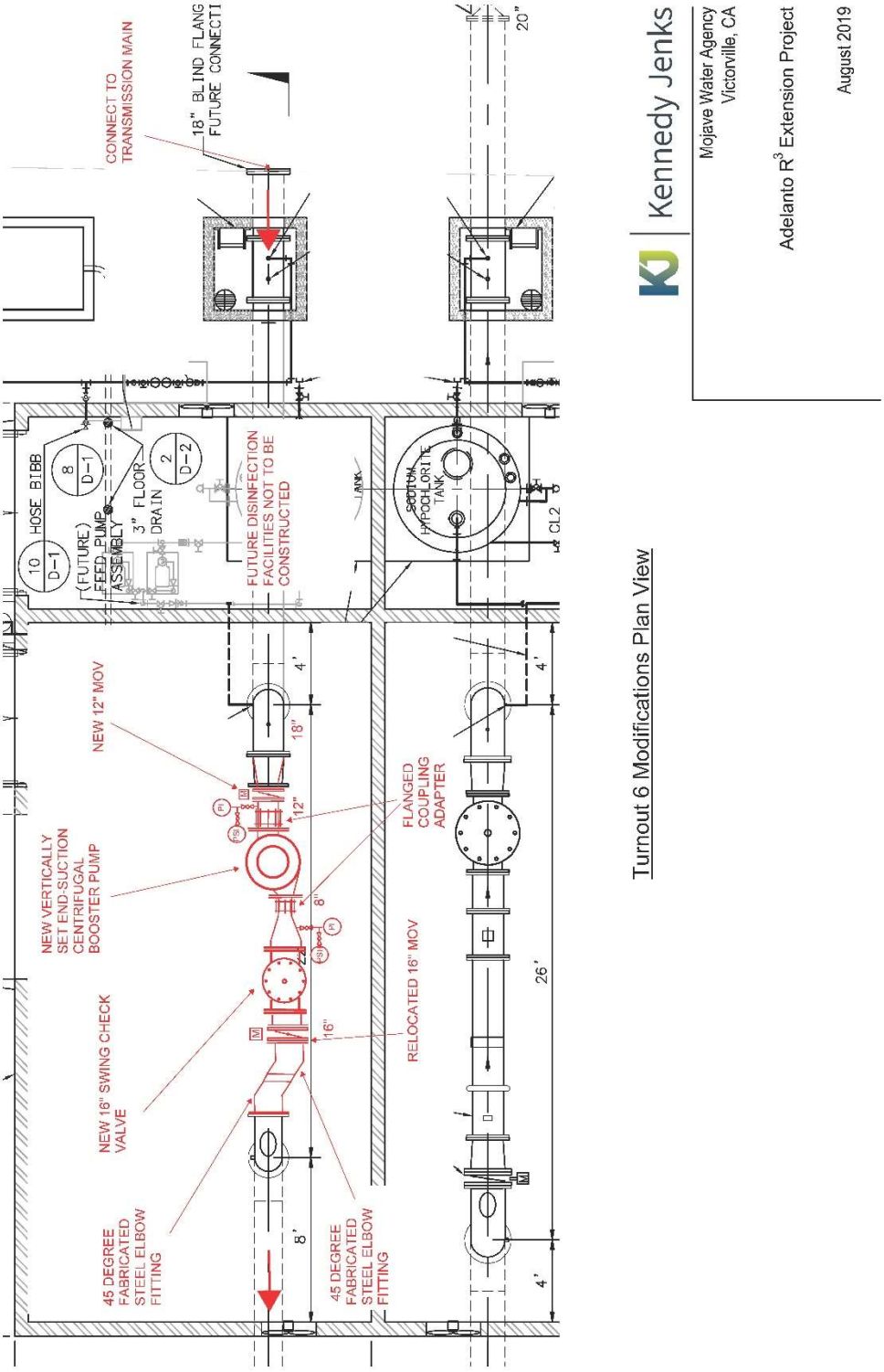


Figure 6: Turnout 6 Modifications – Plan View

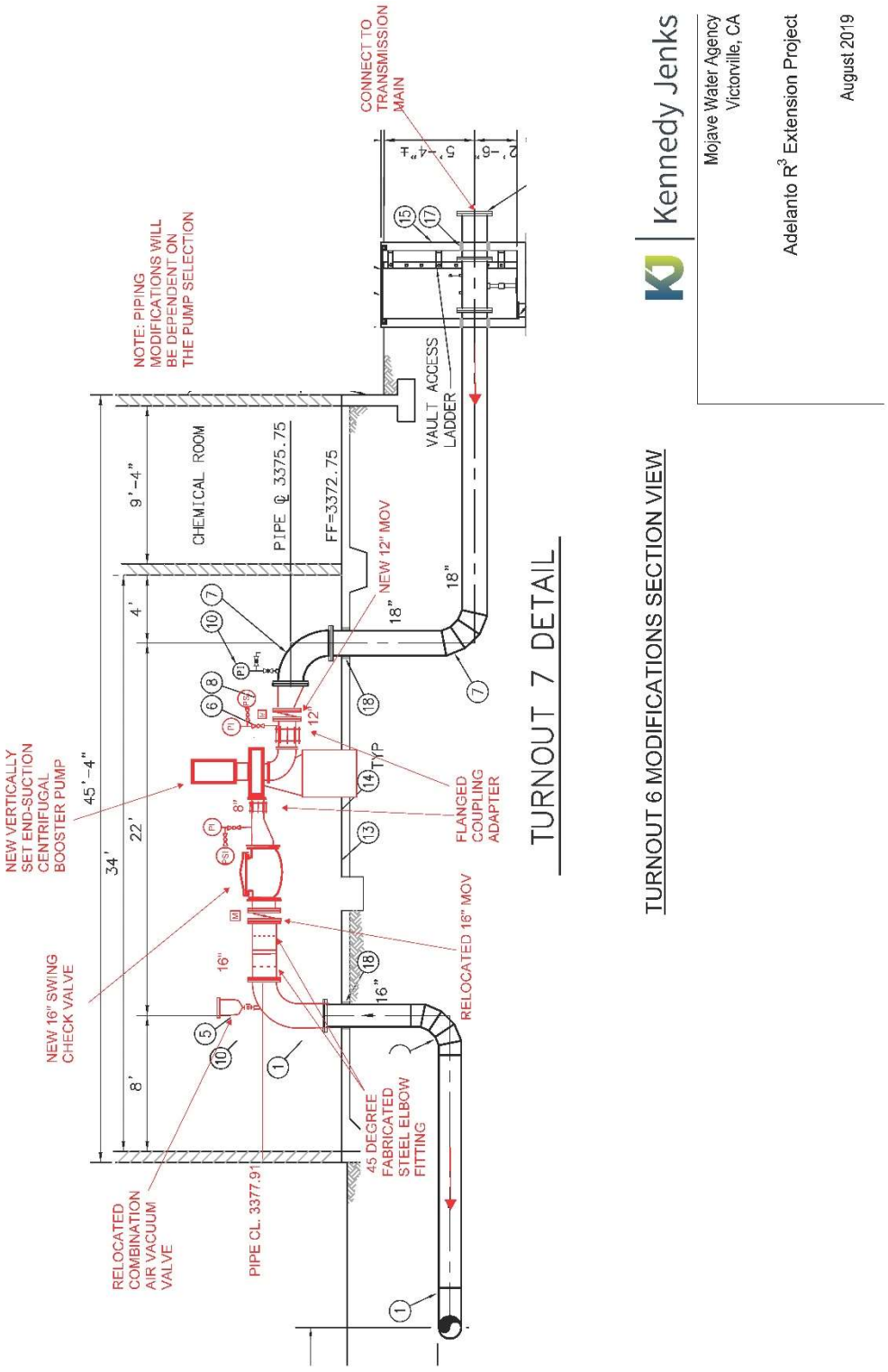


Figure 7: Turnout 6 Modifications – Section View

Section 3: Design Criteria

3.1 Hydraulic Design Flow Rate

The maximum hydraulic design flow rate for the project is based on the turnout's ultimate flow capacity, as noted in Section 1.1, with an applied seasonal flow factor (assuming the annual flow is provided during 300 calendar days of the year per the May 2008 Phase 1 Upper Mojave River Well Field and Water Supply Pipeline Project - Basis of Design Report).

Maximum Design Flow Rate

Turnout 7 = 7,900 AFY*(0.62 GPM/1 AFY)*(365 days/300 days) = 5,960 GPM

Turnout 6 = 6,700 AFY*(0.62 GPM/1 AFY)*(365 days/300 days) = 5,060 GPM

Since the Turnout 6 booster pump design will be based on Phase 1 water deliveries only, the Phase 1 maximum design flow rate is calculated to be 2,040 GPM [2,700 AFY*(0.62 GPM/1 AFY)*(365 days/300 days)] for the Turnout 6 booster pump.

The minimum hydraulic design flow rate for the project is based on the estimated minimum monthly flow to be provided by each turnout. The estimated minimum monthly flow was based upon a review of MWA's 2017 & 2018 monthly flow data. The minimum monthly flow amount is then converted to a corresponding 24-hour per day flow rate.

Minimum Design Flow Rate

Turnout 7 = 100 AF/month*(1 month/43,200 min)*(326,000 gals/1 AF) = 750 GPM

Turnout 6 = 200 AF/month*(1 month/43,200 min)*(326,000 gals/1 AF) = 1,500 GPM

3.2 Pipeline Flow Velocity

For the project pipelines, the maximum design velocity should be less than 5 fps for transmission mains (to minimize head loss) and less than 10 fps for turnout piping with cement lining (to minimize erosion loss to the cement lining) or less than 16 fps for turnout piping with epoxy lining (to minimize erosion loss to the epoxy lining). The calculated flow velocity for various pipeline sizes is shown in Table 2.

	Pipeline Flow Velocity (feet per second)					
Pipeline Diameter (inches)	16	18	20	24	30	36
Turnout 7 - 5,960 GPM	9.51	7.51	6.09	4.23	2.71	1.88
Turnout 6 - 5,060 GPM	8.07	6.38	5.17	3.59	2.30	1.59

Table 2: Calculated Pipeline Flow Velocity by Pipeline Diameter

For the 20-inch diameter size for the Adelanto pipeline extension to Turnout 7, the calculated 6.09 fps pipeline flow velocity is acceptable because the increased head loss does not adversely affect the available pressure at Turnout 7.

3.3 Minimum Design Pressure

For the proposed project, the minimum design pressure should not be less than 150 pounds per square inch (psi).

The calculated static pressure is 94 psi based on the following assumptions:

- High Water Level = 3,498 (based on Le Panto Reservoir, rounded up)
- Lowest Ground Surface = 3,295 (intersection of Olivine Road & Mesa View Drive)
- Deepest Pipeline Invert = 13 feet (10 foot of cover and 3-foot pipe diameter)
- ((3,498 – 3,295) + 13)*0.433 psi/ft = 94 psi

Generally, the minimum design pressure is based on the maximum static pressure times 125%, with the total rounded up to the nearest 25 psi (which equates to 125 psi). Therefore, to meet the minimum design pressure stated above for the project, the minimum design pressure to be used for the project will be 150 psi which also provides an extra measure of safety for unknown pressure surges.

3.4 Turnout 7 Residual Pressure

Three performance head curves were prepared for the west portion of the R^3 system as shown in the Turnout 7 Residual System Pressure Curve in Appendix C. The three curves were developed based on high, average, and low water levels in the Le Panto Reservoir and well as the concurrent operation of Turnout 6 and a full water level for the Adelanto 5.0 MG Reservoir. The flow parameters used were:

- Minimum flow: Turnout 6 = 675 GPM, Turnout 7 = 750 GPM
- Design flow: Turnout 6 = 2,034 GPM, Turnout 7 = 2,260 GPM
- Maximum flow: Turnout 6 = 5,394 GPM, Turnout 7 = 5,960 GPM

The residual pressure was calculated downstream of Turnout 7 at the inlet of Adelanto Reservoir No. 6. Based on the R^3 low head performance curve, the calculated residual pressure at Turnout 7 will therefore be greater than 40 psi for all flow and water level conditions. A summary of the calculated residual pressures based on the performance head curves are shown in Table 3.

Le Panto Reservoir Water Level (feet)	Residual Pressure @ Minimum Flow	Residual Pressure @ Design Flow	Residual Pressure @ Maximum Flow
High Water Level (32 feet)	67 psi	64 psi	51 psi
Average Water Level (15 feet)	61 psi	58 psi	45 psi
Low Water Level (2 feet)	55 psi	52 psi	39 psi

Table 3: Residual Pressure at Adelanto Reservoir 6

Considering the results of Table 3, it is recommended that the proposed pipeline diameter of the Adelanto Pipeline Extension should be 30-inches and not upsized to 36-inches for reduced pipeline friction.

3.5 Turnout 6 Pump Design Parameters

The proposed booster pump for Turnout 6 will deliver water into Victorville's 3485 Pressure Zone. The 3485 Pressure Zone is served by the two (2) Highway 395 Reservoirs:

- Reservoir T-202, 2.0 MG capacity, 3,500 high water level
- Reservoir T-207, 2.7 MG capacity, 3,501 high water level

Due to a significant bottleneck in Victorville's distribution system (12-inch diameter pipeline), separate system head curves were prepared to show the hydraulic changes both before and after the anticipated capital improvements resolve the system constraint. The timing of these improvements is currently undetermined. The system head curves for the Turnout 6 booster pump providing water to Victorville's 3485 Pressure Zone are shown in Appendix C.

The primary objective of the pump design is to provide a single pump that will provide maximum efficiency for the Phase I project flow rates prior to the distribution system improvements to Victorville's distribution system (Phase 1-A) as well as providing maximum efficiency for the Phase I project flow rates after completion of the distribution system improvements to Victorville's distribution system (Phase 1-B). Thus, for both conditions, the pump design parameters for the Turnout 6 booster pump is shown in Table 4.

Parameter	Size (Phase 1-A)	Size (Phase 1-B)
Phase 1 Design Flow (GPM)	2,040	2,040
Total Dynamic Head (feet)	55	28
Pump Efficiency (%)	88	73
Motor Efficiency (%)	85	85
Brake Horsepower	32	19.3
Total Horsepower	40	25

Table 4: Pump Design Parameters

It is anticipated that the maximum shut off head for the pumping unit will be less than 80 feet. Based on our discussion with the pump manufacturer, the largest vertically set end-suction centrifugal pump can produce 3,500 gpm @ 74 TDH (100 hp) with minor piping modifications to install this pump unit.

If Turnout 6 is required to pump the maximum design flow rate of 5,060 GPM (ultimate water delivery), it is anticipated that the Phase 1 pump unit would be replaced with a higher capacity pump unit, likely a horizontal split case pump unit, and the piping and valves connected to the pump unit may need to be upsized also.

Section 4: Adelanto Pipeline Extension

4.1 Facility Design Requirements

Underground pipeline facilities will be designed in conformance with the SWRCB Guidance Memo 2017-01: Separation of Water Mains and Non-Potable Pipelines. When the separation distance between water mains and non-potable pipelines is not in compliance with the California Waterworks Standards, an alternative to this requirement may be requested, provided that the proposed alternative provides at least the same amount of protection to public health. The guidance memo assists with the approval of proposed alternatives. For the proposed project, the underground pipeline facilities will be designed to accommodate future undetermined non-potable pipelines that may affect the separation distance as required by the California Waterworks Standards. The design features will include the following:

- Install the water mains with a minimum cover of 6-feet over the top of the pipeline to facilitate non-potable pipeline service laterals to cross over the top of the pipeline
- Install the water mains using all welded joints to minimize the potential of contamination from joint infiltration
- For steel pipelines, use wire-fabric reinforcement with cement mortar coating of a minimum thickness of ¾-inch to protect the pipeline and to minimize the potential for contamination

For the Adelanto pipeline extension, the below-ground piping will be cement mortar lined and coated steel pipeline. The minimum steel pipe cylinder thickness will be 7 Gage (0.1793 inches) for transmission mains (30” & larger) and 10 Gage (0.1345 inches) for transmission mains (24” & smaller).

The pipeline will be designed to maintain a slope (0.5% minimum, positive or negative slope) to accommodate the release of air from the pipeline and to assist in the draining of the pipeline.

Thrust restraint will be provided by welded joints for steel pipelines, unless concrete thrust blocks are required for special circumstances.

In-line isolation valves will be butterfly valves, spaced apart no greater than 2,000 lineal feet, and located as shown on Figure 3. Normally closed valves will include a locking cap and will be identified by marked valve cover lids.

Combination air and vacuum release valves will be located at high points along the pipeline and spaced a maximum of 2,500 lineal feet on straight pipeline runs. The valve sizing should be a minimum of 2-inches in diameter for 20-inch pipelines and a minimum of 4-inches in diameter for 30-inch pipelines.

Blow-off facilities will be provided at low points of the pipeline, with tangential type outlets, for pipeline draining purposes. The blow-off facilities will have a lateral size of 6-inches and a riser size of 8-inches for pipelines with a diameter of 18-24 inches; while 30-inch and larger pipelines will have a lateral size of 8-inches and a riser size of 12-inches. The riser piping will be capped below grade in a 30-inch diameter manhole. A blow-off assembly will be provided on the 20-inch diameter pipeline prior to entrance to the Turnout 7 facility.

Manways, for 30-inch dimeter and larger pipelines only, will be provided on each side of the (2) in-line isolation valves (4 total), at the connection point for Turnout 6 and prior to cross fitting at the intersection of Mesa View Drive and Olivine Road. The manways will provide internal pipeline access for inspection and maintenance purposes. The manways will consist of a 30-inch dimeter blind flanged tee, located horizontally. Access to the manways will be provided by a 48-inch diameter manhole facility.

All pipeline appurtenances shall be installed a minimum of 24-inches from pipeline joints or fittings and the appurtenances will be constructed at right angles to the pipeline.

4.2 Sole Source Equipment or Material Requirements

For the Adelanto pipeline extension facilities, no specified equipment is proposed for sole source procurement.

4.3 Pressure Surges

A detailed surge analysis will be completed during final design. Anticipated measures to minimize pressure surges for the pipeline will be to evaluate the location and sizing of the air and vacuum release valves.

4.4 Corrosion

A detailed corrosion analysis will be completed during final design. Pipeline protection from corrosion will be provided by the cement mortar coating for below-ground installation or paint coating for above-ground installation.

Active cathodic protection is not anticipated to be required due to the mild to moderate corrosivity levels in the soil (per the previous geotechnical reports), however, installation of cathodic protection test stations is recommended for the proposed pipelines for future corrosion monitoring activities. Cathodic protection test stations are recommended to have a maximum spacing of 1,000 lineal feet.

At Turnout 6, for the connection of the proposed pipeline to the existing R^3 pipeline, the use of an insulating flange kit is recommended to minimize the corrosion potential between the pipeline facilities.

Stray current protection from the existing fuel pipeline in Bear Valley Road is proposed for the pipeline within the Bear Valley intersection. Depending on the final design parameters, stray current protection may be provided by the installation of sacrificial anodes near the intersection.

4.5 Geotechnical

Attached in Appendix D is the Geotechnical Desktop Study for the proposed project. No significant geotechnical issues are anticipated for the proposed pipeline alignment. No active fault zones are located within the project vicinity. Existing trench soil is anticipated to be suitable for trench backfill and imported soil is anticipated for the pipe zone backfill. A detailed geotechnical investigation and report will be completed during final design.

4.6 Facility Operation Strategy

MWA will be responsible for operating and maintaining the Adelanto pipeline extension facilities as necessary to deliver water to Adelanto at the requested flow rate and at a minimum pressure of 40 psi.

4.7 Potential Utility Conflicts

The primary utility conflicts of concern are located within Bear Valley Road. The facilities include the following:

- Fuel pipeline owned by Kinder Morgan Energy
- Transcontinental fiber optic facilities owned by Sprint

During final design, representatives of these utilities will be contacted to review the pipeline drawings. During potholing and construction activities, representatives of these utilities will be notified to allow them to be present for observation and coordination purposes. It is anticipated that no mechanized excavation will be allowed within two feet of these facilities and that the proposed pipeline alignment will avoid these facilities by at least two feet (horizontally and vertically). In addition, no additional surcharge loading will be allowed by the contractor over these facilities.

Section 5: Turnout 7

5.1 Facility Design Requirements

For the Turnout 7 pipelines, the below-ground piping will be cement mortar lined and coated steel pipe and the above-ground piping will be epoxy lined and painted steel pipe. The minimum steel pipe cylinder thickness should be 10 Gage (0.1345 inches) for transmission mains (24" & smaller) and 7 Gage (0.1793 inches) for turnout piping. Thrust restraint will be provided by welded joints for steel pipelines, unless concrete thrust blocks are required for special circumstances. Based on discussions with the City of Adelanto, future blending is not being considered and provisions to add future backflow equipment will not be required.

The Turnout 7 building will be design and constructed similar to MWA's existing Turnout 3 facility and modified as necessary for this project. The location of the doors and ventilation fans will be provided on the north or east side of the turnout building structure to avoid the prevailing wind direction.

5.2 Sole Source Equipment or Material Requirements

For Turnout 7, the following equipment is proposed to be specified for sole source procurement in order to match MWA's existing R^3 project facilities or the City of Adelanto's water facilities in accordance with the California Public Contracting Code:

- Magnetic Flow Meter: Tigermag EP Model FM-656
- Electronic Flow Control Valve: Cal-Val Model 131G or 631G
- Electronic Valve Actuator: EIM Controls
- Tablet Chlorination System: Accu-Tab PowerPro Series 3150
- Chlorine Residual Analyzer: ProMinent Fluid Controls
- Telemetry/Instrumentation: Tesco Controls (MWA facilities)
- Telemetry/Instrumentation: Vertech (Adelanto facilities)

The contract documents will be required to include the findings for the sole source equipment procurement.

5.3 Pressure Surges

A detailed surge analysis will be completed during final design. Anticipated measures to minimize pressure surges will be to specify the minimum required opening and closing times for the flow control valve and the motorized butterfly valve at Turnout 7. In addition, evaluation of the sizing for the air and vacuum release valves and evaluation of pressure/surge relief/anticipator valves will be performed during final design.

5.4 Corrosion

Pipeline protection from corrosion will be provided by the cement mortar coating for below-ground installation or paint coating for above-ground installation.

Active cathodic protection is not anticipated to be required; however, the installation of cathodic protection test stations is recommended for the proposed pipelines for future corrosion monitoring activities. For the connection of the proposed pipeline to the existing Adelanto pipeline, the use of an insulating flange kit is recommended to minimize the corrosion potential between the pipeline facilities. The below-ground pipeline installation prior to entering and after leaving the Turnout 7 building will include the use of insulating flanges.

5.5 Geotechnical

Attached in Appendix D is the Geotechnical Desktop Study for the proposed project. No significant geotechnical issues are anticipated for the proposed pipeline alignment or the turnout location. Over-excavation and re-compaction with structural fill is anticipated for the turnout building foundation. No active fault zones are located within the project vicinity. Existing trench soil is anticipated to be suitable for trench backfill and imported soil is anticipated for the pipe zone backfill. A detailed geotechnical investigation and report will be completed during final design.

5.6 SCADA/Telemetry

Instrumentation and control for Turnout 7 will be provided using radio communication between the radio receiver at Turnout 7 and MWA's and Adelanto's existing SCADA servers. The radio receiver and PLC will be located in a control panel within the Turnout 7 building and an antenna mast will be attached to the Turnout 7 building. A radio survey will be completed during final design to verify the radio signal strength for the proposed antenna location. A separate control panel will be installed to provide SCADA communication and control to Adelanto. Modifications to MWA's SCADA server and programming of the PLC for Turnout 7 will be provided by MWA's systems integrator separate from the construction contractor. Modifications to Adelanto's SCADA server and any required programming will be provided by Adelanto's systems integrator separate from the construction contractor. PLC inputs and outputs will include the following:

- Building intrusion alarm
- UPS or AC power failure
- Pressure transmitters data
- Flow transmitters data
- Flow control valve setpoint
- Motor operated valves (open or closed)
- Calcium hypochlorite low tablet alarm
- Solution tank level
- Chlorine analyzer alarm
- Chlorine residual level

5.7 Facility Operation Strategy

MWA will be responsible for operating and maintaining the conveyance facilities necessary to deliver water to Adelanto at the requested flow rate and at a minimum pressure of 40 psi. MWA's operational responsibility ends at the downstream flange of the flowmeter. MWA will monitor the flowrate at the turnout and will coordinate with Adelanto to schedule and manage the delivery of the water. Adelanto will be responsible for the turnout facilities downstream of the flowmeter. They will control the amount of flow as well as operate and maintain the disinfection facilities. Adelanto will be responsible for the water quality monitoring and reporting for the turnout facility. The turnout will be equipped with a motor operated isolation valve, a flowmeter, a modulating electronic flow control valve, (2) pressure transmitters, and a calcium hypochlorite tablet chlorination system.

The motor operated isolation valve will be used as a shut off valve and will be controlled and monitored by MWA's control panel. This valve will be either open or closed and will be in the open position in normal operation. This valve can also be used by MWA to shut down the flow in the event of a system emergency.

The flowmeter will measure the rate of flow and will be operated by MWA. The 4-20 mA flowmeter signal will be sent to MWA's control panel, Adelanto's control panel and to the controllers for the chlorination system. Since both MWA and Adelanto will receive the same actual flow signal, both entities will be able to monitor the flow for agreement compliance.

The flow control valve will be controlled by Adelanto and will be used to adjust the rate of flow to the flow amount agreed upon by MWA and Adelanto. Adelanto will send the flow set point signal to the flow control valve controller through either the operator interface terminal at the control panel or through the SCADA interface. The flow control valve controller will open or close the flow control valve to the desired flow set point such that the actual measured flow from the flowmeter matches the set point flow.

The pressure transmitters will be used to measure the system pressure at two locations, upstream of the isolation valve (inlet location) and downstream of the flow control valve (outlet location). The inlet pressure transmitter will be sent to both control panels for agreement compliance for the minimum pressure. The outlet pressure transmitter will be sent to only Adelanto's control panel.

The calcium hypochlorite tablet chlorination system will be controlled and monitored by Adelanto's control panel. The chlorinator will be paced from a compound loop pump control unit which will receive the flow signals from the flowmeter and the chlorine residual signals from the chorine residual analyzer. The compound loop control will allow for the accurate trimming of the outlet chlorine residual value independent of the incoming chlorine residual value. The location point of the sampling line will be evaluated to ensure adequate mixing downstream of the turnout piping and an accurate chlorine residual value.

5.8 SCE Electrical Service

Electrical power for Turnout 7 will be provided by Southern California Edison (SCE). Emergency back-up power will not be provided for Turnout 7. The nearest SCE electrical conduit is located approximately 800 lineal feet east of the Adelanto Olivine tank site at the intersection of Olivine Road and Mesa View Drive. It is anticipated that an SCE line extension and new power pole will be required to provide electrical service and meter at Turnout 7. It is also anticipated that a separate electrical meter will be installed for potential future loads allocated for the Adelanto 5.0 MG Reservoir facility. The new electrical service is anticipated to be 120/240V single phase 100A service For Turnout 7 and 120/240V single phase 50A service for the Adelanto 5.0 MG Reservoir facility.

5.9 Potential Utility Conflicts

No significant utility conflicts are anticipated within the existing Adelanto reservoir site.

Section 6: Turnout 6 Modifications

6.1 Facility Design Requirements

The in-line booster pump will be designed as a close coupled, vertically set end-suction centrifugal pump. The electric motor will be 40 horsepower, 1200 rpm constant speed, soft start and rated for premium efficiency. The existing flow control valve will be modified to add check valve functionality to prevent reverse water flow. The existing Turnout 6 building's temperature control system will be evaluated for modifications during final design due to the increased heat caused by the pump's motor and it is anticipated that a redundant air exhaust fan with thermostat control may be required.

Based on the pump design parameters in Section 3.5 for the Phase 1-A flow conditions, a preliminary pump selection was based on a pump curve for a Grundfos 80123 LCV (12.10" impeller) pump unit as shown in the Turnout 6 System Curve (Pre-Bottleneck Improvements) in Appendix C. The Grundfos pump is NSF 61 certified for domestic water use. A comparable pump unit acceptable for bidding purposes is the Cornell 6RB (13" impeller) vertically set end-suction centrifugal pump, although this pump has a lower efficiency rating for the Phase 1-A flow conditions, it has a similar efficiency rating to the Grundfos pump for the Phase 1-B flow conditions. The Cornell pump is also NSF 61 certified.

A third pump unit evaluated, but not recommended for final design, was the Bell & Gossett Series e-80sc (12" impeller) close coupled in-line centrifugal pump. This pump unit was not recommended due to its lower efficiency rating for the Phase 1-A flow conditions and because the pump unit is not NSF 61 certified.

A vertical can turbine pump was also considered but was not evaluated further since this type of pump would require significant structural modifications to the turnout building for roof access to be provided. Consideration of using a pumping unit with a variable frequency drive was also considered but was not evaluated further due to the additional air conditioning required for cooling purposes and the related cost impacts. In addition, the existing flow control valve will be able to satisfactorily modulate the flows as necessary for this application.

It is also noted that upon completion of the distribution system improvements to Victorville's distribution system, the booster pump installed at Turnout 6 would need to be modified with a smaller diameter impeller due to the reduced system head related to the Phase 1-B flow conditions. Under the Phase 1-B flow conditions and the modified pump, this will result in a less efficient pump unit (a reduction of approximately 6-17%). A more costly alternative to increase the pump efficiency would consist of replacing the pump unit with a completely new pump unit. This alternative is not recommended for the Phase 1 flow conditions.

In the future, if Turnout 6 is proposed to be modified to pump the ultimate flow (5,060 GPM @ 74 ft TDH), it is recommended to analyze the replacement of this pump unit with a horizontal split case pump unit. The use of a horizontal split case pump will require evaluation of the space limitations within the former Turnout 7 piping room and the potential relocation of the existing control panel.

6.2 Sole Source Equipment or Material Requirements

For the Turnout 6 modifications, it is presumed that the pump specifications will allow either the Grundfos or Cornell pump unit. However, the following equipment is proposed to be specified for sole source procurement in order to match MWA's existing R^3 project facilities in accordance with the California Public Contracting Code:

- Electronic Valve Actuator: EIM Controls
- Telemetry/Instrumentation: Tesco Controls (MWA facilities)

The contract documents will be required to include the findings for the sole source equipment procurement.

6.3 Pressure Surges

A detailed surge analysis will be completed during final design. Anticipated measures to minimize pressure surges will be to specify the minimum required opening and closing times for the flow control valve and the motorized butterfly valves at Turnout 6. The proposed pumping unit will be evaluated for possible adverse surges caused by pump power failure or start-up of the pumping unit. In addition, evaluation of the sizing for the air and vacuum release valves and evaluation of pressure/surge relief/anticipator valves will be performed during final design.

6.4 Corrosion

Pipeline protection from corrosion will be provided by the cement mortar coating for below-ground installation or paint coating for above-ground installation. For any modifications to the existing piping which will utilize the connection of new steel piping to previously constructed steel piping, the use of an insulating flange kit is recommended to minimize corrosion potential between the pipeline facilities.

6.5 Geotechnical

Attached in Appendix D is the Geotechnical Desktop Study for the proposed project. No significant geotechnical issues are anticipated for the modifications to Turnout 6. A detailed geotechnical investigation and report will be completed during final design.

6.6 SCADA/Telemetry

Existing instrumentation and control for Turnout 6 is provided using radio communication between the radio receiver at Turnout 6 and MWA's and Victorville's existing SCADA servers. Modifications necessary for MWA's SCADA server and programming of the PLC for Turnout 6 will be provided by MWA's systems integrator separate from the construction contractor. Modifications necessary to Victorville's SCADA server and any required programming will be provided by the City of Victorville's systems integrator separate from the construction contractor.

6.7 Facility Operation Strategy

MWA will be responsible for operating and maintaining the conveyance facilities necessary to deliver water to Victorville at the requested flow rate and at a minimum pressure of 40 psi. MWA's operational responsibility ends at the downstream flange of the flowmeter. MWA will monitor the flowrate at the turnout and will coordinate with Victorville to schedule and manage the delivery of the water. Victorville will be responsible for the turnout facilities downstream of the flowmeter. Victorville will control the amount of flow as well as operate and maintain the disinfection facilities. Victorville will be responsible for the water quality monitoring and reporting for the turnout facility. The turnout will continue to operate with the motor operated isolation valves, flowmeter, modulating electronic flow control valve, pressure transmitters and a sodium hypochlorite chlorination system. The turnout will also be re-equipped with a new pumping unit which will be operated and maintained by MWA.

The motor operated isolation valves will be used as a shut off valve and will be controlled and monitored by MWA's control panel. These valves will be either open or closed and will be in the open position in normal operation. These valves will also control whether Turnout 6 is operated in a pumped flow or non-pumped flow mode and they can also be used by MWA to shut down the flow in the event of a system emergency.

The flowmeter will measure the rate of flow and will be operated by MWA. The 4-20 mA flowmeter signal will be sent to MWA's control panel, Victorville's control panel and to the controllers for the (2) sodium hypochlorite metering pumps. Since both MWA and Victorville will receive the same actual flow signal, both entities will be able to monitor the flow for agreement compliance.

The flow control valve will be controlled by Victorville and will be used to adjust the rate of flow to the flow amount agreed upon by MWA and Victorville. Victorville will send the flow set point signal to the flow control valve controller through either the operator interface terminal at the control panel or through the SCADA interface. The flow control valve controller will open or close the flow control valve to the desired flow set point such that the actual measured flow from the flowmeter matches the set point flow.

The pressure transmitters will be used to measure the system pressure at two locations; (1) upstream and downstream of the proposed pump unit installed on the former Turnout 7 piping and (2) continuation of the use of the existing pressure transmitters on the existing Turnout 6 piping. The pressure transmitters for Location No. 1 will be sent to only MWA's control panel to monitor the increased pressure from the pump unit. The pressure transmitters for Location No. 2 will continue to be sent to both MWA and Victorville's control panels for agreement compliance purposes.

The pumping unit will be controlled by MWA and will be used to increase the water pressure to Victorville's distribution system. During pump start-up, MWA will send a signal to start the pump through either the operator interface terminal at the control panel or through the SCADA interface. As the pump ramps up, the flow control valve will slowly open until the measured flow matches the set point flow. The flow control valve will be used to modulate the flow from the pumping unit. During pump shut-down, MWA will send a signal to stop the pump through either the operator interface terminal at the control panel or through the SCADA interface. Upon pump shut down, the flow control valve will be closed and the added check valve functionality will prevent backflow from Victorville's distribution system.

The sodium hypochlorite chlorination system will continue to be controlled and monitored by Victorville's control panel. The chlorine metering pumps will be paced from individual compound loop pump control units which will receive the flow signals from the flowmeter and the chlorine residual signals from the chorine residual analyzer. The compound loop control will allow for the accurate trimming of the outlet chlorine residual value independent of the incoming chlorine residual value.

6.8 SCE Electrical Service

Electrical power for Turnout 6 is currently provided by SCE through a 120/240V single phase 100A service. Emergency back-up power is not provided for Turnout 6. Due to the proposed pump unit installation and the potential for a second pump unit installation, the existing SCE electrical service will be upgraded to a 480V three phase 200A service.

6.9 Potential Utility Conflicts

No potentially significant utility conflicts are anticipated at the Turnout 6 project site.

Section 7: CEQA/NEPA Requirements

7.1 CEQA Requirements

The Final Environmental Impact Report (FEIR) for the Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program SCH No. 2005041103 was approved and adopted by MWA in January 2006. In addition, three (3) subsequent addendums were approved by MWA. The R^3 Project Phase 1 was addressed in the FEIR and addendums, however, due to the age of these documents and changes to the State's California Environmental Quality Act (CEQA) Guidelines, an Initial Study will be prepared for the proposed project which will "tier" off of the FEIR and addendums. Included during the preparation of the Initial Study will be additional technical studies for the following:

- Air Quality/Greenhouse Gas Study
- Biological Resources, Jurisdictional Resources and Joshua Tree Assessment Study
- Cultural Resources Study
- Energy Resources Assessment
- Noise Study
- Traffic Analysis Study

AB52 consultation with Native American tribes will be conducted by MWA this summer. Based on the partial CEQA information prepared during the preparation of the PDR, it is anticipated that a mitigated negative declaration will be the recommended CEQA compliance document for the project and the contract documents for the proposed project will incorporate the adopted mitigation monitoring and reporting program.

7.2 NEPA Requirements

An Environmental Assessment (EA) titled "Upper Mojave River Groundwater Regional Recharge and Recovery including Oro Grande Groundwater Recharge, San Bernardino County, CA" was finalized in December 2009 along with a "Finding of No Significant Impact No. 10-SCAO-002-FONSI". The R^3 Project Phase 1 was addressed in the Environmental Assessment and Finding of No Significant Impact for compliance with the National Environmental Policy Act (NEPA). Included during the preparation of the Initial Study for CEQA, the Cultural Resources Study will be prepared to satisfy Section 106 standards to facilitate SHPO consultation with the Bureau of Reclamation. Based on the partial CEQA/NEPA information prepared during the preparation of the PDR, it is anticipated that the Bureau of Reclamation will prepare a NEPA categorical exclusion for the project.

Section 8: Property Acquisition & Permit Requirements

8.1 Property Acquisition

Based on the preliminary investigation of the existing public right-of-way data, all construction is anticipated to occur within the existing public right-of-way, within the City of Victorville, or within property owned by MWA or the City of Adelanto. For the facilities constructed within the City of Adelanto's property, permission to construct, operate, maintain, replace and access to the site is provided to the MWA for the proposed facilities by the Water Supply Connection Agreement Regional Recharge and Recovery Project, dated April 10, 2019, between MWA and the City of Adelanto.

It is anticipated the contractor will be allowed to string the pipeline along the pipeline alignment during construction. Limited property will be provided for the contractor's staging area and storage yard within the City of Adelanto reservoir property, primarily along the frontage of Olivine Road.

8.2 Permit Requirements

The following permits are anticipated to be required for the proposed project.

8.2.1 City of Victorville Utility & Transportation Permit

A utility permit from the City of Victorville is required as the pipeline will be installed within the City's right-of-way. The contractor will be responsible for complying with all aspects of the City's utility permit process including the preparation of stormwater site inspection report and traffic control plans per the California Manual on Uniform Traffic Control Devices. In addition, the contractor will be responsible to acquire a transportation permit from the City of Victorville to allow the hauling of oversize loads on city streets.

8.2.2 Domestic Water Supply Permit

MWA has an existing domestic water supply permit from the SWRCB for the R^3 Phase 1 project, Operating Permit 05-13-12P-011-R3 Water System, System No. 3610129. An amended domestic water supply permit is required to be submitted to the SRWRB for the Adelanto extension of the R^3 distribution system and the Turnout 6 modifications.

Adelanto has an existing domestic water supply permit from the SWRCB for their water system, Operating Permit 05-13-16PA-006. An amended domestic water supply permit is required to be submitted to the SRWRB for the Adelanto extension of the R^3 distribution system due to the new water supply source provided to Adelanto.

Victorville's existing domestic water supply permit from the SWRCB will be unaffected by the Adelanto extension of the R^3 distribution system or the Turnout 6 modifications.

Prior to the completion of the final design phase, an amended domestic water supply permit for MWA and Adelanto shall be prepared and submitted to:

Amanda Chapman, Water Resource Control Engineer
SWRCB - Division of Drinking Water
464 West 4th Street, Suite 437
San Bernardino, CA 92401

8.2.3 Construction Storm Water Discharge

For construction stormwater permitting, this project will require coverage under Construction General Permit No. CAS000002 (CGP), Water Quality Order 2009-0009-DWQ and will require filing a notice of intent (NOI) and preparing a stormwater pollution prevention plan (SWPPP). The NOI and SWPPP will be prepared during design and incorporated into the contract documents. The contractor will be required to submit the NOI, SWPPP and all other permit documents electronically to the MWA as a submittal for review then upload to the State's Storm Water Multiple Application and Report Tracking System. The MWA shall name a Legally Responsible Person for coverage under the General Permit. The contractor shall install activity-appropriate best management practices (BMPs) for erosion and sediment control during construction and shall implement other requirements for the SWPPP per the General Permit. The contractor shall also implement a monitoring program and reporting plan in accordance with the General Permit's monitoring requirements.

8.2.4 Groundwater/Construction Water Discharge

Discharge of potable or untreated clear water to land from pipeline or hydrant flushing, or pipeline hydrostatic testing, or small temporary groundwater dewatering excavation during construction will be permitted in accordance with the requirements of State Water Resources Control Board Water Quality Order No. 2003-0003-DWQ. The contractor will be required to secure approval from the landowner prior to discharge, in addition to submitting a Notice of Intent and all other documentation for permitting approval by the California Regional Water Quality Control Board, Lahontan Region. The contractor will not be allowed to discharge groundwater or construction water to surface waters within the region. Based on previous geotechnical reports, shallow groundwater is not anticipated during construction for the proposed project.

8.2.5 Other Permits

Other permits to be obtained by the contractor, which will be specified in the construction contract documents, are as follows:

- California Occupational Safety and Health Administration (Cal-OSHA) – The contractor is required to have a Trenching/ Shoring permit for any portion of the project involving trenching, demolition, and excavation greater than 5 feet in depth.
- Mojave Desert Air Quality Management District (MDAQMD) – Implementation of BMPs for dust control and construction equipment emissions is expected to be required by the MDAQMD. Mitigation measures outlined from the approved CEQA document will be incorporated into the construction contract documents.

Section 9: Project Schedule

9.1 Project Schedule

A preliminary project schedule was prepared for the construction of the proposed project and is included in Appendix E. The estimated bid opening date is January 21, 2020 and the estimated construction completion date is September 25, 2020 for the Adelanto pipeline extension and re-located Turnout 7. The estimated project completion date is December 18, 2020 upon construction completion of the Turnout 6 modifications.

It is recommended to solicit bids for construction in a single bid package, not separate bid packages for the pipeline construction and the turnout construction, as this would unnecessarily increase the overall cost of the project (additional project administration cost plus potential for contractor conflicts) without shortening the project schedule.

Project phasing anticipated for the proposed project would consist of requiring the construction completion of the Adelanto pipeline extension and re-located Turnout 7 prior to the removal of Turnout 6 from service. This would avoid Turnout 6 being removed from service during the summer months. Victorville has indicated a preference that Turnout 6 should not be removed from service for construction of the project during the summer months prior to completion of either the re-located Turnout 7 or Victorville's Turnout 5 booster pump station project.

The installation of the 20-inch & 30-inch diameter steel pipeline assumes there will be no restrictions regarding day-time construction. Estimated long lead items for material or equipment procurement are the following items:

- Steel pipe: 8-16 weeks
- Butterfly valves (30" & 36"): 12-16 weeks
- Small diameter valves: 6-8 weeks
- Flow control valve: 8-12 weeks
- Magnetic flow meter: 6-8 weeks
- In-line booster pump: 6-8 weeks
- Chlorination equipment: 6-8 weeks

Options to be evaluated during final design to potentially reduce the project construction schedule will be as follows:

1. Owner purchased equipment/material
2. Owner pre-negotiated pricing of equipment/material, particularly any sole source equipment specified

Section 10: Opinion of Probable Construction Cost

10.1 Opinion of Probable Construction Cost

A Class 3 cost estimate was prepared for the construction of the proposed project and is included in Appendix F. This level of cost estimate, as defined by AACE International, is intended for budgeting, authorization or appropriation purposes for projects at a 10 to 40 percent level of definition. A Class 3 cost estimate has an expected accuracy range of -10 to -20 percent on the low end and +10 to +30 percent on the high end. The construction costs described are based on June 2019 dollars (ENR Construction Cost Index = 11268). The construction cost estimate includes a 20% cost contingency and the following markups:

- Division 1 Costs: 10%
- Contractor's Markup on Subs: 10%
- Taxes (San Bernardino County): 7.75%
- Contractor's Overhead and Profit: 15%
- Escalation to Construction Mid-Point: 3%

A summary of the construction cost estimate is provided in Table 5.

Cost Category	Amount
30" Pipeline (Mesa View Drive)	$2,240,000
20" Pipeline (Olivine Road)	$440,000
Turnout 7	$786,000
Turnout 6 Modifications	$434,000
Total	$3,900,000

Table 5: Opinion of Probable Construction Cost Summary

10.2 Other Project Costs

The construction cost estimate does not include construction services (engineering, surveying, geotechnical testing, SCADA programming, etc.) or construction inspection during construction. The estimated construction services cost is based on 15% of the construction cost, or $585,000. MWA staffing costs during construction is not included in this cost. The design phase costs for the project, excluding MWA staffing costs is estimated to be $577,000.

A summary of the total project cost estimate is provided in Table 6.

Cost Category	Amount
Project Design	$577,000
Construction	$3,900,000
Construction Services	$585,000
Total	$5,062,000

Table 6: Total Project Cost Estimate

Appendix A: Water Supply Connection Agreements

A.1 City of Adelanto Agreement

WATER SUPPLY CONNECTION AGREEMENT
REGIONAL RECHARGE AND RECOVERY PROJECT (R^3)

AGREEMENT made this 10th day of April, 2019, between the MOJAVE WATER AGENCY ("Agency") and the CITY OF ADELANTO ("Customer").

WITNESSETH:

IT IS HEREBY AGREED, in consideration of the mutual covenants of the parties, as follows:

1. Definitions. When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

a. "Agency" as used herein shall mean Mojave Water Agency.

b. "Agency Law" shall mean the Mojave Water Agency Law, Chapter 97 of the Water Code Appendix, Statutes of 1959 of the State of California, as amended and as the same may be hereafter amended, supplemented re-enacted, or codified.

c. "Agreement" as used herein shall mean this agreement for a water connection between Agency and Customer.

d. "Contract" shall mean the contract entitled "Water supply Contract between the State of California Department of Water Resources and the Mojave Water Agency," dated June 22, 1963 as heretofore or hereafter amended.

e. "Customer" as used herein shall mean the City of Adelanto.

f. "Connection Improvements" shall mean those facilities necessary to connect the Customer's water system to the relocated Turnout 7 ("TO 7") of the Regional Recharge and Recovery Project, as depicted and described in Exhibits One, Two, & Three.

g. "General Manager" shall mean the General Manager of the Mojave Water Agency.

h. "Judgment" shall mean the Judgment in City of Barstow, et al. v. City of Adelanto, et al., Superior Court, Riverside County, Case No. 208568.

i. "Ordinance No. 9" as used herein shall mean the Ordinance of the Mojave Water Agency Establishing the Rules and Regulations for the Sale and Delivery of State Project Water.

j. "Point of Connection" as used herein shall mean the outlet flange of the magnetic flow meter shown as item 4 on Exhibit Two, Detail for Turnout 7.

k. "Potable Water" as used herein shall mean water from any source which has been investigated by the State Water Resources Control Board Division of Drinking Water, and which has been approved for human consumption.

l. "R^3 Project" as used herein shall mean the Mojave Water Agency Regional Recharge and Recovery Project, including the Connection Improvements as described herein.

m. "State Water Project" shall mean water made available to the Agency by the State of California pursuant to the terms of the Contract.

n. "Year" means a calendar year.

2. General Purpose and Requirements.

2.1 Customer Connection. The Connection Improvements shall be constructed by the Agency for use solely for the Customer. Customer shall provide a deposit of $500,000 to cover the cost of the relocated TO 7 and connection improvements. Connections will be provided at the relocated TO 7 at the City of Adelanto Reservoir site with pipeline extending from the relocated TO 7 and connecting to the City of Adelanto existing water system Facilities, as shown on Exhibits One, Two ("Point of Connection").

2.2 Environmental Requirements. The Agency is a public agency and is aware of the requirements of the California Environmental Quality Act ("CEQA") and its implementing guidelines, and will comply with the CEQA and its implementing guidelines.

3. Financial Considerations.

3.1 All costs for design, construction, and startup of the relocated Turnout 7 and Connection Improvements will be paid in full by the Agency and paid back by the Customer as a deduction from the deposit required in Section 2.1 above.. All costs incurred for the Customer side of the connection will be deducted from the deposit on a monthly basis and any money remaining at the conclusion of construction and final payment of all costs will be returned to the Customer.

4. Facility Ownership.

4.1 Facilities Included; Ownership by Agency and Customer. The Connection Improvements shall include the facilities for delivery of potable water from the Agency's R^3 Project to the Point of Connection described in paragraph 2.1 herein. The Agency will own, operate, and maintain all portions of the Connection Improvements up to the Point of Connection, as defined herein, including the main turnout structure in its entirety, and will have full un-restricted access to these facilities. The Customer will own, operate, and maintain all piping, equipment, and ancillary facilities related to the turnout on the Customer's side of the Point of Connection.

5. Design Considerations.

5.1 Design and Operating Criteria. The Agency's facilities have been designed and planned in close coordination with the Customer's staff to meet Customer's water service requirements to the maximum extent feasible and to allow for maximum flexibility for use in different modes of operation. The Agency's facilities have been designed to deliver potable water to the Customer's Point of Connection at a reasonably constant minimum water pressure of approximately 40 psi. All deliveries to the Customer will meet the applicable standards of the State Water Resources Control Board Division of Drinking Water.

5.2 Measurement. All water furnished pursuant to this Agreement shall be measured by the Agency at the Point of Connection.

5.3 Back-Flow. Back-flow prevention is not required by the Division of Drinking Water when connecting two approved potable water systems with valid domestic water supply permits, however, the Connection Improvements have been designed and constructed to provide a "check feature" at the Cla-Val electronic control valve (Exhibit Two, Details 3, Item 6) on the Customer's side of the Points of Connection. The Customer shall maintain the control valve such that the check feature remains operable during the term of this Agreement as set forth in Section 8.

However, should the Customer's water supply, practices, or operational procedures pose a water quality concern which may be objectionable and or constitute an unacceptable source of water, a backflow device(s) commensurate to the degree of hazard may be required by the Agency. This may include but not be limited to blending, treatment, non-potable service connections, and other related types of operations. If required, the customer is responsible for the installation, repair, replacement, and maintenance as well as the costs associated with compliance of this requirement. The Agency reserves the right to discontinue service should an unacceptable condition exists until corrected

A cross-connection survey may be required. If a cross-connection survey is required, the Customer agrees to provide access and all applicable information in order to perform a comprehensive cross-connection survey.

5.4 Flow Control Devices and Delivery Rates. The Connection Improvements include an electronic control valve to allow the Customer to control the rate of flow at the Point of Connection. Deliveries of R^3 Project water will be made at flow rates as determined by the Customer, but should not exceed the nominal flow rate shown on Exhibit Three, Schedule of Delivery Capacities for Project Participants, unless approved in advance by the Agency's Director of Operations.

5.5 Pressure Surges (Water Hammer). The R^3 Project has been designed to withstand the effects of pressure surge; however, the Customer shall make every effort to minimize sudden fluctuations in flow rates at the Point of Connection.

6. Operation and Maintenance.

6.1 Maintenance of Connection Improvements. Maintenance of the Connection Improvements will be as described in paragraph 4.1 herein.

6.2 Limits on Agency Responsibility. The Agency has no responsibility in the maintenance and operation of Customer's water system beyond the Point of Connection. Customer shall be responsible and liable for its own water system. Customer agrees to accept and consent to such conditions of pressure and service as may from time to time exist under current operating practices prevailing within the Agency, at the location of the Point of Connection, and Customer agrees to hold Agency harmless from any and all damages caused by or arising out of low, high, or fluctuating pressures or interruption of service which are beyond Agency's reasonable control. Delivery of water pursuant to this Agreement, except as may be specifically provided herein, shall be in accordance with the rules, regulations, and charges of the Agency as they may from time to time exist and apply to all the customers of the Agency. This Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

6.3 Delivery of Water. All facilities in the Connection Improvements up until the Point of Connections necessary to accommodate water delivery are the responsibility of the Agency and shall be operated by Agency employees only. The Agency is required to occasionally flow water in this pipeline during low use times to maintain water quality. This flow of water will be coordinated with Adelanto for delivery to Adelanto. This water will be accounted for and paid for as water delivered to Adelanto.

6.4 Limitations on Service. Due to the nature of the Agency's facilities and the potential modes of service required, the Agency cannot guarantee any specific level of pressure; however, the R^3 Project has been designed to deliver potable water to the Customer's Point of Connection at a reasonably constant minimum water pressure of approximately 40 psi. There are no limits regarding time-of-use, either by time of year or time of day.

6.5 Coordination of Water Deliveries. Water orders must be placed with the Agency Operations Supervisor a minimum of one week in advance of actual delivery. Delivery of water shall continue until the Customer requests the Agency to terminate the flow, and gives the Agency a minimum of one hour in which to do so.

7. Agreement Administration.

7.1 General Terms of Service. All water deliveries made pursuant to Ordinance No. 9 shall be subject to all of the terms and conditions of the Agency's Contract. **CUSTOMER SHOULD USE CAUTION IN THE ISSUANCE OF CAN OR WILL SERVE LETTERS FOR ANY LAND USE ENTITLEMENT BASED UPON STATE WATER PROJECT WATER.**

7.2 Water Flow Measurement and Meter Accuracy. All determinations relative to the measuring of water shall be made by the Agency and, upon request by the Customer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in Ordinance No. 9. The Customer has a right to audit the Agency's measurement determinations. Any error appearing therein will be adjusted pursuant to conditions set forth in Ordinance No. 9. In the event of a disagreement, the Agency and Customer agree to submit the Agency's accuracy tests to a mutually agreed upon third party and to abide by its determination. Customer will ensure that all end-users of water provided under this Agreement are properly metered.

7.3 Water Delivery Subject to Annual Approval and is Interruptible. All water supplied by the Agency is annually determined and shall be served upon an interruptible basis.

7.4 No Rights to Water Vested with Customer. The Customer shall not obtain any vested rights upon the sale and delivery of water apportioned in accordance with Ordinance No. 9, nor are any such rights inferred by virtue of an Agency decision to provide water to Customer in a specific year.

7.5 Water Deliveries required by the Mojave Basin Area Judgment and ID-M Contract. Customer acknowledges that contractual requirements under the Judgment and contractual requirements between the Agency and the Improvement District "M" have priority over the sale of water pursuant to Ordinance 9.

7.6 Water Rates. All water rates for water service made by the Agency shall be established by resolution of the Board of Directors of the Agency pursuant to Ordinance No. 9 and the Mojave Water Agency Act. Such rates for water service may not exceed the estimated cost of providing the service for which the water rate is charged. Such rate will be reasonable, fair, and equitable in nature and proportionately representative of the costs incurred by the Agency.

7.7 Payment of Water Charges. Water charges are due and payable

at the Agency office on the date a bill is mailed to the Customer and shall be delinquent 30 days thereafter. Service may be discontinued without further notice if payment of the water charge is not made prior to the date such charge becomes delinquent.

8. Agreement Term.

8.1 Termination Date. This Agreement shall be for a term of one (1) year, and shall automatically renew each year, if Customer is in compliance with its terms, for a period of thirty (30) years from the date hereof. If Agency reasonably determines Customer is not in compliance, Customer must be given a reasonable opportunity to comply before the Agreement terminates. This Agreement may be terminated by the Customer earlier by providing a written notice at least 30 days prior to the desired date of termination. Upon any termination, the Connection Improvements will remain the property of the Agency, and Customer will have no further responsibility under this Agreement, or for ongoing operations and maintenance of the Connection Improvements.

8.2 Change in Party Status. In the event of dissolution, consolidation, or merger of the Customer or the Agency, all of the terms and conditions of this Agreement shall bind the surviving entity or successor.

9. Indemnity.

9.1 Defense of Agreement. The Customer shall defend, indemnify, and hold harmless Agency and its agents, officers, and employees from any claim, action, or proceeding against Agency or its agents, officers, or employees relating to efforts to attack, set aside, void, or annul this Agreement, including without limitation a CEQA claim. To the extent that Agency uses any of its resources, with the prior approval in writing of Customer, in responding to such claim, action, or proceeding, Customer will reimburse Agency upon demand. Such resources include, but are not limited to staff time, court costs, Agency counsel's time at their regular rate for Agency work, or any other direct or indirect cost associated with responding to the claim, action or proceedings. These obligations shall be binding on Customer's successors and assigns, and Customer shall so obligate all successors and assigns.

9.2 Indemnification for Water Connection and Water Delivery. Except with respect to (1) the Agency's own negligence or willful misconduct and/or (2) an occurrence on the Agency's side of the Point of Connection not resulting from action(s) of the Customer or its agents, contractors, or assigns, and which is/are the direct cause of damage or injury, the Customer shall fully indemnify and hold harmless the Agency and its officers, agents, and employees against liability for damages of any nature whatsoever, including but not limited to, property damage, personal injury, or death, arising from (3) the action(s) of Customer or any person under Customer's control, including without limitation the Customer's agents, contractors, and assigns; (4) claims

made by Customer's own customers and other end users of the water provided by Customer, arising out of, or resulting from, or made in connection with this Water Supply Connection Agreement and the Agency's provision of water to Customer for its use and the use of Customer's own customers; (5) the Customer's control of the rate of flow at the delivery point; or (6) an occurrence on the Customer's side of the Point of Connection not resulting from action(s) of the Agency or its agents, contractors, or assigns.

9.3 Claim Notification. The Agency will, within a reasonable period of time, notify the Customer of any such claim, action, or proceeding covered by this Section 9. If the Agency should fail to cooperate in the defense, the Customer shall not thereafter be responsible to defend, indemnify, and hold harmless the Agency and its agents, officers, and employees pursuant to this Section 9.

9.4 Settlement Approval. The Customer shall not be required to pay or perform any settlement of such claim, action, or proceeding unless the Customer approves the settlement in writing.

9.5 Notices. All notices to the Customer under this Agreement shall be deemed valid and effective five (5) calendar days following deposit in the United States mail, postage prepaid, be certified and/or registered mail, addressed to:

Jesse Flores, City Manager
City of Adelanto
Adelanto, CA 92301

Keith Lemieux, City Counsel
Olivarez, Madruga, Lemieux, O'Neill
4165 E. Thousand Oaks Blvd., Suite 350
Westlake Village, California 91362

All notices to the Agency under this Agreement shall be deemed valid and effective when personally served upon Agency Counsel and General Manager or upon deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to:

William J. Brunick
Brunick, McElhaney & Kennedy
1839 Commercenter West
P O Box 6425
San Bernardino, California 92412

Thomas McCarthy
General Manager

Mojave Water Agency
13846 Conference Center Drive
Apple Valley, California 92307

Except as provided otherwise, all notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Customer by such officers and persons as they may from time to time, authorize in writing to so act.

9.6 Remedies Not Exclusive. Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

9.7 Amendments. This Agreement may be amended or supplemented at any time by mutual written agreement of the Parties in any manner that may be consistent with the applicable law, subject to Paragraph 9.12 of this Agreement. In amending or supplementing this Agreement, the Agency will bear in mind that substantial uniformity of Agreements between its various customers and the desirability to the main contracting concepts and principles that are to be used. The Agency will, therefore, attempt to maintain uniformity between its various customers' Agreements in such respects.

9.8 Opinions and Determinations. Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this Agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

9.9 Waiver of Rights. Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default, or matter.

9.10 Transfer and Assignments. Except as provided in Section 8.2 hereof, the Customer shall not have the right to sell, assign, or transfer this Agreement and any and all of its rights, duties, and obligations hereunder, in whole or in part, to any person or entity at any time during the term of this Agreement, without prior written approval of the Agency.

9.11 Inspection of Books and Records. The proper officers or agents of the Customer shall have full and free access at all reasonable times to the account books and official records of the Agency at the Agency address set forth below insofar as the same pertain to the matters and things provided for in this Agreement, with the right

at any time during office hours to make copies thereof at the Customer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights to inspect the account books and records of the Customer at the Customer's address set forth below as they pertain to the Agency.

Mojave Water Agency	City of Adelanto
13846 Conference Center Drive	
Apple Valley, CA 92307	Adelanto, CA 92301
Telephone: (760) 946-7000	Telephone: (760) 246-2300

9.12 Uniformity of Provisions. It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the Customer and other customers served by the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into will be made to the contracts of all other customers on an equal basis, subject to Customer's approval which shall not be unreasonably withheld. In the event Customer declines to approve subsequent amendments as to the form and content of the Agreement, Agency shall have the right to terminate the Agreement upon giving 30-days written notice to the Customer.

9.13 Controlling Law. If there is any conflict between the provisions of this Agreement and Ordinance No. 9 or the Judgment, Ordinance No. 9 and the Judgment are controlling.

(signature page following)

IN WITNESS WHEREOF, the parties have executed this Agreement.

MOJAVE WATER AGENCY

(SEAL)

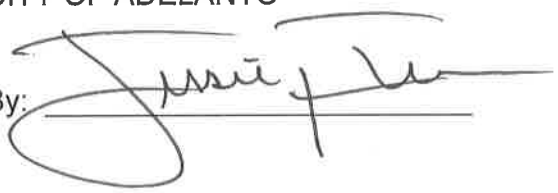
Carl Coleman, President

ATTEST:

Jeanette Hayhurst, Secretary

(SEAL)

CITY OF ADELANTO

By: 

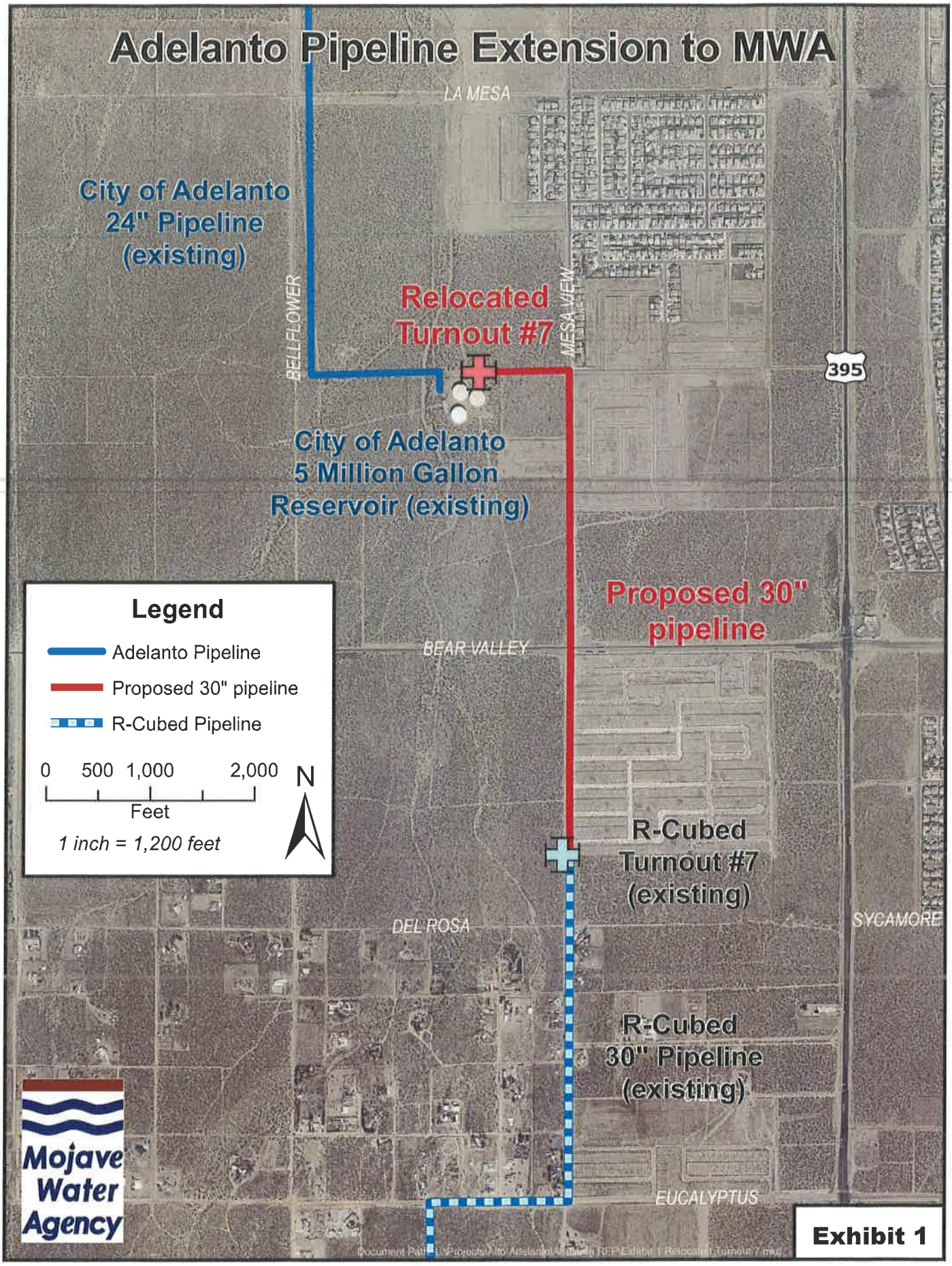
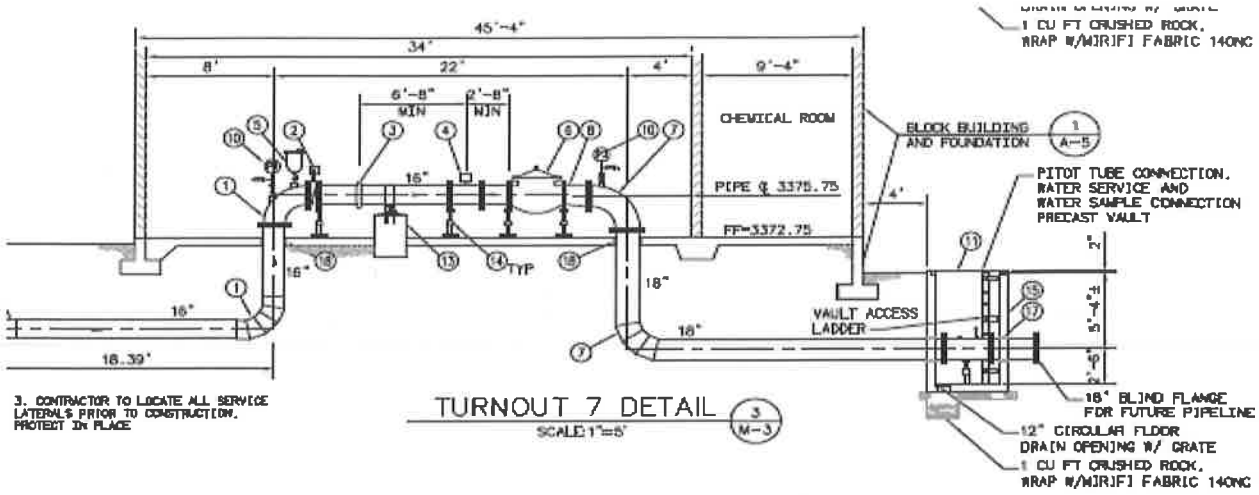
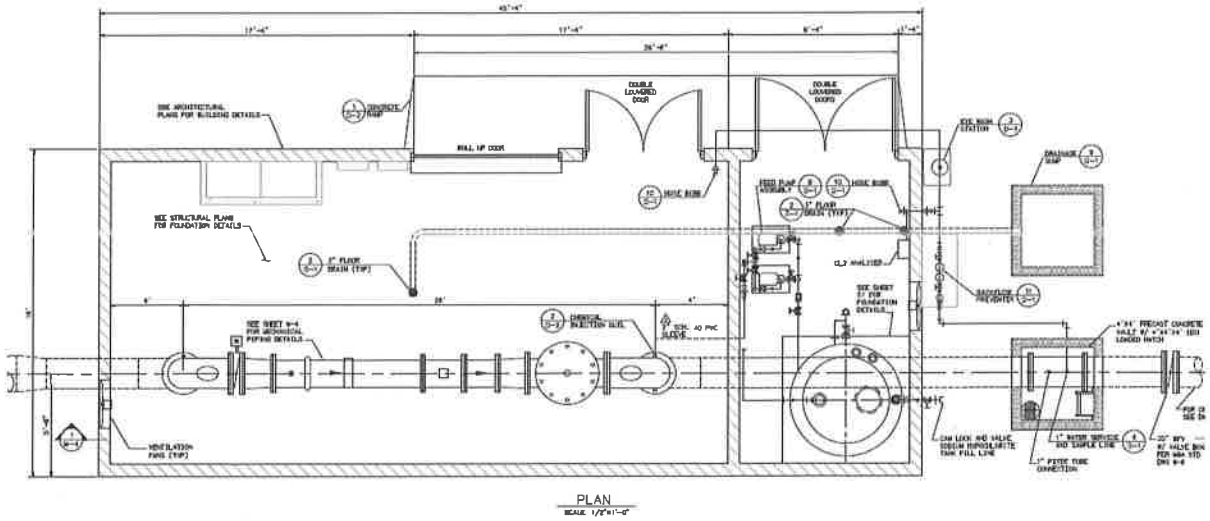

Adelanto Pipeline Extension to MWA
LA MESA
City of Adelanto
24" Pipeline
(existing)
BELLFLOWER
Relocated
Turnout #7
MESA VIEW
395
City of Adelanto
5 Million Gallon
Reservoir (existing)
Proposed 30"
pipeline
BEAR VALLEY
Legend
Adelanto Pipeline
Proposed 30" pipeline
R-Cubed Pipeline
0 500 1,000 2,000
Feet
1 inch = 1,200 feet
N
R-Cubed
Turnout #7
(existing)
DEL ROSA
SYCAMORE
R-Cubed
30" Pipeline
(existing)
Mojave
Water
Agency
EUCALYPTUS
Exhibit 1

Exhibit 2



ITEM	DESCRIPTION	TO-5	TO-6	TO-7
①	90° FULLY RESTRAINED BEND	20"	20"	16"
②	MOTOR OPERATED BUTTERFLY VALVE	20"	20"	16"
③	VICTAULIC COUPLING	18"	18"	16"
④	MAGNETIC TYPE FLOW METER	18"	18"	16"
⑤	COMBINATION AIR VALVE PER DETAIL 1 ON D1	4"	3"	3"
⑥	ELECTRONIC CONTROL VALVE CLA-VAL MODEL 131	20"	18"	16"
⑦	90° FULLY RESTRAINED BEND	20"	20"	16"
⑧	ECCENTRIC REDUCER	20X18	20X18	18X16
⑨	ECCENTRIC REDUCER	-	30X20	-
⑩	PRESSURE INDICATOR / TRANSMITTER WITH SAMPLE STATION PER DETAIL 4 ON DWG D-2			
⑪	48"X48" LOCKABLE H20 ALUMINUM ACCESS HATCH			
⑫	20" BFV W/ VALVE BOX PER DWG M-6			
⑬	THRUST SUPPORT PER MWA STD. PER DETAIL 3 ON DWG D-2			
⑭	PIPE SUPPORT PER DWG M-43			
⑮	48"X48" PRECAST CONCRETE VAULT W/ ACCESS LADDER			
⑯	CHEMICAL INJECTION QUIL PER DETAIL 2 ON DWG D-2			
⑰	PIPE PENETRATION PER DETAIL 7 ON D1 (TYP)			
⑱	FLOOR PENETRATION PER DETAIL 7 ON D2 (TYP)			
⑲	ORIFICE PLATE WITH 11.6"ø BORE			



Conceptual Layout for Relocated Turn Out 7

Exhibit 3

Regional Recharge and Recovery Project
Phase 1 Schedule of Delivery Capacities for Project Participants
June 15, 2012

Annual Amount Approved for Delivery Via W. Conveyance System (acre-feet per year)	Capacity Available to Hesperia Turnout 4		Capacity Available to VWD Turnouts 3 or 6		Capacity Available to Adelanto Turnout 7	
	af per year	cfs	af per year	cfs	af per year	cfs
0	0	0	0	0	0	0
1,000	246	0.41	523	0.88	231	0.39
2,000	492	0.83	1,046	1.76	462	0.78
3,000	738	1.24	1,569	2.64	692	1.16
4,000	985	1.65	2,092	3.52	923	1.55
5,000	1,231	2.07	2,615	4.40	1,154	1.94
6,000	1,477	2.48	3,138	5.27	1,385	2.33
7,000	1,723	2.90	3,662	6.15	1,615	2.71
8,000	1,969	3.31	4,185	7.03	1,846	3.10
9,000	2,215	3.72	4,708	7.91	2,077	3.49
10,000	2,462	4.14	5,231	8.79	2,308	3.88
11,000	2,708	4.55	5,754	9.67	2,538	4.27
12,000	2,954	4.96	6,277	10.55	2,769	4.65
13,000 and above	3,200	5.38	6,800	11.43	3,000	5.04

Note: Capcities at respective turnouts can be interpolated using tabulated values for actual delivery amounts between 0 and 13,000 acre-feet per year.

Mojave Water Agency

APPLICATION FOR THE SALE AND DELIVERY
OF STATE PROJECT WATER OR R3 PROJECT WATER
IN ACCORDANCE WITH MWA ORDINANCE NO. 9

1). APPLICANT NAME: ___ ADELANTO PUBLIC UTILITY AUTHORITY

2). LEGAL CAPACITY:

_____Public Agency (enabling law): _____
_ X _Public Utility (enabling law): ____A010342 LIC#006506
_____Mutual Water Company _____PUC Regulated Water Company
_____Private Water Company _____Partnership _____Individual
_____Corporation (type and State): _____

3). INTENDED USE FOR WATER:

_X_Municipal _____Industrial _____Agriculture _____Recreation
_____Ground Water Recharge _____Other_____

4). CALENDAR YEAR DELIVERY REQUESTED: 2021

STATE WATER PROJECT QUANTITY REQUESTED
BY MONTH FOR EACH INTENDED USE (Acre-Feet)

January	215	July	275
February	215	August	285
March	225	September	275
April	245	October	265
May	255	November	225
June	265	December	215

TOTAL ANNUAL QUANTITY: 2960

R3 WATER QUANTITY REQUESTED
BY MONTH FOR EACH INTENDED USE (Acre-Feet)
(FPA – Free Production Allowance RO – Replacement Obligation)

	FPA	RO		FPA	RO
January	259.1	0	July	259.1	15.9
February	259.1	0	August	259.1	25.9
March	259.1	0	September	259.1	15.9
April	259.1	0	October	259.1	5.9
May	259.1	0	November	259.1	0
June	259.1	5.9	December	259.1	0

TOTAL ANNUAL QUANTITY: 3110

5). DESCRIPTION OF THE PROPOSED USE (attach location map and/or site plan):
At water supply stub named "Turnout 7", with Adelanto connected to the R³ system, Water would be delivered as a domestic potable supply to the customers of the Adelanto Public Utility thereby providing cost saving for additional water supply

6). LOCATION OF THE PROPOSED USE (indicate all that apply):

- Township, Range, Section, ¼ ¼: ___N 1/2, SW 1/4, Sect 33, T5N, R5W_____
- Assessor Parcel Number: __3134-031-020000 _____
- Street Address: ___None_____

7). Describe all physical facilities that will be constructed as a result of this application. Include specific connections to MWA owned facilities: _____
MWA will construct, own, operate and maintain the extended water main to a new, relocated Turnout 7. The city of Adelanto is responsible for financing the relocation of Turnout 7 and connection to city water supply at the 5 mills tank site located on Olivine rd Adelanto CA.

8). Describe the backup water supply capacity the applicant has secured for the intended use (the applicant must demonstrate that water demand for the use can be met by sources other than delivery of State Water Project water by MWA): _____
Backup water supply capacity is approximately 3250 AF produced by 10 potable well sources owned by the Adelanto Public Utility Authority.

9). Describe water treatment facilities (if any) that will be used for the purpose of use intended by the applicant:
SODIUM HYPOCHLORITE / LIQUID CHLORINE FOR DISSINFECTION

10). Describe equipment that the applicant will provide to assure that all end users are metered:
All service connection metered by 3/4" - 4" domestic water meters and recorded on a monthly basis.

11). ACKNOWLEDGMENT BY APPLICANT:

The applicant acknowledges the following by signature below:

- Water service provided under this application will at all times be in accordance with MWA Ordinance 9, and any other rules and regulations as may be amended, adopted or mandated by the MWA Board of Directors or any entity of the State of California. Service provided is wholesale in nature. The MWA will not become subject to the obligations of a retail water purveyor. Water provided is annual and interruptible. Approved applications are valid for one Calendar Year. An application must be filed no later than August 1 for each subsequent Calendar Year the applicant desires to purchase water from MWA. Vested rights are not obtained or inferred to the Customer upon the sale and delivery of water.

- Water service may be reduced or suspended due to conditions on the State Water Project beyond the control of MWA. The MWA makes no representation as to the quantity or quality of water that may be delivered under this application. The Applicant agrees to maintain primary (backup) water delivery systems and supply sufficient to support 100% of the use anticipated by this application in the event water service by MWA is suspended or reduced.

- The Applicant agrees to fund all costs that result from processing this application and/or from construction of facilities required to provide the service requested. Said costs may include, but are not limited to: environmental review; circulation of the application for review by the public; engineering analysis and design; and, construction of related physical facilities (extension pipelines, turnouts, turnout meters, etc.). MWA will work with the applicant to develop an estimate of costs, and the applicant will deposit sufficient funds with the MWA prior to expense being incurred by MWA.

- The Applicant agrees to indemnify and hold harmless the MWA should any legal challenge result from the sale or use of water, or construction and operation of facilities, contemplated by this application.

Raymond Cordero. PERC Water/ City of Adelanto	Superintendent	April-29-2019
APPLICANT	TITLE	DATE

STAFF USE ONLY

First Application _____ Renewal Application _____ Date Received _____

Assigned to _____
Committee Meeting Date _____ Board Hearing Date _____
Staff Recommendation _____
_____
Environmental Finding:
Exempt ___ De Minimus ___ Negative Declaration ___Mitigated Negative Declaration ___ EIR ___

RESOLUTION NO. 1065-19

A RESOLUTION OF THE MOJAVE WATER AGENCY BOARD OF DIRECTORS APPROVING AN ORDINANCE NO. 9 APPLICATION BY THE CITY OF ADELANTO and ADELANTO PUBLIC UTILITY AUTHORITY (ADELANTO) FOR PURCHASE OF WATER FROM THE REGIONAL RECHARGE AND RECOVERY PROJECT

WHEREAS, on May 23, 2019, the City of Adelanto and Adelanto Public Utility Authority (Adelanto) submitted to Mojave Water Agency ("MWA") an Ordinance No. 9 application for the purchase and delivery of water from the Regional Recharge and Recovery (R^3) Project; and,

WHEREAS, a water service connection, once constructed, will be at R^3 Turnout #7, connecting the R^3 project to the Adelanto's municipal water system; and,

WHEREAS, Adelanto and MWA have developed a Water Supply Connection Agreement for the Regional Recharge and Recovery Project ("Connection Agreement") associated with the delivery of said water. The Connection Agreement identifies the duties of the parties, the locations of water service connections to Adelanto's water system, system capacity and water allotments to Adelanto, and other conditions associated with the planning, design, construction, and operation of the water service connection; and,

WHEREAS, compliance with the California Environmental Quality Act (CEQA) was previously completed for the R^3 project under the Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program Final Environmental Impact Report (SCH # 2005041103) adopted January 26, 2006, and a Negative Declaration was subsequently filed on January 31, 2006; and,

WHEREAS, MWA has obtained a Domestic Water Supply Permit from the California Department of Public Health (CDPH) for the operation of R^3 (Permit # 05-13-12P-011),

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors of the Mojave Water Agency ("Board") approves Adelanto's Ordinance No. 9 Application for water service from the Regional Recharge and Recovery Project, subject to the following conditions:

1. Compliance with Connection Agreement. Adelanto shall comply with the terms and provisions of the Connection Agreement.

2. Compliance with Ordinance No. 9. All deliveries made pursuant to this approval are subject to the provisions in the Ordinance of the Mojave Water Agency Establishing Rules and Regulations for the Sale and Delivery of State Project Water ("Ordinance No. 9"), adopted April 25, 1995.

3. Location of Delivery and Use of Water. Deliveries of water shall be made to the Adelanto at R^3 Turnout #7. Water delivered under this approval shall be used solely within the City's municipal water system.

4. Water Delivery Subject to Annual Renewal and is Interruptible. This approval is for the delivery of up to 3,000 acre-feet of water from the R^3 system to Adelanto during a calendar year, and shall be subject to annual renewals. For the purpose of annual renewals, Adelanto shall submit an Ordinance No. 9 Application to MWA, due August 1st of each year, for deliveries requested for the following calendar year. Approval of the sale of any water is temporary and interruptible. No vested rights may be obtained or are inferred by the yearly renewal of water sales.

5. Mojave Basin Area Judgment. All water delivered to Adelanto by MWA via R^3 will be considered Annual Production of Adelanto under City of Barstow et al, v. City of Adelanto et al, Riverside County Superior Court Case No. 208568 ("Judgment"), and will be subject to all assessments and provisions of the Judgment.

6. Payment for Water Delivered. Adelanto shall pay the rate established by MWA and the Watermaster for R^3 water deliveries, according to meter readings at R^3 Turnout #7. MWA will invoice Adelanto on a monthly basis for delivery charges, and the Watermaster will invoice Adelanto annually for Watermaster assessments. As of the date of this Resolution, the MWA monthly delivery charge will include R^3 energy costs only; however MWA will re-assess rates on an annual basis and may include additional charges as appropriate.

7. Water Quality. MWA will comply with the water quality provisions in its Domestic Water Supply Permit from CDPH, but provides no other water quality assurances. MWA assumes no liability for the quality of water that Adelanto delivers to its customers.

ADOPTED this 23rd day of May, 2019.

_____
Carl Coleman, President

ATTEST:

_____
Jeanette Hayhurst, Secretary

A.2 City of Victorville Agreement

WATER SUPPLY CONNECTION AGREEMENT
REGIONAL RECHARGE AND RECOVERY PROJECT (R^3)

AGREEMENT made this 19th day of April, 2013, between the MOJAVE WATER AGENCY ("Agency") and the CITY OF VICTORVILLE ("Customer").

WITNESSETH:

IT IS HEREBY AGREED, in consideration of the mutual covenants of the parties, as follows:

1. Definitions. When used in this Agreement, the following terms shall have the meanings hereinafter set forth:

a. "Agency" as used herein shall mean Mojave Water Agency.

b. "Agency Law" shall mean the Mojave Water Agency Law, Chapter 97 of the Water Code Appendix, Statutes of 1959 of the State of California, as amended and as the same may be hereafter amended, supplemented re-enacted, or codified.

c. "Agreement" as used herein shall mean this agreement for a water connection between Agency and Customer.

d. "Contract" shall mean the contract entitled "Water supply Contract between the State of California Department of Water Resources and the Mojave Water Agency," dated June 22, 1963 as heretofore or hereafter amended.

e. "Customer" as used herein shall mean the City of Victorville.

f. "Connection Improvements" shall mean those facilities necessary to connect the Customer's water system to Turnouts 3 and 6 of the Regional Recharge and Recovery Project, as depicted and described in Exhibits One, Two, Three, Four and Five.

g. "General Manager" shall mean the General Manager of the Mojave Water Agency.

h. "Judgment" shall mean the Judgment in City of Barstow, et al. v. City of Adelanto, et al., Superior Court, Riverside County, Case No. 208568.

i. "Ordinance No. 9" as used herein shall mean the Ordinance of the Mojave Water Agency Establishing the Rules and Regulations for the Sale and Delivery of State Project Water.

j. "Points of Connection" as used herein shall mean the outlet flange of the magnetic flow meter shown as item 4 on Exhibit Five, Details 1 and 2.

k. "Potable Water" as used herein shall mean water from any source which has been investigated by the California Department of Public Health, and which has been approved for human consumption.

l. "R³ Project" as used herein shall mean the Mojave Water Agency Regional Recharge and Recovery Project, including the Connection Improvements as described herein.

m. "State Water Project" shall mean water made available to the Agency by the State of California pursuant to the terms of the Contract.

n. "Year" means a calendar year.

2. General Purpose and Requirements.

2.1 Customer Connection. The Connection Improvements shall be constructed and paid for by the Agency for use solely for the Customer. Connections will be provided at Turnout 3 at Victorville Water District's Plant 10 on Pinon Avenue, as shown on Exhibits One and Three, and at Turnout 6 on Mesa View Drive, as shown on Exhibits Two and Four ("Points of Connection").

2.2 Environmental Requirements. The Agency is a public agency and is aware of the requirements of the California Environmental Quality Act ("CEQA") and its implementing guidelines, and will comply with the CEQA and its implementing guidelines.

3. Financial Considerations.

3.1 All costs for design, construction and startup of the Connection Improvements will be paid in full by the Agency and there will be no cost to the Customer.

4. Facility Ownership.

4.1 Facilities Included; Ownership by Agency and Customer. The Connection Improvements shall include the facilities for delivery of potable water from the Agency's R³ Project to the Points of Connection described in paragraph 2.1 herein.

The Agency will own, operate and maintain all portions of the Connection Improvements up to the Points of Connection, as defined herein, including the main turnout structure in its entirety, and will have full un-restricted access to these facilities. The Customer will own, operate and maintain all piping, equipment and ancillary facilities related to the turnout on the Customer's side of the Points of Connection.

5. Design Considerations.

5.1 Design and Operating Criteria. The Agency's facilities have been designed and planned in close coordination with the Customer's staff to meet Customer's water service requirements to the maximum extent feasible and to allow for maximum flexibility for use in different modes of operation. The Agency's facilities have been designed to deliver potable water to the Customer's Points of Connection at a reasonably constant minimum water pressure of approximately 40 psi. All deliveries to the Customer will meet the applicable standards of the State of California Department of Public Health Drinking Water Services Division.

5.2 Measurement. All water furnished pursuant to this Agreement shall be measured by the Agency at the Points of Connection.

5.3 Back-Flow. Back-flow prevention is not required by the Department of Public Health when connecting two potable water systems with valid domestic water supply permits, however, the Connection Improvements have been designed and constructed to provide a "check feature" at the Cla-Val electronic control valve (Exhibit Five, Details 1 and 2, Item 6) on the Customer's side of the Points of Connection. The Customer shall maintain the control valve such that the check feature remains operable during the life of this Agreement.

5.4 Flow Control Devices and Delivery Rates. The Connection Improvements include an electronic control valve to allow the Customer to control the rate of flow at the Points of Connection. Deliveries of R^3 Project water will be made at flow rates as determined by the Customer, but should not exceed the nominal flow rate shown on Exhibit Six, Schedule of Delivery Capacities for Project Participants, unless approved in advance by the Agency's Director of Operations.

5.5 Pressure Surges (Water Hammer). The R^3 Project has been designed to withstand the effects of pressure surge, however, the Customer shall make every effort to minimize sudden fluctuations in flow rates at the Points of Connection.

6. Operation and Maintenance.

6.1 Maintenance of Connection Improvements. Maintenance of the Connection Improvements will be as described in paragraph 4.1 herein.

6.2 Limits on Agency Responsibility. The Agency has no responsibility in the maintenance and operation of Customer's water system beyond the Points of

Connection. Customer shall be responsible and liable for its own water system. Customer agrees to accept and consent to such conditions of pressure and service as may from time to time exist under current operating practices prevailing within the Agency, at the location of the Points of Connection, and Customer agrees to hold Agency harmless from any and all damages caused by or arising out of low, high, or fluctuating pressures or interruption of service which are beyond Agency's reasonable control. Delivery of water pursuant to this Agreement, except as may be specifically provided herein, shall be in accordance with the rules, regulations and charges of the Agency as they may from time to time exist and apply to all the customers of the Agency. This Agreement and the rights and obligations of the parties hereunder shall be subject to the Agency Law as it now exists and as it may be hereafter amended or codified by the Legislature of the State of California.

6.3 Delivery of Water. All facilities in the Connection Improvements up until the Points of Connection necessary to accommodate water delivery are the responsibility of the Agency and shall be operated by Agency employees only.

6.4 Limitations on Service. Due to the nature of the Agency's facilities and the potential modes of service required, the Agency cannot guarantee any specific level of pressure; however, the R^3 Project has been designed to deliver potable water to the Customer's Points of Connection at a reasonably constant minimum water pressure of approximately 40 psi. There are no limits regarding time-of-use, either by time of year or time of day.

6.5 Coordination of Water Deliveries. Water orders must be placed with the Agency Director of Operations a minimum of one week in advance of actual delivery. Delivery of water shall continue until the Customer requests the Agency to terminate the flow, and gives the Agency a minimum of one hour in which to do so.

7. Agreement Administration

7.1 General Terms of Service. All water deliveries made pursuant to Ordinance No. 9 shall be subject to all of the terms and conditions of the Agency's Contract. **CUSTOMER SHOULD USE CAUTION IN THE ISSUANCE OF CAN OR WILL SERVE LETTERS FOR ANY LAND USE ENTITLEMENT BASED UPON STATE WATER PROJECT WATER.**

7.2 Water Flow Measurement and Meter Accuracy. All determinations relative to the measuring of water shall be made by the Agency and, upon request by the Customer, the accuracy of such measurement shall be investigated by the Agency in the manner set forth in Ordinance No. 9. The Customer has a right to audit the Agency's measurement determinations. Any error appearing therein will be adjusted pursuant to conditions set forth in Ordinance No. 9. In the event of a disagreement, the Agency and Customer agree to submit the Agency's accuracy tests to a mutually agreed upon third party and to abide by its determination. Customer will ensure that all end-users of water provided under this Agreement are properly metered.

7.3 Water Delivery Subject to Annual Approval and is Interruptible. All water supplied by the Agency is annually determined and shall be served upon an interruptible basis.

7.4 No Rights to Water Vested with Customer. The Customer shall not obtain any vested rights upon the sale and delivery of water apportioned in accordance with Ordinance No. 9, nor are any such rights inferred by virtue of an Agency decision to provide water to Customer in a specific year.

7.5 Water Deliveries required by the Mojave Basin Area Judgment and ID-M Contract. Customer acknowledges that contractual requirements under the Judgment and contractual requirements between the Agency and the Improvement District "M" have priority over the sale of water pursuant to Ordinance 9.

7.6 Water Rates. All water rates for water service made by the Agency shall be established by resolution of the Board of Directors of the Agency pursuant to Ordinance No. 9 and the Mojave Water Agency Act. Such rates for water service may not exceed the estimated cost of providing the service for which the water rate is charged. Such rate will be reasonable, fair and equitable in nature and proportionately representative of the costs incurred by the Agency.

7.7 Payment of Water Charges. Water charges are due and payable at the Agency office on the date a bill is mailed to the Customer and shall be delinquent 30 days thereafter. Service may be discontinued without further notice if payment of the water charge is not made prior to the date such charge becomes delinquent.

8. Agreement Term.

8.1 Termination Date. This Agreement shall be for a term of one (1) year, and shall automatically renew each year, if Customer is in compliance with its terms, for a period of thirty (30) years from the date hereof. If Agency reasonably determines Customer is not in compliance, Customer must be given a reasonable opportunity to comply before the Agreement terminates. This Agreement may be terminated by the Customer earlier by providing a written notice at least 30 days prior to the desired date of termination. Upon any termination, the Connection Improvements will remain the property of the Agency, and Customer will have no further responsibility under this Agreement, or for ongoing operations and maintenance of the Connection Improvements.

8.2 Change in Party Status. In the event of dissolution, consolidation or merger of the Customer or the Agency, all of the terms and conditions of this Agreement shall bind the surviving entity or successor.

9. Indemnity.

9.1 Defense of Agreement. The Customer shall defend, indemnify, and hold harmless Agency and its agents, officers, and employees from any claim, action, or proceeding against Agency or its agents, officers, or employees relating to efforts to attack, set aside, void, or annul this Agreement, including without limitation a CEQA claim. To the extent that Agency uses any of its resources, with the prior approval in writing of Customer, in responding to such claim, action, or proceeding, Customer will reimburse Agency upon demand. Such resources include, but are not limited to staff time, court costs, Agency counsel's time at their regular rate for Agency work, or any other direct or indirect cost associated with responding to the claim, action or proceedings. These obligations shall be binding on Customer's successors and assigns, and Customer shall so obligate all successors and assigns.

9.2 Indemnification for Water Connection and Water Delivery. Except with respect to (1) the Agency's own negligence or willful misconduct and/or (2) an occurrence on the Agency's side of the Points of Connection not resulting from action(s) of the Customer or its agents, contractors or assigns, and which is/are the direct cause of damage or injury, the Customer shall fully indemnify and hold harmless the Agency and its officers, agents and employees against liability for damages of any nature whatsoever, including but not limited to, property damage, personal injury, or death, arising from (3) the action(s) of Customer or any person under Customer's control, including without limitation the Customer's agents, contractors and assigns; (4) claims made by Customer's own customers and other end users of the water provided by Customer, arising out of, or resulting from, or made in connection with this Water Supply Connection Agreement and the Agency's provision of water to Customer for its use and the use of Customer's own customers; (5) the Customer's control of the rate of flow at the delivery point; or (6) an occurrence on the Customer's side of the Points of Connection not resulting from action(s) of the Agency or its agents, contractors or assigns.

9.3 Claim Notification. The Agency will, within a reasonable period of time, notify the Customer of any such claim, action, or proceeding covered by this Section 9. If the Agency should fail to cooperate in the defense, the Customer shall not thereafter be responsible to defend, indemnify, and hold harmless the Agency and its agents, officers, and employees pursuant to this Section 9.

9.4 Settlement Approval. The Customer shall not be required to pay or perform any settlement of such claim, action, or proceeding unless the Customer approves the settlement in writing.

9.5 Notices. All notices to the Customer under this Agreement shall be deemed valid and effective five (5) calendar days following deposit in the United States mail, postage prepaid, be certified and/or registered mail, addressed to:

Doug Robertson, City Manager
City of Victorville
14343 Civic Drive
P O Box 5001
Victorville, CA 92392-5001

Andre de Bortnowsky, Esq.
Green de Bortnowsky & Quintanilla LLP
23801 Calabasas Road, Suite 1015
Calabasas , California 91302-1595

Eric L. Garner
Best Best & Krieger LLP
3750 University Avenue
P O Box 1028
Riverside, California 92502

All notices to the Agency under this Agreement shall be deemed valid and effective when personally served upon Agency Counsel and General Manager or upon deposit in the United States mail, postage prepaid, by certified and/or registered mail, addressed to:

William J. Brunick
Brunick, McElhaney & Kennedy
1839 Commercenter West
P O Box 6425
San Bernardino, California 92412

Kirby Brill
General Manager
Mojave Water Agency
13846 Conference Center Drive
Apple Valley, California 92307

Except as provided otherwise, all notices that are required either expressly or by implication to be given by any party to the other under this Agreement shall be signed for the Agency and for the Customer by such officers and persons as they may from time to time, authorize in writing to so act.

9.6 Remedies Not Exclusive. Remedies provided in this Agreement for enforcement of its terms are intended and shall be construed as cumulative rather than exclusive and shall not be deemed to deprive the party using the same from also using any other remedies provided by this Agreement or by law.

9.7 Amendments. This Agreement may be amended or supplemented at any time by mutual written agreement of the Parties in any manner that may be consistent with the applicable law, subject to Paragraph 9.12 of this Agreement. In amending or supplementing this Agreement, the Agency will bear in mind that substantial uniformity of Agreements between its various customers and the desirability to the main contracting concepts and principles that are to be used. The Agency will, therefore, attempt to maintain uniformity between its various customers' Agreements in such respects.

9.8 Opinions and Determinations. Where the terms of this Agreement provide for action to be based upon opinion, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable. In the event legal action is brought to enforce or determine the rights of either party under this Agreement, the prevailing party in such action shall be entitled to court costs and reasonable attorney's fees.

9.9 Waiver of Rights. Any waiver at any time by either party hereto of its rights with respect to a breach or default, or any other matter arising in connection with this Agreement shall not be deemed to be a waiver with respect to any other breach, default or matter.

9.10 Transfer and Assignments. Except as provided in Section 8.2 hereof, the Customer shall not have the right to sell, assign or transfer this Agreement and any and all of its rights, duties and obligations hereunder, in whole or in part, to any person or entity at any time during the term of this Agreement, without prior written approval of the Agency.

9.11 Inspection of Books and Records. The proper officers or agents of the Customer shall have full and free access at all reasonable times to the account books and official records of the Agency at the Agency address set forth below insofar as the same pertain to the matters and things provided for in this Agreement, with the right at any time during office hours to make copies thereof at the Customer's expense, and the proper representatives of the Agency and designated personnel and agents shall have similar rights to inspect the account books and records of the Customer at the Customer's address set forth below as they pertain to the Agency.

Mojave Water Agency	City of Victorville
13846 Conference Center Drive	P O Box 5001
Apple Valley, CA 92307	Victorville, CA 92393-5001
Telephone: (760) 946-7000	Telephone: (760) 955-5000

9.12 Uniformity of Provisions. It is intended by the parties that this Agreement shall be uniform as to form and content as between the Agency and the Customer and other customers served by the Agency and for this reason any subsequent amendments and supplements hereof that may be entered into will be made to the contracts of all other customers on an equal basis, subject to Customer's approval which shall not be unreasonably withheld. In the event Customer declines to approve subsequent amendments as to the form and content of the Agreement, Agency shall have the right to terminate the Agreement upon giving 30-days written notice to the Customer.

9.13 Controlling Law. If there is any conflict between the provisions of this Agreement and Ordinance No. 9 or the Judgment, Ordinance No. 9 and the Judgment are controlling.

IN WITNESS WHEREOF, this Agreement has been executed to be effective as of the date and year first above written.

CITY OF VICTORVILLE

Date: April 24, 2013

By: James L. Cox

Title: Mayor

MOJAVE WATER AGENCY

Date: April 19, 2013

By: _____

Title: General Manager

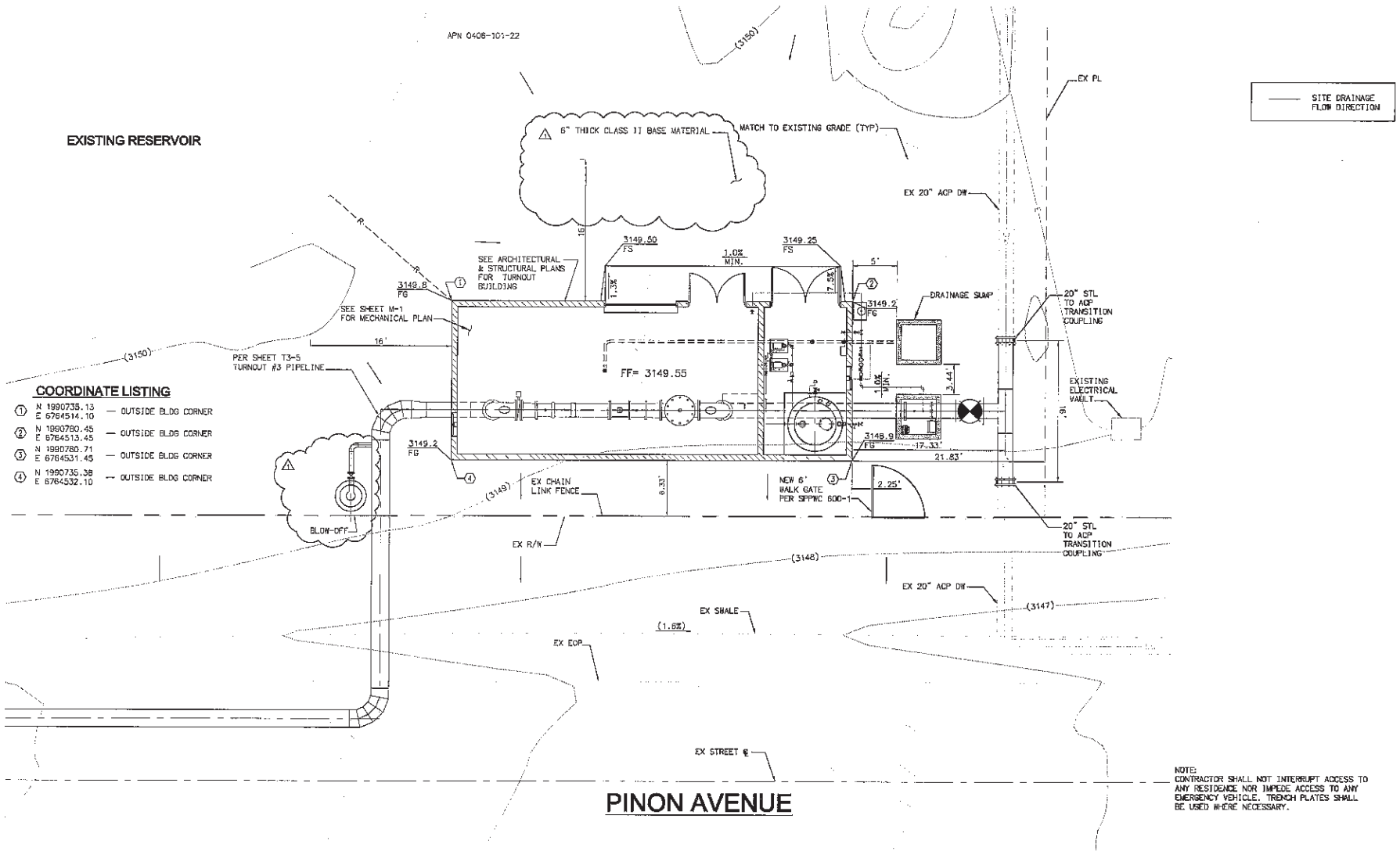
APPROVED AS TO FORM:

GREEN, DE BORTNOWSKY & QUINTANILLA, LLP

By: _____
City Attorney

CHUCK BUQUET

By: _____
Risk Manager



UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

NOTES:
1. CONTACTING DIG ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES
2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE THE CONTRACTOR.
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION, PROTECT IN PLACE

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE
1	8/24/11	JGW	ADDENDUM 1		

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 65100342

PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
GARY MARTIN RCE 31145 DATE

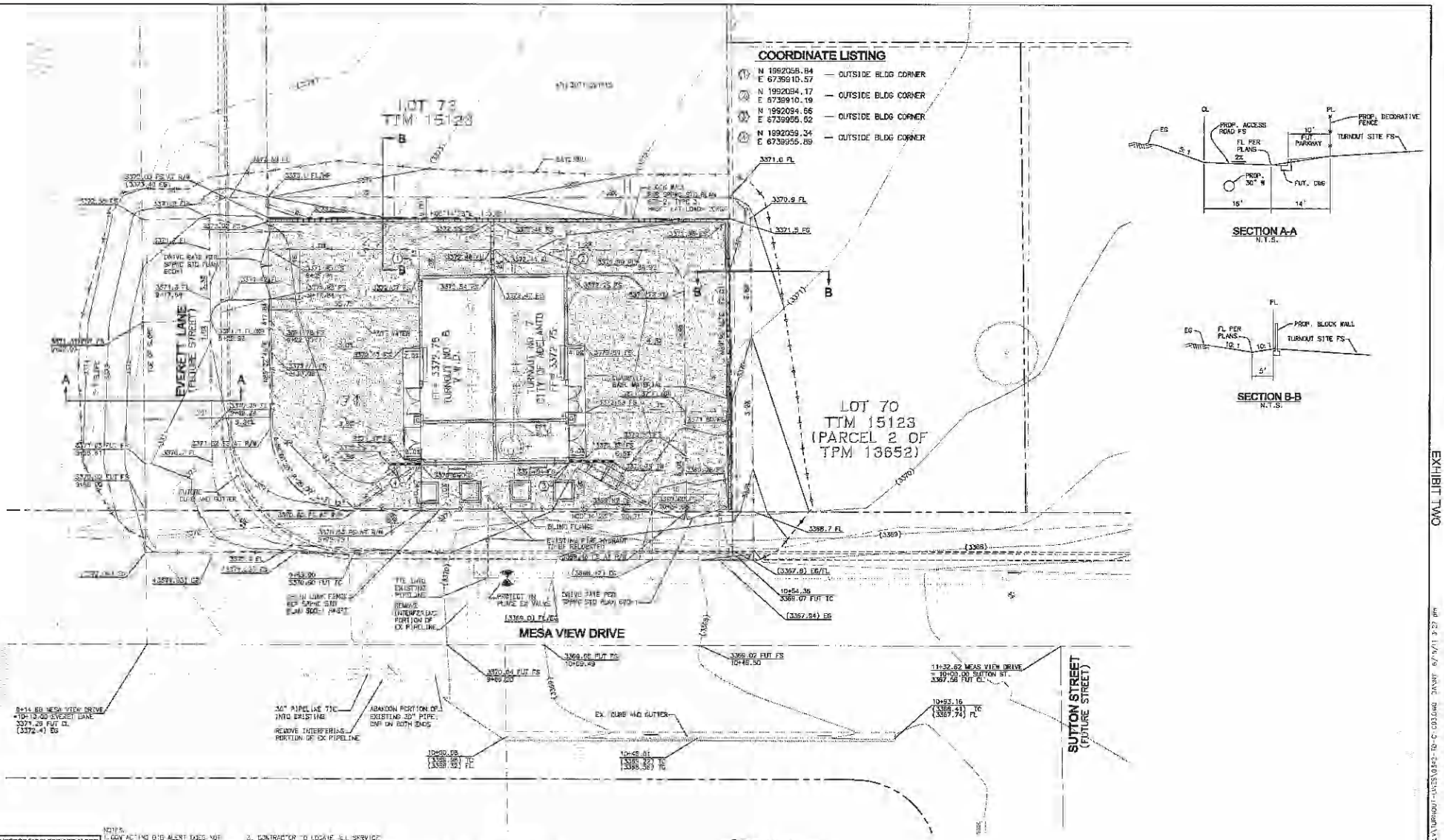
RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
3000 EAST GUASTI ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
909.974.4900 • FAX 909.974.4904 • www.RBF.com

MOJAVE WATER AGENCY
MWA R³ PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
SITE/GRADING PLAN
TURNOUT #3

DRAWING C-1
SHEET 19 OF 80

EXHIBIT ONE

H:\PDATA\Z5100342\CAD\WALKDLV\TURNOUT-JUCSD342 TO C-001.DWG DATAW 8/15/2011 2:36 PM



NOTES:
1. CONTACTING BYD ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES.
2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE PIC CONTRACTOR.
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION AND PROTECT IN PLACE.

NOTE:
ELEVATIONS SHOWN ON THIS PLAN ARE PER SITE SURVEY. SITE SURVEY ELEVATIONS ARE 0.11' HIGHER THAT STREET IMPROVEMENT PLANS FOR MESA VIEW DRIVE.

UNDERGROUND SERVICE ALERT
CALL TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

SCALE: 1"=10'

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 69300342

PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58145 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
BARY MARTIN RCE 31145 DATE

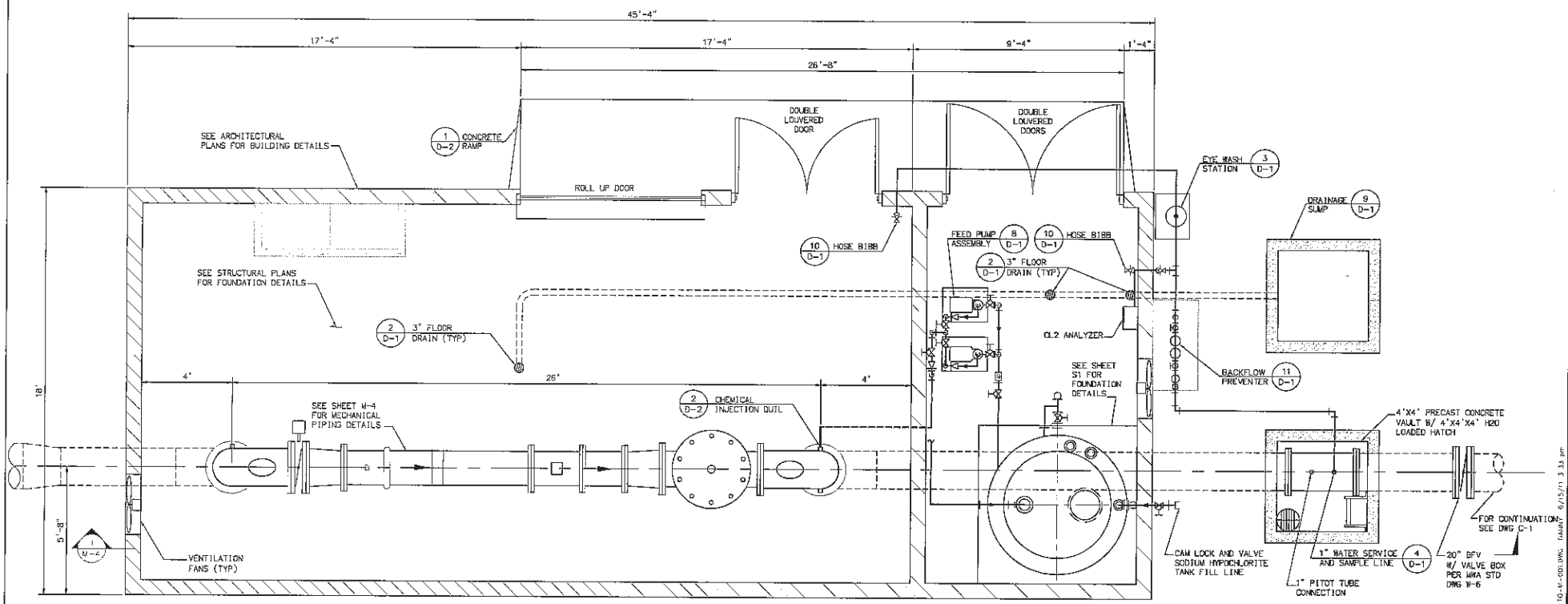
RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
9022 EAST GARVEY ROAD, SUITE 100 ONTARIO, CALIFORNIA 91765
909.974.4900 • FAX 909.974.4910 • www.RBFcon

MOJAVE WATER AGENCY
MWA R³ PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
SITE/GRADING PLAN TURNOUT # 6 & 7

DRAWING C-3
SHEET 21 OF 80

EXHIBIT TWO

H:\PROJECTS\69300342\CADD\WATER\TURNOUT-TM15123-02-C-031.dwg 24x36F 6/15/11 9:23 am



PLAN

SCALE: 1/2"=1'-0"

EXHIBIT THREE

H:\PDATA\PROJDATA\CADD\MAINPIPE-LINES\0342 TO-M-001.DWG 6/15/11 3:35 pm

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NOTES:
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2. IF CONSTRUCTION OCCURS MORE THAN ONE YEAR FROM THE DATE OF THE PLANS EXISTING UTILITIES SHALL BE RE-IDENTIFIED BY THE CONTRACTOR
3. CONTRACTOR TO LOCATE ALL SERVICE LATERALS PRIOR TO CONSTRUCTION, PROTECT IN PLACE

REV.	DATE	BY	DESCRIPTION	APPROVED	DATE

DESIGNED CS
DRAWN CS
REVIEWED SMS
JOB NUMBER 85100342

PREPARED UNDER THE SUPERVISION OF:

CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency

22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org

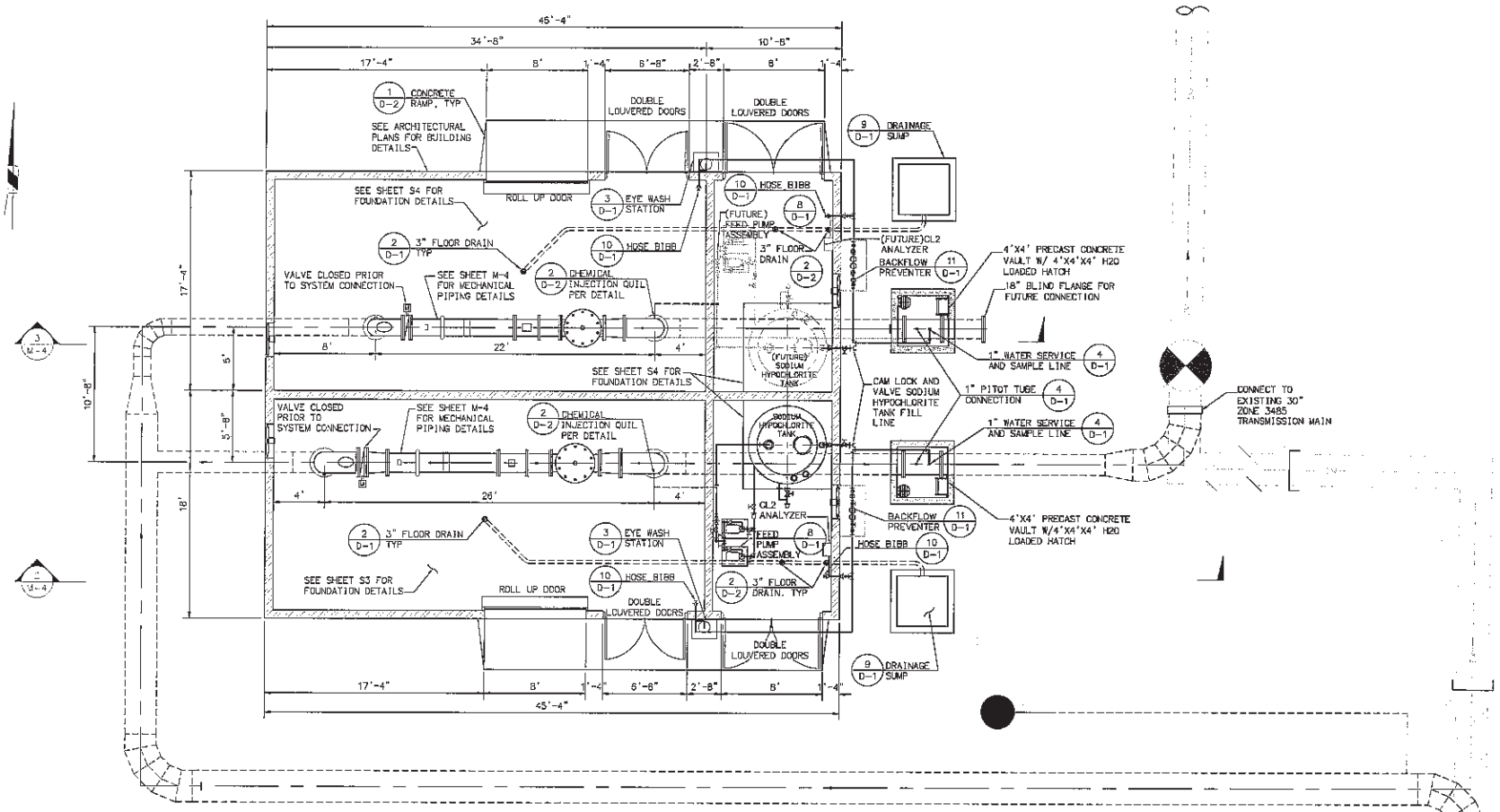
APPROVED

GARY MARTIN RCE 31145 DATE

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3200 EAST GUASTI ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
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MOJAVE WATER AGENCY
MWA R² PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
MECHANICAL PLAN—TURNOUT 3

DRAWING M-1
SHEET 22 OF 80



PLAN

SCALE: 1/4"=1'-0"

NOTE:
FOR TURNOUT NO. 7, SODIUM HYPOCHLORITE STORAGE TANK, FEED PUMP SYSTEM, CHLORINE ANALYZER AND ABOVE GRADE PIPING WITHIN CHEMICAL ROOM WILL BE CONSTRUCTED UNDER A FUTURE CONTRACT. CONTRACTOR TO STUB AND CAP ALL PIPING WITHIN CHEMICAL ROOM FOR FUTURE CONNECTION.

EXHIBIT FOUR

I:\PROJECTS\651003.14\CADD\WATER\PLN\TURNOUT LINES\651003.14-10-M-003.DWG, DAN M, 6/15/11 3:37 pm

UNDERGROUND SERVICE ALERT
CALL: TOLL FREE
811
TWO WORKING DAYS BEFORE YOU DIG

NOTES:
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REV.	DATE	BY	DESCRIPTION	APPROVED	DATE

DESIGNED
DRAWN
REVIEWED
JOB NUMBER 65100342

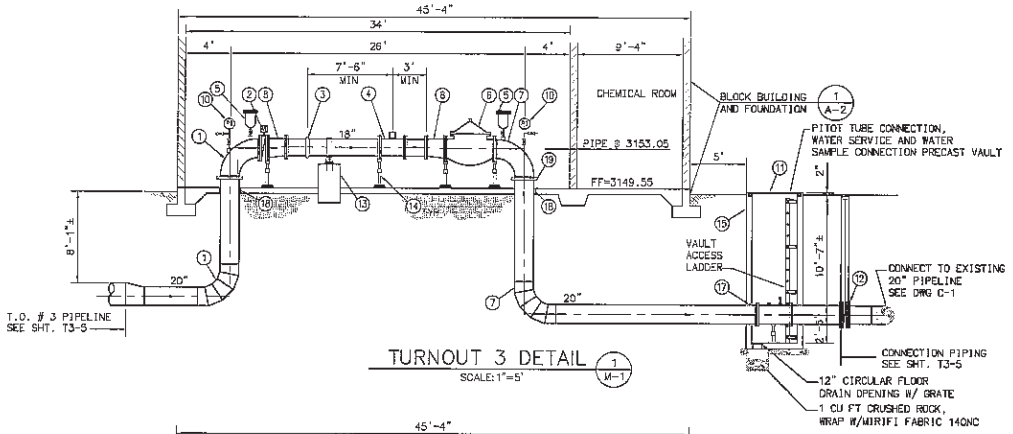
PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
GARY MARTIN RCE 31145 DATE

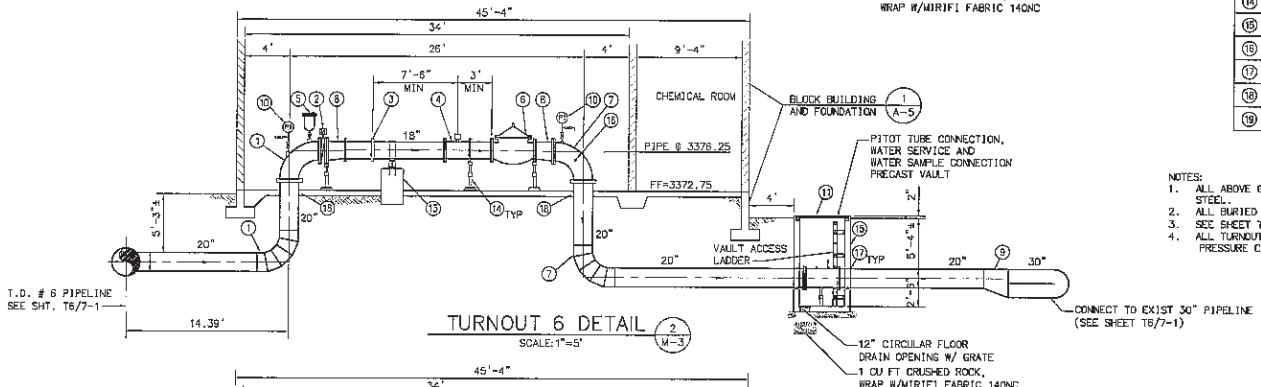
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ONTARIO, CALIFORNIA 91761
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MOJAVE WATER AGENCY
MWA R³ PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
MECHANICAL PLAN—TURNOUTS 6 & 7

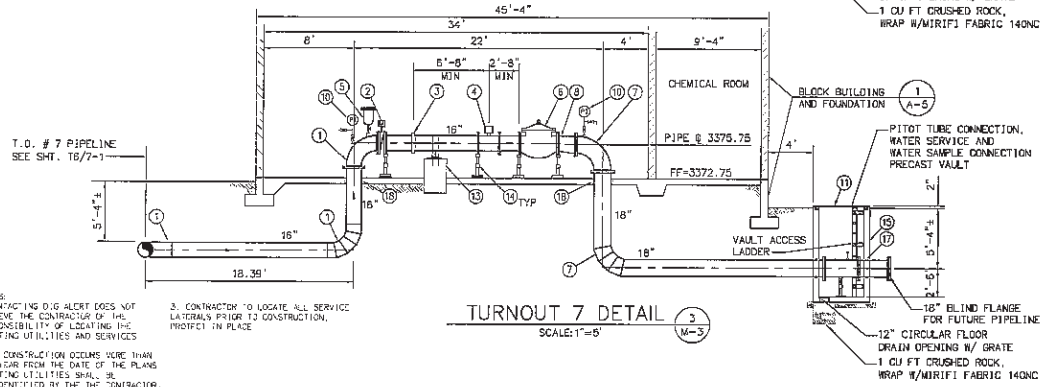
DRAWING M-3
SHEET 24 OF 80



TURNOUT 3 DETAIL
SCALE: 1"=5'
1 M-1



TURNOUT 6 DETAIL
SCALE: 1"=5'
2 M-3



TURNOUT 7 DETAIL
SCALE: 1"=5'
3 M-3

ITEM	DESCRIPTION	TO-3	TO-6	TO-7
1	90° FULLY RESTRAINED BEND	20"	20"	18"
2	MOTOR OPERATED BUTTERFLY VALVE	20"	20"	16"
3	VICTAULIC COUPLING	18"	18"	16"
4	MAGNETIC TYPE FLOW METER	18"	18"	16"
5	COMBINATION AIR VALVE PER DETAIL 1 ON D1	4"	3"	3"
6	ELECTRONIC CONTROL VALVE CLA-VAL MODEL 131	20"	18"	16"
7	90° FULLY RESTRAINED BEND	20"	20"	18"
8	ECCENTRIC REDUCER	20X18	20X18	18X16
9	ECCENTRIC REDUCER	-	30X20	-
10	PRESSURE INDICATOR / TRANSMITTER WITH SAMPLE STATION PER DETAIL 4 ON DWG D-2			
11	48"X48" LOCKABLE H20 ALUMINUM ACCESS HATCH			
12	20" BFV W/ VALVE BOX PER DWG W-6			
13	THRUST SUPPORT PER MWA STD. PER DETAIL 3 ON DWG D-2			
14	PIPE SUPPORT PER DWG W-43			
15	48"X48" PRECAST CONCRETE VAULT W/ ACCESS LADDER			
16	CHEMICAL INJECTION QUIL PER DETAIL 2 ON DWG D-2			
17	PIPE PENTRATION PER DETAIL 7 ON D1 (TYP)			
18	FLOOR PENETRATION PER DETAIL 7 ON D2 (TYP)			
19	ORIFICE PLATE WITH 11.8"ø BORE			

NOTES ABOVE VALID FOR THIS SHEET ONLY

NOTES:
1. ALL ABOVE GROUND PIPE AND FITTINGS TO BE EPOXY LINED AND COATED STEEL.
2. ALL BURIED PIPE AND FITTINGS TO BE CMLAC STEEL.
3. SEE SHEET T3-5 AND T6/7-1 FOR PIPING PROFILE.
4. ALL TURNOUT PIPING, VALVES AND FITTINGS SHALL MATCH AT A MINIMUM PRESSURE CLASS OF UPSTREAM PIPING.

UNDERGROUND SERVICE ALERT
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811
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NOTES:
1. CONTACTING DIG ALERT DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF LOCATING THE EXISTING UTILITIES AND SERVICES
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REV.	DATE	BY	DESCRIPTION	APPROVED	DATE
1	9/21/11	JSN	ADDENDUM 1		

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REVIEWED
JOB NUMBER 65100342

PREPARED UNDER THE SUPERVISION OF:
CINDY L. MILLER RCE 58116 DATE

Mojave Water Agency
22450 HEADQUARTERS DRIVE
APPLE VALLEY, CA 92307
760.946.7000 FAX 760.240.2642
www.MOJAVEWATER.org
APPROVED
BARY MARTIN RCE 37145 DATE

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9755 SANTA GENEVA ROAD, SUITE 100
ONTARIO, CALIFORNIA 91761
909.974.4900 FAX 909.974.4904 www.RBF.com

MOJAVE WATER AGENCY
MWA R² PROJECT
TURNOUTS 3, 4, 6 & 7
PHASE 1 FACILITIES
MECHANICAL SECTIONS–TURNOUTS 3, 6 & 7

DRAWING M-4
SHEET 25 OF 80

EXHIBIT FIVE

M:\PROJECTS\65100342\LAND\WATER\PLANSET-1\PLOT\65100342 TO M-4 PLOTTING.DWG 6/15/11 3:36 pm

EXHIBIT SIX

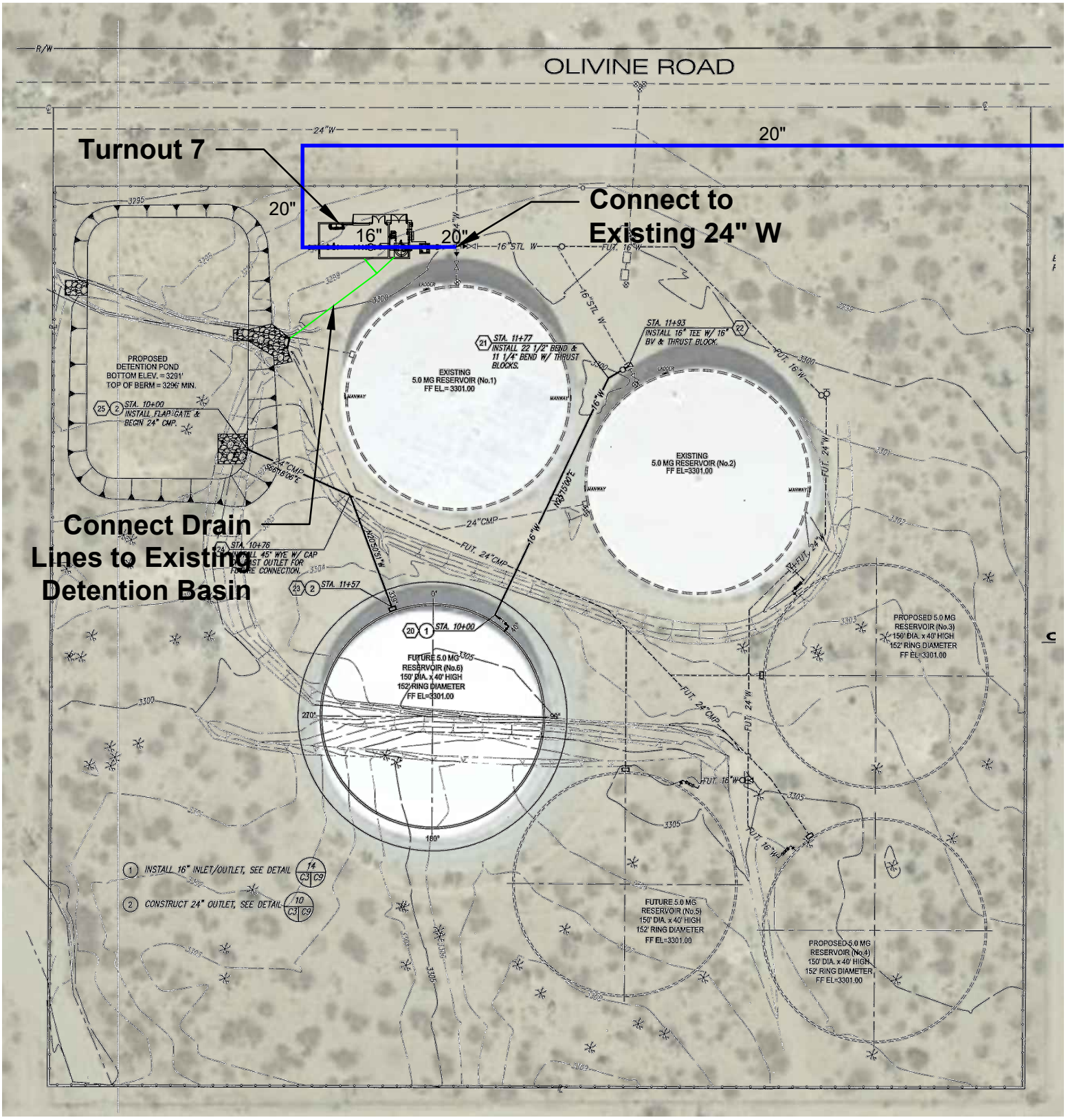
Regional Recharge and Recovery Project
Phase 1 Schedule of Delivery Capacities for Project Participants
June 15, 2012

Annual Amount Approved for Delivery Via W. Conveyance System (acre-feet per year)	Capacity Available to Hesperia Turnout 4		Capacity Available to VWD Turnouts 3 or 6		Capacity Available to Adelanto Turnout 7	
	af per year	cfs	af per year	cfs	af per year	cfs
0	0	0	0	0	0	0
1,000	246	0.41	523	0.88	231	0.39
2,000	492	0.83	1,046	1.76	462	0.78
3,000	738	1.24	1,569	2.64	692	1.16
4,000	985	1.65	2,092	3.52	923	1.55
5,000	1,231	2.07	2,615	4.40	1,154	1.94
6,000	1,477	2.48	3,138	5.27	1,385	2.33
7,000	1,723	2.90	3,662	6.15	1,615	2.71
8,000	1,969	3.31	4,185	7.03	1,846	3.10
9,000	2,215	3.72	4,708	7.91	2,077	3.49
10,000	2,462	4.14	5,231	8.79	2,308	3.88
11,000	2,708	4.55	5,754	9.67	2,538	4.27
12,000	2,954	4.96	6,277	10.55	2,769	4.65
13,000 and above	3,200	5.38	6,800	11.43	3,000	5.04

Note: Capcities at respective turnouts can be interpolated using tabulated values for actual delivery amounts between 0 and 13,000 acre-feet per year.

Appendix B: Project Alternatives

B.1 Turnout 7 Location



Legend

- Proposed CML&C Steel Pipeline

N

0 40 80

SCALE: 1"=80'-0"

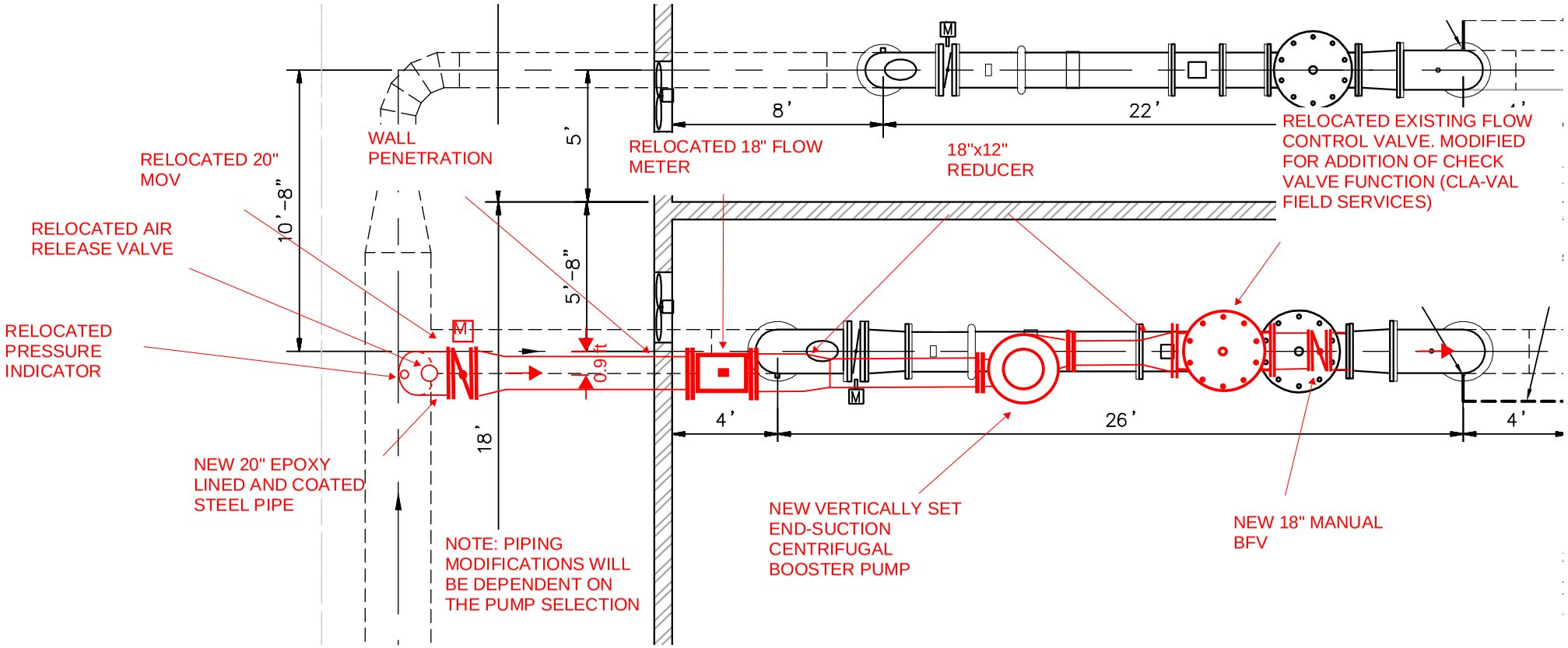
Kennedy/Jenks Consultants

Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

June 2019

B.2 Turnout 6 Modifications



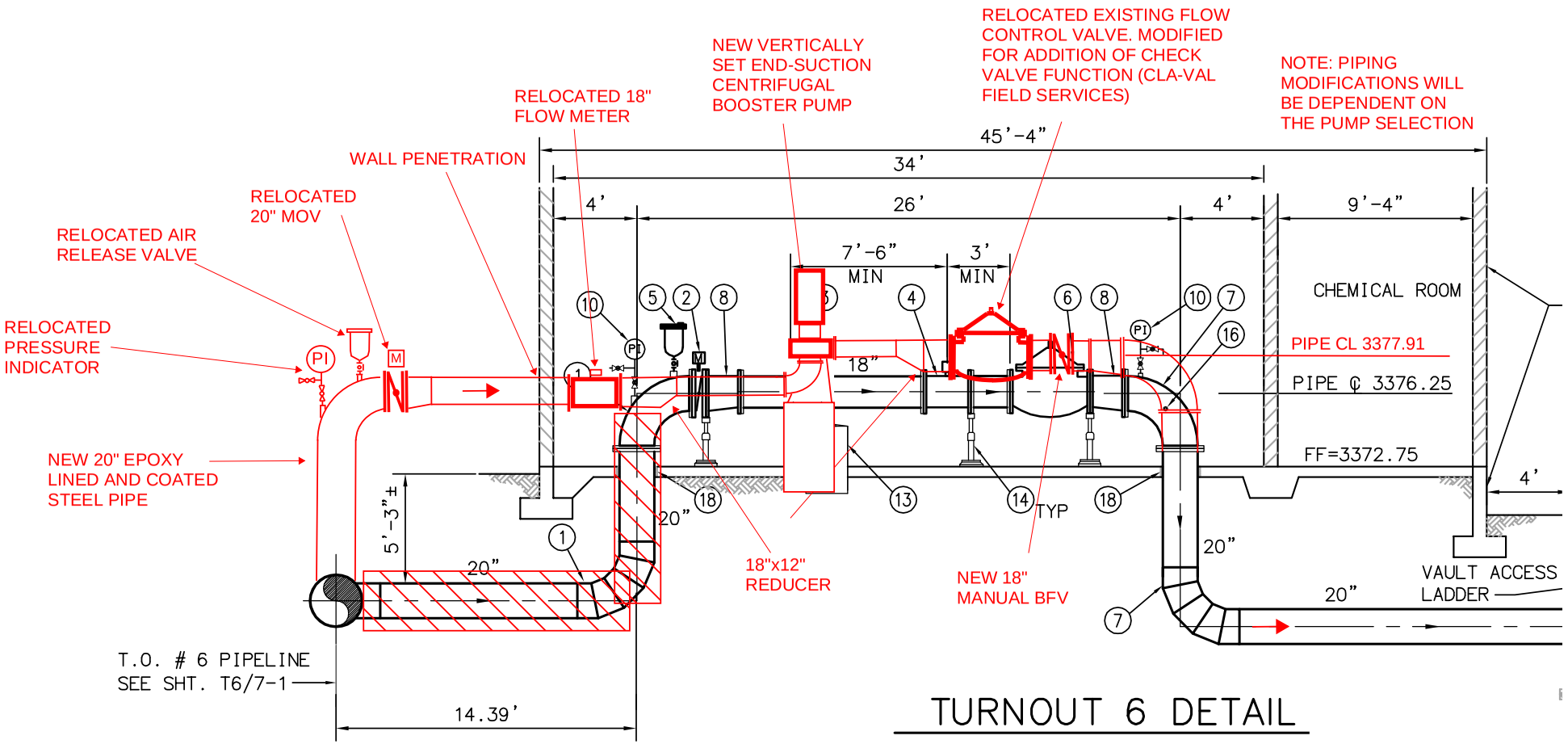
TURNOUT 6 MODIFICATIONS PLAN VIEW ALTERNATIVE

Kennedy Jenks

Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

July 2019



TURNOUT 6 DETAIL

TURNOUT 6 MODIFICATIONS SECTION VIEW ALTERNATIVE

Kennedy Jenks

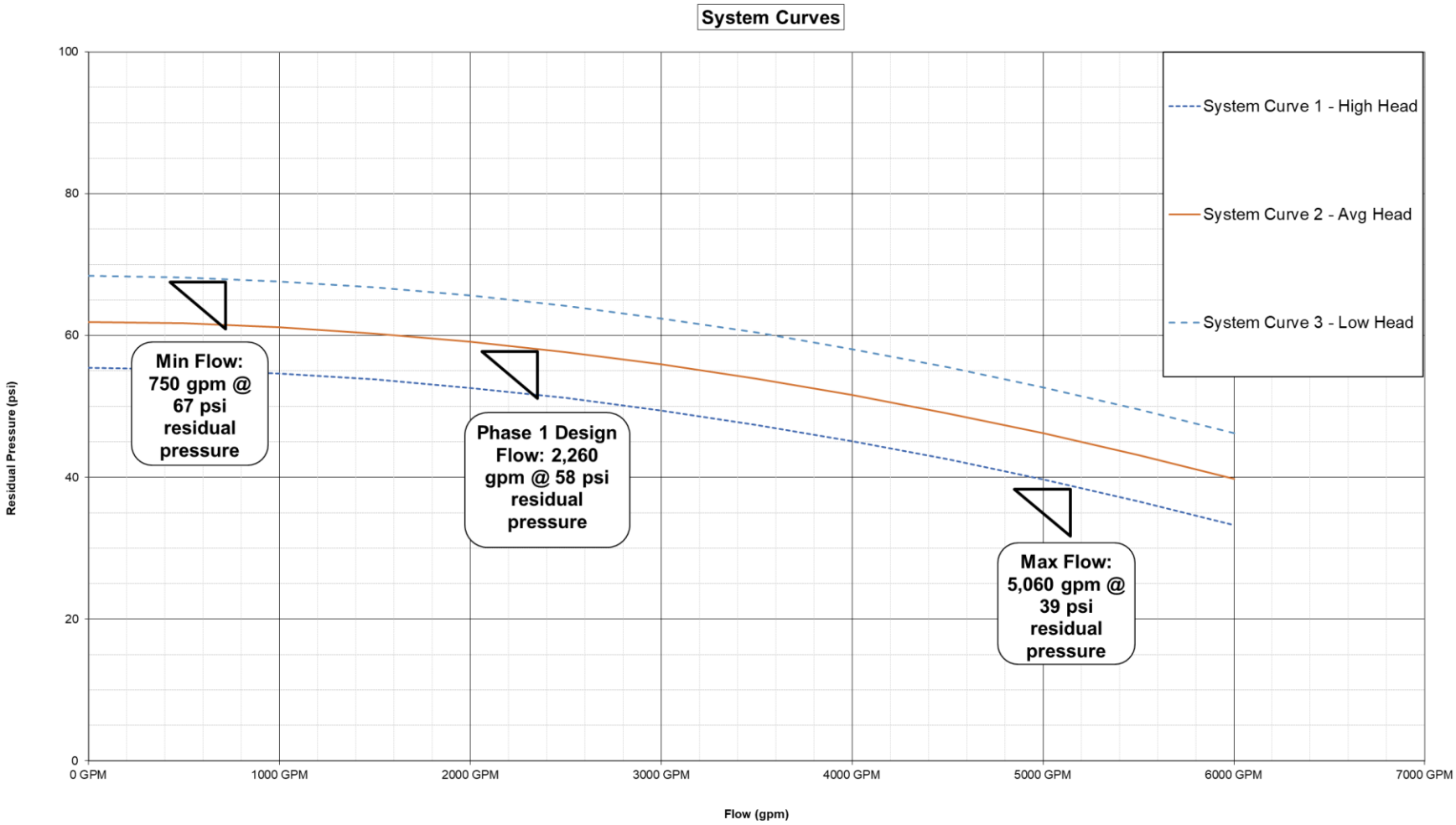
Mojave Water Agency
Victorville, CA

Adelanto R^3 Extension Project

July 2019

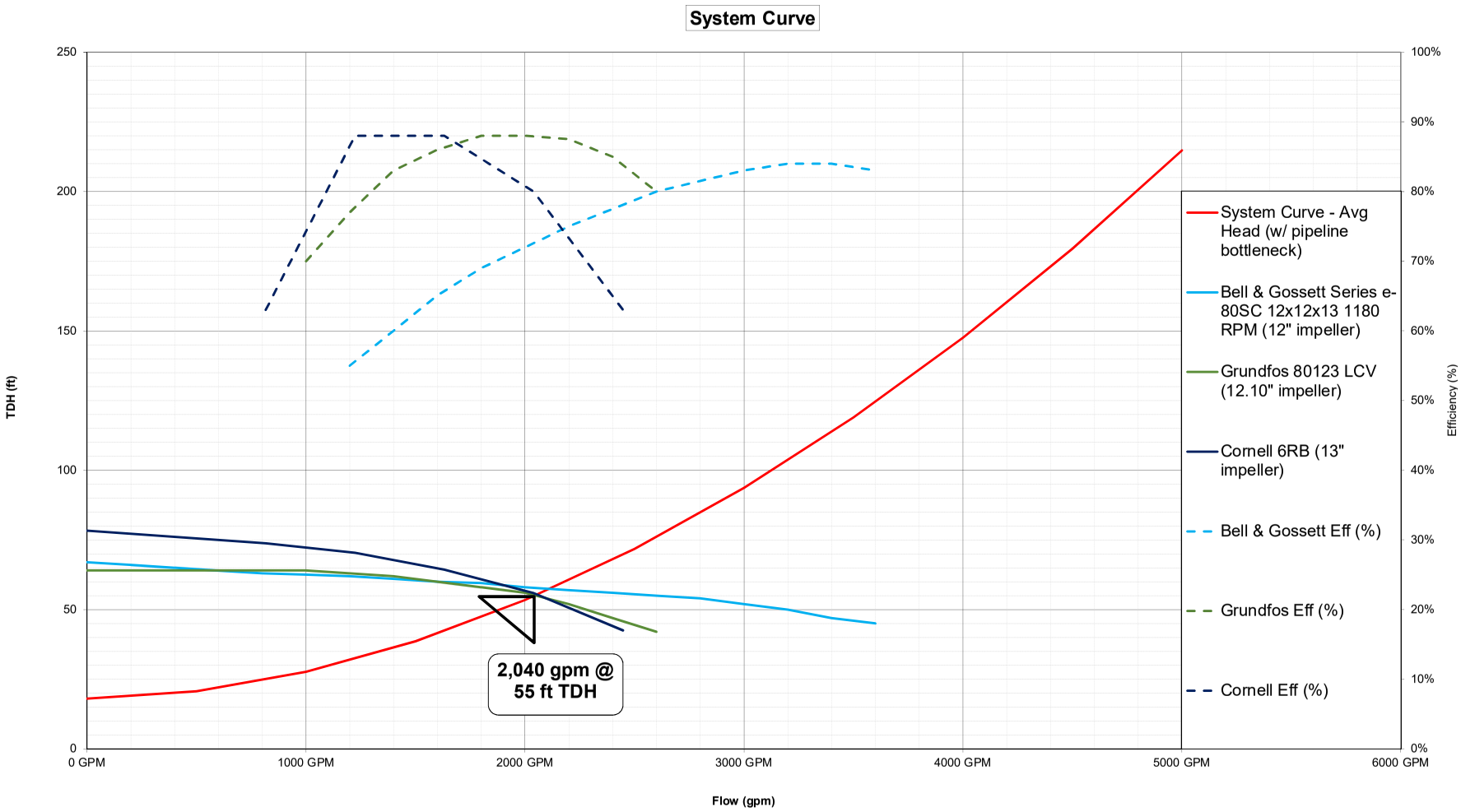
Appendix C: System Curves

C.1 Turnout 7 Residual System Pressure Curve



Turnout 7 Residual Pressure System Head Curves

C.2 Turnout 6 System Curve (Pre-Bottleneck Improvements)



TURNOUT 6 SYSTEM HEAD CURVE
(PRE-BOTTLENECK PIPELINE IMPROVEMENTS)

Manufacturer Pump Selection

Pre-bottleneck

Manuf Pump		
Bell & Gossett Series e-80SC 12x12x13 1180 RPM (12" impeller)		
2040 gpm @ 55 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	67.0	
200	66	
400	65	
600	64	
800	63	
1000	63	
1200	62	55%
1400	61	60%
1600	60	65.1%
1800	59.5	69%
2000	58	72%
2200	57	75%
2400	56	77.5%
2600	55	80%
2800	54	81.5%
3000	52	83%
3200	50	84%
3400	47	84%
3600	45	83%

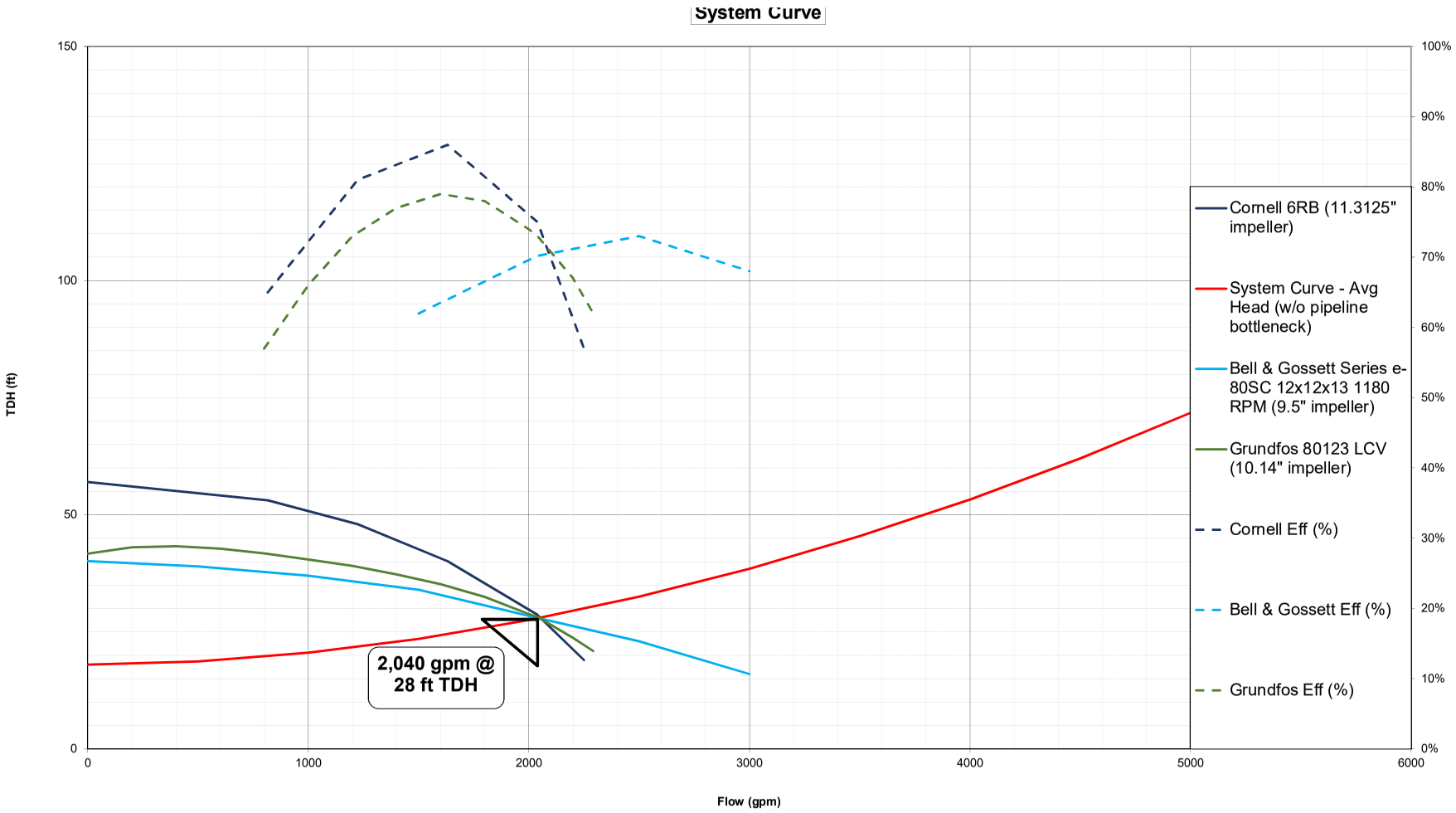
Pre-bottleneck

Manuf Pump		
Grundfos 80123 LCV (12.10" impeller)		
2040 gpm @ 55 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	64.0	
200	64.0	
400	64.0	
600	64.0	
800	64.0	
1000	64.0	70%
1200	63.0	77%
1400	62.0	83%
1600	60.0	86%
1800	58.0	88%
2000	56.0	88%
2200	52.0	87.5%
2400	47.0	85%
2600	42.0	80%
2800		
3000		
3200		
3400		
3600		

Pre-bottleneck

Manuf Pump		
Cornell 6RB (13" impeller)		
2040 gpm @ 55 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	78.3	
816	73.8	63%
1224	70	88%
1632	64	88%
2040	56	80%
2448	43	63%

C.3 Turnout 6 System Curve (Post-Bottleneck Improvements)



TURNOUT 6 SYSTEM HEAD CURVE
(POST-BOTTLENECK PIPELINE IMPROVEMENTS)

Manufacturer Pump Selection

Post-bottleneck

Manuf Pump		
Cornell 6RB (11.3125" impeller)		
2040 gpm @ 28 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	57.0	
816	53.1	65%
1224	48	81%
1632	40	86%
2040	29	75%
2250	19	57%

Post-bottleneck

Manuf Pump		
Bell & Gossett Series e-80SC 12x12x13 1180 RPM (9.5"		
2040 gpm @ 28		
Q (gpm)	TDH (ft)	Eff (%)
0	40.1	
500	39.0	
1000	37	
1500	34	62%
2040	28	70%
2500	23	73%
3000	16	68%

Post-bottleneck

Manuf Pump		
Grundfos 80123 LCV (10.14" impeller)		
2040 gpm @ 28 ft		
Q (gpm)	TDH (ft)	Eff (%)
0	41.7	
200	43.1	
400	43.3	
600	42.8	
800	41.8	57%
1000	40.5	66%
1200	39.1	73%
1400	37.3	77%
1600	35.2	79%
1800	32.5	78%
2000	28.8	74%
2040	28.2	73.0%
2200	23.7	67%
2292	20.9	62%

Appendix D: Geotechnical Desktop Study

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL DESKTOP STUDY REPORT

R3 PHASE I IMPROVEMENTS PROJECT – ADELANTO PIPELINE EXTENSION

CITY OF VICTORVILLE, SAN BERNARDINO COUNTY, CALIFORNIA

CONVERSE PROJECT NO. 19-81-143-01





Prepared For:

KENNEDY-JENKS
38977 Sky Canyon Drive, Suite 100
Murrieta, CA 92563

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

July 3, 2019

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

July 3, 2019

Mr. Ryan Huston, PE
Principal Engineer
Kennedy-Jenks
38977 Sky Canyon Drive, Suite 100
Murrieta, CA 92563

Subject: **GEOTECHNICAL DESKTOP STUDY REPORT**
R^3 Phase I Improvements Project – Adelanto Pipeline Extension
Mesa View Drive and Olivine Road
City of Victorville, San Bernardino County, California
Converse Project No. 19-81-143-01

Dear Mr. Huston:

Converse Consultants (Converse) is pleased to submit this Geotechnical Desktop Study Report to assist with the alignment study for Adelanto Pipeline Extension portion of the R^3 Phase I Improvements Project, located in the City of Victorville, San Bernardino County, California. This report was prepared in accordance with our proposal dated March 25, 2019 and revised March 27, 2019, and your Subcontract Terms and Conditions for Professional Services and Construction Services dated June 14, 2019.

We appreciate the opportunity to be of service to Kennedy-Jenks and Mojave Water Agency. Should you have any questions, please do not hesitate to contact us at 909-796-0544.

CONVERSE CONSULTANTS

REGISTERED PROFESSIONAL ENGINEER
HASHMI S. E. QUAZI
NO. GE 2517
Exp. 06/2021
GEOTECHNICAL
STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST
James Burnham
9621
STATE OF CALIFORNIA

Hashmi S. E. Quazi, PhD, GE, PE
Principal Engineer

James Burnham, PG
Project Geologist

Dist: 1/Addressee (email)
JB//HSQ/kvg

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3.2 ANALYSIS AND REPORT PREPARATION 2

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FIGURES

Following Page No.

Figure No. 1, *Approximate Vicinity Map* 1
Figure No. 2, *Alignment Aerial Photo* 1

APPENDICES

Appendix A ..... Photographs

1.0 INTRODUCTION

This report contains the findings of the geotechnical desktop study performed by Converse for the alignment study for the Adelanto Pipeline Extension portion of the R^3 Phase I Improvements Project, located in the City of Victorville, San Bernardino County, California, as shown in Figure No. 1, *Approximate Vicinity Map*.

The purpose of this study was to utilize existing maps, reports, and databases to characterize the alignment subsurface and identify any geotechnical/geohazards that may impact the project. This report was prepared for the project described herein and is intended for use solely by Kennedy-Jenks and its authorized agents.

2.0 ALIGNMENT AND PROJECT DESCRIPTION

The proposed 30-inch CML&C pipeline begins at the existing Turnout No. 6 & 7 site on Mesa View Drive, approximately 670 feet north of 5th Street/Del Rosa Road. The alignment continues north along Mesa View Drive for approximately 4,660 feet to Olivine Road. The alignment then continues west for approximately 800 feet to the Adelanto tank site. The proposed Adelanto Pipeline Extension alignment is shown on Figure No. 2, *Alignment Aerial Photo,* below.

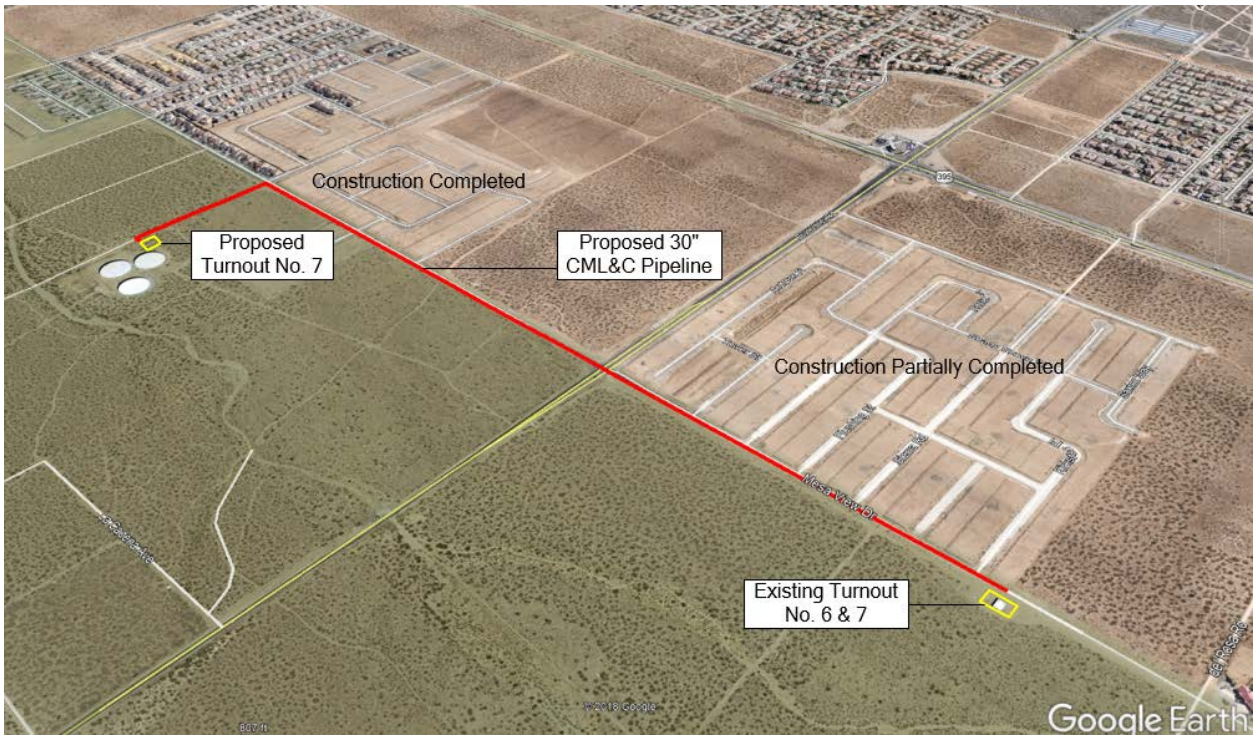
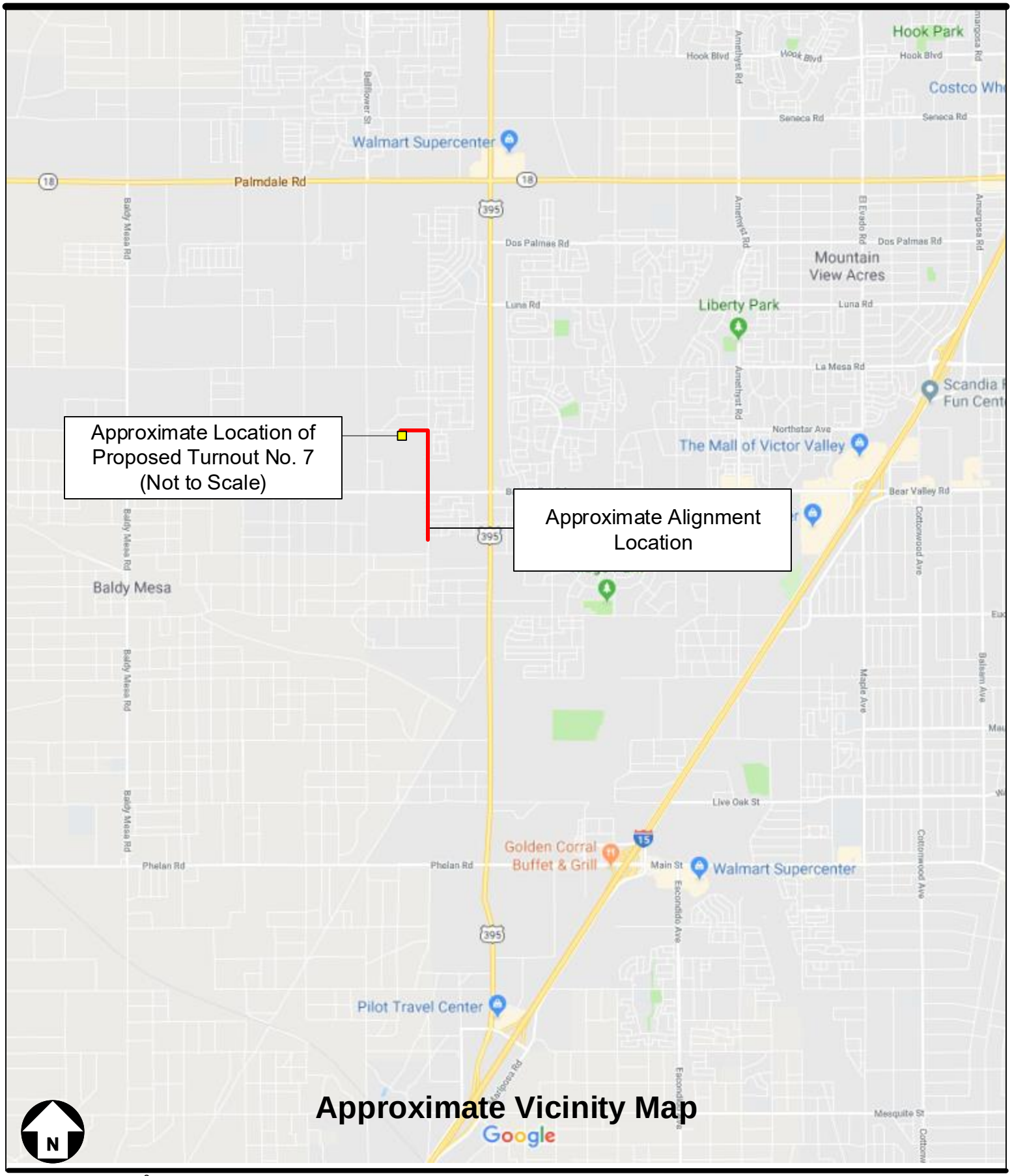


Figure No. 2, Alignment Aerial Photo.

Mesa View Drive is an unpaved, undivided road from the Turnout No. 6 and 7 for approximately 670 feet north to Sierra Road. From Sierra Road to Olivine Road, Mesa



Approximate Vicinity Map

Project: R^3 Phase I Improvements Project – Adelanto Pipeline Extension
Location: Mesa View Drive and Olivine Road
City of Victorville, San Bernardino County, California
For: Kennedy-Jenks

Project No
19-81-143-01

Converse Consultants

Figure No.
1

View Drive is paved with no median and dirt shoulders. Olivine Road from Mesa View Drive to the Adelanto tank site is an unpaved dirt road.

The existing Turnout No. 6 and 7 site is surrounded by a combination of brick wall and fencing. The site contains the Turnout No. 6 structure and associated appurtenances. The ground is unpaved.

The Adelanto tank site is fenced and developed with 3 steel water tanks and associated appurtenances. The location of the proposed Turnout No. 7 is in the vacant northeastern corner of the tank site and is covered in dirt and desert plants.

The proposed alignment is bounded primarily by vacant desert land on the west and a combination of residential tracts and vacant desert land on the east.

Photographs from select locations along the alignment are shown in Appendix A, *Photographs*.

3.0 SCOPE OF WORK

The scope of Converse's study is described in the following sections.

3.1 Desktop Study

The desktop study consisted of the following tasks.

- Field reconnaissance of the proposed alignment and Turnout No. 7 site
- Review of geologic and seismic hazard maps
- Review of aerial photographs
- Review of groundwater databases
- Review of available geotechnical reports in the vicinity

3.2 Analysis and Report Preparation

Data obtained from the field reconnaissance, review of available maps, databases, and reports was assembled and evaluated. This report was prepared to present our findings.

4.0 GROUNDWATER

The State Water Resources Control Board's GeoTracker Database (SWRCB, 2019) was accessed in July 2019 to establish historic groundwater levels, however, no sites with groundwater data were located within a mile of the alignment.

The National Water Information System (USGS, 2019) was also accessed in July 2019 to establish historic groundwater levels. Two sites with historical well measurements were located within approximately one mile of the alignment.

- USGS Site Number 342724117250501, located northwest of the intersection of Eucalyptus Street and Bellflower Street, reported a depth to groundwater of 513 feet bgs in June 1990.
- USGS Site Number 342754117231601, located northeast of the intersection of Sycamore Street and Garlock Road, reported a depth to groundwater of 460 feet bgs in February 1957.

Historical high groundwater at the project site is not known with certainty but is anticipated to be deeper than 400 feet bgs.

Current groundwater conditions, if encountered, will be established with soil borings during the geotechnical investigation. However, based on review of the available groundwater data, groundwater is expected to be deeper than 400 feet bgs. Dewatering during installation of the pipeline and construction of Turnout No. 7 is unlikely to be required. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in the site vicinity. Shallow perched groundwater may be present locally, particularly following precipitation.

5.0 GEOLOGIC SETTING

The regional and local geology are discussed in the following subsections.

5.1 Regional Geology

The project alignment is located in the Mojave Desert Geomorphic Province of Southern California. The Mojave Desert is a broad interior region of isolated mountain ranges separated by wide desert plains. The area is roughly triangular shaped and bounded by the Garlock Fault on the north, the San Andreas Fault on the southwest, and the Colorado River on the east. The drainages are primarily closed and terminate in playas within the valley floors.

The province is a seismically active region primarily characterized by a series of northwest-southeast-trending strike-slip faults and east-west trending secondary faults. The most prominent of the nearby fault zones include the Helendale, Lenwood, Landers, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time.

Extension of the region has resulted in exposure of basement rocks dating to the Precambrian age, deposition of young Holocene-aged sedimentary basins, and eruptions of volcanic units.

5.2 Local Geology

Based on review of available geologic mapping and experience in the area, pipeline alignment and Turnout No. 7 location are primarily underlain by young (middle Holocene - aged) alluvial fan deposits. These deposits primarily consist slightly to moderately consolidated silt, sand, and gravel with possible cobbles and boulders.

6.0 FAULTING

Nearby active faults, seismicity, and their impact on the study area are discussed in the following sections.

6.1 Faulting

No portion of the pipeline alignment or Turnout No. 7 is located within a currently designated State of California or San Bernardino County Earthquake Fault Zone (CGS, 2007; San Bernardino County, 2010). The nearest active fault zones are the Apple Valley Fault Zone 12.1 miles east-southeast; the San Andreas Fault Zone 13 miles southwest, and the Helendale-South Lockhart Fault Zone 18.1 miles northeast.

6.2 Secondary Effects of Seismic Activity

Generally, in addition to ground shaking, effects of seismic activity on a project site may include surface fault rupture, soil liquefaction, and settlement due to earthquake shaking, landslides, lateral spreading, tsunamis, seiches, and flooding due to earthquake-induced dam failure. The site-specific potential for each of these seismic hazards is discussed in the following sections.

Surface Fault Rupture*:* No portion of the study area is located within a currently designated State of California Earthquake Fault Zone (CGS, 2007; San Bernardino County, 2010). The potential for surface rupture resulting from the movement of nearby or distant faults is not known with certainty but is considered low.

Dynamic Settlement (Liquefaction and Dry Seismic Settlement): Liquefaction is defined as the phenomenon in which a soil mass within about the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due the development of excess pore pressures. During earthquakes, excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction occurs during or after strong ground shaking. There are several requirements for liquefaction to occur. They are as follows.

- Soils must be submerged
- Soils must be loose to medium-dense
- Ground motion must be intense

- Duration of shaking must be sufficient for the soils to lose shear resistance

Based on the lack of shallow groundwater, liquefaction is not likely a risk for the pipeline alignment or Turnout No. 7. Dry seismic settlement will be evaluated with data from the soil borings to be conducted during the geotechnical investigation.

7.0 SUBSURFACE PROFILE, EXCAVATABILITY, AND FILL MATERIAL

7.1 Subsurface Profile

The upper 3 to 5 feet of near surface soils along the alignment and at Turnout No. 7 are expected to be relatively loose and potentially compressible if subjected to additional loads. These materials will likely require removal and recompaction prior to foundation construction. The exact removal and recompaction depth will be determined during the geotechnical investigation.

7.2 Excavatability

The subsurface materials along the pipeline alignment are expected to be excavatable with conventional heavy-duty earth moving equipment. The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. Selection of appropriate excavation equipment models should be done by an experienced earthwork contractor. Based on mapped soil types, difficult excavation may be encountered due to the likely presence of gravel and cobbles. This will be verified by field investigation.

7.3 Fill Material

Excavated on-site soils are expected to be suitable for re-use as compacted fill. Prior to re-use, excavated soils should be cleared of all debris, vegetation, rocks larger than 3 inches in maximum dimension, and other deleterious materials. Rocks larger than 1 inch in the largest dimension should not be placed within the upper 12 inches of fill beneath footings and slabs.

7.3.1 Import Soil

Imported soil is anticipated for the pipezone material. Import soil, if used as fill, should be predominantly granular and meet the following criteria.

- Expansion Index less than 20
- Free of all deleterious materials
- Contain no particles larger than 3 inches in the largest dimension

- Contain less than 30 percent by weight retained on ¾-inch sieve
- Have a Plasticity Index of 10 or less
- Corrosivity not greater than the on-site soils

Any imported fill should be tested and approved by geotechnical representative prior to delivery to the site.

7.3.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. Additional pipe bedding material criteria will be provided in the geotechnical investigation report.

8.0 DESIGN CONSIDERATIONS

8.1 Corrosivity, Collapse, and Expansion Potential

Based on the mapped soil types and experience with projects in the area, the young alluvial soils are expected to be slightly corrosive to ferrous metals in contact. Due to grain size and lack of consolidation, the younger alluvial soils may be collapsible and are likely non-expansive.

8.2 Existing Utilities

Residential developments exist on the east side of Mesa View Drive and associated utilities are likely present below the street. Additionally, underground pipelines are present at the Adelanto tanks site. Prior to the start of construction, all existing underground utilities within the vicinity of the pipeline alignment and Turnout No. 7 should be located. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

9.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Kennedy-Jenks, and its authorized agents, to assist in the design and construction of the pipeline and Turnout No. 7 structure. Our findings and opinions were based on generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

10.0 REFERENCES

CALIFORNIA GEOLOGICAL SURVEY (CGS), 2007, Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Faulting Zoning Act with Index to Earthquake Fault Zone Maps, Special Publication 42, revised 2007.

CALIFORNIA GEOLOGICAL SURVEY (CGS), 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, dated September 11, 2008.

CATERPILLAR, INC., 2000, Caterpillar Performance Handbook, Edition 31, dated October, 2000.

MORTON, D.M. and MILLER, F.K., 2006, Geologic Map of the San Bernardino and Santa Ana 30' x 60' Quadrangles, California, U.S. Geological Survey Open-File Report 2006-1217, scale 1:100,000.

SAN BERNARDINO COUNTY, 2010, San Bernardino County Land Use Plan, General Plan, Geologic Hazard Overlays, Map Sheet EHFHC, scale 1:115,200, dated March 9, 2010.

Appendix A

Photographs

APPENDIX A

PHOTOGRAPHS



Photograph 1 - South end of pipeline alignment adjacent to existing Turnout No. 6 & 7, facing north.



Photograph 2 - Alignment crossing at Bear Valley Road, facing north.



Photograph 3 - Intersection of Mesa View Drive and Olivine Road. Adelanto tanks site visible on the right.

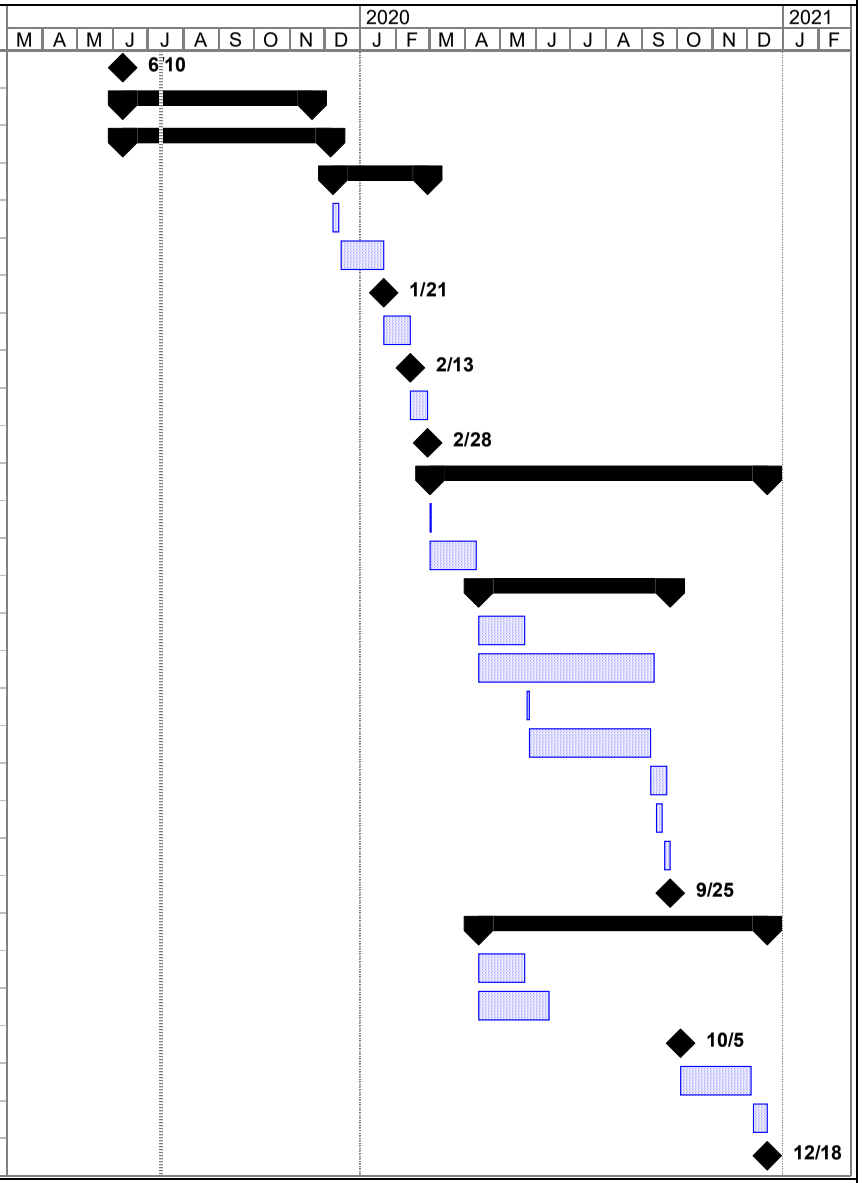


Photograph 4 - Adelanto tanks site. Proposed location of Turnout No. 7 on the left.

Appendix E: Project Schedule

Adelanto R3 Extension Project
Project Schedule

ID	Task Name	Duration	Start	Finish
1	Notice-to-Proceed	0 days	Mon 6/10/19	Mon 6/10/19
2	**Task 1 - Preliminary Design Phase**	**118 days**	**Mon 6/10/19**	**Thu 11/21/19**
16	**Task 2 - Design Phase**	**130 days**	**Mon 6/10/19**	**Fri 12/6/19**
30	**Task 3 - Bid Phase Services**	**60 days**	**Mon 12/9/19**	**Fri 2/28/20**
31	Signatures/Approvals	5 days	Mon 12/9/19	Fri 12/13/19
32	Advertise	27 days	Mon 12/16/19	Tue 1/21/20
33	Bid Opening	0 days	Tue 1/21/20	Tue 1/21/20
34	Bid Evaluation/Board Approval	17 days	Wed 1/22/20	Thu 2/13/20
35	Issue Notice of Award	0 days	Thu 2/13/20	Thu 2/13/20
36	Bonds/Insurance	11 days	Fri 2/14/20	Fri 2/28/20
37	Bid Phase Completion	0 days	Fri 2/28/20	Fri 2/28/20
38	**Construction**	**210 days**	**Mon 3/2/20**	**Fri 12/18/20**
39	Issue NTP	1 day	Mon 3/2/20	Mon 3/2/20
40	Submittals (6 weeks)	30 days	Mon 3/2/20	Fri 4/10/20
41	**Pipeline/Turnout 7 Construction**	**120 days**	**Mon 4/13/20**	**Fri 9/25/20**
42	Pipe Fabrication (6 weeks)	30 days	Mon 4/13/20	Fri 5/22/20
43	New Turnout 7 (5 months)	110 days	Mon 4/13/20	Fri 9/11/20
44	Mobilize (Pipeline)	2 days	Mon 5/25/20	Tue 5/26/20
45	Pipe Installation (5,800'@ 80' day)	75 days	Wed 5/27/20	Tue 9/8/20
46	Pressure Testing/Disinfection	10 days	Wed 9/9/20	Tue 9/22/20
47	Connections	5 days	Mon 9/14/20	Fri 9/18/20
48	Punchlist	5 days	Mon 9/21/20	Fri 9/25/20
49	Completion	0 days	Fri 9/25/20	Fri 9/25/20
50	**Turnout 6 Modifications**	**180 days**	**Mon 4/13/20**	**Fri 12/18/20**
51	Pump Fabrication (6 weeks)	30 days	Mon 4/13/20	Fri 5/22/20
52	SCE Service Upgrade (8 weeks)	45 days	Mon 4/13/20	Fri 6/12/20
53	Shutdown Turnout 6	0 days	Mon 10/5/20	Mon 10/5/20
54	Turnout 6 Modifications (8 weeks)	45 days	Mon 10/5/20	Fri 12/4/20
55	Testing/Controls	10 days	Mon 12/7/20	Fri 12/18/20
56	Project Completion	0 days	Fri 12/18/20	Fri 12/18/20



Project: Mojave R3 Construction Sche
Date: Fri 7/12/19

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

Appendix F: Opinion of Probable Construction Cost

OPINION OF PROBABLE CONSTRUCTION COST

KENNEDY/JENKS CONSULTANTS

Project: 30" Adelanto R3 Extension Project

Prepared By: RJL/JS
Date Prepared: 14-Jun-19
K/J Proj. No. 1944511*00

Building, Area: Adelanto Pipeline Extension

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type:
- [x] **Conceptual**
- [ ] **Preliminary (w/o plans)**
- [ ] **Design Development @**
- [ ] **Construction**
- [ ] **Change Order**
- **% Complete**

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
Adelanto Pipeline Extension											
		30" Pipeline Work									
		30" Pipeline Work									
		30-inch CML&C Steel Pipe	4,650	LF	110.00	511,500	80.00	372,000			883,500
		Excavation	7,363	cy			6.01	44,252			44,252
		Bedding, sand with compaction	2,941	cy	19.00	55,879	13.93	40,968			96,847
		Backfill	3,444	cy			7.82	26,932			26,932
		Spoil	977	cy			9.97	9,741			9,741
		Trench Shield, assume 100'/day	12	wks					577	6,924	6,924
		Pavement Removal - 3" deep (Trench)	2,217	sy			7.35	16,295			16,294.95
		Pavement Disposal (Trench)	185	cy			22.40	4,138			4,138.40
		Pavement Replacement - 4" thick	2,217	sy	15.10	33,477	41.15	91,230			124,706.25
		Aggregate Base Replacement 6"	2,217	sy	5.65	12,526	1.32	2,926			15,452.49
		Sawcut pavement	9,300	LF	0.25	2,325	1.92	17,856			20,181.00
		30-inch Butterfly Valves (max 2000 ft spacing)									
		30-inch Butterfly Valves	4	EA	12,115.00	48,460	455.50	1,822			50,282
		Valve Can and Extension	4	EA	69.50	278	110.00	440			718
		4-inch Combination Air Release	2								
		4-inch CAV	4	EA	1,970.00	7,880	256.00	1,024			8,904
		4-inch Steel piping	50	LF	14.73	737	29.88	1,494			2,231
		4-inch Gate Valves w/ Valve Can	2	EA	585.00	1,170	304.00	608			1,778
		4-inch 90 Degree Elbows	2	EA	53.50	107	256.35	513			620
		Concrete Base	1.0	CY	300.00	300	300.00	300			600
		Bollards	4	EA	460.00	1,840	87.60	350			2,190
		8-inch Blowoff w/ 12-inch Riser	2								
		8-inch Steel Piping	50	LF	66.50	3,325	67.95	3,398			6,723
		8-inch Gate Valve w/ Valve Can	2	EA	1,500.00	3,000	304.00	608			3,608
		8" x 12" Reducer	2	EA	250.00	500	541.50	1,083			1,583
		12" Tee	2	EA	1,225.00	2,450	1,313.00	2,626			5,076
		12" Blind Flange	2	EA	236.00	472	648.85	1,298			1,770
		12" Riser	12	LF	101.00	1,212	103.00	1,236			2,448
		Meter Vault for Riser	2	EA	1,125.00	2,250	1,643.00	3,286			5,536
		4" Camlock for Blowoff	2	EA	45.00	90	45.00	90			180
		48-inch Concrete Manhole	3								
		48-inch Precast Concrete Manhole Rings, 6' deep	3	EA	1,360.00	4,080	856.00	2,568			6,648
		48-inch Precast Concrete Roof with Cast Iron Lid	3	EA	221.00	663	186.50	560			1,223
		Concrete Base for Manhole	7	CY	300.00	2,100	300.00	2,100			4,200
		24-inch Blind Flange for Steel Pipe Riser	3	EA	944.00	2,832	1,107.70	3,323			6,155
		Connection to Existing 30-inch Line									
		Temporary Bulkhead Installation and Removal	2	EA	1,625.00	3,250	2,186.00	4,372			7,622
		30-inch Buttstrap	2	EA	550.00	1,100	400.00	800			1,900
		30-inch Pipe - Final Connection Section	2	LF	550.00	1,100	400.00	800			1,900
		Additional Work									
		Pressure Testing, Air Compressor	1	WK					158	158	158
		Pressure Testing, 3/4" Air hose, 50 ft	1	WK					65	65	65
		Disinfection	1	LS					5,000	5,000	5,000
		Subtotals				704902.25		661035.77		12146.90	1,378,084.92
		Division 1 Costs	@	10%		70490.23		66103.58		1214.69	137,808.49
		Subtotals				775392.48		727139.35		13361.59	1,515,893.41
		Taxes - Materials Costs	@	7.75%		60092.92					60,092.92
		Subtotals				835485.39		727139.35		13361.59	1,575,986.33
		Taxes - Labor Costs									
		Subtotals				835485.39		727139.35		13361.59	1,575,986.33
		Contractor Markup for Sub	@	10%						1336.16	1,336.16
		Subtotals				835485.39		727139.35		14697.75	1,577,322.49
		Contractor OH&P	@	15%		125322.81		109070.90			234,393.71
		Subtotals				960808.20		836210.25		14697.75	1,811,716.20
		Estimate Contingency	@	20%							362,343.24
		Subtotals									2,174,059.44
		Escalate to Midpoint of Construct	@	3%							65,221.78
		Estimated Bid Cost									2,239,281.22
		Total Estimate									2,240,000.00

OPINION OF PROBABLE CONSTRUCTION COST

KENNEDY/JENKS CONSULTANTS

Project: 20" Adelanto R3 Extension Project

Prepared By: RJL/JS
Date Prepared: 14-Jun-19
K/J Proj. No. 1944511*00

Building, Area: Adelanto Pipeline Extension

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type:
- [x] **Conceptual**
- [ ] **Preliminary (w/o plans)**
- [ ] **Design Development @**
- [ ] **Construction**
- [ ] **Change Order**
- **% Complete**

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
Adelanto Pipeline Extension											
		20" Pipeline Work									
		20" Pipeline Work									
		20-inch CML&C Steel Pipe	1,300	LF	70.00	91,000	60.00	78,000			169,000
		Excavation	1,661	cy			6.01	9,983			9,983
		Bedding, sand with combacktion	688	cy	19.00	13,072	13.93	9,584			22,656
		Backfill	843	cy			7.82	6,592			6,592
		Spoil	130	cy			9.97	1,296			1,296
		Trench Shield, assume 100'/day	8	wks					577	4,616	4,616
		Aggregate Base Replacement 6"	400	sy	5.65	2,260	1.32	528			2,788
		20-inch Butterfly Valves (max 2000 ft spacing)									
		20-inch Butterfly Valves	4	EA	4,900.00	19,600	455.50	1,822			21,422
		Valve Can and Extension	4	EA	69.50	278	110.00	440			718
		2-inch Combination Air Release									
		2-inch CAV	2	EA	720.00	1,440	79.00	158			1,598
		2-inch Copper Piping	50	LF	17.55	878	5.55	278			1,155
		2-inch Ball Valves	2	EA	259.00	518	64.50	129			647
		2-inch 90 Degree Elbows	4	EA	252.00	1,008	64.50	258			1,266
		Concrete Base	1.00	CY	300.00	300	300.00	300			600
		Bollards	4	EA	460.00	1,840	87.60	350			2,190
		Valve can or Meter Vault for 2" Valve	2	EA	69.50	139	110.00	220			359
		6-inch Blowoff w/ 8-inch Riser	1								
		6-inch Steel Piping	25	LF	25.18	630	46.20	1,155			1,785
		6-inch Gate Valve w/ Valve Can	1	EA	1,825.00	1,825	620.00	620			2,445
		6" x 8" Reducer	1	EA	116.00	116	391.35	391			507
		8" Tee	1	EA	545.00	545	978.00	978			1,523
		8" Blind Flange	1	EA	495.00	495	159.00	159			654
		8" Riser	6	LF	67.60	406	67.91	407			813
		Meter Vault for Riser	1	EA	1,125.00	1,125	1,643.00	1,643			2,768
		4" Camlock for Blowoff	1	EA	45.00	45	45.00	45			90
		Connection to Existing 20-inch Line									
		Temporary Bulkhead Installation and Removal	2	EA	1,000.00	2,000	1,600.00	3,200			5,200
		20-inch Buttstrap	2	EA	350.00	700	300.00	600			1,300
		20-inch Pipe - Final Connection Section	2	LF	350.00	700	300.00	600			1,300
		Additional Work									
		Pressure Testing, Air Compressor	1	WK					158	158	158
		Pressure Testing, 3/4" Air hose, 50 ft	1	WK					65	65	65
		Disinfection	1	LS					5,000	5,000	5,000
		Subtotals				140918.60		119736.52		9838.90	270,494.02
		Division 1 Costs	@	10%		14091.86		11973.65		983.89	27,049.40
		Subtotals				155010.46		131710.17		10822.79	297,543.42
		Taxes - Materials Costs	@	7.75%		12013.31					12,013.31
		Subtotals				167023.77		131710.17		10822.79	309,556.73
		Taxes - Labor Costs									
		Subtotals				167023.77		131710.17		10822.79	309,556.73
		Contractor Markup for Sub	@	10%						1082.28	1,082.28
		Subtotals				167023.77		131710.17		11905.07	310,639.01
		Contractor OH&P	@	15%		25053.57		19756.53			44,810.09
		Subtotals				192077.34		151466.70		11905.07	355,449.10
		Estimate Contingency	@	20%							71,089.82
		Subtotals									426,538.92
		Escalate to Midpoint of Construct	@	3%							12,796.17
		Estimated Bid Cost									439,335.09
		Total Estimate									440,000.00

OPINION OF PROBABLE CONSTRUCTION COST | **KENNEDY/JENKS CONSULTANTS**

Project: Adelanto R3 Extension Project | **Prepared By:** RJL/JS
Date Prepared: 14-Jun-19
Building, Area: Turnout #6 Modifications | **K/J Proj. No.** 1944511*00

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type: [x] Conceptual [ ] Preliminary (w/o plans) [ ] Design Development @ [ ] Construction [ ] Change Order % Complete

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
Turnout #6 Modifications											
		30" Adelanto Pieline Extension									
		30-inch CML&C Steel Pipe	30	LF	110.00	3,300	80.00	2,400			5,700
		Excavation	48	cy			6.01	288			288
		Bedding, sand with compaction	19	cy	19.00	361	13.93	265			626
		Backfill	22	cy			7.82	172			172
		Spoil	6	cy			9.97	60			60
		Trench Shield	1	wks					577	577	577
		Pavement Removal - 3" deep (Trench)	20	sy			7.35	147			147.00
		Pavement Disposal (Trench)	2	cy			22.40	45			44.80
		Pavement Replacement - 4" thick	20	sy	15.10	302	41.15	823			1,125.00
		Aggregate Base Replacement 6"	20	sy	5.65	113	1.32	26			139.40
		Sawcut pavement	60	LF	0.25	15	1.92	115			130.20
		30-inch Tee	1	EA	7,325.00	7,325	6,538.00	6,538			13,863.00
		30-inch 90 Degree Elbow	1	EA	2,950.00	2,950	4,351.00	4,351			7,301.00
		30-inch Butterfly Valve	1	EA	12,115.00	12,115	455.50	456			12,571
		Valve Can for 30-inch Butterfly Valve	1	EA	69.50	70	110.00	110			180
		30-inch Blind Flange	1	EA	1,200.00	1,200	1,400.00	1,400			2,600
		Modify Existing 30" Line for 36" Transmission Pipeline									
		36-inch x 30-inch Steel Cross	1	EA	10,000.00	10,000	8,000.00	8,000			18,000
		36" x 30" Steel Reducer	1	EA	3,250.00	3,250	5,149.00	5,149			8,399
		36-inch Butterfly Valve	1	Ea	15,000.00	15,000	455.50	456			15,456
		30-inch Butterfly Valve	2	EA	12,115.00	24,230	455.50	911			25,141
		Valve Can for 30-inch Butterfly Valve	3	Ea	69.50	209	110.00	330			539
		Excavation	19	cy			6.01	114			114
		Bedding, sand with compaction	7	cy	19.00	133	13.93	98			231
		Backfill	8	cy			7.82	63			63
		Spoil	3	cy			9.97	30			30
		Trench Shield, assume 100'/day	1	wks					577	577	577
		Modify 30-inch Pipeline for 18-inch Victorvillle Pipeline									
		30-inch x 18-inch steel tee	1	Ea	6,500.00	6,500	5,000.00	5,000			11,500
		18-inch butterfly valve	1	Ea	500.00	500	500.00	500			1,000
		30-inch butterfly valve	1	Ea	12,115.00	12,115	455.50	456			12,571
		Salvage and reuse 30-inch butterfly valve	1	EA	1,000.00	1,000	1,000.00	1,000			2,000
		Valve cans for butterfly valves	3	ea	69.50	209	110.00	330			539
		Excavation	19	cy			6.01	114			114
		Bedding, sand with compaction	7	cy	19.00	133	13.93	98			231
		Backfill	8	cy			7.82	63			63
		Spoil	3	cy			9.97	30			30
		Trench Shield, assume 100'/day	1	wks					577	577	577
		Modify 20-inch pipe inside Turnout 6									
		30-inch x 20-inch steel tee	1	EA	6,750.00	6,750	5,250.00	5,250			12,000
		20-inch CML&EC steel pipe	10	LF	142.00	1,420	217.30	2,173			3,593
		Salvage and relocate 20-inch MOV	1	EA	600.00	600	600.00	600			1,200
		Salvage and relocate pressure indicator	1	EA	150.00	150	150.00	150			300
		Salvage and relocate Air release Valve	1	EA	500.00	500	500.00	500			1,000
		20-inch x 18-inch steel reducer	2	EA	2,000.00	4,000	1,622.50	3,245			7,245
		18-inch CML&EC steel pipe	10	LF	138.00	1,380	178.15	1,782			3,162
		Salvage and relocated 18-inch flowmeter	1	Ea	1,000.00	1,000	1,000.00	1,000			2,000
		18-inch x 12-inch steel reducer	2	Ea	1,000.00	2,000	1,100.00	2,200			4,200
		12-inch CML&EC steel pipe	10	LF	101.00	1,010	103.00	1,030			2,040
		12-inch Flanged coupling Adaptor	1	EA	850.00	850	250.00	250			1,100
		Vertically Set End Suction Booster Pump	1	EA	10,777.84	10,778	2,500.00	2,500			13,278
		Salvage and relocated 18-inch Flow Control Valve	1	Ea	1,500.00	1,500	1,500.00	1,500			3,000
		Modify 18-inch Flow control Valve	1	Ea					5,000	5,000	5,000
		18-inch Butterfly Valve with Handwheel	1	Ea	3,825.00	3,825	455.50	456			4,281
		20-inch 90 degree elbows	2	EA	2,300.00	4,600	1,699.50	3,399			7,999
		12-inch Flanges	2	Ea	236.00	472	648.85	1,298			1,770
		18-inch Flanges	4	Ea	520.00	2,080	1,250.00	5,000			7,080
		20-inch Flanges	2	EA	600.00	1,200	1,500.00	3,000			4,200
		Pipe Supports	4	EA	1,500.00	6,000	500.00	2,000			8,000
		Core Drill /Wall Penetration for 20-inch Pipe	1	Ea					250	250	250
		Electrical Modifications (Conduits, wiring, SCADA)	1	LS					16,601	16,601	16,601
		Upgrade SCE Electrical Service	1	LS					15,000	15,000	15,000
		Subtotals				151143.34		77266.95		38582.15	266,992.44
		Division 1 Costs	@	10%		15114.33		7726.70		3858.22	26,699.24
		Subtotals				166257.67		84993.65		42440.37	293,691.69
		Taxes - Materials Costs	@	7.75%		12884.97					12,884.97
		Subtotals				179142.64		84993.65		42440.37	306,576.66
		Taxes - Labor Costs									
		Subtotals				179142.64		84993.65		42440.37	306,576.66
		Contractor Markup for Sub	@	10%						4244.04	4,244.04
		Subtotals				179142.64		84993.65		46684.40	310,820.69
		Contractor OH&P	@	15%		26871.40		12749.05			39,620.44
		Subtotals				206014.04		97742.69		46684.40	350,441.14
		Estimate Contingency	@	20%							70,088.23
		Subtotals									420,529.36
		Escalate to Midpoint of Construct	@	3%							12,615.88
		Estimated Bid Cost									433,145.25
		Total Estimate									434,000.00

OPINION OF PROBABLE CONSTRUCTION COST | **KENNEDY/JENKS CONSULTANTS**

Project: Adelanto R3 Extension Project

Building, Area: Turnout #7 Relocation

Prepared By: RJL/JS
Date Prepared: 14-Jun-19
K/J Proj. No. 1944511*00

Current at ENR
Escalated to ENR
Months to Midpoint of Construct 12

Estimate Type:
- ☐ **Conceptual**
- ☐ **Preliminary (w/o plans)**
- ☒ **Design Development @** x **% Complete**
- ☐ **Construction**
- ☐ **Change Order**

Spec. No.	Item No.	Description	Qty	Units	Materials $/Unit	Materials Total	Installation $/Unit	Installation Total	Sub-contractor $/Unit	Sub-contractor Total	Total
		Grading									
		Overexcavation and Compaction for bldg	82	cy			10.51	862			862
		Rough Grading	1.00	LS			830.00	830			830
		Finish Grading	1,333	sf			1.43	1,907			1,907
		3" Thick Aggregate Base Surface	148	sy	1.94	287	1.28	190			477
		CMU Building Work									
		Concrete Footings	17	cy	300.00	5,100	300.00	5,100			10,200
		Concrete Foundation	15	cy	300.00	4,500	300.00	4,500			9,000
		Concrete Pad and Ramp	4	cy	300.00	1,200	300.00	1,200			2,400
		Misc. Concrete Work	4	cy	300.00	1,200	300.00	1,200			2,400
		CMU Split Face	2,315	sf	14.00	32,410	14.00	32,410			64,820
		W-10 Roofing Beams	90	LF	33.50	3,015	8.65	779			3,794
		Roofing, Membrane	816	sf	1.39	1,134	2.01	1,640			2,774
		Roofing, Insulatation	816	sf	1.00	816	1.25	1,020			1,836
		Roof Drains and piping	1	LS	1,000.00	1,000	1,000.00	1,000			2,000
		Roll Up Door	1	EA	3,000.00	3,000	1,500.00	1,500			4,500
		Double Swing Door 8' x 8'	2	EA	350.00	700	150.00	300			1,000
		Hollow Metal Work	3	EA	350.00	1,050	200.00	600			1,650
		Finish Hardwar	3	EA	400.00	1,200	200.00	600			1,800
		Misc. Flashing	1	LS	1,000.00	1,000	1,000.00	1,000			2,000
		HVAC Work									
		Fans, 1000 cfm	2	EA	866.00	1,732	515.00	1,030			2,762
		Louvers	6	EA	38.00	228	28.00	168			396
		Chemical Feed System									
		Chlorine Residual Analyzers	1	Ea	6,063.72	6,064	1,000.00	1,000			7,064
		Packaged Chlorine Dosing System	1	LS					40,000	40,000	40,000
		1" SCH 80 PVC piping (Chem & Sample Lines)	50	LF	11.85	593	15.85	793			1,385
		1" PVC Ball Valves	4	ea	51.50	206	29.00	116			322
		Injection Quill	2	ea	250.00	500	100.00	200			700
		1" PVC CheckValves	2	ea	61.00	122	29.00	58			180
		Pipe Supports	8	EA	20.00	160	10.00	80			240
		Outside Vaults									
		4' x 4' x 4" Precast Vault	2	Ea	1,125.00	2,250	1,600.00	3,200			5,450
		6" thick 3/4" Crushed Rock	5	SY	1.94	10	1.28	6			16
		Piping									
		Backflow Preventer	1	EA	1,000.00	1,000	48.50	49			1,049
		1-inch Copper Piping	30	LF	7.40	222	4.00	120			342
		Hose Bibbs	2	EA	12.90	26	20.00	40			66
		Eyewash Station	1	EA	1,050.00	1,050	305.00	305			1,355
		18-inch CML&C/CML&EC Steel Pipe	200	LF	138.00	27,600	178.15	35,630			63,230
		18-inch steel Elbows	4	EA	1,575.00	6,300	1,545.50	6,182			12,482
		18-inch x 16" Reducers	2	Ea	1,200.00	2,400	1,300.00	2,600			5,000
		16-inch Magmeter	1	Ea	10,000.00	10,000	1,000.00	1,000			11,000
		16-inch MOV BFV	1	EA	10,600.00	10,600	1,000.00	1,000			11,600
		Pressure Transmitters/Gauges	2	EA	20.00	40	42.00	84			124
		2-inch CAV	1	EA	720.00	720	150.00	150			870
		16-inch CML&C.CML&EC Pipe	20	LF	149.00	2,980	146.00	2,920			5,900
		16-inch Electronic Control Valve	1	Ea	18,000.00	18,000	20,000.00	20,000			38,000
		Pipe Supports	3	EA	1,500.00	4,500	500.00	1,500			6,000
		Excavation	255	cy			6.01	1,533			1,533
		Bedding, sand with combacktion	106	cy	19.00	2,014	13.93	1,477			3,491
		Backfill	130	cy			7.82	1,017			1,017
		Spoil	20	cy			9.97	199			199
		Trench Shield, assume 100'/day	3	wks					577	1,731	1,731
		Electrical & Instrumentation									
		Electrical & Instrumentation, Lighting, etc.	1	LS					116,787	116,787	116,787
		SCE underground line extension	1,000	LF					35	34,540	34,540
		Meter Service	1	LS					10,000	10,000	10,000
		Subtotals				156928.21		139092.14		203057.58	499,077.93
		Division 1 Costs	@	10%		15692.82		13909.21		20305.76	49,907.79
		Subtotals				172621.03		153001.35		223363.34	548,985.72
		Taxes - Materials Costs	@	7.75%		13378.13					13,378.13
		Subtotals				185999.16		153001.35		223363.34	562,363.85
		Taxes - Labor Costs									
		Subtotals				185999.16		153001.35		223363.34	562,363.85
		Contractor Markup for Sub	@	10%						22336.33	22,336.33
		Subtotals				185999.16		153001.35		245699.67	584,700.19
		Contractor OH&P	@	15%		27899.87		22950.20			50,850.08
		Subtotals				213899.04		175951.55		245699.67	635,550.27
		Estimate Contingency	@	20%							127,110.05
		Subtotals									762,660.32
		Escalate to Midpoint of Construct	@	3%							22,879.81
		Estimated Bid Cost									785,540.13
		Total Estimate									786,000.00

Appendix F
Greenhouse Gas Emissions Analysis

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Adelanto R^3 Extension Project

GREENHOUSE GAS ANALYSIS

MOJAVE WATER AGENCY

Baldy Mesa area, City of Victorville, San Bernardino County

PREPARED BY:

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SEPTEMBER 12, 2019

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LIST OF ABBREVIATED TERMS

(1)	Reference
AB	Assembly Bill
AB 32	Global Warming Solutions Act
AB 1493	Pavley Regulations and Fuel Efficiency Standards
AB 1881	California Water Conservation in Landscaping Act of 2006
APA	Administrative Procedure Act
AQIA	Air Quality Impact Analysis
BAU	Business As Usual
C_2F_6	Hexafluoroethane
C_2H_6	Ethane
$C_2H_2F_4$	Tetrafluroethane
$C_2H_4F_2$	Ethylidene Fluoride
CAA	Federal Clean Air Act
CalEEMod	California Emissions Estimator Model
CALEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CBSC	California Building Standards Commission
CEC	California Energy Commission
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CEQA	California Environmental Quality Act
CF_4	Tetrafluoromethane
CFC	Chlorofluorocarbons
CH_4	Methane
CHF_3	Carbon Trifluoride
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH4	Methane
CITY	City of Banning
CNRA	California Natural Resources Agency
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COP	Conference of Parties
CPUC	California Public Utilities Commission

EPA	Environmental Protection Agency
FED	Functional Equivalent Document
GCC	Global Climate Change
GHGA	Greenhouse Gas Analysis
GHG Plan	Greenhouse Gas Plan
GWP	Global Warming Potential
H_2O	Water
HFC	Hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
ISO	Independent System Operator
LBNL	Lawrence Berkeley National Laboratory
LCFS	Low Carbon Fuel Standard
LEVIII	Low-Emission Vehicle
MMR	Mandatory Reporting Rule
$MMTCO_2e$	Million Metric Ton of Carbon Dioxide Equivalent
MPG	Miles Per Gallon
MPO	Metropolitan Planning Organizations
MT/YR	Metric Tons Per Year
$MTCO_2e$	Metric Ton of Carbon Dioxide Equivalent
N_20	Nitrogen Dioxide
NDC	Nationally Determined Contributions
NF_3	Nitrogen Trifluoride
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute for Occupational Safety and Health
NO_X	Oxides of Nitrogen
OPR	Office of Planning and Research
PFC	Perfluorocarbons
PM_{10}	Particulate Matter 10 microns in diameter or less
$PM_{2.5}$	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
PROJECT	Adelanto R^3 Extension Project
RTP	Regional Transportation Plan
SAR	Second Assessment Report
SB	Senate Bill
SB 32	California Global Warming Solutions Act of 2006
SB 375	Regional Greenhouse Gas Emissions Reduction
SB 1078	Renewable Portfolio Standards
SB 1368	Emissions Performance Standards

SCAQMD	South Coast Air Quality Management District
SF_6	Sulfur Hexaflouride
SLPS	Short-Lived Climate Pollutant Strategy
TITLE 20	Appliance Energy Efficiency Standards
TITLE 24	Building Energy Efficiency Standards
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile Organic Compounds
WRI	World Resources Institute

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this *Adelanto R³ Extension Project Greenhouse Gas Analysis* (GHGA) is summarized below based on the significance criteria in Section 3 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1). Table ES-1 shows the findings of significance for potential greenhouse gas (GHG) impacts under CEQA.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
GHG Impact #1: The Project would not generate direct or indirect GHG emission that would result in a significant impact on the environment.	3.8	*Less Than Significant*	*n/a*
GHG Impact #2: The Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.	3.8	*Less Than Significant*	*n/a*

ES.2 PROJECT REQUIREMENTS

The Project would be required to comply with regulations imposed by the State of California and the Mojave Desert Air Quality Management District (MDAQMD) aimed at the reduction of air pollutant emissions. Those that are directly and indirectly applicable to the Project and that would assist in the reduction of GHG emissions include:

- Global Warming Solutions Act of 2006 (AB 32) (2).
- Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies (SB 375) (3).
- Pavley Fuel Efficiency Standards (AB 1493). Establishes fuel efficiency ratings for new vehicles (4).
- Title 24 California Code of Regulations - California Building Code (CCR, Title 24). Establishes energy efficiency requirements for new construction (5).
- Title 20 California Code of Regulations - Appliance Energy Efficiency Standards (CCR, Title 20). Establishes energy efficiency requirements for appliances (6).
- Executive Order S-01-07 - Low Carbon Fuel Standard (LCFS). Requires carbon content of fuel sold in California to be 10% less by 2020 (7).
- California Water Conservation in Landscaping Act of 2006 (AB 1881). Requires local agencies to adopt the Department of Water Resources updated Water Efficient Landscape Ordinance or equivalent by January 1, 2010 to ensure efficient landscapes in new development and reduced water waste in existing landscapes (8).

- Statewide Retail Provider Emissions Performance Standards (SB 1368). Requires energy generators to achieve performance standards for GHG emissions (9).
- Renewable Portfolio Standards (SB 1078). Requires electric corporations to increase the amount of energy obtained from eligible renewable energy resources to 20 percent by 2010 and 33 percent by 2020 (10).
- California Global Warming Solutions Act of 2006 (SB 32). Requires the state to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15 (11).

Promulgated regulations that will affect the Project's emissions are accounted for in the Project's GHG calculations provided in this report. In particular, the AB 1493, LCFS, and SB 1078 will be in effect for the AB 32 target year of 2020, and therefore are accounted for in the Project's emission calculations.

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1 INTRODUCTION

This report presents the results of the GHGA prepared by Urban Crossroads, Inc., for the Adelanto R^3 Extension Project (Project).

The purpose of this GHGA is to evaluate Project-related construction and operational emissions and determine the level of GHG impacts as a result of constructing and operating the proposed Project.

1.1 SITE LOCATION

The proposed Adelanto R^3 Extension Project is located in the Baldy area of the City of Victorville, in San Bernardino County.

There are no commercial developments adjacent to the Project. Adjacent residential developments are located approximately 100 feet to the north of the intersection of Mesa View Drive and Olivine Road and along Mesa View Drive, south of Bear Valley Road.

1.2 PROJECT DESCRIPTION

The Project includes the following components:

Existing Turnout 6 Modifications

The existing Turnout 6 and Turnout 7 facility will be modified into a dedicated Turnout 6 facility to solely provide water supply to the City of Victorville. Modifications will include adding a pumping unit, modifying the turnout piping and related electrical and instrumentation improvements.

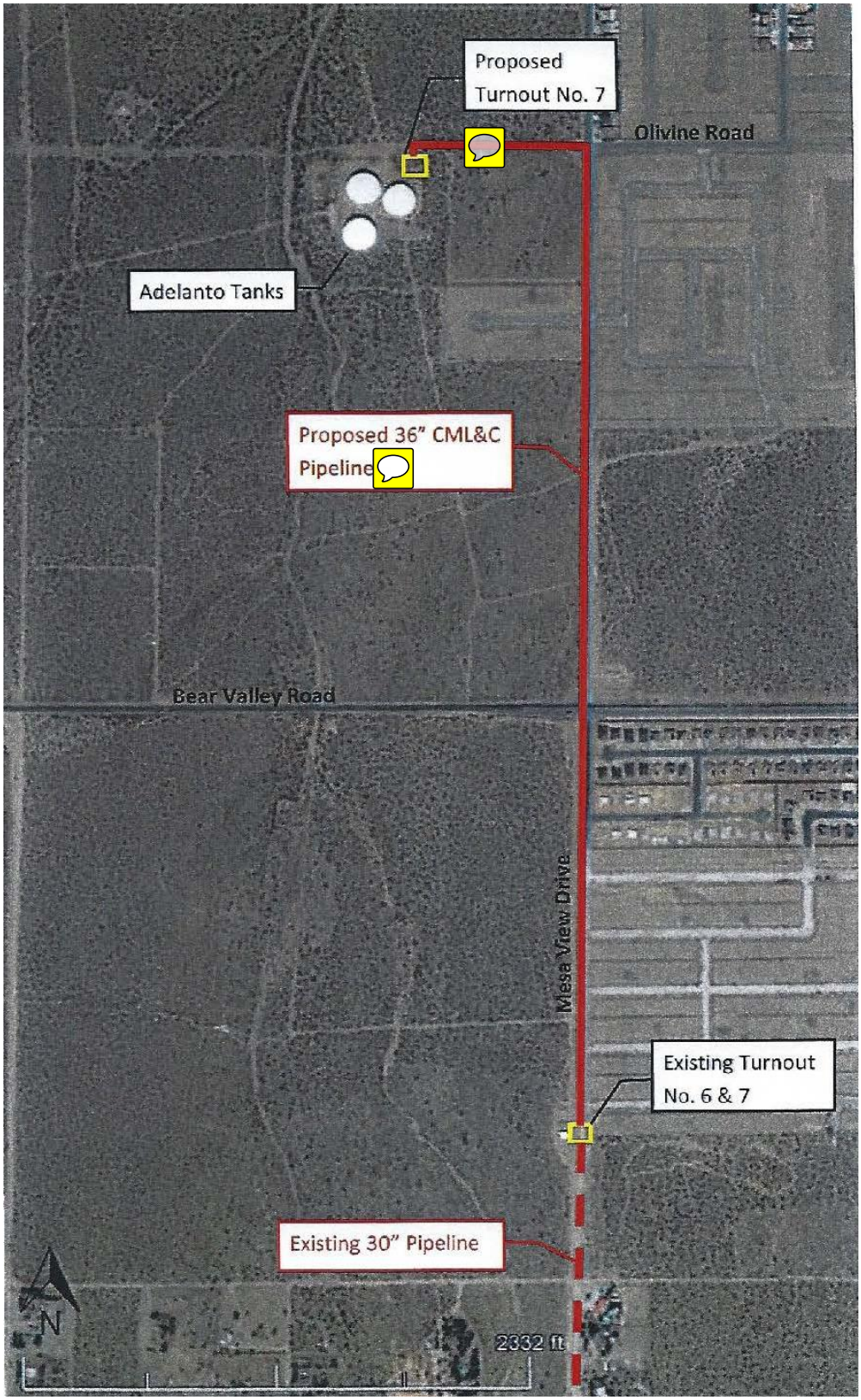
Relocated Turnout 7

The existing Turnout 7, currently located within Turnout 6 facility, will be relocated to within the boundaries of the existing Adelanto reservoir facility. Improvements to Turnout 7 will include the construction of a turnout structure enclosed within an 18 x 46 x 16-foot building and a steel pipeline which will support the future on-site reservoir pipeline distribution system. The relocated Turnout 7 will be re-sized to convey the full volume of the R^3 water delivery to the City of Adelanto.

New Pipeline

The Project will also include installation of pipeline between Turnout 6 and Turnout 7.

EXHIBIT 1-A: PROJECT CONCEPT SKETCH



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2 CLIMATE CHANGE SETTING

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. The majority of scientists believe that the climate shift taking place since the Industrial Revolution is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of GHGs in the earth's atmosphere, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. The majority of scientists believe that this increased rate of climate change is the result of GHGs resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this GHGA cannot generate enough GHG emissions to affect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of GHGs combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, Section 3.0 will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

2.2 GLOBAL CLIMATE CHANGE DEFINED

GCC refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water (H_2O) vapor, CO_2, N_2O, CH_4, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the earth's atmosphere, but prevent radioactive heat from escaping, thus warming the earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages.

Gases that trap heat in the atmosphere are often referred to as GHGs. GHGs are released into the atmosphere by both natural and anthropogenic (human) activity. Without the natural GHG effect, the earth's average temperature would be approximately 61° Fahrenheit cooler than it is currently. The cumulative accumulation of these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

2.3 GREENHOUSE GASES

GREENHOUSE GASES AND HEALTH EFFECTS

GHGs trap heat in the atmosphere, creating a GHG effect that results in global warming and climate change. Many gases demonstrate these properties and as discussed in Table 2-1. For the purposes of this analysis, emissions of CO_2, CH_4, and N_2O were evaluated (see Table 3-1 later in

this report) because these gases are the primary contributors to GCC from development projects. Although there are other substances such as fluorinated gases that also contribute to GCC, these fluorinated gases were not evaluated as their sources are not well-defined and do not contain accepted emissions factors or methodology to accurately calculate these gases.

TABLE 2-1: GREENHOUSE GASES

Greenhouse Gases	Description	Sources	Health Effects
H_2O	H_20 is the most abundant, important, and variable GHG in the atmosphere. H_2O vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. A climate feedback is an indirect, or secondary, change, either positive or negative, that occurs within the climate system in response to a forcing mechanism. The feedback loop in which H_2O is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more H_2O is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more H_2O when it is warmer), leading to more H_2O vapor in the atmosphere. As a GHG, the higher concentration of H_2O vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more H_2O vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop	The main source of H_2O vapor is evaporation from the oceans (approximately 85 percent). Other sources include evaporation from other H_2O bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.	There are no known direct health effects related to H_2O vapor at this time. It should be noted however that when some pollutants react with H_2O vapor, the reaction forms a transport mechanism for some of these pollutants to enter the human body through H_2O vapor.

Greenhouse Gases	Description	Sources	Health Effects
	will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when H_2O vapor increases in the atmosphere, more of it will eventually condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the earth's surface and heat it up) (12).		
CO_2	CO_2 is an odorless and colorless GHG. Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO_2 concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of CO_2 in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (13).	CO_2 is emitted from natural and manmade sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas, and wood. CO_2 is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks (14).	Outdoor levels of CO_2 are not high enough to result in negative health effects. According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of CO_2 can result in health effects such as: headaches, dizziness, restlessness, difficulty breathing, sweating, increased heart rate, increased cardiac output, increased blood pressure, coma, asphyxia, and/or convulsions. It should be noted that current concentrations of CO_2 in the earth's atmosphere are estimated to be approximately 370 ppm, the actual reference exposure level (level at which adverse health effects typically occur) is at exposure levels of 5,000 ppm averaged over 10 hours in a 40-hour workweek and short-term reference exposure levels of 30,000 ppm averaged over a 15 minute period (15).

Greenhouse Gases	Description	Sources	Health Effects
CH_4	CH_4 is an extremely effective absorber of radiation, although its atmospheric concentration is less than CO_2 and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs.	CH_4 has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of CH_4. Other anthropocentric sources include fossil-fuel combustion and biomass burning (16).	CH_4 is extremely reactive with oxidizers, halogens, and other halogen-containing compounds. Exposure to high levels of CH_4 can cause asphyxiation, loss of consciousness, headache and dizziness, nausea and vomiting, weakness, loss of coordination, and an increased breathing rate.
N_2O	N_2O, also known as laughing gas, is a colorless GHG. Concentrations of N_2O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb).	N_2O is produced by microbial processes in soil and H_2O, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also	N_2O can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage) (17).

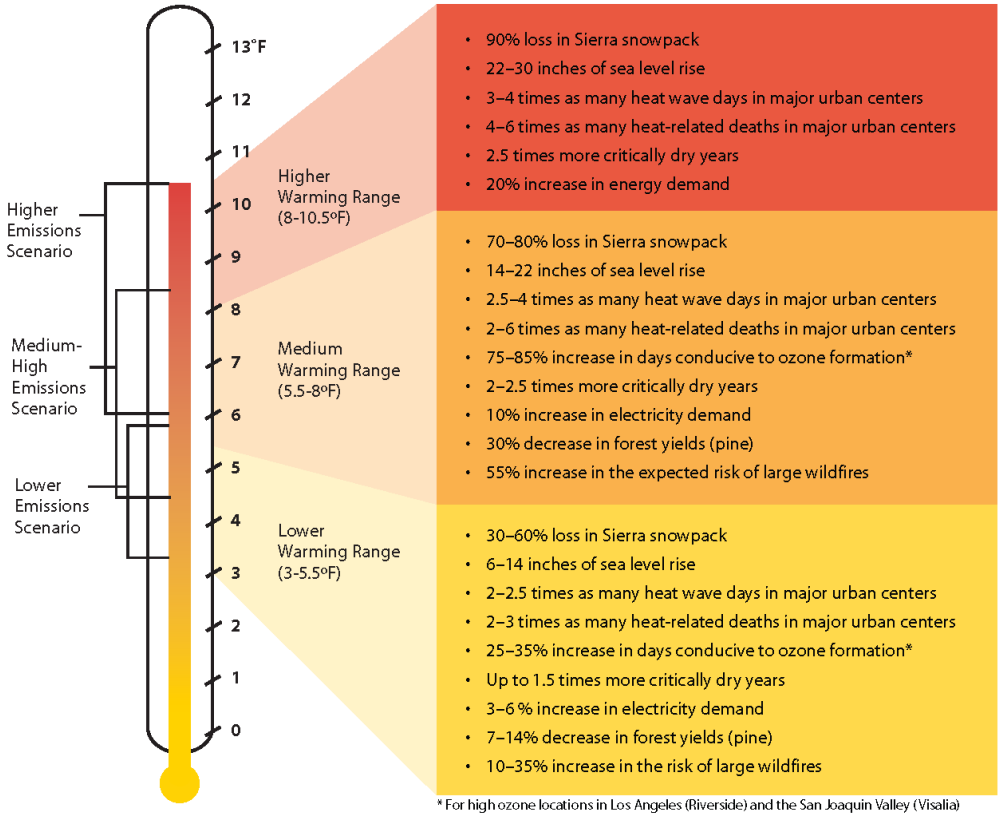
Greenhouse Gases	Description	Sources	Health Effects
		used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. N_2O can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction (17).	
Chlorofluorocarbons (CFCs)	CFCs are gases formed synthetically by replacing all hydrogen atoms in CH_4 or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the earth's surface).	CFCs have no natural source but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years (18).	In confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation.

Greenhouse Gases	Description	Sources	Health Effects
HFCs	HFCs are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential (GWP). The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CH_2FCF), and HFC-152a (CH_3CF_2). Prior to 1990, the only significant emissions were of HFC-23. HFC-134a emissions are increasing due to its use as a refrigerant.	HFCs are manmade for applications such as automobile air conditioners and refrigerants.	No health effects are known to result from exposure to HFCs.
PFCs	PFCs have stable molecular structures and do not break down through chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above earth's surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). The EPA estimates that concentrations of CF_4 in the atmosphere are over 70 parts per trillion (ppt).	The two main sources of PFCs are primary aluminum production and semiconductor manufacture.	No health effects are known to result from exposure to PFCs.
SF_6	SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (23,900) (19). The EPA indicates that concentrations in the 1990s were about 4 ppt.	SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.	In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.
Nitrogen Trifluoride (NF_3)	NF_3 is a colorless gas with a distinctly moldy odor. The World Resources Institute (WRI)	NF_3 is used in industrial processes and is produced in the manufacturing of	Long-term or repeated exposure may affect the liver

Greenhouse Gases	Description	Sources	Health Effects
	indicates that NF_3 has a 100-year GWP of 17,200 (20).	semiconductors, LCD (Liquid Crystal Display) panels, types of solar panels, and chemical lasers.	and kidneys and may cause fluorosis (21).

The potential health effects related directly to the emissions of CO_2, CH_4, and N_2O as they relate to development projects such as the proposed Project are still being debated in the scientific community. Their cumulative effects to GCC have the potential to cause adverse effects to human health. Increases in Earth's ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (22). Exhibit 2-A presents the potential impacts of global warming (23).

EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT, 2070-2099 (AS COMPARED WITH 1961-1990)



Source: Barbara H. Allen-Diaz. "Climate change affects us all." *University of California, Agriculture and Natural Resources*, 2009.

2.4 GLOBAL WARMING POTENTIAL

GHGs have varying GWP values. GWP of a GHG indicates the amount of warming a gas causes over a given period of time and represents the potential of a gas to trap heat in the atmosphere. CO_2 is utilized as the reference gas for GWP, and thus has a GWP of 1. Carbon dioxide equivalent (CO_2e) is a term used for describing the difference GHGs in a common unit. CO_2e signifies the amount of CO_2 which would have the equivalent GWP.

The atmospheric lifetime and GWP of selected GHGs are summarized at Table 2-2. As shown in the table below, GWP for the Second Assessment Report (SAR), the Intergovernmental Panel on Climate Change (IPCC)'s scientific and socio-economic assessment on climate change, range from 1 for CO_2 to 23,900 for SF_6 and GWP for the IPCC's 5th Assessment Report range from 1 for CO_2 to 23,500 for SF_6 (24).

TABLE 2-2: GLOBAL WARMING POTENTIAL AND ATMOSPHERIC LIFETIME OF SELECT GHGS

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)	
		SAR	5th Assessment Report
CO_2	See*	1	1
CH_4	12 .4	21	28
N_2O	121	310	265
HFC-23	222	11,700	12,400
HFC-134a	13.4	1,300	1,300
HFC-152a	1.5	140	138
SF_6	3,200	23,900	23,500

*As per Appendix 8.A. of IPCC's 5th Assessment Report, no single lifetime can be given.
Source: Table 2.14 of the IPCC Fourth Assessment Report, 2007

2.5 GREENHOUSE GAS EMISSIONS INVENTORIES

Global

Worldwide anthropogenic (human) GHG emissions are tracked by the IPCC for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Human GHG emissions data for Annex I nations are available through 2017. Based on the latest available data, the sum of these emissions totaled approximately 29,216,501 Gg CO_2e[1] (25) (26) as summarized on Table 2-3.

[1] The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2017 data, the UNFCCC data for the most recent year were used. United Nations Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF," The most recent GHG emissions for China and India are from 2014.

United States

As noted in Table 2-3, the United States, as a single country, was the number two producer of GHG emissions in 2017.

TABLE 2-3: TOP GHG PRODUCING COUNTRIES AND THE EUROPEAN UNION [2]

Emitting Countries	GHG Emissions (Gg CO_2e)
China	11,911,710
United States	6,456,718
European Union (28-member countries)	4,323,163
India	3,079,810
Russian Federation	2,155,470
Japan	1,289,630
Total	**29,216,501**

Note: Gg – gigagram

State of California

California has significantly slowed the rate of growth of GHG emissions due to the implementation of energy efficiency programs as well as adoption of strict emission controls, but is still a substantial contributor to the U.S. emissions inventory total (27). The California Air Resource Board (CARB) compiles GHG inventories for the State of California. Based upon the 2018 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2016 GHG emissions period, California emitted an average 429.4 million metric tons of CO_2e ($MMTCO_2e$) per year including emissions resulting from imported electrical power in 2015 (28).

2.6 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

Public Health

Higher temperatures may increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation could increase from 25 to 35 percent under the lower warming range to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances, depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming range scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large

[2] Used http://unfccc.int data for Annex I countries. Consulted the CAIT Climate Data Explorer in https://www.climatewatchdata.org site to reference Non-Annex I countries of China and India.

increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures could increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Water Resources

A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

If temperatures continue to increase, more precipitation could fall as rain instead of snow, and the snow that does fall could melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. Under the lower warming range scenario, snowpack losses could be only half as large as those possible if temperatures were to rise to the higher warming range. How much snowpack could be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack could pose challenges to water managers and hamper hydropower generation. It could also adversely affect winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater could degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta – a major fresh water supply.

Agriculture

Increased temperatures could cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply needed. Although higher CO_2 levels can stimulate plant production and increase plant water-use efficiency, California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts.

In addition, continued GCC could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued GCC could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

GCC has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In contrast, wildfires in northern California could increase by up to 90 percent due to decreased precipitation.

Moreover, continued GCC has the potential to alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems could decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests has the potential to decrease as a result of GCC.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Under the higher warming range scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate low-lying coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. Under the lower warming range scenario, sea level could rise 12-14 inches.

2.7 REGULATORY SETTING

INTERNATIONAL

Climate change is a global issue involving GHG emissions from all around the world; therefore, countries such as the ones discussed below have made an effort to reduce GHGs.

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nation's Framework Convention on Climate Change ("Convention"). On March 21, 1994, the U.S. joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to

expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

International Climate Change Treaties. The Kyoto Protocol is an international agreement linked to the Convention. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at an average of five percent against 1990 levels over the five-year period 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2° Celsius above pre-industrial levels, subject to a review in 2015. The UN Climate Change Committee held additional meetings in Durban, South Africa in November 2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings are gradually gaining consensus among participants on individual climate change issues.

On September 23, 2014 more than 100 Heads of State and Government and leaders from the private sector and civil society met at the Climate Summit in New York hosted by the United Nations. At the Summit, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

Parties to the U.N. Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12, 2015 in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating a four-year negotiating round, the new treaty ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. This includes, for the first time, requirements that all parties report regularly on their emissions and implementation efforts and undergo international review.

The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st session of the UNFCCC Conference of the Parties (COP) 21. Together, the Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees;
- Establish binding commitments by all parties to make "nationally determined contributions" (NDCs), and to pursue domestic measures aimed at achieving them;

- Commit all countries to report regularly on their emissions and "progress made in implementing and achieving" their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they will "represent a progression" beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;
- Extend a mechanism to address "loss and damage" resulting from climate change, which explicitly will not "involve or provide a basis for any liability or compensation;"
- Require parties engaging in international emissions trading to avoid "double counting;" and
- Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country's NDC (C2ES 2015a) (29).

On June 2, 2017 President Donald Trump announced his intention to withdraw from the Paris Agreement. It should be noted that under the terms of the agreement, the United Sates cannot formally announce its resignation until November 4, 2019. Subsequently, withdrawal would be effective one year after notification in 2020.

NATIONAL

Prior to the last decade, there have been no concrete federal regulations of GHGs or major planning for climate change adaptation. The following are actions regarding the federal government, GHGs, and fuel efficiency.

GHG Endangerment. In *Massachusetts v. Environmental Protection Agency* 549 U.S. 497 (2007), decided on April 2, 2007, the Supreme Court found that four GHGs, including CO_2, are air pollutants subject to regulation under Section 202(a)(1) of the Federal Clean Air Act (CAA). The Court held that the EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs— CO_2, CH_4, N_2O, HFCs, PFCs, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section

"Clean Vehicles" below. After a lengthy legal challenge, the U.S. Supreme Court declined to review an Appeals Court ruling that upheld the EPA Administrator's findings (30).

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the U.S. On April 1, 2010, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the U.S.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty (MD) passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon (mpg) if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. Together, these standards would cut CO_2 emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the NHTSA issued final rules on a second-phase joint rulemaking establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012 (EPA 2012c). The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and MD passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO_2 in model year 2025, which is equivalent to 54.5 mpg if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty (HD) trucks and buses on September 15, 2011, effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20 percent reduction in CO_2 emissions and fuel consumption by the 2018 model year. For HD pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles and a 15 percent reduction for diesel vehicles by the 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10 percent reduction in fuel consumption and CO_2 emissions from the 2014 to 2018 model years.

On April 2, 2018, the EPA signed the Mid-term Evaluation Final Determination, which finds that the model year 2022-2025 GHG standards are not appropriate and should be revised (31). This Final Determination serves to initiate a notice to further consider appropriate standards for model year 2022-2025 light-duty vehicles. On August 24, 2018, the EPA and NHTSA published a proposal to freeze the model year 2020 standards through model year 2026 and to revoke California's waiver under the CAA to establish more stringent standards (32).

Mandatory Reporting of GHGs. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On

September 22, 2009, the EPA issued the Final Mandatory Reporting of GHGs Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the U.S. and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons per year (MT/yr) or more of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010, that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these CAA permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the Federal Code of Regulations, the EPA states:

> *"This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for GHG emissions until at least April 30, 2016."*

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for GHG Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of CO_2 for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatts would be required to meet an output-based standard of 1,000 pounds of CO_2 per megawatt-hour, based on the performance of widely used natural gas combined cycle technology. It should be noted that on February 9, 2016 the U.S. Supreme Court issued a stay of this regulation pending litigation. Additionally, the current EPA Administrator has also signed a measure to repeal the Clean Power Plan, including the CO_2 standards.

Cap-and-Trade. Cap-and-trade refers to a policy tool where emissions are limited to a certain amount and can be traded or provides flexibility on how the emitter can comply. Successful examples in the U.S. include the Acid Rain Program and the Nitrous Oxide (NO_X) Budget Trading Program and Clean Air Interstate Rule in the northeast. There is no federal GHG cap-and-trade

program currently; however, some states have joined to create initiatives to provide a mechanism for cap-and-trade.

The Regional GHG Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps CO_2 emissions from power plants, auctions CO_2 emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners were originally California, British Columbia, Manitoba, Ontario, and Quebec. However, Manitoba and Ontario are not currently participating. California linked with Quebec's cap-and-trade system January 1, 2014, and joint offset auctions took place in 2015 (C2ES 2015).

SmartWay Program. The SmartWay Program is a public-private initiative between the EPA, large and small trucking companies, rail carriers, logistics companies, commercial manufacturers, retailers, and other federal and state agencies. Its purpose is to improve fuel efficiency and the environmental performance (reduction of both GHG emissions and air pollution) of the goods movement supply chains. SmartWay is comprised of four components (EPA 2014):

1. SmartWay Transport Partnership: A partnership in which freight carriers and shippers commit to benchmark operations, track fuel consumption, and improve performance annually.
2. SmartWay Technology Program: A testing, verification, and designation program to help freight companies identify equipment, technologies, and strategies that save fuel and lower emissions.
3. SmartWay Vehicles: A program that ranks light-duty cars and small trucks and identifies superior environmental performers with the SmartWay logo.
4. SmartWay International Interests: Guidance and resources for countries seeking to develop freight sustainability programs modeled after SmartWay.

SmartWay effectively refers to requirements geared towards reducing fuel consumption. Most large trucking fleets driving newer vehicles are compliant with SmartWay design requirements. Moreover, over time, all HD trucks will have to comply with the CARB GHG Regulation that is designed with the SmartWay Program in mind, to reduce GHG emissions by making them more fuel-efficient. For instance, in 2015, 53 foot or longer dry vans or refrigerated trailers equipped with a combination of SmartWay-verified low-rolling resistance tires and SmartWay-verified aerodynamic devices would obtain a total of 10 percent or more fuel savings over traditional trailers.

Through the SmartWay Technology Program, the EPA has evaluated the fuel saving benefits of various devices through grants, cooperative agreements, emissions and fuel economy testing, demonstration projects and technical literature review. As a result, the EPA has determined the following types of technologies provide fuel saving and/or emission reducing benefits when used properly in their designed applications, and has verified certain products:

- Idle reduction technologies – less idling of the engine when it is not needed would reduce fuel consumption.

- Aerodynamic technologies minimize drag and improve airflow over the entire tractor-trailer vehicle. Aerodynamic technologies include gap fairings that reduce turbulence between the tractor and trailer, side skirts that minimize wind under the trailer, and rear fairings that reduce turbulence and pressure drop at the rear of the trailer.
- Low rolling resistance tires can roll longer without slowing down, thereby reducing the amount of fuel used. Rolling resistance (or rolling friction or rolling drag) is the force resisting the motion when a tire rolls on a surface. The wheel will eventually slow down because of this resistance.
- Retrofit technologies include things such as diesel particulate filters, emissions upgrades (to a higher tier), etc., which would reduce emissions.
- Federal excise tax exemptions.

CALIFORNIA

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark AB 32 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

Global Warming Solutions Act of 2006 (AB 32). The California State Legislature enacted AB 32, which requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "GHGs" as defined under AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The CARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

> *"Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems."*

CARB approved the 1990 GHG emissions level of 427 $MMTCO_2e$ on December 6, 2007 (CARB 2007). Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 $MMTCO_2e$. Emissions in 2020 in a "business as usual" (BAU) scenario were estimated to be 596 $MMTCO_2e$, which do not account for reductions from AB 32 regulations (CARB 2008). At that level, a 28.4 percent reduction was required to achieve the 427 $MMTCO_2e$ 1990 inventory. In October 2010, CARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation

is now estimated at 545 $MMTCO_2e$. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels (CARB 2010).

Progress in Achieving AB 32 Targets and Remaining Reductions Required

The State has made steady progress in implementing AB 32 and achieving targets included in Executive Order S-3-05. The progress is shown in updated emission inventories prepared by CARB for 2000 through 2012 (CARB 2014a). The State has achieved the Executive Order S-3-05 target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target.

- 1990: 427 $MMTCO_2e$ (AB 32 2020 target)
- 2000: 463 $MMTCO_2e$ (an average 8 percent reduction needed to achieve 1990 base)
- 2010: 450 $MMTCO_2e$ (an average 5 percent reduction needed to achieve 1990 base)

CARB has also made substantial progress in achieving its goal of achieving 1990 emissions levels by 2020. As described earlier in this section, CARB revised the 2020 BAU inventory forecast to account for new lower growth projections, which resulted in a new lower reduction from BAU to achieve the 1990 base. The previous reduction from 2020 BAU needed to achieve 1990 levels was 28.4 percent and the latest reduction from 2020 BAU is 21.7 percent.

- 2020: 545 $MMTCO_2e$ BAU (an average 21.7 percent reduction from BAU needed to achieve 1990 base)

California Global Warming Solutions Act of 2006 (SB 32). On September 8, 2016, Governor Jerry Brown signed the Senate Bill (SB) 32 and its companion bill, Assembly Bill (AB) 197. SB 32 requires the state to reduce statewide GHG emissions to 40 percent below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal of 1990 levels by 2020 and provides an intermediate goal to achieving S-3-05, which sets a statewide GHG reduction target of 80 percent below 1990 levels by 2050. AB 197 creates a legislative committee to oversee regulators to ensure that CARB not only responds to the Governor, but also the Legislature (11).

CARB Scoping Plan. CARB's Climate Change Scoping Plan ("Scoping Plan") contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32 (CARB 2008). The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;

- Establishing targets for transportation related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the LCFS; and
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The CARB approved the First Update to the Scoping Plan ("Update") on May 22, 2014. The Update identifies the next steps for California's climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 GHG limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities for the next several years. The Update does not set new targets for the State but describes a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050 (CARB 2014).

Forecasting the amount of emissions that would occur in 2020 if no actions are taken was necessary to assess the amount of reductions California must achieve to return to the 1990 emissions level by 2020 as required by AB 32. The no-action scenario is known as "business-as-usual" or BAU. The CARB originally defined the BAU scenario as emissions in the absence of any GHG emission reduction measures discussed in the Scoping Plan.

As part of CEQA compliance for the Scoping Plan, CARB prepared a Supplemental Functional Equivalent Document (FED) in 2011. The FED included an updated 2020 BAU emissions inventory projection based on current economic forecasts (i.e., as influenced by the economic downturn) and emission reduction measures already in place, replacing its prior 2020 BAU emissions inventory. CARB staff derived the updated emissions estimates by projecting emissions growth, by sector, from the state's average emissions from 2006–2008. The new BAU estimate includes emission reductions for the million-solar-roofs program, the AB 1493 (Pavley I) motor vehicle GHG emission standards, and the LCFS. In addition, CARB factored into the 2020 BAU inventory emissions reductions associated with 33 percent Renewables Portfolio Standard (RPS) for electricity generation. The updated BAU estimate of 507 $MMTCO_2e$ by 2020 requires a reduction of 80 $MMTCO_2e$, or a 16 percent reduction below the estimated BAU levels to return to 1990 levels (i.e., 427 $MMTCO_2e$) by 2020.

In order to provide a BAU reduction that is consistent with the original definition in the Scoping Plan and with threshold definitions used in thresholds adopted by lead agencies for CEQA purposes and many CAPs, the updated inventory without regulations was also included in the Supplemental FED. The CARB 2020 BAU projection for GHG emissions in California was originally estimated to be 596 $MMTCO_2e$. The updated CARB 2020 BAU projection in the Supplemental FED is 545 $MMTCO_2e$. Considering the updated BAU estimate of 545 $MMTCO_2e$ by 2020, CARB estimates a 21.7 percent reduction below the estimated statewide BAU levels is necessary to

return to 1990 emission levels (i.e., 427 $MMTCO_2e$) by 2020, instead of the approximate 28.4 percent BAU reduction previously reported under the original Climate Change Scoping Plan (2008).

2017 Climate Change Scoping Plan Update

In November 2017, CARB released the final 2017 Scoping Plan Update, which identifies the State's post-2020 reduction strategy. The 2017 Scoping Plan Update reflects the 2030 target of a 40 percent reduction below 1990 levels, set by Executive Order B-30-15 and codified by SB 32. Key programs that the proposed Second Update builds upon include the Cap-and-Trade Regulation, the LCFS, and much cleaner cars, trucks and freight movement, utilizing cleaner, renewable energy, and strategies to reduce CH_4 emissions from agricultural and other wastes.

The 2017 Scoping Plan establishes a new emissions limit of 260 $MMTCO_2e$ for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030.

California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (CH_4, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California's local air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks.
- LCFS, with an increased stringency (18 percent by 2030).
- Implementing SB 350, which expands the RPS to 50 percent RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of zero-emission vehicles (ZEV) trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing CH_4 and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Continued implementation of SB 375.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- 20 percent reduction in GHG emissions from refineries by 2030.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

Note, however, that the 2017 Scoping Plan acknowledges that:

> *"[a]chieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA."*

In addition to the statewide strategies listed above, the 2017 Scoping Plan also identifies local governments as essential partners in achieving the State's long-term GHG reduction goals and identifies local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 metric tons of CO_2e ($MTCO_2e$) or less per capita by 2030 and 2 $MTCO_2e$ or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or, a performance-based metric using a CAP or other plan to reduce GHG emissions is appropriate.

According to research conducted by the Lawrence Berkeley National Laboratory (LBNL) and supported by CARB, California, under its existing and proposed GHG reduction policies, is on track to meet the 2020 reduction targets under AB 32 and could achieve the 2030 goals under SB 32. The research utilized a new, validated model known as the California LBNL GHG Analysis of Policies Spreadsheet (CALGAPS), which simulates GHG and criteria pollutant emissions in California from 2010 to 2050 in accordance to existing and future GHG-reducing policies. The CALGAPS model showed that GHG emissions through 2020 could range from 317 to 415 $MTCO_2e$ per year, "indicating that existing state policies will likely allow California to meet its target [of 2020 levels under AB 32]." CALGAPS also showed that by 2030, emissions could range from 211 to 428 $MTCO_2e$ per year, indicating that "even if all modeled policies are not implemented, reductions could be sufficient to reduce emissions 40 percent below the 1990 level [of SB 32]." CALGAPS analyzed emissions through 2050 even though it did not generally account for policies that might be put in place after 2030. Although the research indicated that the emissions would not meet the State's 80 percent reduction goal by 2050, various combinations of policies could allow California's cumulative emissions to remain very low through 2050 (33) (34).

Cap-and-Trade Program. The Scoping Plan identifies a Cap-and-Trade Program as one of the key strategies for California to reduce GHG emissions. According to CARB, a cap-and-trade program will help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by the year 2020 and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap will be able to trade permits to emit GHGs within the overall limit.

CARB adopted a California Cap-and-Trade Program pursuant to its authority under AB 32. See Title 17 of the California Code of Regulations (CCR) §§ 95800 to 96023). The Cap-and-Trade Program is designed to reduce GHG emissions from major sources (deemed "covered entities")

by setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve AB 32's emission-reduction mandate of returning to 1990 levels of emissions by 2020. The statewide cap for GHG emissions from the capped sectors (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and will decline over time, achieving GHG emission reductions throughout the program's duration.

Covered entities that emit more than 25.000 $MTCO_2e$ per year must comply with the Cap-and-Trade Program. Triggering of the 25.000 $MTCO_2e$ per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of GHG Emissions (Mandatory Reporting Rule or "MRR").

Under the Cap-and-Trade Program, CARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities are allocated free allowances in whole or part (if eligible), and may buy allowances at auction, purchase allowances from others, or purchase offset credits. Each covered entity with a compliance obligation is required to surrender "compliance instruments" (30) for each $MTCO_2e$ of GHG they emit. There also are requirements to surrender compliance instruments covering 30 percent of the prior year's compliance obligation by November of each year. For example, in November 2014, a covered entity was required to submit compliance instruments to cover 30 percent of its 2013 GHG emissions.

The Cap-and-Trade Program provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by CARB in the First Update:

> *"The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative (CARB 2014)."*

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. Thus, the Cap-and-Trade Program assures that California will meet its 2020 GHG emissions reduction mandate:

> *"The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. The Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions. In sum, the Cap-and-Trade Program will achieve aggregate, rather than site specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by CARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the State's emissions forecasts and the effectiveness of direct regulatory measures (CARB 2014)."*

As of January 1, 2015, the Cap-and-Trade Program covered approximately 85 percent of California's GHG emissions. The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period. While the Cap-and-Trade Program technically covered fuel suppliers as early as 2012, they did not have a compliance obligation (i.e., they were not fully regulated) until 2015. The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are "supplied" (i.e., delivered into commerce). Accordingly, as with stationary source GHG emissions and GHG emissions attributable to electricity use, virtually all, if not all, of GHG emissions from CEQA projects associated with VMT are covered by the Cap-and-Trade Program (CARB 2015) (35). In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. "Capped" strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the Program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. "Uncapped" strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional GHG emission reductions.[3]

[3] On March 17, 2011, the San Francisco Superior Court issued a final decision in *Association of Irritated Residents v. California Air Resources Board* (Case No. CPF-09-509562). While the Court upheld the validity of the CARB Scoping Plan for the implementation of AB 32, the Court enjoined CARB from further rulemaking under AB 32 until CARB amends its CEQA environmental review of the Scoping Plan to address the flaws identified by the Court. On May 23, 2011, CARB filed an appeal. On June 24, 2011, the Court of Appeal granted CARB's petition staying

Sustainable Communities and Climate Protection Act of 2008 (SB 375). Passing the Senate on August 30, 2008, Senate Bill (SB) 375 was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: it (1) requires metropolitan planning organizations (MPO) to include sustainable community strategies in their regional transportation plans (RTP) for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28, states that CEQA findings for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts, or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the CARB accepts as achieving the GHG emission reduction targets.
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

Pavley Regulations and Fuel Efficiency Standards (AB 1493). California AB 1493, enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in about a 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program (LEV III) or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025.

the trail court's order pending consideration of the appeal. In the interest of informed decision-making, on June 13, 2011, CARB released the expanded alternatives analysis in a draft Supplement to the AB 32 Scoping Plan Functional Equivalent Document. The CARB Board approved the Scoping Plan and the CEQA document on August 24, 2011.

The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles and hydrogen fuel cell cars. The package will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

Clean Energy and Pollution Reduction Act of 2015 (SB 350). In October 2015, the legislature approved, and the Governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the RPS, higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States (California Leginfo 2015).

EXECUTIVE ORDERS RELATED TO GHG EMISSIONS

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the state and guide the actions of state agencies.

Executive Order B-55-18 and SB 100. Executive Order B-55-18 and SB 100. SB 100 and Executive Order B-55-18 were signed by Governor Brown on September 10, 2018. Under the existing RPS, 25 percent of retail sales are required to be from renewable sources by December 31, 2016, 33 percent by December 31, 2020, 40 percent by December 31, 2024, 45 percent by December 31, 2027, and 50 percent by December 31, 2030. SB 100 raises California's RPS requirement to 50 percent renewable resources target by December 31, 2026, and to achieve a 60 percent target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. In addition to targets under AB 32 and SB 32, Executive Order B-55-18 establishes a carbon neutrality goal for the state of California by 2045; and sets a goal to maintain net negative emissions thereafter. The Executive Order directs the California Natural Resources Agency (CNRA), California Environmental Protection Agency (CalEPA), the California Department of Food and Agriculture (CDFA), and CARB to include sequestration targets in the

Natural and Working Lands Climate Change Implementation Plan consistent with the carbon neutrality goal.

Executive Order S-3-05. Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

Executive Order S-01-07. The Governor signed Executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the Executive Order established a LCFS and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the CARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to CARB for consideration as an "early action" item under AB 32. The CARB adopted the LCFS on April 23, 2009.

The LCFS was challenged in the U.S. District Court in Fresno in 2011. The court's ruling issued on December 29, 2011, included a preliminary injunction against CARB's implementation of the rule. The Ninth Circuit Court of Appeals stayed the injunction on April 23, 2012, pending final ruling on appeal, allowing CARB to continue to implement and enforce the regulation. The Ninth Circuit Court's decision, filed September 18, 2013, vacated the preliminary injunction. In essence, the court held that LCFS adopted by CARB were not in conflict with federal law. On August 8, 2013, the Fifth District Court of Appeal (California) ruled CARB failed to comply with CEQA and the Administrative Procedure Act (APA) when adopting regulations for LCFS. In a partially published opinion, the Court of Appeal reversed the trial court's judgment and directed issuance of a writ of mandate setting aside Resolution 09-31 and two executive orders of CARB approving LCFS regulations promulgated to reduce GHG emissions. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while CARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, CARB was required to bring a new LCFS regulation to the Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon intensity fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement.

On November 16, 2015 the Office of Administrative Law (OAL) approved the Final Rulemaking Package. The new LCFS regulation became effective on January 1, 2016.

Executive Order S-13-08. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the Order, the 2009 California Climate Adaptation Strategy (CNRA 2009) was adopted, which is the ". . . first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Order B-30-15. On April 29, 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The Order sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050 and directs CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of $MMTCO_2e$. The Order also requires the state's climate adaptation plan to be updated every three years, and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this Order is not legally enforceable for local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate is in process in the State Legislature.

CALIFORNIA REGULATIONS AND BUILDING CODES

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

Appliance Efficiency Standards (CCR, Title 20). CCR, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. 23 categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles or other mobile equipment (CEC 2012).

Title 24 Energy Efficiency Standards and California Green Building Standards. California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration

and possible incorporation of new energy efficient technologies and methods. CCR, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect on January 1, 2011, and is administered by the California Building Standards Commission. CALGreen is updated on a regular basis, with the most recent approved update consisting of the 2019 CALGreen that will be effective January 1, 2020. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction and demolition ordinances and defers to them as the ruling guidance provided, they establish a minimum 65 percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State Building Code provides the minimum standard that buildings must meet in order to be certified for occupancy, which is generally enforced by the local building official.

Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2019 version of Title 24 was adopted by the California Energy Commission (CEC) and will become effective on January 1, 2020. It should be noted that the analysis herein assumes compliance with the 2019 Title 24 Standards because the Project will be constructed after January 1, 2020.

The 2019 Title 24 standards will result in less energy use, thereby reducing air pollutant emissions associated with energy consumption in the MDAB and across the State of California. For example, the 2019 Title 24 standards will require solar photovoltaic systems for new homes, establish requirements for newly constructed healthcare facilities, encourage demand responsive technologies for residential buildings, and update indoor and outdoor lighting requirements for nonresidential buildings. The CEC anticipates that single-family homes built with the 2019 standards will use approximately 7 percent less energy compared to the residential homes built under the 2016 standards. Additionally, after implementation of solar photovoltaic systems, homes built under the 2019 standards will use about 53 percent less energy than homes built under the 2016 standards. Nonresidential buildings (such as the proposed Project) will use approximately 30 percent less energy due to lighting upgrade requirements (36).

Because the Project will be constructed after January 1,2019, the 2019 CALGreen standards are applicable to the Project and require, among other items (37):

- Short-term bicycle parking. If the new project or an additional alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility (5.106.4.1.2).
- Designated parking. In new projects or additions to alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).

- Construction waste management. Recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1. 5.405.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent (5.408.1).
- Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed (5.408.3).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive (5.410.1).
- Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:
    - Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush (5.303.3.1)
    - Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush (5.303.3.2.1). The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush (5.303.3.2.2).
    - Showerheads. Single showerheads shall have a minimum flow rate of not more than 1.8 gallons per minute and 80 psi (5.303.3.3.1). When a shower is served by more than one showerhead, the combine flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi (5.303.3.3.2).
    - Faucets and fountains. Nonresidential lavatory faucets shall have a maximum flow rate of note more than 0.5 gallons per minute at 60 psi (5.303.3.4.1). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute of 60 psi (5.303.3.4.2). Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute (5.303.3.4.3). Metering faucets shall not deliver more than 0.20 gallons per cycle (5.303.3.4.4). Metering faucets for wash fountains shall have a maximum flow rate not more than 0.20 gallons per cycle (5.303.3.4.5).
- Outdoor portable water use in landscaped areas. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient (MWELO), whichever is more stringent (5.304.1).
- Water meters. Separate submeters or metering devices shall be installed for new buildings or additions in excess of 50,000 square feet (sf) or for excess consumption where any tenant within a new building or within an addition that is project to consume more than 1,000 gal/day (5.303.1.1 and 5.303.1.2).
- Outdoor water use in rehabilitated landscape projects equal or greater than 2,500 sf. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sf requiring a building or landscape permit (5.304.3).
- Commissioning. For new buildings 10,000 sf and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements (5.410.2).

Model Water Efficient Landscape Ordinance. The Model Water Efficient Landscape Ordinance ("Ordinance") was required by AB 1881, the Water Conservation Act. The bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected upon compliance with the ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed Department of Water Resources (DWR) to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015 effective December 15, 2015. New development projects that include landscape areas of 500 sf or more are subject to the Ordinance. The update requires:

- More efficient irrigation systems;
- Incentives for graywater usage;
- Improvements in on-site stormwater capture;
- Limiting the portion of landscapes that can be planted with high water use plants; and
- Reporting requirements for local agencies.

CARB Refrigerant Management Program. CARB adopted a regulation in 2009 to reduce refrigerant GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal. The regulation is set forth in sections 95380 to 95398 of Title 17, CCR. The rules implementing the regulation establish a limit on statewide GHG emissions from stationary facilities with refrigeration systems with more than 50 pounds of a high GWP refrigerant. The refrigerant management program is designed to (1) reduce emissions of high-GWP GHG refrigerants from leaky stationary, non-residential refrigeration equipment; (2) reduce emissions from the installation and servicing of refrigeration and air-conditioning appliances using high-GWP refrigerants; and (3) verify GHG emission reductions.

Tractor-Trailer GHG Regulation. The tractors and trailers subject to this regulation must either use EPA SmartWay certified tractors and trailers or retrofit their existing fleet with SmartWay verified technologies. The regulation applies primarily to owners of 53-foot or longer box-type trailers, including both dry-van and refrigerated-van trailers, and owners of the HD tractors that pull them on California highways. These owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. Sleeper cab tractors model year 2011 and later must be SmartWay certified. All other tractors must use SmartWay verified low rolling resistance tires. There are also requirements for trailers to have low rolling resistance tires and aerodynamic devices.

Phase I and 2 Heavy-Duty Vehicle GHG Standards. CARB has adopted a new regulation for GHG emissions from HD trucks and engines sold in California. It establishes GHG emission limits on truck and engine manufacturers and harmonizes with the EPA rule for new trucks and engines nationally. Existing HD vehicle regulations in California include engine criteria emission standards, tractor-trailer GHG requirements to implement SmartWay strategies (i.e., the Heavy-Duty Tractor-Trailer Greenhouse Gas Regulation), and in-use fleet retrofit requirements such as the Truck and Bus Regulation. In September 2011, the EPA adopted their new rule for HD trucks

and engines. The EPA rule has compliance requirements for new compression and spark ignition engines, as well as trucks from Class 2b through Class 8. Compliance requirements begin with model year (MY) 2014 with stringency levels increasing through MY 2018. The rule organizes truck compliance into three groupings, which include a) HD pickups and vans; b) vocational vehicles; and c) combination tractors. The EPA rule does not regulate trailers.

CARB staff has worked jointly with the EPA and the NHTSA on the next phase of federal GHG emission standards for MD and HD vehicles, called federal Phase 2. The federal Phase 2 standards were built on the improvements in engine and vehicle efficiency required by the Phase 1 emission standards and represent a significant opportunity to achieve further GHG reductions for 2018 and later model year HD vehicles, including trailers. But as discussed above, the EPA and NHTSA have proposed to roll back GHG and fuel economy standards for cars and light-duty trucks, which suggests a similar rollback of Phase 2 standards for MD and HD vehicles may be pursued.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research (OPR) shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the OPR pursuant to subdivision (a)." Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA.

On December 28, 2018, the Natural Resources Agency announced the OAL approved the amendments to the CEQA Guidelines for implementing the CEQA. The CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

Section 1506.4 was amended to state that in determining the significance of a project's GHG emissions, the lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and state regulatory schemes. Additionally, a lead agency may use a model or methodology to estimate GHG emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use (38).

2.8 DISCUSSION ON ESTABLISHMENT OF SIGNIFICANCE THRESHOLDS

The City of Victorville has not adopted a numeric significance threshold for determining significant impacts associated with GHG emissions. As such thresholds established by the MDAQMD are utilized.

On May 13, 2010 EPA finalized the GHG Tailoring Rule (75 FR 31514, June 3, 2010). The Tailoring Rule sets major source emissions thresholds that define when federal operating permits under Prevention Significant Deterioration (PSD) or Title V are required. The Tailoring Rule establishes a threshold of 100,000 tons per year (tpy) or 90,719 MT per year (MT/yr)[4] of GHGs from new sources above which sources are considered major sources requiring a federal operating permit.

As such, the MDAQMD has adopted a significance threshold for GHGs of 100,000 tpy and is thus applied to this project (39). More specifically, 100,000 tpy of GHG emissions from a single facility constitutes major sources that require a federal operating permit. Similarly, the MDAQMDs NO_X significance threshold of 25 tons/year is equal to the major source threshold applicable to areas designated severe non-attainment for ozone. As such, use of the EPAs determination of whether a Project is a major source and consequently establishing a threshold based on that is supported by substantial evidence.

[4] For purposes of analysis, this GHGA utilizes the 90,719 MT/yr threshold.

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3 PROJECT GREENHOUSE GAS IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will result in a significant GHG impact. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related GHG impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to GHG if it would (1):

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG?

3.3 CALIFORNIA EMISSIONS ESTIMATOR MODEL™ EMPLOYED TO ANALYZE GHG EMISSIONS

On October 17, 2017, the SCAQMD, in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model™ (CalEEMod) v2016.3.2. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (VOCs, NO_X, SO_X, CO, PM_{10}, and $PM_{2.5}$) and GHG emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (40). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine GHG emissions. Output from the model runs for construction activity is provided in Appendix 3.1.

3.4 CONSTRUCTION EMISSIONS

Construction activities associated with the Project would result in emissions of CO_2 and CH_4 from construction activities. The report *Adelanto R³ Extension Project Air Quality Impact Analysis Report* (Urban Crossroads, Inc., 2019) (AQIA) contains detailed information regarding construction activity (41).

3.5 OPERATIONAL EMISSIONS

In terms of operational GHG emissions, the proposed Project involves upgrading the existing turnout 6, relocating turnout 7, and existing pipeline. The proposed Project does not include any substantive new stationary or mobile sources of emissions, and therefore, by its very nature, will not generate quantifiable GHG emissions from Project operations. While it is anticipated that the Project would require intermittent maintenance to be, such maintenance would be minimal requiring a negligible amount of traffic trips on an annual basis. Therefore, there is no significant operational impact.

3.6 EMISSIONS SUMMARY

As shown in Table 3-1, the Project will result in approximately 1,544.69 $MTCO_2e$ per year from construction activities.

TABLE 3-1: PROJECT GHG EMISSIONS

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Annual construction-related emissions	1,534.32	0.41	0.00	1,544.69
Total CO_2E (All Sources)	**1,544.69**			

Source: CalEEMod model output, See Appendix 3.1 for detailed model outputs.

3.7 GREENHOUSE GAS EMISSIONS FINDINGS AND RECOMMENDATIONS

GHG Impact #1: The Project would generate direct or indirect GHG emission that would result in a significant impact on the environment.

The Mojave Water Agency has not adopted a numeric significance threshold for determining significant impacts associated with GHG emissions. As such thresholds established by the MDAQMD are utilized.

On May 13, 2010, the EPA finalized the GHG Tailoring Rule. The Tailoring Rule sets major source emissions thresholds that define when federal operating permits under PSD or Title V are required. The Tailoring Rule establishes a threshold of 100,000 tpy or 90,719 MT/yr of GHGs from new sources above which sources are considered major sources requiring a federal operating permit.

As such, the MDAQMD has adopted a significance threshold for GHGs of 100,000 tpy and is thus applied to this project (39). More specifically, 100,000 tpy of GHG emissions from a single facility constitutes major sources that require a federal operating permit. Similarly, the MDAQMDs NO_X significance threshold of 25 tons/year is equal to the major source threshold applicable to areas designated severe non-attainment for ozone. As such, use of the EPAs determination of whether a Project is a major source and consequently establishing a threshold based on that is supported by substantial evidence.

The annual GHG emissions associated with the operation of the proposed Project are estimated to be 1,544.69 $MTCO_2e$ per year as summarized in Table 3-1. As such, the proposed Project would result in a less than significant impact with respect to GHG emissions for GHG Impact #1.

GHG Impact #2: The Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHG.

As discussed above, the Project involves construction activity and does not propose a trip-generating land use or facilities that would generate any substantive amount of on-going GHG emissions. As presented in Table 3-1, the project's short-term GHG emissions are below the 90,719 MT/yr screening threshold. As concluded in Impact Statement GHG-1 the proposed

Project would not generate a significant amount of GHGs emissions. The proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Impacts are less than significant in this regard.

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5 CERTIFICATIONS

The contents of this GHG study report represent an accurate depiction of the GHG impacts associated with the proposed Adelanto R^3 Extension Project. The information contained in this GHG report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 3.1:

CALEEMOD ANNUAL CONSTRUCTION EMISSIONS MODEL OUTPUTS

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Adelanto R3 Extension Project (Construction - Unmitigated)

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 Light Industry	0.84	1000sqft	0.02	844.00	0
Other Asphalt Surfaces	13.75	1000sqft	0.32	13,750.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	32
Climate Zone	10			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Annual

Project Characteristics -

Land Use - The General Light Industrial land use will be used to model the Building and Pre-Cast Concrete Vault at Turnout 7 and the Other Asphalt Surfaces will be used to model the Pipeline.

Construction Phase - Duration of construction activity is anticipated to take place over the course of 1 year (365 days)

Off-road Equipment - Construction Equipment based on information provided by the Project Applicant.

Grading - For purposes of analysis, total acres graded per day is based on the equipment specific grading rates (CalEEMod Appendix A) and the equipment list.

Trips and VMT - Haul Trips based on the CalEEMod assumption of a 16 CY haul capacity.

Vehicle Trips - Construction Run Only.

Energy Use - Construction Run Only.

Water And Wastewater - Construction Run Only.

Solid Waste - Construction Run Only.

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	365.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	PhaseEndDate	3/18/2020	3/1/2021
tblConstructionPhase	PhaseStartDate	3/17/2020	3/2/2020
tblEnergyUse	LightingElect	2.93	0.00
tblEnergyUse	NT24E	5.02	0.00
tblEnergyUse	NT24NG	17.13	0.00
tblEnergyUse	T24E	2.20	0.00
tblEnergyUse	T24NG	15.36	0.00
tblGrading	AcresOfGrading	0.00	261.00
tblGrading	MaterialImported	0.00	3,354.00
tblLandUse	LandUseSquareFeet	840.00	844.00
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Dumpers/Tenders

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Annual

tblOffRoadEquipment	OffRoadEquipmentType		Off-Highway Trucks
tblOffRoadEquipment	OffRoadEquipmentType		Pavers
tblOffRoadEquipment	OffRoadEquipmentType		Cement and Mortar Mixers
tblOffRoadEquipment	OffRoadEquipmentType		Other Construction Equipment
tblOffRoadEquipment	OffRoadEquipmentType		Cranes
tblOffRoadEquipment	OffRoadEquipmentType		Generator Sets
tblOffRoadEquipment	OffRoadEquipmentType		Rollers
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	UsageHours	1.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblSolidWaste	SolidWasteGenerationRate	1.04	0.00
tblTripsAndVMT	HaulingTripNumber	419.00	420.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TTP	59.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	0.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	SU_TR	0.68	0.00

tblVehicleTrips	WD_TR	6.97	0.00
tblWater	IndoorWaterUseRate	194,250.00	0.00

2.0 Emissions Summary

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					
2020	0.9905	9.1563	6.2706	0.0149	1.1342	0.4094	1.5436	0.5403	0.3817	0.9220	0.0000	1,282.4680	1,282.4680	0.3468	0.0000	1,291.1381
2021	0.1813	1.6171	1.2005	2.9200e-003	0.3367	0.0716	0.4083	0.1189	0.0668	0.1857	0.0000	251.8504	251.8504	0.0681	0.0000	253.5526
Maximum	**0.9905**	**9.1563**	**6.2706**	**0.0149**	**1.1342**	**0.4094**	**1.5436**	**0.5403**	**0.3817**	**0.9220**	**0.0000**	**1,282.4680**	**1,282.4680**	**0.3468**	**0.0000**	**1,291.1381**

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					
2020	0.9905	9.1563	6.2706	0.0149	1.1342	0.4094	1.5436	0.5403	0.3817	0.9220	0.0000	1,282.4666	1,282.4666	0.3468	0.0000	1,291.1366
2021	0.1813	1.6171	1.2005	2.9200e-003	0.3367	0.0716	0.4083	0.1189	0.0668	0.1857	0.0000	251.8501	251.8501	0.0681	0.0000	253.5523
Maximum	**0.9905**	**9.1563**	**6.2706**	**0.0149**	**1.1342**	**0.4094**	**1.5436**	**0.5403**	**0.3817**	**0.9220**	**0.0000**	**1,282.4666**	**1,282.4666**	**0.3468**	**0.0000**	**1,291.1366**

	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**

Adelanto R3 Extension Project (Construction - Unmitigated) - San Bernardino-Mojave Desert County, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-2-2020	6-1-2020	3.0610	3.0610
2	6-2-2020	9-1-2020	3.0609	3.0609
3	9-2-2020	12-1-2020	3.0278	3.0278
4	12-2-2020	3-1-2021	2.7969	2.7969
		Highest	3.0610	3.0610

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	5.6500e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
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	**5.6500e-003**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

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	5.6500e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
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	**5.6500e-003**	**0.0000**	**1.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

	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	Project Construction	Grading	3/2/2020	3/1/2021	7	365	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.32

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
Project Construction	Excavators	1	8.00	158	0.38
Project Construction	Dumpers/Tenders	10	8.00	16	0.38
Project Construction	Off-Highway Trucks	3	8.00	402	0.38
Project Construction	Concrete/Industrial Saws	0	8.00	81	0.73
Project Construction	Pavers	1	8.00	130	0.42
Project Construction	Cement and Mortar Mixers	3	8.00	9	0.56
Project Construction	Other Construction Equipment	1	8.00	172	0.42
Project Construction	Cranes	1	8.00	231	0.29
Project Construction	Generator Sets	1	8.00	84	0.74
Project Construction	Rollers	1	8.00	80	0.38
Project Construction	Rubber Tired Dozers	1	8.00	247	0.40
Project Construction	Tractors/Loaders/Backhoes	1	8.00	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
Project Construction	24	60.00	0.00	420.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Project Construction - 2020

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					1.0570	0.0000	1.0570	0.5198	0.0000	0.5198	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9533	9.0849	5.9898	0.0140		0.4087	0.4087		0.3811	0.3811	0.0000	1,205.6845	1,205.6845	0.3441	0.0000	1,214.2870
Total	**0.9533**	**9.0849**	**5.9898**	**0.0140**	**1.0570**	**0.4087**	**1.4657**	**0.5198**	**0.3811**	**0.9009**	**0.0000**	**1,205.6845**	**1,205.6845**	**0.3441**	**0.0000**	**1,214.2870**

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	1.1100e-003	0.0443	6.7800e-003	1.4000e-004	3.4700e-003	1.3000e-004	3.6000e-003	9.4000e-004	1.2000e-004	1.0600e-003	0.0000	13.1109	13.1109	7.4000e-004	0.0000	13.1295
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	0.0361	0.0270	0.2740	7.1000e-004	0.0737	5.1000e-004	0.0742	0.0196	4.7000e-004	0.0201	0.0000	63.6726	63.6726	1.9600e-003	0.0000	63.7216
Total	**0.0372**	**0.0714**	**0.2808**	**8.5000e-004**	**0.0772**	**6.4000e-004**	**0.0778**	**0.0205**	**5.9000e-004**	**0.0211**	**0.0000**	**76.7835**	**76.7835**	**2.7000e-003**	**0.0000**	**76.8511**

3.2 Project Construction - 2020

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					1.0570	0.0000	1.0570	0.5198	0.0000	0.5198	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.9533	9.0849	5.9898	0.0140		0.4087	0.4087		0.3811	0.3811	0.0000	1,205.6831	1,205.6831	0.3441	0.0000	1,214.2855
Total	**0.9533**	**9.0849**	**5.9898**	**0.0140**	**1.0570**	**0.4087**	**1.4657**	**0.5198**	**0.3811**	**0.9009**	**0.0000**	**1,205.6831**	**1,205.6831**	**0.3441**	**0.0000**	**1,214.2855**

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	1.1100e-003	0.0443	6.7800e-003	1.4000e-004	3.4700e-003	1.3000e-004	3.6000e-003	9.4000e-004	1.2000e-004	1.0600e-003	0.0000	13.1109	13.1109	7.4000e-004	0.0000	13.1295
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	0.0361	0.0270	0.2740	7.1000e-004	0.0737	5.1000e-004	0.0742	0.0196	4.7000e-004	0.0201	0.0000	63.6726	63.6726	1.9600e-003	0.0000	63.7216
Total	**0.0372**	**0.0714**	**0.2808**	**8.5000e-004**	**0.0772**	**6.4000e-004**	**0.0778**	**0.0205**	**5.9000e-004**	**0.0211**	**0.0000**	**76.7835**	**76.7835**	**2.7000e-003**	**0.0000**	**76.8511**

3.2 Project Construction - 2021

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					0.3193	0.0000	0.3193	0.1143	0.0000	0.1143	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1745	1.6043	1.1497	2.7600e-003		0.0715	0.0715		0.0667	0.0667	0.0000	237.1675	237.1675	0.0676	0.0000	238.8574
Total	**0.1745**	**1.6043**	**1.1497**	**2.7600e-003**	**0.3193**	**0.0715**	**0.3908**	**0.1143**	**0.0667**	**0.1810**	**0.0000**	**237.1675**	**237.1675**	**0.0676**	**0.0000**	**238.8574**

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	2.1000e-004	8.0600e-003	1.3000e-003	3.0000e-005	2.8600e-003	2.0000e-005	2.8900e-003	7.2000e-004	2.0000e-005	7.4000e-004	0.0000	2.5558	2.5558	1.4000e-004	0.0000	2.5594
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	6.6000e-003	4.7600e-003	0.0495	1.3000e-004	0.0145	1.0000e-004	0.0146	3.8500e-003	9.0000e-005	3.9400e-003	0.0000	12.1272	12.1272	3.5000e-004	0.0000	12.1359
Total	**6.8100e-003**	**0.0128**	**0.0508**	**1.6000e-004**	**0.0174**	**1.2000e-004**	**0.0175**	**4.5700e-003**	**1.1000e-004**	**4.6800e-003**	**0.0000**	**14.6829**	**14.6829**	**4.9000e-004**	**0.0000**	**14.6952**

3.2 Project Construction - 2021

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					0.3193	0.0000	0.3193	0.1143	0.0000	0.1143	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1745	1.6043	1.1497	2.7600e-003		0.0715	0.0715		0.0667	0.0667	0.0000	237.1672	237.1672	0.0676	0.0000	238.8571
Total	**0.1745**	**1.6043**	**1.1497**	**2.7600e-003**	**0.3193**	**0.0715**	**0.3908**	**0.1143**	**0.0667**	**0.1810**	**0.0000**	**237.1672**	**237.1672**	**0.0676**	**0.0000**	**238.8571**

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	2.1000e-004	8.0600e-003	1.3000e-003	3.0000e-005	2.8600e-003	2.0000e-005	2.8900e-003	7.2000e-004	2.0000e-005	7.4000e-004	0.0000	2.5558	2.5558	1.4000e-004	0.0000	2.5594
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	6.6000e-003	4.7600e-003	0.0495	1.3000e-004	0.0145	1.0000e-004	0.0146	3.8500e-003	9.0000e-005	3.9400e-003	0.0000	12.1272	12.1272	3.5000e-004	0.0000	12.1359
Total	**6.8100e-003**	**0.0128**	**0.0508**	**1.6000e-004**	**0.0174**	**1.2000e-004**	**0.0175**	**4.5700e-003**	**1.1000e-004**	**4.6800e-003**	**0.0000**	**14.6829**	**14.6829**	**4.9000e-004**	**0.0000**	**14.6952**

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 Light Industry	0.00	0.00	0.00		
Other Asphalt Surfaces	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 Light Industry	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010
Other Asphalt Surfaces	0.549952	0.037123	0.179649	0.119457	0.017229	0.005267	0.017877	0.062669	0.001348	0.001607	0.006000	0.000812	0.001010

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 Light 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
Other Asphalt Surfaces	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 Light 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
Other Asphalt Surfaces	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**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	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 Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	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

	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	5.6500e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Unmitigated	5.6500e-003	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004

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	1.4600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Total	**5.6600e-003**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

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	1.4600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	4.1900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Total	**5.6600e-003**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	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 Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	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 Light Industry	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	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 Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	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 Light Industry	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	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

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