

DRAFT INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION
EAST AMES-RECHE RECHARGE FACILITY PROJECT
LANDERS, CALIFORNIA

PREPARED FOR:

MOJAVE WATER AGENCY

13846 CONFERENCE CENTER DRIVE, APPLE VALLEY, CA 92307

Mojave Water Agency

PREPARED BY:

ARDURRA GROUP

ARDURRA

SEPTEMBER 12, 2025

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For the proposed:

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Apple Valley, CA 92307

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LIST OF ACRONYMS

AAQS	Ambient Air Quality Standards
AB	Assembly Bill
APN	Assessor's Parcel Number
ADT	Average Daily Traffic
AMSL	Above Mean Sea Level
ANSI	American National Standard Institute
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
bgs	Below Ground Surface
BMP	Best Management Practice
CAAQS	California Ambient Air Quality Standards
CA DOC	California Department of Conservation
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CalFIRE	California Department of Forestry and Fire Protection
CalGREEN	California Green Building Standards Code
CalTrans	California Department of Transportation
CARB	California Air Resources Board
CASQA	California Stormwater Quality Association
CDFW	California Department of Fish and Wildlife
CDNPA	California Desert Native Plants Act
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Data Base
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
CRHR	California Register of Historic Resources
CUPACWA	Certified Unified Program Agency
CWA	Clean Water Act
D/E/N	Day / Evening / Night
dB	Decibel
dBA or dB(A)	Decibel "A-Weighted"
dBA / DD	Decibel per Double Distance
dBA Leq	Average Noise Level over a Period of Time
DNL	Day-Night Average Noise Level
DOC	Department of Conservation
DTSC	California Department of Toxic Substances Control
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ERU	Emergency Response Unit
ESA	Endangered Species Act (federal)
FEMA	Federal Emergency Management Agency
FFMP	Farmland Mapping and Monitoring Program
FHSZ	Fire Hazard Severity Zone
FHWA	Federal Highway Administration
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	Greenhouse Gas

GP	General Plan
Gpm	Gallons per minute
GWh	Gigawatt-Hour
HWMP	Hazardous Waste Management Plan
IRWMP	Integrated Regional Water Management Plan
IS/MND	Initial Study/ Mitigated Negative Declaration
L_{02}, L_{08}, L_{50}, L_{90}	A-weighted Noise Levels at 2 percent, 8 percent, 50 percent, and 90 percent, respectively, of the time period
Ldn	Day-Night Average Sound Level
Leq(x)	Equivalent Noise Level for "x" period of time
Leq	Equivalent Noise Level
LID	Low Impact Development
Lmax	Maximum Level of Noise (measured using a sound level meter)
Lmin	Minimum Level of Noise (measured using a sound level meter)
LOS	Level of Service
Lp	Sound Pressure Level
Lw	Sound Power Level
MBTA	Migratory Bird Treaty Act
MDAQMD	Mojave Desert Air Quality Management District
Mgd	Million gallons per day
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
MRZ	Mineral Resource Zones
MS4	Municipal Separate Storm Sewer System
MSHCP	Multi-Species Habitat Conservation Plan
MWA	Mojave Water Agency
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NO2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
O3	Ozone
OPR	California Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PM10	Particulate matter 10 micrometers or less in diameter
PM2.5	Particulate matter 2.5 micrometers or less in diameter
PPV	Peak Particle Velocities
RCNM	Road Construction Noise Model
RCRA	Resource Conservation and Recovery
REMEL	Reference Energy Mean Emission Level
RL	Rural Living
RMS	Root Mean Square
ROG	Reactive organic gases
RPS	Renewable Portfolio Standard
RTIP	Regional Transportation Improvement Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SBCFD	San Bernardino County Fire Department
SCADA	Supervisory control and data acquisition
SCAG	Southern California Association of Governments

SCCIC	South Central Coastal Information Center
SCE	Southern California Edison
SIP	State Implementation Plan
SJMSHCP	San Joaquin Multiple Species Habitat Conservation Plan
SLF	Sacred Lands File
SMARA	Surface Mining and Reclamation Act
SO2	Sulfur Dioxide
SR	State Route
SSPWC	Standard Specifications for Public Works Construction
SWMP	Storm Water Management Program
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic air contaminant
TIs	Traffic Indices
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
VMT	Vehicle Miles Traveled

1.0 PURPOSE AND SCOPE

Mojave Water Agency (MWA, Agency) proposes to construct the East Ames-Reche groundwater recharge facility on approximately 10-acres of land consisting of APN 0629-211-13 and APN 0629-211-14. The Project Site has a total of approximately 640 linear feet of frontage along the north side of Winters Road in Landers, unincorporated San Bernardino County, California. Permanent improvements that are proposed with the Project include perimeter fencing, a multi-completion groundwater monitoring well, two (2) 2.5-acre groundwater recharge basins, maintenance access, and appurtenant piping connecting to an existing 12-inch water main (Ames-Reche Extension) in Winters Road. A vegetated berm, 3-feet above existing grade, will surround the property.

Once constructed, the Project will provide reliable groundwater recharge pursuant to approved goals and policies outlined in MWA's Strategic Plan for sustainable management and development of groundwater basins (MWA Strategic Plan, 2021). The purpose of the Project is to increase the functional capacity of the existing Ames-Reche Recharge for reliable groundwater recharge and sustainable groundwater management throughout periods of drought. The existing Ames-Reche recharge facility is on federal property west of the Project Site, located approximately 1,400 linear feet west of the Project, and experiences permitting and operational constraints due to the current location.

Plans for the Project indicate that activities for the construction of the East Ames-Reche groundwater recharge facility are consistent with the definition of a "Project" provided in the California Environmental Quality Act (CEQA) Statute and Guidelines, (Public Resources Code 21000-21189 and California Code of Regulations, and Title 14, Division 6, Chapter 3, Sections 15000-15387). Construction of the proposed East Ames-Reche groundwater recharge facility requires discretionary approvals and permits for construction. Due to the location and scope, the Project does not meet the definition of an exemption under CEQA, and an Initial Study must be prepared to evaluate and disclose levels of potentially significant impacts from construction and operation. This IS/MND is intended to provide evaluation and disclosure to the public and decision-makers on the level of significance of anticipated temporary and permanent impacts from Project implementation pursuant to CEQA. This document includes an Initial Study Environmental Checklist (IS), a Mitigated Negative Declaration (MND), and a Mitigation Monitoring and Reporting Program (MMRP). The use of an IS/MND requires 30-day circulation for public review and comment on the Project. This IS/MND has been circulated for a 30-day public review beginning on September 15, 2025 and ending on October 16, 2025 in compliance with CEQA.

A Mitigated Negative Declaration (MND) is the appropriate level of environmental review for CEQA compliance on the Project because all potentially significant impacts will be mitigated to less than significant levels with the incorporation of best management practices (BMPs), engineering standards, and Mitigation Measures that will be implemented during all phases of the Project pursuant to the MMRP. The Mojave Water Agency is the Project applicant and lead agency for CEQA. MWA will utilize the information in this document, along with other Project information in MWA's administrative record, for decision-making, to approve or deny the Project.

The Project is a groundwater recharge facility and will not result in cumulative or growth-inducing impacts. The Project could result in potentially significant impacts, as discussed in Section 4.0 of this document, which require the implementation of Project-specific Mitigation Measures to reduce such impacts to less than significant levels. Mitigation measures for the Project are included in an MMRP pursuant to California Public Resources Code Section § 21081.6 which will be implemented during all phases of the Project; as a result, this IS/MND indicates Project consistency with CEQA Guidelines §15070, that an MND is appropriate when:

a. The Project Initial Study identifies potentially significant effects, but: Revisions to the Project plan were made that would avoid, or reduce the effects to a point where no significant effects would occur, and
b. There is no substantial evidence that the Project, as revised, may have a significant effect on the environment.

This document is intended to be informational and for use in decision making. Levels of significant environmental impacts from Project implementation are identified within Section 4.0 of this document according to the CEQA

thresholds of significance that are found in Appendix G of the CEQA Guidelines. MWA, as the lead agency, will certify Project compliance with CEQA. MWA and Trustee and Responsible Agencies that must make decisions and issue permits on the Project will also utilize information in this document during their evaluation of the Project for discretionary approvals and permits.

Mitigation Measures proposed for each potentially significant Project impact identified in this IS/MND are included in the MMRP for the Project. The effectiveness of each Mitigation Measure has also been evaluated in the IS and technical studies for the Project. Recommended Mitigation Measures, which reduce Project impacts have been incorporated in the MMRP for the Project under the Public Resources Code, Section 21081.6, and include timing, methods of implementation, and responsible parties for implementation. The methods, timing, and responsible parties for implementation will be used by the Agency and the contractor during construction to track the implementation of Mitigation Measures and BMPs identified as required to reduce potentially significant impacts to less than significance.

1.1 Content and Format of the Initial Study/ Mitigated Negative Declaration

The IS/MND is organized as follows:

Section 1.0 – Purpose and Scope. This section introduces the scope of the proposed Project and MWA's role in the project, as well as a summary of findings.

Section 2.0 – Project Summary and Environmental Determination. This section summarizes the Project and actions undertaken by MWA; and provides the determination of the environmental document to be approved by MWA.

Section 3.0 – Project Description. This section details the Project components and general environmental setting.

Section 4.0 – Environmental Impacts. This section contains the Environmental Checklist Form (Form), in Section 15063(d)(3) of the State CEQA Guidelines, as amended, and includes a series of questions about the Project for each of the 20 subject categories as well as Mandatory Findings of Significance. The Form evaluated whether significant environmental effects were associated with the development of the Project and provided Mitigation Measures, when required, to reduce impacts to a less than-significant level.

Section 5.0 – List of Preparers. This section identifies the names and affiliations of individuals who contributed to the preparation of the environmental evaluation.

Section 6.0 – Reference Materials. This section identifies the references used in the preparation of this IS/MND.

1.2 Initial Study Summary of Findings

The analysis in this document supports findings of less than significant with mitigation for CEQA compliance based on recommendations for implementing Mitigation Measures to reduce temporary and intermittent impacts from construction as discussed in the Environmental Checklist. Therefore, Mitigation Measures have been proposed for the Project to reduce potentially significant impacts from Project construction identified in this IS/MND to a less than significant level.

1.3 Documents Incorporated by Reference

This IS/MND analyzes the environmental impacts of the most feasible design alternative for Project implementation involving a location and metrics that were not specifically evaluated in the conceptual CEQA clearances provided in the Agency's 2020 Urban Water Management Plan, 2018 Integrated Regional Water Management Plan, 2021 Strategic Plan, or County General Plan. This environmental analysis utilizes information from these previously certified EIRs and provides a Project-specific evaluation of construction and long-term operations and maintenance for the Project; this report is intended to fully disclose all reasonably anticipated impacts, under the CEQA Checklist, Appendix G of the CEQA Guidelines, from implementation of the recharge basins, including construction-related localized impacts on rural development and public facilities, permanent impacts on archeological resources, cumulative impacts, and growth inducement.

1.4 Contact Person

Any questions about the preparation of the IS/MND, its assumptions, or its conclusions should be referred to the following:

Mojave Water Agency

Attn: Melody Bailey, Water Resources Manager
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Apple Valley, CA 92307
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2.0 PROJECT SUMMARY AND ENVIRONMENTAL DETERMINATION

2.1 Project Summary

Project Title: East Ames-Reche Recharge Facility Project

Public Comment Period: September 15, 2025 - October 16, 2025

Lead Agency: Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

Contact Person and Phone Number: Melody Bailey
(760) 946-7030

Documents Posted At: https://www.mojavewater.org/

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General Plan Designation: Rural Living (RL)

Zoning: Homestead Valley (HV)/ Rural Residential (RL)

Specific Plan or Master Plan: 2020 Urban Water Master Plan; 2018 Integrated Regional Water Management Plan; 2021 Strategic Plan

Project Site Surrounding Land Uses and Setting: The Project is located in unincorporated San Bernadino County, California on Assessor's Parcel Number (APN) 0629-211-13 and - 14. Specifically, within Section 24, Township 2 North, Range 5 East San Bernardino Principal Median (Latitude 34.237068, Longitude -116.4408) See **Figure 1: Regional Location Map** and **Figure 2: Local Vicinity Map.**

The surrounding land uses are primarily vacant, rural residential developments within unincorporated San Bernardino County east of Flamingo Heights, southeast of Homestead Valley, and north of the City of Yucca Valley. See ***Table 1****. Surrounding Land Uses* and **Figure 2: Local Vicinity Map**.

TABLE 1: SURROUNDING LAND USES

	Land Use	General Plan	Zoning
Project Site	Vacant, (Portions of Abandoned Structures)	Rural Living (RL)	Homestead Valley/Rural Living (HV/ RL)[1]
North	Vacant	Rural Living (RL)	HV/RL
South	Vacant	Rural Living (RL)	HV/RL
East	Vacant, (Existing Ames-Reche Flow Control Facility)	Rural Living (RL)	HV/RL
West	Vacant, (Existing Ames-Reche Recharge Basin)	Rural Living (RL)	HV/RL

Table 1: Surrounding Land Uses
Source: San Bernardino County Land Use Map, 2020

[1] According to San Bernardino County, Rural Residential land use zoning district provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses (San Bernardino Zoning and Development Code)

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation under 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.?

The State of California and San Joaquin County Guidelines identify Native American consultation as an important aspect of the cultural resource evaluation. To identify potential Native American resources, a Sacred Lands File (SLF) Search was conducted at the Native American Heritage Commission (NAHC). A current Sacred Lands File Search response from the NAHC was received on February 5,2025 (See **Appendix C**). The results from the Sacred Lands Search were negative, indicating the absence of cultural resources in the Project Area.

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

This ISMND is intended to assist state and local agencies carry out their responsibilities for permit review or approval authority over various aspects of the Project. ***Table 2: Summary of Agency Approvals,*** identifies the permit and approval that is required for the proposed Project (see below):

TABLE 2: SUMMARY OF AGENCY APPROVALS

Agency	Permit/ Review Required
California Department of Fish & Wildlife (CDFW)	Joshua Tree Incidental Take Permit

Table 2: Summary of Agency Approvals

2.2 Environmental Analysis and Determination

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 will 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) Less Than Significant with Mitigation Incorporated" applies where the incorporation of Mitigation Measures has reduced an effect from a "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 may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or another 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 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.
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.

2.2.1 Terminology Used in This Analysis

The Initial Study is based on the Environmental Checklist Form within Section 15063 (d) (3) of the State CEQA Guidelines (CEQA 2022). The responses to questions about the proposed Project, found in Section 2.2, indicate less than significant environmental impacts with mitigation are anticipated from Project implementation. The Form in Section 2.4 is used to evaluate impacts and includes an explanation for each answer within Section 4.0. The following terminology is used to describe the level of significance of Project-related impacts.

Area of Potential Effects: The footprint of development (both horizontal and vertical) where direct impacts from the Project will occur and the Local Vicinity where indirect impacts from a project could occur.

Impact: A physical change in the environment on a sensitive or regulated resource.

Less Than Significant Impact: Level of changes in the environment from a project when there is potential for an impact based on the location of resources or the location or nature of the project; however, the extent of the change is not expected to exceed thresholds of significance identified in the Appendix G Checklist and other agency standards.

Less Than Significant Impact with Mitigation: The level of changes in the environment with the implementation of a project, which includes the application of Mitigation Measures or avoidance measures and regulations, intended to reduce changes in the environment from a project when a project has the potential to result in significant modifications, and impacts are reduced to below thresholds of significance as either stated or referenced in Appendix G and stated in other agency codes and regulations.

Local Vicinity: The area and parcels surrounding the Project Site where direct or indirect impacts from Project implementation may occur.

Mitigation: Feasible measures that could be applied to project design and construction to minimize significant adverse impacts, which are tailored to specific circumstances of a particular project and place. Mitigation places requirements on a project beyond standard applicable ordinances and is intended to tailor a project and project activities to a particular location.

No Impact: Level of changes in the environment from a project when there are either no related resources that could be affected by a project or there are no project-related changes that could result in a change in the environment.

Potentially Significant Impacts: The level of substantive changes that will result from project implementation resulting in significant changes to the environment, and expected with a project, after avoidance and Mitigation Measures have been applied, exceeding thresholds of significance.

Project: An activity undertaken by an agency or private entity that requires discretionary approval leading either to a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

Threshold of Significance: A guideline or standard established for public health, safety, welfare, protection of natural resources, or stewardship of the environment.

Significant: Substantial or potentially substantial adverse change to any of the physical conditions within the area affected by the project.

2.2.2 Project-related Terminology

A-Weighted Sound Level, dBA: The calculated levels of sound that represent perceived loudness from activities.

Ambient Noise Levels: The measured background noise levels associated with a given environment, at a specified time, usually a composite of sound from many sources, in many directions, near and far, in which usually no particular sound is dominant.

Carbon Dioxide (CO2): Common product of combustion. Not a criteria pollutant but considered an important greenhouse gas. Important on a national or global scale (MDAQMD 2020).

Carbon Monoxide (CO): Common product of incomplete combustion. A criteria pollutant with state and federal standards. Not a primary photochemical reaction compound but involved in photochemical reactions. Dissipates rapidly and is therefore only important on a local scale near sources (MDAQMD 2020).

Community Noise Equivalent Level (CNEL): A weighted 24-hour noise level that is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours.

Criteria Pollutants: Those air pollutants specifically identified for control under the Federal Clean Air Act (currently six: carbon monoxide, nitrogen oxides, lead, sulfur oxides, ozone and particulates) (MDAQMD 2020)

Decibel, dB: A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.

Day-Night Level (DNL, or Ldn): A weighted 24-hour noise level that is obtained by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the nighttime hours.

Equivalent Continuous Noise Level, Leq: A level of steady-state sound that during a defined timeframe, and at a stated location, has the same A-weighted sound energy as the time-varying sound.

Farmland of Statewide Importance is similar to Prime Farmland but with minor shortcomings, such as steeper slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years before the mapping date (CA DOC).

Farmland of Local Importance includes all farmable land not meeting the definitions of “prime farmland,” “farmland of statewide importance,” and “unique farmland.” This includes land that is or has been used for irrigated pasture, dryland farming, confined livestock or dairy facilities, aquaculture, poultry facilities, and dry grazing. It also includes lands previously designated by soil characteristics as “prime farmland,” “farmland of statewide importance,” and “unique farmland” that has since become idle (CA DOC). In addition, the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), recognizes Farmland of Local Importance as the best land for producing food, feed, fiber, forage, and oilseed crops (USDA NRCS).

Fast/Slow Meter Response. The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.

Fire Hazard Severity Zone: A mapped area that designated zones (based on factors such as fuel, slope, and fire weather) with varying degrees of fire hazard (CALFIRE, 2022).

Forest Land (§12220 G): 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, and other public benefits (CA Public Resources Code).

Frequency/ Hertz. In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).

Hazardous Materials Site (§ 65962.5): Hazardous waste facilities subject to corrective action under Section 25187.5 of the Health and Safety Code, the Department of Toxic Substances Control (DTSC) shall compile and update as appropriate, but at least annually, and submit to the Secretary for Environmental Protection (CA Public Resources Code).

L_{02}, L_{08}, L_{50}, L_{90}. The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.

L_{max}, L_{min}: Lmax is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. **Lmin** is the minimum level.

Lead (Pb): A heavy metal, present in the environment mainly due to historical use in motor vehicle fuel. Primarily associated with lead smelting operations. A criteria pollutant with state and federal standards. Primarily of concern near sources (MDAQMD 2020).

Local Vicinity: The area and parcels surrounding a Project Site where direct or indirect impacts from Project implementation may occur

Low Impact Development (LID) is "a stormwater management and land development strategy that combines a hydrologically functional site design with pollution prevention measures to compensate for land development impacts on hydrology and water quality. LID techniques mimic the site pre-development site hydrology by using site design techniques that store, infiltrate, evapotranspiration, bio-filter or detain runoff close to its source" (San Bernardino County, 2013).

Mineral Resource Zones (MRZs): The classification of land that has potential for the discovery of mineral resource. MRZ designations are as follows:

- **MRZ-1**: Areas where available geologic information indicates that there is minimal likelihood of significant resources.
- **MRZ-2**: Areas underlain by mineral deposits where geologic data indicate that significant mineral deposits are located or likely to be located.
- **MRZ-3**: Areas where mineral deposits are found but the significance of the deposits cannot be evaluated without further exploration.
- **MRZ-4**: Areas where there is not enough information to assess the zone. These are areas that have unknown mineral resource significance.
- **SZ**: Areas containing unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance shall be classified in this zone.

Offensive/ Offending/ Intrusive Noise. The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.

Oxides of Nitrogen (NOx): Common product of combustion in the presence of nitrogen. Includes NO2, which is a criteria pollutant with state and federal standards. Locally and regionally important due to its involvement in the photochemical formation of ozone.

Oxides of Sulfur (SOx): Common product of combustion in the presence of sulfur. Associated primarily with diesel and coal burning. Includes SO2, a criteria pollutant with state and federal standards. Primarily of concern near sources (MDAQMD 2020).

Ozone (O3): A gas mainly produced by a photochemical reaction between reactive organic gases and oxides of nitrogen in the presence of sunlight (also produced by molecular oxygen in the presence of ultraviolet light or electrical discharge). A strong oxidant that is damaging at ground level but necessary at high altitude (in the stratosphere, where it absorbs dangerous ultraviolet light). Also considered an important greenhouse gas. A criteria pollutant with state and federal standards (MDAQMD 2020).

Prime Farmland has the best combination of physical and chemical features able to sustain long-term agricultural production. Prime Farmland has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agriculture production at some time during the four years before the mapping date (CA DOC).

Project Site is located on APNs 062-921-113 and -114.

Project Footprint is the area where active construction and staging will occur.

Respirable Particulate Matter (coarse or PM10, and fine or PM2.5): That portion of particulate matter that tends to penetrate into the human lung. The subscript refers to aerodynamic diameter. Criteria pollutants with state and federal standards. Locally and regionally important (MDAQMD 2020).

Reactive/Volatile Organic Compounds/Gases (ROG, VOC, NMOG, NMOC): A portion of total organic compounds or gases, excludes methane, ethane and acetone (due to low photochemical reactivity). "ROG" is generally used by the California Air Resources Board, "VOC" is generally used by the United States Environmental Protection Agency, but all four terms are interchangeable for most uses. Regionally important due to its involvement in the photochemical reaction that produces ozone (MDAQMD 2020).

Root Mean Square (RMS). A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.

Special-status: plant and wildlife species that are federally, State, and MSHCP listed, proposed, or candidates; plant species that have been designated with a California Native Plant Society Rare Plant Rank; wildlife species that are designated by the CDFW as fully protected, species of special concern, or watch list species; and specially protected natural vegetation communities as designated by the CDFW (ELMT Consulting 2024).

Traffic Indices (TIs). a measure of the number of all truck/bus types expected in the traffic lane over the pavement design life of the facility.

Transit Priority Area (TPA) (§ 21099): an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planned horizon including a Transportation Improvement Program or applicable regional transportation plan (CA Public Resources Code).

Timber Land (§ 4526): land, other than land owned by the Federal government and land designated by the County as experimental forest land, which is available for, and capable of growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the Board on a District basis after consultation with the District committees and others (CA Public Resources Code).

Timber Land Production Zone (§51104 G): areas that have been zoned and are devoted to uses for growing and harvesting timber, or for growing and harvesting timber and compatible uses (CA Public Resources Code).

Unique Farmland consists of lesser-quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been farmed at some time during the four years before the mapping date (CA DOC).

Urban and Built-Up Land is occupied by structures with a building density of at least one unit per 1.5 acres, or approximately six structures to a 10-acre parcel. Common examples include residential structures, industrial structures, commercial structures, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment structures, and water control structures (CA DOC).

2.3 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. In addition, Air Quality (though not potentially significant) has been checked to indicate that a mitigation measure has been included regarding air quality-related regulatory compliance.

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

2.4 Determination (To be completed by the Lead Agency):

On the basis of this initial evaluation:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment because all potentially significant effects (a) have been analyzed adequately in an earlier EIR 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.



Signature

09/12/2025
Date

Melody Bailey, Water Resources Manager
Printed Name

Mojave Water Agency
For

3.0 PROJECT DESCRIPTION

3.1 Background

MWA is a regional water management entity created by a special act of the State legislature in 1960 to ensure that sufficient water would be available for any present and future beneficial use of the land and inhabitants within the Agency's jurisdiction. MWA encompasses 4,900 square miles within the High Desert Region of San Bernardino County in Southern California and is one of 29 State Water Contractors (SWC) and holds a contract with the California Department of Water Resources (DWR) for an 89,800 acre-foot (AF) annual entitlement to State Water Project (SWP) for imported use. MWA uses imported water to supplement the limited natural recharge of groundwater within its service area for continued beneficial use and basin health considerations due to significant challenges including the unreliability of both natural and imported water sources. Demand for groundwater within MWA's service area remains consistent and is projected to increase over time (UWMP, 2020), leading to instances of substantial decline in groundwater levels around well fields during periods of extended drought. The Agency aims to address this vulnerability and increase resilience to drought by proposing to bring in more supplemental water.

The Mojave Water Agency has acquired state and federal funding to help improve the Mojave Water Region's water infrastructure and supplies. Under the 2014 Integrated Regional Water Management Plan (IRWMP), and 2020 Urban Water Management Plan (UMWP), the Agency has proposed to focus improvement efforts on Ames Valley Recharge. Oversight of the Ames Valley Basin has been established by an agreement from 1991 between Hi-Desert Water District (HDWD) and Bighorn-Desert View Water Agency (BDVWA) for the construction and operation of the HDWD Mainstream Well in the Ames Valley Basin (MWA IRWMP, 2014). However, this agreement was expanded in 2014 with the Ames/Reche Groundwater Storage and Recovery Program and Management Agreement, which includes all pumpers in the Ames Valley including County Service Area (CSA) No. 70, and provides monitoring and management plan for the operation of the Basin within the Ames Valley Recharge Project. In addition, the Ames/Reche Agreement ensures that groundwater supplies are protected; provisions are placed over supplemental water supplies for beneficial use; allocations are established for water production; storage and transfer rights to all of the public entity water retailers utilizing the subject groundwater supply are protected and regulated; and continuous monitoring of the water supply quality and quantity occurs (MWA UWMP, 2020). Currently, the Ames/ Reche Management Area includes 95 square miles encompassing the communities of Flamingo Heights, Landers, Pioneertown, and Yucca Mesa (MWA UWMP, 2020).

ENVIRONMENTAL SETTING FOR THE PROJECT

Regionally, the Project Site is located within the East Desert within Unincorporated San Bernadino County within the Ames-Reche groundwater basin. As of 2020, a total of 192,948 acre-feet (AF) of groundwater was reported to be stored throughout MWA's local groundwater basins (Mojave Basin; Ames-Reche, Joshua Basin); and approximately 373 AF is stored within the Ames-Reche basin (UWMP, 2020; *Table 3-9: MWA Total Stored Groundwater (September 2020)*). This basin covers approximately 110,000 acres and is surrounded by the San Bernardino Mountains in the west Iron Ridge to the north, the Hidalgo Mountain on the northeast, and various fault lines on the east and northern boundaries.

The closest City to the Project Site is the Town of Yucca Valley, approximately 12 miles south of the Project Site accessible via the regional transportation route State Route 247 (SR-247). Surrounding unincorporated areas include Homestead Valley and Flamingo Heights, approximately 2.4 miles northwest and west of the Project Site (See **Figure 1: Regional Location Map**). The unincorporated areas are well connected to the Project Site via local roadways (Tracy Blvd, Landers Lane, Reche Road, etc.), which lead to SR-247. In addition, the Project Site is located approximately 30 miles east from the foothills of the San Bernardino Mountains; and approximately 41 miles west from the Cleghorn Lakes Wilderness Area.

Due to the geographic location of the Project Site, average rainfall is roughly five to seven inches per year (MWA IRWM Plan, 2014). Rainfall within the area drains into pipes wash, a dry wash located approximately 0.4 miles east of the proposed Project Site. The Project Site contains natural slopes towards the northern and northwestern perimeter, resulting in elevations ranging from 3,307 feet to 3,323 feet above mean seal level (AMSL), with approximately 16 feet

of elevation variances. As a result, the Project Site is prone to flooding from runoff that drains naturally into the low-lying portions of the Project Site.

3.2 Project Description

The Project consists of the development of two (2) new recharge basins (north and south basin) on 10 acres surrounded by 12-ft tall berms. The berms are sloped at 3:1 from the edge of the proposed 16-ft to 24-ft wide access road, which surrounds the perimeter of each basin, to the bottom of each basin. The north basin bottom is approximately 2.3 acres at 3,304 ft AMSL, and the south basin bottom is 2.5 acres at 3,311.5 ft AMSL. In addition to the installation of the recharge basins, the Project proposes to install 6-foot perimeter fencing with barbered wire; a new tee connection within the Winters Road right-of-way; approximately 500 linear feet of 12-inch nonpotable water pipeline from Winters Road to the eastern perimeter of each basin (north and south); two (2) headwalls located along the eastern perimeter of each basin connecting to the new 12-inch nonpotable water pipeline; outlet with energy dissipator to the proposed recharge basin; and a nested or multi-completion monitoring well located within the proposed site to monitor infiltration rates, groundwater levels, and water quality. The proposed improvements will allow MWA to increase its groundwater recharge capacity of annual State Water Project Table A allocations[2]. The recharge basin will include a perimeter access road, fencing, signage, and a landscaped berm surrounding the property. Electrical and SCADA are not required at the site. The existing pipeline and recharge basin will remain but shall be isolated with a valve. To determine the site for the monitoring well, a Synthetic Precipitation Leaching Procedure (SPLP) leach test will be conducted, and geochemical modeling performed if the SPLP test results warrant.

LOCAL VICINITY

The Project Site is a 10-acre site comprised of two parcels (APN 0629-211-13, -14) located on federal property, along Winters Road, approximately 0.3 miles east of the existing recharge facility and adjacent to the 12-inch diameter HDPE pipeline along Winters Road within the Ames Valley Groundwater Basin (MWA Stormwater Resources Plan 2020). The Project Site is heavily disturbed at the southern perimeter with two (2) existing concrete pads, one (1) containing walls littered with debris from the abandoned structure and illegal dumping. Debris is composed of a hot tub, glass, drywall, clothes, car parts, etc., which will require removal upon Project implementation. The parcels are naturally vegetated with 68 Western Joshua Trees, and a plant community known as the creosote bush scrub. The Project Site is surrounded by vacant open spaces and rural residential developments, ***Table 1****. Surrounding Land Uses*. The closest residential development to the Project Site is approximately 500 feet northeast, located along Lucky Lane.

Other notable facilities close to the Project Site include the existing Ames-Reche recharge facility, approximately 0.3 miles east of the Project Site; and the flow control facility, located near the intersection of Winters Road and Landers Lane, approximately 0.3 miles west of the Project Site. The existing Ames-Reche recharge facility was completed in 2014 and delivers water from the State Water Project directly to the Pipes Wash in Landers, California, located north of Yucca Valley, as shown in **Figure 2: Local Vicinity Map**. The facility consists of a flow control facility and pipeline extending west from MWA's Morongo Basin Pipeline at Winters Road to an outlet in Pipes Wash. The turnout has a maximum capacity of 5 cfs, recharging a maximum of approximately 1,500 acre-feet per year (AFY). While the existing facility remains operational, permitting and operational requirements have severely reduced its functional capacity.

3.3 Project Objectives

The major goals of the Project are as follows:

1. Address population increases over time which can lead to decreases in potential groundwater recharge;
2. Increase resilience to drought;
3. Provide reliable groundwater recharge; and
4. Ensure safe yield is achieved and maintained.

[2] According to the 2023 State Water Project Table A Allocations, Mojave Water Agency requested 89,800 total Acre-Feet per year and was allowed only 26,940 Acre-Feet per year, which is 30 percent of their initial request (DWR CA State Water Project, 2023).

3.4 Project Characteristics - Construction

Project construction is anticipated to last for approximately 11 months, beginning in or before January 2026 and concluding around November 2026. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days). Construction activities will occur between 7:30 AM and 4:30 PM, Monday through Friday; weekend work will be avoided when feasible, however, weekend or night work might occur to avoid peak traffic.

Construction activities for Phase 1 will involve up to 3 crew members daily. Construction activities for Phase 2 will involve approximately 8 to 10 crew members[3] daily at any one time during active construction. Crew members will get to the construction site utilizing personal vehicles, approximately 10 vehicles at any one time, accessing the construction site via local roadways (Tracy Blvd, Winters Road, Landers Lane, Reche Road, etc.) or regional transportation routes (State Route (SR) 247). Personal vehicles will be parked along the public right-of-way, adjacent to the Project Site within the roadway, shoulder, or at the street curbs. Temporary fencing will be placed around the perimeter of each work area to secure construction sites after each work date and prevent theft/ vandalism that has the potential to occur overnight. In addition to fencing, active construction will either be backfilled or covered with trench plates at the end of each day. Water for construction and potable water during construction activities will be supplied by the local water purveyor and conveyed to the site by the contractor via water trucks. Earthworks during construction involved 68,411 CY of cut and 1,594 CY of fill (66,817 CY of net cut).

Construction will include the implementation of relevant Mojave Water Agency standards and guidelines as well as Mitigation Measures tailored to the Project. The analysis in this document supports findings of less than significant impacts with mitigation for CEQA compliance based on recommendations for implementing Mitigation Measures to reduce temporary and intermittent impacts from construction as discussed in the Environmental Checklist. Therefore, Mitigation Measures have been proposed for the Project to reduce potentially significant impacts from Project construction identified in this IS/MND to a less than significant level.

CONSTRUCTION EQUIPMENT

Construction activities will involve the utilization of a variety of diesel-powered equipment along the Project Alignment throughout construction. Potential equipment on-site during construction includes:

Phase 1 – Monitoring Well Drilling

- one (1) drilling rig
- one (1) loader
- one (1) crane
- 2-3 work trucks

Phase 2 – Recharge Basins

- two (2) scrapers
- one (1) tractor / loader / backhoe
- two (2) off-highway trucks
- two (2) plate compactors
- two (2) excavators
- two (2) other material handling equipment
- two (2) other construction equipment
- four (4) pumps
- two (2) skid steer loaders
- two (2) surfacing equipment
- two (2) rubber tiered dozers

[3] The number of construction crew members is an assumption based on the scale of the Proposed Project and type of infrastructure being implemented.

- one (1) crane
- one (1) water truck

During Project construction, equipment will be kept at a designated laydown yard (see Staging below) or the Project contractor's facilities.

STAGING

Staging areas will be located inside the existing public right-of-way along Winters Road and on-site within APNs 062-921-113, -114, and/or adjacent parcels. These staging locations will depend on the portion of the alignment under construction.

SCHEDULE AND PHASING

Project construction is anticipated to begin in January 2026 and conclude in November 2026, lasting for approximately 11 months. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days).

LONG-TERM OPERATIONS AND MAINTENANCE

The Project is anticipated to be operational for a minimum of 50 years from completion of initial construction. The Agency will operate and manage the Project similarly to existing conditions since the Project will install a new 10-acre recharge basin approximately 0.3 miles east of the existing Ames-Reche Recharge Basin. Therefore, Mojave Water Agency does not anticipate additional staffing needs for long-term operation and maintenance of the proposed Project. Monthly worker trips over the lifetime of the Proposed Project will be required to conduct routine inspections and ensure proper long-term maintenance.

Figure 1- Regional Location

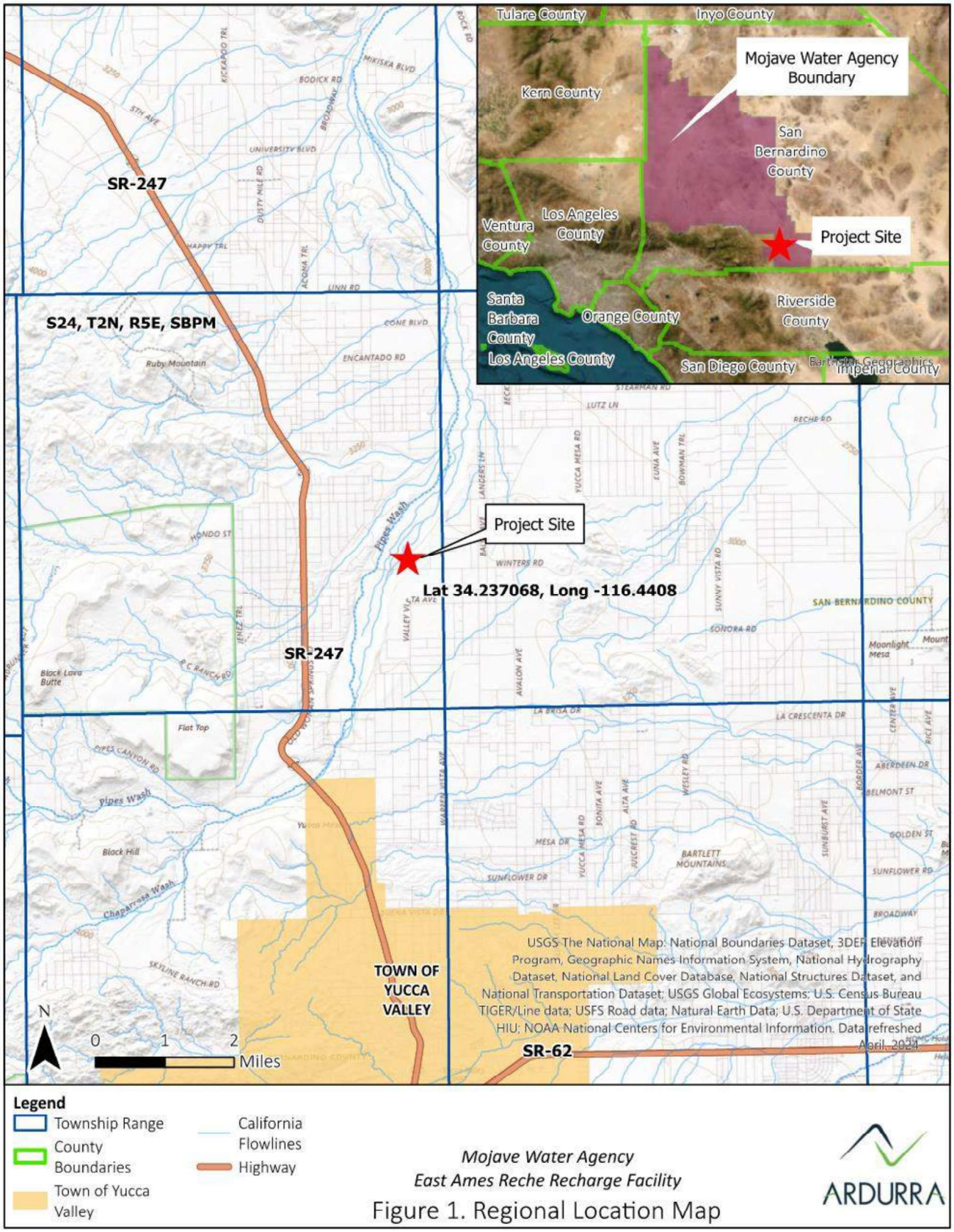

Figure 2- Local Vicinity Map

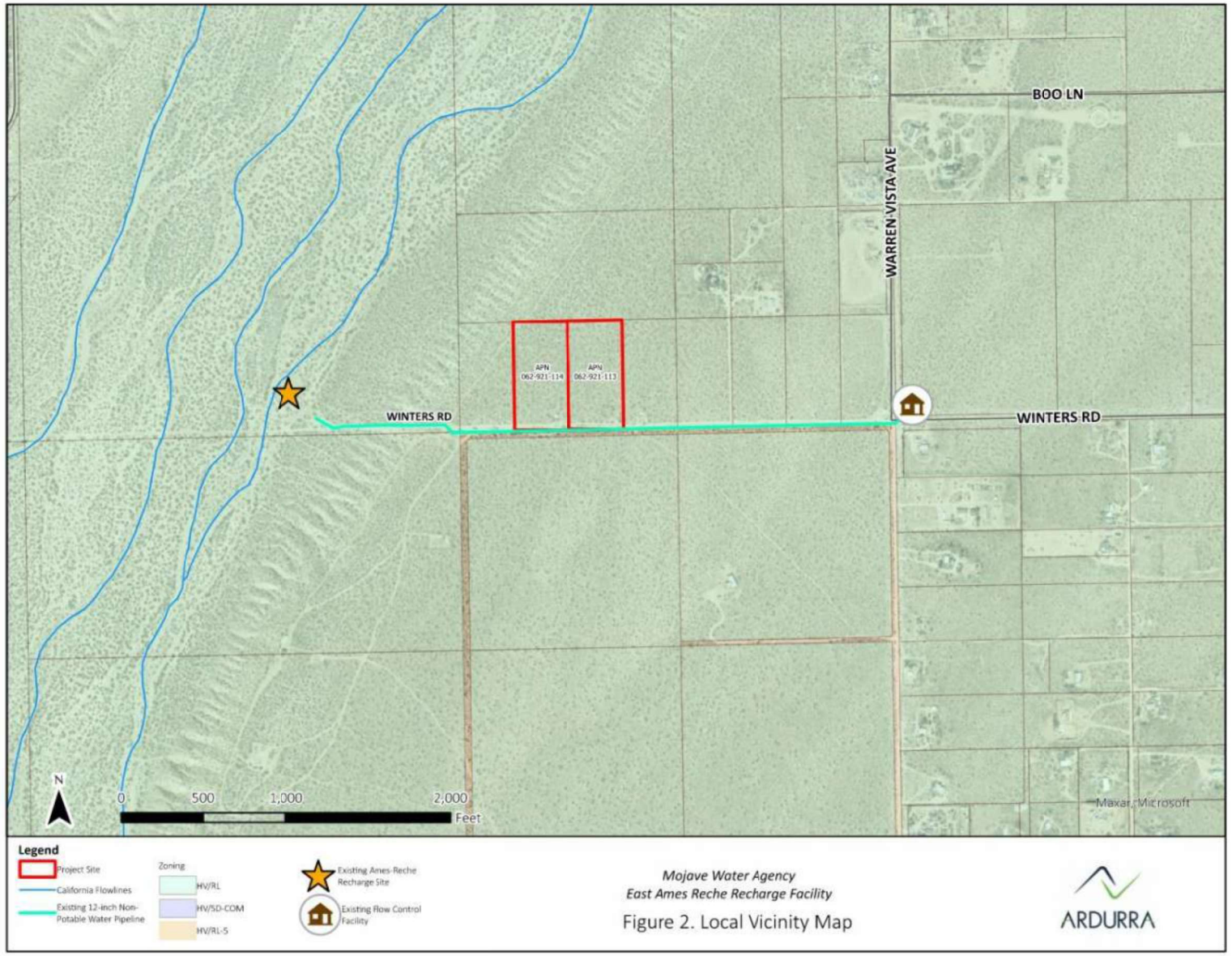

Figure 3- Site Plan

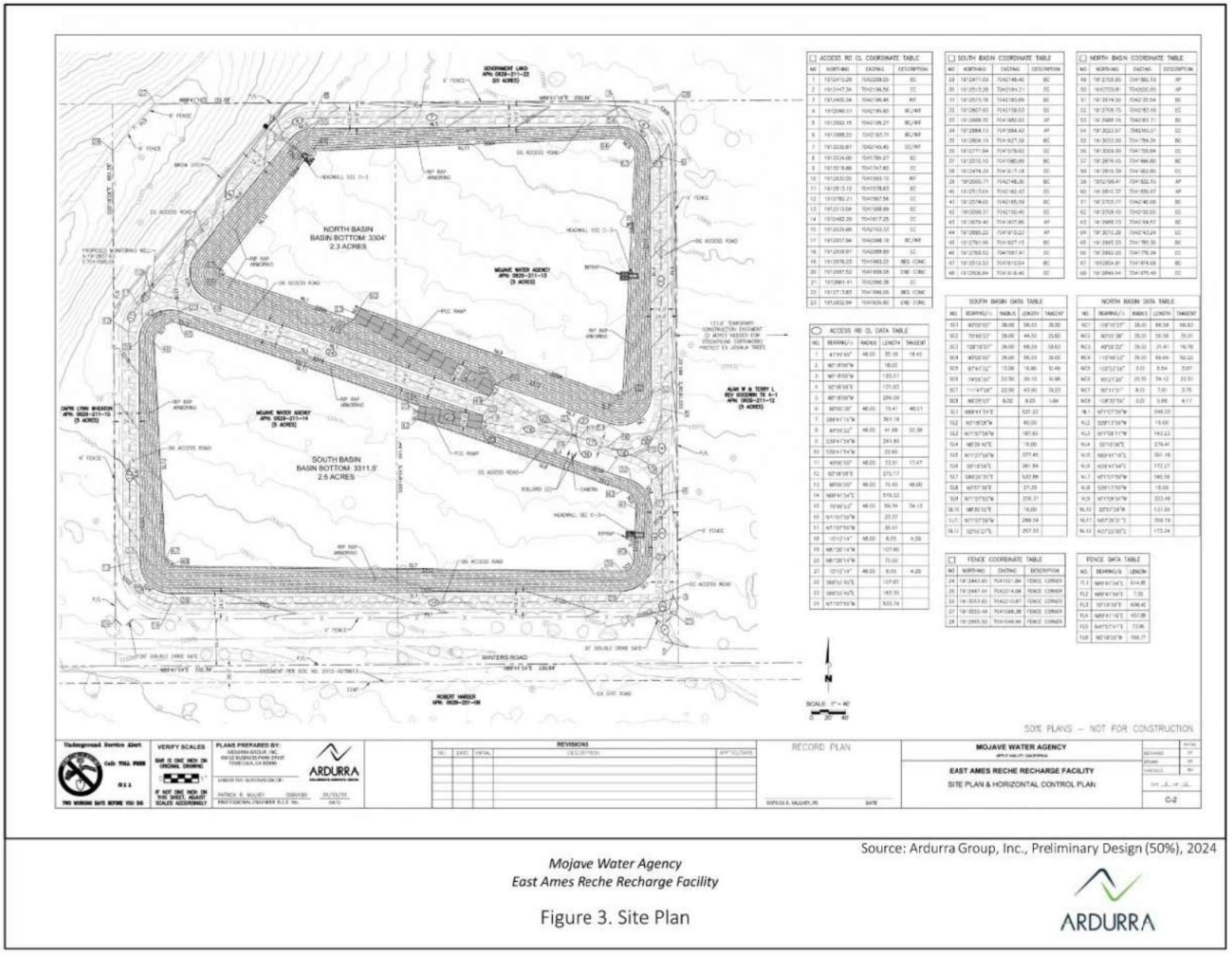

Figure 4- Land Use Map

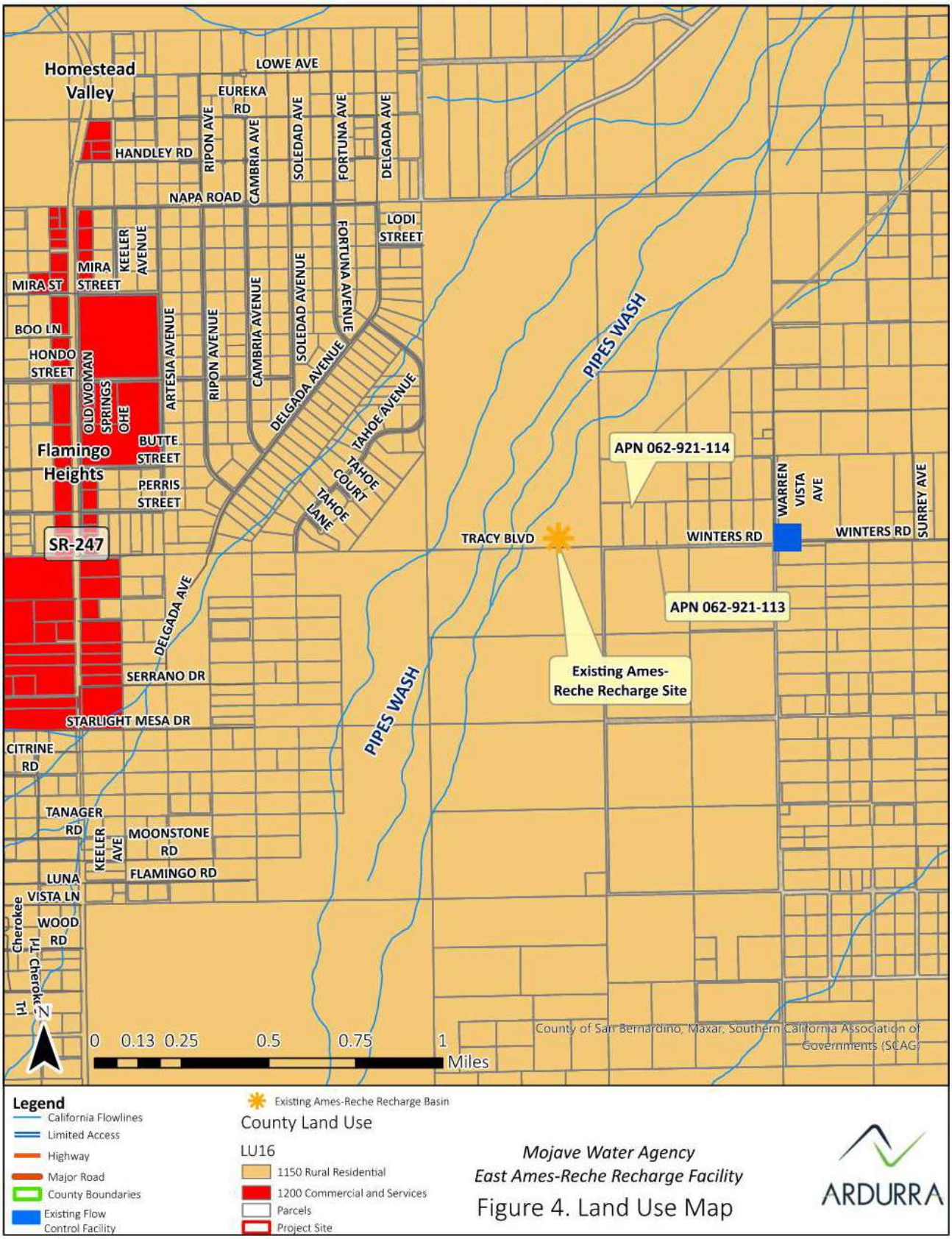

Figure 5- Photo Location Key Map

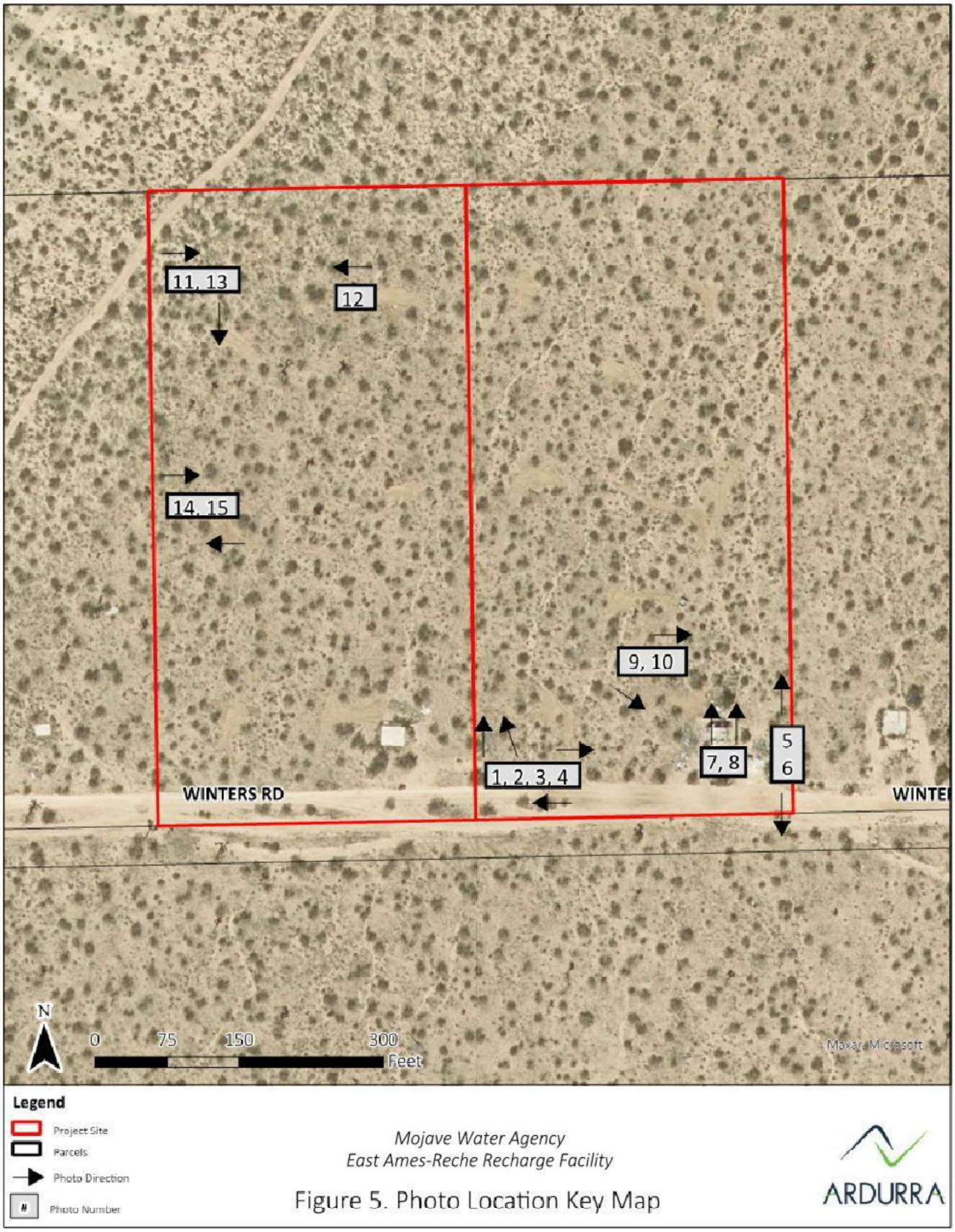

Figure 6- Site Photos



Photo 1: Looking North from Winters Road.



Photo 2: Looking Northwest from Winters Road, towards the pipe wash.



Photo 3: Looking West from Winters Road, towards Tracy Blvd.



Photo 4: Looking East from Winters Road.



Photo 5: Looking North from the Southeastern corner of the Project Site.



Photo 6: Looking South from Winters Road.



Photo 7: Looking North from Winters Road at the existing debris onsite.



Photo 8: Looking North from Winters Road at abandoned structure with debris.



Photo 9: Looking Southeast towards existing abandoned structure.

Mojave Water Agency
East Ames-Reche Recharge Facility
Figure 6. Site Photos

ARDURRA



Photo 10: Looking East toward existing debris on the Project Site.



Photo 11: Looking East from the Project Site's northwestern corner.



Photo 12: Looking West toward animal dens on the Project Site's northern perimeter.



Photo 13: Looking South from the Project Site's northwestern corner.



Photo 14: Looking East from the Project Site's western perimeter.



Photo 15: Looking West from the Project Site's Northwestern perimeter.

Mojave Water Agency
East Ames-Reche Recharge Facility
Figure 6. Site Photos

ARDURRA

4.0 ENVIRONMENTAL IMPACTS

4.1 Aesthetics

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
AESTHETICS. Except as provided in Public Resources Code Section 21099, would the Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☒	☐	☐
c) In 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 publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

REGULATORY COMPLIANCE

California Scenic Highway Program

In 1963, the State's Legislature passed the California Scenic Highway Program to protect scenic highway corridors from changes that would impact the visual aesthetics of lands surrounding highways. The program is managed by the California Department of Transportation (Caltrans), who has taken "responsibility for the protection and enhancement of California's natural scenic beauty by identifying those portions of the State highway system which, together with adjacent scenic corridors, require special conservation treatment" (CA DOT 2022). Caltrans coordinates with local government agencies, communities, and citizens to comply with the California Scenic Highway Program and preserve the State's scenic resources.

San Bernardino County

Development Code

San Bernardino's Development Code includes polices that minimize aesthetic and light and glare impacts throughout implementation of the General Plan buildout and proposed Projects:

- **Chapter 83.02 (General Development and Use Standards)**. This chapter provides development standards that ensure an environment of stable and desirable character that is harmonious and compatible between existing and future development. Sections within this chapter detail requirements pertaining to maximum building heights, screening and buffering, setbacks, and allowed projections/structures within setbacks.
- **Chapter 83.06 (Fences, Hedges, and Walls)**. This chapter establishes requirements for fences, hedges, and walls to ensure that these elements do not unnecessarily block views and sunlight; provide adequate buffering between different land uses, provide screening of outdoor uses and equipment; and provide for noise mitigation. Overall, the requirements are designed to provide aesthetic enhancement of the County. This chapter of the code discusses requirements for fences, hedges, and walls, including maximum height limit, walls required between different land uses, special wall/fencing for different uses, and prohibited fence materials.

- **Chapter 83.07 (Glare and Outdoor Lighting)**. This chapter encourages outdoor lighting practices and systems that minimize light pollution, glare, and light trespass; conserve energy and resources while maintaining nighttime safety, visibility, utility and productivity; and curtail the degradation of the nighttime visual environment. Section 83.07.030 provides standards for outdoor lighting in the Valley Region and Section 83.07.040 provides stricter standards for the Mountain and Desert Regions.
- **Chapter 83.10 (Landscaping Standards)**. The purpose of this chapter is to enhance the aesthetic appearance of the County by providing standards related to the quality and functional aspects of landscaping. In addition to enhancing the aesthetic quality of the County, the landscaping standards are intended to benefit air and water quality, help prevent and manage erosion, offer fire protection, and replace valuable ecosystems that may be lost during development. These standards also encourage water conservation, efficient water management, natural vegetation preservation, and more.
- **Chapter 83.13 (Sign Regulation)**. This chapter establishes regulations for signs and other exterior advertising formats helping to improve the appearance of the County and protect public and private investment in structures and open spaces.

DISCUSSION

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

RESPONSE:

Less than Significant Impact. The Project Site is within the East Desert Region, which is a relatively flat region bounded by the San Bernardino Mountains ranges in the west and San Gabriel Mountains in the east. The mountains ranges are visually prominent from the Project Site and regional transportation routes due to the low elevation of the Mojave Desert in comparison. Other visually significant resources to the Project Area are distant playas, basins, plateaus, and dunes; and rock formations and outcroppings.

According to the San Bernadino County General Plan, State Route (SR) 38, highway located approximately 40 miles west of the Project Site traversing east-west from San Bernadino Mountains to South Fork Campground, is the closest "Officially Designated State Scenic Highway" (San Bernardino County GP EIR, 2019). However, the Department of Transportation and the San Bernadino Homestead Valley Communities Action Guide recognize other regional transportation routes adjacent to the Project Site as eligible for official designation. The Project Site's closest regional transportation route, State Route (SR) 247 is a County Scenic Route and eligible to be a state scenic highway (DOT, 2018; Homestead Valley Communities Action Guide, 2019). SR 247 is "a transportation backbone that vitally links the four communities of Yucca, Flamingo Heights, Landers, and Johnson Valley. The historical significance and natural scenic beauty of the highway are irrefutable, as recognized by the official designation of State Route 247 as a Scenic Highway" (Homestead Valley Communities Action Guide, 2019). Therefore, officially designating SR 247 as a Scenic Highway would enhance the quality of life for residence living adjacent to the transportation corridor, encourage economic growth, and ensure the preservation of scenic resources by preventing land uses and activities that may negatively impact preservation efforts.

The Project proposes to develop two (2) retention basins approximately 7-12-feet below the existing grade. The only visual feature of the project are the berms that surround the basins are approximately 3 feet above the existing grade; and access road that surrounds the basins, enclosed by a 6-foot chain link fence. Since the Project is proposed mostly below the existing grade and does not contain structures that exceed heights of existing structures or conflict with the current zoning requirements, the Project does not propose to disrupt views of the outlying scenic resources. According to the County's General Plan EIR, "sparsely distributed development projects consistent with the proposed Project are not expected to result in significant adverse impacts on scenic views in the region" (San Bernardino County GP EIR, 2019). The project's consistency with County General Plan policies is summarized below in *Table 3*.

Project plans indicate the Project Footprint will be restored to its original state immediately following construction. Therefore, less than significant impacts to scenic vistas are anticipated. No Mitigation Measures are needed.

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

RESPONSE:

Less than Significant with Mitigation Incorporated. See Response 1a). The Project will not impact state scenic highways. Views of the Project during construction will be localized and limited to the right-of-way at street level within areas of active construction that will not affect regional views. Regionally significant scenic resources such as the mountain ranges north and northeast including San Gabriel and San Bernadino Mountains will not be affected during construction or permanently from Project implementation. The levels of impact during construction and long-term operation at the Project Site and within the streets are anticipated to be temporary and localized with impact levels associated directly to the levels of community activity and traffic around each segment of active construction.

Since the proposed improvements are primarily below grade, with maximum heights 7-12 feet above the existing grade, views are not proposed to be disrupted from the Local Vicinity or surrounding parcels. However, the Project proposes the removal of part of the creosote bush scrub plant community including approximately 27 Western Joshua Trees; and other common plat species found within this plant species including ed-stemmed filaree (*Erodium cicutarum*), red brome (*Bromus madritensis ssp. rubens*), silver cholla (*Cylindropuntia echinocarpa*), desert sand verbena (*Abronia villosa*), rayless goldenhead (*Acamptopappus sphaerocephalus*), branched pencil cholla (*Cylindopuntia ramosissima*), canaigre dock (*Rumex hymenosepalus*), flatspine bursage (*Ambrosia villosa*), Fremont's pincushion (*Chaenactis fremontii*), woolly desert marigold (*Baileya pleniradiata*), Mediterranean grass (*Schismus barbatus*), Mormon tea (*Ephedra nevadensis*), and desert needlegrass (*Stipa speciosa*). Western Joshua trees are candidates for listing under the CESA; therefore, removal will require the implementation of Mitigation Measure **MM BIO-05: Tree & Plant Removal Permit** to ensure that the proposed Project meets the requirements of the Western Joshua Tree Conservation Act Incidental Take Permit and mitigation fees are paid for their continuous protection and off-site conservation efforts.

As a result of implementation of mitigation measures, substantial damage to scenic resources including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway are not anticipated.

TABLE 3: PROJECT CONSISTENCY WITH AESTHETIC-RELATED COUNTY GENERAL PLAN POLICIES

General Plan Policy	Project Consistency
LU- 2.2. Compatibility with planned uses. *We require that new residential development is located, scaled, buffered, and designed to minimize negative impacts both on and from adjacent areas designated for nonresidential land uses.*	The proposed Project is the construction of two (2) retention basins that will facilitate sustainable groundwater management and provide reliable groundwater recharge to the surrounding areas, including neighboring residential communities. According to the Project plans, the project will not disrupt views of the Local Vicinity due to most of the Project features remaining below grade.
LU-2.3. Compatibility with natural environment. *We require that new development is located, scaled, buffered, and designed for compatibility with the surrounding natural environment and biodiversity.*	The Project proposes to install berms that are approximately 3-feet above the existing grade; and a 6-ft chain link fence.
LU- 2.4. Land use map consistency. *We consider proposed development that is consistent with the Land Use Map (i.e., it does not require a change in Land Use Category), to be generally compatible and consistent with surrounding land uses and a community's identity. Additional site, building, and landscape design treatment, per other policies in the Policy Plan and development standards in the Development Code, may be required to maximize compatibility with surrounding land uses and community identity.*	The Project does not propose to change the existing land use at the site. The Project Site is currently designated as a Rural Living area within the Homestead Valley's Specific Plan Area. This land use "provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses" (San Bernardino County Zoning and Development, n.d.). The Project will remain consistent with the surrounding land use, since it does not propose to develop structures with heights that exceed the County's development code. In addition, the Project plans indicate the design of the basins will change the existing grade on-site; however, berms and basin bottoms will contain soils that remain consistent with existing conditions.
LU- 4.1 Context-sensitive design in the Mountain/Desert regions. *We require new development to employ site and*	According to the Project plans, the above ground features including the berms and access roads will be constructed with the intention to keep

building design techniques and use building materials that reflect the natural mountain or desert environment and preserve scenic resources.	uninterrupted view of the surrounding visual resources. Berms will be approximately 3 feet above grade and be constructed with imported soils that are made to look like the nature conditions found on-site.
M/H-1/4. Protection of scenic qualities. We use the planned development permit or other discretionary reviews to regulate the density and configuration of residential development along the shores of all mountain lakes or on slopes to protect their scenic qualities	The Protect does not propose to increase density at the site, since the Project will not develop structures that are habitable. The recharge basins are intended to provide MWA with sustainable groundwater recharge capabilities.

Table 3: Project Consistency with Aesthetic-Related County General Plan Policies
Source: San Bernardino County General Plan EIR, 2019.

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 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?**

RESPONSE:

Less than Significant Impact. See Responses 1a) and b). As mentioned above, Project plans indicate above ground features will be 7-12 feet below the existing grade. The proposed berms are anticipated to be 3-feet above grade with a 24-foot-wide access road, which wraps around the entire perimeter of the North and South Basin and is enclosed by a 6-foot-tall chain fence. The outside face of the berms would be vegetated. The design of the berms and the low profile of the fencing aim to minimize visual disruption from surrounding parcels and existing public viewpoints.

For these reasons stated above, impacts on visual character or quality public views are less than significant . No mitigation is required.

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

RESPONSE:

No Impact. See Responses 1a) through c). Based on conceptual Project plans, installation of exterior lighting is not proposed for the Project. Nighttime construction is not anticipated to occur and would be avoided when possible. Therefore, the proposed Project does not include significant new sources of lighting or reflective surfaces that would create substantial light or glare.

As a result, the Project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. Therefore, no impacts are anticipated as a result of Project implementation.

MITIGATION MEASURES

See Mitigation Measure **MM BIO-05: Tree & Plant Removal Permit** in Section 4.4 Biological Resources.

4.2 Agriculture and Forestry Resources

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☒	☐	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

REGULATORY COMPLIANCE

<u>The California Land Conservation Act or Williamson Act</u>

The California Land Conservation Act or Williamson Act was established after World War II in response to increasing conservation pressures on agricultural lands. The Act allows local agencies to contract with private landowners, allowing reduced property tax in exchange for restricting use of land exclusively for agriculture or open space. In 1965, Assembly Bill 1227 was enacted to establish a contract process to manage the rate of conversion of agricultural lands to urban uses. In determining whether impacts to agricultural resources are significant, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation.

<u>Farmland Mapping and Monitoring Program</u>

The California Natural Resources Agency is tasked with preserving, protecting, and maintaining California's natural, cultural, and historic resources, including agricultural resources. As a result, the California Department of Conservation (CA DOC) manages the Farmland Mapping and Monitoring Program (FMMP), which provides a map of farmland resources throughout California according to the following classifications: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Urban and Built-Up Land. See Section 2.2 Definitions for more information.

San Bernadino County

Policy Plan

San Bernadino County Plan (Policy Plan) contains goals and policies that protect agricultural uses throughout the County. The Policy Plan addresses losses in agriculture experienced because of increased urban and built-up land. In addition, the Policy Plan is intended to preserve agriculture through adopted policies for regulation of erosion control; improvements to soil quality; pest management; and conservation of forestlands and natural habitats throughout the County, which include the following:

- **Policy NR-7.1 Protection of agricultural land:** We protect economically viable and productive agricultural lands from the adverse effects of urban encroachment, particularly increased erosion and sedimentation, trespass, and non-agricultural land development.
- **Policy NR-7.2 Preservation of important farmlands:** We require project applicants seeking to develop 20 or more acres of farmland (classified as prime, of statewide importance, or unique farmland) to non-agricultural uses to prepare an agricultural resource evaluation prior to project approval. The evaluation shall use generally accepted methodologies to identify the potentially significant impact of the loss of agricultural land as well as the economic viability and sustainability of future agricultural use of the property, including long-term sustainability and economic viability of water resources. If the conversion is deemed significant, the County shall require mitigation at a 1:1 ratio of converted to preserved acreage through conservation easements, payment of its valuation equivalent if a fee mitigation program is established, or inclusion in a regional agricultural preservation program.
- **Policy NR-7.3 Conservation and preservation incentives:** We support programs and policies that provide tax and economic incentives to conserve existing productive agricultural lands or preserve farmland classified as prime, of statewide importance, unique, or of local importance. We support landowners in establishing new and maintaining existing California Land Conservation (Williamson Act) contracts.
- **Policy NR-7.4 Economic diversity of farm operations:** We encourage farm operations to strengthen their economic viability through diversifying potential sources of farm income and activity, including value added products, agricultural tourism, roadside stands, organic farming, and farmers markets.
- **Policy NR-7.5 Agriculture on Rural Living and Open Space properties:** We permit small-scale, non-water-intensive, and incidental agricultural on properties designated for Rural Living. In the Oak Glen and Mentone community planning areas, we also permit commercial-scale agriculture on properties designated for Rural Living. In the Oak Glen and Mentone community planning areas and in the Crafton Hills, we also permit commercial-scale agriculture on privately-owned properties designated for Open Space.
- **Policy NR-7.6 Sustainable grazing practices:** We require all grazing on open rangelands to be compatible with the conservation of threatened and endangered species.

DISCUSSION

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?**

RESPONSE:

No Impact. In San Bernardino County, there are approximately 60,279 acres used for existing agricultural use including ranching; 2,208 acres of which are located within unincorporated portions of the East Desert. However, under the Farmland Mapping and Monitoring Program and according to San Bernadino County General Plan EIR (*Table 5.2-3, Mapped Important Farmland in San Bernardino County*), the East Desert Region, where the Project is located, does not contain land designated for agricultural use. Therefore, the Project Site does not contain land designated as Prime Farmland, Unique Farmland of Statewide Importance, or Local Importance. The Project Site is on land designated under a rural residential designation within unincorporated County according to the County's General Plan Land Use Map. The Project Site and Local Vicinity are part of the Homestead Valley Community Plan area.

The Project will convert underutilized rural residential land to expand the MWA groundwater recharge within the County of San Bernadino, East Desert Region. The footprint for Project construction will occur within the Project Site and along adjacent Rights-of-Way including Winters Road. The Project is not located directly adjacent to

farming operations including ranching or land designated as farmland. The Project does not propose construction directly on Farmland nor does the Project propose to convert any portions of Farmland to non-agriculture use indirectly. There are no parcels within the County's East Desert Region that are designated as Farmland on the County's Approved General Plan Land Use Designation Map.

No direct or indirect agricultural impacts would result from Project implementation at the Project Site since farmland is not in proximity to the proposed Project. Therefore, the Project will not conflict with local or regional policies related to Farmland or Williamson Act contracts. For these reasons, no project impacts on Farmland will occur, and Project implementation will not result in conversion of agricultural land to other uses or cumulative impacts on agricultural land beyond what has already been considered and approved in the County's General Plan. No impacts are anticipated; therefore, no Mitigation Measures are needed.

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

RESPONSE:

No Impact. According to the California Department of Conservation Williamson Act Enrollment 2022 map, the Project Site is not adjacent to or on land designated under the Williamson Act Contract. As mentioned within the San Bernadino General Plan EIR, there are no agricultural land designations within the East Desert Region of the County (San Bernadino County GP EIR, 2019). Therefore, the Project will not conflict with existing zoning for agricultural use or a Williamson Act contract.

As a result, the proposed Project will have no impacts related to zoning or the Williamson Act; therefore, no Mitigation Measures are necessary.

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))?**

RESPONSE:

Less than Significant with Mitigation Incorporated. "Forest land", defined by Public Resources Code Section 4526, "is 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."

In portions of the Desert Regions of San Bernadino County there are Pine and Woodland Forests. According to the County's General Plan EIR, the forest land makes up approximately 13,444 acres (28 percent of forest and woodland vegetation in Desert Regions; and 36 percent of total forest and woodland vegetation in the County's authority) (San Bernardino County GP EIR, 2019). These forested areas are shown on County General Plan Map (NR-2 Parks & Open Space Resources) and are approximately 30 miles and upgradient from the Project Site. Within the existing parcel boundaries, the Project Site currently supports sixty-eight (68) western Joshua Trees, which are a federally protected species and are considered native to this location. The Western Joshua Tree Conservation Act was adopted in July 2023 and established a framework for long-term conservation of western Joshua Tree involving incidental take for certain development activities and collection of mitigation fees for the acquisition and conservation of western Joshua tree habitat and other actions to conserve western Joshua Tree. Since impacts to a federally protected species are anticipated, Mitigation Measures **MM BIO-04: Cover Species Inventory** and **MM BIO-05: Incidental Take Permit** will be implemented prior to Project construction to document and identify species protected by the California Desert Native Plants Act (CNDPA).

The Project will implement the protocol requirements for mitigation of impacts to western Joshua Tree that are established for the Project through the CDFW incidental take process and are considered full mitigation for the Project. In addition, the Project will implement the County's approved General Plan by fulfilling approved policies for sustainability and water conservation associated with the full buildout of the approved Land Use Map for the County, which is also reflected in regional plans; therefore, the Project will not conflict with existing zoning or cause rezoning either directly or indirectly. The Project will have no impacts related to existing zoning or rezoning of forest land or timberland with the implementation of proposed Mitigation Measures.

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

RESPONSE:

No Impact. Project implementation will fulfill the Agency's 2020 Urban Water Management Plan, 2018 Integrated Regional Water Management Plan, and 2021 Strategic Plan, ensuring that safe, reliable groundwater recharge is achieved and maintained throughout periods of drought. The Project is intended to support the full implementation of sustainable groundwater management and would not result in loss of forest land or conversion of forest land. The Project involves temporary construction impacts for excavation, grading, and trenching that will occur within the Project Site and Winters Road, an unpaved public right-of-way.

For these reasons, no impacts involving loss or conversion of land labeled as Forest land will result from Project implementation. No Mitigation Measures are needed.

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.**

RESPONSE:

Less than Significant Impact. See Section 5.2.3, Response a) through d) above. Additional changes in the existing environment resulting in conversation of Farmland to non-agricultural use or conversion of forest to non-forest use from Project implementation are not anticipated. The proposed land use and utility improvement resulting from the Project is consistent with approved recommendations made by within the Agency's 2020 UWMP, 2014 IRWMP, and MWA Strategic Plan, which outlined the need for a recharge basin within the Ames-Valley groundwater basin.

Implementation of the proposed Project will provide reliable and sustainable groundwater recharge for existing demands due to increases in extreme weather conditions; therefore, the Project does not propose or result in changes in the local agency's approved land use plan. No impacts are anticipated; therefore, no mitigation measures are needed.

MITIGATION MEASURES

See Mitigation Measures **MM BIO-04: Cover Species Inventory** and **MM BIO-05: Incidental Take Permit** in Section 4.4. Biological Resources.

4.3 Air Quality

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

REGULATORY COMPLIANCE

The federal, state, and regional agencies listed below establish regulations for air emissions, as well as monitor and regulate activities that impair air quality. California is divided into 11 air basins for monitoring and regulation of air quality within regions possessing common geographical and meteorological characteristics. Air quality regulations are focused on controlling emissions of criteria pollutants, which are either direct emissions from combustion, dust, and activities, such as application of paints and coatings, or are secondary emissions which form from primary Criteria Pollutant mixing due to weather patterns and air temperatures. Criteria pollutants are indicators of the overall level of regional air pollution.

The Project is within the Mojave Desert Air Basin (Basin) and air quality within the Basin is the responsibility of the Mojave Desert Air Quality Management District (MDAQMD). Criteria pollutants regulated by MDAQMD. include Ozone (O3), Nitrogen Dioxide (NOx), Carbon Monoxide (CO), Sulfur Dioxide (SOx), Lead (Pb), and Particulate Matter less than 10 microns and 2.5 microns in diameter (PM10 and PM 2.5). Regulated criteria pollutants have been proven to harm health and the environment to the point of causing damage to property and health. Monitoring and regulating agencies like the EPA identify "criteria" air pollutant emissions based on related human health outcomes and/or environmental quality as criteria for setting permissible levels. The following agencies, air quality plans, and programs are applicable to the Project regarding establishment and enforcement air quality regulations:

<u>Federal and State Ambient Air Quality Standards</u>

The Federal Clean Air Act was first implemented by the U.S. Environmental Protection Agency (EPA) in 1970 and later amended to enforce national ambient air quality standards (NAAQS) for six criteria air pollutants, which include particular matter of aerodynamic radius of 10 micrometers or less (PM 10), carbon monoxide (CO), nitrogen dioxide (NO2), ground-level ozone, and lead; and later particulate matter of aerodynamic radius of 2.5 micrometers of less (PM 2.5) was added. Federal standards are designed to protect public health and the environment with a reasonable margin of safety (Reference *Table 4: Federal and State Pollutant Standards*).

TABLE 4: FEDERAL AND STATE POLLUTANT STANDARDS

Air Pollutant	Concentration/ Averaging Time		Most Relevant Effect
	California Standards	Federal Primary Standards	
Ozone (O3)	0.09 ppm/1-hour 0.07 ppm/8-hour	0.070 ppm/8-hour	(a) Decline in pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage.
Carbon Monoxide (CO)	20.0 ppm/1-hour 9.0 ppm/8-hour	35.0 ppm/1-hour 9.0 ppm/8-hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO2)	0.18 ppm/1-hour 0.03 ppm/annual	100 ppb/1-hour 0.053 ppm/annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	0.25 ppm/1-hour 0.04 ppm/24-hour	75 ppb/1-hour 0.14 ppm/annual	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM10)	50 µg/m^3/24-hour 20 µg/m^3/annual	150 µg/m^3/24-hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in elderly.
Suspended Particulate Matter (PM2.5)	12 µg/m^3 / annual	35 µg/m^3/24-hour 12 µg/m^3/annual	
Sulfates	25 µg/m^3/24-hour	No Federal Standards	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) property damage.
Lead	1.5 µg/m^3/30-day	0.15 µg/m^3/3-month rolling	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more due to particles when humidity is less than 70 percent.	No Federal Standards	Visibility impairment on days when relative humidity is less than 70 percent.

Table 4: Federal and State Pollutant Standards

Source : https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf

California Air Resources Board (CARB)

The California Air Resources Control Board (CARB) is a part of the California Environmental Protection Agency (CalEPA) that coordinates and administers both federal and state air pollution control programs within California. CARB conducts research and sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the State Implementation Plan (SIP). CARB is also responsible for regulations pertaining to Toxic Air Contaminants.

The CARB and the CalEPA designate air basins across the state as "nonattainment areas" where air quality standards are exceeded. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. *Table 5: Mojave Desert Air Quality Management District Attainment Status* displays the current attainment status of MDAQMD.

TABLE 5: MOJAVE DESERT AIR QUALITY MANAGMENT DISTRICT ATTAINMENT STATUS

Pollutant	Federal Attainment Status	State Status
Ozone – 1-hour	--	Non-attainment
Ozone – 8- hour	Non-attainment	Non-attainment
Carbon Monoxide (CO)	Unclassified/ Attainment	Attainment
PM10	Non-attainment	Non-attainment
PM2.5	Unclassified/ Attainment	Non-attainment
Lead	Unclassified/ Attainment	Attainment
Sulfur Dioxide (SO2)	Unclassified/ Attainment	Attainment
Nitrogen Dioxide (NO2)	Unclassified/ Attainment	Attainment

Table 5: Mojave Desert Air Quality Management District Attainment Status

Source: (1) MDAQMD (n.d.)
Notes:
(1) **Unclassified**- A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
(2) **Attainment.** A pollutant is in attainment if the AAQS for that pollutant was not violated at any site in the area during a three-year period.
(3) **Nonattainment.** A pollutant is in nonattainment if there was at least one violation of an AAQS for that pollutant in the area.
(4) **Nonattainment/Transitional.** A subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the AAQS for that pollutant.

Mojave Desert Air Quality Management District (MDAQMD)

Mojave Desert Air Quality Management District (MDAQMD) is the regional agency principally responsible for comprehensive air pollution control in the Mojave Desert Air Basin (Basin). MDAQMD works directly with the Southern California Association of Governments (SCAG), county transportation commissions, and local governments and cooperates actively with all federal and state agencies. MDAQMD is responsible for preparing and implementing the Air Quality Management Plan (AQMP) within the Basin in compliance with the SIP, CAAQS and NAAQS.

The MDAQMD's mission is "attaining and maintaining healthful air quality while supporting strong and sustainable economic growth" (MDAQMD 2024). The agency regulates air quality through preparation and implementation of air quality compliance measures for Basin compliance with national and state air quality standards established for this area. The MDAQMD maintains an air-monitoring network that measures levels of several air pollutants throughout the air basin. The stations record meteorological information to help forecast daily pollution levels.

CEQA Guidelines Policy Document

To assist local jurisdictions, MDAQMD's CEQA Air Quality Policy Document (MDAQMD CEQA Policy Document) was prepared by the MDAQMD in February 2020. The version with current updates can be found at https://www.mdaqmd.ca.gov/rules/overview and was developed in accordance with the projections and programs of the Attainment Plan and SIP. In addition, this document is used as a guidance document for preparing air quality impact analysis and Project mitigation. The Policy document defines MDAQMD significant emissions thresholds and annual thresholds for Criteria Pollutants.

SCAG

Transportation Plan and Regional Transportation Improvement Plan

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. SCAG has prepared the Regional Transportation Plan and Regional Transportation Improvement Plan (RTIP), which addresses regional development and growth forecasts. These plans form the basis for the land use and transportation components of the AQMP, which are utilized for air quality forecasts and in the consistency, analysis included in the AQMP. The Regional Transportation Plan, Regional Transportation Improvement Plan, and AQMP are based on projections originating within the City and County General Plans.

EXISTING CONDITONS

Since not all air monitoring stations measure all of the tracked pollutants, the data from two monitoring stations have been used for this analysis. The nearest air monitoring station to the project site is the Joshua Tree National Monument monitoring station (Joshua Tree Station) located approximately 39 miles southeast of the project site. As not all monitoring stations monitor all pollutants, data was also taken from the San Bernardino – 4th Street monitoring station (San Bernardino Station). The San Bernardino Station is located approximately 49.98 mile southwest of the project site at 24302 4th Street, San Bernardino.

DISCUSSION

The responses within this section are based on the Air Quality, Global Climate Change, and Energy Impact Analysis, dated May 5, 2025, prepared by Ganddini Group (**Appendix A**). The study was performed to address the possibility of regional/local air quality impacts and global climate change impacts for short-term Project construction and long-term operations.

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

RESPONSE:

Less than Significant Impact. The potential for the project to exceed applicable emissions thresholds, thereby conflicting with or obstructing implementation of the applicable air quality plan, are discussed below for both construction and operations-related emissions.

Short-term Construction Emissions

Emissions were estimated using the CalEEMod (Version 2022.1.1.29) software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. Daily regional emissions during construction were forecasted by assuming a conservative estimate of construction activities, and applying mobile source and fugitive dust emissions factors.

Construction-related criteria pollutant emissions, summarized below in *Table 6*, shows that none of the analyzed criteria pollutants would exceed the MDAQMD daily emissions thresholds. Therefore, a less than significant regional air quality impact would occur from construction of the proposed project. While no mitigation is required, **Mitigation Measure MM-AQ-1, MDAQMD Compliance**, is provided to ensure that applicable MDAQMD rules and regulations are followed during project construction.

TABLE 6: CONSTRUCTION RELATED REGIONAL POLLUTANT EMISSIONS

Activity	Pollutant Emissions (pounds/day)					
	ROG	NOx	CO	SO_2	PM10	PM2.5
Maximum Daily Emissions[1, 2]	9.10	75.60	80.70	0.25	10.10	5.67
MDAQMD Thresholds	137	137	548	137	82	82
Exceeds Thresholds?	No	No	No	No	No	No

Table 6: Construction Related Regional Pollutant Emissions

Source: CalEEMod Version 2022.1.1.29

Notes: See **Appendix A** (Air Quality Global Greenhouse Gas Emissions, Energy Impact Analysis, Ganddini, May 5, 2025)

(1) Includes both on-site and off-site emissions. On -site grading PM-10 and PM-2.5 emissions show compliance with SCAQMD Rule 403 for fugitive dust.

(2) Construction, painting and paving phases may overlap.

Long-term Operational Emissions

The project comprises the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. To conduct routine inspections and ensure proper long-term maintenance, the long-term operation of the project will require a minimal number of monthly worker trips. Additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated. Therefore, operational emissions associated with the proposed project would be negligible and would not be anticipated to exceed MDAQMD thresholds. Operation of the proposed project would result in a less than significant regional air quality impact.

According to the MDAQMD, a project is non-conforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable MDAQMD rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan).

Due to the nature of the project and its location relevant to existing water infrastructure, the project is an allowable use under the current land use designations for these two parcels. Furthermore, the project's emissions do not exceed any MDAQMD thresholds during either short-term construction or long-term operation of the project. The proposed project would not conflict with implementation of the MDAQMD Attainment Plans, and impacts are considered to be less than significant.

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?

RESPONSE:

Less Than Significant Impact. The timing or sequencing of potential cumulative projects to be built in the project vicinity is unknown, therefore any quantitative analysis to ascertain daily construction emissions that assumes multiple, concurrent construction projects would be speculative.

The project area is out of attainment for both ozone and particulate matter. Construction and operation of cumulative projects will further degrade the air quality of the Mojave Desert Air Basin. The greatest cumulative impact on regional air quality will be the incremental addition of pollutants associated with increased traffic from development and the use of heavy equipment and trucks used during construction. Air quality will be temporarily degraded during construction; however, in accordance with the MDAQMD methodology, projects that do not exceed the MDAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact.

Project operations would generate emissions of NOx, ROG, CO, PM10, and PM2.5, which would not exceed the MDAQMD regional thresholds and would not be expected to result in ground level concentrations that exceed the NAAQS or CAAQS. Therefore, project operation would not result in a cumulatively considerable net increase for non-attainment of criteria pollutants or ozone precursors. As a result, the project would result in a less than significant cumulative impact for operational emissions.

c) Expose sensitive receptors to substantial pollutant concentrations?

RESPONSE:

Less than Significant Impact. The potential impacts associated with exposing sensitive receptors to substantial pollutant concentrations are discussed below for both construction and operations-related emissions.

Short-term Construction Emissions

The greatest potential for toxic air contaminant (TAC) emissions would be related to diesel particulate emissions associated with heavy equipment operations during construction of the proposed project. Given the relatively limited number of heavy-duty construction equipment and the short-term construction schedule (approximately 11 months), the proposed project would not result in a long-term (i.e., 30 years) substantial source of toxic air

contaminant emissions and corresponding individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project.

The project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than 5 minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would minimize emissions of TACs during construction. Therefore, impacts from TACs during construction would be less than significant.

Regarding health effects related to criteria pollutant emissions, applicable significance thresholds are established for regional compliance with the state and federal ambient air quality standards, which are intended to protect public health from both acute and long-term health impacts, depending on the potential effects of the pollutant. Because regional emissions of criteria pollutants during construction of the project would be below the applicable thresholds, it would not contribute to long-term health impacts related to nonattainment of the ambient air quality standards. Therefore, significant adverse acute health impacts as a result of project construction are not anticipated.

Long-term Operational Emissions

The project is a water infrastructure project that includes the construction of a new recharge basin and monitoring well and will not be a source of toxic air contaminants. The site is currently vacant and does not contain any operational land uses that emit toxic air contaminants. Therefore, a project-specific health risk assessment is not required or warranted. Applicable significance thresholds established for regional compliance with the state and federal ambient air quality standards are intended to protect public health from both acute and long-term health impacts, depending on the potential effects of the pollutant. Because regional emissions of criteria pollutants during operation of the project would be below the applicable thresholds, it would not contribute to long-term health impacts related to nonattainment of the ambient air quality standards. Therefore, significant adverse acute health impacts to sensitive receptors as a result of project operation are not anticipated.

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

RESPONSE:

Less than Significant Impact. The potential impacts associated with odor-generating emissions are discussed below for both construction and operations-related emissions.

Short-term Construction Emissions

Potential sources that may emit odors during construction activities include the application of materials such as asphalt pavement. The objectionable odors that may be produced during the construction process are short-term in nature and the odor emissions are expected to cease upon the drying or hardening of the odor producing materials. Due to the short-term nature and limited amounts of odor producing materials being utilized, no significant impact related to odors would occur during construction of the proposed project. Diesel exhaust and VOCs would be emitted during construction of the project; however, such emissions would disperse rapidly from the project site and would not reach an objectionable level at the nearest sensitive receptors.

Long-term Operational Emissions

Potential sources that may emit odors during the on-going operations of the proposed project would include odor emissions from diesel truck emissions and trash storage areas. As the project comprises recharge basin water infrastructure, no significant impact related to odors would occur during the ongoing operations of the proposed project.

MITIGATION MEASURES

MM-AQ-1, MDAQMD Compliance. The project applicant shall ensure that all applicable MDAQMD Rules and Regulations are complied with during construction.

4.4 Biological Resources

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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 Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan	☐	☐	☐	☒

The responses within this section are based on the following reports:

Appendix B- Biological Resources Assessment for the East Ames-Reche Recharge Facility Project conducted by ELMT Consulting dated September 2024. The report includes a field investigation conducted by Project Biologist Meghan E. Peukert on February 12, 2024, to document baseline conditions and assess the potential for special status[4] plant and wildlife species to occur within the proposed Project Location that could pose a constraint to implementation of the Project. The Project Site was also evaluated for the presence of jurisdictional waters of the United States, waters of the State, and/or jurisdictional streambed.

[4] As used in this report, "special-status" refers to plant and wildlife species that are federally, State, and MSHCP listed, proposed, or candidates; plant species that have been designated with a California Native Plant Society Rare Plant Rank; wildlife species that are designated by the CDFW as fully protected, species of special concern, or watch list species; and specially protected natural vegetation communities as designated by the CDFW.

Background research included review of standard field guides and texts for specific habitat requirements of special-status and non-special-status biological resources and historical conditions of the Project Site documented in the following resources:

- Google Earth Pro historic aerial imagery (1994-2023);
- San Bernardino County General Plan;
- Oro Grande Silica Quarries Mining/Reclamation Plan;
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[5];
- USFWS Critical Habitat designations for Threatened and Endangered Species; and
- USFWS National Wetlands Inventory (NWI).

REGULATORY COMPLIANCE

Federal Endangered Species Act

The Endangered Species Act (ESA) was enacted in 1973 and establishes protections for fish, wildlife, and plants that are listed as threatened or endangered along with the ecosystems these species depend on (16 U.S.C. 1531-1544) (USFWS 2023). The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Services (NMFS) share the responsibility for implementing the ESA. Generally, USFSW oversees terrestrial and freshwater species, while the NMFS manages marine and anadromous species.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 establishes a conservation treaty intended to promote the sustainability of populations of protected migratory bird species. The MBTA prohibits killing, capture, selling, trading, and transport of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife (USFWS 2023). In addition, the MBTA makes it unlawful to remove nests, eggs, and feathers from any of the species protected under the act.

Migratory bird species that are protected by law depend on the bird family and species included in the four international treaties (Canada in 1916; Mexico in 1936; Japan in 1972; Russia in 1976). This list can be found under Title 50 Part 10.13 (10.13 list), which was last updated in 2020 to incorporate current scientific information on taxonomy and natural distribution. The MBTA applies to almost all avian species that are native to California.

A migratory bird species is included on the list if it meets on one more of the following criteria:

1. It occurs in the United States or U.S. territories as the result of natural biological or ecological processes and is currently, or was previously listed as, a species or part of a family protected by one of the four international treaties or their amendments.
2. Revised taxonomy results in it being newly split from a species that was previously on the list, and the new species occurs in the United States or U.S. territories as the result of natural biological or ecological processes.
3. New evidence exists for its natural occurrence in the United States or U.S. territories resulting from natural distributional changes and the species occurs in a protected family.

The Migratory Bird Treaty Reform Act amends the MBTA so that nonnative birds or birds that have been introduced by humans to the United States or its territories are excluded from protection under the MBTA. Most birds found in southern California are protected under the MBTA.

California Fish and Game Code

The California Fish and Game Code is composed of various statues that aid in the protection of biological resources, including Native Plant Protection Act (NPPA) of 1977 and the California Endangered Species Act (CESA) (California Fish

[5] A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

and Game Code Sections 2050-2098). The NPPA designated plants as rare or endangered and prohibits the take of any such plants, unless authorized in limited circumstances by the Fish and Game Commission. Incidental take may be authorized by permit, when all of the following criteria are met: (1) the take is identical to an otherwise lawful activity; and (2) the impacts of the authorized take shall be minimized and fully mitigated (CA Fish & Game Code Section 2081(b)). CESA prohibits public agencies from approving projects that could jeopardize species listed under CESA as endangered or threatened.

In addition, California Fish and Game Code protects native and migratory birds including nests and eggs in addition to protecting various mammals (Section 4700), amphibians (Section 5050), and fish species (Section 5515). For this reason, California Fish and Game Code requires that CDFW be notified of lake or streambed alteration activities. If activities are determined to adversely affect existing fish and wildlife resources by CDFW, a streambed alteration agreement must be authorized to ensure the protection of biological resources and water quality.

California Department of Fish and Wildlife

Western Joshua Tree Conservation Act

The Western Joshua Tree Conservation Act (WJCA) was enacted in July 2023, prohibiting the "importation, export, take, possession, purchase, or sale of any western Joshua tree in California" (CDFW, n.d.). The act allows CDFW to issue permits for the incidental take of one or more western Joshua tree in California by having the applicant pay in-lieu fees that are collected for the purposes of acquiring, conserving, and managing, western Joshua tree conservation lands and completing other activities to conserve the western Joshua tree.

California Desert Native Plants Act

CDNPA was established by Division 23 of the California Food and Agricultural Code. It ensures "the protection of desert native plants from unlawful harvesting on public and private lands" in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties (San Bernadino GP EIR, 2015). The CDNPA contains legal provisions against the harvest and transplant of native plants for the greatest possible chance of survival (San Bernardino GP EIR, 2015).

San Bernardino County

Municipal Code

Section 88.01.060 of the County of San Bernardino Development Code provides regulations for the removal or harvesting of specified desert native plants to preserve and protect the plants and to provide for the conservation and wise use of desert resources. The provisions are intended to coincide with the Desert Native Plants Act (Food and Agricultural Code Section 8001 et seq.) and the State Department of Food and Agriculture to implement and enforce the Act.

General Plan

San Bernadino's General Plan, Conservation Element identifies the following policies and goals specific to biological resources within the Desert Planning Region:

- Goal CO 2: The County will maintain and enhance biological diversity and healthy ecosystems throughout the County.
- Policy CO 2.1: The County will coordinate with state and federal agencies and departments to ensure that their programs to preserve rare and endangered species and protect areas of special habitat value, as well as conserve populations and habitats of commonly occurring species, are reflected in reviews and approvals of development programs.
- Policy CO 2.2: Provide a balanced approach to resource protection and recreational use of the natural environment.
- Policy CO 2.3: In addition to conditions of approval that may be required for specific future development proposals, the County shall establish long-term comprehensive plans for the County's role in the protection of native species because preservation and conservation of biological resources are statewide, Regional, and local issues that directly affect development rights. The conditions of approval of any land use application approved with the Biotic Resources (BR) overlay district shall incorporate mitigation measures identified in

the report required by Section 82.13.030 (Application Requirements), to protect and preserve the habitats of the identified plants and/or animals.

EXISTING CONDITIONS

Elevations at the Project Site from approximately 3,311 to 3,341 feet AMSL; on-site topography is relatively flat with little area of topographic relief. According to the NRCS Custom Soil Resource Report, the project site is underlain by the soil unit Cajon-Arizo complex (2 to 15 percent slopes) (See **Appendix B**) Soils are disturbed along Winters Road and surrounding the developed areas of the project site. Soils within the undeveloped areas are generally undisturbed.

Vegetation

One (1) plant community was observed within the boundaries of the Project Site: creosote bush scrub. In addition, two (2) land cover types that would be classified as disturbed and developed were observed onsite; these areas are not vegetation classifications, but rather land cover types. The Creosote Buch Scrub plant community occurs throughout the undeveloped and disturbed portions of the surrounding landscape and is the dominant plant community. Most of the Project Site is undisturbed with the exception of areas that have been disturbed from illegal dumping and past development (i.e. concrete foundations) Common plant species found within this plant community include western Joshua tree (*Yucca brevifolia*), red-stemmed filaree (*Erodium cicutarum*), red brome (*Bromus madritensis ssp. rubens*), silver cholla (*Cylindropuntia echinocarpa*), desert sand verbena (*Abronia villosa*), rayless goldenhead (*Acamptopappus sphaerocephalus*), branched pencil cholla (*Cylindopuntia ramosissima*), canaigre dock (*Rumex hymenosepalus*), flatspine bursage (*Ambrosia villosa*), Fremont's pincushion (*Chaenactis fremontii*), woolly desert marigold (*Baileya pleniradiata*), Mediterranean grass (*Schismus barbatus*), Mormon tea (*Ephedra nevadensis*), and desert needlegrass (*Stipa speciosa*).

Disturbed

Disturbed areas adjacent to the Project Site include a dirt access road along Winters Road. The access road is within MWA's 20-ft easement for access to an existing pipeline from the flow control facility in the east to the existing Ames-Reche recharge basin approximately 0.4 miles northwest near Pipes Wash. At the Project Site, disturbances consist of remnants of concrete foundations, illegal dumping and encampments. Plant species occurring within these disturbed areas include red brome, London rocket (*Sisybrium irio*), flatspine bursage, canaigre dock, and Mediterranean grass.

Developed

The developed areas of the Project Site include a concrete pad in the middle of the southern portion as well as a partially demolished concrete structure in the southeastern portion. These areas are completely absent of plant communities.

Wildlife

Plant communities and undeveloped land within the boundaries of the project site provide foraging habitat, nesting/denning sites, and shelter from adverse weather or predation. Research from the California Natural Diversity Database (CNDDB) and California Native Plant Society's (CPNS) Electronic Inventory identified twenty-four (24) special-status plant species and fifteen (15) special-status wildlife species as having potential to occur within the Project Site and the Goat Mountain, Joshua Tree North, Landers, and Yucca Valley North quadrangles. No special-status plants were identified within the boundaries of the Project Site. During the site visit, the potential for occurrence of special-status plant and wildlife species was evaluated based on field conditions and habitat requirements for each species, such as availability and quality of suitable habitat on the Project Site and known distributions for each species. See *Table 7: Special-Status Species Documented within the Vicinity of the Study Area*. The Status of wildlife species at the Project Site are summarized below in Response a).

TABLE 7: SPECIAL-STATUS SPECIES DOCUMENTED WITHIN THE VICINITY OF THE STUDY AREA

Species	Status	Description of Habitat Requirements	Observed On-Site	Potential to Occur in Study Area
SPECIAL STATUS WILDLIFE SPECIES				
Aquila chrysaetos golden eagle	Fed: None CA: FP/WL	Occupies nearly all terrestrial habitats of the western states except densely forested areas. Favors secluded cliffs with overhanging ledges and large trees for nesting and cover. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats. Deeply cut canyons rising to open mountain slopes and crags are ideal.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Atene cunicularia Burrowing owl	Fed: None CA: SSC	Prefers habitat with short, sparse vegetation with few shrubs and well-drained soils in grassland, shrub steppe, and desert habitats. Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by lowgrowing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**Low** Suitable foraging habitat is present within and surrounding the project site. No suitable burrows found onsite.
Chaetodipus fallax pallidus pallid San Diego pocket mouse	Fed: None CA: None	Common resident of sandy herbaceous areas, usually in association with rocks or course gravel in southwestern California. Occurs mainly in arid coastal and desert border areas. Habitats include coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyonjuniper, and annual grassland.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Falco mexicanus prairie falcon	Fed: None CA: WL	Commonly occur in arid and semiarid shrubland and grassland community types. Also occasionally found in open parklands within coniferous forests. During the breeding season, they are found commonly in foothills and mountains which provide cliffs and escarpments suitable for nest sites.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Gopherus agassizii desert tortoise	Fed: THR CA: THR	Widely distributed in the Mojave, Sonoran, and Colorado deserts from below sea level to 7,220 feet. Most common in desert scrub, desert wash, and Joshua tree habitats, but occurs in almost every desert habitat except those on the most precipitous slopes.	No	**Low** Suitable foraging habitat is present within and surrounding the project site. No suitable burrows found onsite.
Lanius ludovicianus loggerhead shrike	Fed: None CA: SSC	Prefers open habitats with bare ground, scattered shrubs, and areas with low or sparse herbaceous cover including open-canopied valley foothill hardwood, riparian, pinyon-juniper, desert riparian, creosote bush scrub, and Joshua tree woodland. Requires suitable perches including trees, posts, fences, utility lines, or other perches.	No	**High** Suitable foraging and nesting habitat are present within and surrounding the project site.
Lasiurus xanthinus western yellow bat	Fed: None CA: SSC	Roosts in palm trees in foothill riparian, desert wash, and palm oasis habitats with access to water for foraging.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Ovis canadensis nelsoni desert bighorn sheep	Fed: None CA: FP	Preferred habitat is near mountainous terrain above the desert floor that is visually open, as well as steep and rocky. Most Mojave Desert Mountain ranges satisfy these requirements well. Surface water is another	No	**Presumed Absent** There is no suitable habitat present

Species	Status	Description of Habitat Requirements	Observed On-Site	Potential to Occur in Study Area
		element that is considered important to population health.		within or adjacent to the project site
Paranomada californica California cuckoo bee	Fed: None CA: None	Habitat data is unknown. It is a kleptoparasite of other solitary ground-nesting bees.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Phrynosoma blainvillii coast horned lizard	Fed: None CA: SSC	Occurs in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. In inland areas, this species is restricted to areas with pockets of open microhabitat, created by disturbance (i.e. fire, floods, roads, grazing, fire breaks). The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Spizella breweri Brewer's sparrow	Fed: None CA: None	Habitats include arid sagebrush and brushy plains. Nests in tall and densely branching shrubs, most often in big sagebrush (Artemesia tridentata). Winters in desert grasslands.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Taxidea taxus American badger	Fed: None CA: SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Toxostoma bendirei Bendires thrasher	Fed: None CA: SSC	Prefers relatively open grassland, shrubland, or woodland with scattered trees or shrubs for breeding. Generally found in brushy habitats in deserts or grasslands, and Joshua tree stands.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Toxostoma lecontei Le Conte's thrasher	Fed: None CA: SSC	An uncommon to rare, local resident in southern California deserts from southern Mono Co. south to the Mexican border, and in western and southern San Joaquin Valley. Occurs primarily in open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats; also occurs in Joshua tree habitat with scattered shrubs.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Uma scoparia Mojave fringe-toed lizard	Fed: None CA: SSC	Restricted to sparsely vegetated, windblown sand in dunes, flats, riverbanks and washes. It requires fine, loose sand for burrowing and lays its eggs in subsurface burrows. Vegetation is typically scant and often consists of creosote bush scrub or other scrub.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
SPECIAL STATUS PLANT SPECIES				
Astragalus bernardinus San Bernardino milk-vetch	Fed: None CA: None CNPS: 1B.2	Grows in carbonate (often), granitic (often) areas within Joshua tree "woodland" and Pinyon and juniper woodland habitats. Found at elevations ranging from 2,955 to 6,560 feet in the San Bernardino Mountains and Mojave Desert. Blooming period is from April to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Astragalus nutans	Fed: None CA: None CNPS: 4.3	Grows in gravelly (sometimes), sandy (sometimes) soils within Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland, and Sonoran desert scrub habitats. Found at elevations ranging from 1,475 to	No	**Presumed Absent** There is no suitable habitat present

Species	Status	Description of Habitat Requirements	Observed On-Site	Potential to Occur in Study Area
Providence Mountains milk-vetch		6,400 feet. Blooming period is from March to June (October).		within or adjacent to the project site
Berberis fremontii Fremont berry	Fed: None CA: None CNPS: 2B.3	Grows in granitic (sometimes), rocky soils within Joshua tree "woodland" and Pinyon and juniper woodland habitats. Found at elevations ranging from 3,755 to 5,645 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site. The site occurs outside of the known elevation range for this species.
Boechera dispar pinyon rockcress	Fed: None CA: None CNPS: 2B.3	Found on loose, granitic slopes or compact talus soils in Joshua tree woodland, Mojavean Desert scrub, and pinyon-juniper woodland. Grows at elevations from 3,900 to 8,300 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site. The site occurs outside of the known elevation range for this species.
Camissonia kernensis ssp. Kernensis Kern County evening primrose	Fed: None CA: None CNPS: 4.3	Grows in granitic, gravelly (sometimes), sandy (sometimes) areas within chaparral, Joshua tree "woodland", and pinyon and juniper woodland habitats. Found at elevations ranging from 2,590 to 6,990 feet. Blooming period is from March to May	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Canbya candida white pygmy-poppy	Fed: None CA: None CNPS: 4.2	Occurs on gravelly, sandy, granitic soils in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. Found at elevations ranging from 2,297 to 5,249 feet above mean sea level (msl). Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Cymopterus multinervatus purple-nerve cymopterus	Fed: None CA: None CNPS: 2B.2	Grows in sandy or gravelly soils within Mojavean desert scrub and pinyon and juniper woodland habitats. Found at elevations ranging from 2,590 to 5,905 feet. Blooming period is from March to April	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Erigeron parishii Parish's daisy	Fed: THR CA: None CNPS: 1B.1	Grows in carbonate (usually) and granitic (sometimes) soils in Mojavean desert scrub and pinyon/juniper woodland habitats. Found at elevations ranging from 2,625 to 6,560 feet. Blooming period is from May to August.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Eschscholzia androuxii Joshua Tree poppy	Fed: None CA: None CNPS: 4.3	Occurs on sandy, gravelly, and/or rocky desert washes, flats, and slopes in Joshua tree woodland and Mojavean desert scrub. Found at elevations from 1,900 to 5,530 feet. Blooming period is February to June	No	**Low** Limited habitat is present within or adjacent to the project site.
Euphorbia abramsiana Abram's spurge	Fed: None CA: None CNPS: 2B.2	Found on sandy soils in Mojavean desert scrub and Sonoran Desert scrub. Found at elevations ranging from -15 to 4,300 feet. Blooming period is from September to November	No	**Low** Limited habitat is present within or adjacent to the project site.
Euphorbia vallis-mortae	Fed: None CA: None CNPS: 4.2	Grows within Mojavean desert scrub (gravelly, sandy) habitats. Found at elevations ranging from 755 to 4,790 feet. Blooming period is from May to October	No	**Presumed Absent** There is no suitable habitat present

Species	Status	Description of Habitat Requirements	Observed On-Site	Potential to Occur in Study Area
Death Valley sandmat				within or adjacent to the project site
Funastrum utahense Utah vine milkweed	Fed: None CA: None CNPS: 4.2	Occurs in sandy or gravelly soil in Mojavean desert scrub and Sonoran desert scrub. Found at elevations ranging from 328 to 4,708 feet. Blooming period typically ranges from April to June but can begin as early as March and end as late as October.	No	**Low** Limited habitat is present within or adjacent to the project site.
Galium angustifolium ssp. gracillimum slender bedstraw	Fed: None CA: None CNPS: 4.2	Grows on rocky, granitic soils within Joshua tree woodland and Sonoran desert scrub habitats. Found at elevations ranging from 427 to 5,085 feet. Blooming period is from April to June.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Grusonia parishii Parish's club-cholla	Fed: None CA: None CNPS: 2B.2	Grows in rocky, sandy soils within Joshua tree "woodland", Mojavean desert scrub, and Sonoran desert scrub habitats. Found at elevations ranging from 985 to 5,000 feet. Blooming period is from May to June (July).	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Linanthus bernardinus Pioneertown linanthus	Fed: None CA: None CNPS: 1B.2	Grows within Joshua tree "woodland" and pinyon and juniper woodland habitats. Found at elevations ranging from 460 to 4,005 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Linanthus maculatus ssp. Maculatus Little San Bernardino Mtns. linanthus	Fed: None CA: None CNPS: 1B.2	Preferred habitats include desert dunes, Joshua tree woodland, Mojavean desert scrub, and Sonoran Desert scrub in sandy soils. Found at elevations ranging from 640 to 6,808 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Lycium torreyi Torrey's box-thorn	Fed: None CA: None CNPS: 4.2	Grows in rocky, sandy streambank, and wash areas within Mojave desert scrub and Sonoran desert scrub habitats. Found at elevations ranging from -165 to 4,005 feet. Blooming period is from (January to February) March to June (September to November).	No	**Presumed Absent** No suitable habitat is present within or adjacent to the project site
Monardella robisonii Robisons monardella	Fed: None CA: None CNPS: 1B.3	Grows within pinyon and juniper woodland habitats. Known to occur only in sky island habitats in the Mojave Desert mountains, primarily within areas of Joshua Tree National Park and of lower elevations in Sand to Snow National Monument. Found at elevations ranging from 2,000 to 4,920 feet. Blooming period is from (February) April to September (October).	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Muilla coronata crowned muilla	Fed: None CA: None CNPS: 4.2	Found in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland habitats. Blooming period is from May to April. Grows in elevation from 2,198 to 6,430 feet	No	**Low** Limited habitat is present within or adjacent to the project site.
Penstemon clevelandii var. mohavensis Mojave beardtongue	Fed: None CA: None CNPS: 1B.2	Grows in granitic (often), rocky areas within Mojavean desert scrub and Pinyon and juniper woodland habitats. Found at elevations ranging from 3,035 to 5,315 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Petalonyx thurberi ssp. gilmanii Death Valley sandpaper-plant	Fed: None CA: None CNPS: 1B.3	Grows within desert dunes and Mojavean desert scrub habitats. Found at elevations ranging from 855 to 4,740 feet. Blooming period is from May to September.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site

Species	Status	Description of Habitat Requirements	Observed On-Site	Potential to Occur in Study Area
Saltugilia latimeri Latimer's woodland-gilia	Fed: None CA: None CNPS: 1B.2	Habitats include chaparral, Mojavean desert scrub, pinyon and juniper woodland. Prefers rocky or sandy, often granitic, soils. Found at elevations ranging from 1,310 to 6,235 feet. Blooming period is from March to June.	No	**Low** Limited habitat is present within or adjacent to the project site.
Streptanthus campestris southern jewelflower	Fed: None CA: None CNPS: 1B.3	Occurs in open, rocky areas in chaparral, lower montane coniferous forest, and pinyon-juniper woodland. Found at elevations ranging from 2,955 to 7,545 feet. Blooming period is from May to July	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site
Yucca brevifolia western Joshua tree	Fed: None CA: CE CNPS: N/A	Occurs in a variety of arid habitats within the Mojave Desert. Found at elevations ranging from 1,600 to 6,600 feet. Blooming period is from March to June.	Yes	**Present** Suitable habitat is present within and surrounding the project site

Table 7: Special-Status Species Documented within the Vicinity of the Study Area

Source: (ELMT, 2024). See Appendix B
Notes:
**Species having low to high potential to occur at the Project Location are grey filled.

U.S. Fish and Wildlife Service (Fed) -Federal
END- Federal Endangered
THR- Federal Threatened

CDFW (CA) - California
END- California Endangered
THR- California Threatened
Candidate- Candidate for listing under the California Endangered Species Act
FP- California Fully Protected
SSC- Species of Special Concern
WL- Watch List

California Native Plant Society (CNPS)
California Rare Plant Rank
1B Plants Rare, Threatened, or Endangered in California and 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

CNPS Threat Ranks
0.1- Seriously threatened in California
0.2- Moderately threatened in California
0.3- Not very threatened in California

DISCUSSION

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

RESPONSE:

Less than Significant with Mitigation Incorporated. According to the CNDDB and California Native Plant Society (CNPS), twenty-four (24) special-status plant species have been recorded in *Goat Mountain, Joshua Tree North, Landers,* and *Yucca Valley North* quadrangles. One special-status plant species was observed on the Project Site.

Impacts to Plants

Western Joshua tree (*Yucca brevifolia)* was designated as a candidate for listing under the CESA in October 2020 and is subject to regulation by CDFW under the Western Joshua Tree Conservation Act (WJTCA), enacted in July 2023. This legislation stipulates that importation, export, take, possession, purchase, or sale of any western Joshua tree in California is prohibited unless authorized under CDFW's established Incidental Take process. This process is applied to infrastructure improvements on a regular basis. Project activities involving "take" of a Joshua Tree are subject to regulatory review, prior authorization and full mitigation for project impacts. Unauthorized 'take" results in fines and criminal penalties. CDFW's Incidental Take process requires quantitative inventory and evaluation of existing trees for full mitigation. CDFW has established an in-lieu fee schedule, which is intended to fund conservation of this species. Therefore, full mitigation can be achieved via payment of in-lieu mitigation fees or another methods stipulated in the WJTCA and permitted by CDFW. CDFW has established a mitigation fee map showing the boundaries reduced Mitigation Fees for impacts to Western Joshua Trees (Yucca brevifolia) in California as defined in the California Department of Fish and Wildlife Code (Section 1927). The Project Site is not within the boundaries of the area mapped for reduced fees. An in-lieu fee schedule pursuant to CESA protections is provided in *Table 8: Joshua Tree Mitigation Fees* below.

TABLE 8: JOSHUA TREE MITIGATION FEES

Location	Mitigation Fees
The Project Site is not located within the "Reduced Mitigation Fee Area": the area bounded on the east and west by Interstate 5 and Interstate 15, respectively, and on the north and south by Highway 58 and Highways 138 and 18, respectively.	Full mitigation, or in-lieu fee as follows: - $2,500 per tree > 5 meters tall - $500 per tree 1 to 5 meters tall - $340 per tree < 1 meter tall

Table 8: Joshua Tree Mitigation Fees

Source: (ELMT Consulting, 2024)

A total of sixty-eight (68) western Joshua trees were observed during the field investigation, including ten (10) individuals measuring less than one meter in height, forty-four (44) individuals measuring between one and five meters in height, and fourteen (14) individual measuring over five meters in height. Using *Table 8: Joshua Tree Mitigation Fees*, impacts to all of the western Joshua trees onsite will require a mitigation fee of $60,400 to be paid into the Western Joshua Tree Mitigation Fund for approved off-site conservation.

Impacts to Birds

The Project Site provides suitable foraging and nesting habitat for a variety of resident and migratory bird species adapted to conditions within the Mojave Desert. Avian species detected during the survey included black-throated sparrow (*Amphispiza bilineata*), house finch (*Haemorhous mexicanus*), Gambel's quail (Callipepla gambelii), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), cactus wren (*Campylorhynchus brunneicapillus*), rock wren (*Salpinctes obsoletus*), and Say's phoebe (*Sayornis saya*).

While no active bird nests or birds were observed during the field survey; courtship and nesting behaviors were observed. The Mojavean desert scrub plant community provides suitable foraging and nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that have adapted to conditions in the Mojave Desert. Based on the biological resources field investigation, as well as likelihood of occurrence for nesting birds

and burrowing owls identified during research, the Project could result in impacts on migratory birds. Accordingly, Mitigation Measures **MM BIO-01: Preconstruction Nesting Bird Clearance Survey** and **MM BIO-02: Pre-construction Burrowing Owl Clearance Surveys** are required prior to the start of vegetation removal or ground disturbing activities, if Project construction is expected to occur between February 1 and Augst 31. Implementation of these Mitigation Measures will ensure that no nesting birds or burrowing owls will be disturbed throughout construction activities pursuant to the MBTA and Fish and Game Code.

Impacts to Fish & Amphibians

No fish or hydrogeomorphic features (e.g., creeks, ponds, lakes, reservoirs) or amphibians with frequent sources of water that would support populations of fish or amphibians were observed on or within the vicinity of the Project Site. Therefore, no fish or amphibians are expected to occur and are presumed absent from the Project Site.

Impacts to Reptiles

The Project Site provides suitable foraging and nesting habitat for a variety of reptilian species adapted to conditions within the Mojave Desert. No reptilian species were observed during the field investigation. Common reptilian species that could be expected to occur at the Project Site include common side-blotched lizard (*Uta stansburiana elegans*), great basin whiptail (*Aspidoscelis tigris tigris*), and Great Basin gopher snake (*Pituophis catenifer deserticola*). No desert tortoise or signs were observed during the field investigation. However, due to the potential for occurrence for the Desert Tortoise and presence of habitat, Mitigation Measure **MM BIO-03: Pre-construction Desert Tortoise Clearance Survey** shall be conducted thirty (30) days prior to ground disturbing activities throughout undeveloped areas of the Project Site. This Mitigation Measure will reduce potential impacts to the Desert Tortoise, a Federally Endangered Species, to a less than significant level, through thorough inspections for presence/absence prior to earthworks and other ground disturbances; in addition, a preconstruction Desert Tortoise Clearance Survey would identify the need for an Incidental Take Permit (ITP) for this species prior to Project implementation.

Impacts to Mammals

The Project Site provides suitable foraging and denning habitat for a variety of mammalian species adapted to conditions within the Mojave Desert. Most mammal species are nocturnal and are difficult to observe during a diurnal field visit. The only mammalian species observed or detected during the field investigation were white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), coyote (*Canis latrans*), and kit fox (Vulpes macrotis). Other common mammalian species that have potential to occur on-site include kangaroo rat (*Dipodomys* sp.) and desert cottontail (*Sylvilagus audubonii*). No bat species are expected to occur due to a lack of suitable roosting habitat (i.e., trees, crevices, abandoned structures) within and surrounding the Project Site.

For the reasons above, Project impacts are anticipated to be reduced to less than significant levels with the implementation of Mitigation Measure **MM BIO-01: Pre-construction Nesting Bird Clearance Survey**.

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

RESPONSE:

Less than Significant with Mitigation Incorporated. Based on habitat requirements for the identified special-status species and known distributions, it was determined that the Project would not impact riparian habitat. The creosote bush scrub plant community found on the Project Site includes Western Joshua Trees. Existing conditions determined that the undeveloped and undisturbed portions of the Project Site that support the creosote bush scrub plant community have a low potential for Joshua Tree poppy (*Eschscholzia androuxii*), Abram's spurge (*Euphorbia abramsiana*), Utah vine milkweed (*Funastrum utahense*), crowned muilla (*Muilla coronata*), and Latimer's woodland-gilia (*Saltugilia latimeri*). With the exception of the western Joshua trees, it was determined that the Project Site and associated pipeline areas do not provide suitable habitat for remaining special-status plant species known to occur in the area and are presumed absent.

Impacts to western Joshua trees will require an ITP to be prepared and processed with CDFW, and a mitigation fee of $60,400 to be paid into the western Joshua tree mitigation tree fund pursuant to Mitigation Measure **MM BIO-05: Incidental Take Permit**

As a result, impacts are no anticipated due to the implementation of Mitigation Measure **MM BIO-05: Incidental Take Permit.**

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?**

RESPONSE:

No Impact. Based on the site visit and review of USFWS National Wetland Inventory (NWI) and EPA Water Program "My Waters" data layers, it was determined by the Project Biologist that no wetlands are near or adjacent to the Project Alignment. Therefore, no impacts to wetlands are anticipated; therefore, no additional Mitigation Measures are needed.

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?**

RESPONSE:

Less than Significant Impact. According to the San Bernardino County General Plan, the Project Alignment has not been identified as occurring within a Wildlife Corridor or Linkage. As designated by the San Bernardino County General Plan Open Space Element, the nearest major corridor or linkage documented in the vicinity of the Northern Portion of the Project Alignment lies approximately 4.51 miles to the southwest in association with Chino Hills State Park.

The proposed Project is located on the eastern bank of Pipes Wash and has the potential to have temporary impacts to wildlife movement during construction of the proposed project. However, based on the proposed Site Plan, no direct permanent impacts to Pipes Wash are expected to occur from Project implementation, and wildlife will continue to have movement opportunities within Pipes Wash during construction and throughout the immediate area. As a result, implementation of the proposed Project is not expected to have significant impacts to wildlife movement opportunities or prevent local wildlife movement through the area since there is ample habitat adjacent to the project site to support wildlife movement opportunities.

As a result, the Project anticipates less than significant impacts with the implementation of mitigation measures.

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

RESPONSE:

Less than Significant with Mitigation Incorporated. Based on the results of the field investigation, multiple species covered by the CDNPA, and the County of San Bernardino Development Code were observed within Project boundaries during the field investigation, including silver cholla, pencil cholla, hedgehog cactus, chaparral yucca, beavertail prickly pear, and Mohave yucca. Impacts to these species should be avoided in all instances. However, in the event that avoidance is not feasible, the Agency will need an inventory of covered species within the Project Site completed and a Tree or Plant Removal Permit will need to be obtained from the County of San Bernardino prior to removal of any regulated tree or plant. Therefore, Mitigation Measures **MM BIO-04: Cover Species Inventory** and **MM BIO-05: Tree & Plant Removal Permit** will be implemented to ensure that species covered by the CDNPA are documented and identified; and a tree or plant removal

With implementation of the proposed Mitigation Measures, potential impacts are considered to be less than significant.

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?**

RESPONSE:

No Impact. The Project Site is not located within an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan. Therefore, impacts to any local, regional, or state habitat conservation plans are not expected to occur from development of the proposed project, and mitigation is not required.

No Impacts are anticipated; therefore, no Mitigation Measures are needed.

MITIGATION MEASURES

MM BIO-01: Pre-construction Nesting Bird Clearance Survey. If construction occurs between February 1st and August 31st, MWA shall ensure a pre-construction clearance survey for nesting birds be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur.

If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.

MM BOI-02: Pre-construction Burrowing Owl Clearance Survey. Due to the potential of occurrence, MWA shall ensure a pre-construction burrowing owl clearance survey shall be conducted by a qualified biologist concurrently with the pre-construction nesting bird clearance survey to ensure that burrowing owl remains absent from the Project Site. Depending on the results from the pre-construction Burrowing Owl Survey, the District shall perform the following:

- **Not Detected**: If burrowing owl are not detected during the pre-construction survey, no further mitigation is required. If burrowing owl are detected, CDFW shall be sent written notification within 3 days of detection of burrowing owls.
- **Discovery of Burrowing Owl**: If active burrowing owl burrows are detected, the District shall not commence activities until no sign is present that the burrows are being used by adult or juvenile owls or following CDFW approval of a Burrowing Owl Plan as described below. If owl presence is difficult to determine, a qualified biologist shall monitor the burrows with motion-activated trail cameras for at least 24 hours to evaluate burrow occupancy. The onsite qualified biologist will verify the nesting effort has finished according to methods identified in the Burrowing Owl Plan.
- **Burrowing Owl Plan**: The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFW Staff Report on Burrowing Owl (March 2012). The qualified biologist and MWA shall coordinate with the Agency and CDFW to develop a Burrowing Owl Plan to be approved by the District and CDFW prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, relocation, monitoring, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial burrows (numbers, location, and type of burrows) and management activities for relocated owls shall also be included in the Burrowing Owl Plan. The District shall implement the Burrowing Owl Plan following CDFW review and approval.

MM BIO-03: Pre-construction Desert Tortoise Clearance Survey: Thirty (30) days prior to ground disturbing areas, MWA shall ensure a preconstruction Desert Tortoise Clearance survey shall be conducted in undeveloped areas to

confirm the absence of desert tortoise within the boundaries of the survey area. All burrows, if present, will be thoroughly inspected for the presence of desert tortoise or evidence of recent use using non-intrusive methods (i.e., mirror, digital camera). Burrow characteristics including class, shape, orientation, size, and evidence of deterioration will be recorded on field data sheets.

Although not anticipated, if desert tortoise are found onsite during the pre-construction clearance survey, coordination will need to occur with the USFWS and CDFW to determine if avoidance and minimization measures can be implemented to avoid any direct or indirect impacts to desert tortoise, or if "Take" permits will need to be obtained prepared and approved by the USFWS and CDFW.

MM BIO-04: Cover Species Inventory: MWA shall obtain a qualified biologist to conduct a comprehensive inventory of all covered species within the Project Site and Project Footprint, no more than 30-days and 3-days prior to Project construction. The inventory shall include identification and documentation of all special status species present on-site; mapping of species location using GPS coordinates; and photographic documentation of species and their habitats. Any changes in species presence shall be recorded and provided to MWA and the Project contractor.

MM BIO-05: Incidental Take Permit: Prior to the start of construction, the permittee shall obtain a western Joshua tree incidental take permit and pay in-lieu fees for the removal of 68 western Joshua trees within the Project Site. The permittee must adhere to the conditions of the WJTCA Incidental Take Permit.

4.5 Cultural Resources

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

REGULATORY COMPLIANCE

California Public Resources Code 15064.5

The following regulations are applicable to cultural resources that could be found at the Project Site:

California Code of Regulations Title 14 Subsection 15064.5 generally defines historically significant cultural resources as any object, building, structure, site, area, place, record, or manuscript which is:

- A resource listed or eligible for listing by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR)
- A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code, or identified as significant in a historical resource survey meeting the requirements section 5024.1(g), (listed as historical by local ordinance)
- A resource a lead agency determines to be historically significant.

California Code of Regulations §15064.5 relating to historical resources pertains to environmental changes impacting any object, building, structure, site, area, place, record, or manuscript meeting the following criteria:

1. Events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. The lives of persons important in our past.
3. 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. Resources which have yielded, or may likely yield, information important in prehistory or history.

Properties that are listed in or eligible for listing in the National Register of Historic Places pursuant to Section 106 of the National Historic Preservation Act are considered eligible for listing in the CRHR and thus are significant historical resources for the purpose of CEQA (PRC Section 5024.1(d)(1)).

CEQA Section 21083.2

CEQA Section 21083.2 requires that the CEQA Lead Agency determine whether a project may have a significant effect on unique archaeological resources. A unique archaeological resource is defined in as an archaeological artifact, object, or site about which it can be clearly demonstrated that there is a high probability that it:

- Contains information needed to answer important scientific research questions, and there is demonstrable public interest in that information;
- Has a special or particular quality, such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

California Health and Safety Code Section 8100

Section 8100 of the California Health and Safety Code defines a cemetery as six or more human burials at one location. Disturbance of Native American cemeteries is a felony (Health and Safety Code Section 7052). Section 7050.5 of the Health and Safety Code requires that if human remains are found during construction or excavation, the activities be stopped until the county coroner can determine if the remains are Native American. If the remains are determined to be Native American, the coroner must then contact the Native American Heritage Commission (NAHC), which has jurisdiction pursuant to PRC Section 5097.

EXISTING CONDITIONS

Natural Setting

The Area of Potential Effects (APE), or project site, is located in Section 24 of Township 2 North, Range 5 East, San Bernardino Baseline and Meridian. The project site is depicted on the United States Geological Survey (USGS) Yucca Valley North, California (1979) 7.5-minute topographic quadrangle.

The project is located in the south Mojave Desert with an elevation of approximately 3,316 to 3,331 feet above mean sea level (AMSL). Previous geologic mapping indicates that the proposed project site is situated upon early Pleistocene alluvium and late Holocene wind-blown sand (Biehler et al. 1988), locally consisting of poorly sorted sandy silt containing scattered pebbles and cobbles. Field observations conducted for the Project's Cultural Resources Assessment (BCR 2025) are consistent with these descriptions.

DISCUSSION

The following responses are based on a Cultural Resources Investigation

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

RESPONSE:

Less Than Significant with Mitigation Incorporated. An archaeological records search was conducted at the South Central Coastal Information Center (SCCIC) on January 29, 2025. This included a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources, and survey and excavation reports generated from projects located within one mile of the APE. In addition, a review was conducted of the National Register of Historic Places (National Register), the California Register, and documents and inventories from the California Office of Historic Preservation including the lists of California Historical Landmarks, California Points of Historical Interest, Listing of National Register Properties, and the Built Environment Resources Directory (BERD). Additional research conducted through the San Bernardino County Assessor and Recorder, General Land Office records of the Bureau of Land Management, and various internet resources such as historicaerials.com, Newspapers.com, Ancestry.com, and the BERD hosted by the Office of Historic Preservation provided supplemental information (BRC 2025).

Data from the SCCIC revealed that seven cultural resource studies have taken place resulting in three cultural resources identified within a one-mile radius of the APE. Of the seven previous studies, one has assessed a portion of the APE and no resources were previously identified within its boundaries. The records search results are summarized in the table below. Additional details are provided in the Cultural Resources Assessment at Appendix C.

TABLE 9: CULTURAL RESOURCES WITHIN ONE MILE OF THE PROJECT SITE

USGS 7.5 Min Quad	Primary No.	Period	Resource	Approx. Distance from Project Site
Yucca Valley North, California (1979)	P-36-034534	Historic	GC-ISO-001	0.30 miles east
	P-36-034535	Historic	GC-ISO-002	0.60 miles east
	P-36-034545	Historic	Rainbow Drive	0.65 miles east

Table 9: Cultural Resources within One Mile of the Project Site

Source: South Central Coastal Information Center, 2025.

A field survey for the Project was conducted by BCR on January 30, 2025. During the field survey four historic-period concrete foundations were identified. These resources are described in detail at Appendix C. No other cultural resources (including prehistoric or historic archaeological or historic architectural resources) were identified during the field survey. The project sites have been subject to moderate disturbances such as OHV activity and modern refuse dumping.

The Cultural Resources Assessment concluded that the resources that occupy the project site do not meet eligibility criteria for the National Register or for the California Register, and as such they are not recommended historic properties under Section 106 of the NHPA and are not recommended historical resources under CEQA. Therefore, the project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 and will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.

While the current study has not indicated sensitivity for unknown cultural resources within the project boundaries, ground disturbing activities have the potential to reveal buried deposits not observed on the surface. Therefore, Mitigation Measures **MM-CUL-01: Cultural Resources Monitoring** and **MM-CUL-02: Cultural Resources Monitoring and Treatment Plan** are provided to reduce potential impacts to buried cultural resources to a level of insignificance.

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

RESPONSE:

Less Than Significant with Mitigation Incorporated. See Response 5a above. The project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 and will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. Nonetheless, ground disturbing activities have the potential to reveal buried deposits not observed on the surface. Therefore, Mitigation Measures **MM-CUL-01: Cultural Resources Monitoring** and **MM-CUL-02: Cultural Resources Monitoring and Treatment Plan** are provided to reduce potential impacts to buried cultural resources to a level of insignificance.

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

RESPONSE:

Less Than Significant Impact. Disturbances associated with the construction and maintenance of housing and utilities at the project have been identified which has disrupted soil. As a result, the potential to encounter in-situ remains associated with significant archaeological materials during project-related excavation is low. There is no evidence that the project contains or is sensitive for human remains, including those interred outside of dedicated cemeteries. As such, the project is not likely to disturb any human remains. Based on these results, though no mitigation is required, **Mitigation Measure MM-CUL-03: Discovery of Human Remains** is established to provide guidance in the event that remains are encountered.

MITIGATION MEASURES

MM-CUL-01: Cultural Resources Monitoring. In the event that 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 Yuhaaviatam of San Manuel Nation Cultural Resources Department (YSMN) shall be contacted, as detailed within TCR-1, regarding any pre-contact finds 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.

MM-CUL-02: Cultural Resources Monitoring and Treatment Plan. If significant pre-contact 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 YSMN for review and comment, as detailed within TCR-1. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly

MM-CUL-03: Discovery of Human Remains. 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 that code enforced for the duration of the project.

4.6 Energy

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
ENERGY. Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

REGULATORY COMPLIANCE

USEPA

Tier 2 Emissions Standards

The USEPA has adopted multiple tiers of emission standards pertaining to the operation of diesel engines to reduce emission from nonroad diesel engines by integrating engine and fuel controls (USEPA, n.d.). These standards provide thresholds for exhaust and evaporative emissions.

Energy Policy Act

The Energy Policy Act was adopted in 2005 to address energy production in the United States. Issues covered by the Act include (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Tribal energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology (EPA, n.d.).

Energy Star

ENERGY STAR is a joint program with the USEPA and the Department of Energy (DOE). The purpose of the program is to help customers, businesses, and industry save money to protect the environment through the adoption of energy-efficient products and practices (ENERGY.gov). ENERGY STAR is a program focused on energy efficiency in buildings and products, and does not apply to groundwater recharge basins such as the Project.

California Energy Commission

The California Energy Commission (CEC) is a planning and policy agency responsible for forecasting future energy needs, promoting energy efficiency, maintaining energy data, developing energy technology, promoting renewable energies, and planning for energy emergencies throughout California.

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 and accommodate pedestrian and bicycle access.

Renewable Portfolio Standard

The California Renewable Portfolio Standard (RPS) was established in 2002 under Senate Bill 1078, which requires "investor-owned utilities' aggregated forecast project that they will meet the 2030 Renewable Portfolio Standard of 50 percent by 2020 (CPUC 2017)" (San Bernadino County GP EIR, 2019). As a result, the State's electricity grid is

transitioning to renewable energy; currently, the three largest retail energy companies in California provide 43 percent of its supplies from renewable energy sources.

Pavley (AB 1493) Regulations

California Assembly Bill 1493 enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. In 2005, the CARB submitted a "waiver" request to the EPA from a portion of the federal Clean Air Act in order to allow the State to set more stringent tailpipe emission standards for CO2 and other GHG emissions from passenger vehicles and light duty trucks. On December 19, 2007, the EPA announced that it denied the "waiver" request. On January 21, 2009, CARB submitted a letter to the EPA administrator regarding the State's request to reconsider the waiver denial. The EPA approved the waiver on June 30, 2009.

DISCUSSION

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

RESPONSE:

Less than Significant Impact. Electricity would be provided to the project by Southern California Edison (SCE). SCE provides electric power to more than 15 million persons, within a service area encompassing approximately 50,000 square miles. SCE derives electricity from varied energy resources, including fossil fuels, hydroelectric generators, nuclear power plants, geothermal power plants, solar power generation, and wind farms. SCE also purchases from independent power producers and utilities, including out-of-state suppliers. As of 2023, SCE's power mix has renewable energy at 37.6 percent of the overall energy resources, of which biomass and waste is at 0.1 percent, geothermal is at 5.2 percent, eligible hydroelectric is at 0.7 percent, solar energy is at 19.8 percent, and wind power is at 11.7 percent; other energy sources include large hydroelectric at 4.5 percent, natural gas at 20 percent, nuclear at 9.1 percent, other at 0.1 percent, and unspecified sources at 28.8 percent (CEC, 2023).

Natural gas would be provided to the project by Southwest Gas. The California Public Utilities Commission (CPUC) regulates natural gas utility service for approximately 11 million customers that receive natural gas from Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E), Southwest Gas, and several smaller investor-owned natural gas utilities. The CPUC also regulates independent storage operators Lodi Gas Storage, Wild Goose Storage, Central Valley Storage and Gill Ranch Storage.

The project would attract additional vehicle trips with resulting consumption of energy resources, predominantly gasoline and diesel fuel. Gasoline (and other vehicle fuels) are commercially-provided commodities and would be available to the project patrons and employees via commercial outlets.

Construction Energy Demands

The principal source of energy demand during project construction is power for on-site electricity consumption. As the project does not include the construction of buildings, diesel fuel consumed by construction equipment would be the primary energy resource expended over the course of project construction. The Energy Study performed for the project (see Appendix A) estimates that project construction activities would consume an estimated 155,769 gallons of diesel fuel. As stated previously, 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. In addition, an estimated 2,644 gallons of fuel would be consumed for construction worker trips, and an estimated 26,466 gallons of fuel would be consumed for vendor and hauling trips.

The project's construction is required to comply with CARB regulations and does not include the need for construction processes that would require the use of equipment that is more energy efficient. Therefore, the proposed project annual construction related fuel consumption would not be considered significant. No mitigation is needed.

Operational Energy Demands

Additional staffing needs for long-term operation and maintenance of the proposed project are not expected. However, a minimal number of monthly worker trips are anticipated to conduct routine inspections and ensure

proper long-term maintenance. Therefore, the increase in project generated trips is minimal and the project's transportation and operational energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary. Similarly, potential energy demands of the proposed project would be comparable to other water recharge projects of similar scale and configuration. Therefore, the project facilities' energy demands, and energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

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

RESPONSE:

No Impact. Access to/from the project site is from existing roads. These roads are already in place so the project would not interfere with, nor otherwise obstruct intermodal transportation plans or projects that may be proposed because SCAG is not planning for intermodal facilities in the project area.

With respect to the State's Renewable Portfolio Standards, the project would be required to meet or exceed the energy standards established in the California Green Building Standards Code, Title 24, Part 11 (CALGreen) as applicable. However, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards (CALGreen). There would be no impact. No mitigation is needed.

MITIGATION MEASURES

No mitigation measures are needed.

4.7 Geology and Soils

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
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- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

REGULATORY COMPLIANCE

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (PRC Section 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (earthquake fault zones). It also defines criteria for identifying active faults, giving legal weight to terms such as active, and establishes a process for reviewing building proposals in and adjacent to earthquake fault zones.

Under the Alquist-Priolo Act, faults are zoned and construction along or across them is regulated if they are active. "A fault is considered well defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment.

CEQA: Paleontological Resources

CEQA provides guidance relative to significant impacts on paleontological resources, indicating that a project will have a significant impact on paleontological resources if it disturbs or destroys a unique paleontological resources or site or unique geologic feature. Section 5097.5 of the California Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, California Penal Code Section 622.5 sets penalties for damage or removal of paleontological resources. CEQA documentation prepared for projects would be required to analyze paleontological resources as a condition of the CEQA process to disclose potential impacts. Please note that as of January 2018 paleontological resources are considered in the geological rather than cultural category.

DISCUSSION

The responses within this section are based on technical reports outlining the baseline conditions of the soil composition. Specifically, the IS/MND used the following resources:

1) **Appendix C**: Cultural Resources Assessment, Ames-Reche Recharge Basin Project, San Bernardino County, California, prepared by BCR Consulting LLC on April 2, 2025.
2) **Appendix D**: Geotechnical Investigation Report for Ames-Reche Recharge Basin, San Bernardino County, CA, conducted by Converse Consultants, Project No. 23-81-275-01, April 19, 2024.

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

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

RESPONSE:

No Impact. According to the Project Geologist, the Project Site is not located within a currently designated State of California or San Bernardino County Fault Zone (Conserve Consultants, 2024). There are no known active faults projecting toward or extending across the Project Site. In addition, the Project Site is not located within the boundaries of an Earthquake Fault Zone for fault rupture hazard defined by the Alquist-Priolo Earthquake Zoning Act of 1972, which was concluded by using the California's Department of Conservation, Geological Survey Website (DOC, 2015) and San Bernardino General Plan EIR, *Figure 5.6-1: Alquist-Priolo Zones and County Fault Hazard Zones* (San Bernardino County GP EIR, 2019). However, the Department of Conservation, Fault Activity Map of California shows the Project Site is approximately 5.8 miles east of the Johnson Valley Fault Zone, approximately 1.4 miles southwest from the Homestead Valley Fault Zone, and approximately 2.1 miles west from an unnamed fault dating back to the Holocene (DOC, 2015). Since the Project Site is not within mapped fault zones or within the confines of active fault traces or their associated Alquist- Priolo Fault Zones, it is unlikely the potential of ground displacement will occur outside of their boundaries. Therefore, construction will not likely result in substantially increased exposure to risk from an earthquake fault. Over the long-term the Project will not increase the level of human activity or exposure to risk of loss from an earthquake.

For the reasons above, due to the location of the Project Site, existing conditions do not pose as a threat to proposed Project activities or significant impacts associated with fault rupture including risk of loss, injury, or death. Project impacts are not anticipated to differ substantially from what is expected to occur at other properties in the Local Vicinity.

ii. **Strong seismic ground shaking?**

RESPONSE:

Less than Significant Impact. All of California is subject to potential seismic activity, and areas within proximity of fault zones are subject to regulations minimizing risk associated with ground shaking. The Project Area is subject to ground shaking due to its geographic location and the state's overall susceptibility to earthquakes and there is nothing unique about the location of the Project that would make it more susceptible to strong seismic ground shaking.

As mentioned above in Response a), the Project Site is not within a fault zone and there is nothing unique about the Project that would make it more susceptible to strong seismic ground shaking above general earthquake susceptibility levels at similar locations within the state; however, during the life of the Project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the Project Site (Converse Consulting, 2024). The severity of shaking is dependent on proximity with active faults and the estimated maximum ground acceleration of the fault. Since the closest fault zone is the Johnson Valley Fault Zone, which is approximately 1.4 miles east of the Project Site, the potential for strong seismic ground shaking is not anticipated to be high.

However, while seismic ground shaking is not prone to occur on site, the Project Site is still within an area that is prone to seismic activities. Therefore, the Project will implement various design features related to Factors of Safety, Over-Excavation/Removal, Compacted Fill Placement, Recharge Basin Bottoms, Construction of Recharge Basin, Slope Grading, Pipeline Subgrade Preparation, Pipe Bedding, Trench Zone Backfill, Project Design, Shoring Design, and Temporary Slope Excavation into the Project plans and throughout construction activities. The implementation of applicable design features will specify compaction, slope ratios, require fill materials, backfill, temporary shoring, etc. to ensure safety throughout Project construction as well as ensure slope stability for the proposed basin and pipeline stability over the lifetime of the Project. As a result, less than significant impacts from strong seismic ground shaking are anticipated with the implementation of applicable design features.

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

RESPONSE:

No Impact. The Project Site is not located in an area designated by San Bernardino County with susceptibility to liquefaction (San Bernardino County, 2007b). The current groundwater depth is greater than 101.5 feet bgs and historically highest groundwater depth was approximately at 222 feet bgs (Conserve Consulting, 2024). Based on a site-specific liquefaction analysis performed on boring samples taken by Conserve Consulting, presented in **Appendix D**, the potential for liquefaction of the site is expected to be negligible.

Therefore, no impacts are anticipated; no Mitigation Measures are needed.

iv. **Landslides?**

RESPONSE:

No Impact. According to the California Department of Conservation, Landslide Inventory Map, City Limits, and the Project Location are not located within an area prone to landslides (DOC, 2016). Therefore, no impacts are anticipated; no Mitigation Measures are needed.

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

RESPONSE:

Less than Significant Impact. See Response 7a) i) through iv) above. Project construction will consist of the following activities: (1) mobilization, (2) demobilization, (3) site preparation, grading, berm construction, excavation, open-trench excavation, & pipeline installation. Project construction will occur over a an approximate 3-month period and use equipment including tractors, scrapers, and backhoes. See Project *Section 3.0: Project Description, Project Construction* for more information. Project construction is anticipated to involve open-trench construction and excavation, and earthwork activities are anticipated to remain within Project Footprint and open-trench excavation will return to pre-Project conditions. However, throughout Project construction, excavation and grading will disrupt topsoil leading to potential instability and losses from the construction of the basins and associated berms. Due to potential losses to topsoil and instability from earthwork activities, design features related to Factors of Safety, Over-Excavation/Removal, Compacted Fill Placement, Recharge Basin Bottoms, Construction of Recharge Basin, Slope Grading, Pipeline Subgrade Preparation, Pipe Bedding, Trench Zone Backfill, Project Design, Shoring Design, and Temporary Slope Excavation would be incorporated into the project. These design features will ensure safety is maintained at the Project Site throughout Project construction, and stability of topsoil is maintained throughout long-term operations. As a result, substantial soil erosion or loss of topsoil are not anticipated from Project construction. Impacts are anticipated to be less than significant; therefore, no Mitigation Measures are needed.

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- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?**

RESPONSE:

Less than Significant Impact. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Lateral spreading is possible in basins during shallow groundwater conditions which may occur during infiltration or high surface flow of the adjacent Pipes Wash (Conserve Consulting, 2024). On March 4 and 5, 2024, Converse Consultants drilled three exploratory borings at depths of 31.5 to 10.5 feet below ground surface (bgs). Based on the borings and laboratory results, the Project Site is underlain to a depth of at least 101.5 feet by alluvial sediments consisting primarily of sand and silty sand, which is generally fine to coarse-grained, with few pieces of gravel up to 2.5 inches maximum (Conserve Consulting, 2024). Using existing conditions and a conceptual recharge basin design with slope heights of approximately 10 feet tall, 30 feet wide, and a slope ratio of 3:1 horizontal: vertical (H: V), the modeling software, Slide 9.008, estimated under worst-case soils that a factor of safety shall exceed 3.0. As a result, design features related to Factors of Safety, Over-Excavation/Removal, Compacted Fill Placement, Recharge Basin Bottoms, Construction of Recharge Basin, Slope Grading, Pipeline Subgrade Preparation, Pipe Bedding, Trench Zone Backfill, Project Design, Shoring Design, and Temporary Slope Excavation would be incorporated into the project. The design features will ensure that slope failure of 1.5 under static conditions and 1.1 under seismic condition protect human safety and nearby structures; in addition, the design specifications will apply specify compaction, shoring, backfill, and excavation requirements throughout Project construction; and enforce specific slope ratios and design requirements for long-term stability of the basins and associated berms against on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. For these reasons, a less than significant impact is anticipated from geologic units or soils that are unstable resulting in potential on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. Therefore, no Mitigation Measures are needed.

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

RESPONSE:

No Impact. Expansive soils are defined by San Bernardino County as soils that "are subject to changes in volume and settlement in response to wetting and drying" (San Bernardino County GP EIR, 2019). Expansive soils are often times compose of clay, that shirk when dry and swells when wet; collapsible soils are loose, dry, low-density materials that collapse when compressed. Both soil types are common and costly geologic hazards if mitigation is not implemented. Based on laboratory test results, the expansion index of the upper 10 feet soils was 0, corresponding to very low expansion potential.

Therefore, no impacts from substantial direct or indirect risks of life or property are anticipated. No Mitigation Measures are needed.

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?

RESPONSE:

No Impact. Septic tanks or alternative wastewater disposal systems are not proposed with the Project. There are no existing septic tanks or alternative wastewater disposal systems at the Project Site. The Project proposes to install a recharge basin, which will increase recharge capabilities at in the Local Vicinity and Project Site.

Therefore, no impacts are anticipated, and no Mitigation Measures are needed.

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

RESPONSE:

Less Than Significant with Mitigation Incorporated. A paleontological overview was completed for the Project by the Western Science Center (see Appendix C, Cultural Resources Assessment). The Geologic units underlying the project are composed of gravel and sand deposits from the Pleistocene epoch (Dibblee and Minch 2008). Pleistocene alluvial units are considered to be highly paleontologically sensitive. While the Western Science Center does not have any mapped resources within a 1-mile radius of the Project Site, the Center has identified localities within similarly mapped deposits across Southern California.

Fossil specimens from the Proposed East Ames-Reche Recharge Facility Project would likely be scientifically significant, and excavation activity associated with the development of the project area would potentially impact paleontologically sensitive Pleistocene alluvial units. Therefore, Mitigation Measure **MM-GEO-1: Paleontological Resources Monitoring,** is provided to reduce potential impacts to paleontological resources to a level of insignificance.

MITIGATION MEASURES

MM-GEO-1: Paleontological Resources Monitoring. A paleontological resources mitigation program shall be put in place to monitor, salvage, and curate recovered fossils associated within the Project Area. A qualified paleontological resources specialist will spot check construction excavations that would impact Pleistocene alluvial units. The frequency will be determined with the paleontological resources specialist and the construction contractor based on the work schedule and anticipated depth of soil excavation. If evidence of subsurface paleontological resources is found during construction, excavation and other construction activity in that area shall cease and the construction contractor shall contact the County of San Bernardino Planning Department. With direction from the County, a paleontologist certified by the County of San Bernardino shall evaluate the find prior to resuming ground disturbing activities in the immediate vicinity. If warranted, the paleontologist shall prepare and complete a standard Paleontological Resources Mitigation Program for the salvage and curation of identified resources.

4.8 Greenhouse Gas Emissions

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

REGULATORY COMPLIANCE

Greenhouse Gases (GHGs) trap heat in the atmosphere and can occur both naturally and from human activities. Sources of naturally occurring GHG include volcanic activity, respiration, and decomposition of plants. Climate data indicates a relationship between increased industrialization and continuously elevated atmospheric temperatures attributed to GHG. Human activities that are considered a continuous source of GHG emissions include electricity production, transportation, manufacturing, and agriculture. Greenhouse gases are formed via mixing of chemicals emitted into the atmosphere. Specific chemicals that are known to result in GHG include water vapor, carbon dioxide (CO2), methane (CH4), nitrogen oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) (State Guidelines, Section (State CEQA Guidelines, Section 15364.5 and Health and Safety Code, Section 38505(g)). Levels of GHGs in the atmosphere enhance the Greenhouse Gas Effect, resulting in trapped heat within earth's atmosphere leading to the continual warming of the earth's climate. According to the 2007 International Panel on Climate Change (IPCC) Report, global temperatures are anticipated to increase by approximately 0.2 degrees Celsius per decade (IPCC 2007).

Due to the impacts greenhouse gas emissions have on the planet, Senate Bill (SB) 97 was signed into legislation in 2007. SB 97 required CEQA documents to prepare feasible mitigation of greenhouse gas emissions and evaluate potential effects. A comprehensive summary of GHG-related regulations is provided in **Appendix A**, Air Quality, Global Climate Change, and Energy Impact Analysis (Ganddini 2025).

U.S. Environmental Protection Agency

The federal government administers a wide array of public-private partnerships to reduce the GHG intensity generated in the United States. The U.S. EPA is responsible for implementing federal policies and programs to address GHGs, which primarily focus on energy efficiency, renewable energy, methane and other non-CO2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions.

CARB

Scoping Plan

The CARB Board approved a Climate Change Scoping Plan in December 2008, which outlined the State's strategy to achieve the 2020 greenhouse gas emissions limit. The Scoping Plan proposed "a comprehensive set of actions designed to reduce overall greenhouse gas emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health" (CARB 2008). The Scoping Plan was updated in 2014, 2017, and 2022. The 2022 Scoping Plan lays out a sector-by-sector roadmap for California to achieve carbon neutrality by 2045 or earlier, extending and expanding upon earlier plans with a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045.

San Bernardino County

GHG Reduction Plan

In 2011, San Bernadino County implemented the San Bernadino County GHG Reduction Plan (GHG Plan), which was developed to help the reduce greenhouse gas emissions throughout the County. Each region within the County contains their own reduction goals; the East Desert region selected goals to reduce GHG emissions throughout their communities 40% below 2020 GHG emissions by the year 2030.

The County intends to meet these reduction goals through a combination of state and local level efforts including the Pavley standards[6], other state measures, and local measures. Important local measures include Solar Installation for Existing Commercial/Industrial (Energy-8); Waste Diversion and Reduction (Waste-2); Solar Installation for Existing Housing (Energy-7). The GHG Plan was updated in June 2021, and includes reduction goals in energy efficiency, water conservation, alternative transportation, solid waste reduction, and clean energy.

DISCUSSION

The responses within this section are based on **Appendix A** - Air Quality, Global Climate Change, and Energy Impact Analysis dated May 5, 2025, prepared by Ganddini Group Inc. Results from the study are based on modeling from CalEEMod Version 2022.1.1.29, which was used to calculate the GHG emissions from the construction of the proposed Project. The construction-related GHG emissions were included in the analysis and were based on a 30-year amortization rate.

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

RESPONSE:

Less Than Significant Impact. GHG emissions are attributed to sources including industrial/manufacturing, agriculture, utilities, transportation, and residential land use. A large percentage of the State's GHG emissions come from transportation, approximately 41 percent followed by energy generation. However, water and wastewater services only account for 4% of all electricity consumption nationally and 6.9% of all electricity in California.

Similarly, emissions within unincorporated San Bernadino County in 2016 were 2,873,469 MTCO2e per year with on-road transportation and building energy accounting for a majority of the overall GHG emissions. See *Table 10: Existing Emissions & Potential Reductions for Unincorporated San Bernardino County.*

TABLE 10: EXISTING EMISSIONS & POTENTIAL REDUCTIONS FOR UNINCORPORATED SAN BERNARDINO COUNTY

Sector	Existing MTCO2e/year	2030 Emissions with Reduction Plan (MTCO2e)	Reduction (Percent)
Building Energy	948,183	464,764	55.5%
On-Road Transportation	1,519,146	1,109,358	32.4%
Off-Road Equipment	35,618	44,224	1.0%
Waste	197,260	42,098	80.0%
Agriculture	143,146	80,591	0.0%
Wastewater Treatment	9,651	10,304	0.0%
Water Conveyance	20,465	17,988	14.2%
GHG Performance			
Standard*	-	-	-
Total	2,873,469	1,752,437	42.6%

Table 10: Existing Emissions & Potential Reductions for Unincorporated San Bernardino County

Source: San Bernadino GHG Reduction Plan, 2021.

[6] The Pavley Standards are California's low carbon fuel standards that help with GHG reduction (SB GHG Reduction Plan, 2021).

To determine whether the project's GHG emissions are significant, the GHG analysis uses the San Bernardino County GHG Reduction Plan threshold of 3,000 MTCO2e per year and the MDAQMD thresholds of 100,000 MTCO2e per year and 548,000 pounds per year of CO2e.

The proposed project has the potential to generate GHG emissions from mobile sources and construction equipment. However, mobile sources were not included in the analysis as additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated and only a minimal number of daily worker trips will be needed for routine inspections and maintenance. Therefore, additional vehicle trips and emissions associated with the operation of the proposed project would be negligible.

Construction related GHG emissions were calculated based on the parameters described above. A summary of the results is shown below in *Table 11* and the CalEEMod Model run for the proposed project is provided in **Appendix A**. *Table 11* shows that the subtotal for the proposed project would result in annual construction emissions of 60.9 MTCO2e per year. This level of does not exceed the MDAQMD annual threshold of 100,000 MTCO2e nor the San Bernardino County GHGRP Update threshold of 3,000 MTCO2e per year. Therefore, construction of the proposed project would not create a significant cumulative impact to global climate change.

TABLE 11: PROJECT-RELATED GREENHOUSE GAS EMISSSIONS

Category	Greenhouse Gas Emissions (Metric Tons/Year)						Lbs/day
	Bio-CO2	NonBio-CO2	CO2	CH4	N2O	CO2e	CO2e
Construction[1]	0.00	60.33	60.33	0.00	0.00	60.90	959.43
County of San Bernardino GHG Reduction Plan Update Threshold						3,000	--
Exceeds Threshold?						No	--
MDAQMD GHG Thresholds						100,000	548,000
Exceeds Threshold?						No	No

Table 11: Project-Related Greenhouse Gas Emissions

Source: **Appendix A**- Air Quality, Greenhouse Gas, Energy Technical Memorandum, Ganddini Group, Inc. May 5, 2025.
Notes: CalEEMod Version 2022.1.1.29 for Opening Year 2026
(1) Construction GHG emissions CO2e based on a 30-year amortization rate.

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

RESPONSE:

Less Than Significant Impact. According to the San Bernardino County GHG Plan Update, "all development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 MTCO2e per year will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG emissions."

As stated in Response 8a above, the proposed project has the potential to generate GHG emissions from mobile sources and construction equipment. However, mobile sources were not included in the analysis as additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated and only a minimal number of daily worker trips will be needed for routine inspections and maintenance. Therefore, additional vehicle trips and emissions associated with the operation of the proposed project would be negligible. Furthermore, the project's construction GHG emissions would not exceed the County's screening threshold of 3,000 MTCO2e per year; therefore, the project does not need to accrue points using the screening tables and is consistent with the GHG Plan pursuant to Section 15183.5 of the State CEQA Guidelines.

As the project comprises the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well, none of the performance standards detailed in the San Bernardino County GHG Plan Update are applicable to the prosed project. Therefore, the proposed project will not result in substantial

emissions of greenhouse gases, will not conflict with the Green County initiatives, and will not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. Impacts are less than significant. Similarly, it is concluded that the project's incremental contribution to greenhouse gas emissions and their effects on climate change would not be cumulatively considerable.

MITIGATION MEASURES

No mitigation measures are needed.

4.9 Hazards and Hazardous Materials

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

REGULATORY COMPLIANCE

U.S. Environmental Protection Agency (EPA)

The EPA provides federal regulations regarding hazardous waste management. The EPA was given authority by Congress to develop the Resource Conservation and Recovery (RCRA) program through the RCRA Act. The Act created the framework from the proper management of hazardous and non-hazardous solid waste. Under RCRA, the EPA regulates hazardous waste from generation to disposal, referred to as "cradle to grave." Pursuant to this regulation, preparation of applications for hazardous waste disposal are required and processes vary based on type and qualities of materials.

Over the years, the EPA has led several hazardous waste initiatives to meet growing challenges that come with hazardous waste management. The EPA has created standards, exclusions, and exemptions for certain types of wastes including Universal Waste, Household Hazardous Waste, Pharmaceutical hazardous waste, etc.

California Department of Toxic Substances Control (DTSC)

The California Department of Toxic Substances Control (DTSC) has primary responsibility for regulating hazardous materials in California under authority of Resource Conservation and Recovery Act and the California Health and Safety Code and California Hazardous Waste Control Law. Other state entities with responsibility for hazardous materials regulation include:

- Regional Water Quality Control Board – under authority of the Porter Cologne Water Quality Control Act of 1969
- California Department of Pesticide Regulations, Department of Food and Agriculture, and the Department of Public Health – under authority of California Code of Regulations Title 3 and Title 22
- California Department of Industrial Relations, Division of OSHA – under authority of California Code of Regulations Title 8
- California Air Toxic "Hot Spots" (AB 2588) Program – under authority of the California Safety Code & SJVAPCD Air Toxics Program

Temporary ID numbers are issued to generators who do not typically generate hazardous waste and are valid for 90 days. Hazardous waste ID numbers are issued by the Department of Toxic Substances Control (DTSC) through their website: dtsc.ca.gov/IDManifest/index.cfm. Construction or demolition Projects can be considered temporary generators of hazardous waste.

In addition to various regulations, the DTSC also provides an Emergency Response Unit (ERU). The ERU is in place to issue "statewide response to actual and potential releases of hazardous substances that pose an acute threat to public health and/ or the environment" (DTSC 2022).

State Department of Industrial Relations, California Division of Occupational Safety and Health (CAL-OSHA)

CAL-OSHA establishes protocol, provides training, and issues permits for regulation of workplace conditions, including construction sites, to foster safe work conditions and regulate workers' levels of exposure to hazardous materials. CAL-OSHA standards specifically for hazardous waste operations, emergency response, safety, and preparedness can be found in the California Code of Regulations. OSHA standards for worker exposure must be implemented during general industry and construction activities.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) is a permit program led and managed by the U.S. Environmental Protection Agency Office of Wastewater Management in coordination with EPA regional offices. The NPDES permit program ensures water quality is not degraded by pollutants discharged with stormwater flows from development and construction projects. The NPDES General Construction Permit applies to projects that plan to disturb one acre or more of land during construction. Compliance with permitting requirements requires a Storm Water Pollution Prevention Plan (SWPPP) to be implemented during construction.

Certified Unified Program Agency (CUPA)

The Certified Unified Program Agency (CUPA) is a program that consolidates the administrative requirements, permit, inspections, and enforcement activities of six environmental and emergency response programs. California Environmental Protection Agency and other state agencies set the standards for the Program, while local governments enforce their standards via CUPAs. The San Bernardino County Fire Department manages CUPA within San Bernadino County. The CUPA program is "designed to consolidate, coordinate, and uniformly and consistently administer permits, inspection activities, and enforcement activities throughout San Bernardino County" (SBFPD 2023). This department administers/ oversees the Hazardous Material Business Plan, California Accidental Release Prevention (Cal-ARP), Aboveground Petroleum Storage Act, Hazardous Waste Generator, Hazardous Waste Onsite Treatment (Tiered Permitting) and Underground Storage Tank program.

San Bernardino

Hazardous Waste Management Plan

The County adopted a Hazardous Waste Management Plan (HWMP) in 1990, in response to Assembly Bill 2948 (Chapter 1504, Statues of 1986). The HWMP serves as the primary planning document for programs and best management practices/ procedures for handling, transporting, and disposing of hazardous materials within the County. It is a standard practice for the San Bernardino County Fire Protection District to manage hazardous materials within the County based on the HWMP.

Office of Emergency Services

The Office of Emergency Services is a division of the San Bernardino County Fire Protection District. This division is responsible for emergency preparedness and emergency services coordination throughout San Bernardino County. The division manages and operates the Emergency Operations Center (EOC); deploys preselected and trained personnel for complex disasters or incidents; and assists parts of unincorporated San Bernardino County by assigning OES personnel to manage local planning goals and needs.

Multi-Jurisdictional Hazard Mitigation Plan

In 2022, San Bernardino updated the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) to provide updated information regarding hazards within County limits that impact emergency services including San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and Board-governed Special District's administered by the San Bernardino County Special District's Department (San Bernardino MJHMP, 2022).

DISCUSSION

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

RESPONSE:

Less than Significant Impact. Routine transport, use, or disposal of hazardous materials occurs throughout San Bernardino County roadways. Highway transportation is a leading cause of hazardous materials incidents within the County, with 3,240 incidents reported from 2,000 to 2015 (San Bernardino County, 2017). Due to the dangers of transporting hazard materials along highways throughout the County, hazardous materials must be transported by a California-registered hazardous waste transporter in compliance with Title 22 requirements, enforced by California Highway Patrol (CHP) and Caltrans.

SR-247 is considered a hazardous waste route. According to the Safety Background Report conducted for the General Plan EIR, nonradiative hazardous materials categorized as explosive (Class B) by CHP are routinely transported along SR- 247 from Lucerne Valley to Yucca Valley (San Bernardino County, Appendix G- Safety Background Report, 2017; *Table 4-7: Hazardous Wate Transportation: Major Routes in San Bernardino County*).

Routine transport of waste occurs at Landers Landfill, approximately 3 miles east from the Project Site. However, Landers Landfill is a sanitary landfill categorized under Class III, which means these types of landfills only accept "nonhazardous wastes… and does not need to be isolated from the surrounding environment" (San Bernardino County, 2017).

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?

RESPONSE:

Less than Significant Impact. According to the San Bernardino County General Plan and CALFIRE SRA Viewer, the Project Site and Local Vicinity are within the Local Responsibility Area within portions of moderate to low fire susceptibility (San Bernardino County GP EIR, *Figure 5.8-6. Fire Severity Zones and Potential Growth Areas in the East Desert Region*; CALFIRE SRA Viewer). The closest areas designated as high or very high fire severity are located west of SR 247, approximately 20 miles from the Project Site. In addition, the San Bernardino General Plan indicates that the Project Site is not within an area susceptible to flood risks, dam hazard inundation, or earthquake fault zones.

The Project proposes to implement a groundwater recharge basin on undeveloped land for sustainable ground water recharge. Therefore, the proposed improvements will not construct infrastructure that may add significant hazard to the public or the environment. Ongoing operation of the Project Site does not involve substantially increased foreseeable risk to the public involving release of hazardous materials from upset and accident conditions due to location.

Project construction will involve the mobilization of heavy equipment to the Project Site, the use of hazardous materials including gasoline, and diesel from construction equipment. However, the handling, use, and disposal of hazardous materials at the Project Site is temporary during construction activities and will be regulated by the Agency through routine inspection and compliance with the Project's Stormwater Pollution and Prevention Plan (SWPPP).

For the reasons above, impacts related to 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 would be less than significant.

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

RESPONSE:

No Impact. The closest school to the Project Site is Yucca Mesa Elementary School (3380 Avalon Avenue, Yucca Valley, CA 92284), located within unincorporated San Bernardino County's Yucca Valley, approximately 4.5 miles southeast (San Bernardino County GP EIR, 2019; *Figure 5.14-1 Critical Facilities*). Due to the proximity of existing schools from the Project Site, impacts related to emission of hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school is not anticipated. Therefore, no mitigation is required.

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

RESPONSE:

No Impact. Government Code section 65962.5 is an updated list of Hazardous Waste Substances, also referred to as the Cortese List. The California Department of Toxic Substances Control Publishes the list as the EnviroStor Website (DTSC Cortese List 2022).

Based on a preliminary search on the EnviroStor Website, utilizing the City name, Zip Code, and County, no results were found. Since the Project Site is not included on the Cortese List of sites that have known or potential contamination and is not located where facilities permitted to treat, store, or dispose of hazardous waste, no impacts are anticipated with the Project regarding Government Code section 65962.5. For this reason, mitigation measures are not required.

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

RESPONSE:

No Impact. The closest airport to the Project Site is the Yucca Valley Airport, approximately 11.4 miles southwest of the Project Site. Since the closest airport is over two (2) miles from a public airport or public use airport, the Project will not result in impacts to a safety hazards or excessive noise for people working or residing in the Local Vicinity. No Mitigation Measures are needed.

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

RESPONSE:

Less than Significant Impact. According to San Bernardino County's General Plan, *Table 5.8-10 Evacuation Routes in San Bernardino County*, SR 247 is a designated state highway evacuation route (San Bernardino County GP EIR, 2019). Since the Project Site is located approximately 6 miles east from SR 247, the mobilization of construction equipment nor the ongoing maintenance of the proposed improvements are anticipated to impair or physically interfere with an adopted emergency response plan or emergency evacuation plan due to proximity from the Project Site. In addition, truck trips are anticipated to be minimal due to the nature and scale of the Project and are intended to be temporary over the course of construction. The Project Site is also located in an area designated for rural residential development; and traffic does not regularly occur along Winters Road since it is not a through-street to SR 247.

As a result, the Project does not anticipate significant impact to an evacuation plan or emergency response plan. Less than significant impacts are anticipated; no Mitigation Measures are needed.

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

RESPONSE:

Less than Significant Impact. Project implementation will not result in permanently increased population, activity, or structures at the Project Site and in the Local Vicinity. The Project will not substantively affect inspection frequencies in the long term. Construction will temporarily increase activity and population from the construction crew during work hours. Due to the scope of the Project, up to 10 workers are expected at any one time during construction, and this is not expected to result in significantly elevated exposure to risk of people or structures either directly or indirectly involving wildland fires as described in Responses a) through f) and Section 20, Wildfires.

As a result, less than significant impacts are anticipated. No additional Mitigation Measures are needed.

MITIGATION MEASURES

No Mitigation Measures are needed.

4.10 Hydrology and Water Quality

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
HYDROLOGY AND WATER QUALITY. Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐
i. result in a substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐

REGULATORY COMPLIANCE

The Clean Water Act

CWA implementation is overseen by the U.S. EPA with the intent to "restore and maintain the chemical, physical, and biological integrity of the nation's waters" (EPA, n.d.). EPA has assigned implementation authority for the CWA to other trustee and responsible agencies, such as the Corps, and state and local agencies including the SWQCB, Regional Water Quality Control Boards (RWQCB), and County of San Bernardino. The CWA is an important instrument for waterboards across California in the management of surface water quality and is the foundation of various regulatory and non-regulatory programs (education, outreach, voluntary efforts, partnerships with stakeholders, etc.) to monitor water quality and to reduce pollutant discharges into waterways. Regulated waterways under the CWA include lakes, streams, creeks, rivers as well as groundwater and recharge basins and the ocean. The CWA contains several provisions protecting water quality, including Sections 303(c)(2)(B), 303(d), 401, 402(p), and 404, and the Toxics Rule.

Section 303(c)(2)(B) establishes water quality standards and designated beneficial uses within various water bodies (e.g., drinking water, recreation, biological preservation, etc.). This Section of the CWA requires the State to review and update standards for designated uses.

Section 303(d) pertains to impaired waters. The State is required to submit a list of waters that do not meet water quality standards and are impaired due to pollutants. The State must develop Total Maximum Daily Loads (TMDLs) for these water bodies, which establishes a maximum threshold of a pollutant allowed within a waterbody.

Section 401 gives the State the authority to issue water quality certifications to conduct activities including, but not limited to, construction or operation of large facilities by an individual permittee, which may result in any discharge into surface waters. Individual permits can be issued for projects that exceed the approved threshold of the NPDES Permit issued to the local agency. As a result, prior to the issuance of a permit that might result in a discharge to navigable waters, the State must certify that the activity will comply with State water quality standards, either through an individual permit issued for a specific project or verification by the local agency that a project conforms with the general permit issued to the local agency (city or county) for a specific activity identified via plan check and discretionary approval.

Section 402(p) pertains to the NPDES program. This section focuses on regulating point source stormwater discharges associated with industrial activity, requiring industrial facilities to obtain permits for their stormwater discharges.

Section 404 regulates discharge of fill materials into "Waters of the United States", including wetlands. The Corps is responsible for the issuance of the Section 404 permit if any project proposes to fill wetlands or "waters of the United States."

Toxic Rules includes various regulations related to toxic substances within water bodies. The EPA establishes thresholds for toxic pollutants discharges into navigable waters.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act protects waters of the State for use and enjoyment of the people by regulating activities that foreseeably degrade water quality within the state. To attain the highest reasonable water quality and to protect beneficial uses of surface water bodies, wetland and groundwater, the Porter-Cologne Water Quality Act is administered at a regional level within the framework of the SWRCB and nine RWQCBs across the state of California. Under this legislation, each RWQCB must formulate and adopt their own water quality control plan that establishes water quality objectives to ensure the reasonable protection of beneficial uses and prevention of nuisance either from point source or non-point source discharges (CA.gov 2023).

National Pollutant Discharge Elimination System

The NPDES is a permit program led and managed by the U.S. Environmental Protection Agency Office of Wastewater Management in coordination with EPA regional offices. The EPA has retained oversight authority for this program and has delegated responsibility for program implementation to the SWQCB and RWQCB. This program is managed at the local level through plan check and inspections by local agencies (e.g., Cities and Counties) under authority delegated

by the State and pursuant to state-issued water quality permits. Improved water quality is achieved through a combination of pollutant monitoring in receiving waters, discretionary review of specific projects and modification of activities that have the potential to contribute to water quality impairments, as well as requisite deployment of pollutant source control requirements on construction, new development, and related activities via local discretionary reviews. The program implements pollution source control to filter runoff prior to discharge into local stormwater systems from developed land use and activities to protect water quality and beneficial uses in receiving waters pursuant to the CWA. This process places requirements for BMPs on new construction during deign and local agency reviews through either State-issued individual permits or Municipal Storm (MS-4) Water Program.

The Project is under jurisdiction of the Colorado River RWQCB, San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS-4) permit (Water Quality Order No. R8-2002-0012, NPDES. No. CAS618036). The MS-4 permit applies water quality regulations to new construction and development meeting specific thresholds. The MS-4 permit program regulates water quality in urban storm water runoff under authority of the CWA within cities and unincorporated County and provides a framework for water quality compliance via individual project reviews verifying coverage within the established guidelines approved for the County under the MS-4 permit for pollution source control. This program implements standard BMPs, which have been approved by the State Water Board to specifically target and minimize water quality concerns in surface water runoff within San Bernardino County. Under the MS-4 permit, certain types of construction activities must implement standard BMPs to reduce pollution that may contribute to known water quality deficiencies in receiving waters. Projects which do not meet the guidelines established in the approved MS-4 Permit must apply for an individual NPDES permit pursuant to Section 401 of the CWA.

The NPDES General Construction Permit applies to new projects that plan to disturb more than one acre of land during Project construction. This permit requires Project Applicants to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for all construction projects. The implementation of the SWPPP starts prior to construction with installation of temporary BMPs for erosion and pollution source control. Projects shall implement appropriate construction and post-construction BMPs, as listed in their Stormwater Quality Management Plan or the "California Stormwater Best Management Practice Handbook," to reduce pollutants to the maximum extent possible or the extent required by law.

<u>San Bernardino County</u>

Stormwater Program

On January 29th, 2010, the Santa Ana RWQCB issued an area wide MS4 permit to the County and municipalities (County Flood Control District and incorporated cities) establishing water discharge requirements for stormwater entering municipal storm drainage systems. According to the "Technical Guidance Document for Water Quality Management Plans (WQMP)", San Bernardino County's guidance document for stormwater design for future projects, requires that MS4 permits contain a preliminary project specific WQMP, which addresses the following and applies to new development including short-term construction activities and long-term maintenance:

1) Develop site design measures using low impact development (LID) principals;
2) Establish project-specific design capture volume and applicable hydrologic conditions of concern requirements;
3) Evaluate feasibility of on-site LID BMPs
4) Maximize hydrologic source control, infiltration, and biotreatment BMPs;
5) Select applicable source control BMPs;
6) Address post-construction BMP maintenance requirements;
7) Implement short-term construction BMPs for erosion and sediment control as well as waste and materials; management for pollutant source control during construction.

General Plan

The San Bernardino County General Plan contains the following policies and goals that encourage groundwater management and coordination:

Policy IU-1.7: Areas vital for groundwater recharge. We allow new development on areas vital for groundwater recharge when stormwater management facilities are installed onsite and maintained to infiltrate predevelopment levels of stormwater into the ground.

Policy IU-1.8: Groundwater management coordination. We collaborate with water masters, groundwater sustainability agencies, water purveyors, and other government agencies to ensure groundwater basins are being sustainably managed. We discourage new development when it would create or aggravate groundwater overdraft conditions, land subsidence, or other "undesirable results" as defined in the California Water Code. We require safe yields for groundwater sources covered by the Desert Groundwater Management Ordinance.

Colorado Regional Water Quality Control Board

The Colorado RWQCB regulates water quality within the Eastern Desert and is given water permitting authority by the U.S. EPA. The primary responsibly of the Regional Board is to protect the quality of the waters within the region for all beneficial uses through the formulation and adoption of water quality plans for specific ground or surface water basins. In addition, the RWQCB, enforces regulations for industrial, domestic, and agricultural water discharges contained within the Porter-Cologne Water Quality Control Act.

DISCUSSION

The responses within this section are based on **Appendix D**: Geotechnical Investigation Report for Ames-Reche Recharge Basin, San Bernardino County, CA, conducted by Converse Consultants, Project No. 23-81-275-01, April 19, 2024.

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

RESPONSE:

Regional Hydrology

The Project Site is within the Southern Mojave-Salton Sea Watershed, specifically the Emerson Watershed (San Bernardino County GP EIR, *Figure 5.9-1: Major Watersheds;* MWA GIS Library, n.d.). A prominent river in this watershed is the Mojave River, which run northeast to southwest for approximately 120 miles. The river is dry for most of the year, and ends in Baker, California.

Local Hydrology

Surface Waters

Other drainages and dry washes are located throughout the watershed running from the mountain ranges east and west that drain into Homestead Valley. Pipes Wash is a prominent surface drainage, that receives approximately 4-12 inches of precipitation annually and flows into the dry lakebed of Emerson Lake (CA DWR, 2003). Pipes Wash is located directly northwest of the Project Site and receives surface drainage from the Project Site's southwestern corner. According to the 2018 Colorado River Regional Board Draft Integrated Report, Pipes Wash is not listed as an Impaired waterbody pursuant to Section 303(d) of the Clean Water Act (CA SWRCB, n.d.).

Storm Drains

The Project Site is currently undeveloped; therefore, there are not storm drains in place. Natural drainage flows southwest towards Pipes Wash and existing Ames-Reche Recharge Basin.

Flood Zones

The Project Site is within a FEMA-designated "Zone D," which indicates that flooding is possible; however, it is currently underdetermined since no hazardous risk analysis has been conducted for this area (FEMA, n.d.).

Dam Inundation Zones

According to the San Bernardino General Plan EIR, no dam inundation areas are mapped in the East Desert or Mountain regions (San Bernardino County GP EIR, 2019).

Less than Significant Impact. Based on the plan set, the Project proposes to modify the existing grade via excavation and trenching at the Project Site for the installation of two (2) recharge basins. The recharge basins are intended to provide the Agency with sustainable groundwater recharge and allow for continuous reliance on the groundwater systems. Therefore, the recharge basins are designed to incorporate materials similar to the Local Vicinity and existing Project Site; impervious surfaces are not proposed for the Project since this will disrupt groundwater recharge capabilities onsite. Instead, the 16-foot access road will be covered with decomposed granite along the perimeter of the basins to promote infiltration into the soil, consistent with structural BMPs proposed in the Mojave River Watershed Stormwater Management Plan (San Bernardino County SWMP, 2003).

Long-term operations at the Project Site will facilitate improved groundwater recharge and allow surface flows from the Project Site and adjacent parcels to percolate into the soil. The grading plan is designed to support the existing topography, and the basin depths are proposed 12-feet below the existing grade; however, the Project's 3-ft berms will allow surface drainage to flow onsite and into the recharge basin; and the 24-inch pipeline along Winters Road will extend north toward the western perimeter connecting the facility to MWA's non-potable water line and allowing water to be pumped into the basin bottoms. The Project is designed with the intention of capturing as much surface water as possible for maximum recharge capabilities; and storing water from MWA's flow control facility. This is beneficial to the runoff on site, and water pumped in via the 24-inch pipeline, since it will be captured in the basin bottom and be naturally filtered for groundwater recharge. As a result of the intended use of the recharge basin and natural filtration capabilities, the Project's long-term operations do not propose to violate water quality standards or waste discharge requirements. The Project is a Low Impact Development, according to the County's definition, which is "to preserve the pre-development hydrology of the Project Site…the outcome of the use of these [LIDs] is to mimic the local watershed's natural hydrologic functions to the maximum extent practicable" (San Bernardino County, 2013). By inserting a recharge basin at the Project Site, a LID as defined by the County of San Bernardino, the benefits include but are not limited to the following according to the County's Technical Guidance Document for Water Quality Management:

1. **Maintain pre-development hydrology**: Reduce the volume of water conveyed offsite, which also reduces erosion, sedimentation, and flood control impacts
2. **Water Quality Benefits**: Increase infiltration capabilities of runoff into the groundwater supply
3. **Increases preservation of Open Spaces**: Decreases the amount of impervious surfaces that can be detrimental to runoff and water quality; leaving more open spaces and natural surfaces
   Source: San Bernardino County, 2013

Project construction is anticipated to involve approximately 68,411 cubic yards of cut, and 1,594 cubic yards of fill, associated with excavation, trenching for the installation of the proposed pipeline on site and within Winters Road, and grading for the creation of the berms and basin bottom. However, throughout construction activities the Agency shall remain compliant with the NPDES requirements by incorporating BMPs pursuant to **BMP HYDRO-01: Construction BMPs.** The BMPs provide general steps for erosion and pollution control throughout construction activities including stabilization, potential hydroseeding, and dust suppression. These BMPs are enforceable through the NPDES General Construction Permit and County SWPPP. The Agency shall ensure that the Project contractor is compliant with these BMPs prior to the start of construction by implementing these BMPs into the Project specifications.

For the reasons above, the Project impacts related to violation of any water quality standard or waste discharge requirements or otherwise substantially degrade surface or ground water quality are less than significant. Mitigation will not be required.

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

RESPONSE:

No Impact. The groundwater basin underlaying the Project Site is the Ames Valley Groundwater Basin and consists of alluvial fan deposits comprised of gravels, conglomerates and silts; this basin is located within the Eastern Desert of San Bernadino County and spans over 169.7 square miles (110,000 acres) (CA DWR, 2003). Natural

recharge occurs from percolation of stream flows received from the nearby mountain ranges, septic tanks, and subsurface inflows from Means Valley Groundwater Basin (CA DWR, 2003). According to the review of the State Water Board's GeoTracker database, no site with groundwater data was identified within a 1.0-mile radius of the Project Site (Conserve Consulting, 2024).

During the Project Geologist's field investigation on March 4 and 5, 2024, no groundwater was encountered at depths of 101.5 feet bgs. The current depth of groundwater at the site is estimated to be deeper than 222 feet bgs (Conserve Consultants, 2024). Therefore, groundwater is not anticipated to be encounter during construction of the proposed basin and associated pipeline. Therefore, no impacts are anticipated throughout Project construction.

Long-term operation of the recharge basins will increase groundwater recharge capabilities in the Local Vicinity beyond existing conditions. Therefore, the Project anticipates contributing to the groundwater supply and to enhanced management for the continuous use and reliance on groundwater wells for residential and industrial uses.

As a result, substantial decreases in groundwater supplies or substantial interference with groundwater recharge are not anticipated. Therefore, no Mitigation Measures are needed.

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

i. Result in a substantial erosion or siltation on- or off-site;

RESPONSE:

Less than Significant Impact. The Project Site is approximately 3,310 to 3315 feet AMSL. Surface runoff at the Project Site flows southwest from the northern perimeter, towards Pipes Wash, located approximately 0.3 miles off-site. The Project intends to excavate the Project Site to construct two recharge basins, approximately 12-feet below the existing grade, with berms approximately 3-feet above the existing grade. While modifications to the existing grade are proposed, grading plans will remain consistent with the natural topography of the Project Site and finish surfaces with recompacted soils found on-site. Impervious surfaces are not proposed. However, throughout construction activities erosion, sediment, wind erosion, and dust tracking controls will be deployed pursuant to **BMP HYDRO-01: Construction BMPs.**

Upon the completion of Project construction, the Project Site will contain stable surfaces with contours that allow for surface drainage to collect at the basin bottom; and offsite water to be pumped into the basin for storage to enhance groundwater recharge. The finished surfaces at the Project Site do not allow for substantial erosion or siltation on- or off-site, since recharge will remain within the boundaries of the Project Site. In addition, water quality from the proposed Project is expected to improve due to the percolation and infiltration in the groundwater table that are anticipated to occur as a result of the Project's design.

As a result, impacts are anticipated to be less than significant, and no Mitigation Measures are needed.

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

RESPONSE:

Less than Significant Impact. As mentioned within Response 10 a) of this section, the Project does not propose to increase the number of impervious surfaces at the Project Site. The intended use of the Project is to increase the groundwater infiltration throughout the Project Site by developing a basin that will collect water to percolate into the groundwater table. Collection of surface water will be controlled and limited since berms will prevent fall from entering the basins in excess. In addition, the installation of the 24-inch pipeline that connects to existing facilities along Winters Road will control water that is pumped into the basin via the flow control facility. Surfaces will be constructed and recompacted with

soils natural to the Local Vicinity. The access roads will utilize decomposed granite, a porous surface, that will inhibit increased rates of runoff at the Project Site. Therefore, throughout the Project's lifetime, the rate of surface runoff is not anticipated to change.

During construction water quality BMPs will be implemented by the Contractor pursuant to **BMP HYDRO-01: Construction BMPs** of the MMRP. Implementation of these BMPs for erosion control during construction will result in runoff conditions that are substantially similar to existing conditions.

As a result, less than significant impacts are anticipated, and no additional Mitigation Measures are needed.

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

RESPONSE:

Less than Significant Impact. The Project is intended to improve sustainable groundwater recharge for the Agency. As mentioned above, the Project does not propose impervious surfaces and will not deviate substantially from MWA's regional and local plans. The Project Site is currently undeveloped and will provide a basin for stormwater runoff, should the Project Site experience a major storm event. The basin is designed to naturally filter the stormwater through percolation into the soil, which will eventually make its way into the groundwater table for sustainable recharge.

As a result, less than significant impacts are anticipated, and no Mitigation Measures are needed.

iv. **Impede or redirect flood flows?**

RESPONSE:

Less than Significant Impact. According to the FEMA Flood Hazard Map, the Project Site is not located within a designated 100-year flood zone or 50-year flood zone. FEMA designates the Project Site and Local Vicinity as having potential for flooding; however, flood risk is undetermined since a hazardous risk analysis has not been performed for this area. In addition, Project construction is not anticipated to result in impacts due to the implementation of the SWPPP and the grading plan, which will follow the natural contours of the Project Site and Local Vicinity.

Plans for Project development indicate general consistency between the completed Project and the existing Ames-Reche recharge basin facility, located approximately 0.3 miles west of the Project Site. Excavation of the proposed recharge basin's bottom will leave a depression for runoff to collect inside of the basin, ultimately flooding the basin bottom for groundwater recharge. However, the size of the basin is designed based on annual rates of precipitation and anticipated surface flows from adjacent parcels. The recharge basin does not intend to flood the surrounding parcels, since storage capacity will be monitored remotely via the flow control facility.

Since the Project intends to collect and control surface drainage at the Project Site for groundwater recharge on land not designated as a FEMA flood zone, the Project does not anticipate to permanently impede or redirect flood flows beyond what is already considered or approved by the Agency and Project Engineers. Impacts are considered less than significant, and no Mitigation Measures are needed.

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

RESPONSE:

No Impact. See Responses 10 a) through c) iv above. The California Department of Conservation does not place the Project Site within a zone at risk for a tsunami (CA Department of Conversation, 2015). The Project Site is located within the Eastern Desert of San Bernardino County, which is not geographically close to ocean or large bodies of water.

For the reasons above, the proposed Project is anticipated to have no impacts related to release of pollutants due to Project inundation in a flood hazard, tsunami or seiche zone. Therefore, no Mitigation Measures are needed.

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

RESPONSE:

Less than Significant with Mitigation Incorporated. See Responses 10 a) through d) above. The Project will follow current requirements for pollution source control and flood control or sustainable ground water management plan. A Storm Water Pollution Prevention Plan (SWPPP) pursuant to the NPDES will be incorporated into Project specifications. In addition, the Project contractor will implement stormwater pollution prevention measures and erosion control pursuant to **BMP HYDRO-01: Construction BMPs**.

For the reasons above, Project impacts are less than significant with mitigation incorporated during construction activities.

BEST MANAGEMENT PRACTICES

BMP HYDRO- 01: Construction BMPs. In accordance with the Construction General Permit and San Bernadino County General Plan EIR, the Project Contractor shall implement a Project-specific SWPPP, which will deploy construction BMPs from the California Stormwater Quality Association (CASQA). The following construction BMPs shall be implemented throughout construction activities:

1. ***Erosion Controls***: will consist of using project scheduling and planning to reduce soil or vegetation disturbance (particularly during the rainy season), preventing or reducing erosion potential by diverting or controlling drainage, as well as preparing and stabilizing disturbed soil areas.
    a. Examples of erosion controls include scheduling, preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, straw mulch, geotextile and mats, wood mulching, earth dikes and drainage swales, velocity dissipation devices, slope drains, streambank stabilization, compost blankets, soil preparation/roughening, and nonvegetative stabilization.

2. ***Sediment Controls*** will filter out soil particles that have been detached and transported in water.
    a. Examples of sediment controls include silt fence, sediment basin, sediment riprap, check dam, fiber rolls, gravel bag berm, street sweeping and vacuuming, sandbag barrier, straw bale barrier, storm drain inlet protection, manufactured linear sediment controls, compost socks and berms, and biofilter bags.

3. ***Wind Erosion Controls*** will consist of applying water or other dust palliatives to prevent or minimize dust nuisance.
    a. Examples of wind erosion controls include dust control soil binders, chemical dust suppressants, covering stockpiles, permanent vegetation, mulching, watering, temporary gravel construction, synthetic covers, and minimization of disturbed area.

4. ***Tracking Dust Controls*** will minimize the tracking of soil offsite by vehicles
    a. Examples of tracking dust controls includes stabilized construction roadways and construction entrances/exits, and entrance/outlet tire wash.

5. ***Non-storm water management controls*** will prohibit discharge of materials other than stormwater, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. Conduct various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize non-stormwater discharges and contamination of any such discharges.
    a. Examples of non-stormwater management controls include water conservation practices, temporary stream crossings, clear water diversions, illicit connection/discharge, potable and

irrigation water management, and the proper management of the following operations: paving and grinding, dewatering, vehicle and equipment cleaning, fueling and maintenance, pile driving, concrete curing, concrete finishing, demolition adjacent to water, material over water, and temporary batch plants.

6. ***Waste Management and Controls*** (i.e. good housekeeping practices) will manage materials and wastes to avoid contamination of stormwater.
    a. Examples include stockpile management, spill prevention and control, solid waste management, hazardous waste management, contaminated soil management, concrete waste management, sanitary/septic waste management, liquid waste management, and management of material delivery storage and use.

Source: CASQA, 2012; San Bernardino County GP EIR, 2019, Table 5.9-1: Construction Best Management Practices

4.11 Land Use and Planning

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

DISCUSSION

a) Physically divide an established community?

RESPONSE:

Less than Significant Impact. The Project Site encompasses two recorded parcels located in the East Desert of San Bernardino County (Unincorporated San Bernardino County) and is subject to the County's Municipal Code and development standards established within the Homestead Valley Community Plan Area. The Project would be implemented approximately 12 miles north from the closest City, Yucca Valley. The County's General Plan designates the Project Site for rural living (RL), which "provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses" (San Bernardino County Zoning and Development, n.d.). According to the County's General Plan, the Local Vicinity is characterized by "vacant land and very low intensity uses", with land use comprised of 96 percent undeveloped, 2 percent rural residential, and 1 percent industrial (San Bernardino County GP EIR, 2019). Within the Local Vicinity, are mostly scattered residential developments on 1–2-acre parcels; the existing MWA-owned Ames-Reche recharge basin and test site, approximately 0.3 miles west and 0.25 miles east of the Project Site; and Landers Landfill, located at 59200 Winters Road, Landers, CA 92285, approximately 3.2 miles east of the Project Site.

Existing access to the site is from Winters Road, which is a dirt road along the south property line of Project Site. Based on a site visit conducted on February 26, 2024 and a topographic survey of the Project site, there are remnants of structures and debris on-site including portions of walls, a jacuzzi and a concrete pad as well as discarded household items indicating previous use of the site for residential. There were no immediately adjacent residences noted during the site visit or on the topographic survey.

The Project proposes site modification for two 2.5-acre recharge basins, involving over excavation, trenching, installation of basin bedding and inflow/outflow piping. The perimeter of the basins will be contoured to direct flows toward each basin and resurfaced with a 16-foot wide accessway covered with decomposed granite along the entire border of each basin, a chain link fence and gate installed along the perimeter of the 10-acre Project Site (APN 0629-211-13, -14). The Project will install large infrastructure within an existing parcel and fencing along existing property lines that are consistent with existing land use subdivisions in the Local Vicinity and well as MWA's 2020 Urban Water Management Plan, 2018 Integrated Regional Water Management Plan, and 2021 Strategic Plan. Therefore, the Project would not cause physical divides to an established community.

The Project plans Indicate the recharge basin will be graded to tie In with natural topography along parcel boundaries of the Project Site and will maintain access to nearby properties along Winters Road. The existing Ames-Reche recharge basin is located on APN 0629-222-01, the same land use designation as the Project Site. The construction of the recharge basin does not propose development that is incompatible with the County's General Plan land use designations. As presented in Section 1.0, Purpose and Scope, the purpose of the Project

is to replace the functional capacity of the existing Ames-Reche recharge facility for reliable groundwater recharge and sustainable groundwater management throughout periods of drought.

For the reasons above, the Project will not result in a significant impact related to permanent division of the community or substantial modification of existing or approved land use. The Project will facilitate implementation of approved General Plan Land Use Map. Impacts are anticipated to be less than significant. No Mitigation Measures are necessary.

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?

RESPONSE:

Less than Significant Impact. Site improvements will not exceed what has been anticipated under MWA's Strategic Plan for sustainable management of groundwater basins (MWA Strategic Plan, 2021). Therefore, Project implementation will not cause a significant environmental impact due to conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The Project is intended to facilitate sustainable groundwater management by ensuring safe, reliable groundwater recharge is achieved and maintained throughout periods of drought.

As a result, less than significant impacts are anticipated. No Mitigation Measures are necessary.

MITIGATION MEASURES

No mitigation measures are needed.

4.12 Mineral Resources

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
MINERAL RESOURCES. Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

REGULATORY COMPLIANCE

The California Surface Mining and Reclamation Act of 1975

The County of San Bernardino identifies potential mineral resources within their General Plan documents pursuant to the California Surface Mining and Reclamation Act of 1975 (SMARA). The Act sets requirements for mining and reclamation policy to ensure the following:

- Production and conservation of minerals is encouraged;
- Environmental effects are prevented or minimized;
- Consideration is given to recreational activities, watersheds, wildlife, range and forage, and aesthetic enjoyment;
- Mined lands are reclaimed to a useable condition once mining is completed; and
- Hazards to public safety both now and in the future are eliminated.

In addition, the Act requires local jurisdictions, within the State of California, to classify land that has potential for the discovery of mineral resource called Mineral Resource Zones (MRZs). According to the California State Board's Guidelines for Classification and Designation of Mineral Lands, the MRZ designations are:

- MRZ-1: Areas where available geologic information indicates that there is minimal likelihood of significant resources.
- MRZ-2: Areas underlain by mineral deposits where geologic data indicate that significant mineral deposits are located or likely to be located.
- MRZ-3: Areas where mineral deposits are found but the significance of the deposits cannot be evaluated without further exploration.
- MRZ-4: Areas where there is not enough information to assess the zone. These are areas that have unknown mineral resource significance.
- SZ: Areas containing unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance shall be classified in this zone.

The State Office of Mining Reclamation (OMR) and County Public Works Department monitors all mining activities within San Bernadino County to ensure operations are compliant with applicable laws.

DISCUSSION

a) Result in the loss of availability of a known mineral resource that would be a value to the region and the residents of the state?

RESPONSE:

Less than Significant Impact. According to the San Bernardino County General Plan EIR, *Figure 5.11-1 Mineral Resource Zones 2 & 3 in the Southwest Quadrant of the County*, the Project Site is not within a mineral resource area. In addition, approximately 2 percent of the East Desert Region is designated as MRZ-2, areas with mineral resources identified, or MRZ-3, potentially significant mineral resources present. However, the closest area designated as MRZ-2 is located approximately 15 miles northwest of the Project Site in Lucerne Valley; the closest area designated as MRZ-3 is located approximately 5 miles northwest near Flamingo Heights, on the western side of SR 247.

The County's General Plan and General Plan DEIR indicate there are no mineral resources at the Project Site or vicinity known to be significant regionally or to the state. The Project will comply with SMARA regulations; since the Project does not threaten the potential to extract minerals in the area, the Project is not required to prepare a statement specifying its reasons for permitting the proposed Project and use. In addition, the proposed Project will not result in substantive changes to the existing conditions of these areas.

Since the areas with known mineral resources of significance are outside the bound of the Project Site and Vicinity, no impacts for implementation of the Project on mineral resources are anticipated. Therefore, the proposed Project would not result in the loss of availability of a known mineral resource in Homestead Valley, and impacts to mineral resources are anticipated to be less than significant. No Mitigation Measures are needed.

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?

RESPONSE:

No Impact. See Response 12 a). There are no locally important mineral resource recovery sites delineated in the County's General Plan. The Project is consistent with existing zoning and general plan at its location. Therefore, Project implementation will not result in the loss of availability of a locally important mineral resources recovery site delineated on a local general plan or other land use plan. No impacts are anticipated; therefore, no Mitigation Measures are needed.

MITIGATION MEASURES

No Mitigation Measures are needed.

4.13 Noise

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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 in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒

REGULATORY COMPLIANCE

Federal Noise Control Act of 1972

In 1972, the EPA Office of Noise Ambient and Control issued the Federal Noise Control Act, which established programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. The EPA established Levels of Environmental Noise recommended that Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas (e.g. residences, schools, hospitals, etc.). 55 dBA was identified as an "adequate margin of safety" for noise level increase relative to a baseline noise exposure level of 55 dBA Ldn. The standards set by the EPA's Federal Noise Control Act are advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

San Bernardino County

General Plan

As discussed in Topic 11, Land Use and Planning, the County of San Bernardino General Plan land use for the Project Site is Rural Living (RL). According to the San Bernardino County General Plan EIR, Section 5.12 Noise, *Table 5.12-4 Community Noise and Land Use Compatibility*, residential- low density land use allows noise levels to be up to 60 dBA under normally acceptable conditions; 55 dBA to 70 dBA for new construction or development. Noise levels that exceed 70 dBA are typically unacceptable (San Bernardino County GP EIR, 2019).

DISCUSSION

The responses in this section are based on the Ames-Reche Noise Impact Analysis, dated May 2, 2005 (see **Appendix E**).

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

RESPONSE:

Less Than Significant Impact. For the existing noise environment, Sensitive receptors that may be affected by project generated noise include the nearest sensitive receptor to the project site are the existing single-family residential uses with property lines located approximately 275 feet southeast and 290 feet northeast of the project site. Measured short-term ambient noise levels in the project vicinity ranged between 31.6 and 34 dBA Leq and long-term noise ambient noise levels ranged between 20.4 to 43.6 dBA Leq. The dominant noise sources in the project vicinity are vehicle traffic associated with Tracy Boulevard/Winters Road as well as bird song, residential activity, and dogs barking.

Construction Noise

Onsite Equipment: Based on the modeled construction noise levels, construction noise levels are estimated to reach up to 69.2 dBA Leq at the nearest existing residential property line and will not exceed the FTA residential construction noise standard of 80 dBA Leq (daytime) and 70 dBA Leq (nighttime) – see *Table 12* below. Therefore, the project would not exceed established standards relating to construction noise. The project impact is less than significant; no mitigation is required. Notwithstanding this impact conclusion, best management practices (BMPs) can be added to project plans and in contract specifications to minimize construction noise emanating from the proposed project.

Offsite Vehicle Trips: Project vehicle traffic generated during project construction would result in an existing plus project noise level of 51.6 dBA CNEL, which is below the County's mobile source residential noise level standard of 60 dBA CNEL. Off-site project generated construction vehicle trips would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

TABLE 12: CONSTRUCTION NOISE LEVELS AT THE NEAREST RECEPTORS

	Receptor Location	Construction Noise Levels (dBA Leq)	Applicable Daytime FTA Threshold (dBA Leq)	Applicable Daytime FTA Threshold (dBA Leq)	FTA Threshold Exceeded (Day/Night)?
Phase 1: Monitoring Well Drilling)	Residential to Northeast (57522 Lucky Ln)	63.7	80	70	No/No
	Residential to Southeast (57635 Winters Rd)	63.3	80	70	No/No
Phase 2: Retention Basins	Residential to Northeast (57522 Lucky Ln)	69.2	80	70	No/No
	Residential to Southeast (57635 Winters Rd)	68.8	80	70	No/No

Table 12: Construction Noise Levels at the Nearest Receptors

Source: Noise Impact Analysis, Ganddini May 2, 2025.

Operational Noise

The project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. There are no stationary noise sources associated with the project. However, to conduct routine inspections and ensure proper long-term maintenance, the long-term operation of the project will require a minimal number of monthly worker trips. Additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated. Therefore, the addition of project vehicle trips would result in a

negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

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

RESPONSE:

Less Than Significant Impact. Groundborne vibration generated by project construction would not exceed the levels necessary to cause architectural damage or annoyance; therefore, potential construction-related groundborne vibration and noise impacts would be less than significant – see *Table 13* below. The most substantial sources of groundborne vibration during post-construction project operations would comprise the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction. This impact would not be significant. No mitigation is required.

TABLE 13: CONSTRUCTION VIBRATION AT THE NEAREST RECEPTORS

Receptor Location	Distance to Nearest Structure (feet)	Equipment	Vibration Level (PPV in/sec)	Threshold Exceeded?[1]
Residential to Northeast (57522 Lucky Ln, Landers)	536	Vibratory Roller	0.002	No
	536	Large Bulldozer	0.001	No
Residential to Southeast (57635 Winters Rd, Landers)	1,105	Vibratory Roller	0.001	No
	1,105	Large Bulldozer	0.000	No

Table 13: Construction Vibration at the Nearest Receptors

Source: Noise Impact Analysis, Ganddini May 2, 2025.
Notes:
(1) Caltrans identifies a vibration level of 0.3 in/sec PPV as the threshold at which there is a risk to "architectural" damage to older residential buildings.

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?

RESPONSE:

No Impact. There are no private airstrips or public airports located within two miles of the project site. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels. There is no impact, and no mitigation is required.

MITIGATION MEASURES

No Mitigation Measures are needed.

4.14 Population and Housing

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

DISCUSSION

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

RESPONSE:

No Impact. From 2000 to 2016, the population within San Bernardino County increased substantially, resulting in 2,035,210 residents living throughout unincorporated and incorporated areas of the County (San Bernardino County GP EIR, 2019). Specifically, unincorporated areas grew by 5.1 percent; however, the proportion of residents living within unincorporated areas decreased overall from 17.1 percent to 14.6 percent. This is largely due to the expansion of incorporated cities and town resulting in the annexation of unincorporated communities/ land (San Bernardino County GP EIR, 2019). The Project Site is located within Homestead Valley, a community located in the Eastern Desert region of unincorporated San Bernardino County. In 2014, the total population within Homestead Valley Communities, a collection of unincorporated communities, was 6,924; however, recently the population has decreased throughout the Homestead Valley Communities.

Within the Local Vicinity, residential developments rely on groundwater wells for their drinking water supply. Therefore, ensuring the groundwater supply remains at an appropriate level of continued service to existing residence is essential to residents throughout Homestead Valley and adjacent unincorporated communities. While the Project does not propose to develop infrastructure for human occupancy that will directly or indirectly induce population growth; the Project will provide groundwater recharge to ensure drinking water is available to the local communities of Homestead Valley and Flamingo Heights.

The Project is consistent with long-range plans outlined within MWA's Urban Water Management Plan. The Project will not induce substantial unplanned population growth by either implementing new homes or business or indirectly by extending infrastructure in support of the construction of new homes or the establishment of new businesses. As a result, impacts are not anticipated, and no Mitigation Measures are needed.

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

RESPONSE:

No Impact. See Response 14 a). The Project will remain within the boundaries of the Project Site (APN 062-921-113 and -114) and will not result in significant indirect, off-site impacts due to implementation of Standard Conditions, BMPs, and Mitigation Measures for the Project. The Project will allow MWA to increase reliability and

resilience to drought by increasing groundwater recharge capabilities in the Local Vicinity and at the Project Site. The Project has been previously approved by the Agency's 2014 Integrated Regional Water Management Plan (IRWMP), 2020 Urban Water Management Plan (UMWP) to support the Ames/Reche Management Area. Upon the completion of Project construction, maintenance of the Project Site will remain the same since MWA employees will be servicing the Project Site instead of the existing recharge basin, approximately 0.3 miles west.

For these reasons, no impacts related to the displacement of substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere is not anticipated to occur. Mitigation Measures are not needed.

MITIGATION MEASURES

No Mitigation Measures are needed.

4.15 Public Services

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
PUBLIC SERVICES. Would the Project:				
a) 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:	☐	☐	☒	☐
i. Fire Protection?	☐	☐	☒	☐
ii. Police Protection?	☐	☐	☒	☐
iii. Schools?	☐	☐	☒	☐
iv. Parks?	☐	☐	☒	☐
v. Other public facilities?	☐	☐	☐	☒

DISCUSSION

a) 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:

i. Fire Protection?

RESPONSE:

Less than Significant Impact. The Project Site is within the jurisdiction of the San Bernardino County Fire Department (SBCFD). SBCFD provides emergency mitigation and management during fires, medical services, hazardous materials response, and fire abatement (San Bernardino County GP EIR, 2019). The Project Site is serviced by SBCFD's "East Valley" and "South Desert" Service Zones, within the County's second and fourth Divisions, comprised of 84 total employees (San Bernardino County GP EIR, 2019; *Figure 5.14-1 Critical Facilities*). In 2017, there were 10,759 calls for service. As of 2019, SBCFD maintains an average response time of 8 minutes and 38 seconds; however, for rural areas they have a target response time of 22 minutes and 30 seconds (San Bernardino County GP EIR, 2019).

The closest fire stations to the Project Site are Station 42, approximately 4.7 miles southeast, located at 58612 Aberdeen Dr, Yucca Valley, CA 92284; and Station 19, approximately 7.3 miles northwest, located at 55481 Jesse Road, Yucca Valley, CA 92284. Station 42 is staffed with three full-time personnel and equipped with one (1) Type 1 Medic Engine, one (1) Cross-staff Truck, and one (1) Cross-staff Water Tender. Station 19 is staffed with nine (9) full-time personnel and equipped with two (2) Type 1 Medic Engines, and one (1) Medic Truck.

The Project proposes to relocate the existing Ames-Reche recharge basin onto 10-acres of mostly undeveloped land along Winters Road within Homestead Valley. The Project will not increase the

population or use of the Project Site beyond what has already been considered and approved by MWA and the County. population and level of activity within the local vicinity will not increase or result in the need for an additional fire station, equipment, or staff over the long-term. The Project will not change land use, either directly or indirectly, from what was considered and approved in the existing General Plan and UWMP. Therefore, there will not be an increased need for fire response beyond what has already been identified in the MWA's approved UWMP and IRWMP.

Construction will occur over 11 months, requiring a crew of up to 10 construction workers at any time, which is not of a duration or scale that would result in substantial need for changes in the existing public services or physically altered facilities beyond what has already been planned and approved. During construction an approved traffic control plan, including input from the Fire Department, will be followed by the construction crew to reduce conflicts and delays from construction activities within the public right-of-way. This will allow fire protection services to function according to agency standards. Therefore, Fire Department and emergency response through the construction zone will be maintained pursuant to agency input and standards without the need for new or physically altered government facilities. As a result, less than significant impacts to fire and emergency services are expected during construction.

ii. Police Protection?

RESPONSE:

Less than Significant Impact. The Project Site is within the jurisdiction of the San Bernardino County Sheriff's Department. The County's Sheriff Department employs 3,956 staff, consisting of 1,875 Sheriff/ Coroner/ Public Administrator staff, 1,467 Detentions staff, and 614 Law Enforcement Contracts staff (San Bernardino County GP EIR, 2019). The closest station to the Project Site is the Morongo Basin Station, approximately 15 miles southeast, located on 6527 White Feather Road, Joshua Tree, CA 92252. This station has 17 patrol deputies servicing a population of 24,426. In 2018, there were 20,060 calls for service at this station. According to forecasted population growth, the County will need to add stations throughout the East Desert to accommodate growth in various communities (San Bernardino County GP EIR, 2019).

However, the Project does not propose to increase the population in the Local Vicinity. The Project is intended to increase groundwater recharge for the continued reliability and reliance on groundwater wells for the nearby residential developments. Throughout Project construction, a traffic control plan will be implemented to allow services to remain open. The proposed Project will not permanently increase population or change land use resulting in increased need for police services either directly or indirectly.

Since the Project is a part of the approved UWMP and IRWMP, intended to benefit the local community for continued access to groundwater used for drinking water, the Project will not impact the level of police protection at the Project Location. The Project does not propose to increase population or change land use.

iii. Schools?

RESPONSE:

Less than Significant Impact. The closest school to the Project Site is Landers Elementary School, approximately 5.3 miles northwest, located along 56450 Reche Road, Homestead Valley, CA 92285. During Project construction, mobilization of heavy equipment and trucks may be required along Reche Road slowing traffic at the school during pick ups and drop offs. Overall, construction-related traffic along Reche Road that will directly and indirectly impact Landers Elementary School are negligible.

Additionally, the Project will not increase population or density either directly or indirectly within the planning area; therefore, the Project will not result in changes to school enrollment. Less than significant impacts are anticipated; no Mitigation Measures are needed.

iv. Parks?

RESPONSE:

Less than Significant Impact. The Project is public works improvement and will not result in any short-term or permanent changes in demand for parks services. As mentioned within Section 5.16. Recreation, the closest parkland and open spaces are approximately 11.7 miles south of the proposed Project. The Project does not propose to change land use resulting, either directly or indirectly, in an increase in density or population that would affect park use. Therefore, long-term impacts are not anticipated.

In addition, the Project is planned to be constructed entirely within APNs owned by MWA. While the Project Footprint may temporarily impact local roadways during construction including Winters Road and Landers Lane, an approved traffic control plan will be implemented in compliance with the County's Standard Specifications. As a result, access to existing park land adjacent to Project Components is not anticipated to be impacted by Project construction. Impacts would be less than significant.

v. Other public facilities?

RESPONSE:

No Impact. The Project Site is surrounded by primarily undeveloped and rural residential land uses in unincorporated San Bernardino County. Public facilities such as libraries and community centers are not located adjacent to the Project Site; the closest public facilities are within the City of Yucca Valley.

As a result, construction is not anticipated to result in significant temporary or permanent changes to public facilities.

MITIGATION MEASURES

No mitigation measures are needed.

4.16 Recreation

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐
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?	☐	☐	☐	☒

REGULATORY COMPLIANCE

The Quimby Act

The Quimby Act of 1965, Section 66477 of the California Government Code, enables local governments, cities, or counties to require the dedication of land or impose a requirement of the payment of the in-lieu fees for development of community parks as well as setting minimal standards for parks.

San Bernardino County

General Plan

- **Policy NR-3.1 Open space preservation.** We regulate land use and coordinate with public and nongovernmental agencies to preserve open space areas that protect natural resources, function as a buffer against natural hazards or between land uses, serve as a recreation or tourist destination, or are central to the identity of an unincorporated community.
- **Policy NR-3.2 Residential clustering.** We allow residential development to cluster housing units in order to reduce the consumption of undeveloped land, maximize the amount of open space, preserve natural resources, conform to natural topography/grade, and/or reduce exposure of structures to natural hazards.
- **Policy NR-3.3 Management of designated areas.** We coordinate with public and nongovernmental agencies to sustainably manage and conserve land within or adjacent to locally-, state-, or federally-designated open space or resource conservation areas.
- **Policy NR-3.4 Land exchange.** We coordinate with state and federal agencies to exchange publicly owned lands in order to provide additional areas for open space, recreation, and resource protection. We also request the right of first refusal on publicly owned lands made available for purchase to the public.
- **Policy NR-3.5 Private conservation efforts.** We support nongovernmental organizations and private entities who purchase, own, maintain, and expand areas for conservation and preservation. We also support the voluntary transition of privately held lands within a larger boundary designated by the state or federal government for open space and resource conservation to public ownership.
- **Policy NR-3.6 Regional park land.** We coordinate with other jurisdictions and agencies to provide regional park land. We prioritize the maintenance and improvement of existing County parks and trails over their expansion or creation of new facilities.

- **Policy NR-3.7 Regional park revenue.** We generate revenues from County-owned parks and facilities to offset the costs of operation and maintenance. We may also coordinate with local jurisdictions and leverage other resources to support the maintenance and improvement of park and trail facilities.
- **Policy NR-3.8 Regional trail system.** We coordinate with incorporated jurisdictions, state and federal agencies, and other regional and not-for-profit entities to maintain and improve a regional trail system. We prioritize the maintenance and improvement of the Santa Ana River Trail, followed by the creation of trails in unincorporated areas that connect to existing trails in incorporated areas and to state- and federally maintained trails.
- **Policy NR-3.9 Local parks, trails, and recreation.** We support the provision of local and community parks, trails, and recreational programs and facilities in unincorporated areas when a locally approved funding and financing mechanism is established to pay for acquisition, construction, maintenance, and operations. We encourage unincorporated communities to apply for funding and cooperate with them in their funding applications for local trails that are identified in a non-motorized transportation plan that is accepted or adopted by the County. We also encourage, where feasible, local trails to be separated from vehicular traffic to improve the safety of trail users.
- **Policy NR-3.10 Joint use facilities.** We promote the creation of joint use facilities for local parks and recreation programs through coordination with the County Flood Control District, local school districts, utilities, and other public agencies.
- **Policy NR-3.11 Off-highway vehicle areas.** In areas under the County's land use authority, we require new or expansion of existing commercial off-highway vehicle (OHV) areas to be situated and buffered to minimize effects on nearby residential uses, military activity, and environmentally sensitive areas.
- **Policy NR-3.12 Rights-of-way and easements.** We consider reserving portions of rights-of-way and easements found to be unnecessary for the ultimate buildout of roadways or flood control facilities for use as local pedestrian, bicycle, and/or equestrian trails.

DISCUSSION

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?

RESPONSE:

Less than Significant Impact. The closest parkland to the Project Site is the Community Center Park, located approximately 11.7 mile south within the City of Yucca Valley. In addition, the closest regional parkland to the Project Site is Big Morongo Canyon Preserve, located approximately 15 miles southwest. Big Canyon Preserve is 31,000 acres of open space, which includes walking and hiking trails; a wheelchair accessible boardwalk through riparian habitat; and docent-led hikes. The Bureau of Land Management oversees 177 acres of the preserve with the intention to protect the unique wildlife within the region.

Project implementation does not propose to create long-term employment, build housing, or increase the local population. Therefore, the Project will not increase the use of existing neighborhood and regional parks.

The Project consists of improvements on APN 062-921-113 and -114 that will temporarily disrupt site access due to grading and mobilization and heavy equipment. Through access to local streets will be maintained during construction with the implementation of an approved traffic control plan by the contractor; therefore, construction would not alter traffic resulting temporary changes to park utilization within the Local Vicinity or outlying areas. Upon completion, the public right-of-way and Project Location will be restored to existing conditions. The Project does not propose structures or buildings that will directly increase population or levels of activity, nor any permanently increased use of neighborhood and regional parks or other recreational facilities. The Project will temporarily increase daytime, weekday population at the Project Site during construction; however, significantly increased park uses, resulting in substantial or accelerated physical deterioration of nearby parks, is not expected during construction due to the size of the Project and anticipated modest size of the construction crew.

As a result, the Project will have no impact on recreational facilities. No Mitigation Measures are required.

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?

RESPONSE:

No Impact. See Response 16 a). The Project will not construct or expand recreational facilities. The Project is composed of the construction of the East Ames-Reche Recharge Facility and installation of a monitoring well, pipeline connection, and perimeter fencing on a parcel containing debris and an abandoned building. During construction the contractor will be required to implement mitigation measures and BMPs to reduce the physical effects of construction on the environment to less than significance. Upon completion of construction the Project will restore areas outside of affected by construction to existing conditions. Therefore, the Project will have no temporary or permanent impacts related to construction or expansion of recreational facilities which will have an adverse physical effect on the environment, and no mitigation is required.

MITIGATION MEASURES

No Mitigation Measures are needed.

4.17 Transportation

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

REGULATORY COMPLIANCE

CEQA Guidelines

In December 2018, CEQA Guidelines Section 15064.3, subdivision (b) was adopted by the California Natural Resources Agency. The updated guidelines outline the specific considerations for evaluating a project's transportation impacts; identifying "vehicle miles traveled" (VMT) as the most appropriate measure for determining impact levels. The updated guidelines focus primarily on transit priority areas, shifting the focus from driver delay to GHG reductions, the utilization of multimodal networks, and mixed land uses.

Section 15064.3 subdivision (b) considers all the following acceptable criteria for analyzing transportation impacts:

(1) **Land Use Projects**. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

(2) **Transportation Projects**. Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. To the extent that such impacts have already been adequately addressed at a programmatic level, such as in a regional transportation plan EIR, a lead agency may tier from that analysis as provided in Section 15152.

(3) **Qualitative Analysis**. If existing models or methods are not available to estimate the vehicle miles traveled for the particular project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively. Such a qualitative analysis would evaluate factors such as the availability of transit, proximity to other destinations, etc. For many projects, a qualitative analysis of construction traffic may be appropriate.

(4) **Methodology**. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled and may revise

those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section. (Source: CEQA Guidelines Section 15064.3- Determining the Significance of Transportation Impacts).

DISCUSSION

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

RESPONSE:

No Impact. The Project is located within the East Desert of unincorporated San Bernardino County, adjacent to and on the north side of Winters Road, approximately 1,500 feet west of Warren Vista Avenue. There are no bicycle, pedestrian or transit facilities near the Project Site, nor does the San Bernardino County General Plan identify any such facilities near the Project Site. Therefore, the Project does not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities. There would be no impact, and no mitigation is required.

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

RESPONSE:

Less Than Significant Impact. CEQA Guidelines Section 15064.3 provides direction for determining the significance of potential transportation impacts associated with a project. Measures of automobile delay – referred to as Levels of Service (LOS) – are no longer considered the principal criteria upon which transportation impacts are considered. Rather, impacts associated with projects that generate traffic (such as residential, commercial, industrial, linear, or roadway projects) are typically evaluated by evaluating the Project's Vehicle Miles Traveled (VMT). Given that the Project comprises the construction and operation of a water recharge basin, traffic would largely be associated with short-term construction-related activities. There would be no operations-related traffic other than occasional maintenance-related visits likely by a single vehicle, and VMT would not apply.

Project construction is anticipated to last for approximately 11 months. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days). Construction activities will occur between 7:30 AM and 4:30 PM, Monday through Friday; weekend work will be avoided when feasible, however, weekend or night work might occur to avoid peak traffic.

Construction activities for Phase 1 will involve up to 3 crew members daily. Construction activities for Phase 2 will involve approximately 8 to 10 crew members[7] daily at any one time during active construction. Crew members will travel to the construction site utilizing personal vehicles, approximately 10 vehicles at any one time assuming each crew members drives separately, accessing the construction site via local roadways (e.g., Tracy Blvd, Winters Road, Landers Lane, Reche Road) or regional transportation routes (State Route (SR) 247). Personal vehicles will be parked along the public right-of-way, adjacent to the Project Site within the roadway, shoulder, or at the street curbs. Delivery of construction equipment (see Section 3.0, Project Description) and materials will be scheduled as dictated by construction needs, are few in number, and can easily be accommodated by local roadways.

Grading and excavation activities are estimated to require approximately 68,411 cy of cut and 1,594 cy of fill, resulting in a net cut of 66,817 cy. Assuming a haul truck capacity of 16 cy per truck = 4,176 truckloads to be carried offsite. Over the estimated 172 days of construction, this results in an average of about 24 trucks per day, or about 3 trucks per hour during a typical work day – well within the local roadway capacity.

Overall, the Project would not conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). Impacts are less than significant, and no mitigation is required.

[7] The number of construction crew members is an assumption based on the scale of the Proposed Project and type of infrastructure being implemented.

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

RESPONSE:

No Impact. The Project does not include the construction or widening of any public roads. Onsite access roads will be constructed and graded to accommodate occasional maintenance-related visits during operation of the recharge basins and will have clear visibility across the project site. The Project does not introduce any geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses that would increase hazards either on or off the project site. There is no impact, and no mitigation is required.

d) Result in inadequate emergency access?

RESPONSE:

No Impact. The Project comprises the construction and operation of water recharge basins that would not impact emergency access on local roadways. Therefore, there is no impact, and no mitigation is required.

MITIGATION MEASURES

No mitigation measures are needed.

4.18 Tribal Cultural Resources

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

REGULATORY COMPLIANCE

Assembly Bill (AB) 52

Assembly Bill (AB) 52 became effective on July 1st, 2015, and requires lead agencies to provide notice to any California Native American tribes that have requested notice of projects. Upon the receipt of the notice, the tribe has 30 days to request consultation with the lead agency. AB 52 created a new category of resources formally known as "Tribal Cultural Resources".

Public Resources Code 21074 defines "Tribal cultural resources as any of the following "Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either: (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources and/or (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1. This may include 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 Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe."

Mojave Water Agency AB 52 Tribal Consultation

On February 20, 2025, the Mojave Water Agency notified the following tribes of the Project and that the 30-day timeframe in which to request consultation in accordance with AB52 would end on March 21, 2025. The results of the consultation are as follows:

- Agua Caliente Band of Cahuilla Indians – No response
- Morongo Band of Mission Indians – No response
- Quechan Indian Tribe of the Fort Yuma Reservation – No response
- San Manuel Band of Mission Indians (now the Yuhaaviatam of San Manuel Nation) - Requested consultation and responded with suggested mitigation measures
- Serrano Nation of Mission Indians – No response
- Twenty-Nine Palms Band of Mission Indians – No response

San Bernardino County

General Plan

San Bernardino County's General Plan contains polices pertaining to tribal cultural resources that look to preserve and celebrate Native American beliefs and traditions out of respect for their heritage which has influenced the Southern California Region. The applicable policies include the following:

Policy CR-1.1 Tribal notification and coordination

We notify and coordinate with tribal representatives in accordance with state and federal laws to strengthen our working relationship with area tribes, avoid inadvertent discoveries of Native American archaeological sites and burials, assist with the treatment and disposition of inadvertent discoveries, and explore options of avoidance of cultural resources early in the planning process.

Policy CR-1.2 Tribal planning

We will collaborate with local tribes on countywide planning efforts and, as permitted or required, planning efforts initiated by local tribes.

Policy CR-1.3 Mitigation and avoidance

We consult with local tribes to establish appropriate project-specific mitigation measures and resource-specific treatment of potential cultural resources. We require project applicants to design projects to avoid known tribal cultural resources, whenever possible. If avoidance is not possible, we require appropriate mitigation to minimize project impacts on tribal cultural resources.

Policy CR-1.4 Resource monitoring

We encourage active participation by local tribes as monitors in surveys, testing, excavation, and grading phases of development projects with potential impacts on tribal resources.

DISCUSSION

a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined

in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

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

RESPONSE:

Less than Significant with Mitigation Incorporated. A Cultural Resources Assessment for the Project was prepared by BCR Consulting in April 2025 (see **Appendix C**) which addressed Native American ethnography. Findings were negative during the Sacred Lands File search with the Native American Heritage Commission (NAHC).

As discussed in Response 5, Cultural Resources, the cultural records search conducted at the South Coastal Central Information Center (SCCIC) indicated that seven previous cultural resource studies have taken place, and three cultural resources have been identified within the one-mile resource radius of the Project Site. A field survey conducted of the Project Site in January 2025 identified four historic period concrete foundations. No other cultural resources (including prehistoric or historic archaeological or historic architectural resources) were identified during the field survey.

The Cultural Resources Assessment concluded that the resources that occupy the Project Site do not meet eligibility criteria for the National Register or for the California Register, and as such they are not recommended historic properties under Section 106 of the NHPA and are not recommended historical resources under CEQA. Therefore, the project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 and will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. Similarly, the results from the Sacred Lands File search suggest no anticipated impacts to tribal cultural resources pursuant to Public Resources Code Section 21074 and 5020.1(k).

While the current study has not indicated sensitivity for unknown cultural resources, including tribal cultural resources, within the project boundaries, ground disturbing activities have the potential to reveal buried deposits not observed on the surface. Therefore, Mitigation Measure **MM-TCR-01: Tribal Cultural Resources Monitoring and Treatment Plan** is provided to reduce potential impacts to buried tribal cultural resources to a level of insignificance.

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

RESPONSE:

Less than Significant Impact with Mitigation Incorporated. See Response 18 a) above. On February 20, 2025, the Mojave Water Agency notified tribes who are relatively close to the Project site of the Project and the 30-day timeframe in which to request consultation in accordance with AB52. The Yuhaaviatam of San Manuel Nation (formerly the San Manuel Band of Mission Indians) requested consultation and in subsequent correspondence with MWA provided suggested mitigation measures related to a Cultural Resources Monitoring and Treatment Plan, and Tribal Consultation. The mitigation measures were agreed to by MWA and have been incorporated into the environmental impact assessment as presented below.

In addition to Mitigation Measure **MM-CUL-01**, Mitigation Measures **MM-TCR-01: Cultural Resources Monitoring and Treatment Plan,** and **MM-TCR-02 Tribal Consultation,** are included to ensure there would be no impacts in the event unanticipated finds are discovered. With the implementation of **MM-TRC-01** and **MM-TRC-02**, potential impacts to Tribal Cultural Resources would be less than significant.

MITIGATION MEASURES

MM-TCR-01: Tribal Cultural Resources Monitoring and Treatment Plan. The Yuhaaviatam of San Manuel Nation Cultural Resources Management Department (YSMN) shall be contacted, as detailed in CUL-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 YSMN, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents YSMN for the remainder of the project, should YSMN elect to place a monitor on-site.

MM-TCR-02: Tribal Consultation. 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 YSMN. The Lead Agency and/or applicant shall, in good faith, consult with YSMN throughout the life of the project.

4.19 Utilities and Service Systems

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☐	☒
c) Result in a determination by the wastewater treatment provider, which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

DISCUSSION

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?

RESPONSE:

Less than Significant Impacts. The Project Site is comprised of two parcels on vacant open spaces. Due to the undeveloped nature of a majority of the Project Site, the site does not contain storm water drainage, electricity, water, or gas connections.

The Project proposes to implement a recharge basin to expand MWA's groundwater recharge capabilities for the State Water Project (SWP) that will not result in changes to water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities. Short-term grading activities during project construction would require limited quantities of water for dust control. Less than significant impacts are anticipated. No Mitigation Measures are needed.

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

RESPONSE:

No Impact. The proposed Project is consistent with MWA's UWMP, Strategic Plan, and other long-range plans and would not induce growth beyond what is currently approved in the County General Plan. The Project does not propose to develop infrastructure that would increase population or density at the Project Location or Local Vicinity.

As a result, no impacts are foreseen, as the Project is not anticipated to substantially impact water supplies that serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years. No Mitigation Measures are needed.

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?

RESPONSE:

No Impact. The proposed Project does not anticipate an increase in the generation of wastewater over the short- and long-term; therefore, additional wastewater capacity does not need to be added at the Project Site or adjacent land uses due to Project activities. Changes to the wastewater treatment provider's existing commitments are not anticipated. No impacts are anticipated, and no Mitigation Measures are required.

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?

RESPONSE:

Less than Significant Impact. The California Integrated Waste Management Board (CIWMB) oversees, manages, and tracks waste generated within California. Assembly Bill (AB) 939 and Senate Bill 1322 shaped the CIWMB and required that all California cities and counties implement programs to reduce, recycle, and compost at least 50 percent of wastes by 2000 (PRC Section 41780). To remain compliant with CIWMB, cities and counties track diverted waste by counting the materials disposed at landfills and subtracting that amount from the base-year amount.

The Project does not propose to permanently increase population or density either at the Project Site, in the Local Vicinity, or within the region. Therefore, waste management services or submittal of an approved Waste Management and Recycling Plan for the Project Site is not necessary. Upon completion of construction, no new waste generation is expected. No impacts are anticipated; no Mitigation Measures are needed.

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

RESPONSE:

No Impact. The Project will implement applicable recycling and disposal requirements during construction and during long-term operations and maintenance. The Project will not increase the amount of solid waste generated at the Project Site over the long term since the Project does not propose to convert the land use from a water utility to development generating solid waste. No impacts are anticipated, and no mitigation measures are required.

MITIGATION MEASURES

No Mitigation Measures are needed.

4.20 Wildfire

Issues	Potentially Significant Impact	Less than Significant Impact with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

REGULATORY COMPLIANCE

2019 CEQA Guidelines

In 2019, CEQA Guidelines were amended to address the need to evaluate wildfire impacts. While wildfires have been prevalent throughout California's history, more acres of California have burned in the past decade than in the previous 90 years (CALFIRE, Top 20 Largest California Wildfires 2022). Wildfires are caused from natural sources, such as lightening or meteors, and from human activities such as downed powerlines, electrical sources, associated with development (CA Attorney General 2022). As development expands, there is greater potential for wildland fire to occur at wildland-urban interfaces. Approximately one-third of California's housing units are currently located within these areas (CA Attorney General 2022). As a result of the increased risk to wildfire risks within the state of California, CEQA recognizes best practices to disclose, analyze, and mitigate wildfire impacts can be found within local jurisdictions by utilizing general plan documents, in particular the Safety Element of the General Plan.

CALFIRE Fire Hazard Severity Zones

The CALFIRE Fire Hazard Severity Zone (FHSZs) is "a mapped area that designated zones (based on factors such as fuel, slope, and fire weather) with varying degrees of fire hazard" (CALFIRE 2022). CALFIRE released a FHSZ Viewer that identifies areas where wildfires are prone to occur (CALFIRE FHSZ Viewer, 2022). The utilization of this tool is

intended to limit wildfire damage in preliminary phases of planning to mitigate and prevent activities or land uses that would cause greater risk for a wildfire.

DISCUSSION

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

RESPONSE:

Less than Significant Impact. According to CALFIRE's Fire Hazard Severity Zone Viewer, areas surrounding the west side of SR 247, approximately 5 miles from the Project Site, are the closest Hazard Severity Zones. According to the County's General Plan EIR, SR 247 is a designated evacuation route. Access to the SR 247 from the Project Site can be taken via local roadways including Winters Road, Landers Lane, and Reche Road. Local roadways surrounding the Project Site are situated on an east-west/north-south street grid and consist of mostly undeveloped parcels with residential development scattered throughout the Local Vicinity. As mentioned within Response 9. Hazards and Hazardous Waste, Item e), and Response 15. Public Services Item a), the Project will implement a Traffic Control Plan pursuant to Mitigation Measure MM TRAF-01: Traffic Control Plan to ensure emergency access and safety throughout construction activities are maintained.

In the event of a fire, SBCFD Stations 19 and 42 will serve the Project Site. Station 42, approximately 4.7 miles southeast, is located at 58612 Aberdeen Dr, Yucca Valley, CA 92284; and Station 19, approximately 7.3 miles northwest, is located at 55481 Jesse Road, Yucca Valley, CA 92284. Station 42 is staffed with three full-time personnel and equipped with one (1) Type 1 Medic Engine, one (1) Cross-staffed Truck, and one (1) Cross-staff Water Tender. Station 19 is staffed with nine (9) full-time personnel and equipped with two (2) Type 1 Medic Engines, and one (1) Medic Truck.

However, due to the Project Location's proximity to the closest CALFIRE Fire Hazard Severity Zone (CALFIRE FHSZ Viewer), Project implementation is not anticipated to involve significant impacts to evacuation routes and emergency response plans within vulnerable, fire-prone areas. As a result, the Project is anticipated to require no additional or unique emergency response services. However, slower moving trucks along public rights-of-way may temporarily impact local circulation. To manage potential short-term impairments to the local roadways and evacuation routes during project construction, the Project will implement a traffic control plan. The proposed traffic control plan will be reviewed by the County's Fire Department and additional emergency response personnel. Impacts will be less than significant.

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

RESPONSE:

Less than Significant Impact. See Response 20 a). The Project Site is gently sloping, mostly undeveloped, and is not located within a CALFIRE Fire Hazard Severity Zone. Therefore, BMPs for handling machinery should be utilized during Project construction, such as ensuring equipment is properly stored on staging areas and regular inspections of the equipment are performed to ensure flammable gasoline is not leaking. Potential impacts due to slope, prevailing winds, and other factors related to wildfire are less than significant. No Mitigation Measures are needed.

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?

RESPONSE:

Less than Significant Impact. The Project proposes to construct the East Ames-Reche recharge facility at the proposed Project Site. The Project does not propose to install infrastructure that will require the continued use of fuel breaks, emergency water sources, power lines, or other utilities that may exacerbate fire risks.

For the reasons above, implementation of the Project will not exceed what has already been considered and approved by the MWA UWMP and IRWMP, and therefore the Project will not result in additional impacts due to Project implementation. No Mitigation Measures are needed.

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?**

RESPONSE:

Less than Significant Impact. See Responses 20 a) through c). According to CALFIRE's Fire Hazard Safety Zone Map, the area is designated as Local Responsibility exhibiting no high-moderate fire hazards. The Project Site is not located in an area with slopes or other unique features that are associated with elevated risk from post-fire flooding and landslides due to wildfire. The Project Site is located within an environment characterized by gently sloping terrain. Existing land use and the plans for infrastructure proposed with the Project indicate compliance with the Agency's UWMP and IRWMP and will be verified during the standard application of the County's plan check process during construction. For these reasons, impacts are less than significant.

MITIGATION MEASURES

No mitigation measures are needed.

4.21 Mandatory Findings of Significance

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

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

RESPONSE:

Less than Significant with Mitigation Incorporated.

The Project Site is comprised of two parcels, heavily disturbed at the southern perimeter with concrete pads and debris. The parcels are naturally vegetated with 68 Western Joshua Trees, and a plant community known as the creosote bush scrub. The Project Site is surrounded by vacant open spaces and rural residential developments.

Surface runoff at the Project Site flows southwest from the northern perimeter, towards Pipes Wash, located approximately 0.3 miles off-site. The Project Site is not located within an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan. The project would be consistent with federal, state, and local natural resources-related regulations, subject to CDFW's Incidental Take process for the Western Joshua Tree. Mitigation Measures MM-BIO-01 through MM-BIO-05 would be implemented to reduce potential impacts to nesting birds, burrowing owl, desert tortoise, other covered species, and western Joshua tree to less than significant levels.

The Cultural Resources Assessment indicates that three cultural resources were previously identified within a one-mile radius of the APE. Four historic-period concrete foundations were identified onsite. No other cultural resources (including prehistoric or historic archaeological or historic architectural resources) were identified. The resources that occupy the project site do not meet eligibility criteria for the National Register or for the California Register, and are not recommended historic properties under Section 106 of the NHPA nor recommended historical resources under CEQA. Therefore, the project will not cause a substantial adverse change in the significance of a historical or archaeological resource. While there appears no sensitivity for unknown cultural resources within the project boundaries, ground disturbing activities have the potential to reveal buried deposits not observed on the surface. Therefore, Mitigation Measures MM-CUL-01 through MM-CUL-03 are provided to reduce potential impacts to buried cultural resources, including human remains, to a level of insignificance. In addition, Mitigation Measures MM-TCR-01 and MM-TCR-02 are included to ensure there would be no impacts to tribal resources in the event unanticipated finds are discovered. Mitigation Measure MM-GEO-15 is also provided to reduce potential impacts to paleontological resources, associated with Project excavation activity, to a level of insignificance.

With implementation of the aforementioned mitigation measures, the Proposed Project would not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or an endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

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

RESPONSE:

Less than Significant with Mitigation Incorporated. As demonstrated by the analysis in this Initial Study, the Proposed Project would not result in any significant and unavoidable environmental impacts in any environmental category with the implementation of Project-specific mitigation measures. Implementation of mitigation measures at the Project level would reduce the potential for incremental environmental effects of the Proposed Project when viewed in conjunction with the effects of past projects, current projects, or planned future projects. Project impacts would be less than significant with mitigation incorporated.

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

RESPONSE:

Less Than Significant with Mitigation Incorporated. The analysis in this report indicates that, with the incorporation of mitigation measures, Project implementation will not cause substantial adverse effects on human beings either directly or indirectly.

5.0 LIST OF PREPARERS

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APPENDIX A

Air Quality, Global Climate Change, and Energy Impact Analysis (Ganddini Group Inc 2025)

AMES-RECHE RECHARGE BASIN AIR QUALITY, GLOBAL CLIMATE CHANGE, AND ENERGY IMPACT ANALYSIS

County of San Bernardino

May 5, 2025

ganddini

Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

AMES-RECHE RECHARGE BASIN AIR QUALITY, GLOBAL CLIMATE CHANGE, AND ENERGY IMPACT ANALYSIS

County of San Bernardino

May 5, 2025

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Project No. 19712

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EXECUTIVE SUMMARY

The purpose of this air quality, global climate change, and energy impact analysis is to provide an assessment of the impacts resulting from development of the proposed Ames-Reche Recharge Basin project and to identify measures that may be necessary to reduce potentially significant impacts.

Construction-Source Emissions

Project construction-source emissions would not exceed applicable regional thresholds of significance established by the Mojave Desert Air Quality Management District (MDAQMD).

As discussed herein, the project will comply with all applicable MDAQMD construction-source emission reduction rules and guidelines. Project construction source emissions would not cause or substantively contribute to violation of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS).

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less than significant.

Operational-Source Emissions

The project operational-sourced emissions would not exceed applicable regional thresholds of significance established by the MDAQMD. Additionally, project-related trips will not cause or result in CO concentrations exceeding applicable state and/or federal standards (CO "hotspots). Project operational-source emissions would therefore not adversely affect sensitive receptors within the vicinity of the project.

The project's emissions meet MDAQMD regional thresholds and will not result in a significant cumulative impact. The project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential operational-source odor impacts are therefore considered less than significant.

Greenhouse Gases

Project-related construction GHG emissions do not exceed the MDAQMD thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds per year of CO2e. GHG emissions are considered to be less than significant.

The project would not conflict with the goals of SB-32 or the San Bernardino County GHG Reduction Plan; therefore, the project would not conflict with an applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases and impacts are considered to be less than significant.

Energy

Project construction and operations would not result in the inefficient, wasteful or unnecessary consumption of energy. The proposed project does not include any unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities and is a water supply infrastructure project that is not proposing any additional features that would require a larger energy demand than other water supply infrastructure projects of similar scale and configuration. 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. Notwithstanding, the project proposes a water supply infrastructure project and will not have any long-term effects on an energy provider's future energy development or future energy conservation strategies.

1. INTRODUCTION

This section describes the purpose of this air quality, global climate change, and energy impact analysis, project location, proposed development, and study area.

PURPOSE AND OBJECTIVES

This study was performed to address the possibility of regional/local air quality impacts and global climate change impacts, from project related air emissions. The objectives of the study include:

- documentation of the atmospheric setting
- discussion of criteria pollutants and greenhouse gases
- discussion of the air quality and global climate change regulatory framework
- analysis of the construction related air quality and greenhouse gas emissions
- analysis of the operations related air quality and greenhouse gas emissions
- analysis of the conformity of the proposed project with the MDAQMD Attainment Plans
- analysis of the project's energy use during construction and operation
- recommendations for mitigation measures

The County of San Bernardino is the lead agency for this air quality, greenhouse gas, and energy analysis, in accordance with the California Environmental Quality Act authorizing legislation. Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with terms unique to air quality and global climate change, a definition of terms has been provided in Appendix A.

PROJECT LOCATION

Regionally, the Project Site is located within the East Desert within Unincorporated San Bernadino County within the Ames-Reche groundwater basin. As of 2020, a total of 192,948 acre-feet (AF) of groundwater was reported to be stored throughout MWA's local groundwater basins (Mojave Basin; Ames-Reche, Joshua Basin); and approximately 373 AF is stored within the Ames-Reche basin.[1] This basin covers approximately 110,000 acres and is surrounded by the San Bernardino Mountains in the west Iron Ridge to the north, the Hidalgo Mountain on the northeast, and various fault lines on the east and northern boundaries.

The closest City to the Project Site is Yucca Valley, approximately 12 miles south of the Project Site accessible via the regional transportation route State Route 247 (SR-247). Surrounding unincorporated areas include Homestead Valley and Flamingo Heights, approximately 2.4 miles northwest and west of the Project Site. The unincorporated areas are well connected to the Project Site via local roadways (Tracy Blvd, Landers Lane, Reche Road, etc.), which lead to SR-247. In addition, the Project Site is located approximately 30 miles east from the foothills of the San Bernardino Mountains; and approximately 41 miles west from the Cleghorn Lakes Wilderness Area. A project location map is provided on Figure 1.

The Project Site is a 10-acre site comprised of two parcels (APN 062-921-113, -114) located on federal property, along Winters Road, approximately 0.3 miles east of the existing recharge facility and adjacent to the 12-inch diameter HDPE pipeline along Winters Road within the Ames Valley Groundwater Basin.[2] The Project Site is heavily disturbed at the southern perimeter with two (2) existing concrete pads, one (1) containing walls littered with debris from the abandoned structure and illegal dumping. Debris is composed of a hot tub, glass, drywall, clothes, car parts, etc., which will require removal upon Project implementation. The parcels are naturally vegetated with 68 Western Joshua Trees, and a plant community known as the creosote bush scrub. The Project Site is surrounded by vacant open spaces and rural residential developments. The

[1] UWMP, 2020; Table 3-9: MWA Total Stored Groundwater, September 2020.

[2] MWA Stormwater Resources Plan, 2020.

surrounding land uses are shown in Table 1. The closest residential development to the Project Site is approximately 500 feet northeast, located along Lucky Lane.

Other notable facilities close to the Project Site include the existing Ames-Reche recharge facility, approximately 0.3 miles east of the Project Site; and the flow control facility, located near the intersection of Winters Road and Landers Lane, approximately 0.3 miles west of the Project Site. The existing Ames-Reche recharge facility was completed in 2014 and delivers water from the State Water Project directly to the Pipes Wash in Landers, California, located north of Yucca Valley. The facility consists of a flow control facility and pipeline extending west from MWA's Morongo Basin Pipeline at Winters Road to an outlet in Pipes Wash. The turnout has a maximum capacity of 5 cubic feet per second (cfs), recharging a maximum of approximately 1,500 acre-feet per year (AFY). While the existing facility remains operational, permitting and operational requirements have severely reduced its functional capacity. A local vicinity map showing the project location is provided on Figure 2.

PROJECT DESCRIPTION

The Project consists of the development of two (2) new recharge basins (north and south basin) on 10 acres surrounded by 12-ft tall berms. The berms are sloped at 3:1 from the edge of the proposed 16-ft to 24-ft wide access road, which surrounds the perimeter of each basin, to the bottom of each basin. The north basin bottom is approximately 2.3 acres at 3,304 ft AMSL, and the south basin bottom is 2.5 acres at 3,311.5 ft AMSL. The development of the recharge basin will result in a maximum flow rate of 5 cfs with an anticipated annual recharge capacity of 1,500 AFY. In addition to the installation of the recharge basins, the Project proposes to install 6-foot perimeter fencing with barbered wire; a new tee connection within the Winters Road right-of-way; approximately 500 linear feet of 12-inch non-potable water pipeline from Winters Road to the eastern perimeter of each basin (north and south); two (2) headwalls located along the eastern perimeter of each basin connecting to the new 12-inch non-potable water pipeline; outlet with energy dissipator to the proposed recharge basin; and a nested or multi-completion monitoring well located within the proposed site to monitor infiltration rates, groundwater levels, and water quality. The proposed improvements will allow MWA to increase its groundwater recharge capacity of annual State Water Project Table A allocations.[3] The recharge basin will include a perimeter access road, fencing, and signage. Electrical and SCADA are not required at the site. The existing pipeline and recharge basin will remain but shall be isolated with a valve. To determine the site for the monitoring well, a Synthetic Precipitation Leaching Procedure (SPLP) leach test will be conducted, and geochemical modeling performed if the SPLP test results warrant.

Project Objectives

The major goals of the Project are as follows:

1. Address population increases over time which can lead to decreases in potential groundwater recharge;
2. Increase resilience to drought;
3. Provide reliable groundwater recharge; and
4. Ensure safe yield is achieved and maintained

Project Characteristics – Construction

Project construction is anticipated to begin in January 2026 and conclude in November 2026, lasting for approximately 11 months. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days). Construction activities will occur between 7:30 AM and 4:30 PM, Monday through Friday; weekend work will be avoided when feasible, however, weekend or night work might occur to avoid peak traffic.

[3] According to the 2023 State Water Project Table A Allocations, Mojave Water Agency requested 89,800 total Acre-Feet per year and was allowed only 26,940 Acre-Feet per year, which is 30 percent of their initial request (DWR CA State Water Project, 2023).

Construction activities for Phase 1 will involve up to 3 crew members daily. Construction activities for Phase 2 will involve approximately 8 to 10 crew members daily at any one time during active construction. Crew members will get to the construction site utilizing personal vehicles, approximately 10 vehicles at any one time, accessing the construction site via local roadways (Tracy Blvd, Winters Road, Landers Lane, Reche Road, etc.) or regional transportation routes (State Route (SR) 247). Personal vehicles will be parked along the public right-of-way, adjacent to the Project Site within the roadway, shoulder, or at the street curbs. Temporary fencing will be placed around the perimeter of each work area to secure construction sites after each work date and prevent theft/ vandalism that has the potential to occur overnight. In addition to fencing, active construction will either be backfilled or covered with trench plates at the end of each day. Water for construction and potable water during construction activities will be supplied by the local water purveyor and conveyed to the site by the contractor via water trucks. Earthworks during construction involved 68,411 CY of cut and 1,594 CY of fill (66,817 CY of net cut).

Construction will include the implementation of relevant Mojave Water Agency standards and guidelines as well as Mitigation Measures tailored to the Project. The analysis in this document supports findings of less than significant impacts with mitigation for CEQA compliance based on recommendations for implementing Mitigation Measures to reduce temporary and intermittent impacts from construction as discussed in the Environmental Checklist. Therefore, Mitigation Measures have been proposed for the Project to reduce potentially significant impacts from Project construction identified in this IS/MND to a less than significant level.

Construction Equipment

Construction activities will involve the utilization of a variety of diesel-powered equipment along the Project Alignment throughout construction. Potential equipment on-site during construction includes:

Phase 1 – Monitoring Well Drilling

- one (1) drilling rig
- one (1) loader
- one (1) crane
- 2-3 work trucks

Phase 2 – Recharge Basins

- two (2) scrapers
- one (1) tractor / loader / backhoe
- two (2) off-highway trucks
- two (2) plate compactors
- two (2) excavators
- two (2) other material handling equipment
- two (2) other construction equipment
- four (4) pumps
- two (2) skid steer loaders
- two (2) surfacing equipment
- two (2) rubber tiered dozers
- one (1) crane
- one (1) water truck

During Project construction, equipment will be kept at a designated laydown yard (see Staging below) or the Project contractor's facilities.

Staging

Staging areas will be located inside the existing public right-of-way along Winters Road and on-site within APNs 062-921-113, -114, and/or adjacent parcels. These staging locations will depend on the portion of the project under construction.

Schedule and Phasing

Project construction is anticipated to begin in January 2026 and conclude in November 2026, lasting for approximately 11 months. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days).

Project Characteristics –Operation

The Project is anticipated to be operational for a minimum of 50 years from completion of initial construction. The Agency will operate and manage the Project similarly to existing conditions since the Project will install a new 10-acre recharge basin approximately 0.3 miles east of the existing Ames-Reche Recharge Basin. Therefore, Mojave Water Agency does not anticipate additional staffing needs for long-term operation and maintenance of the proposed Project. Monthly worker trips over the lifetime of the Proposed Project will be required to conduct routine inspections and ensure proper long-term maintenance.

Figure 3 illustrates the proposed site plan.

PHASING AND TIMING

The proposed project is anticipated to be operational in 2026. The project is anticipated to be built in two phases with project construction anticipated to start no sooner than the beginning of January 2026 and concluding in November 2026, lasting for approximately eleven months. The construction schedule utilized in the analysis represents a "worst-case" analysis scenario even if construction was to 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.[4]

SENSITIVE RECEPTORS IN PROJECT VICINITY

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. For purposes of CEQA, the MDAQMD considers a sensitive receptor to be residences, schools, daycare centers, playgrounds and medical facilities (Mojave Desert Air Quality Management District 2016).

The nearest sensitive receptors to the project site are the existing single-family residential uses with property lines located approximately 275 feet (~84 meters) southeast and 290 feet (~88 meters) northeast of the project site. Other air quality sensitive land uses are located further from the project site and would experience lower impacts.

[4] As shown in the California Emissions Estimator Model (CalEEMod) User's Guide Version 2020.4.0, Section 4.3.2 "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.

Table 1
Surrounding Land Uses

Location	Land Use	General Plan	Zoning
Project Site	Vacant (Portions of Abandoned Structures)	Rural Living (RL)	Homestead Valley/Rural Living (HV/RL)
North	Vacant	Rural Living (RL)	HV/RL
South	Vacant	Rural Living (RL)	HV/RL
East	Vacant (Existing Ames-Reche Flow Control Facility)	Rural Living (RL)	HV/RL
West	Vacant (Existing Ames-Reche Flow Control Facility)	Rural Living (RL)	HV/RL

Source: San Bernardino County Land Use Map, 2020.

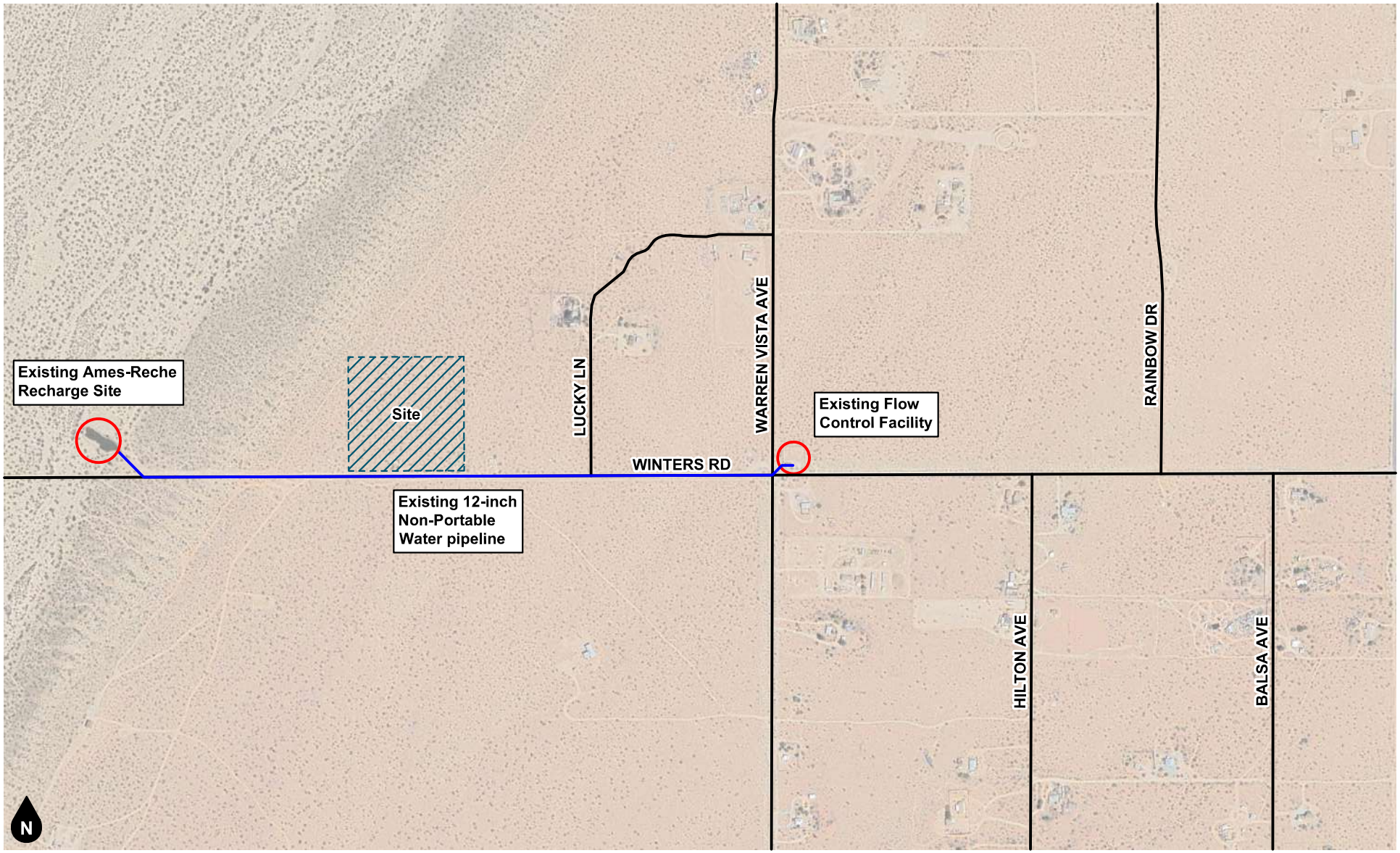

Figure 1
Project Location Map

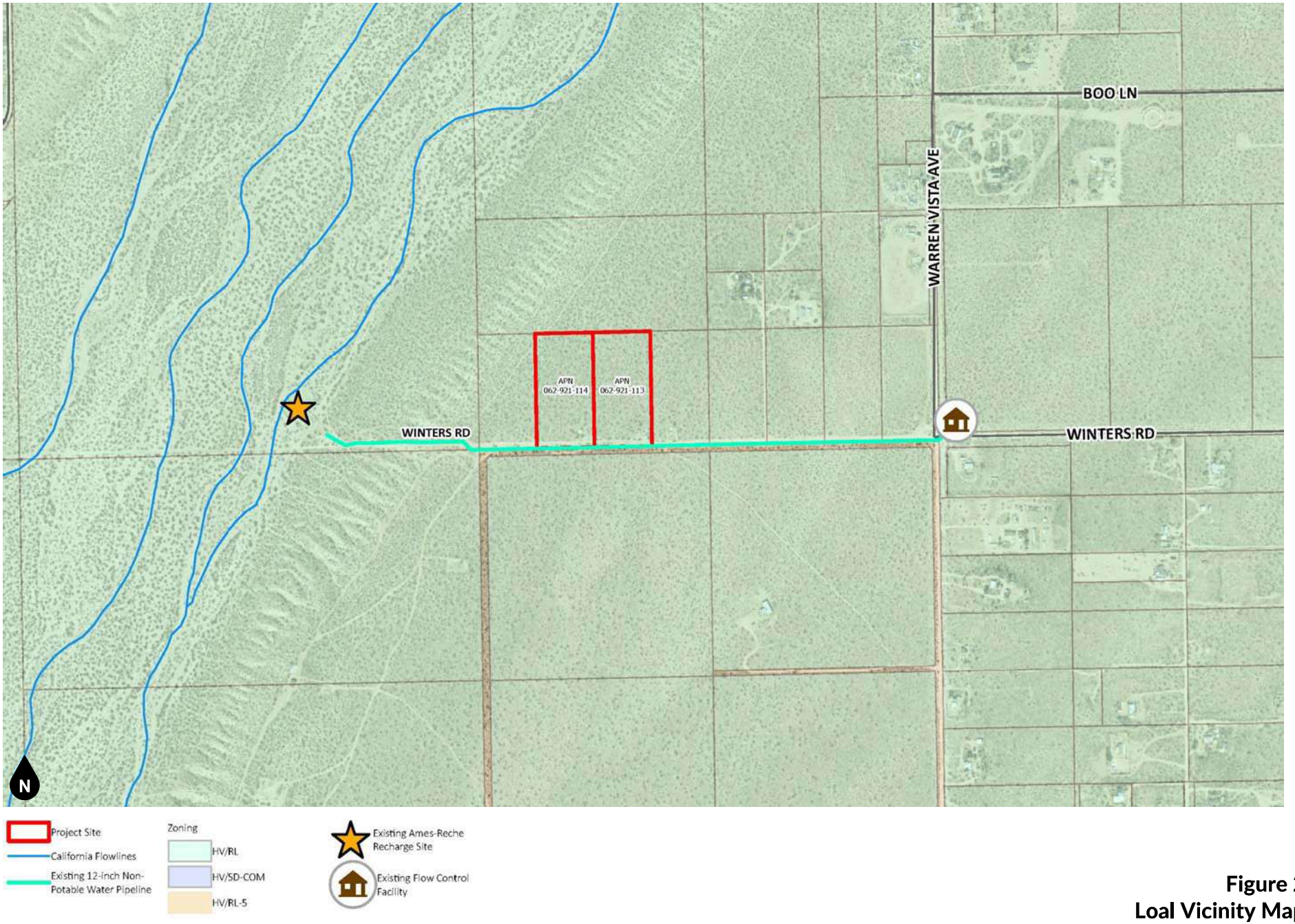

Figure 2
Loal Vicinity Map

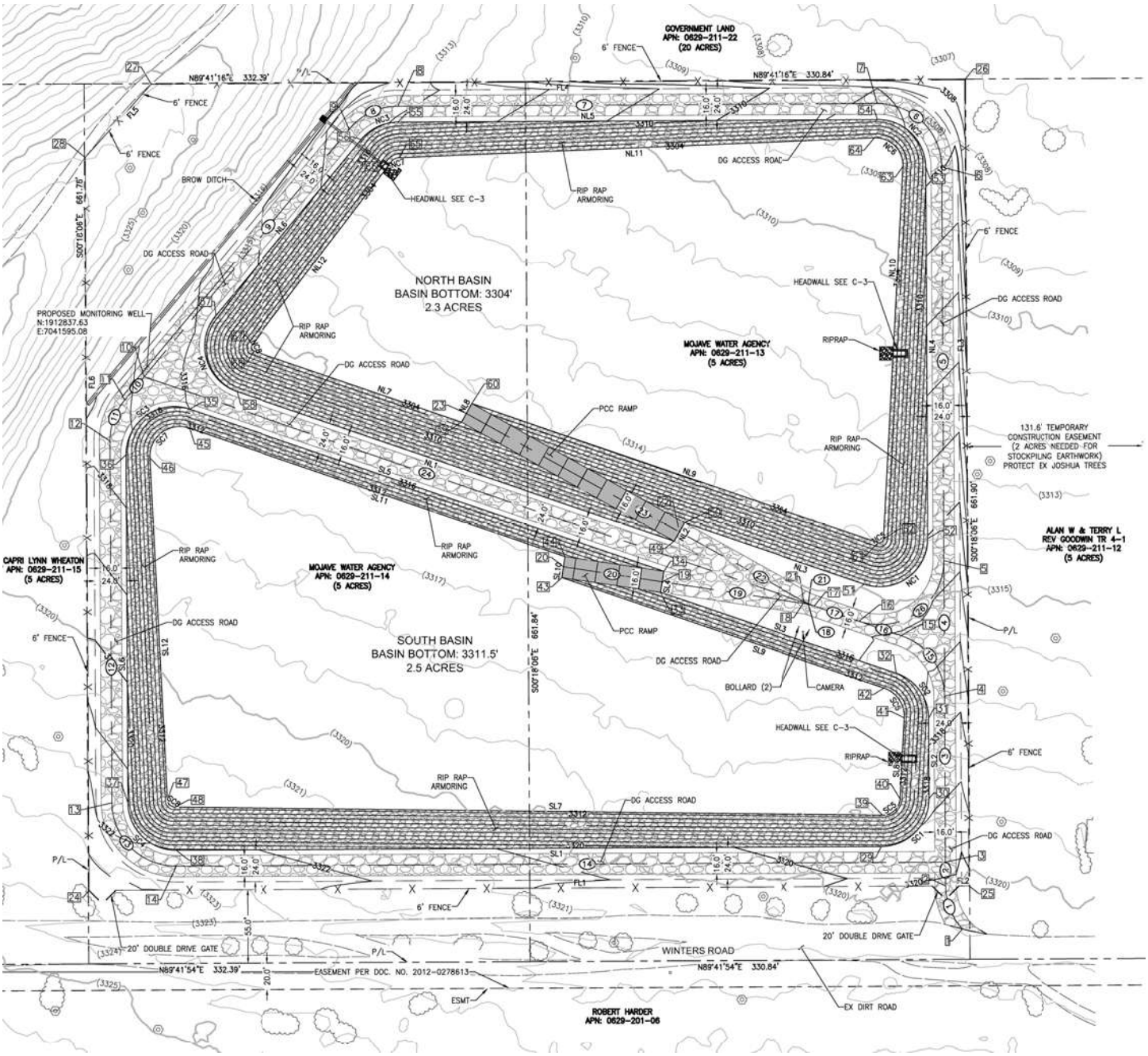

Figure 3
Site Plan

2. AIR QUALITY ANALYSIS

EXISTING AIR QUALITY CONDITIONS

Local Air Quality

The project site is located within the County of San Bernardino in an area that is part of the Mojave Desert Air Basin (MDAB). The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains which dot 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 approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevada's in the north by the Tehachapi Pass (3,800-foot elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 feet). The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriel's by the Cajon Pass (4,200 feet). A lesser channel lies between the San Bernardino Mountains and the Little San Bernardino Mountains (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 the 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 inches of precipitation). The MDAB is classified as a dry-hot desert climate (BWh), with portions classified as dry-very hot desert (BWhh), to indicate at least three months have maximum average temperatures over 100.4° F.[5]

The temperature and precipitation levels for Joshua Tree, closest monitoring station to the project site with data, are shown below in Table 2. Table 2 shows that July is typically the warmest month and December is typically the coolest month. Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

[5] MDAQMD California Environmental Quality Act (CEQA) and Federal Conformity Guidelines (February 2020). https://www.mdaqmd.ca.gov/rules/rule-plan-development

Table 2
Local Monthly Climate Data

Descriptor	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Max. Temperature	60.6	59.9	67.6	75.4	86.2	91.8	101.3	99.4	94.3	81.6	67.9	59.1
Avg. Min. Temperature	38.3	37.6	39.6	45.3	53.8	59.5	70.6	68.3	63	53.8	42.5	36.8
Avg. Total Precipitation (in.)	2.08	0.81	0.12	0.03	0.04	0.01	0	0.05	0.02	0.15	0.36	1.22

Source: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca4405
Data from the Joshua Tree, CA station (044405).

Pollutants

Pollutants are generally classified as either criteria pollutants or non-criteria pollutants. Federal ambient air quality standards have been established for criteria pollutants, whereas no ambient standards have been established for non-criteria pollutants. For some criteria pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). A summary of federal and state ambient air quality standards is provided in the Regulatory Framework section.

Criteria Pollutants

The criteria pollutants consist of: ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, lead, and particulate matter. These pollutants can harm your health and the environment, and cause property damage. The Environmental Protection Agency (EPA) calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria for setting permissible levels. The following provides descriptions of each of the criteria pollutants.

Nitrogen Dioxides

Nitrogen Oxides (NOx) is the generic term for a group of highly reactive gases which contain nitrogen and oxygen. While most NOx are colorless and odorless, concentrations of nitrogen dioxide (NO_2) can often be seen as a reddish-brown layer over many urban areas. NOx form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NOx are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuel. NOx reacts with other pollutants to form, ground-level ozone, nitrate particles, acid aerosols, as well as NO_2, which cause respiratory problems. NOx and the pollutants formed from NOx can be transported over long distances, following the patterns of prevailing winds. Therefore, controlling NOx is often most effective if done from a regional perspective, rather than focusing on the nearest sources.

Ozone

Ozone (O_3) is not usually emitted directly into the air but at ground-level is created by a chemical reaction between NOx and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, chemical solvents as well as natural sources emit NOx and VOC that help form ozone. Ground-level ozone is the primary constituent of smog. Sunlight and hot weather cause ground-level ozone to form with the greatest concentrations usually occurring downwind from urban areas. Ozone is subsequently considered a regional pollutant. Ground-level ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Because NOx and VOC are ozone precursors, the health effects associated with ozone are also indirect health effects associated with significant levels of NOx and VOC emissions.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are indoor sources of CO. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air. CO is described as having only a local influence because it dissipates quickly. Since CO concentrations are strongly associated with motor vehicle emissions, high CO concentrations generally occur in the immediate vicinity of roadways with high

traffic volumes and traffic congestion, active parking lots, and in automobile tunnels. Areas adjacent to heavily traveled and congested intersections are particularly susceptible to high CO concentrations.

CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. The health threat from lower levels of CO is most serious for those who suffer from heart disease such as angina, clogged arteries, or congestive heart failure. For a person with heart disease, a single exposure to CO at low levels may cause chest pain and reduce that person's ability to exercise; repeated exposures may contribute to other cardiovascular effects. High levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

Sulfur Dioxide

Sulfur Oxide (SOx) gases (including sulfur dioxide [SO2]) are formed when fuel containing sulfur, such as coal and oil is burned, and from the refining of gasoline. SOx dissolves easily in water vapor to form acid and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and the environment.

Lead

Lead (Pb) is a metal found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been motor vehicles and industrial sources. Due to the phase out of leaded gasoline, metal processing is now the primary source of lead emissions to the air. High levels of lead in the air are typically only found near lead smelters, waste incinerators, utilities, and lead-acid battery manufacturers. Exposure of fetuses, infants and children to low levels of lead 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 lead levels are associated with increased blood pressure.

Particulate Matter

Particulate matter (PM) is the term for a mixture of solid particles and liquid droplets found in the air. Particulate matter is made up of a number of components including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. Particles that are less than 10 micrometers in diameter (PM10) are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Particles that are less than 2.5 micrometers in diameter (PM2.5) have been designated as a subset of PM10 due to their increased negative health impacts and its ability to remain suspended in the air longer and travel further.

Reactive Organic Gases (ROG)

Although not a criteria pollutant, reactive organic gases (ROGs), or volatile organic compounds (VOCs), are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably. Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM10 and lower visibility.

Other Pollutants of Concern

Toxic Air Contaminants

In addition to the above-listed criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. Sources of toxic air contaminants include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important of these toxic air contaminants, in terms of health risk, are diesel particulates, benzene, formaldehyde, 1,3-butadiene, and acetaldehyde. Public exposure to toxic air contaminants can result from emissions from normal operations as well as from accidental releases. Health effects of toxic air contaminants include cancer, birth defects, neurological damage, and death.

Toxic air contaminants are less pervasive in the urban atmosphere than criteria air pollutants, however they are linked to short-term (acute) or long-term (chronic or carcinogenic) adverse human health effects. There are hundreds of different types of toxic air contaminants with varying degrees of toxicity. Sources of toxic air contaminants include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), and motor vehicle exhaust.

According to the 2013 California Almanac of Emissions and Air Quality, the majority of the estimated health risk from toxic air contaminants can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM). Diesel particulate matter is a subset of PM2.5 because the size of diesel particles are typically 2.5 microns and smaller. The identification of diesel particulate matter as a toxic air contaminant in 1998 led the California Air Resources Board (CARB) to adopt the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles in September 2000. The plan's goals are a 75-percent reduction in diesel particulate matter by 2010 and an 85-percent reduction by 2020 from the 2000 baseline. Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot". Diesel exhaust also contains a variety of harmful gases and over 40 other cancer-causing substances. California's identification of diesel particulate matter as a toxic air contaminant was based on its potential to cause cancer, premature deaths, and other health problems. Exposure to diesel particulate matter is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems. Overall, diesel engine emissions are responsible for the majority of California's potential airborne cancer risk from combustion sources.

Asbestos

Asbestos is listed as a TAC by the ARB and as a Hazardous Air Pollutant by the EPA. Asbestos occurs naturally in mineral formations and crushing or breaking these rocks, through construction or other means, can release asbestiform fibers into the air. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining. The risk of disease is dependent upon the intensity and duration of exposure. When inhaled, asbestos fibers may remain in the lungs and with time may be linked to such diseases as asbestosis, lung cancer, and mesothelioma. Naturally occurring asbestos is not present in San Bernardino County. The nearest likely locations of naturally occurring asbestos, as identified in the General Location Guide for Ultramafic Rocks in California prepared by the California Division of Mines and Geology, is located at Asbestos Mountain in the San Jacinto Valley; approximately 42 miles south of the site. Due to the distance to the nearest natural occurrences of asbestos, the project site is not likely to contain asbestos.

REGULATORY SETTING

The proposed project is addressed through the efforts of various international, federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through

legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality are discussed below.

Federal – United States Environmental Protection Agency

The United States Environmental Protection Agency (EPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The National Ambient Air Quality Standards (NAAQS) pollutants were identified using medical evidence and are shown below in Table 3.

The EPA and the California Air Resource Board (CARB) designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual PM2.5 standard is met if the three-year average of the annual average PM2.5 concentration is less than or equal to the standard. Attainment status is shown in Table 4.

As part of its enforcement responsibilities, the EPA requires each state with federal nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the national standards. The State Implementation Plan (SIP) must integrate federal, state, and local components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the State Implementation Plan (SIP).

As indicated below in Table 4, the MDAB has been designated by the EPA as a non-attainment area for ozone (O_3) and suspended particulates (PM10). Currently, the Basin is in attainment with the ambient air quality standards for carbon monoxide (CO), lead, sulfur dioxide (SO_2), nitrogen dioxide (NO_2) and particulate matter (PM2.5).

State – California Air Resources Board

The California Air Resources Board (CARB), which is a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, the CARB conducts research, sets the California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the State Implementation Plan (SIP). The California Ambient Air Quality Standards (CAAQS) for criteria pollutants are shown in Table 3. In addition, the CARB establishes emission standards for motor vehicles sold in California, consumer products (e.g., hairspray, aerosol paints, and barbeque lighter fluid), and various types of commercial equipment. Furthermore, the motor vehicle emission standards established by CARB include compliance with the Safer Affordable Fuel-Efficient Vehicles (SAFE) Rule, issued by NHTSA and EPA in March 2020 (published on April 30, 2020 and effective after June 29, 2020). The SAFE Rule sets fuel economy and carbon dioxide standards that increase 1.5 percent in stringency each year from model years 2021 through 2026, and apply to both passenger cars and light trucks. CARB. It also sets fuel specifications to further reduce vehicular emissions.

The MDAQMD-portion of the Mojave Desert Air Basin (MDAB) has been designated by the CARB as a nonattainment area for ozone, PM10 and PM2.5. Currently, the MDAB is in attainment with the ambient air quality standards for CO, lead, SO_2, NO_2, and sulfates.

On June 20, 2002, the CARB revised the PM10 annual average standard to 20 µg/m3 and established an annual average standard for PM2.5 of 12 µg/m3. These standards were approved by the Office of Administrative Law in June 2003 and are now effective. On September 27, 2007 CARB approved the South Coast Air Basin and the Coachella Valley 2007 Air Quality Management Plan for Attaining the Federal 8-hour Ozone and PM2.5 Standards. The plan projected attainment for the 8-hour Ozone standard by 2024 and the PM2.5 standard by 2015.

On December 12, 2008 the CARB adopted Resolution 08-43, which limits NOx, PM10 and PM2.5 emissions from on-road diesel truck fleets that operate in California. On October 12, 2009 Executive Order R-09-010 was adopted that codified Resolution 08-43 into Section 2025, Title 13 of the California Code of Regulations. This regulation requires that by the year 2023 all commercial diesel trucks that operate in California shall meet model year 2010 (Tier 4) or latter emission standards. In the interim period, this regulation provides annual interim targets for fleet owners to meet. This regulation also provides a few exemptions including a onetime per year 3-day pass for trucks registered outside of California.

The CARB is also responsible for regulations pertaining to toxic air contaminants. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, 1987, Connelly) was enacted in 1987 as a means to establish a formal air toxics emission inventory risk quantification program. AB 2588, as amended, establishes a process that requires stationary sources to report the type and quantities of certain substances their facilities routinely release into the Mojave Desert Air Basin. The data is ranked by high, intermediate, and low categories, which are determined by: the potency, toxicity, quantity, volume, and proximity of the facility to nearby receptors.

AB 617 Nonvehicular air pollution: criteria air pollutants and toxic air contaminants

This bill requires the state board to develop a uniform statewide system of annual reporting of emissions of criteria air pollutants and toxic air contaminants for use by certain categories of stationary sources. The bill requires those stationary sources to report their annual emissions of criteria air pollutants and toxic air contaminants, as specified. This bill required the state board, by October 1, 2018, to prepare a monitoring plan regarding technologies for monitoring criteria air pollutants and toxic air contaminants and the need for and benefits of additional community air monitoring systems, as defined. The bill requires the state board to select, based on the monitoring plan, the highest priority locations in the state for the deployment of community air monitoring systems. The bill requires an air district containing a selected location, by July 1, 2019, to deploy a system in the selected location. The bill would authorize the air district to require a stationary source that emits air pollutants in, or that materially affect, the selected location to deploy a fence-line monitoring system, as defined, or other specified real-time, on-site monitoring. The bill authorizes the state board, by January 1, 2020, and annually thereafter, to select additional locations for the deployment of the systems. The bill would require air districts that have deployed a system to provide to the state board air quality data produced by the system. By increasing the duties of air districts, this bill would impose a state-mandated local program. The bill requires the state board to publish the data on its Internet Web site.

Regional

Regional Air Quality Planning Framework. The 1976 Lewis Air Quality Management Act established the MDAQMD and other air districts throughout the State. The federal CAA Amendments of 1977 required that each state adopt an implementation plan outlining pollution control measures to attain the federal standards in nonattainment areas of the state.

The ARB is responsible for incorporating air quality management plans for local air basins into a State Implementation Plan (SIP) for EPA approval. Significant authority for air quality control within them has been given to local air districts that regulate stationary source emissions and develop local nonattainment plans.

California is divided geographically into air basins for the purpose of managing the air resources of the State on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The State is currently divided into 15 air basins. The proposed project site is located within the Mojave Desert

Air Basin (MDAB). The MDAQMD includes the desert portion of the San Bernardino County. The MDAQMD is responsible for controlling emissions primarily from stationary sources within the MDAQMD and also maintains air quality monitoring stations to document historical and current levels of air quality within the District. The MDAQMD is also responsible for developing, updating, and implementing the Ozone Attainment Plan (MDAQMD 2004) which establishes a plan to implement, maintain, and enforce a program of emission control measures to attain and maintain the federal ozone air quality standards. Attainment plans prepared by the various air pollution control districts throughout the state are used to develop the SIP for the State of California. The proposed project is located within the MDAQMD and, thus, is subject to the rules and regulations of the MDAQMD.

Regional Air Quality Management Plan. The MDAQMD and SCAG are responsible for formulating and implementing the air quality attainment plan (AQAP) for the Basin. Regional AQAPs were adopted in 1991, 1994, and 1997. The following SIP and AQAP are the currently approved plans for the Basin region:

- 1997 SIP for O_3, PM10, and NO_2
- 1995 Mojave Desert Planning Area Federal PM10 Attainment Plan; no formal action by the EPA

The MDAQMD completed the MDAQMD 2004 Ozone Attainment Plan (State and federal) in April 2004, which has been approved by the EPA.

MDAQMD. The MDAQMD is downwind of the Los Angeles basin and the San Joaquin Valley. Prevailing winds transport ozone and ozone precursors from both regions into and through the MDAB during the summer ozone season. These transport couplings have been officially recognized by the CARB. Local MDAQMD emissions contribute to exceedances of both the NAAQS and CAAQS for ozone, but photochemical ozone modeling conducted by the MDAQMD and CARB indicates that the MDAB would be in attainment of both standards without the influence of this transported air pollution from upwind regions. Therefore, emissions reductions in the upwind area are critical to the attainment demonstration.

The following includes, but is not limited to, the MDAQMD rules that are applicable to the proposed project:

- Rule 201 (Permit to Construct) - requires written authorization to build, erect, install, alter, or replace any equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce, or control the issuance of air contaminants. With respect to the proposed project, this rule would apply to any stationary equipment that is not otherwise exempt from this rule as an insignificant source of air pollutants (see Rule 219).

- Rule 203 (Permit to Operate) - requires written authorization to operate any equipment, the use of which may cause the issuance of air pollutants, or the use of which may reduce or control the issuance of air contaminants. With respect to the proposed project, this rule would apply to any stationary equipment that is not otherwise exempt from this rule as an insignificant source of air pollutants (see Rule 219).

- Rule 219 (Equipment Not Requiring A Written Permit Pursuant to Regulation II) - specifies stationary sources that the MDAQMD considers to be insignificant sources of air pollutants that are exempt from Rules 201 and 202. With respect to the proposed project, the following sources would be exempt from permit requirements:

    - Comfort air conditioning or ventilating systems which are not designed or used to remove air contaminants generated by, or released from, specific equipment units;
    - Space heaters;
    - Equipment used exclusively for steam cleaning;

- Rule 402 (Nuisance) - This rule specifies that a person may 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.

- Rule 403.2 (Fugitive Dust Control for the Mojave Desert Planning Area) - This rule requires owners or operators of a construction or demolition fugitive dust source to implement the fugitive dust control measures listed in Rule 403.2. These measures include periodic watering for short-term stabilization of disturbed surface area to minimize visible dust emissions, stabilization of graded surfaces if no development is planned within 30 days, reducing non-essential earth moving activity under high wind conditions, and more. In addition, for sites over 100 acres such as the proposed project, the control measures in Rule 403.2 must also be implemented. The additional control measures include preparing and submitting a dust control plan to the MDAQMD prior to commencing earth-moving activities. The dust control plan must describe all applicable dust control measures that will be implemented at the project site. Other additional control measures to minimize visible fugitive dust for sites over 100 acres include stabilizing access routes, maintaining natural topography to the extent possible, and constructing paved roads and parking lots first where feasible.

- Rule 1113 (Architectural Coatings) - This rule requires manufacturers, distributors, and end-users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

- Rule 1160 (Internal Combustion Engines) - This rule establishes limits for VOC, NOx, and CO emissions associated with stationary internal combustion engines. However, the provisions of the rule do not apply to the following engines:

    - All internal combustion engines rated at less than 500 brake horsepower;
    - All internal combustion engines operated less than 100 hours within any continuous four consecutive calendar quarter period; and
    - Emergency internal combustion engines.

Regulation XIII (New Source Review) - For new and modified stationary sources subject to permitting requirements (see Rule 201), this series of rules prescribes the use of Best Available Control Technology and the provision of emission offsets (i.e., mitigation) for equipment whose emissions exceed specified thresholds. The applicability of these requirements would be determined upon submittal of an application for permit to construct under Rule 201.

To assist in the establishment of a quantitative determination of what is considered "significant," the MDAQMD has published significance thresholds that apply to new projects constructed or operated within the MDAQMD.

Thresholds. The MDAQMD recommends that lead agencies apply these thresholds in determining whether a proposed project would result in a significant air quality impact. If the lead agency finds that a proposed project has the potential to exceed these air pollution thresholds, the project would be considered significant. The MDAQMD has defined thresholds for NOx, VOC, SOx, CO, and PM10, hereinafter referred to as "criteria" pollutants, and for health risk in terms of cancer and non-cancer risk (MDAQMD 2009). Any project is significant if it:

1. Generates total emissions (direct and indirect) in excess of the thresholds given in Table 6; and/or

2. Generates a violation of any ambient air quality standard when added to the local background*; and/or

3. Does not conform with the applicable attainment or maintenance plan(s)*[6]; and/or

4. Exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in one million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to one*.

*These significance thresholds are not applicable to all projects. In general, the emissions comparison (criteria number 1) is sufficient.

Air Quality Guidance Documents

Southern California Association of Governments

The SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino and Imperial Counties and addresses regional issues relating to transportation, the economy, community development and the environment. SCAG is the Federally designated metropolitan planning organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With respect to air quality planning, SCAG has prepared the Regional Transportation Plan and Regional Transportation Improvement Plan (RTIP), which addresses regional development and growth forecasts. These plans form the basis for the land use and transportation components of the AQMP, which are utilized in the preparation of air quality forecasts and in the consistency, analysis included in the AQMP. The Regional Transportation Plan, Regional Transportation Improvement Plan, and AQMP are based on projections originating within the City and County General Plans.

On April 7, 2016, SCAG's Regional Council adopted the 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS or Plan). The Plan is a long-range visioning plan that balances future mobility and housing needs with economic, environmental and public health goals. The Plan charts a course for closely integrating land use and transportation – so that the region can grow smartly and sustainably. It outlines more than $556.5 billion in transportation system investments through 2040. The Plan was prepared through a collaborative, continuous, and comprehensive process with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses and local stakeholders within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura. In June 2016, SCAG received its conformity determination from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) indicating that all air quality conformity requirements for the 2016 RTP/SCS and associated 2015 FTIP Consistency Amendment through Amendment 15-12 have been met.

On September 3, 2020, SCAG's Regional Council unanimously voted to approve and fully adopt Connect SoCal (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy), and the addendum to the Connect SoCal Program Environmental Impact Report. Connect SoCal is a long-range visioning plan that builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. Connect SoCal outlines more than $638 billion in transportation system investments through 2045. It was prepared through a collaborative, continuous, and comprehensive process with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses and local stakeholders within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura.

Local – County of San Bernardino

Local jurisdictions, such as the County of San Bernardino, have the authority and responsibility to reduce air pollution through its police power and decision-making authority. Specifically, the County is responsible for

[6] A project is deemed to not exceed this threshold, and hence not be significant, if it is consistent with the existing land use plan. Zoning changes, specific plans, general plan amendments and similar land use plan changes which do not increase dwelling unit density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to not exceed this threshold.

the assessment and mitigation of air emissions resulting from its land use decisions. The County is also responsible for the implementation of transportation control measures as outlined in the AQMP and MDAQMD Attainment Plans. Examples of such measures include bus turnouts, energy-efficient streetlights, and synchronized traffic signals. In accordance with CEQA requirements and the CEQA review process, the County assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits, and monitors and enforces implementation of such mitigation.

In accordance with the CEQA requirements, the County does not, however, have the expertise to develop plans, programs, procedures, and methodologies to ensure that air quality within the County and region will meet federal and state standards. Instead, the County relies on the expertise of the SCAQMD and MDAQMD and utilizes the SCAQMD CEQA Handbook and MDAQMD California Environmental Quality Act (CEQA) And Federal Conformity Guidelines (depending on the location/jurisdiction of the project) as guidance documents for the environmental review of plans and development proposals within its jurisdiction.

The County of San Bernardino Countywide Plan (Policy Plan) serves as the County's General Plan and was adopted in October 2020. The air quality related goals and policies from the Natural Resources Element that are applicable to the proposed project are presented below:

Goal NR-1 Air quality that promotes health and wellness of residents in San Bernardino County through improvements in locally-generated emissions.

Policy NR-1.1 *Land Use*. We promote compact and transit-oriented development countywide and regulate the types and locations of development in unincorporated areas to minimize vehicle miles traveled and greenhouse gas emissions.

Policy NR-1.2 *Indoor Air Quality*. We promote the improvement of indoor air quality through the California Building and Energy Codes and through the provision of public health programs and services.

Policy NR-1.3 *Coordination on Air Pollution*. We collaborate with air quality management districts and other local agencies to monitor and reduce major pollutants affecting the county at the emission source.

Policy NR-1.5 *Sensitive Land Uses*. We consider recommendations from the California Air Resources Board on the siting of new sensitive land uses and exposure to specific source categories.

Policy NR-1.6 *Fugitive Dust Emissions*. We coordinate with air quality management districts on requirements for dust control plans, revegetation, and soil compaction to prevent fugitive dust emissions.

Policy NR-1.8 *Construction and Operations*. We invest in County facilities and fleet vehicles to improve energy efficiency and reduce emissions. We encourage County contractors and other builders and developers to use low-emission construction vehicles and equipment to improve air quality and reduce emissions.

Policy NR-1.9 *Building Design and Upgrades*. We use the CALGreen Code to meet energy efficiency standards for new buildings and encourage the upgrading of existing buildings to incorporate design elements, building materials, and fixtures that improve environmental sustainability and reduce emissions.

Table 3
State and Federal Criteria Pollutant Standards

Air Pollutant	Concentration / Averaging Time		Most Relevant Effects
	California Standards	Federal Primary Standards	
Ozone (O_3)	0.09 ppm/1-hour 0.07 ppm/8-hour	0.070 ppm/8-hour	(a) Decline in pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage.
Carbon Monoxide (CO)	20.0 ppm/1-hour 9.0 ppm/8-hour	35.0 ppm/1-hour 9.0 ppm/8-hour	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses.
Nitrogen Dioxide (NO_2)	0.18 ppm/1-hour 0.03 ppm/annual	100 ppb/1-hour 0.053 ppm/annual	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration.
Sulfur Dioxide (SO_2)	0.25 ppm/1-hour 0.04 ppm/24-hour	75 ppb/1-hour 0.14 ppm/annual	(a) Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM_{10})	50 µg/m^3/24-hour 20 µg/m^3/annual	150 µg/m^3/24-hour	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in elderly.
Suspended Particulate Matter ($PM_{2.5}$)	12 µg/m^3 / annual	35 µg/m^3/24-hour 12 µg/m^3/annual	
Sulfates	25 µg/m^3/24-hour	No Federal Standards	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) property damage.
Lead	1.5 µg/m^3/30-day	0.15 µg/m^3/3-month rolling	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction.
Visibility Reducing Particles	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more due to particles when humidity is less than 70 percent.	No Federal Standards	Visibility impairment on days when relative humidity is less than 70 percent.

Source: https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf

Table 4
Attainment Status of MDAQMD-Portion of Mojave Desert Air Basin

Pollutant	Federal Designation	State Designation
1-Hour Ozone	--	Nonattainment
8-Hour Ozone	Nonattainment	Nonattainment
CO	Unclassified/Attainment	Attainment
PM10	Nonattainment	Nonattainment
PM2.5	Unclassified/Attainment	Nonattainment
Lead	Unclassified/Attainment	Attainment
SO_2	Unclassified/Attainment	Attainment
NO_2	Unclassified/Attainment	Attainment

Notes:

(1) MDAQMD = Mojave Desert Air Quality Management District

(2) Source: California Air Resources Board (2020) (https://ww2.arb.ca.gov/resources/documents/maps-state-and-federal-area-designations) and MDAQMD (https://www.mdaqmd.ca.gov/air-quality/mdaqmd-attaiment-status).

MONITORED AIR QUALITY

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified". National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the Federal annual PM2.5 standard is met if the three-year average of the annual average PM2.5 concentration is less than or equal to the standard. Attainment status is shown in Table 4.

The MDAQMD maintains an air-monitoring network that measures levels of several air pollutants throughout the air basin. Since not all air monitoring stations measure all of the tracked pollutants, the data from the following two monitoring stations, listed in the order of proximity to the project site have been used. The nearest air monitoring station to the project site is the Joshua Tree National Monument monitoring station (Joshua Tree Station) located approximately 39 miles southeast of the project site. As not all monitoring stations monitor all pollutants, data was also taken from the San Bernardino – 4th Street monitoring station (San Bernardino Station). The San Bernardino Station is located approximately 49.98 mile southwest of the project site at 24302 4th Street, San Bernardino. Table 5 presents the monitored pollutant levels from the Hesperia and Victorville Stations. However, it should be noted that due to the air monitoring station distances from the project site, recorded air pollution levels at the air monitoring station reflect with varying degrees of accuracy, local air quality conditions at the project site.

The monitoring data presented in Table 5 shows that ozone and particulate matter (PM10 and PM2.5) are the air pollutants of primary concern in the project area, which are detailed below.

Ozone

During the 2021 to 2023 monitoring period, the State 1-hour concentration standard for ozone were exceeded between one and three days each year at the Joshua Tree Station. The State 8-hour ozone standard has been exceeded between 29 and 42 days each year over the past three years at the Joshua Tree Station. The Federal 8-hour ozone standard was exceeded between 24 and 37 days each year over the past three years at the Joshua Tree Station.

Carbon Monoxide

CO is another important pollutant that is due mainly to motor vehicles. The Joshua Tree Station did not record an exceedance of the state or federal 8-hour CO standard for the last three years.

Nitrogen Dioxide

The San Bernardino Station did not record an exceedance of the State or Federal NO_2 standards for the last three years.

Particulate Matter

Over the last three years, the State 24-hour concentration standards for PM10 were exceeded for four days in 2021 at the San Bernardino Station. Over the past three years, the Federal 24-hour standards for PM10 were exceeded for one day in 2021 and one day in 2022 at the San Bernardino Station.

Over the past three years, the Federal 24-hour standard for PM2.5 were exceeded between one and two days each year at the San Bernardino Station.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM10 and PM2.5). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive, because many breathe through their mouths during exercise.

Table 5
Air Quality Monitoring Summary

Pollutant (Standard)[1,2]		Year		
		2021	2022	2023
Ozone:	Maximum 1-Hour Concentration (ppm)	0.106	0.099	0.096
	Days > CAAQS (0.09 ppm)	3	2	1
	Maximum 8-Hour Concentration (ppm)	0.095	0.084	0.084
	Days > NAAQS (0.070 ppm)	37	37	24
	Days > CAAQS (0.070 ppm)	42	39	29
Carbon Monoxide:	Maximum 8-Hour Concentration (ppm)	*	*	*
	Days > CAAQS (9 ppm)	0	0	0
	Days > NAAQS (9 ppm)	0	0	0
Nitrogen Dioxide:[3]	Maximum 1-Hour Concentration (ppm)	0.056	0.053	0.056
	Days > CAAQS (0.18 ppm)	0	0	0
Inhalable Particulates (PM10):[3]	Maximum 24-Hour Concentration (µg/m^3)	182.4	177.8	*
	Days > NAAQS (150 µg/m3)	1	1	0
	Days > CAAQS (50 µg/m3)	4	*	0
	Annual Average (µg/m3)	40.5	38.4	*
Ultra-Fine Particulates (PM2.5):[3]	Maximum 24-Hour Concentration (µg/m3)	57.9	40.1	52.9
	Days > NAAQS (35 µg/m3)	1	2	1
	Annual Average (µg/m3)	11.8	11.2	10.5

Notes:

(1) Source: http://www.arb.ca.gov/adam/topfour/topfour1.php. Data from the Joshua Tree - National Monument Monitoring Station unless otherwise noted.

(2) CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million

(3) Data taken from the San Bernardino - 4th Street Monitoring Station.

* Means there was insufficient data available to determine value.

AIR QUALITY STANDARDS

Significance Thresholds

Appendix G of the State CEQA Guidelines

Appendix G of the State CEQA Guidelines states that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make a significance determination. Pursuant to Appendix G, the project would result in a significant impact related to air quality if it would:

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

The CEQA Guidelines Section 15064.7 provides the significance criteria established by the applicable air quality management district or air pollution control district, when available, may be relied upon to make determinations of significance. The potential air quality impacts of the project are, therefore, evaluated according to thresholds developed by MDAQMD in their CEQA Guidelines.[7]

Regional Air Quality

According to the MDAQMD, a project is non-conforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable MDAQMD rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and it is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan).

Violation of Air Quality Standards or Substantial Contribution to Air Quality Violations. The MDAQMD currently recommends that projects with construction-related and/or operational emissions that exceed any of the following emissions thresholds should be considered significant:

- 25 tons per year or 137 pounds per day pounds per day of VOC
- 25 tons per year or 137 pounds per day of NOx
- 100 tons per year or 548 pounds per day of CO
- 25 tons per year or 137 pounds per day of SOx
- 15 tons per year or 82 pounds per day of PM10
- 15 tons per year or 82 pounds per day of PM2.5

For the purposes to this air quality impact analysis, a regional air quality impact would be considered significant if emissions exceed the MDAQMD significance thresholds identified above and in Table 6.

Toxic Air Contaminants

According to the MDAQMD CEQA Guidelines, any project that has the potential to expose the public to toxic air contaminants in excess of the following thresholds would be considered to have a significant air quality impact:

[7] MDAQMD. California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, August 2016.

- If the Maximum Incremental Cancer Risk is 10 in one million or greater; or
- Toxic air contaminants from the proposed project would result in a Hazard Index increase of 1 or greater.

Residences, schools, daycare centers, playgrounds and medical facilities are considered sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using significance threshold criteria above.

- 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.

Table 6
MDAQMD Air Quality Significance Thresholds

Pollutant	Annual Thresholds (tons/year)	Daily Thresholds (lbs/day)
NOx	25	137
VOC	25	137
PM10	15	82
PM2.5	15	82
SOx	25	137
CO	100	548
Lead	0.6	3
Greenhouse Gases (CO2e)	100,000	548,000

Source: https://www.mdaqmd.ca.gov/rules/rule-plan-development

SHORT-TERM CONSTRUCTION EMISSIONS

Construction activities associated with the proposed project would have the potential to generate air emissions, toxic air contaminant emissions, and odor impacts. Assumptions for the phasing, duration, and required equipment for the construction of the proposed project were obtained from the project applicant. The project includes the development of two new recharge basins, 6-foot perimeter fencing with barbered wire, a new tee connection within Winters Road right-of-way, approximately 500 linear feet of 12-inch non potable water pipeline from Winters Road to the eastern perimeter of each basin, two headwalls located along the eastern perimeter of each basin connecting to the new 12-inch non potable water pipeline, an outlet with energy dissipator to the proposed recharge basins, and a nested or multi-completion monitoring well. The total area of disturbance assumed for construction of the proposed project is anticipated to be approximately 10 acres, as this is the size of the project site. Per the project applicant, construction is anticipated to occur in two phases with phase 1 being the monitoring well drilling and phase 2 being the recharge basins. The construction equipment for phase 1 (monitoring well drilling) is to include one (1) drilling rig, one (1) loader, one (1) crane, and 2-3 work trucks and for phase 2 (recharge basins) is to include two (2) scrapers, one (1) tractors/loaders/backhoe, two (2) off-highway trucks, two (2) plate compactors, two (2) excavators, two (2) other material handling equipment, two (2) other construction equipment, four (4) pumps, two (2) skid steer loaders, two (2) surfacing equipment, two (2) rubber tired dozers, one (1) crane, and one (1) water truck. Based on these details, to provide a conservative scenario, all proposed equipment per phase was assumed to be in operation simultaneously. It is estimated that the project would include approximately 1,594 cubic yards (CY) of import and 68,411 CY of export. There are two existing concrete pads at the project site which total approximately 847.5 square feet which are to be removed as part of the project.[8] It was assumed that concrete pad removal and earthworks would occur during phase 2 of construction. See Appendix B for more details.

The proposed project is anticipated to start construction no sooner than the beginning of January 2026, taking approximately 11 months to complete, with completion estimated by November 2026. The project is anticipated to be operational in 2026.

Methodology

The following provides a discussion of the methodology used to calculate regional construction air emissions and an analysis of the proposed project's short-term construction emissions for the criteria pollutants. The construction-related regional air quality impacts have been analyzed for both criteria pollutants and GHGs.

Emissions are estimated using the CalEEMod (Version 2022.1.1.29) software, which is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions from a variety of land use projects. CalEEMod was developed in collaboration with the air districts of California. Regional data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions. The model is considered to be an accurate and comprehensive tool for quantifying air quality and GHG impacts from land use projects throughout California.

Daily regional emissions during construction are forecasted by assuming a conservative estimate of construction activities (i.e., assuming all construction occurs at the earliest feasible date) and applying the mobile source and fugitive dust emissions factors. The input values used in this analysis were adjusted to be project-specific for the construction schedule and the equipment used was based on CalEEMod defaults. The CalEEMod program uses the EMFAC2021 computer program to calculate the emission rates specific for the MDAQMD portion of San Bernardino County for construction-related employee vehicle trips and the OFFROAD2017 computer program to calculate emission rates for heavy truck operations. EMFAC2021 and OFFROAD2017 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running

[8] Square footage estimated based on approximate square footage provided on page C-1 of the 50% design plans.

hour. Daily truck trips and CalEEMod default trip length data were used to assess roadway emissions from truck exhaust. The maximum daily emissions are estimated values for the worst-case day and do not represent the emissions that would occur for every day of project construction. The maximum daily emissions are compared to the MDAQMD daily regional numeric indicators. Detailed construction equipment lists, construction scheduling, and emission calculations are provided in Appendix B.

Per MDAQMD Rule 1113 as amended on April 23, 2012, the architectural coatings that would be applied after January 1, 2013 will be limited to an average of 150 grams per liter or less.

The phases of the construction activities which have been analyzed below for each phase are: (1) monitoring well drilling (2) recharge basins. Details pertaining to the project's construction timing and the type of equipment modeled for each construction phase are available in the CalEEMod output in Appendix B.

Construction-Related Regional Impacts

The construction-related criteria pollutant emissions for each phase are shown below in Table 7. Table 7 shows that none of the analyzed criteria pollutants would exceed the MDAQMD daily emissions thresholds. Therefore, a less than significant regional air quality impact would occur from construction of the proposed project.

Construction-Related Health Impacts

Regarding health effects related to criteria pollutant emissions, the applicable significance thresholds are established for regional compliance with the state and federal ambient air quality standards, which are intended to protect public health from both acute and long-term health impacts, depending on the potential effects of the pollutant. Because regional emissions of criteria pollutants during construction of the project would be below the applicable thresholds, it would not contribute to long-term health impacts related to nonattainment of the ambient air quality standards. Therefore, significant adverse acute health impacts as a result of project construction are not anticipated.

Construction-Related Toxic Air Contaminant Impacts

The greatest potential for toxic air contaminant emissions would be related to diesel particulate emissions associated with heavy equipment operations during construction of the proposed project. According to MDAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of "individual cancer risk". "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of toxic air contaminants over a 30-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. Given the relatively limited number of heavy-duty construction equipment and the short-term construction schedule (approximately 11 months), the proposed project would not result in a long-term (i.e., 30 years) substantial source of toxic air contaminant emissions and corresponding individual cancer risk. Therefore, no significant short-term toxic air contaminant impacts would occur during construction of the proposed project.

The project would comply with the CARB Air Toxics Control Measure that limits diesel powered equipment and vehicle idling to no more than 5 minutes at a location, and the CARB In-Use Off-Road Diesel Vehicle Regulation; compliance with these would minimize emissions of TACs during construction. Therefore, impacts from TACs during construction would be less than significant.

Construction-Related Odor Impacts

Potential sources that may emit odors during construction activities include the application of materials such as asphalt pavement. The objectionable odors that may be produced during the construction process are of short-term in nature and the odor emissions are expected to cease upon the drying or hardening of the odor

producing materials. Due to the short-term nature and limited amounts of odor producing materials being utilized, no significant impact related to odors would occur during construction of the proposed project. Diesel exhaust and VOCs would be emitted during construction of the project, which are objectionable to some; however, emissions would disperse rapidly from the project site and therefore should not reach an objectionable level at the nearest sensitive receptors.

Table 7
Construction-Related Regional Pollutant Emissions

Activity	Pollutant Emissions (pounds/day)					
	ROG	NOx	CO	SO_2	PM10	PM2.5
Maximum Daily Emissions[1,2]	9.10	75.60	80.70	0.25	10.10	5.67
MDAQMD Thresholds	137	137	548	137	82	82
Exceeds Thresholds?	No	No	No	No	No	No

Notes:

Source: CalEEMod Version 2022.1.1.29.

(1) Includes both on-site and off-site emissions. On-site PM-10 and PM-2.5 emissions show compliance with MDAQMD Rule 403.

(2) Construction, painting and paving phases may overlap.

LONG-TERM OPERATIONAL EMISSIONS

The on-going operation of the proposed project would result in a long-term increase in air quality emissions. This increase would be due to emissions from the project-generated vehicle trips and through operational emissions from the on-going use of the proposed project. The following section provides an analysis of potential long-term air quality impacts due to: regional air quality impacts with the on-going operations of the proposed project.

Operations-Related Regional Air Quality Impacts

The potential operations-related air emissions have been analyzed below for the criteria pollutants and cumulative impacts.

Operations-Related Criteria Pollutants Analysis

The project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. To conduct routine inspections and ensure proper long-term maintenance, the long-term operation of the project will require a minimal number of monthly worker trips. Additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated. Therefore, operational emissions associated with the proposed project would be negligible and would not be anticipated to exceed MDAQMD thresholds. Operation of the proposed project would result in a less than significant regional air quality impact.

Operations-Related Toxic Air Contaminant Impacts

The CARB Air Quality and Land Use Handbook (CARB Handbook) provides an advisory recommendation to avoid the locating of new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. MDAQMD recommends avoiding siting new sensitive land uses such as residences, schools, daycare centers, playgrounds, or medical facilities within 1,000 feet of a major transportation project (50,000 or more vehicles per day).

As determined in the *California Building Industry Association v. Bay Area Air Quality Management District (2015) 62 Cal. 4th 369 (CBIA)* case the California Supreme Court determined that CEQA does not generally require an impact analysis of the existing environmental conditions on the future residents of a proposed project and generally only requires an analysis of the proposed project's impact on the environment. However, the CBIA case also stated that when a proposed project brings development and people into an area already subject to specific hazards and the new development/people exacerbate the existing hazards, then CEQA requires an analysis of the hazards and the proposed project's effect in terms of increasing the risks related to those hazards. In regards to air quality hazards, TACs are defined as substances that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. As such, if a proposed project would not exacerbate pre-existing hazards (e.g., TAC health risks) then an analysis of those hazards and the proposed project's effect on increasing those hazards is not required. The project is a water infrastructure project that includes the construction of a new recharge basin and monitoring well and will not be a source of toxic air contaminants. The site is currently vacant and does not contain any operational land uses that emit toxic air contaminants.

Therefore, a project-specific health risk assessment is not required or warranted. Impacts to future on-site sensitive receptors are considered to be less than significant.

Operations-Related Health Impacts

Regarding health effects related to criteria pollutant emissions, the applicable significance thresholds are established for regional compliance with the state and federal ambient air quality standards, which are intended to protect public health from both acute and long-term health impacts, depending on the potential

effects of the pollutant. Because regional emissions of criteria pollutants during operation of the project would be below the applicable thresholds, it would not contribute to long-term health impacts related to nonattainment of the ambient air quality standards. Therefore, significant adverse acute health impacts as a result of project operation are not anticipated.

Operations-Related Odor Impacts

Potential sources that may emit odors during the on-going operations of the proposed project would include odor emissions from diesel truck emissions and trash storage areas. As the project is that of water infrastructure uses no significant impact related to odors would occur during the on-going operations of the proposed project.

CUMULATIVE AIR QUALITY IMPACTS

There are a number of cumulative projects in the project area that have not yet been built or are currently under construction. Since the timing or sequencing of the cumulative projects is unknown, any quantitative analysis to ascertain daily construction emissions that assumes multiple, concurrent construction projects would be speculative. Further, cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel well out of the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered would cover an even larger area.

Project Specific Impacts

The project area is out of attainment for both ozone and particulate matter. Construction and operation of cumulative projects will further degrade the air quality of the Mojave Desert Air Basin. The greatest cumulative impact on the quality of regional air cell will be the incremental addition of pollutants mainly from increased traffic from residential, commercial, and industrial development and the use of heavy equipment and trucks associated with the construction of these projects. Air quality will be temporarily degraded during construction activities that occur separately or simultaneously. However, in accordance with the MDAQMD methodology, projects that do not exceed the MDAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact.

Project operations would generate emissions of NOx, ROG, CO, PM10, and PM2.5, which would not exceed the MDAQMD regional thresholds and would not be expected to result in ground level concentrations that exceed the NAAQS or CAAQS. Therefore, operation of the project would not result in a cumulatively considerable net increase for non-attainment of criteria pollutants or ozone precursors. As a result, the project would result in a less than significant cumulative impact for operational emissions.

Air Quality Compliance

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). According to the MDAQMD, a project is non-conforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan.

A project is conforming if it complies with all applicable District rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast. An example of a non-conforming project would be one that increases the gross number of dwelling units, increases the number of trips, and/or increases the overall vehicle miles traveled in an affected area (relative to the applicable land use plan).

The proposed project includes the construction of a new recharge basin and monitoring well. The project is located approximately 0.3 miles east of the existing Ames-Reche recharge facility and approximately 0.3 miles west of the existing flow control facility and is located along Winters Road (Assessor Parcel Numbers 062921113, -14). Per the San Bernardino Countywide Policy Plan, the current land use of the project site is Homestead Valley/Rural Living (HV/RL). Per Table LU-1 of the County Policy Plan (October 2020), the RL land use designation allows for rural residential; small-scale, non-water invasive and incidental agricultural uses; and public and quasi-public facilities such as parks, religious facilities, schools, sheriff's stations, and fire stations. The project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. Therefore, due to the nature of the project and its location relevant to existing water infrastructure, the project is an allowable use under the current land use designations for these two parcels. Furthermore, as shown by the results of this air analysis, the project's emissions do not exceed any MDAQMD thresholds during either short-term construction or long-term operation of the project. Therefore, the proposed project is not anticipated to exceed the Attainment Plan assumptions for the project site and is found to be consistent with the Attainment Plan for the second criterion.

Based on the above, the proposed project would not conflict with implementation of the MDAQMD Attainment Plans, impacts are considered to be less than significant.

3. GLOBAL CLIMATE CHANGE ANALYSIS

EXISTING GREENHOUSE GAS ENVIRONMENT

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. The following provides a description of each of the greenhouse gases and their global warming potential.

Water Vapor

Water vapor is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water 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 water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water 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 water vapor and so on and so on. This is referred to as a "positive feedback loop". The extent to which this positive feedback loop will continue is unknown as there is also dynamics that put the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also 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).

Carbon Dioxide (CO_2)

The natural production and absorption of CO_2 is achieved through the terrestrial biosphere and the ocean. However, humankind has altered the natural carbon cycle by burning coal, oil, natural gas, and wood. Since the industrial revolution began in the mid-1700s. Each of these activities has increased in scale and distribution. CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration with the first conclusive measurements being made in the last half of the 20th century. Prior to the industrial revolution, concentrations were fairly stable at 280 parts per million (ppm). The International Panel on Climate Change (IPCC Fifth Assessment Report, 2014) Emissions of CO_2 from fossil fuel combustion and industrial processes contributed about 78% of the total GHG emissions increase from 1970 to 2010, with a similar percentage contribution for the increase during the period 2000 to 2010. Globally, economic and population growth continued to be the most important drivers of increases in CO_2 emissions from fossil fuel combustion. The contribution of population growth between 2000 and 2010 remained roughly identical to the previous three decades, while the contribution of economic growth has risen sharply.

Methane (CH_4)

CH_4 is an extremely effective absorber of radiation, although its atmospheric concentration is less than that of CO_2. Its lifetime in the atmosphere is brief (10 to 12 years), compared to some other GHGs (such as CO_2, N_2O, and Chlorofluorocarbons (CFCs). 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 methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide (N_2O)

Concentrations of N_2O also began to rise at the beginning of the industrial revolution. In 1998, the global concentration of this GHG was documented at 314 parts per billion (ppb). N_2O is produced by microbial processes in soil and water, 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 also commonly used as an aerosol spray propellant, (i.e., in whipped cream bottles, in potato chip bags to keep chips fresh, and in rocket engines and in race cars).

Chlorofluorocarbons (CFC)

CFCs are gases formed synthetically by replacing all hydrogen atoms in methane 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. It was 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 in 1989 the European Community agreed to ban CFCs by 2000 and subsequent treaties banned CFCs worldwide by 2010. This effort was extremely successful, and the levels of the major CFCs are now remaining level or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons (HFC)

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. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were HFC-23. HFC-134a use is increasing due to its use as a refrigerant. Concentrations of HFC-23 and HFC-134a in the atmosphere are now about 10 parts per trillion (ppt) each. Concentrations of HFC-152a are about 1 ppt. HFCs are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons (PFC)

PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays 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). Concentrations of CF_4 in the atmosphere are over 70 ppt. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing.

Sulfur Hexafluoride (SF_6)

SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 has the highest global warming potential of any gas evaluated; 23,900 times that of CO_2. Concentrations in the 1990s were about 4 ppt. Sulfur hexafluoride 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.

Aerosols

Aerosols are particles emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel containing sulfur is burned. Black carbon (or soot) is emitted during biomass burning due to the incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

Global Warming Potential

The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2). The larger the GWP, the more that a given gas warms the Earth compared to CO_2 over that time period. The time period usually used for GWPs is 100 years. GWPs provide a common unit of measure, which allows analysts to add up emissions estimates of different gases (e.g., to compile a national GHG inventory), and allows policymakers to compare emissions reduction opportunities across sectors and gases. A summary of the atmospheric lifetime and the global warming potential of selected gases are summarized in Table 8. As shown in Table 8, the global warming potential of GHGs ranges from 1 to 22,800.

Table 8
Global Warming Potentials and Atmospheric Lifetimes

Gas	Atmospheric Lifetime	Global Warming Potential[1] (100 Year Horizon)
Carbon Dioxide (CO_2)	–[2]	1
Methane (CH_4)	12	28-36
Nitrous Oxide (NO)	114	298
Hydrofluorocarbons (HFCs)	1-270	12-14,800
Perfluorocarbons (PFCs)	2,600-50,000	7,390-12,200
Nitrogen trifluoride (NF_3)	740	17,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Notes:

Source: http://www3.epa.gov/climatechange/ghgemissions/gases.html

(1) Compared to the same quantity of CO_2 emissions.

(2) Carbon dioxide's lifetime is poorly defined because the gas is not destroyed over time, but instead moves among different parts of the ocean–atmosphere–land system. Some of the excess carbon dioxide will be absorbed quickly (for example, by the ocean surface), but some will remain in the atmosphere for thousands of years, due in part to the very slow process by which carbon is transferred to ocean sediments.

GREENHOUSE GAS STANDARDS AND REGULATION

International

Montreal Protocol

In 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) to evaluate the impacts of global climate change and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations' Framework Convention on Climate Change (UNFCCC) agreement with the goal of controlling GHG emissions. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The plan consists of more than 50 voluntary programs.

Additionally, the Montreal Protocol was originally signed in 1987 and substantially amended in 1990 and 1992. The Montreal Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere—CFCs, halons, carbon tetrachloride, and methyl chloroform—were to be phased out, with the first three by the year 2000 and methyl chloroform by 2005.

The Paris Agreement

The Paris Agreement became effective on November 4, 2016. Thirty days after this date at least 55 Parties to the United Nations Framework Convention on Climate Change (Convention), accounting in total for at least an estimated 55 % of the total global greenhouse gas emissions, had deposited their instruments of ratification, acceptance, approval or accession with the Depositary.

The Paris Agreement built upon the Convention and – for the first time – attempted to bring all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.

The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. Additionally, the agreement aims to strengthen the ability of countries to deal with the impacts of climate change. To reach these ambitious goals, appropriate financial flows, a new technology framework and an enhanced capacity building framework will be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives. The Agreement also provides for enhanced transparency of action and support through a more robust transparency framework.

Federal

The United States Environmental Protection Agency (USEPA) is responsible for implementing federal policy to address GHGs. The federal government administers a wide array of public-private partnerships to reduce the GHG intensity generated in the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. The USEPA implements numerous voluntary programs that contribute to the reduction of GHG emissions. These programs (e.g., the ENERGY STAR labeling system for energy-efficient products) play a significant role in encouraging voluntary reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

In Massachusetts v. Environmental Protection Agency (Docket No. 05–1120), argued November 29, 2006 and decided April 2, 2007, the U.S. Supreme Court held that not only did the EPA have authority to regulate greenhouse gases, but the EPA's reasons for not regulating this area did not fit the statutory requirements. As

such, the U.S. Supreme Court ruled that the EPA should be required to regulate CO_2 and other greenhouse gases as pollutants under the federal Clean Air Act (CAA).

In response to the FY2008 Consolidations Appropriations Act (H.R. 2764; Public Law 110-161), EPA proposed a rule on March 10, 2009 that requires mandatory reporting of GHG emissions from large sources in the United States. On September 22, 2009, the Final Mandatory Reporting of GHG Rule was signed and published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. This rule requires suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions to submit annual reports to EPA.

On December 7, 2009, the EPA Administrator signed two distinct findings under section 202(a) of the Clean Air Act. One is an endangerment finding that finds concentrations of the six GHGs in the atmosphere threaten the public health and welfare of current and future generations. The other is a cause or contribute finding, that finds emissions from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare. These actions will not themselves impose any requirements on industry or other entities. However, it is a prerequisite to finalizing the EPA's proposed GHG emission standards for light-duty vehicles, which were jointly proposed by the EPA and Department of Transportation on September 15, 2009.

Clean Air Act

In Massachusetts v. Environmental Protection Agency (Docket No. 05–1120), the U.S. Supreme Court held in April of 2007 that the EPA has statutory authority under Section 202 of the federal Clean Air Act (CAA) to regulate GHGs. The court did not hold that the EPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA. The EPA adopted a Final Endangerment Finding for the six defined GHGs (CO2, CH4, N2O, HFCs, PFCs, and SF6) on December 7, 2009. The Endangerment Finding is required before EPA can regulate GHG emissions under Section 202(a)(1) of the CAA consistently with the United States Supreme Court decision. The EPA also adopted a Cause or Contribute Finding in which the EPA Administrator found that GHG emissions from new motor vehicle and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. These findings do not, by themselves, impose any requirements on industry or other entities. However, these actions were a prerequisite for implementing GHG emissions standards for vehicles.

Energy Independence Security Act

The Energy Independence and Security Act of 2007 (EISA) facilitates the reduction of national GHG emissions by requiring the following:

- Increasing the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) that requires fuel producers to use at least 36 billion gallons of biofuel in 2022;
- Prescribing or revising standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances;
- Requiring approximately 25 percent greater efficiency for light bulbs by phasing out incandescent light bulbs between 2012 and 2014; requiring approximately 200 percent greater efficiency for light bulbs, or similar energy savings, by 2020; and
- While superseded by the USEPA and NHTSA actions described above, (i) establishing miles per gallon targets for cars and light trucks and (ii) directing the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for trucks.

Additional provisions of EISA address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of green jobs.[9]

Executive Order 13432

In response to the Massachusetts v. Environmental Protection Agency ruling, the President signed Executive Order 13432 on May 14, 2007, directing the USEPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision. Executive Order 13432 was codified into law by the 2009 Omnibus Appropriations Law signed on February 17, 2009. The order sets goals in the areas of energy efficiency, acquisition, renewable energy, toxics reductions, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation. Light-Duty Vehicle Greenhouse Gas and Corporate Average Fuel Economy Standards.

On May 19, 2009, President Obama announced a national policy for fuel efficiency and emissions standards in the United States auto industry. The adopted federal standard applies to passenger cars and light-duty trucks for model years 2012 through 2016. The rule surpasses the prior Corporate Average Fuel Economy standards (CAFE)[10] and requires an average fuel economy standard of 35.5 miles per gallon (mpg) and 250 grams of CO2 per mile by model year 2016, based on USEPA calculation methods. These standards were formally adopted on April 1, 2010. In August 2012, standards were adopted for model year 2017 through 2025 for passenger cars and light-duty trucks. By 2025, vehicles are required to achieve 54.5 mpg (if GHG reductions are achieved exclusively through fuel economy improvements) and 163 grams of CO2 per mile. According to the USEPA, a model year 2025 vehicle would emit one-half of the GHG emissions from a model year 2010 vehicle.[11] In 2017, the USEPA recommended no change to the GHG standards for light-duty vehicles for model years 2022-2025.

In December 2021, the EPA finalized federal GHG emissions standards for passenger cars and light trucks for model years 2023 through 2026. The updated standards will result in avoiding more than 3 billion tons of GHG emissions through 2050. These standards set the light-duty vehicle GHG program on track to provide a strong launch point for the agency's next phase of standards for model year 2027 and beyond.[12] On April 12, 2023, EPA announced new, more ambitious proposed standards to further reduce harmful air pollutant emissions from light-duty and medium-duty vehicles starting with model year 2027. The proposal builds upon EPA's final standards for federal greenhouse gas emissions standards for passenger cars and light trucks for model years 2023 through 2026 and leverages advances in clean car technology to unlock benefits to Americans ranging from reducing climate pollution, to improving public health, to saving drivers money through reduced fuel and maintenance costs. The proposed standards would phase in over model years 2027 through 2032.[13]

Issued by NHTSA and EPA in March 2020 (published on April 30, 2020 and effective after June 29, 2020), the Safer Affordable Fuel-Efficient Vehicles Rule would maintain the CAFE and CO2 standards applicable in

[9] A green job, as defined by the United States Department of Labor, is a job in business that produces goods or provides services that benefit the environment or conserve natural resources.

[10] The Corporate Average Fuel Economy standards are regulations in the United States, first enacted by Congress in 1975, to improve the average fuel economy of cars and light trucks. The U.S Department of Transportation has delegated the National Highway Traffic Safety Administration as the regulatory agency for the Corporate Average Fuel Economy standards.

[11] United States Environmental Protection Agency, EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks, August 2012, https://nepis.epa.gov/ Exe/ZyPDF.cgi/P100EZ7C.PDF?Dockey=P100EZ7C.PDF.

[12] United States Environmental Protection Agency (EPA), Regulations for Emissions from Vehicles and Engines, Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026. https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions

[13] United States Environmental Protection Agency (EPA), Regulations for Emissions from Vehicles and Engines, Proposed Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles. https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-multi-pollutant-emissions-standards-model

model year 2020 for model years 2021 through 2026. The estimated CAFE and CO2 standards for model year 2020 are 43.7 mpg and 204 grams of CO2 per mile for passenger cars and 31.3 mpg and 284 grams of CO2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. This Rule also excludes CO2- equivalent emission improvements associated with air conditioning refrigerants and leakage (and, optionally, offsets for nitrous oxide and methane emissions) after model year 2020.[14]

On May 12, 2021, the National Highway Traffic Safety Administration (NHTSA) published a notice of proposed rulemaking in the Federal Register, proposing to repeal "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," published Sept. 27, 2019 (SAFE I Rule), in which NHTSA codified regulatory text and made additional pronouncements regarding the preemption of state and local laws related to fuel economy standards. Specifically, this document proposed to fully repeal the regulatory text and appendices promulgated in the SAFE I Rule. In addition, this document proposed to repeal and withdraw the interpretative statements made by the Agency in the SAFE I Rule preamble, including those regarding the preemption of particular state Greenhouse Gas (GHG) Emissions standards or Zero Emissions Vehicle (ZEV) mandates. As such, this document proposed to establish a clean slate with respect to NHTSA's regulations and interpretations concerning preemption under the Energy Policy and Conservation Act (EPCA).[15] This action is effective as of January 28, 2022. [16]

State of California

California Air Resources Board

CARB, a part of the California Environmental Protection Agency (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (California Ambient Air Quality Standards [CAAQS]), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In 2004, the California Air Resources Board (CARB) adopted an Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants (Title 13 California Code of Regulations [CCR], Section 2485). The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. This measure generally does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given location with certain exemptions for equipment in which idling is a necessary function such as concrete trucks. While this measure primarily targets diesel particulate matter emissions, it has co-benefits of minimizing GHG emissions from unnecessary truck idling.

In 2008, CARB approved the Truck and Bus regulation to reduce particulate matter and nitrogen oxide emissions from existing diesel vehicles operating in California (13 CCR, Section 2025, subsection (h)). CARB has also promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The regulation, adopted by the CARB on July 26, 2007, aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with

[14] National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (USEPA), 2018. Federal Register / Vol. 83, No. 165 / Friday, August 24, 2018 / Proposed Rules, The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks 2018. Available at: https://www.gpo.gov/fdsys/pkg/FR-2018-08-24/pdf/2018-16820.pdf.

[15] https://www.federalregister.gov/documents/2021/05/12/2021-08758/corporate-average-fuel-economy-cafe-preemption

[16] https://www.federalregister.gov/documents/2021/05/12/2021-08758/corporate-average-fuel-economy-cafe-preemption

newer emission-controlled models. Refer to Section IV.B, *Air Quality*, of this Draft EIR for additional details regarding these regulations. While these regulations primarily target reductions in criteria air pollutant emission, they have co-benefits of minimizing GHG emissions due to improved engine efficiencies.

The State currently has no regulations that establish ambient air quality standards for GHGs. However, the State has passed laws directing CARB to develop actions to reduce GHG emissions, which are listed below.

Assembly Bill 1493

California Assembly Bill 1493 enacted on July 22, 2002, required the CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. In 2005, the CARB submitted a "waiver" request to the EPA from a portion of the federal Clean Air Act in order to allow the State to set more stringent tailpipe emission standards for CO_2 and other GHG emissions from passenger vehicles and light duty trucks. On December 19, 2007 the EPA announced that it denied the "waiver" request. On January 21, 2009, CARB submitted a letter to the EPA administrator regarding the State's request to reconsider the waiver denial. The EPA approved the waiver on June 30, 2009. After adopting these initial greenhouse gas standards for passenger vehicles, CARB adopted continuing standards for future model years.

Executive Order S-3-05

The California Governor issued Executive Order S-3-05, GHG Emission, in June 2005, which established the following reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. To comply with the Executive Order, the secretary of CalEPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of businesses, local governments, and communities and through State incentive and regulatory programs.

Assembly Bill 32 (California Health and Safety Code, Division 25.5 – California Global Warming Solutions Act of 2006)

In 2006, the California State Legislature adopted Assembly Bill (AB) 32 (codified in the California Health and Safety Code [HSC], Division 25.5 – California Global Warming Solutions Act of 2006), which focuses on reducing GHG emissions in California to 1990 levels by 2020. HSC Division 25.5 defines GHGs as CO2, CH4, N2O, HFCs, PFCs, and SF6 and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost effective. Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. CARB is required to adopt rules and regulations directing state actions that would achieve GHG emissions reductions equivalent to 1990 statewide levels by 2020.

Senate Bill 32 and Assembly Bill 197

In 2016, the California State Legislature adopted Senate Bill (SB) 32 and its companion bill AB 197, and both were signed by Governor Brown. SB 32 and AB 197 amends HSC Division 25.5 and establishes a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and includes provisions to ensure the benefits of state climate policies reach into disadvantaged communities.

Climate Change Scoping Plan (2008)

A specific requirement of AB 32 was to prepare a Climate Change Scoping Plan for achieving the maximum technologically feasible and cost-effective GHG emission reduction by 2020 (Health and Safety Code section 38561 (h)). CARB developed an AB 32 Scoping Plan that contains strategies to achieve the 2020 emissions cap. The initial Scoping Plan was approved in 2008, and contains a mix of recommended strategies that combined direct regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs calculated to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives.

As required by HSC Division 25.5, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was originally set at 427 $MMTCO_2e$ using the GWP values from the IPCC SAR. CARB also projected the state's 2020 GHG emissions under no-action-taken (NAT) conditions – that is, emissions that would occur without any plans, policies, or regulations to reduce GHG emissions. CARB originally used an average of the state's GHG emissions from 2002 through 2004 and projected the 2020 levels at approximately 596 $MMTCO_2e$ (using GWP values from the IPCC SAR). Therefore, under the original projections, the state must reduce its 2020 NAT emissions by 28.4 percent in order to meet the 1990 target of 427 $MMTCO_2e$.

First Update to the Climate Change Scoping Plan (2014)

The First Update to the Scoping Plan was approved by CARB in May 2014 and builds upon the initial Scoping Plan with new strategies and recommendations. In 2014, CARB revised the target using the GWP values from the IPCC AR4 and determined that the 1990 GHG emissions inventory and 2020 GHG emissions limit is 431 $MMTCO_2e$. CARB also updated the State's 2020 NAT emissions estimate to account for the effect of the 2007–2009 economic recession, new estimates for future fuel and energy demand, and the reductions required by regulation that were recently adopted for motor vehicles and renewable energy. CARB's projected statewide 2020 emissions estimate using the GWP values from the IPCC AR4 is 509.4 $MMTCO_2e$.

2017 Climate Change Scoping Plan

In response to the 2030 GHG reduction target, CARB adopted the 2017 Climate Change Scoping Plan at a public meeting held in December 2017. The 2017 Scoping Plan outlines the strategies the State will implement to achieve the 2030 GHG reduction target of 40 percent below 1990 levels. The 2017 Scoping Plan also addresses GHG emissions from natural and working lands of California, including the agriculture and forestry sectors. The 2017 Scoping Plan considered the Scoping Plan Scenario and four alternatives for achieving the required GHG reductions but ultimately selected the Scoping Plan Scenario.

CARB states that the Scoping Plan Scenario "is the best choice to achieve the State's climate and clean air goals."[17] Under the Scoping Plan Scenario, the majority of the reductions would result from the continuation of the Cap-and-Trade regulation. Additional reductions are achieved from electricity sector standards (i.e., utility providers to supply at least 50 percent renewable electricity by 2030), doubling the energy efficiency savings at end uses, additional reductions from the LCFS, implementing the short-lived GHG strategy (e.g., hydrofluorocarbons), and implementing the mobile source strategy and sustainable freight action plan. The alternatives were designed to consider various combinations of these programs, as well as consideration of a carbon tax in the event the Cap-and-Trade regulation is not continued. However, in July 2017, the California Legislature voted to extend the Cap-and-Trade regulation to 2030. Implementing this Scoping Plan will ensure that California's climate actions continue to promote innovation, drive the generation of new jobs, and achieve continued reductions of smog and air toxics. The ambitious approach draws on a decade of successful programs that address the major sources of climate-changing gases in every sector of the economy:

[17] California Air Resources Board, California's 2017 Climate Change Scoping Plan, November 2017, https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf

- More Clean Cars and Trucks: The plan sets out far-reaching programs to incentivize the sale of millions of zero-emission vehicles, drive the deployment of zero-emission trucks, and shift to a cleaner system of handling freight statewide.
- Increased Renewable Energy: California's electric utilities are ahead of schedule meeting the requirement that 33 percent of electricity come from renewable sources by 2020. The Scoping Plan guides utilities to 50 percent renewables, as required under SB 350.
- Slashing Super-Pollutants: The plan calls for a significant cut in super-pollutants such as methane and HFC refrigerants, which are responsible for as much as 40 percent of global warming.
- Cleaner Industry and Electricity: California's renewed cap-and-trade program extends the declining cap on emissions from utilities and industries and the carbon allowance auctions. The auctions will continue to fund investments in clean energy and efficiency, particularly in disadvantaged communities.
- Cleaner Fuels: The Low Carbon Fuel Standard will drive further development of cleaner, renewable transportation fuels to replace fossil fuels.
- Smart Community Planning: Local communities will continue developing plans which will further link transportation and housing policies to create sustainable communities.
- Improved Agriculture and Forests: The Scoping Plan also outlines innovative programs to account for and reduce emissions from agriculture, as well as forests and other natural lands.

The 2017 Scoping Plan also evaluates reductions of smog-causing pollutants through California's climate programs.

2022 Climate Change Scoping Plan

CARB adopted the 2022 Scoping Plan for Achieving Carbon Neutrality on November 16, 2022. The 2022 Scoping Plan lays out the sector-by-sector roadmap for California, the world's fifth largest economy, to achieve carbon neutrality by 2045 or earlier, outlining a technologically feasible, cost-effective, and equity-focused path to achieve the state's climate target. The Plan addresses recent legislation and direction from Governor Newsom and extends and expands upon earlier plans with a target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045. The plan also takes the unprecedented step of adding carbon neutrality as a science-based guide and touchstone for California's climate work. Specifically, this plan:

- Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030.
- Identifies a technologically feasible, cost-effective path to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels.
- Focuses on strategies for reducing California's dependency on petroleum to provide consumers with clean energy options that address climate change, improve air quality, and support economic growth and clean sector jobs.
- Integrates equity and protecting California's most impacted communities as driving principles throughout the document.
- Incorporates the contribution of natural and working lands (NWL) to the state's GHG emissions, as well as their role in achieving carbon neutrality.
- Relies on the most up-to-date science, including the need to deploy all viable tools to address the existential threat that climate change presents, including carbon capture and sequestration, as well as direct air capture.
- Evaluates the substantial health and economic benefits of taking action.
- Identifies key implementation actions to ensure success.

SB 32, Pavley. California Global Warming Solutions Act of 2006

(1) The California Global Warming Solutions Act of 2006 designates the State Air Resources Board as the state agency charged with monitoring and regulating sources of emissions of greenhouse gases. The state

board is required to approve a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions level in 1990 to be achieved by 2020 and to adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective greenhouse gas emissions reductions. This bill would require the state board to ensure that statewide greenhouse gas emissions are reduced to 40% below the 1990 level by 2030.

(2) This bill would become operative only if AB 197 of the 2015–16 Regular Session is enacted and becomes effective on or before January 1, 2017. AB 197 requires that the California Air Resources Board, which directs implementation of emission-reduction programs, should target direct reductions at both stationary and mobile sources. AB 197 of the 2015-2016 Regular Session was approved on September 8, 2016.

Senate Bill 1368

Senate Bill 1368 (SB 1368) is the companion Bill of AB 32 and was adopted September, 2006. SB 1368 requires the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007, and for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas-fired plant. Furthermore, the legislation states that all electricity provided to the State, including imported electricity, must be generated by plants that meet the standards set by California Public Utilities Commission (CPUC) and California Energy Commission (CEC).

Executive Order S-1-07

Executive Order S-1-07 was issued in 2007 and proclaims that the transportation sector is the main source of GHG emissions in the State, since it generates more than 40 percent of the State's GHG emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in the State by at least ten percent by 2020. This Order also directs the CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009, the CARB approved the proposed regulation to implement the low carbon fuel standard. The low carbon fuel standard is anticipated to reduce GHG emissions by about 16 MMT per year by 2020. The low carbon fuel standard is designed to provide a framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. Separate standards are established for gasoline and diesel fuels and the alternative fuels that can replace each. The standards are "back-loaded", with more reductions required in the last five years, than during the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the low carbon fuel standard will be based on a combination of both lower carbon fuels and more efficient vehicles.

The LCFS is designed to encourage the use of cleaner low-carbon transportation fuels in California, encourage the production of those fuels, and therefore, reduce GHG emissions and decrease petroleum dependence in the transportation sector. Separate standards are established for gasoline and diesel fuels and the alternative fuels that can replace each. The standards are "back-loaded", with more reductions required in the last five years, than during the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the low carbon fuel standard will be based on a combination of both lower carbon fuels and more efficient vehicles.

Reformulated gasoline mixed with corn-derived ethanol at ten percent by volume and low sulfur diesel fuel represent the baseline fuels. Lower carbon fuels may be ethanol, biodiesel, renewable diesel, or blends of these fuels with gasoline or diesel as appropriate. Compressed natural gas and liquefied natural gas also may be low carbon fuels. Hydrogen and electricity, when used in fuel cells or electric vehicles are also considered as low carbon fuels for the low carbon fuel standard.

Senate Bill 97

Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Natural Resources Agency, to prepare, develop, and transmit to the CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Natural Resources Agency was required to certify and adopt those guidelines by January 1, 2010.

Pursuant to the requirements of SB 97 as stated above, on December 30, 2009, the Natural Resources Agency adopted amendments to the state CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed 14 sections of the CEQA Guidelines and incorporate GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance were provided and no specific mitigation measures were identified. The GHG emission reduction amendments went into effect on March 18, 2010, and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation".
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

Senate Bill 100

Senate Bill 100 (SB 100) requires 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045. SB 100 was adopted September 2018.

The interim thresholds from prior Senate Bills and Executive Orders would also remain in effect. These include Senate Bill 1078 (SB 1078), which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 (SB 107) which changed the target date to 2010. Executive Order S-14-08, which was signed on November 2008 and expanded the State's Renewable Energy Standard to 33 percent renewable energy by 2020. Executive Order S-21-09 directed the CARB to adopt regulations by July 31, 2010 to enforce S-14-08. Senate Bill X1-2 codifies the 33 percent renewable energy requirement by 2020.

Senate Bill 375

Senate Bill 375 (SB 375) was adopted September 2008 and aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPO) to adopt a sustainable communities strategy (SCS) or alternate planning strategy (APS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP). The CARB, in consultation with each MPO, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. The CARB is also charged with reviewing each MPO's sustainable communities strategy or alternate planning strategy for consistency with its assigned targets.

The proposed project is located within the Southern California Association of Governments (SCAG) jurisdiction, which has authority to develop the SCS or APS. For the SCAG region, the targets set by the CARB are at eight percent below 2005 per capita GHG emissions levels by 2020 and 19 percent below 2005 per capita GHG emissions levels by 2035. These reduction targets became effective October 2018.

Senate Bill X7-7

Senate Bill X7-7 (SB X7-7), enacted on November 9, 2009, mandates water conservation targets and efficiency improvements for urban and agricultural water suppliers. SB X7-7 requires the Department of Water Resources (DWR) to develop a task force and technical panel to develop alternative best management practices for the water sector. In addition, SB X7-7 required the DWR to develop criteria for baseline uses for residential, commercial, and industrial uses for both indoor and landscaped area uses. The DWR was also required to develop targets and regulations that achieve a statewide 20 percent reduction in water usage.

Assembly Bill 939 and Senate Bill 1374

Assembly Bill 939 (AB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004, suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills.

California Code of Regulations (CCR) Title 24, Part 6

CCR Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24) were first established 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 efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The Energy Commission adopted 2008 Standards on April 23, 2008, and Building Standards Commission approved them for publication on September 11, 2008. These updates became effective on August 1, 2009. CalEEMod modeling defaults to 2008 standards. 2013 Standards were approved and have been effective since July 1, 2014. 2016 Standards were adopted January 1, 2017. 2019 standards were published July 1, 2019 and became effective January 1, 2020. All buildings for which an application for a building permit is submitted on or after January 1, 2020 must follow the 2019 standards. The 2016 residential standards were estimated to be approximately 28 percent more efficient than the 2013 standards, whereas the 2019 residential standards are estimated to be approximately 7 percent more efficient than the 2016 standards. Furthermore, once rooftop solar electricity generation is factored in, 2019 residential standards are estimated to be approximately 53 percent more efficient than the 2016 standards. Under the 2019 standards, nonresidential buildings are estimated to be approximately 30 percent more efficient than the 2016 standards.

Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions.

Per Section 100 Scope, the 2019 Title 24, Part 6 Building Code now requires healthcare facilities, such as assisted living facilities, hospitals, and nursing homes, to meet documentation requirements of Title 24, Part 1 Chapter 7 – Safety Standards for Health Facilities. A healthcare facility is defined as any building or portion thereof licensed pursuant to California Health and Safety Code Division 2, Chapter 1, Section 1204 or Chapter 2, Section 1250.

Section 120.1 Ventilation and Indoor Air Quality included both additions and revisions in the 2019 Code. This section now requires nonresidential and hotel/motel buildings to have air filtration systems that use forced air ducts to supply air to occupiable spaces to have air filters. Further, the air filter efficiency must be either MERV 13 or use a particle size efficiency rating specific in the Energy Code AND be equipped with air filters with a minimum 2 inch depth or minimum 1 inch depth if sized according to the equation 120.1-A. If natural ventilation is to be used the space must also use mechanical unless ventilation openings are either permanently open or controlled to stay open during occupied times. The 2019 version of the Code also completely revised the minimum ventilation requirements including DVC airflow rates within Section 120.1 Table 120.1–A. Table 120.1-A now includes air classification and recirculation limitations, these are based on either the number of occupants or the CFM/ft^2 (cubic feet per minute per square foot), whichever is greater.

Section 120.1 Ventilation and Indoor Air Quality also included additions for high-rise residential buildings. Requirements include that mechanical systems must provide air filters that and that air filters must be MERV 13 or use a particle size efficiency rating specified in the Energy Code. Window operation is no longer a method allowed to meet ventilation requirements, continuous operation of central forced air system ari handlers used in central fan integrated ventilation system is not a permissible method of providing the dwelling unit ventilation airflow, and central ventilation systems that serve multiple dwelling units must be balanced to provide ventilation airflow to each dwelling unit. In addition, requirements for kitchen range hoods were also provided in the updated Section 120.1.

Per Section 120.1(a) healthcare facilities must be ventilated in accordance with Chapter 4 of the California Mechanical Code and are NOT required to meet the ventilations requirements of Title 24, Part 6.

Section 140.4 Space Conditioning Systems included both additions and revisions within the 2019 Code. The changes provided new requirements for cooling tower efficiency, new chilled water cooling system requirements, as well as new formulas for calculating allowed fan power. Section 140.4(n) also provide a new exception for mechanical system shut-offs for high-rise multifamily dwelling units, while Section 140.4(o) added new requirements for conditioned supply air being delivered to space with mechanical exhaust.

Section 120.6 Covered Processes added information in regards to adiabatic chiller requirements that included that all condenser fans for air-cooled converseness, evaporative-cooled condensers, adiabatic condensers, gas coolers, air or water fluid coolers or cooling towers must be continuously variable speed, with the speed of all fans serving a common condenser high side controlled in unison .Further, the mid-condensing setpoint must be 70 degrees Fahrenheit for all of the above mentioned systems.

New regulations were also adopted under Section 130.1 Indoor Lighting Controls. These included new exceptions being added for restrooms, the exception for classrooms being removed, as well as exceptions in regards to sunlight provided through skylights and overhangs.

Section 130.2 Outdoor Lighting Controls and Equipment added automatic scheduling controls which included that outdoor lighting power must be reduced by 50 to 90 percent, turn the lighting off during unoccupied times and have at least two scheduling options for each luminaire independent from each other and with a 2-hour override function. Furthermore, motion sensing controls must have the ability to reduce power within 15 minutes of area being vacant and be able to come back on again when occupied. An exception allows for lighting subject to a health or life safety statute, ordinance, or regulation may have a minimum time-out period

longer than 15 minutes or a minimum dimming level above 50% when necessary to comply with the applicable law.

The 2022 Building Energy Efficiency Standards became effective on January 1, 2023. [18] The core focus of the building standards has been efficiency, but the 2019 Energy Code ventured into onsite generation by requiring solar PV on new homes, providing significant GHG savings. The 2022 update builds off this progress with expanded solar standards and the move to onsite energy storage that will help Californians save on utility bills while bolstering the grid. The 2022 Energy Code update focuses on four key areas in new construction of homes and businesses:

- Encouraging electric heat pump technology and use, which consumes less energy and produces fewer emissions than traditional HVACs and water heaters.
- Establishing electric-ready requirements when natural gas is installed, which positions owners to use cleaner electric heating, cooking and electric vehicle (EV) charging options whenever they choose to adopt those technologies.
- Expanding solar photovoltaic (PV) system and battery storage standards to make clean energy available onsite and complement the state's progress toward a 100 percent clean electricity grid.
- Strengthening ventilation standards to improve indoor air quality.

The 2022 Energy Code affects homes by establishing energy budgets based on efficient heat pumps for space or water heating to encourage builders to install heat pumps over gas-fueled HVAC units; requiring homes to be electric-ready, with dedicated 240-volt outlets and space (with plumbing for water heaters) so electric appliances can eventually replace installed gas appliances; increasing minimum kitchen ventilation requirements so that fans over cooktops have higher airflow or capture efficiency to better exhaust pollution from gas cooking and improve indoor air quality; and allowing exceptions to existing solar PV standards when roof area is not available (such as for smaller homes). In addition, the effect on businesses includes establishing combined solar PV and battery standards for select businesses with systems being sized to maximize onsite use of solar energy and avoid electricity demand during times when the grid must use gas-powered plants; establishing new efficiency standards for commercial greenhouses (primarily cannabis growing); and improving efficiency standards for building envelope, various internal systems, and grid integration equipment, such as demand-responsive controls to buoy grid stability.[19,20]

However, as the project is a water supply infrastructure project, it is not subject to these Title 24 Building Energy Efficiency Standards.

California Code of Regulations (CCR) Title 24, Part 11 (California Green Building Standards)

On January 12, 2010, the State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011.

2016 CALGreen Code: The 2016 residential standards were estimated to be approximately 28 percent more efficient than the 2013 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions. During the 2016-2017 fiscal year, the Department of Housing and Community Development (HCD) updated CALGreen through the 2015 Triennial Code Adoption Cycle.

HCD also increased the required construction waste reduction from 50 percent to 65 percent of the total building site waste. This increase aids in meeting CalRecycle's statewide solid waste recycling goal of 75

[18] California Energy Commission (CEC). 2022. Building Energy Efficiency Standards. https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency.

[19] https://www.lightnowblog.com/2021/08/california-energy-commission-adopts-2022-building-energy-efficiency-standards/

[20] State of California Energy Commission. 2022 Building Energy Efficiency Standards Summary. https://www.energy.ca.gov/sites/default/files/2021-08/CEC_2022_EnergyCodeUpdateSummary_ADA.pdf

percent for 2020 as stated in Chapter 476, Statutes of 2011 (AB 341). HCD adopted new regulations requiring recycling areas for multifamily projects of five or more dwelling units. This regulation requires developers to provide readily accessible areas adequate in size to accommodate containers for depositing, storage and collection of non-hazardous materials (including organic waste) for recycling. This requirement assists businesses that were required as of April 1, 2016, to meet the requirements of Chapter 727, Statutes of 2014 (AB 1826).

HCD adopted new regulations to require information on photovoltaic systems and electric vehicle chargers to be included in operation and maintenance manuals. Currently, CALGreen section 4.410.1 Item 2(a) requires operation and maintenance instructions for equipment and appliances. Photovoltaic systems and electric vehicle chargers are systems that play an important role in many households in California, and their importance is increasing every day. HCD incorporated these two terms in the existing language in order to provide clarity to code users as to additional systems requiring operation and maintenance instructions.

HCD updated the reference to Clean Air Standards of the United States Environmental Protection Agency applicable to woodstoves and pellet stoves. HCD also adopted a new requirement for woodstoves and pellet stoves to have a permanent label indicating they are certified to meet the emission limits. This requirement provides clarity to the code user and is consistent with the United States Environmental Protection Agency's New Source Performance Standards. HCD updated the list of standards which can be used for verification of compliance for exterior grade composite wood products. This list now includes four standards from the Canadian Standards Association (CSA): CSA O121, CSA O151, CSA O153 and CSA O325. HCD updated heating and air-conditioning system design references to the ANSI/ACCA 2 Manual J, ANSI/ACCA 1 Manual D, and ANSI/ACCA 3 Manual S to the most recent versions approved by ANSI. HCD adopted a new elective measure for hot water recirculation systems for water conservation. The United States Department of Energy estimates that 3,600 to 12,000 gallons of water per year can be saved by the typical household (with four points of hot water use) if a hot water recirculation system is installed.

2019 CALGreen Code: During the 2019-2020 fiscal year, the Department of Housing and Community Development (HCD) updated CALGreen through the 2019 Triennial Code Adoption Cycle. The 2019 version of the California Green Building Standards became effective January 1, 2020.

HCD modified the best management practices for stormwater pollution prevention adding Section 5.106.2 for projects that disturb one or more acres of land. This section requires projects that disturb one acre or more of land or less than one acre of land but are part of a larger common plan of development or sale must comply with the postconstruction requirement detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board. The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff pre-project hydrology) with installation of postconstruction stormwater management measures.

HCD added sections 5.106.4.1.3 and 5.106.4.1.5 in regard to bicycle parking. Section 5.106.4.1.3 requires 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. In addition, Section 5.106.4.1.5 states that acceptable bicycle parking facility for Sections 5.106.4.1.2 through 5.106.4.1.4 shall be convenient from the street and shall meeting one of the following: (1) covered, lockable enclosures with permanently anchored racks for bicycles; (2) lockable bicycle rooms with permanently anchored racks; or (3) lockable, permanently anchored bicycle lockers.

HCD amended section 5.106.5.3.5 allowing future charging spaces to qualify as designated parking for clean air vehicles.

HCD updated section 5.303.3.3 in regard to showerhead flow rates. This update reduced the flow rate to 1.8 GPM.

HCD amended section 5.304.1 for outdoor potable water use in landscape areas and repealed sections 5.304.2 and 5.304.3. The update requires nonresidential developments to comply with a local water efficient landscape ordinance or the current California Department of Water Resource's' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent. Some updates were also made in regard to the outdoor potable water use in landscape areas for public schools and community colleges.

HCD updated Section 5.504.5.3 in regard to the use of MERV filters in mechanically ventilated buildings. This update changed the filter use from MERV 8 to MERV 13. MERV 13 filters are to be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

The 2022 California Green Building Standards Code will become effective on January 1, 2023.[21]

HCD amended Section 5.106.5.3 in regard to increasing the EV capable space percentages and adding a new requirement for installed Level 2 DCFC chargers.

HCD under Section 5.106.5.4 added new regulation for electric vehicle charging readiness requirements for new construction of warehouse, grocery stores, and retail stores with planned off-street loading spaces. [22]

However, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards (CALGreen).

Executive Order B-30-15

On April 29, 2015, Governor Brown issued Executive Order B-30-15. Therein, the Governor directed the following:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Ordered all state agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets.
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

Executive Order B-29-15

Executive Order B-29-15, mandates a statewide 25 percent reduction in potable water usage. EO B-29-15 signed into law on April 1, 2015.

Executive Order B-37-16

Executive Order B-37-16, continuing the State's adopted water reductions, was signed into law on May 9, 2016. The water reductions build off the mandatory 25 percent reduction called for in EO B-29-15.

Executive Order N-79-20

Executive Order N-79-20 Signed in September 2020, Executive Order N-79-20 establishes as a goal that where feasible, all new passenger cars and trucks, as well as all drayage/cargo trucks and off-road vehicles and equipment, sold in California, will be zero-emission by 2035. The executive order sets a similar goal requiring that all medium and heavy-duty vehicles will be zero-emission by 2045 where feasible. It also directs

[21] California Building Standards Commission (CBSC). 2022. California Green Building Standards. Website: https://codes.iccsafe.org/content/CAGBC2022P1.

[22] https://www.dgs.ca.gov/BSC/Resources/2022-Title-24-California-Code-Changes

CARB to develop and propose rulemaking for passenger vehicles and trucks, medium-and heavy-duty fleets where feasible, drayage trucks, and off-road vehicles and equipment "requiring increasing volumes" of new zero emission vehicles (ZEVs) "towards the target of 100 percent." The executive order directs the California Environmental Protection Agency, the California Geologic Energy Management Division (CalGEM), and the California Natural Resources Agency to transition and repurpose oil production facilities with a goal toward meeting carbon neutrality by 2045. Executive Order N-79-20 builds upon the CARB Advanced Clean Trucks regulation, which was adopted by CARB in July 2020.

SBX1 2

Signed into law in April 2011, SBX1 2, requires one-third of the State's electricity to come from renewable sources. The legislation increases California's current 20 percent renewables portfolio standard target in 2010 to a 33 percent renewables portfolio standard by December 31, 2020.

Senate Bill 350

Signed into law October 7, 2015, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. This will increase the use of Renewables Portfolio Standard (RPS) eligible resources, including solar, wind, biomass, geothermal, and others. In addition, SB 350 requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030. To help ensure these goals are met and the greenhouse gas emission reductions are realized, large utilities will be required to develop and submit Integrated Resource Plans (IRPs). These IRPs will detail how each entity will meet their customers resource needs, reduce greenhouse gas emissions and ramp up the deployment of clean energy resources.

Governor Newsom's September 2022 Climate Legislation

On September 16, 2022, California enacted some of the nation's most aggressive climate measures in history as Governor Gavin Newsom signed a sweeping package of legislation to cut pollution, protect Californians from big polluters, and accelerate the state's transition to clean energy. The Governor partnered with legislative leaders to advance groundbreaking measures to achieve carbon neutrality no later than 2045 and 90 percent clean energy by 2035, establish new setback measures protecting communities from oil drilling, capture carbon pollution from the air, advance nature-based solutions, and more.

Over the next two decades, the California Climate Commitment will:

- Create 4 million new jobs
- Cut air pollution by 60 percent
- Reduce state oil consumption by 91 percent
- Save California $23 billion by avoiding the damages of pollution
- Reduce fossil fuel use in buildings and transportation by 92 percent
- Cut refinery pollution by 94 percent[23]

The following describes a few of the many bills signed in through the Governor's climate package.

Assembly Bill 1279

Establishes a clear, legally binding, and achievable goal for California to achieve statewide carbon neutrality as soon as possible, and no later than 2045, and establishes an 85% emissions reduction target as part of that goal.

[23] https://www.gov.ca.gov/2022/09/16/governor-newsom-signs-sweeping-climate-measures-ushering-in-new-era-of-world-leading-climate-action/

Senate Bill 1137

Establishes a setback distance of 3,200 feet between any new oil well and homes, schools, parks or businesses open to the public. Ensures comprehensive pollution controls for existing oil wells within 3,200 feet of these facilities.

Senate Bill 1020

Creates clean electricity targets of 90 percent by 2035 and 95 percent by 2040 with the intent of advancing the state's trajectory to the existing 100 percent clean electricity retail sales by 2045 goal.

Senate Bill 905

Establishes a clear regulatory framework for carbon removal and carbon capture, utilization and sequestration. Bans the practice of injecting carbon dioxide for the purpose of enhanced oil recovery.

Assembly Bill 1757

Requires the state to develop an achievable carbon removal target for natural and working lands.

Energy Sector and CEQA Guidelines Appendix F

The CEC first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods. The 2016 update to the Energy Efficiency Standards for Residential and Nonresidential Buildings focuses on several key areas to improve the energy efficiency of renovations and addition to existing buildings as well as newly constructed buildings and renovations and additions to existing buildings. The major efficiency improvements to the residential Standards involve improvements for attics, walls, water heating, and lighting, whereas the major efficiency improvements to the nonresidential Standards include alignment with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1-2013 national standards. Furthermore, the 2016 update required that enforcement agencies determine compliance with CCR, Title 24, Part 6 before issuing building permits for any construction.[24]

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality."[25] As of January 1, 2011, the CALGreen Code is mandatory for all new buildings constructed in the state. The CALGreen Code establishes mandatory measures for new residential and non-residential buildings. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. The CALGreen Code was most recently updated in 2022 to include new mandatory measures for residential and nonresidential uses; the new measures took effect on January 1, 2023.

[24] California Energy Commission, 2016 Building Energy Efficiency Standards, June 2015, http://www.energy.ca.gov/2015publications/CEC-400-2015-037/CEC-400-2015-037-CMF.pdf

[25] California Building Standards Commission, 2010 California Green Building Standards Code, (2010).

However, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards.

Regional – Mojave Desert Air Quality Management District

The project is within the Mojave Desert Air Basin, which is under the jurisdiction of the Mojave Desert Air Quality Management District (MDAQMD).

As shown in Table 6, the MDAQMD has identified thresholds of 100,000 tons per year or 548,000 pounds per day of CO2e emissions for individual projects.

Local – County of San Bernardino

County of San Bernardino General Plan

As stated previously, the County of San Bernardino Countywide Plan (Policy Plan) serves as the County's General Plan and was adopted in October 2020. The greenhouse gas emissions related goals and policies from the Natural Resources Element that are applicable to the proposed project are presented below:

Goal NR-1 Air quality that promotes health and wellness of residents in San Bernardino County through improvements in locally-generated emissions.

Policy NR-1.1 *Land Use*. We promote compact and transit-oriented development countywide and regulate the types and locations of development in unincorporated areas to minimize vehicle miles traveled and greenhouse gas emissions.

Policy NR-1.7 *Greenhouse Gas Reduction Targets*. We strive to meet the 2040 and 2050 greenhouse gas emission reduction targets in accordance with state law.

Policy NR-1.8 *Construction and Operations*. We invest in County facilities and fleet vehicles to improve energy efficiency and reduce emissions. We encourage County contractors and other builders and developers to use low-emission construction vehicles and equipment to improve air quality and reduce emissions.

Policy NR-1.9 *Building Design and Upgrades*. We use the CALGreen Code to meet energy efficiency standards for new buildings and encourage the upgrading of existing buildings to incorporate design elements, building materials, and fixtures that improve environmental sustainability and reduce emissions.

San Bernardino Associated Governments (SANBAG) San Bernardino County Regional Greenhouse Gas Reduction Plan

The County of San Bernardino adopted its Greenhouse Gas Emissions Reduction Plan (GHGRP) in December 2011.Through the GHGRP, the County has established goals and policies that incorporate environmental responsibility into the everyday management of its community operations. The GHGRP was updated in June 2021. The GHGRP Update includes reduction goals in energy efficiency, water conservation, alternative transportation, solid waste reduction, and clean energy. The GHGRP Update is built on a combination of State, County, and local reduction measures to achieve the County's GHG reduction goal of 40 percent below 2020 levels by 2030.

Furthermore, as shown in the County of San Bernardino Greenhouse Gas Emissions Development Review Process Screening Tables (revised September 2021), the initial screening procedure is to determine if a project will emit 3,000 metric tons of carbon dioxide equivalents ($MTCO_2e$) per year or more. Projects that do not

exceed this threshold require no further climate change analysis. Projects exceeding this threshold must either use the County's Screening Tables to garner at least 100 points or quantify project-specific GHG emissions that achieve the equivalent level of GHG emissions efficiency as a 100-point project. Projects failing to meet the 100-point threshold would have a potentially significant impact related to climate change and greenhouse gas emissions.

SIGNIFICANCE THRESHOLDS

Appendix G of State CEQA Guidelines

The CEQA Guidelines recommend that a lead agency consider the following when assessing the significance of impacts from GHG emissions on the environment:

- The extent to which the project may increase (or reduce) GHG emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
- The extent to which the project complies with regulations or requirements adopted to implement an adopted statewide, regional, or local plan for the reduction or mitigation of GHG emissions.[26]

Thresholds of Significance for this Project

To determine whether the project's GHG emissions are significant, this analysis uses the San Bernardino County GHG Reduction Plan threshold of 3,000 $MTCO_2e$ per year and the MDAQMD thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds per year of CO2e.

METHODOLOGY

The proposed project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. Therefore, the proposed project has the potential to generate GHG emissions from mobile sources and construction equipment. However, it should be noted that mobile sources were not included in the analysis as additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated and only a minimal number of daily worker trips will be needed for routine inspections and maintenance. Therefore, additional vehicle trips and emissions associated with the operation of the proposed project would be negligible.

CalEEMod Version 2022.1.1.29 was used to calculate the GHG emissions from the construction of the proposed project. The construction-related GHG emissions were included in the analysis and were based on a 30-year amortization rate as recommended in the SCAQMD GHG Working Group meeting on November 19, 2009. The construction related GHG emissions were calculated by CalEEMod and in the manner detailed above in Section 2. The CalEEMod Output is available in Appendix B.

PROJECT GREENHOUSE GAS EMISSIONS

The construction related GHG emissions have been calculated based on the parameters described above. A summary of the results is shown below in Table 9 and the CalEEMod Model run for the proposed project is provided in Appendix C. Table 9 shows that the subtotal for the proposed project would result in annual construction emissions of 60.9 MTCO2e per year. This level of does not exceed the MDAQMD annual

[26] The Governor's Office of Planning and Research recommendations include a requirement that such a plan must be adopted through a public review process and include specific requirements that reduce or mitigate the project's incremental contribution of GHG emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

threshold of 100,000 $MTCO_2e$ or the San Bernardino County GHGRP Update threshold of 3,000 $MTCO_2e$ per year.

According to the MDAQMD thresholds of significance established above, a cumulative global climate change impact would occur if the GHG emissions created from project would exceed 100,000 $MTCO_2e$ per year and 548,000 pounds per year of CO2e. Therefore, as the project's total emissions do not exceed either 100,000 $MTCO_2e$ per year or 548,000 pounds per year of CO2e, construction of the proposed project would not create a significant cumulative impact to global climate change.

Table 9
Project-Related Greenhouse Gas Emissions

Category	Greenhouse Gas Emissions (Metric Tons/Year)						(lbs/day)
	Bio-CO2	NonBio-CO_2	CO_2	CH_4	N_2O	CO_2e	CO2e
Construction[1]	0.00	60.33	60.33	0.00	0.00	60.90	959.43
San Bernardino County GHGRP Update Threshold						3,000.00	-
Exceeds Threshold?						No	-
MDAQMD GHG Thresholds						100,000	548,000
Exceeds Threshold?						No	No

Notes:

Source: CalEEMod Version 2022.1.1.29.

(1) Construction GHG emissions CO2e based on a 30 year amortization rate.

Consistency With Applicable Greenhouse Gas Reduction Plans and Policies

The proposed project would have the potential to conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

According to the San Bernardino County GHGRP Update, "all development projects, including those otherwise determined to be exempt from CEQA will be subject to applicable Development Code provisions, including the GHG performance standards, and state requirements, such as the California Building Code requirements for energy efficiency. With the application of the GHG performance standards, projects that are exempt from CEQA and small projects that do not exceed 3,000 $MTCO_2e$ per year will be considered to be consistent with the Plan and determined to have a less than significant individual and cumulative impact for GHG emissions." The GHGRP Update also states that the County utilizes the 3,000 $MTCO_2e$ per year value as it is "the size of development that is too small to be able to provide the level of GHG emission reductions expected from the Screening Tables or alternate emission analysis method (described in Attachment D) based upon the 90th percentile capture rate concept."

As stated in the Methodology section above, the proposed project has the potential to generate GHG emissions from mobile sources and construction equipment. However, mobile sources were not included in the analysis as additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated and only a minimal number of daily worker trips will be needed for routine inspections and maintenance. Therefore, additional vehicle trips and emissions associated with the operation of the proposed project would be negligible. Furthermore, the project's construction GHG emissions would not exceed the County's screening threshold of 3,000 $MTCO_2e$ per year; therefore, the project does not need to accrue points using the screening tables and is consistent with the GHG Plan pursuant to Section 15183.5 of the State CEQA Guidelines. As the project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well, none of the performance standards detailed in the San Bernardino County Greenhouse Gas Emissions Reduction Plan Update (see Appendix D) are applicable to the prosed project. Therefore, the proposed project will not result in substantial emissions of greenhouse gases, will not conflict with the Green County initiatives, and would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. Impacts are less than significant.

Cumulative Greenhouse Gas Impacts

Although the project is expected to emit GHGs, the emission of GHGs by a single project into the atmosphere is not itself necessarily an adverse environmental effect. Rather, it is the increased accumulation of GHG from more than one project and many sources in the atmosphere that may result in global climate change. Therefore, in the case of global climate change, the proximity of the project to other GHG emission generating activities is not directly relevant to the determination of a cumulative impact because climate change is a global condition. According to CAPCOA, "GHG impacts are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective."[27] The resultant consequences of that climate change can cause adverse environmental effects. A project's GHG emissions typically would be very small in comparison to state or global GHG emissions and, consequently, they would, in isolation, have no significant direct impact on climate change.

The state has mandated a goal of reducing statewide emissions to 1990 levels by 2020, even though statewide population and commerce are predicted to continue to expand. In order to achieve this goal, CARB is in the process of establishing and implementing regulations to reduce statewide GHG emissions. Consistent with

[27] Source: California Air Pollution Control Officers Association, CEQA & Climate change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act, (2008).

CEQA Guidelines Section 15064h(3),[28] the City, as lead agency, has determined that the project's contribution to cumulative GHG emissions and global climate change would be less than significant if the project is consistent with the applicable regulatory plans and policies to reduce GHG emissions.

Thus, given the project's consistency with the County of San Bernardino GHGRP Update and MDAQMD thresholds of 100,000 $MTCO_2e$ per year and 548,000 pounds per year of CO2e, 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. Given this consistency, it is concluded that the project's incremental contribution to greenhouse gas emissions and their effects on climate change would not be cumulatively considerable.

[28] The State CEQA Guidelines were amended in response to SB 97. In particular, the State CEQA Guidelines were amended to specify that compliance with a GHG emissions reduction program renders a cumulative impact insignificant. Per State CEQA Guidelines Section 15064(h)(3), a project's incremental contribution to a cumulative impact can be found not cumulatively considerable if the project will comply with an approved plan or mitigation program that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area of the project. To qualify, such a plan or program must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency. Examples of such programs include a "water quality control plan, air quality attainment or maintenance plan, integrated waste management plan, habitat conservation plan, natural community conservation plan, [and] plans or regulations for the reduction of greenhouse gas emissions."

4. ENERGY ANALYSIS

EXISTING CONDITIONS

This section provides an overview of the existing energy conditions in the project area and region.

Overview

California's estimated annual energy use as of 2023 included:

- Approximately 281,140 gigawatt hours of electricity;[29]
- Approximately 2,087,461 million cubic feet of natural gas per year;[30] and
- Approximately 23.2 billion gallons of transportation fuel (for the year 2015).[31]

As of 2022, the year of most recent data currently available by the United States Energy Information Administration (EIA), energy use in California by demand sector was:

- Approximately 42.6 percent transportation;
- Approximately 22.5 percent industrial;
- Approximately 17.6 percent residential; and
- Approximately 17.4 percent commercial.[32]

California's electricity in-state generation system generates approximately 215,623 gigawatt-hours each year. In 2023, California produced approximately 77 percent of the electricity it uses; the rest was imported from the Pacific Northwest (approximately 6 percent) and the U.S. Southwest (approximately 18 percent). Natural gas is the main source for electricity generation at approximately 43.68 percent of the total in-state electric generation system power as shown in Table 10.

A summary of and context for energy consumption and energy demands within the State is presented in "U.S. Energy Information Administration, California State Profile and Energy Estimates, Quick Facts" excerpted below:

- In 2023, California was the seventh-largest producer of crude oil among the 50 states, and, the state ranked third in crude oil refining capacity.
- California is the largest consumer of jet fuel and second-largest consumer of motor gasoline among the 50 states.
- California was the second-largest total energy consumer among the states, after Texas, but its per capita energy consumption is the fourth lowest in the nation.
- In 2023, renewable resources, including hydroelectric power and small-scale solar power, supplied 54% of California's in-state electricity generation. Natural gas fueled another 39% and nuclear power supplied almost all the rest.

[29] California Energy Commission. Energy Almanac. Total Electric Generation. [Online] 2023. 2023 Total System Electric Generation (ca.gov).

[30] Natural Gas Consumption by End Use. U.S. Energy Information Administration. [Online] 2023. https://www.eia.gov/dnav/ng/ng_cons_sum_dcu_SCA_a.htm.

[31] California Energy Commission. Revised Transportation Energy Demand Forecast 2018-2030. [Online] 2021. https://www.energy.ca.gov/data-reports/planning-and-forecasting

[32] U.S. Energy Information Administration. California Energy Consumption by End-Use Sector, 2021. California State Profile Overview.[Online] January 8, 2023 https://www.eia.gov/state/?sid=CA#tabs-2

- In 2023, California was the fourth-largest electricity producer in the nation. It is also the nation's third-largest electricity consumer and imports more electricity than any other state.[33]

As indicated above, California is one of the nation's leading energy-producing states, and California per capita energy use is among the nation's most efficient. Given the nature of the proposed project, the remainder of this discussion will focus on the three sources of energy that are most relevant to the project—namely, electricity and natural gas for building uses, and transportation fuel for vehicle trips associated with the proposed project.

Electricity

Electricity would be provided to the project by Southern California Edison (SCE). SCE provides electric power to more than 15 million persons, within a service area encompassing approximately 50,000 square miles.[34] SCE derives electricity from varied energy resources including: fossil fuels, hydroelectric generators, nuclear power plants, geothermal power plants, solar power generation, and wind farms. SCE also purchases from independent power producers and utilities, including out-of-state suppliers. [35]

Table 11 identifies SCE's specific proportional shares of electricity sources in 2023. As shown in Table 11, the 2023 SCE Power Mix has renewable energy at 37.6 percent of the overall energy resources, of which biomass and waste is at 0.1 percent, geothermal is at 5.2 percent, eligible hydroelectric is at 0.7 percent, solar energy is at 19.8 percent, and wind power is at 11.7 percent; other energy sources include large hydroelectric at 4.5 percent, natural gas at 20 percent, nuclear at 9.1 percent, other at 0.1 percent, and unspecified sources at 28.8 percent.

Natural Gas

Natural gas would be provided to the project by Southwest Gas. The following summary of natural gas resources and service providers, delivery systems, and associated regulation is excerpted from information provided by the California Public Utilities Commission (CPUC).

The CPUC regulates natural gas utility service for approximately 11 million customers that receive natural gas from Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E), Southwest Gas, and several smaller investor-owned natural gas utilities. The CPUC also regulates independent storage operators Lodi Gas Storage, Wild Goose Storage, Central Valley Storage and Gill Ranch Storage.

The vast majority of California's natural gas customers are residential and small commercial customers, referred to as "core" customers. Larger volume gas customers, like electric generators and industrial customers, are called "noncore" customers. Although very small in number relative to core customers, noncore customers consume about 65% of the natural gas delivered by the state's natural gas utilities, while core customers consume about 35%.

The PUC regulates the California utilities' natural gas rates and natural gas services, including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing.

Most of the natural gas used in California comes from out-of-state natural gas basins. In 2017, for example, California utility customers received 38% of their natural gas supply from basins located in the U.S. Southwest, 27% from Canada, 27% from the U.S. Rocky Mountain area, and 8% from production located in California."[36]

[33] State Profile Overview. [Online] [Cited: April 20, 2023.] https://www.eia.gov/state/?sid=CA#tabs-2

[34] https://www.sce.com/about-us/who-we-are/leadership/our-service-territory

[35] California Energy Commission. Utility Energy Supply plans from 2015. https://www.energy.ca.gov/almanac/electricity_data/supply_forms.html

[36] California Public Utilities Commission. Natural Gas and California. http://www.cpuc.ca.gov/natural_gas/

Transportation Energy Resources

The project would attract additional vehicle trips with resulting consumption of energy resources, predominantly gasoline and diesel fuel. Gasoline (and other vehicle fuels) are commercially-provided commodities and would be available to the project patrons and employees via commercial outlets.

The most recent data available shows the transportation sector emits 38 percent of the total greenhouse gases in the state and about 84 percent of smog-forming oxides of nitrogen (NOx).[37,38] About 27 percent of total United States energy consumption in 2022 was for transporting people and goods from one place to another. In 2022, petroleum comprised about 90 percent of all transportation energy use, excluding fuel consumed for aviation and most marine vessels.[39] In 2022, about 135.06 billion gallons (or about 3.22 billion barrels) of finished motor gasoline were consumed in the United States, an average of about 370 million gallons (or about 8.81 million barrels) per day.[40]

Regulatory Background

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. On the state level, the PUC and the California Energy Commissions (CEC) are two agencies with authority over different aspects of energy. Relevant federal and state energy-related laws and plans are summarized below.

Federal Regulations

Corporate Average Fuel Economy (CAFE) Standards

First established by the U.S. Congress in 1975, the Corporate Average Fuel Economy (CAFE) standards reduce energy consumption by increasing the fuel economy of cars and light trucks. The National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (USEPA) jointly administer the CAFE standards. The U.S. Congress has specified that CAFE standards must be set at the "maximum feasible level" with consideration given for: (1) technological feasibility; (2) economic practicality; (3) effect of other standards on fuel economy; and (4) need for the nation to conserve energy.[41]

Issued by NHTSA and EPA in March 2020 (published on April 30, 2020 and effective after June 29, 2020), the Safer Affordable Fuel-Efficient Vehicles Rule would maintain the CAFE and CO2 standards applicable in model year 2020 for model years 2021 through 2026. The estimated CAFE and CO2 standards for model year 2020 are 43.7 mpg and 204 grams of CO2 per mile for passenger cars and 31.3 mpg and 284 grams of CO2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. This Rule also excludes CO2- equivalent emission improvements associated with air conditioning refrigerants and leakage (and, optionally, offsets for nitrous oxide and methane emissions) after model year 2020.[42]

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[37] CARB. California Greenhouse Gas Emissions Inventory – 2022 Edition. https://www.arb.ca.gov/cc/inventory/data/data.htm

[38] CARB. 2016 SIP Emission Projection Data. https://www.arb.ca.gov/app/emsinv/2017/emseic1_query.php?F_DIV=-4&F_YR=2012&F_SEASON=A&SP=SIP105ADJ&F_AREA=CA

[39] US Energy Information Administration. Use of Energy in the United States Explained: Energy Use for Transportation. https://www.eia.gov/energyexplained/?page=us_energy_transportation

[40] https://www.eia.gov/tools/faqs/faq.php?id=23&t=10

[41] https://www.nhtsa.gov/lawsregulations/corporate-average-fuel-economy.

[42] National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (USEPA), 2018. Federal Register / Vol. 83, No. 165 / Friday, August 24, 2018 / Proposed Rules, The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks 2018. Available at: https://www.gpo.gov/fdsys/pkg/FR-2018-08-24/pdf/2018-16820.pdf.

On May 12, 2021, the National Highway Traffic Safety Administration (NHTSA) published a notice of proposed rulemaking in the Federal Register, proposing to repeal "The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," published Sept. 27, 2019 (SAFE I Rule), in which NHTSA codified regulatory text and made additional pronouncements regarding the preemption of state and local laws related to fuel economy standards. Specifically, this document proposed to fully repeal the regulatory text and appendices promulgated in the SAFE I Rule. In addition, this document proposed to repeal and withdraw the interpretative statements made by the Agency in the SAFE I Rule preamble, including those regarding the preemption of particular state Greenhouse Gas (GHG) Emissions standards or Zero Emissions Vehicle (ZEV) mandates. As such, this document proposed to establish a clean slate with respect to NHTSA's regulations and interpretations concerning preemption under the Energy Policy and Conservation Act (EPCA). This action is effective as of January 28, 2022. [43]

Intermodal Surface transportation Efficiency Act of 1991 (ISTEA)

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs) were to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values guiding transportation decisions.

The Transportation Equity Act of the 21st Century (TEA-21)

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation, discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

State Regulations

Integrated Energy Policy Report (IEPR)

Senate Bill 1389 requires the California Energy Commission (CEC) 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. 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 2022 Integrated Energy Policy Report (2022 IEPR) was adopted in February 28, 2023. The 2022 IEPR provides updates on a variety of energy issues facing California. These issues will require action if the state is to meet its climate, energy, air quality, and other environmental goals while maintaining reliability and controlling costs. The 2022 IEPR also discusses the California Energy Commission's equity and environmental justice efforts, its development of a more easily navigable online data platform via the California Energy Planning Library, and an update to the California Energy Demand Forecast. The report also provides

[43] https://www.federalregister.gov/documents/2021/05/12/2021-08758/corporate-average-fuel-economy-cafe-preemption

information on emerging topics related to energy reliability, western electricity integration, hydrogen, gasoline prices, gas transition, and distributed energy resources.[44]

The 2023 Integrated Energy Policy Report (2023 IEPR) was completed in January 2024. The 2023 IEPR discusses speeding connection of clean resources to the electricity grid, the potential use of clean and renewable hydrogen, and the California Energy Demand Forecast to 2040. The report also provides updates on topics such as gas decarbonization, energy efficiency, the Clean Transportation Program, Assembly Bill 1257 (Bocanegra, Chapter 749, Statutes of 2013), and publicly owned utilities' progress toward peak demand reserves and margins.[45]

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 and accommodate pedestrian and bicycle access.

California Building Standards Code (Title 24)

The California Building Standards Code Title 24 was previously discussed in Section 3 of this report.

California Building Energy Efficiency Standards (Title 24, Part 6)

The California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) were adopted to ensure that building construction and system design and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The current California Building Energy Efficiency Standards (Title 24 standards) are the 2019 Title 24 standards, which became effective on January 1, 2020. The 2019 Title 24 standards include efficiency improvements to the lighting and efficiency improvements to the non-residential standards include alignment with the American Society of Heating and Air-Conditioning Engineers. For example, window operation is no longer a method allowed to meet ventilation requirements, continuous operation of central forced air system handlers used in central fan integrated ventilation system is not a permissible method of providing the dwelling unit ventilation airflow, and central ventilation systems that serve multiple dwelling units must be balanced to provide ventilation airflow to each dwelling unit. In addition, requirements for kitchen range hoods were also provided in the updated Section 120.1. Ventilation and Indoor Air Quality included both additions and revisions in the 2019 Code. This section now requires nonresidential and hotel/motel buildings to have air filtration systems that use forced air ducts to supply air to occupiable spaces to have air filters. Further, the air filter efficiency must be either MERV 13 or use a particle size efficiency rating specific in the Energy Code AND be equipped with air filters with a minimum 2-inch depth or minimum 1-inch depth if sized according to the equation 120.1-A. If natural ventilation is to be used the space must also use mechanical unless ventilation openings are either permanently open or controlled to stay open during occupied times.

New regulations were also adopted under Section 130.1 Indoor Lighting Controls. These included new exceptions being added for restrooms, the exception for classrooms being removed, as well as exceptions in regard to sunlight provided through skylights and overhangs.

[44] California Energy Commission. Final 2022 Integrated Energy Policy Report. February 2023. https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update

[45] California Energy Commission. Final 2023 Integrated Energy Policy Report. January 2024. https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2023-integrated-energy-policy-report

All buildings for which an application for a building permit is submitted on or after January 1, 2020 must follow the 2019 standards. The 2016 residential standards were estimated to be approximately 28 percent more efficient than the 2013 standards, whereas the 2019 residential standards are estimated to be approximately 7 percent more efficient than the 2016 standards. Furthermore, once rooftop solar electricity generation is factored in, 2019 residential standards are estimated to be approximately 53 percent more efficient than the 2016 standards. Under the 2019 standards, nonresidential buildings are estimated to be approximately 30 percent more efficient than the 2016 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions.

The 2022 Building Energy Efficiency Standards became effective on January 1, 2023. [46] The core focus of the building standards has been efficiency, but the 2019 Energy Code ventured into onsite generation by requiring solar PV on new homes, providing significant GHG savings. The 2022 update builds off this progress with expanded solar standards and the move to onsite energy storage that will help Californians save on utility bills while bolstering the grid. The 2022 Energy Code update focuses on four key areas in new construction of homes and businesses:

- Encouraging electric heat pump technology and use, which consumes less energy and produces fewer emissions than traditional HVACs and water heaters.
- Establishing electric-ready requirements when natural gas is installed, which positions owners to use cleaner electric heating, cooking and electric vehicle (EV) charging options whenever they choose to adopt those technologies.
- Expanding solar photovoltaic (PV) system and battery storage standards to make clean energy available onsite and complement the state's progress toward a 100 percent clean electricity grid.
- Strengthening ventilation standards to improve indoor air quality.

The 2022 Energy Code affects homes by establishing energy budgets based on efficient heat pumps for space or water heating to encourage builders to install heat pumps over gas-fueled HVAC units; requiring homes to be electric-ready, with dedicated 240-volt outlets and space (with plumbing for water heaters) so electric appliances can eventually replace installed gas appliances; increasing minimum kitchen ventilation requirements so that fans over cooktops have higher airflow or capture efficiency to better exhaust pollution from gas cooking and improve indoor air quality; and allowing exceptions to existing solar PV standards when roof area is not available (such as for smaller homes). In addition, the effect on businesses includes establishing combined solar PV and battery standards for select businesses with systems being sized to maximize onsite use of solar energy and avoid electricity demand during times when the grid must use gas-powered plants; establishing new efficiency standards for commercial greenhouses (primarily cannabis growing); and improving efficiency standards for building envelope, various internal systems, and grid integration equipment, such as demand-responsive controls to buoy grid stability.[47,48]

However, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards.

California Building Energy Efficiency Standards (Title 24, Part 11)

The 2019 California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, went into effect on January 1, 2020. The 2019 CALGreen Code includes mandatory measures for non-residential development related to site development; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental quality.

[46] California Energy Commission (CEC). 2022. Building Energy Efficiency Standards. https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency.

[47] https://www.lightnowblog.com/2021/08/california-energy-commission-adopts-2022-building-energy-efficiency-standards/

[48] State of California Energy Commission. 2022 Building Energy Efficiency Standards Summary. https://www.energy.ca.gov/sites/default/files/2021-08/CEC_2022_EnergyCodeUpdateSummary_ADA.pdf

As previously discussed in Section 3 of this report, the Department of Housing and Community Development (HCD) updated CALGreen through the 2019 Triennial Code Adoption Cycle. HCD modified the best management practices for stormwater pollution prevention adding Section 5.106.2 for projects that disturb one or more acres of land. This section requires projects that disturb one acre or more of land or less than one acre of land but are part of a larger common plan of development or sale must comply with the postconstruction requirement detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board. The NPDES permits require postconstruction runoff (post-project hydrology) to match the preconstruction runoff pre-project hydrology) with installation of postconstruction stormwater management measures.

HCD added sections 5.106.4.1.3 and 5.106.4.1.5 in regard to bicycle parking. Section 5.106.4.1.3 requires 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. In addition, Section 5.106.4.1.5 states that acceptable bicycle parking facility for Sections 5.106.4.1.2 through 5.106.4.1.4 shall be convenient from the street and shall meeting one of the following: (1) covered, lockable enclosures with permanently anchored racks for bicycles; (2) lockable bicycle rooms with permanently anchored racks; or (3) lockable, permanently anchored bicycle lockers.

HCD amended section 5.106.5.3.5 allowing future charging spaces to qualify as designated parking for clean air vehicles.

HCD updated section 5.303.3.3 in regard to showerhead flow rates. This update reduced the flow rate to 1.8 GPM.

HCD amended section 5.304.1 for outdoor potable water use in landscape areas and repealed sections 5.304.2 and 5.304.3. The update requires nonresidential developments to comply with a local water efficient landscape ordinance or the current California Department of Water Resource's' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent. Some updates were also made in regard to the outdoor potable water use in landscape areas for public schools and community colleges.

HCD updated Section 5.504.5.3 in regard to the use of MERV filters in mechanically ventilated buildings. This update changed the filter use from MERV 8 to MERV 13. MERV 13 filters are to be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.

The 2022 California Green Building Standards Code became effective on January 1, 2023[49] and builds upon the 2019 Standards.

In the 2022 Code, HCD amended Section 5.106.5.3 in regard to increasing the EV capable space percentages and adding a new requirement for installed Level 2 DCFC chargers. HCD under Section 5.106.5.4 added new regulation for electric vehicle charging readiness requirements for new construction of warehouse, grocery stores, and retail stores with planned off-street loading spaces. [50]

However, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards (CALGreen).

[49] California Building Standards Commission (CBSC). 2022. California Green Building Standards. Website: https://codes.iccsafe.org/content/CAGBC2022P1.

[50] https://www.dgs.ca.gov/BSC/Resources/2022-Title-24-California-Code-Changes

Senate Bill 100

Senate Bill 100 (SB 100) requires 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045. SB 100 was adopted September 2018.

The interim thresholds from prior Senate Bills and Executive Orders would also remain in effect. These include Senate Bill 1078 (SB 1078), which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 (SB 107) which changed the target date to 2010. Executive Order S-14-08, which was signed on November 2008 and expanded the State's Renewable Energy Standard to 33 percent renewable energy by 2020. Executive Order S-21-09 directed the CARB to adopt regulations by July 31, 2010 to enforce S-14-08. Senate Bill X1-2 codifies the 33 percent renewable energy requirement by 2020.

Senate Bill 350

As previously discussed in Section 3 of this report, Senate Bill 350 (SB 350) was signed into law October 7, 2015, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. This will increase the use of Renewables Portfolio Standard (RPS) eligible resources, including solar, wind, biomass, geothermal, and others. In addition, SB 350 requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030. To help ensure these goals are met and the greenhouse gas emission reductions are realized, large utilities will be required to develop and submit Integrated Resource Plans (IRPs). These IRPs will detail how each entity will meet their customers resource needs, reduce greenhouse gas emissions and ramp up the deployment of clean energy resources.

Assembly Bill 32

As discussed in Section 3 of this report, in 2006 the California State Legislature adopted Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006. AB 32 requires CARB, to adopt rules and regulations that would achieve GHG emissions equivalent to statewide levels in 1990 by 2020 through an enforceable statewide emission cap which will be phased in starting in 2012. Emission reductions shall include carbon sequestration projects that would remove carbon from the atmosphere and best management practices that are technologically feasible and cost effective. Please see Section 4 for further detail on AB 32.

Assembly Bill 1493/Pavley Regulations

As discussed in Section 3 of this report, California Assembly Bill 1493 enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. In 2005, the CARB submitted a "waiver" request to the EPA from a portion of the federal Clean Air Act in order to allow the State to set more stringent tailpipe emission standards for CO_2 and other GHG emissions from passenger vehicles and light duty trucks. On December 19, 2007 the EPA announced that it denied the "waiver" request. On January 21, 2009, CARB submitted a letter to the EPA administrator regarding the State's request to reconsider the waiver denial. The EPA approved the waiver on June 30, 2009.

Executive Order S-1-07/Low Carbon Fuel Standard

As discussed in Section 3 of this report, Executive Order S-1-07 was issued in 2007 and proclaims that the transportation sector is the main source of GHG emissions in the State, since it generates more than 40 percent of the State's GHG emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in the State by at least ten percent by 2020. This Order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009 CARB approved the proposed regulation to implement the low carbon fuel standard. The low carbon fuel standard is anticipated to reduce GHG emissions by about 16 MMT per year by 2020. The low carbon fuel standard is designed to provide a framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. The framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. Separate standards are established for gasoline and diesel fuels and the alternative fuels that can replace each. The standards are "back-loaded", with more reductions required in the last five years, than during the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the low carbon fuel standard will be based on a combination of both lower carbon fuels and more efficient vehicles.

Reformulated gasoline mixed with corn-derived ethanol at ten percent by volume and low sulfur diesel fuel represent the baseline fuels. Lower carbon fuels may be ethanol, biodiesel, renewable diesel, or blends of these fuels with gasoline or diesel as appropriate. Compressed natural gas and liquefied natural gas also may be low carbon fuels. Hydrogen and electricity, when used in fuel cells or electric vehicles are also considered as low carbon fuels for the low carbon fuel standard.

California Air Resources Board

CARB's Advanced Clean Cars Program

Closely associated with the Pavley regulations, the Advanced Clean Cars emissions control program was approved by CARB in 2012. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles for model years 2015–2025. The components of the Advanced Clean Cars program include the Low-Emission Vehicle (LEV) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the Zero-Emission Vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.[51]

In addition, the Advanced Clean Cars II was effective as of November 30, 2022. This regulation takes the state's already growing zero-emission vehicle market and robust motor vehicle emission control rules and augments them to meet more aggressive tailpipe emissions standards and ramp up to 100 percent zero-emission vehicles. The Advanced Clean Cars II regulations will rapidly scale down light-duty passenger car, pickup truck and SUV emissions starting with the 2026 model year through 2035. The regulations are two-pronged. First, it amends the Zero-emission Vehicle Regulation to require an increasing number of zero-emission vehicles, and relies on currently available advanced vehicle technologies, including battery-electric, hydrogen fuel cell electric and plug-in hybrid electric-vehicles, to meet air quality and climate change emissions standards. These amendments support Governor Newsom's 2020 Executive Order N-79-20 that requires all new passenger vehicles sold in California to be zero emissions by 2035. Second, the Low-emission Vehicle Regulations were amended to include increasingly stringent standards for gasoline cars and heavier passenger trucks to continue to reduce smog-forming emissions. In October 2023, CARB staff launched a new effort to consider potential amendments to the Advanced Clean Cars II regulations, including updates to the tailpipe greenhouse gas emission standard and limited revisions to the Low-emission Vehicle and Zero-emission Vehicle regulations.[52]

[51] California Air Resources Board, California's Advanced Clean Cars Program, January 18, 2017. www.arb.ca.gov/msprog/acc/acc.htm.

[52] California Air Resources Board, Advanced Clean Cars II. https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii

Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

The Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling (Title 13, California Code of Regulations, Division 3, Chapter 10, Section 2435) was adopted to reduce public exposure to diesel particulate matter and other air contaminants by limiting the idling of diesel-fueled commercial motor vehicles. This section applies to diesel-fueled commercial motor vehicles with gross vehicular weight ratings of greater than 10,000 pounds that are or must be licensed for operation on highways. Reducing idling of diesel-fueled commercial motor vehicles reduces the amount of petroleum-based fuel used by the vehicle.

Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen, and other Criteria Pollutants, form In-Use Heavy-Duty Diesel-Fueled Vehicles

The Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles (Title 13, California Code of Regulations, Division 3, Chapter 1, Section 2025) was adopted to reduce emissions of diesel particulate matter, oxides of nitrogen (NOX) and other criteria pollutants from in-use diesel-fueled vehicles. This regulation is phased, with full implementation by 2023. The regulation aims to reduce emissions by requiring the installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission-controlled models. The newer emission-controlled models would use petroleum-based fuel in a more efficient manner.

Sustainable Communities Strategy

The Sustainable Communities and Climate Protection Act of 2008, or Senate Bill 375 (SB 375), coordinates land use planning, regional transportation plans, and funding priorities to help California meet the GHG reduction mandates established in AB 32.

As previously stated in Section 3 of this report, Senate Bill 375 (SB 375) was adopted September 2008 and aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPO) to adopt a sustainable communities strategy (SCS) or alternate planning strategy (APS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP). CARB, in consultation with each MPO, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's sustainable communities strategy or alternate planning strategy for consistency with its assigned targets.

The proposed project is located within the Southern California Association of Governments (SCAG) jurisdiction, which has authority to develop the SCS or APS. For the SCAG region, the targets set by CARB are at eight percent below 2005 per capita GHG emissions levels by 2020 and 19 percent below 2005 per capita GHG emissions levels by 2035. These reduction targets became effective October 2018.

PROJECT ENERGY DEMANDS AND ENERGY EFFICIENCY MEASURES

Evaluation Criteria

In compliance with Appendix G of the State CEQA Guidelines, this report analyzes the project's anticipated energy use to determine if the project would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

In addition, Appendix F of the State CEQA Guidelines states that the means of achieving the goal of energy conservation includes the following:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on fossil fuels such as coal, natural gas and oil; and
- Increasing reliance on renewable energy sources.

Methodology

Information from the CalEEMod 2022.1.1.29 Outputs contained in Appendix B, utilized for air quality and greenhouse gas analyses in Sections 2 and 3 of this report, were also utilized for this analysis. The CalEEMod outputs detail project related construction equipment, transportation energy demands, and facility energy demands.

Construction Energy Demands

The construction schedule is anticipated to begin no sooner than early January 2026, end November 2026, and be completed in two phases. Staging of construction vehicles and equipment will occur on-site. The approximately 11-month schedule is relatively short and the project site is approximately 10 acres.

Construction Equipment Electricity Usage Estimates

As stated previously, Electrical service will be provided by Southern California Edison. The focus within this section is the energy implications of the construction process, specifically the power cost from on-site electricity consumption during construction of the proposed project. Based on the 2021 National Construction Estimator, Richard Pray (2021)[53], the typical power cost per 1,000 square feet of building construction per month is estimated to be $2.37. The project includes construction of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. Therefore, the project does not include the construction of buildings.

Construction Equipment Fuel Estimates

Fuel consumed by construction equipment would be the primary energy resource expended over the course of project construction. Fuel consumed by construction equipment was evaluated with the following assumptions:

- Construction schedule of 11 months
- All construction equipment was assumed to run on diesel fuel
- Typical daily use of 8 hours, with some equipment operating from ~6-7 hours
- Aggregate fuel consumption rate for all equipment was estimated at 18.5 hp-hr/gallon (from CARB's 2017 Emissions Factors Tables and fuel consumption rate factors as shown in Table D-21 of the Moyer Guidelines: (https://www.arb.ca.gov/msprog/moyer/guidelines/2017gl/2017_gl_appendix_d.pdf).
- Diesel fuel would be the responsibility of the equipment operators/contractors and would be sources within the region.
- Project construction represents a "single-event" for diesel fuel demand and would not require on-going or permanent commitment of diesel fuel resources during long term operation.

Using the CalEEMod data input for the air quality and greenhouse gas analyses (Sections 2 and 3 of this report), the project's construction phase would consume electricity and fossil fuels as a single energy demand, that is, once construction is completed their use would cease. CARB's 2014 Emissions Factors Tables show

[53] Pray, Richard. 2021 National Construction Estimator. Carlsbad : Craftsman Book Company, 2021.

that on average aggregate fuel consumption (gasoline and diesel fuel) would be approximately 18.5 hp-hr-gal. Table 12 shows the results of the analysis of construction equipment.

As presented in Table 12, project construction activities would consume an estimated 155,769 gallons of diesel fuel. As stated previously, 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.

Construction Worker Fuel Estimates

It is assumed that construction worker trips are from light duty autos (LDA), light duty truck 1 (LDT1), and light duty truck 2 (LDT2) at a mix of 25 percent/50 percent/25 percent, respectively, along area roadways.[54] With respect to estimated VMT, the construction worker trips would generate an estimated 71,965 VMT. Data regarding project related construction worker trips were based on CalEEMod 2022.1.1.29 model defaults.

Vehicle fuel efficiencies for construction workers were estimated in the air quality and greenhouse gas analyses (Sections 2 and 3 of this report) using information generated using CARB's 2021 EMFAC model (see Appendix B for details). An aggregate fuel efficiency of 27.22 miles per gallon (mpg) was used to calculate vehicle miles traveled for construction worker trips. Table 13 shows that an estimated 2,644 gallons of fuel would be consumed for construction worker trips.

Construction Vendor/Hauling Fuel Estimates

Tables 14 and 15 show the estimated fuel consumption for vendor and hauling during project construction. With respect to estimated VMT, the vendor and hauling trips would generate an estimated 170,968 VMT. Data regarding project related construction worker trips were based on CalEEMod 2022.1.1.29 model defaults.

For the architectural coatings it is assumed that the contractors would be responsible for bringing coatings and equipment with them in their light duty vehicles. Therefore, vendors delivering construction material or hauling debris from the site during project construction would use medium to heavy duty vehicles with an average fuel consumption of 7.98 mpg for medium heavy-duty trucks and 6.46 for heavy heavy-duty trucks (see Appendix B for details). [55] Tables 14 and 15 show that an estimated 26,466 gallons of fuel would be consumed for vendor and hauling trips.

Construction Energy Efficiency/Conservation Measures

Construction equipment used over the approximately 11-month construction phase would conform to CARB regulations and California emissions standards and is evidence of related fuel efficiencies. There are no unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities; or equipment that would not conform to current emissions standards (and related fuel efficiencies). Equipment employed in construction of the project would therefore not result in inefficient wasteful, or unnecessary consumption of fuel.

The project would utilize construction contractors which practice compliance with applicable CARB regulation regarding retrofitting, repowering, or replacement of diesel off-road construction equipment. Additionally, CARB has adopted the Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other Toxic Air Contaminants. Compliance with

[54] CalEEMod User's Guide Appendix C (April 2022) states that construction work trips are made by a fleet consisting of 25 percent light-duty auto (or passenger car), 50 percent light-duty truck type 1 (LDT1), and 25 percent light duty truck type 2 (LDT2).

[55] CalEEMod User's Guide Appendix C (April 2022) states that vendor trips are made by a fleet consisting of 50 percent medium trucks (MHDT) and 50 percent heavy trucks (HHDT) and that hauling and onsite truck trips are made by a fleet consisting of 100 percent HHDT.

these measures would result in a more efficient use of construction-related energy and would minimize or eliminate wasteful or unnecessary consumption of energy. Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption.

Additionally, as required by California Code of Regulations Title 13, Motor Vehicles, section 2449(d)(3) Idling, limits idling times of construction vehicles to no more than five minutes, thereby minimizing or eliminating unnecessary and wasteful consumption of fuel due to unproductive idling of construction equipment. Enforcement of idling limitations is realized through periodic site inspections conducted by City building officials, and/or in response to citizen complaints.

Therefore, as the project's construction is required to comply with CARB regulations and does not include the need of construction processes that would require the use of equipment that is more energy efficient, the proposed project annual construction related fuel consumption would not be considered significant.

Operational Energy Demands

Energy consumption in support of or related to project operations would include transportation energy demands (energy consumed by employee and patron vehicles accessing the project site) and facilities energy demands (energy consumed by building operations and site maintenance activities).

Transportation Fuel Consumption

As stated previously, additional staffing needs for long-term operation and maintenance of the proposed project are not expected. However, a minimal number of daily worker trips are anticipated to conduct routine inspections and ensure proper long-term maintenance. Therefore, the increase in project generated trips is minimal and the project's transportation and operational energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

Facility Energy Demands (Electricity and Natural Gas)

In 2022, the non-residential sector of the County of San Bernardino consumed approximately 10,328 million kWh of electricity and approximately 295 million therms of gas.[56,57,58] The project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well and, therefore, project operation would not require any additional consumption of energy or natural gas. Additionally, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards (CALGreen).

Furthermore, any potential energy demands of the proposed project would be comparable to other water distribution projects of similar scale and configuration. Therefore, the project facilities' energy demands, and energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

RENEWABLE ENERGY AND ENERGY EFFICIENCY PLAN CONSISTENCY

Regarding federal transportation regulations, the project site is located in an already developed area. Access to/from the project site is from existing roads. These roads are already in place so the project would not interfere with, nor otherwise obstruct intermodal transportation plans or projects that may be proposed pursuant to the ISTEA because SCAG is not planning for intermodal facilities in the project area.

[56] California Energy Commission, Electricity Consumption by County. https://ecdms.energy.ca.gov/elecbycounty.aspx

[57] California Energy Commission, Gas Consumption by County. http://ecdms.energy.ca.gov/gasbycounty.aspx

[58] 1 kBTU = 1,000 BTU and 1 therm = 100,000 BTU; therefore, 1 therm = 100 kBTU.

Regarding Pavley (AB 1493) regulations, an individual project does not have the ability to comply or conflict with these regulations because they are intended for agencies and their adoption of procedures and protocols for reporting and certifying GHG emission reductions from mobile sources.

Regarding the State's Renewable Energy Portfolio Standards, the project would be required to meet or exceed the energy standards established in the California Green Building Standards Code, Title 24, Part 11 (CALGreen) as applicable. However, as the project is a water supply infrastructure project, it is not subject to Title 24 Building Energy Efficiency Standards (CALGreen).

As shown in Section 3 above, the proposed project will be consistent with the goals of the County of San Bernardino GHGRP Update.

CONCLUSIONS

As supported by the preceding analyses, project construction and operations would not result in the inefficient, wasteful or unnecessary consumption of energy. The proposed project does not include any unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities and is a water supply infrastructure project that is not proposing any additional features that would require a larger energy demand than other water supply infrastructure projects of similar scale and configuration. 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. Notwithstanding, the project proposes a water supply infrastructure project and will not have any long-term effects on an energy provider's future energy development or future energy conservation strategies.

Table 10
Total Electricity System Power (California 2023)

Fuel Type	California In-State Generation (GWh)	Percent of California In-State Generation	Northwest Imports (GWh)	Southwest Imports (GWh)	Total Imports (GWh)	Total California Energy Mix (GWh)	Total California Power Mix
Coal	257	0.12%	163	4,561	4,724	4,981	1.77%
Natural Gas	94,192	43.68%	52	8,530	8,582	102,774	36.56%
Oil	36	0.02%	-	-	-	36	0.01%
Other (Waste Heat/Petroleum Coke)	206	0.10%	-	-	-	206	0.07%
Unspecified Sources of Power	0	0.00%	100	10,273	10,373	10,373	3.69%
Total Thermal and Unspecified	94,690	43.91%	316	23,363	23,679	118,370	42.10%
Nuclear	17,714	8.22%	196	8361	8558	26,272	9.34%
Large Hydro	27,066	12.55%	4,712	1,109	5,821	32,886	11.70%
Biomass	5,037	2.34%	753	-	753	5,790	2.06%
Geothermal	10,999	5.10%	221	2,347	2,569	13,567	4.83%
Small Hydro	4,853	2.25%	133	2	135	4,988	1.77%
Solar	41,344	19.17%	417	6,108	6,525	47,869	17.03%
Wind	13,920	6.46%	9,177	8,302	17,479	31,399	11.17%
Total Non-GHG and Renewables	120,932	56.09%	15,609	26,229	41,838	162,771	57.90%
Total Energy	215,623	100%	15,925	49,593	65,518	281,140	100%

Notes:

(1) Source: California Energy Commission. 2023 Total System Electric Generation. https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation

Table 11
SCE 2023 Power Content Mix

Energy Resources	2023 SCE Power Mix
Eligible Renewable	37.6%
Biomass & Biowaste	*0.1%*
Geothermal	*5.2%*
Eligible Hydroelectric	*0.7%*
Solar	*19.8%*
Wind	*11.7%*
Coal	0.0%
Large Hydroelectric	4.5%
Natural Gas	20.0%
Nuclear	9.1%
Other	0.1%
Unspecified Sources of power*	28.8%
Total	100%

Notes:

(1) https://www.energy.ca.gov/filebrowser/download/7362

* Unspecified sources of power means electricity from transactions that are not traceable to specific generation sources.

Table 12
Construction Equipment Fuel Consumption Estimates

Phase	Number of Days	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	HP hrs/day	Total Fuel Consumption (gal diesel fuel)[1]
Phase 1 - Monitoring Well Drilling	75	Bore/Drill Rigs	1	24	367	0.4	3523.2	14,283
	75	Tractors/Loaders/Backhoes	1	8	84	0.37	249	1,008
	75	Cranes	1	8	367	0.29	851	3,452
	75	Off-Highway Trucks (Work Trucks)	3	8	376	0.38	3,429	13,902
Phase 2 - Recharge Basins	172	Scrapers	2	8	367	0.4	2,349	21,837
	172	Tractors/Loaders/Backhoes	1	8	84	0.37	249	2,312
	172	Off-Highway Trucks	2	8	376	0.38	2,286	21,254
	172	Plate Compactors	2	8	8	0.43	55	512
	172	Excavators	2	8	36	0.38	219	2,035
	172	Other Material Handling Equipment	2	8	93	0.4	595	5,534
	172	Other Construction Equipment	2	8	82	0.42	551	5,123
	172	Pumps	4	8	11	0.74	260	2,422
	172	Skid Steer Loaders	2	8	71	0.37	420	3,908
	172	Surfacing Equipment	2	8	399	0.3	1,915	17,806
	172	Rubber Tired Dozers	2	8	367	0.4	2,349	21,837
	172	Cranes	1	8	367	0.29	851	7,916
	172	Off-Highway Trucks (Water Truck)	1	8	376	0.38	1,143	10,627
CONSTRUCTION FUEL DEMAND (gallons of diesel fuel)								155,769

Notes:

(1) Using Carl Moyer Guidelines Table D-21 Fuel consumption rate factors (bhp-hr/gal) for engines less than 750 hp. (Source: https://www.arb.ca.gov/msprog/moyer/guidelines/2017gl/2017_gl_appendix_d.pdf)

Table 13
Construction Worker Fuel Consumption Estimates

Phase	Number of Days	Worker Trips/Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1 - Monitoring Well Drilling	75	6	18.5	8,325	27.22	306
Phase 2 - Recharge Basins	172	20	18.5	63,640	27.22	2,338
Total Construction Worker Fuel Consumption						2,644

Notes:

(1) Assumptions for the worker trip length and vehicle miles traveled are consistent with CalEEMod 2022.1.1.29 defaults.

(2) Per CalEEMod User's Guide Appendix C (April 2022), CalEEMod assumes that construction work trips are made by a fleet consisting of 25 percent light-duty auto (or passenger car), 50 percent light-duty truck type 1 (LDT1), and 25 percent light duty truck type 2 (LDT2).

Table 14
Construction Vendor Fuel Consumption Estimates (MHD & HHD Trucks)

Phase	Number of Days	Vendor Trips/Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1 - Monitoring Well Drilling	75	0	10.2	0	7.22	0
Phase 2 - Recharge Basins	172	0	10.2	0	7.22	0
Total Construction Worker Fuel Consumption						0

Notes:

(1) Assumptions for the worker trip length and vehicle miles traveled are consistent with CalEEMod 2022.1.1.29 defaults.

(2) Per CalEEMod User's Guide Appendix C (April 2022), CalEEMod assumes vendor trips are made by a fleet consisting of 50 percent medium trucks (MHDT) and 50 percent heavy trucks (HHDT).

Table 15
Construction Hauling Fuel Consumption Estimates (HHD Trucks)

Phase	Number of Days	Hauling Trips/Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1 - Monitoring Well Drilling	75	0	20	0	6.46	0
Phase 2 - Recharge Basins	172	49.7	20	170,968	6.46	26,466
Total Construction Worker Fuel Consumption						26,466

Notes:
(1) Assumptions for the worker trip length and vehicle miles traveled are consistent with CalEEMod 2022.1.1.29 defaults.

5. MITIGATION MEASURES

CONSTRUCTION MEASURES

The project applicant shall ensure that all applicable MDAQMD Rules and Regulations (as detailed in Sections 2 above) are complied with during construction.

No mitigation measures required.

OPERATIONAL MEASURES

No mitigation measures required.

6. REFERENCES

California Air Resources Board

2008 Resolution 08-43

2008 Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act

2008 Climate Change Scoping Plan, a framework for change.

2011 Supplement to the AB 32 Scoping Plan Functional Equivalent Document

2013 Almanac of Emissions and Air Quality.
Source: https://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm

2014 First Update to the Climate Change Scoping Plan, Building on the Framework Pursuant to AB32, the California Global Warming Solutions Act of 2006. May.

2017 California's 2017 Climate Change Scoping Plan. November.

2022 2022 Scoping Plan for Achieving Carbon Neutrality. November 16.

County of San Bernardino

2020 County of San Bernardino Policy Plan

2021 County of San Bernardino Greenhouse Gas Reduction Plan Update. June.

2021 County of San Bernardino Greenhouse Gas Emissions Development Review Process Screening Tables. Revised September.

Governor's Office of Planning and Research

2008 CEQA and Climate: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review

2018 CEQA Guideline Sections to be Added or Amended

Intergovernmental Panel on Climate Change (IPCC)

2014 IPCC Fifth Assessment Report, Climate Change 2014: Synthesis Report

Mojave Desert Air Quality Management District (MDAQMD)

2020 California Environmental Quality Act (CEQA) And Federal Conformity Guidelines. February

Office of Environmental Health Hazard Assessment

2015 Air Toxics Hot Spots Program Risk Assessment Guidelines

Southern California Association of Governments

2020 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy

U.S. Environmental Protection Agency (EPA)

2017 Understanding Global Warming Potentials
(Source: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials)

U.S. Geological Survey

2011 Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California

APPENDICES

Appendix A Glossary of Terms
Appendix B CalEEMod Model Detailed report and EMFAC Data

APPENDIX A

GLOSSARY OF TERMS

AQMP	Air Quality Management Plan
BACT	Best Available Control Technologies
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CNG	Compressed natural gas
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DPM	Diesel particulate matter
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
GWP	Global warming potential
HIDPM	Hazard Index Diesel Particulate Matter
HFCs	Hydrofluorocarbons
IPCC	International Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LST	Localized Significant Thresholds
MDAB	Mojave Desert Air Basin
MDAQMD	Mojave Desert Air Quality Management District
$MTCO_2e$	Metric tons of carbon dioxide equivalent
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NOx	Nitrogen Oxides
NO_2	Nitrogen dioxide
N_2O	Nitrous oxide
O_3	Ozone
OPR	Governor's Office of Planning and Research
PFCs	Perfluorocarbons
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PMI	Point of maximum impact
PPM	Parts per million
PPB	Parts per billion
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
SANBAG	San Bernardino Association of Governments
SCAG	Southern California Association of Governments
SSAB	Salton Sea Air Basin
SF_6	Sulfur hexafluoride
SIP	State Implementation Plan
SOx	Sulfur Oxides
TAC	Toxic air contaminants
VOC	Volatile organic compounds

APPENDIX B

CALEEMOD MODEL DETAILED REPORT

19712 Ames-Reche Recharge Basin - CONSTRUCTION ANALYSIS ONLY Detailed Report

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1.1. Basic Project Information

Data Field	Value
Project Name	19712 Ames-Reche Recharge Basin - CONSTRUCTION ANALYSIS ONLY
Construction Start Date	1/1/2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	3.60
Precipitation (days)	14.4
Location	34.2379065012187, -116.41131721896139
County	San Bernardino-Mojave Desert
City	Unincorporated
Air District	Mojave Desert AQMD
Air Basin	Mojave Desert
TAZ	5143
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Other Non-Asphalt Surfaces	10.0	Acre	10.0	0.00	0.00	—	—	Project site is ~10 acres.

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	10.8	9.10	75.3	80.7	0.25	2.87	7.19	10.1	2.64	3.03	5.67	—	28,530	28,530	1.03	0.74	8.16	28,783
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	10.8	9.08	75.6	80.1	0.25	2.87	7.19	10.1	2.64	3.03	5.67	—	28,491	28,491	1.02	0.74	0.21	28,736
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	4.27	3.59	30.8	32.0	0.10	1.18	3.36	4.54	1.08	1.42	2.51	—	10,930	10,930	0.38	0.33	1.62	11,038
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.78	0.66	5.62	5.84	0.02	0.21	0.61	0.83	0.20	0.26	0.46	—	1,810	1,810	0.06	0.05	0.27	1,827

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	10.8	9.10	75.3	80.7	0.25	2.87	7.19	10.1	2.64	3.03	5.67	—	28,530	28,530	1.03	0.74	8.16	28,783

Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	10.8	9.08	75.6	80.1	0.25	2.87	7.19	10.1	2.64	3.03	5.67	—	28,491	28,491	1.02	0.74	0.21	28,736
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	4.27	3.59	30.8	32.0	0.10	1.18	3.36	4.54	1.08	1.42	2.51	—	10,930	10,930	0.38	0.33	1.62	11,038
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2026	0.78	0.66	5.62	5.84	0.02	0.21	0.61	0.83	0.20	0.26	0.46	—	1,810	1,810	0.06	0.05	0.27	1,827

3. Construction Emissions Details

3.1. Monitoring Well Drilling (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.06	2.57	18.1	21.5	0.09	0.66	—	0.66	0.60	—	0.60	—	9,329	9,329	0.38	0.08	—	9,361
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	3.06	2.57	18.1	21.5	0.09	0.66	—	0.66	0.60	—	0.60	—	9,329	9,329	0.38	0.08	—	9,361
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.63	0.53	3.71	4.42	0.02	0.13	—	0.13	0.12	—	0.12	—	1,917	1,917	0.08	0.02	—	1,923
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	0.10	0.68	0.81	< 0.005	0.02	—	0.02	0.02	—	0.02	—	317	317	0.01	< 0.005	—	318
Dust From Material Movement	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.46	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	85.8	85.8	< 0.005	< 0.005	0.29	87.0

Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.31	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	76.0	76.0	< 0.005	< 0.005	0.01	76.9
Vendor	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	0.00
Hauling	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	16.1	16.1	< 0.005	< 0.005	0.03	16.3
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.66	2.66	< 0.005	< 0.005	< 0.005	2.70
Vendor	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	0.00
Hauling	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	0.00

3.3. Recharge Basins (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	7.54	6.33	53.5	56.4	0.15	2.15	—	2.15	1.97	—	1.97	—	15,509	15,509	0.63	0.13	—	15,562

Dust From Material Movement	—	—	—	—	—	—	5.95	5.95	—	2.72	2.72	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	7.54	6.33	53.5	56.4	0.15	2.15	—	2.15	1.97	—	1.97	—	15,509	15,509	0.63	0.13	—	15,562
Dust From Material Movement	—	—	—	—	—	—	5.95	5.95	—	2.72	2.72	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.55	2.98	25.2	26.6	0.07	1.01	—	1.01	0.93	—	0.93	—	7,308	7,308	0.30	0.06	—	7,333
Dust From Material Movement	—	—	—	—	—	—	2.80	2.80	—	1.28	1.28	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	0.54	4.60	4.85	0.01	0.18	—	0.18	0.17	—	0.17	—	1,210	1,210	0.05	0.01	—	1,214
Dust From Material Movement	—	—	—	—	—	—	0.51	0.51	—	0.23	0.23	—	—	—	—	—	—	—
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.10	0.09	1.54	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	286	286	0.01	0.01	0.97	290
Vendor	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	0.00
Hauling	0.08	0.07	3.70	0.83	0.02	0.07	0.90	0.97	0.07	0.23	0.30	—	3,321	3,321	< 0.005	0.52	6.90	3,483
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.08	0.10	1.03	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	253	253	< 0.005	0.01	0.03	256
Vendor	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	0.00
Hauling	0.07	0.07	3.92	0.85	0.02	0.07	0.90	0.97	0.07	0.23	0.30	—	3,324	3,324	< 0.005	0.52	0.18	3,480
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.05	0.55	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	123	123	< 0.005	< 0.005	0.20	124
Vendor	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	0.00
Hauling	0.04	0.03	1.85	0.40	0.01	0.03	0.42	0.45	0.03	0.11	0.14	—	1,566	1,566	< 0.005	0.25	1.40	1,640
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.10	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	20.3	20.3	< 0.005	< 0.005	0.03	20.6

Vendor	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	0.00
Hauling	0.01	0.01	0.34	0.07	< 0.005	0.01	0.08	0.08	0.01	0.02	0.03	—	259	259	< 0.005	0.04	0.23	272

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Monitoring Well Drilling	Site Preparation	1/5/2026	4/17/2026	5.00	75.0	—
Recharge Basins	Site Preparation	3/16/2026	11/10/2026	5.00	172	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Monitoring Well Drilling	Bore/Drill Rigs	Diesel	Average	1.00	24.0	367	0.40
Monitoring Well Drilling	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Monitoring Well Drilling	Cranes	Diesel	Average	1.00	8.00	367	0.29

Monitoring Well Drilling	Off-Highway Trucks	Diesel	Average	3.00	8.00	376	0.38
Recharge Basins	Scrapers	Diesel	Average	2.00	8.00	367	0.40
Recharge Basins	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Recharge Basins	Off-Highway Trucks	Diesel	Average	2.00	8.00	376	0.38
Recharge Basins	Plate Compactors	Diesel	Average	2.00	8.00	8.00	0.43
Recharge Basins	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Recharge Basins	Other Material Handling Equipment	Diesel	Average	2.00	8.00	93.0	0.40
Recharge Basins	Other Construction Equipment	Diesel	Average	2.00	8.00	82.0	0.42
Recharge Basins	Pumps	Diesel	Average	4.00	8.00	11.0	0.74
Recharge Basins	Skid Steer Loaders	Diesel	Average	2.00	8.00	71.0	0.37
Recharge Basins	Surfacing Equipment	Diesel	Average	2.00	8.00	399	0.30
Recharge Basins	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Recharge Basins	Cranes	Diesel	Average	1.00	8.00	367	0.29
Recharge Basins	Off-Highway Trucks	Diesel	Average	1.00	8.00	376	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Monitoring Well Drilling	—	—	—	—
Monitoring Well Drilling	Worker	6.00	18.5	LDA,LDT1,LDT2
Monitoring Well Drilling	Vendor	—	10.2	HHDT,MHDT
Monitoring Well Drilling	Hauling	0.00	20.0	HHDT
Monitoring Well Drilling	Onsite truck	—	—	HHDT
Recharge Basins	—	—	—	—
Recharge Basins	Worker	20.0	18.5	LDA,LDT1,LDT2

Recharge Basins	Vendor	—	10.2	HHDT,MHDT
Recharge Basins	Hauling	49.7	20.0	HHDT
Recharge Basins	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Ton of Debris)	Acres Paved (acres)
Monitoring Well Drilling	—	—	0.00	0.00	—
Recharge Basins	1,594	68,411	516	6.00	—

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Other Non-Asphalt Surfaces	10.0	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2026	0.00	532	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	33.8	annual days of extreme heat
Extreme Precipitation	0.70	annual days with precipitation above 20 mm
Sea Level Rise	—	meters of inundation depth
Wildfire	0.84	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.

The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	N/A	N/A	N/A	N/A
Wildfire	N/A	N/A	N/A	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	N/A	N/A	N/A	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	93.6
AQ-PM	1.44

AQ-DPM	0.71
Drinking Water	55.1
Lead Risk Housing	32.7
Pesticides	1.34
Toxic Releases	7.68
Traffic	1.70
Effect Indicators	—
CleanUp Sites	68.9
Groundwater	0.00
Haz Waste Facilities/Generators	0.00
Impaired Water Bodies	0.00
Solid Waste	23.0
Sensitive Population	—
Asthma	52.5
Cardio-vascular	97.5
Low Birth Weights	45.9
Socioeconomic Factor Indicators	—
Education	46.5
Housing	75.7
Linguistic	33.3
Poverty	84.9
Unemployment	98.7

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	8.161170281

Employed	2.091620685
Median HI	6.73681509
Education	—
Bachelor's or higher	21.46798409
High school enrollment	100
Preschool enrollment	1.873476197
Transportation	—
Auto Access	89.83703323
Active commuting	1.039394328
Social	—
2-parent households	34.44116515
Voting	53.98434492
Neighborhood	—
Alcohol availability	91.10740408
Park access	31.79776723
Retail density	2.977030669
Supermarket access	2.399589375
Tree canopy	0.025664057
Housing	—
Homeownership	87.62992429
Housing habitability	62.69729244
Low-inc homeowner severe housing cost burden	42.06339022
Low-inc renter severe housing cost burden	11.6514821
Uncrowded housing	79.21211344
Health Outcomes	—
Insured adults	41.5629411
Arthritis	0.0
Asthma ER Admissions	56.3

High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	0.6
Cognitively Disabled	3.1
Physically Disabled	2.5
Heart Attack ER Admissions	23.6
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	81.9
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	88.7
Elderly	20.2
English Speaking	77.5
Foreign-born	9.7
Outdoor Workers	15.3

Climate Change Adaptive Capacity	—
Impervious Surface Cover	99.4
Traffic Density	0.1
Traffic Access	23.0
Other Indices	—
Hardship	73.4
Other Decision Support	—
2016 Voting	78.7

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	35.0
Healthy Places Index Score for Project Location (b)	10.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	Yes
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification

Construction: Construction Phases	Construction to occur in two phases, phase 1 is monitoring well drilling and phase 2 is recharge basins. Phase 1 (monitoring well drilling) is to begin 1/5/26 and end 4/17/2026 (lasting ~75 days) and Phase 2 (recharge basins) is to begin 3/16/26 and end 11/10/26 (lasting ~172 days). Earthworks during construction involves 68,411 CY of cut and 1,594 CY of fill (modeling assumed earthworks takes place during phase 2 - recharge basins).
Construction: Off-Road Equipment	Per the project applicant, construction equipment for phase 1 (monitoring well drilling) is to include: one (1) drilling rig, one (1) loader, one (1) crane, and 2-3 work trucks and for phase 2 (recharge basins) is to include two (2) scrapers, one (1) tractors/loaders/backhoe, two (2) off-highway trucks, two (2) plate compactors, two (2) excavators, two (2) other material handling equipment, two (2) other construction equipment, four (4) pumps, two (2) skid steer loaders, two (2) surfacing equipment, two (2) rubber tired dozers, one (1) crane, and one (1) water truck. The work trucks and water trucks were modeled as off-highway trucks. Per project applicant, the drilling rig in Phase 1 is to operate 24 hours a day.
Construction: Demolition	~847.5 sf (per 50% design plans) of existing concrete pads are to be removed. Concrete to be removed =847.5sfx0.3in=~254.25cftx45lbs/cf2=~11,441.25lbs=~6 tons. It was assumed the existing concrete would be removed during phase 2 - recharge basin phase of the project.
Construction: Trips and VMT	Per the project description, phase 1 is to include 3 workers per day and phase 2 will have 10 workers per day. Therefore, phase 1 is anticipated to have ~6 one-way worker trips per day and phase 2 is anticipated to have ~20 one-way worker trips per day.



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APPENDIX B

Biological Resources (ELMT 2024)

AMES-RECHE
RECHARGE FACILITY PROJECT

YUCCA VALLEY, SAN BERNARDINO COUNTY, CALIFORNIA

Biological Resources and Jurisdictional Assessment

Prepared For:

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September 2024

AMES-RECHE
RECHARGE FACILITY PROJECT

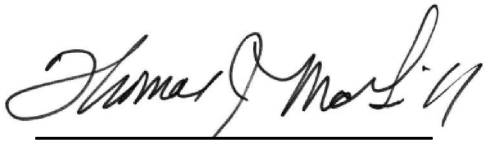
YUCCA VALLEY, SAN BERNARDINO COUNTY, CALIFORNIA

Biological Resources and Jurisdictional Assessment

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.



Travis J. McGill
Director/Biologist



Thomas J. McGill, Ph.D.
Managing Director

September 2024

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Section 1 Introduction

This report contains the findings of ELMT Consulting's (ELMT) habitat and jurisdictional assessment for Ames-Reche Recharge Facility (Project) located north of the Town of Yucca Valley in unincorporated San Bernardino County, California. ELMT biologists Megan E. Peukert conducted a field survey and evaluated the condition of the habitat within the project site (survey area) on April 18, 2024.

The biological resources assessment was conducted to characterize existing site conditions and to assess the probability of occurrence of special-status[1] plant and wildlife species that could pose a constraint to project implementation. This report provides an in-depth assessment of the suitability of the on-site habitat to support desert tortoise (*Gopherus agassizii*), burrowing owl (*Athene cunicularia*), western Joshua tree (*Yucca brevifolia*), as well as several other special-status plant and wildlife species identified by the California Natural Diversity Data Base (CNDDB) and other electronic databases as potentially occurring in the vicinity of the Project site.

The site was also evaluated for its potential to support natural drainage features, ponded areas, and/or water bodies that have the potential to fall under the regulatory authority of the of the United States Army Corps of Engineers (Corps), Regional Water Quality Control Board (Regional Board), or California Department of Fish and Wildlife (CDFW) pursuant to Sections 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Section 1600 *et seq*. of the Fish and Game Code.

1.1 PROJECT LOCATION

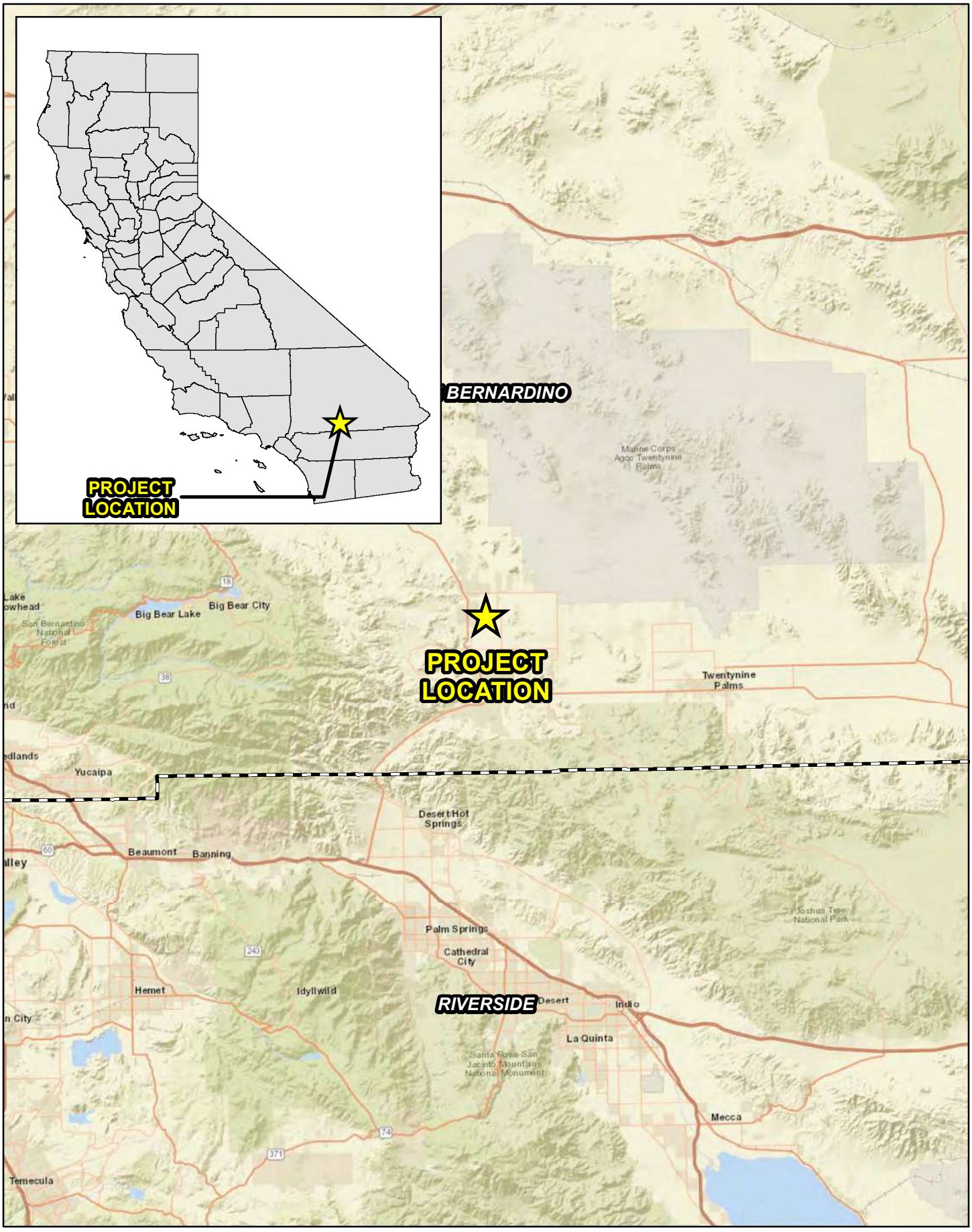
The Project site is generally located west of Twentynine Palms Marine Corps Military base, east of State Route 247, north of State Route 62, and south of Interstate 40 north of the Town of Yucca Valley, in unincorporated San Bernardino County, California (Exhibit 1, *Regional Vicinity*). The project site is depicted on the Yucca Valley North quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series in Section 24 of Township 2 North, Range 5 East (Exhibit 2, *Site Vicinity*). Specifically, the project site is located north of Winters Road and just east of Pipes Wash (Exhibit 3, *Project Site*).

1.2 PROJECT DESCRIPTION

The project consists of installing a new tee connection to the existing 12-inch diameter HDPE pipeline, 2 isolation valves, pipeline, and outlet with energy dissipator to the proposed recharge basin. The recharge basin shall be designed for a maximum flow rate of 5 cfs and an anticipated annual recharge capacity of 1,500 AFY or better. The recharge basin shall include a perimeter access road, fencing and signage.

[1] As used in this report, "special-status" refers to plant and wildlife species that are federally or State listed, proposed, or candidates; plant species that have been designated a California Native Plant Society (CNPS) Rare Plant Rank; and wildlife species that are designated by the California Department of Fish and Wildlife (CDFW) as fully protected, species of special concern, or watch list species.

Electrical and SCADA is not required at the site. The existing pipeline and recharge basin shall remain but shall be isolated with a valve. Refer to Appendix A, *Site Plan*.



ELMT CONSULTING

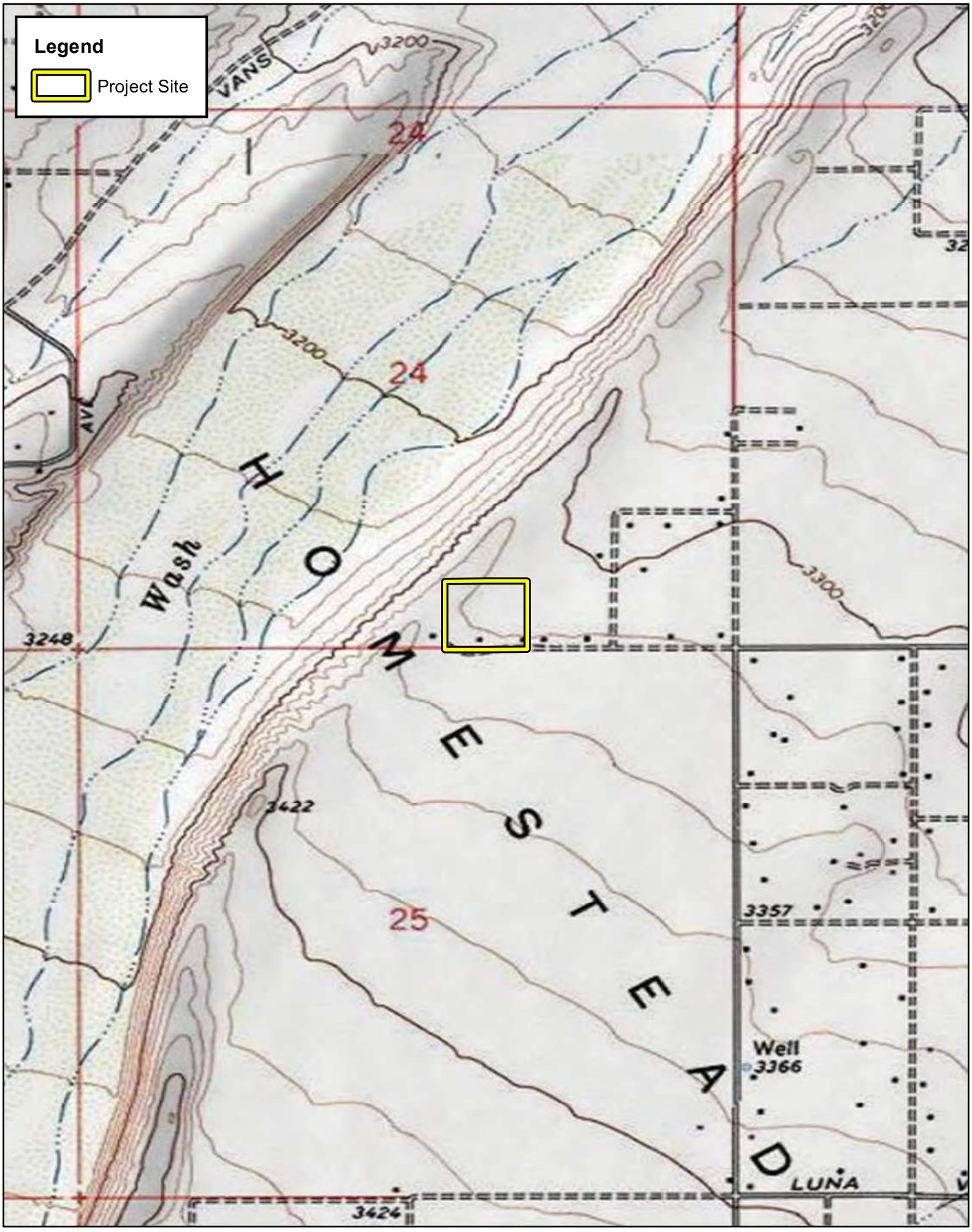
0 2.5 5 10 Miles

Source: World Street Map, San Bernardino County

AMES-RECHE RECHARGE BASIN

Regional Vicinity

Exhibit 1



0 500 1,000 2,000 Feet

Source: USA Topographic Map, San Bernardino County

AMES-RECHE RECHARGE BASIN

Site Vicinity

Exhibit 2



ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

AMES-RECHE RECHARGE BASIN

Project Site

Exhibit 3

Section 2 Methodology

A literature review and records search were conducted to determine which special-status biological resources have the potential to occur on or within the general vicinity of the project site. In addition to the literature review, a general biological resources assessment or field investigation of the project site was conducted. The field investigation was conducted to document existing conditions within the project site to assess the potential for special-status biological resources to occur.

2.1 LITERATURE REVIEW

Prior to conducting the field investigation, a literature review and records search was conducted for special-status biological resources potentially occurring on or within the vicinity of the project site. Previously recorded occurrences of special-status plant and wildlife species and their proximity to the project site were determined through a query of the CDFW QuickView Tool in the Biogeographic Information and Observation System (BIOS), CNDDB Rarefind 5, the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California, Calflora Database, compendia of special-status species published by CDFW, and the United States Fish and Wildlife Service (USFWS) species listings.

All available reports, survey results, and literature detailing the biological resources previously observed on or within the vicinity of the project site was reviewed to understand existing site conditions and note the extent of any disturbances that have occurred on the project site that would otherwise limit the distribution of special-status biological resources. Standard field guides and texts were reviewed for specific habitat requirements of special-status and non-special-status biological resources, as well as the following resources:

- Google Earth Pro historic aerial imagery (1994-2024);
- San Bernardino County General Plan;
- Oro Grande Silica Quarries Mining/Reclamation Plan;
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), Soil Survey[2];
- USFWS Critical Habitat designations for Threatened and Endangered Species; and
- USFWS National Wetlands Inventory (NWI).

The literature review provided a baseline from which to inventory the biological resources potentially occurring on the subject property. The CNDDB database was used, in conjunction with ArcGIS software, to locate the nearest recorded occurrences of special-status species and determine the distance from the project site.

[2] A soil series is defined as a group of soils with similar profiles developed from similar parent materials under comparable climatic and vegetation conditions. These profiles include major horizons with similar thickness, arrangement, and other important characteristics, which may promote favorable conditions for certain biological resources.

2.2 FIELD INVESTIGATION

ELMT biologists Megan E. Peukert evaluated the extent and conditions of the plant communities found within the boundaries of the project site on April 18, 2024. Plant communities identified on aerial photographs during the literature review were verified in the field by walking meandering transects through the on-site plant communities and along boundaries between plant communities. The plant communities were evaluated for their potential to support special-status plant and wildlife species. In addition, field staff identified any natural corridors and linkages that may support the movement of wildlife through the area. Special attention was given to special-status habitats and/or undeveloped areas, which have higher potentials to support special-status plant and wildlife species.

All plant and wildlife species observed, as well as dominant plant species within each plant community, were recorded. Wildlife detections were made through observation of scat, trails, tracks, burrows, nests, and/or visual and aural observation. In addition, site characteristics such as soil condition, topography, hydrology, anthropogenic disturbances, indicator species, condition of on-site plant communities, and presence of potential jurisdictional drainage and/or wetland features were noted.

2.3 SOIL SERIES ASSESSMENT

On-site and adjoining soils were researched prior to the field survey using the USDA NRCS Soil Survey for San Bernardino County. In addition, a review of the local geological conditions and historical aerial photographs was conducted to assess the ecological changes that the project site has undergone.

2.4 PLANT COMMUNITIES

Plant communities were mapped using 7.5-minute USGS topographic base maps and aerial photography. The plant communities were classified in accordance with Sawyer, Keeler-Wolf and Evens (2009), CDFW (2010) and Holland (1986), delineated on an aerial photograph, and then digitized into ArcGIS. The ArcGIS application was used to compute the area of each plant community in acres.

2.5 PLANTS

Common plant species observed during the field survey were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

2.6 WILDLIFE

Wildlife species detected during field surveys by sight, calls, tracks, scat, or other sign were recorded during surveys in a field notebook. Field guides were used to assist with identification of wildlife species during the survey included The Sibley Field Guide to the Birds of Western North America (Sibley 2003), A Field Guide to Western Reptiles and Amphibians (Stebbins 2003), and A Field Guide to Mammals of North

America (Reid 2006). Although common names of wildlife species are fairly well standardized, scientific names are provided immediately following common names in this report (first reference only).

2.7 JURISDICTIONAL DRAINAGES AND WETLANDS

Aerial photography was reviewed prior to conducting a field investigation in order to locate and inspect any potential natural drainage features, ponded areas, or water bodies that may fall under the jurisdiction of the Corps, Regional Board, and/or CDFW. In general, surface drainage features indicated as blue-line streams on USGS maps that are observed or expected to exhibit evidence of flow are considered potential riparian/riverine habitat and are also subject to state and federal regulatory jurisdiction. In addition, ELMT reviewed jurisdictional waters information through examining historical aerial photographs to gain an understanding of the impact of land-use on natural drainage patterns in the area. The USFWS NWI and Environmental Protection Agency (EPA) Water Program "My Waters" data layers were also reviewed to determine whether any hydrologic features and wetland areas have been documented on or within the vicinity of the Project site.

Section 3 Existing Conditions

3.1 LOCAL CLIMATE

The Mojave Desert is found at elevations of 2,000 to 5,000 feet above mean sea level and is characterized by cool winter temperatures and warm summer temperatures, with its rainfall occurring almost entirely in the winter. Climatological data obtained for the City of Yucca Valley indicates the annual precipitation averages between 4 to 5 inches per year. Almost all of the precipitation in the form of rain occurs in the months between November and March, with hardly any occurring between the months of June and September. The wettest month is February, with a monthly average total precipitation of 1.08 inches. The average minimum and maximum temperatures for the region are 43 and 74 degrees Fahrenheit (°F) respectively with December and January (monthly average 46° F) being the coldest months and July being the hottest (monthly average 81.5° F). Temperatures during the site visit were in the high-70 (° F).

3.2 TOPOGRAPHY AND SOILS

On-site surface elevation ranges from approximately 3,311 to 3,341 feet above mean sea level. Topography on-site is generally flat with little areas of topographic relief.

According to the NRCS Custom Soil Resource Report, soils underlying the project areas have not been mapped in detail, but the general area is mapped as being underlain by Cajon-Arizo soils. Soils underlying the project site are relatively undisturbed.

3.3 SURROUNDING LAND USES

The project site is located in a relatively undeveloped area north of the Town of Yucca Valley. Areas surrounding the site consist of vacant, undeveloped land with scattered rural residential development. The project site is located on the eastern bank of Pipes Wash north of Winters Road.

Section 4 Discussion

4.1 SITE CONDITIONS

The survey area supports primarily undeveloped and undisturbed land. The areas on the perimeter of the project site are relatively undeveloped/undisturbed, with some disturbance and development on the southern limits and along Winters Road. Disturbed areas include those areas surrounding the existing developed areas. The remainder of the project site is undeveloped and generally undisturbed.

4.2 VEGETATION

During the field investigation one (1) plant community was observed within the boundary of the project site: creosote bush scrub (Exhibit 4, *Vegetation*). In addition, two (2) land cover type that would be classified as disturbed and developed were observed onsite; these areas are not vegetation classifications, but rather land cover types. The vegetation community and land cover types are described in further detail below.

4.2.1 Creosote Bush Scrub

The creosote bush scrub plant community occurs throughout the undeveloped/undisturbed portions and is the dominant plant community within the surrounding landscape. This plant community is found throughout the project site and is dominated by creosote (*Larrea tridentata*). Common plant species found within this plant community include western Joshua tree (*Yucca brevifolia*), red-stemmed filaree (*Erodium cicutarum*), red brome (*Bromus madritensis ssp. rubens*), silver cholla (*Cylindropuntia echinocarpa*), desert sand verbena (*Abronia villosa*), rayless goldenhead (*Acamptopappus sphaerocephalus*), branched pencil cholla (*Cylindopuntia ramosissima*), canaigre dock (*Rumex hymenosepalus*), flatspine bursage (*Ambrosia villosa*), Fremont's pincushion (*Chaenactis fremontii*), woolly desert marigold (*Baileya pleniradiata*), Mediterranean grass (*Schismus barbatus*), Mormon tea (*Ephedra nevadensis*), and desert needlegrass (*Stipa speciosa*).

4.2.2 Disturbed

Disturbed areas are generally areas that have been subject to a high level of human disturbances that no longer comprise a native plant community. These areas are unpaved and are primarily or entirely devoid of vegetation, or support ruderal/weedy plant species. Disturbed areas include dirt access roads in the southern and northwestern portion of the project site, illegal dumping immediately surrounding the developed portions of the project site. Plant species occurring within these disturbed areas include red brome, London rocket (*Sisybrium irio*), flatspine bursage, canaigre dock, and Mediterranean grass.

4.2.3 Developed

The developed areas of the project site include a concrete pad in the middle of the southern portion as well as a partially demolished concrete structure in the southeastern portion. These areas are completely absent of plant communities.

4.3 WILDLIFE

Plant communities provide foraging habitat, nesting and denning sites, and shelter from adverse weather or predation. This section provides a discussion of those wildlife species that were observed during the field survey or that are expected to occur within the project site. The discussion is to be used as a general reference and is limited by the season, time of day, and weather condition in which the field survey was conducted. Wildlife detections were based on calls, songs, scat, tracks, burrows, and direct observation.

4.3.1 Fish

No fish or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) with frequent sources of water that would provide suitable habitat for fish were observed on or immediately adjacent to the project site. Therefore, no fish are expected to occur and are presumed absent from the project site.

4.3.2 Amphibians

No amphibians or hydrogeomorphic features (e.g., perennial creeks, ponds, lakes, reservoirs) that would provide suitable habitat for amphibian species were observed on or immediately adjacent to the project site. Therefore, no amphibians are expected to occur on the project site and are presumed absent.

4.3.3 Reptiles

The project site provides suitable foraging and nesting habitat for a variety of reptilian species adapted to conditions within the Mojave Desert. No reptilian species were observed during the field investigation. Other common reptilian species that could be expected to occur include common side-blotched lizard (*Uta stansburiana elegans*), great basin whiptail (*Aspidoscelis tigris tigris*), and Great Basin gopher snake (*Pituophis catenifer deserticola*). It should be noted that no desert tortoise or signs were observed during the field investigation.

4.3.4 Birds

The project site provides suitable foraging and nesting habitat for a variety of resident and migrant bird species adapted to conditions within the Mojave Desert. Avian species detected during the survey included black-throated sparrow (*Amphispiza bilineata*), house finch (*Haemorhous mexicanus*), Gambel's quail (Callipepla gambelii), American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), cactus wren (*Campylorhynchus brunneicapillus*), rock wren (*Salpinctes obsoletus*), and Say's phoebe (*Sayornis saya*).

4.3.5 Mammals

The project site provides suitable foraging and denning habitat for a variety of mammalian species adapted to conditions within the Mojave Desert. Most mammal species are nocturnal and are difficult to observe during a diurnal field visit. The only mammalian species observed or detected during the field investigation were white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), coyote (*Canis latrans*), and kit fox (Vulpes macrotis). Other common mammalian species that have potential to occur on-site include

kangaroo rat (*Dipodomys* sp.) and desert cottontail (*Sylvilagus audubonii*). No bat species are expected to occur due to a lack of suitable roosting habitat (i.e., trees, crevices, abandoned structures) within and surrounding the project site.

4.4 NESTING BIRDS

No active nests or birds were observed during the field survey; however, courtship and nesting behaviors were observed. The Mojavean desert scrub plant community provides suitable foraging and nesting habitat for year-round and seasonal avian residents, as well as migrating songbirds that have adapted to conditions in the Mojave Desert.

Nesting birds are protected pursuant to the federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted prior to the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. A pre-construction nesting bird clearance survey shall be conducted within three (3) days prior to ground disturbance to ensure no nesting birds will be impacted from proejct implementaiton.

4.5 WILDLIFE CORRIDORS AND LINKAGES

Habitat linkages provide links between larger undeveloped habitat areas that are separated by development. Wildlife corridors are similar to linkages but provide specific opportunities for animals to disperse or migrate between areas. A corridor can be defined as a linear landscape feature of sufficient width to allow animal movement between two comparatively undisturbed habitat fragments. Adequate cover is essential for a corridor to function as a wildlife movement area. It is possible for a habitat corridor to be adequate for one species yet inadequate for others. Wildlife corridors are significant features for dispersal, seasonal migration, breeding, and foraging. Additionally, open space can provide a buffer against both human disturbance and natural fluctuations in resources.

According to the San Bernardino County General Plan, the project site has not been identified as occurring within a Wildlife Corridor or Linkage. However, Pipes Wash, which occurs immediately west of the site, serves as a seasonal migratory corridor for local wildlife species migrating between northwest limits of the San Bernardino Mountains and the Bed Mountains and Bullion Mountains to the north. The area surrounding nearby portions of Pipes Wash is primarily composed of undeveloped land that supports natural plant communities, with scattered road and residential developments throughout.

The proposed project, primarily located on the eastern bank of Pipes Wash, has the potential to have temporary impacts to wildlife movement during construction of the proposed project. However, based on the proposed site plan, no impacts to Pipes Wash are expected to occur from project implementation, and wildlife will continue to have movement opportunities within Pipes Wash during construction and throughout the immediate area. As a result, implementation of the proposed project is not expected to have a significant impacts to wildlife movement opportunities or prevent local wildlife movement through the area since there is ample habitat adjacent to the project site to support wildlife movement opportunities.

4.6 STATE AND FEDERAL JURISDICTIONAL AREAS

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates discharge of dredge and/or fill materials into "waters of the United States" pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the Regional Board regulates discharges into surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act and the CDFW regulates alterations to streambed and associated plant communities pursuant to Section 1602 of the California Fish and Game Code.

The project site was also evaluated for the presence of jurisdictional waters of the United States, waters of the State, and/or jurisdictional streambed. Prior to the field visit, aerial photographs of the site were viewed and compared with the surrounding USGS 7.5-minute topographic quadrangle maps to identify drainage features within the survey area as indicated from topographic changes, blue-line features, or visible drainage patterns. Similarly, the USDA NRCS soil maps for San Bernardino County were used to identify the soil series in the area and to check these soils to determine whether they are regionally identified as hydric soils. The biologists carefully assessed the site for depressions, inundation, presence of hydrophytic vegetation, staining, cracked soil, ponding, and 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.

The USFWS NWI and the USGS National Hydrography Dataset were reviewed to determine if any blueline streams or riverine resources have been documented within or immediately surrounding the project site. Based on this review, a riverine feature, Pipes Wash, is located west of the project site. Pipes Wash is located approximately 0.2 mile west of the project site, outside of the proposed project footprint.

The proposed project is not expected to impact Pipes Wash. Pipes wash is not a relatively permanent, standing, or continuously flowing bodies of water and, therefore, will not qualify as waters of the United States under the regulatory authority of the Corps (*Sackett v. EPA* (2022) 143 S. Ct. 1322, 1336). However, Pipes Wash will qualify as waters of the State and fall under the regulatory authority of the Regional Board and CDFW.

4.7 SPECIAL-STATUS BIOLOGICAL RESOURCES

The CNDDB Rarefind 5, CNDDB Quickview Tool in BIOS and the CNPS Electronic Inventory of Rare and Endangered Vascular Plants of California were queried for reported locations of special-status plant and wildlife species as well as special-status natural plant communities in the *Goat Mountain, Joshua Tree North, Landers,* and *Yucca Valley North* USGS 7.5-minute quadrangles. The biological resources assessment evaluated the conditions of the habitat(s) within the boundaries of the project site to determine if the existing plant communities, at the time of the survey, have the potential to provide suitable habitat(s) for special-status plant and wildlife species.

The literature search identified twenty-four (24) special-status plant species and fifteen (15) special-status wildlife species as having the potential to occur within the *Goat Mountain, Joshua Tree North, Landers,*

and *Yucca Valley North* quadrangles. No special-status plant communities were identified within these quadrangles. Special-status plant and wildlife species were evaluated for their potential to occur within the project boundaries based on habitat requirements, availability and quality of suitable habitat, and known distributions. Species determined to have the potential to occur within the general vicinity are presented in *Table C-1: Potentially Occurring Special-Status Biological Resources*, provide in Appendix C. Refer to Table C-1 for a determination regarding the potential occurrence of special-status plant and wildlife species within the project site.

4.7.1 Special-Status Plants

According to the CNDDB and CNPS, twenty-four (24) special-status plant species have been recorded in *Goat Mountain, Joshua Tree North, Landers,* and *Yucca Valley North* quadrangles (refer to Appendix C). The only special-status plant species observed on-site was western Joshua tree (*Yucca brevifolia*; State Candidate Endangered Species). Based on habitat requirements for the identified special-status species and known distributions, it was determined that the undeveloped and undisturbed portions of the project site that support the creosote bush scrub plant community have a low potential to Joshua tree poppy (*Eschscholzia androuxii*; CNPS 4.3), Abram's spurge (*Euphorbia abramsiana*; CNPS 2B.2), Utah vine milkweed (*Funastrum utahense*; CNPS 4.2), crowned muilla (*Muilla coronata*; CNPS 4.2), and Latimer's woodland-gilia (*Saltugilia latimeri*; CNPS 1B.2). Further it was determined that the project site does not provide suitable habitat for any of the remaining special-status plant species known to occur in the area and are presumed absent.

Western Joshua Tree

The California Fish and Game Commission (Commission) designated the western Joshua tree as a candidate for listing under the California Endangered Species Act (CESA) in October 2020. This action afforded the western Joshua tree the same CESA protections as listed species, which means that removal of the desert trees was subject to fines and criminal penalties unless authorized by a "take" permit issued by the CDFW. Such permits were difficult to obtain, and when issued would authorize removal only in limited circumstances. The new law which became effective July 1, 2023, streamlines the western Joshua Tree take permit process and broadens the purposes for which a permit may be issued. A western Joshua tree may now be removed for any purpose, so long as a permit is obtained and the removal is fully mitigated, or alternatively, an in-lieu mitigation fee is paid. The table below summarizes the new rules for the are the project site is located.

Location	Mitigation Fees
The project site is not located within the "Reduced Mitigation Fee Area": the area bounded on the east and west by Interstate 5 and Interstate 15, respectively, and on the north and south by Highway 58 and Highways 138 and 18, respectively.	Full mitigation, or in-lieu fee as follows: • $2,500 per tree > 5 meters tall • $500 per tree 1 to 5 meters tall • $340 per tree < 1 meter tall

A total of sixty-eight (68) western Joshua trees were observed during the field investigation, including ten (10) individuals measuring less than one meter in height, forty-four (44) individuals measuring between one and five meters in height, and fourteen (14) individual measuring over five meters in height. Using the mitigation fee table, impacts to all of the western Joshua trees onsite will require a mitigation fee of $60,400 to be paid into the Western Joshua Tree Mitigation Fund.

Size Classification	Count	Fee per Tree	Fees
1 (<1 meter)	10	$340.00	$3,400.00
2 (1 to 5 meters)	44	$500.00	$22,000.00
3 (> 5 meters)	14	$2,500.00	$35,000.00
TOTALS	**68**		**$ 60,400.00**

4.7.2 Special-Status Wildlife

According to the CNDDB, fifteen (15) special-status wildlife species have been reported in the *Goat Mountain, Joshua Tree North, Landers,* and *Yucca Valley North* quadrangles (refer to Appendix C). No special-status wildlife species were observed on-site during the habitat assessment. Based on habitat requirements for specific species and the availability and quality of on-site habitats, it was determined that the proposed project site has a moderate potential to provide suitable habitat for loggerhead shrike (*Lanius ludocivianus*), and low potential to provide habitat for Mojave desert tortoise (*Gopherus agassizii*), and burrowing owl (*Athene cunicularia*). Further it was determined that the project site and do not provide suitable habitat for any of the other special-status wildlife species known to occur in the area.

No suitable burrows, live tortoises, burrowing owls, or signs were observed on the project site during the field investigation. Due to routine anthropogenic disturbances associated with off-road vehicle use and other human disturbances, desert tortoise are not expected to occur onsite. As a result, desert tortoise and burrowing owls have a low potential to occur onsite, and pre-construction clearance surveys should be conducted, prior to ground disturbing activities to ensure desert tortoise and burrowing owl remain absent from the project site.

In order to ensure impacts to the aforementioned species do not occur from implementation of the project, pre-construction clearance surveys shall be conducted prior to ground disturbance. With implementation of the pre-construction clearance surveys, impacts to these special-status species will be less than significant and no mitigation will be required.

Desert Tortoise

The Mojave population of the desert tortoise inhabits areas north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran Desert in California. Throughout the majority of the Mojave Desert, desert tortoises occur most commonly on gentle sloping soils characterized by an even mix of sand and gravel and sparsely vegetated low-growing

vegetation where there is abundant inter-shrub space. Typical habitat for the Mojave desert tortoise has been characterized as Mojavean desert scrub below 5,500 feet in elevation with a high diversity of perennial and ephemeral plants. The dominant shrub commonly associated with desert tortoise habitat is creosote bush; however, other shrubs including burrobush (*Ambrosia dumosa*), Mojave yucca, cheesebush (*Ambrosia salsola*), and Mojave prickly pear (*Opuntia mojavensis*) also provide suitable habitat. The desert tortoise spends 95 percent of its life underground and will opportunistically utilize burrows of various lengths, deep caves, rock and caliche crevices, or overhangs for cover. Therefore, a moderately friable soil is required to allow for burrow construction and ensure that burrows do not collapse.

No live desert tortoises, suitable burrows, or other sign were observed during the field investigation.

Burrowing Owl

The burrowing owl is currently listed as a California Species of Special Concern. It is a grassland specialist distributed throughout western North America where it occupies open areas with short vegetation and bare ground within shrub, desert, and grassland environments. Burrowing owls use a wide variety of arid and semi-arid environments with well-drained, level to gently-sloping areas characterized by sparse vegetation and bare ground (Haug and Didiuk 1993; Dechant et al. 1999). Burrowing owls are dependent upon the presence of burrowing mammals (such as ground squirrels) whose burrows are used for roosting and nesting (Haug and Didiuk 1993). The presence or absence of colonial mammal burrows is often a major factor that limits the presence or absence of burrowing owls. Where mammal burrows are scarce, burrowing owls have been found occupying man-made cavities, such as buried and non-functioning drain pipes, stand-pipes, and dry culverts. Burrowing mammals may burrow beneath rocks and debris or large, heavy objects such as abandoned cars, concrete blocks, or concrete pads. They also require open vegetation allowing line-of-sight observation of the surrounding habitat to forage as well as watch for predators.

No live burrowing owls, suitable burrows, or other sign were observed during the field investigation.

4.8 CRITICAL HABITAT

Under the federal Endangered Species Act, "Critical Habitat" is designated at the time of listing of a species or within one year of listing. Critical Habitat refers to specific areas within the geographical range of a species at the time it is listed that include the physical or biological features that are essential to the survival and eventual recovery of that species. Maintenance of these physical and biological features requires special management considerations or protection, regardless of whether individuals or the species are present or not. All federal agencies are required to consult with the United States Fish and Wildlife Service (USFWS) regarding activities they authorize, fund, or permit which may affect a federally listed species or its designated Critical Habitat. The purpose of the consultation is to ensure that projects will not jeopardize the continued existence of the listed species or adversely modify or destroy its designated Critical Habitat. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing is on federal lands, uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highways Administration or a CWA Permit from the Corps). If a there is a federal nexus, then the federal agency that is responsible for providing the funding or permit would consult with the USFWS.

The project site is not located within federally designated Critical Habitat. Further, the closest Critical Habitat designation is located approximately 14 miles west of the project site for Parish's daisy and 14.2 miles west the project site for Cushenbury buckwheat (*Eriogonum ovalifolium var. vineum*). Therefore, no impacts to federally designated Critical Habitat will occur from implementation of the proposed project.

4.9 SAN BERNARDINO COUNTY DEVELOPMENT CODE

The California Desert Native Plants Act (CDNPA) protects California desert native plants from unlawful harvesting on both public and privately owned lands within Imperial, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties. The following native plants, or any part thereof, may not be harvested except under a permit issued by the commissioner or the sheriff of the county in which the native plants are growing: all species of the Agavaceae (century plants, nolinas, and yuccas); all species of the family Cactaceae; all species of the family Fouquieriaceae (ocotillo, candlewood); all species of the genus *Prosopis* (mesquites); all species of the genus *Cercidium* (palo verdes); catclaw acacia (*Acacia greggii*); desert holly (*Atriplex hymenelytra*); smoke tree (*Dalea spinosa*); and desert ironwood (*Olneya tesota*), both dead and alive (provision 80073). This provision excludes any plant that is declared to be a rare, endangered, or threatened species by federal or State law or regulations, including, but not limited to, the California State Fish and Game Code.

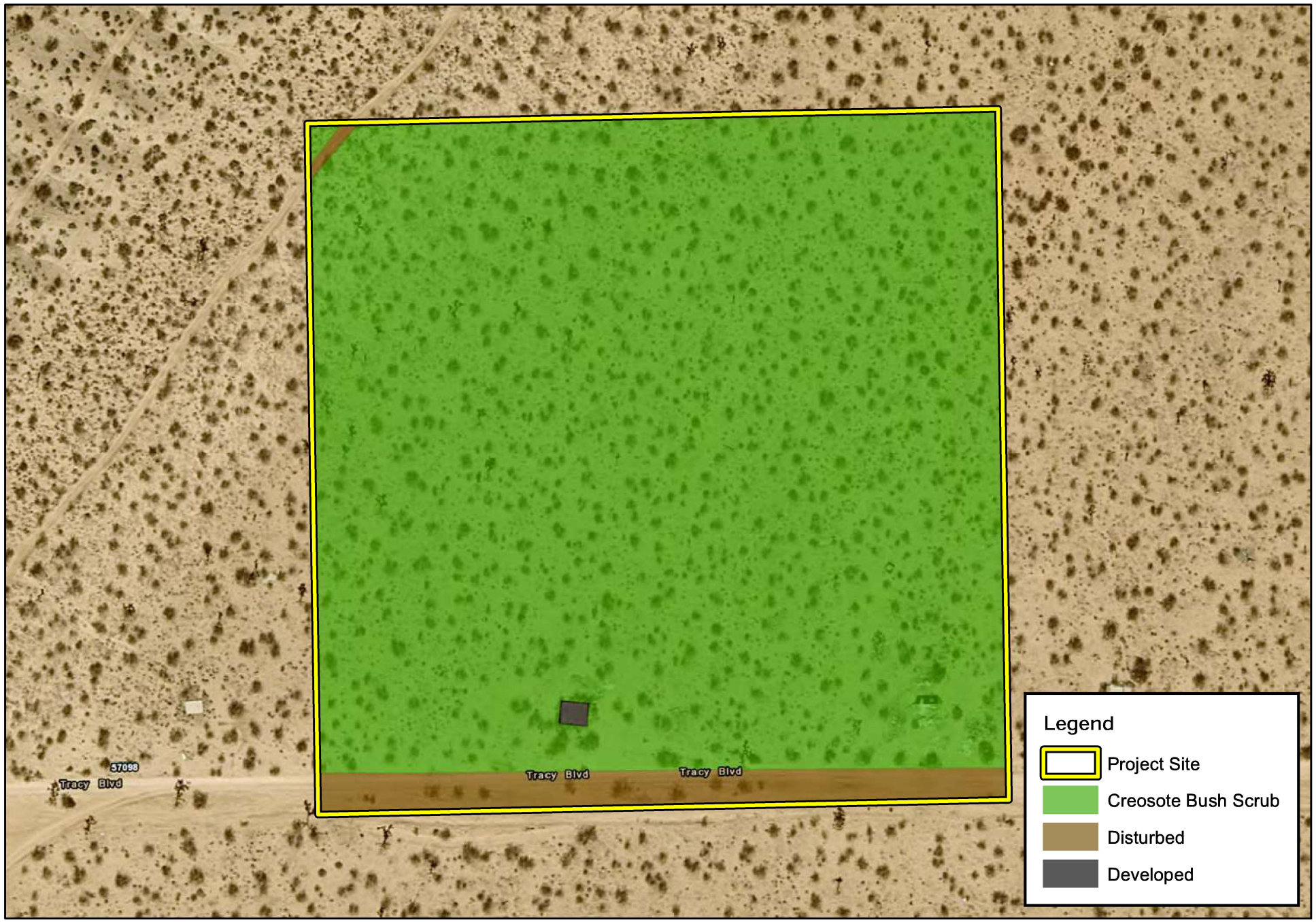
In addition, Section 88.01.060 of the County of San Bernardino Development Code provides regulations for the removal or harvesting of specified desert native plants in order to preserve and protect the plants and to provide for the conservation and wise use of desert resources. The provisions are intended to coincide with the Desert Native Plants Act (Food and Agricultural Code Section 8001 et seq.) and the State Department of Food and Agriculture to implement and enforce the Act.

Pursuant to Section 88.01.060 of the Development Code, the following desert native plants or any part of them, except the fruit, shall not be removed except under a Tree or Plant Removal Permit:

a. The following desert native plants with stems two inches or greater in diameter or six feet or greater in height:
    1. *Dalea spinosa* (smoke tree)
    2. All species of the genus *Prosopis* (mesquites)
b. All species of the family *Agavaceae* (century plants, nolinas, yuccas)
c. Creosote Rings, 10 feet or greater in diameter
d. All Joshua trees (*Yucca brevifolia*)
e. Any part of any of the following species, whether living or dead:
    1. *Olneya tesota* (desert ironwood)
    2. All species of the genus *Prosopis* (mesquites)
    3. All species of the genus *Parkinsonia* (palos verdes)

Based on the results of the field investigation, multiple species covered by the CDNPA and the County of San Bernardino Development Code were observed within project boundaries during the field investigation, including silver cholla, pencil cholla, Joshua tree, and beavertail. Impacts to these species should be avoided in all instances. In the event that avoidance is not feasible, the project applicant will need an inventory of

covered species within the project site completed and a Tree or Plant Removal Permit will need to be obtained from the County of San Bernardino prior to removal of any regulated tree or plant.



ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

AMES-RECHE RECHARGE BASIN

Vegetation

Exhibit 4

Section 5 Conclusion and Recommendations

The project site is located in a primarily undeveloped area with development, adjacent to Pipes Wash, north of the Town of Yucca Valley in unincorporated San Bernardino County. Areas surrounding the site consist of vacant, undeveloped land with scattered residential and commercial land, and Pipes Wash to the west. The project site is relatively undeveloped except areas in the southern areas of the project site. The areas along the perimeter of the project site are relatively undeveloped/undisturbed, with the exception of the northwestern corner along Winters Road. During the field investigation one (1) plant community was observed within the boundary of the project site: creosote bush scrub. In addition, two (2) land cover type that would be classified as disturbed and developed were observed on-site.

Special-Status Plant Species

Based on habitat requirements for the identified special-status species and known distributions, it was determined that the undeveloped and undisturbed portions of the project site that support the creosote bush scrub plant community have a low potential to Joshua tree poppy (CNPS 4.3), Abram's spurge (CNPS 2B.2), Utah vine milkweed (CNPS 4.2), crowned muilla (CNPS 4.2), and Latimer's woodland-gilia (CNPS 1B.2). Further it was determined that the project site does not provide suitable habitat for any of the remaining special-status plant species known to occur in the area and are presumed absent.

These species are not regulated under the federal or state Endangered Species Acts. In an effort to increase coverage for unlisted but regionally sensitive plants under the California Environmental Quality Act (CEQA), the CNPS began publishing sensitivity rankings for special-status plant species. These species, therefore, do not rise to the level of a species of concern under CEQA. Potential project impacts to the aforementioned species, if found, would therefore be less than significant, and no mitigation is required.

Western Joshau Tree

Impacts to western Joshua trees will require an Incidental Take Permit (ITP) to be prepared and processed with CDFW, and a mitigation fee of $60,4000.00 will need to be paid into the western Joshua tree mitigation tree fund.

Special-Status Wildlife Species

No special-status wildlife species were observed on-site during the field investigation. Based on habitat requirements for specific species and the availability and quality of on-site habitats, it was determined that the proposed project site has a moderate potential to provide suitable habitat for loggerhead shrike; and low potential to provide suitable habitat for Mojave desert tortoise and burrowing owl. It was further determined that the project site does not provide suitable habitat for any of the other special-status wildlife species known to occur in the area since the project site was determined not to provide suitable habitat.

Recommendations for avoidance and minimization:

Migratory Bird Treaty Act and Fish and Game Code

Nesting birds are protected pursuant to the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (Sections 3503, 3503.5, 3511, and 3513 prohibit the take, possession, or destruction of birds, their nests or eggs). In order to protect migratory bird species, a nesting bird clearance survey should be conducted prior to any ground disturbance or vegetation removal activities that may disrupt the birds during the nesting season.

If construction occurs between February 1st and August 31st, a pre-construction clearance survey for nesting birds should be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.

Pre-construction Burrowing Owl Clearance Survey

To avoid impacts to burrowing owls, a pre-construction clearance survey for burrowing owls in accordance with CDFW's Staff Report on Burrowing Owl Mitigation is recommended to be conducted. Two surveys shall be conducted, the first 14 days prior to ground disturbing activities and the second within 24 hours immediately before ground disturbing activities. If burrowing owls are documented on-site, the Applicant shall prepare and implement a plan for avoidance or passive exclusion, in coordination with CDFW. If no burrowing owls are observed onsite, no further review will be required.

Pre-Construction Desert Tortoise Clearance Survey

A pre-construction clearance survey shall be conducted thirty (30) days prior to ground disturbing areas in undeveloped areas to confirm the absence of desert tortoise within the boundaries of the survey area. All burrows, if present, will be thoroughly inspected for the presence of desert tortoise or evidence of recent use using non-intrusive methods (i.e., mirror, digital camera). Burrow characteristics including class, shape, orientation, size, and evidence of deterioration will be recorded on field data sheets.

Although not anticipated, if desert tortoise are found onsite during the pre-construction clearance survey, coordination will need to occur with the USFWS and CDFW to determine if avoidance and minimization

measures can be implemented to avoid any direct or indirect impacts to desert tortoise, or if "Take" permits will need to be obtained prepared and approved by the USFWS and CDFW.

Riparian Habitat and Special-Status Natural Communities

No riparian habitat or jurisdictional features are expected to be impacted from project implementation. Further, no sensitive natural communities will be impacted from project implementation.

Wildlife Corridors

The proposed project, primarily located on the eastern bank of Pipes Wash, has the potential to have temporary impacts to wildlife movement during construction of the proposed project. However, based on the proposed site plan, no impacts to Pipes Wash are expected to occur from project implementation, and wildlife will continue to have movement opportunities within Pipes Wash during construction and throughout the immediate area. As a result, implementation of the proposed project is not expected to have a significant impacts to wildlife movement opportunities or prevent local wildlife movement through the area since there is ample habitat adjacent to the project site to support wildlife movement opportunities.

Local Policies or Ordinances

Section 88.01.060 of the County of San Bernardino Development Code provides regulations for the removal or harvesting of specified desert native plants in order to preserve and protect the plants and to provide for the conservation and wise use of desert resources. The provisions are intended to coincide with the Desert Native Plants Act (Food and Agricultural Code Section 8001 et seq.) and the State Department of Food and Agriculture to implement and enforce the Act.

Based on the results of the field investigation, multiple species covered by the CDNPA and the County of San Bernardino Development Code were observed within project boundaries during the field investigation, including silver cholla, pencil cholla, hedgehog cactus, chaparral yucca, beavertail prickly pear, and Mohave yucca. Impacts to these species should be avoided in all instances. In the event that avoidance is not feasible, the project applicant will need an inventory of covered species within the project site completed and a Tree or Plant Removal Permit will need to be obtained from the County of San Bernardino prior to removal of any regulated tree or plant.

Local, Regional, and State Plans

The project site is not located within an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state Habitat Conservation Plan. Therefore, impacts to any local, regional, or state habitat conservation plans are not expected to occur from development of the proposed project, and mitigation is not required.

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Appendix A Site Plan

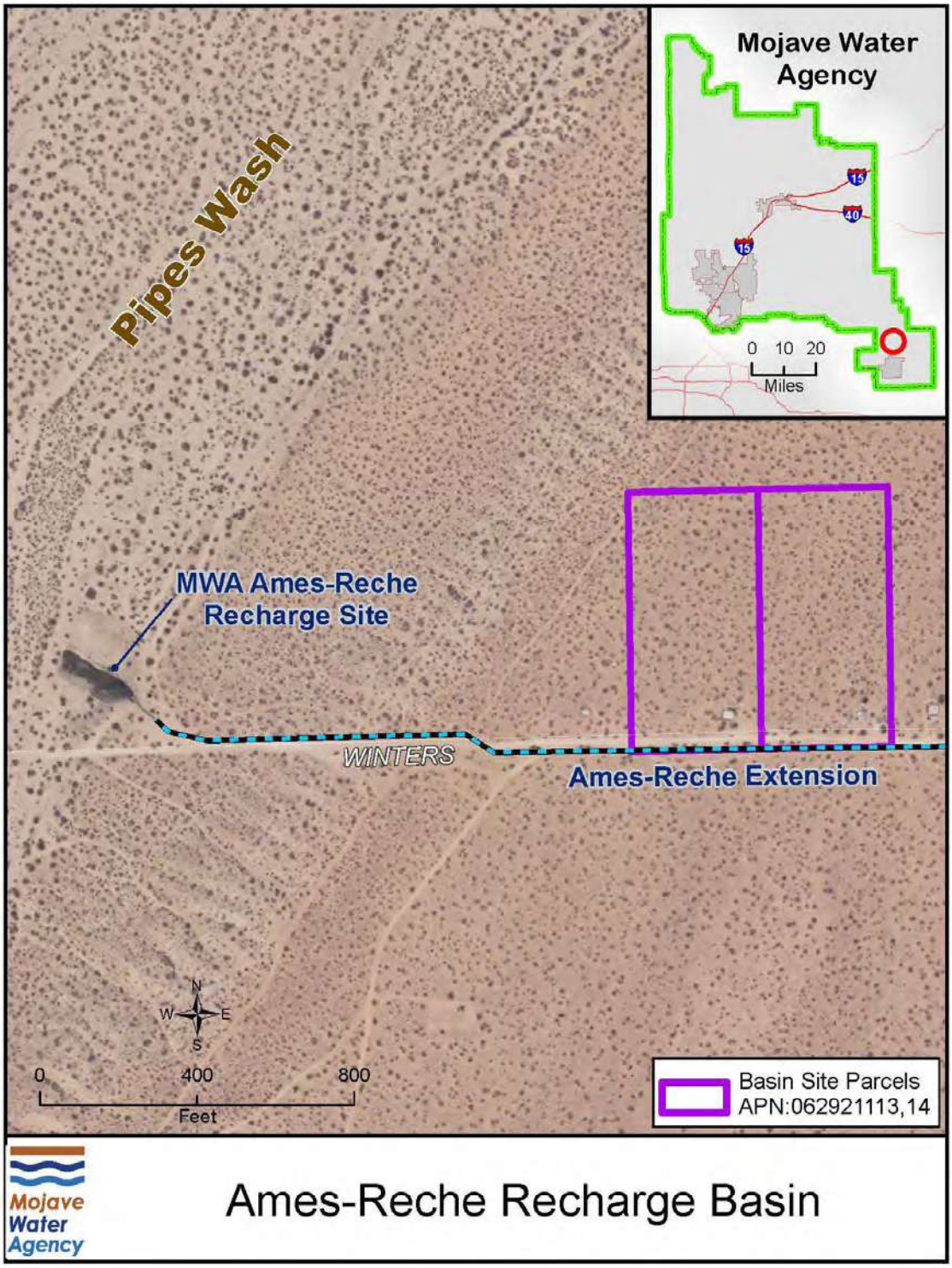

Figure 2 Ames-Reche Recharge Basin Location

Appendix B Site Photographs



Photograph 1: From the northwest corner of the project site looking east along the northern boundary.



Photograph 2: From the northwest corner of the project site looking south along the western boundary.



Photograph 3: From the northeast corner of the project site looking west along the northern boundary.



Photograph 4: From the northeast corner of the project site looking south along the eastern boundary.



Photograph 5: From the southeast corner of the project site looking north along the eastern boundary.



Photograph 6: From the southeast corner of the project site looking west along the southern boundary and Winters Road.



Photograph 7: From the southwest corner of the project site looking north along the western boundary.



Photograph 8: From the northwest corner of the project site looking east along the southern boundary and Winters Road.

Appendix C Potentially Occurring Special-Status Biological Resources

Table C-1: Potentially Occurring Sensitive Biological Resources

Scientific Name Common Name	**Status**	**Habitat**	**Observed On-site**	**Potential to Occur**
SPECIAL – STATUS WILDLIFE SPECIES				
Aquila chrysaetos golden eagle	Fed: None CA: FP/WL	Occupies nearly all terrestrial habitats of the western states except densely forested areas. Favors secluded cliffs with overhanging ledges and large trees for nesting and cover. Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats. Deeply cut canyons rising to open mountain slopes and crags are ideal.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Athene cunicularia Burrowing owl	Fed: None CA: SSC	Prefers habitat with short, sparse vegetation with few shrubs and well-drained soils in grassland, shrub steppe, and desert habitats. Primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity. Occurs in open, annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation.	No	**Low** Suitable foraging habitat is present within and surrounding the project site. No suitable burrows found onsite.
Chaetodipus fallax pallidus pallid San Diego pocket mouse	Fed: None CA: None	Common resident of sandy herbaceous areas, usually in association with rocks or course gravel in southwestern California. Occurs mainly in arid coastal and desert border areas. Habitats include coastal scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Falco mexicanus prairie falcon	Fed: None CA: WL	Commonly occur in arid and semiarid shrubland and grassland community types. Also occasionally found in open parklands within coniferous forests. During the breeding season, they are found commonly in foothills and mountains which provide cliffs and escarpments suitable for nest sites.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Gopherus agassizii desert tortoise	Fed: **THR** CA: **THR**	Widely distributed in the Mojave, Sonoran, and Colorado deserts from below sea level to 7,220 feet. Most common in desert scrub, desert wash, and Joshua tree habitats, but occurs in almost every desert habitat except those on the most precipitous slopes.	No	**Low** Suitable foraging habitat is present within and surrounding the project site. No suitable burrows found onsite.
Lanius ludovicianus loggerhead shrike	Fed: None CA: SSC	Prefers open habitats with bare ground, scattered shrubs, and areas with low or sparse herbaceous cover including open-canopied valley foothill hardwood, riparian, pinyon-juniper, desert riparian, creosote bush scrub, and Joshua tree woodland. Requires suitable perches including trees, posts, fences, utility lines, or other perches.	No	**High** Suitable foraging and nesting habitat are present within and surrounding the project site.
Lasiurus xanthinus western yellow bat	Fed: None CA: SSC	Roosts in palm trees in foothill riparian, desert wash, and palm oasis habitats with access to water for foraging.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Ovis canadensis nelsoni desert bighorn sheep	Fed: None CA: FP	Preferred habitat is near mountainous terrain above the desert floor that is visually open, as well as steep and rocky. Most Mojave Desert Mountain ranges satisfy these requirements well. Surface water is another element that is considered important to population health.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed On-site**	**Potential to Occur**
Paranomada californica California cuckoo bee	Fed: None CA: None	Habitat data is unknown. It is a kleptoparasite of other solitary ground-nesting bees.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Phrynosoma blainvillii coast horned lizard	Fed: None CA: SSC	Occurs in a wide variety of vegetation types including coastal sage scrub, annual grassland, chaparral, oak woodland, riparian woodland and coniferous forest. In inland areas, this species is restricted to areas with pockets of open microhabitat, created by disturbance (i.e. fire, floods, roads, grazing, fire breaks). The key elements of such habitats are loose, fine soils with a high sand fraction; an abundance of native ants or other insects; and open areas with limited overstory for basking and low, but relatively dense shrubs for refuge.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Spizella breweri Brewer's sparrow	Fed: None CA: None	Habitats include arid sagebrush and brushy plains. Nests in tall and densely branching shrubs, most often in big sagebrush (*Artemesia tridentata*). Winters in desert grasslands.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Taxidea taxus American badger	Fed: None CA: SSC	Primarily occupy grasslands, parklands, farms, tallgrass and shortgrass prairies, meadows, shrub-steppe communities and other treeless areas with sandy loam soils where it can dig more easily for its prey. Occasionally found in open chaparral (with less than 50% plant cover) and riparian zones.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Toxostoma bendirei Bendires thrasher	Fed: None CA: SSC	Prefers relatively open grassland, shrubland, or woodland with scattered trees or shrubs for breeding. Generally found in brushy habitats in deserts or grasslands, and Joshua tree stands.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Toxostoma lecontei Le Conte's thrasher	Fed: None CA: SSC	An uncommon to rare, local resident in southern California deserts from southern Mono Co. south to the Mexican border, and in western and southern San Joaquin Valley. Occurs primarily in open desert wash, desert scrub, alkali desert scrub, and desert succulent shrub habitats; also occurs in Joshua tree habitat with scattered shrubs.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
Uma scoparia Mojave fringe-toed lizard	Fed: None CA: SSC	Restricted to sparsely vegetated, windblown sand in dunes, flats, riverbanks and washes. It requires fine, loose sand for burrowing and lays its eggs in subsurface burrows. Vegetation is typically scant and often consists of creosote bush scrub or other scrub.	No	**Presumed Absent** There is no suitable habitat present within or adjacent to the project site.
SPECIAL – STATUS PLANT SPECIES				
Astragalus bernardinus San Bernardino milk-vetch	Fed: None CA: None CNPS: 1B.2	Grows in carbonate (often), granitic (often) areas within Joshua tree "woodland" and Pinyon and juniper woodland habitats. Found at elevations ranging from 2,955 to 6,560 feet in the San Bernardino Mountains and Mojave Desert. Blooming period is from April to June.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Astragalus nutans Providence Mountains milk-vetch	Fed: None CA: None CNPS: 4.3	Grows in gravelly (sometimes), sandy (sometimes) soils within Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland, and Sonoran desert scrub habitats. Found at elevations ranging from 1,475 to 6,400 feet. Blooming period is from March to June (October).	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Berberis fremontii Fremont berry	Fed: None CA: None CNPS: 2B.3	Grows in granitic (sometimes), rocky soils within Joshua tree "woodland" and Pinyon and juniper woodland habitats. Found at elevations ranging from 3,755 to 5,645 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site. The site occurs outside of the known elevation range for this species.

Scientific Name Common Name	**Status**	**Habitat**	**Observed On-site**	**Potential to Occur**
Boechera dispar pinyon rockcress	Fed: None CA: None CNPS: 2B.3	Found on loose, granitic slopes or compact talus soils in Joshua tree woodland, Mojavean Desert scrub, and pinyon-juniper woodland. Grows at elevations from 3,900 to 8,300 feet. Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site. The site occurs outside of the known elevation range for this species.
Camissonia kernensis ssp. Kernensis Kern County evening primrose	Fed: None CA: None CNPS: 4.3	Grows in granitic, gravelly (sometimes), sandy (sometimes) areas within chaparral, Joshua tree "woodland", and pinyon and juniper woodland habitats. Found at elevations ranging from 2,590 to 6,990 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Canbya candida white pygmy-poppy	Fed: None CA: None CNPS: 4.2	Occurs on gravelly, sandy, granitic soils in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. Found at elevations ranging from 2,297 to 5,249 feet above mean sea level (msl). Blooming period is from March to June.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Cymopterus multinervatus purple-nerve cymopterus	Fed: None CA: None CNPS: 2B.2	Grows in sandy or gravelly soils within Mojavean desert scrub and pinyon and juniper woodland habitats. Found at elevations ranging from 2,590 to 5,905 feet. Blooming period is from March to April.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Erigeron parishii Parish's daisy	Fed: **THR** CA: None CNPS: 1B.1	Grows in carbonate (usually) and granitic (sometimes) soils in Mojavean desert scrub and pinyon/juniper woodland habitats. Found at elevations ranging from 2,625 to 6,560 feet. Blooming period is from May to August.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Eschscholzia androuxii Joshua Tree poppy	Fed: None CA: None CNPS: 4.3	Occurs on sandy, gravelly, and/or rocky desert washes, flats, and slopes in Joshua tree woodland and Mojavean desert scrub. Found at elevations from 1,900 to 5,530 feet. Blooming period is February to June.	No	**Low** Limited habitat is present within or adjacent to the project site.
Euphorbia abramsiana Abram's spurge	Fed: None CA: None CNPS: 2B.2	Found on sandy soils in Mojavean desert scrub and Sonoran Desert scrub. Found at elevations ranging from -15 to 4,300 feet. Blooming period is from September to November.	No	**Low** Limited habitat is present within or adjacent to the project site.
Euphorbia vallis-mortae Death Valley sandmat	Fed: None CA: None CNPS: 4.2	Grows within Mojavean desert scrub (gravelly, sandy) habitats. Found at elevations ranging from 755 to 4,790 feet. Blooming period is from May to October.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Funastrum utahense Utah vine milkweed	Fed: None CA: None CNPS: 4.2	Occurs in sandy or gravelly soil in Mojavean desert scrub and Sonoran desert scrub. Found at elevations ranging from 328 to 4,708 feet. Blooming period typically ranges from April to June but can begin as early as March and end as late as October.	No	**Low** Limited habitat is present within or adjacent to the project site.
Galium angustifolium* ssp. *gracillimum slender bedstraw	Fed: None CA: None CNPS: 4.2	Grows on rocky, granitic soils within Joshua tree woodland and Sonoran desert scrub habitats. Found at elevations ranging from 427 to 5,085 feet. Blooming period is from April to June.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Grusonia parishii Parish's club-cholla	Fed: None CA: None CNPS: 2B.2	Grows in rocky, sandy soils within Joshua tree "woodland", Mojavean desert scrub, and Sonoran desert scrub habitats. Found at elevations ranging from 985 to 5,000 feet. Blooming period is from May to June (July).	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Linanthus bernardinus Pioneertown linanthus	Fed: None CA: None CNPS: 1B.2	Grows within Joshua tree "woodland" and pinyon and juniper woodland habitats. Found at elevations ranging from 460 to 4,005 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.

Scientific Name Common Name	**Status**	**Habitat**	**Observed On-site**	**Potential to Occur**
Linanthus maculatus* ssp. *maculatus Little San Bernardino Mtns. linanthus	Fed: None CA: None CNPS: 1B.2	Preferred habitats include desert dunes, Joshua tree woodland, Mojavean desert scrub, and Sonoran Desert scrub in sandy soils. Found at elevations ranging from 640 to 6,808 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site.
Lycium torreyi Torrey's box-thorn	Fed: None CA: None CNPS: 4.2	Grows in rocky, sandy streambank, and wash areas within Mojave desert scrub and Sonoran desert scrub habitats. Found at elevations ranging from -165 to 4,005 feet. Blooming period is from (January to February) March to June (September to November).	No	**Presumed Absent** No suitable habitat is present within or adjacent to the project site.
Monardella robisonii Robisons monardella	Fed: None CA: None CNPS: 1B.3	Grows within pinyon and juniper woodland habitats. Known to occur only in sky island habitats in the Mojave Desert mountains, primarily within areas of Joshua Tree National Park and of lower elevations in Sand to Snow National Monument. Found at elevations ranging from 2,000 to 4,920 feet. Blooming period is from (February) April to September (October).	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site
Muilla coronata crowned muilla	Fed: None CA: None CNPS: 4.2	Found in chenopod scrub, Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland habitats. Blooming period is from May to April. Grows in elevation from 2,198 to 6,430 feet.	No	**Low** Limited habitat is present within or adjacent to the project site.
Penstemon clevelandii* var. *mohavensis Mojave beardtongue	Fed: None CA: None CNPS: 1B.2	Grows in granitic (often), rocky areas within Mojavean desert scrub and Pinyon and juniper woodland habitats. Found at elevations ranging from 3,035 to 5,315 feet. Blooming period is from March to May.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site
Petalonyx thurberi* ssp. *gilmanii Death Valley sandpaper-plant	Fed: None CA: None CNPS: 1B.3	Grows within desert dunes and Mojavean desert scrub habitats. Found at elevations ranging from 855 to 4,740 feet. Blooming period is from May to September.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site
Saltugilia latimeri Latimer's woodland-gilia	Fed: None CA: None CNPS: 1B.2	Habitats include chaparral, Mojavean desert scrub, pinyon and juniper woodland. Prefers rocky or sandy, often granitic, soils. Found at elevations ranging from 1,310 to 6,235 feet. Blooming period is from March to June.	No	**Low** Limited habitat is present within or adjacent to the project site.
Streptanthus campestris southern jewelflower	Fed: None CA: None CNPS: 1B.3	Occurs in open, rocky areas in chaparral, lower montane coniferous forest, and pinyon-juniper woodland. Found at elevations ranging from 2,955 to 7,545 feet. Blooming period is from May to July.	No	**Presumed Absent** There is no suitable habitat within or adjacent to the project site
Yucca brevifolia western Joshua tree	Fed: None CA: CE CNPS: N/A	Occurs in a variety of arid habitats within the Mojave Desert. Found at elevations ranging from 1,600 to 6,600 feet. Blooming period is from March to June.	Yes	**Present** Suitable habitat is present within and surrounding the project site.

U.S. Fish and Wildlife Service (USFWS) - Federal
END - Federal Endangered
THR - Federal Threatened

California Department of Fish and Wildlife (CDFW) - California
END - California Endangered
THR - California Threatened
SSC - California Species of Concern
WL - Watch List
FP - California Fully Protected
CE - California Candidate Endangered

California Native Plant Society (CNPS)
California Rare Plant Rank
1A - Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere
1B - Plants Rare, Threatened, or Endangered in California and Elsewhere
2B - Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere
4 - Plants of Limited Distribution – A Watch List

Threat Ranks
0.1 - Seriously threatened in California
0.2 - Moderately threatened in California
0.3 - Not very threatened in California

Appendix D Regulations

Special status species are native species that have been afforded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels.

Federal Regulations

Endangered Species Act of 1973

Federally listed threatened and endangered species and their habitats are protected under provisions of the Federal Endangered Species Act (ESA). Section 9 of the ESA prohibits "take" of threatened or endangered species. "Take" under the ESA is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." The presence of any federally threatened or endangered species that are in a project area generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. Under the regulations of the ESA, the United States Fish and Wildlife Service (USFWS) may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

Critical Habitat is designated for the survival and recovery of species listed as threatened or endangered under the ESA. Critical Habitat includes those areas occupied by the species, in which are found physical and biological features that are essential to the conservation of an ESA listed species and which may require special management considerations or protection. Critical Habitat may also include unoccupied habitat if it is determined that the unoccupied habitat is essential for the conservation of the species.

Whenever federal agencies authorize, fund, or carry out actions that may adversely modify or destroy Critical Habitat, they must consult with USFWS under Section 7 of the ESA. The designation of Critical Habitat does not affect private landowners, unless a project they are proposing uses federal funds, or requires federal authorization or permits (e.g., funding from the Federal Highway Administration or a permit from the U.S. Army Corps of Engineers (Corps)).

If USFWS determines that Critical Habitat will be adversely modified or destroyed from a proposed action, the USFWS will develop reasonable and prudent alternatives in cooperation with the federal institution to ensure the purpose of the proposed action can be achieved without loss of Critical Habitat. If the action is not likely to adversely modify or destroy Critical Habitat, USFWS will include a statement in its biological opinion concerning any incidental take that may be authorized and specify terms and conditions to ensure the agency is in compliance with the opinion.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 U.S. Government Code [USC] 703) makes it unlawful to pursue, capture, kill, possess, or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union, and authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs (16 USC 703; 50 CFR 10, 21).

The MBTA covers the taking of any nests or eggs of migratory birds, except as allowed by permit pursuant to 50 CFR, Part 21. Disturbances causing nest abandonment and/or loss of reproductive effort (i.e., killing or abandonment of eggs or young) may also be considered "take." This regulation seeks to protect migratory birds and active nests.

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). Six families of raptors occurring in North America were included in the amendment: Accipitridae (kites, hawks, and eagles); Cathartidae (New World vultures); Falconidae (falcons and caracaras); Pandionidae (ospreys); Strigidae (typical owls); and Tytonidae (barn owls). The provisions of the 1972 amendment to the MBTA protects all species and subspecies of the families listed above. The MBTA protects over 800 species including geese, ducks, shorebirds, raptors, songbirds and many relatively common species.

State Regulations

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) provides for the protection of the environment within the State of California by establishing State policy to prevent significant, avoidable damage to the environment through the use of alternatives or mitigation measures for projects. It applies to actions directly undertaken, financed, or permitted by State lead agencies. If a project is determined to be subject to CEQA, the lead agency will be required to conduct an Initial Study (IS); if the IS determines that the project may have significant impacts on the environment, the lead agency will subsequently be required to write an Environmental Impact Report (EIR). A finding of non-significant effects will require either a Negative Declaration or a Mitigated Negative Declaration instead of an EIR. Section 15380 of the CEQA Guidelines independently defines "endangered" and "rare" species separately from the definitions of the California Endangered Species Act (CESA). Under CEQA, "endangered" species of plants or animals are defined as those whose survival and reproduction in the wild are in immediate jeopardy, while "rare" species are defined as those who are in such low numbers that they could become endangered if their environment worsens.

California Endangered Species Act (CESA)

In addition to federal laws, the state of California implements the CESA which is enforced by CDFW. The CESA program maintains a separate listing of species beyond the FESA, although the provisions of each act are similar.

State-listed threatened and endangered species are protected under provisions of the CESA. Activities that may result in "take" of individuals (defined in CESA as; "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") are regulated by CDFW. Habitat degradation or modification is not included in the definition of "take" under CESA. Nonetheless, CDFW has interpreted "take" to include the destruction of nesting, denning, or foraging habitat necessary to maintain a viable breeding population of protected species.

The State of California considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers throughout its range that it is likely to become an endangered species in the near future in the

absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. State threatened and endangered species are fully protected against take, as defined above.

The CDFW has also produced a species of special concern list to serve as a species watch list. Species on this list are either of limited distribution or their habitats have been reduced substantially, such that a threat to their populations may be imminent. Species of special concern may receive special attention during environmental review, but they do not have formal statutory protection. At the federal level, USFWS also uses the label species of concern, as an informal term that refers to species which might be in need of concentrated conservation actions. As the Species of Concern designated by USFWS do not receive formal legal protection, the use of the term does not necessarily ensure that the species will be proposed for listing as a threatened or endangered species.

Fish and Game Code

Fish and Game Code Sections 3503, 3503.5, 3511, and 3513 are applicable to natural resource management. For example, Section 3503 of the Code makes it unlawful to destroy any birds' nest or any birds' eggs that are protected under the MBTA. Further, any birds in the orders Falconiformes or Strigiformes (Birds of Prey, such as hawks, eagles, and owls) are protected under Section 3503.5 of the Fish and Game Code which makes it unlawful to take, possess, or destroy their nest or eggs. A consultation with CDFW may be required prior to the removal of any bird of prey nest that may occur on a project site. Section 3511 of the Fish and Game Code lists fully protected bird species, where the CDFW is unable to authorize the issuance of permits or licenses to take these species. Pertinent species that are State fully protected by the State include golden eagle (*Aquila chrysaetos*) and white-tailed kite (*Elanus leucurus*). Section 3513 of the Fish and Game Code makes it unlawful to take or possess any migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Native Plant Protection Act

Sections 1900–1913 of the Fish and Game Code were developed to preserve, protect, and enhance Rare and Endangered plants in the state of California. The act requires all state agencies to use their authority to carry out programs to conserve Endangered and Rare native plants. Provisions of the Native Plant Protection Act prohibit the taking of listed plants from the wild and require notification of the CDFW at least ten days in advance of any change in land use which would adversely impact listed plants. This allows the CDFW to salvage listed plant species that would otherwise be destroyed.

California Native Plant Society Rare and Endangered Plant Species

Vascular plants listed as rare or endangered by the CNPS, but which have no designated status under FESA or CESA are defined as follows:

California Rare Plant Rank

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 More 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 (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known).

Local Regulations

San Bernardino County Development Code

Section 88.01.060 of the County of San Bernardino Development Code provides regulations for the removal or harvesting of specified desert native plants in order to preserve and protect the plants and to provide for the conservation and wise use of desert resources. The provisions are intended to coincide with the Desert Native Plants Act (Food and Agricultural Code Section 8001 et seq.) and the State Department of Food and Agriculture to implement and enforce the Act.

Pursuant to Section 88.01.060 of the Development Code, the following desert native plants or any part of them, except the fruit, shall not be removed except under a Tree or Plant Removal Permit:

1) The following desert native plants with stems two inches or greater in diameter or six feet or greater in height:

   (A) *Dalea spinosa* (smoke tree)
   (B) All species of the genus *Prosopis* (mesquites)

2) All species of the family *Agavaceae* (century plants, nolinas, yuccas)

3) Creosote Rings, 10 feet or greater in diameter

4) All Joshua trees

5) Any part of any of the following species, whether living or dead:

   (A) *Olneya tesota* (desert ironwood)
   (B) All species of the genus *Prosopis* (mesquites)
   (C) All species of the genus *Cercidium* (palos verdes)

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Branch regulates activities pursuant to Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. Of the State agencies, the CDFG regulates activities under the Fish and Game Code Section 1600-1616, and the Regional Board regulates activities pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act.

Federal Regulations

Section 404 of the Clean Water Act

In accordance with the Revised Definition of "Waters of the United States"; Conforming (September 8, 2023), "waters of the United Sates" are defined as follows:

(a) *Waters of the United States* means:

(1) Waters which are:
(i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
(ii) The territorial seas; or
(iii) Interstate waters;

(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;

(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;

(4) Wetlands adjacent to the following waters:
(i) Waters identified in paragraph (a)(1) of this section; or
(ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

(5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section

(b) The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

(1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted

cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;
(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;
(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (*e.g.,* gullies, small washes) characterized by low volume, infrequent, or short duration flow.

(c) In this section, the following definitions apply:

(1) *Wetlands* means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) *Adjacent* means having a continuous surface connection

(3) *High tide line* means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(4) *Ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) *Tidal waters* means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

Section 401 of the Clean Water Act

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits, and helps insure that federal actions will not violate water quality standards of the State or Indian tribe. In California, there are nine Regional Water Quality Control Boards (Regional Board) that issue or deny certification for discharges to waters of the United States and waters of the State, including wetlands, within their geographical jurisdiction. The State Water Resources Control Board assumed this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

State Regulations

Fish and Game Code

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

Fish and Game Code Section 1602 requires any person, state, or local governmental agency or public utility to notify the CDFW before beginning any activity that will do one or more of the following:

(1) substantially obstruct or divert the natural flow of a river, stream, or lake;
(2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or
(3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake.

Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. CDFW's regulatory authority extends to include riparian habitat (including wetlands) supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. Generally, the CDFW takes jurisdiction to the top of bank of the stream or to the outer limit of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place in or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish or other aquatic life and watercourses having a surface or subsurface flow that support or have supported riparian vegetation. A Section 1602 Streambed Alteration Agreement would be required if impacts to identified CDFW jurisdictional areas occur.

Porter Cologne Act

The California *Porter-Cologne Water Quality Control Act* gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Porter-Cologne Act has become an important tool in the post SWANCC and Rapanos regulatory environment, with respect to the state's authority over isolated and insignificant waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a Report of Waste Discharge in the event that there is no Section 404/401 nexus. Although "waste" is partially defined as any waste substance associated with human habitation, the Regional Board also interprets this to include fill discharged into water bodies.

APPENDIX C

Cultural/Archaeological/Tribal/Paleontological Resources Report (BCR Consulting 2025)

CULTURAL RESOURCES ASSESSMENT

Ames-Reche Recharge Basin Project
Unincorporated San Bernardino County, California

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Project No. ARD2404

Data Base Information:
Type of Study: Phase I Cultural Resources Assessment
Resources Recorded: ARD2404-H-2, ARD2404-H-3, ARD2404-H-4, ARD2404-H-5
Keywords: Mojave Water Agency, Hi-Desert Water District, Concrete Foundation
USGS Quadrangle: 7.5-minute *Yucca Valley North, California* (1979)

BCRCONSULTING LLC

April 30, 2025

MANAGEMENT SUMMARY

BCR Consulting LLC (BCR Consulting) is under contract to Ardurra to conduct a Phase I Cultural Resources Assessment of the Ames-Reche Recharge Basin Project (project) in Unincorporated San Bernardino County, California. The work is being performed pursuant to Section 106 of the National Historic Preservation Act of 1966 (Section 106 of the NHPA), and to the California Environmental Quality Act (CEQA). A cultural resources records search, additional research, field survey, Sacred Lands File Search with the Native American Heritage Commission (NAHC), and paleontological overview were conducted for the project. The records search revealed that seven cultural resource studies have taken place resulting in three cultural resources identified within a one-mile radius of the APE. Of the seven previous studies, one has assessed a portion of the APE located on Winters Road, west of Warren Vista Avenue, but no resources have been previously identified within its boundaries.

During the research and field survey, BCR Consulting archaeologists identified six cement foundations that occupy the project site. Two of the six cement foundations occupy the project site directly south of the southeast intersection of Winters Road and Rainbow Drive, while the remaining four occupy the project site on Winters Road, just west of Lucky Lane. BCR Consulting recommends that the resources that occupy the project site do not meet eligibility criteria for the National Register, or for the California Register, and as such they are not recommended historic properties under Section 106 of the NHPA and are not recommended historical resources under CEQA. Therefore, the project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 and will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. Furthermore, there is no evidence that the project contains or is sensitive for human remains, including those interred outside of dedicated cemeteries. As such, the project is not likely to disturb any human remains. Based on these results no further cultural resource mitigations are recommended for the current undertaking.

While the current study has not indicated sensitivity for unknown cultural resources within the project boundaries, ground disturbing activities always have the potential to reveal buried deposits not observed on the surface. Prior to the initiation of ground-disturbing activities, the applicant (in consultation with a U.S. Secretary of the Interior Qualified Archaeologist and any participating Native American entities) should alert field personnel to the possibility of buried prehistoric or historic cultural deposits. If field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register, plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include:

- historic artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;

- historic structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;
- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks.

Findings were negative during the Sacred Lands File search with the Native American Heritage Commission (NAHC). Since the lead agency or agencies will initiate and carry out required Native American Consultation, results of consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff are available to answer questions and address concerns as necessary.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would "directly or indirectly destroy a unique paleontological resource". The paleontological overview has been completed by the Western Science Center in Hemet California. Results are summarized below (see also Appendix F).

> The Geologic units underlying the project are composed of gravel and sand deposits from the Pleistocene epoch (Dibblee and Minch 2008). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have any localities within the project area or within a 1 mile radius, but does have localities within similarly mapped deposits across Southern California.
>
> Any fossil specimen from the Proposed Ames-Reche Recharge Basin Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The applicant should notify the County Coroner of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC within 24 hours. The NAHC must then immediately identify the Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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INTRODUCTION

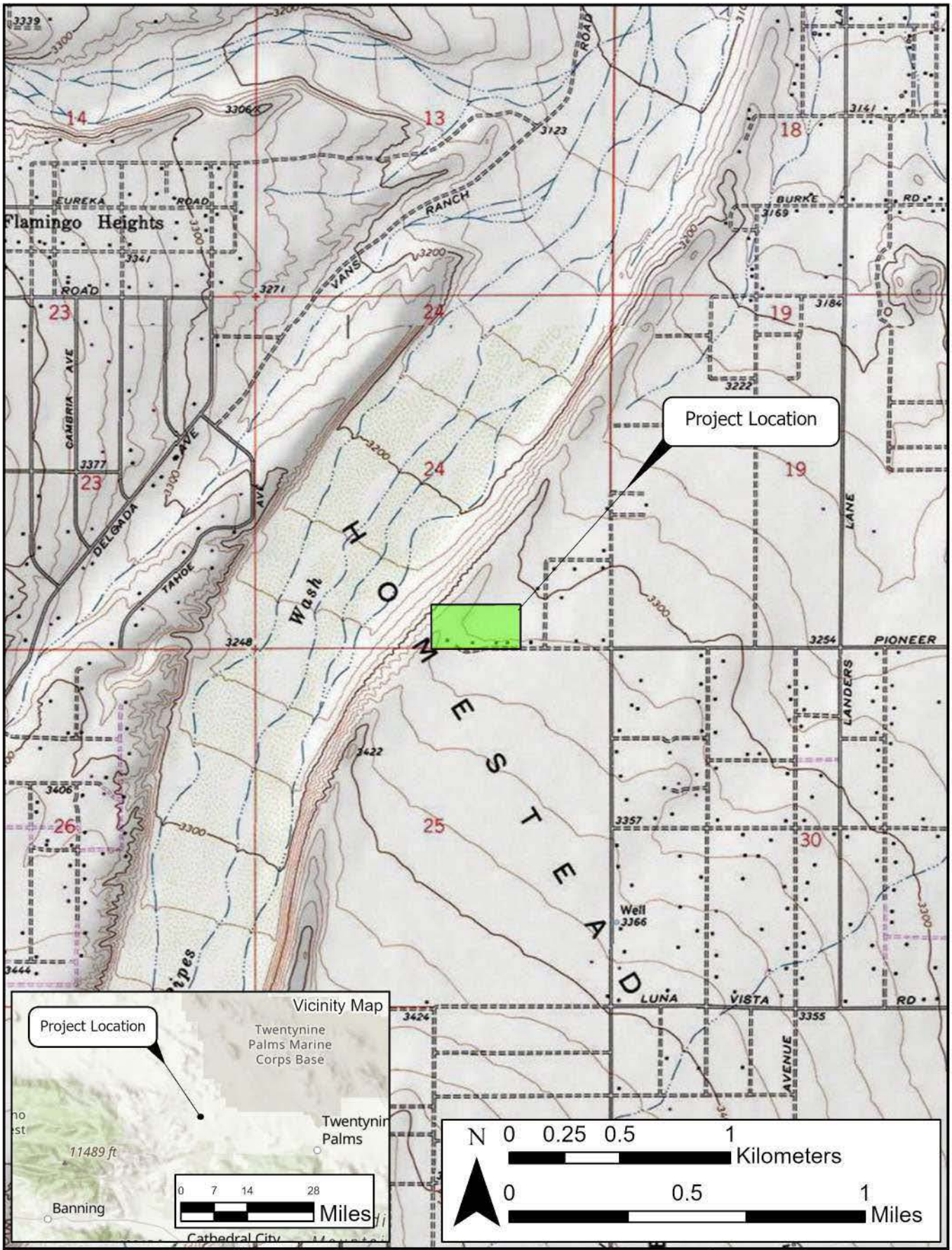
BCR Consulting LLC (BCR Consulting) is under contract to Ardurra to complete a Phase I Cultural Resources Assessment of the Ames-Reche Recharge Basin Project (project) located in unincorporated San Bernardino County, California. The work is being performed pursuant to Section 106 of the National Historic Preservation Act of 1966 (Section 106 of the NHPA), and to the California Environmental Quality Act (CEQA).

AREA OF POTENTIAL EFFECTS AND UNDERTAKING/PROJECT

The Area of Potential Effects (APE), or project site, is located in Section 24 of Township 2 North, Range 5 East, San Bernardino Baseline and Meridian. The project site is depicted on the United States Geological Survey (USGS) *Yucca Valley North, California* (1979) 7.5-minute topographic quadrangle (Figure 1). A detailed project exhibit is provided as Appendix A. The APE consists of areas in which effects/impacts from a proposed undertaking or project to potential historic properties/historical resources could occur. The undertaking, or project, would include the construction of a new recharge basin and monitoring well on the proposed 10-acre Mojave Water Agency (MWA) owned site located along Winters Road, approximately 0.3 miles east of the existing recharge facility. The new recharge facility will allow MWA to increase its groundwater recharge capacity of State Water Project allocations. The proposed project would include the installation of a new tee connection to the existing 12-inch diameter HDPE pipeline, two isolation valves, pipeline, and outlet with energy dissipator to the proposed recharge basin. The recharge basin will be designed for the maximum flow rate of five cubic feet per second, and an anticipated annual recharge capacity of 1,500 acre-feet per year or better. A nested or multi-completion monitoring well is proposed onsite or adjacent to the site as determined by the Firm and MWA to monitor infiltration rates, groundwater levels, and water quality. A Synthetic Perception Leaching Procedure (SPLP) leach test is also proposed conducted, and geochemical modeling performed if the SPLP test results warrant.

NATURAL SETTING

The project is located in the south Mojave Desert with an elevation of approximately 3,316 to 3,331 feet above mean sea level (AMSL). Previous geologic mapping indicates that the proposed project site is situated upon early Pleistocene alluvium and late Holocene wind blown sand (Biehler et al. 1988). These locally consist of poorly sorted sandy silt containing scattered pebbles and cobbles. Field observations during the current study are consistent with these descriptions. None of the materials observed during the field survey exhibited evidence of the manufacture or acquisition of prehistoric stone tools or materials. Local rainfall ranges from 2 to 5 inches annually (Jaeger and Smith 1971: 36-37). The mild climate of the late Pleistocene allowed piñon-juniper woodland to thrive throughout most of the Mojave (Van Devender et al. 1987). The vegetation and climate during this epoch attracted significant numbers of Rancholabrean fauna, including dire wolf, saber-toothed cat, short-faced bear, horse, camel, antelope, mammoth, as well as birds which included pelican, goose, duck, cormorant, and eagle (Reynolds 1988). The drier climate of the middle Holocene resulted in the local development of complementary flora and fauna, which remain largely intact to this day.



BCRCONSULTING LLC

Project Location Site
Ames-Reche Recharge Basin Project

Figure 1

Reference: ESRI; USGS Quad: Yucca Valley North, California (1979)

Ardurra

cheesebush, species of sage, and various grasses. Common native animals include coyotes, cottontail and jackrabbits, rats, mice, desert tortoises, roadrunners, raptors, turkey vultures, and other bird species.

CULTURAL SETTING

Prehistoric Context

The local prehistoric cultural setting has been organized into many chronological frameworks (see Warren and Crabtree 1986; Bettinger and Taylor 1974; Lanning 1963; Hunt 1960; Wallace 1958, 1962, 1978; Campbell and Campbell 1935), although there is no definitive sequence for the region. The difficulties in establishing cultural chronologies for western San Bernardino County are a function of its enormous size and the small amount of archaeological excavations conducted there. Moreover, throughout prehistory many groups have occupied the area and their territories often overlap spatially and chronologically resulting in mixed artifact deposits. Due to dry climate and capricious geological processes, these artifacts rarely become integrated in-situ. Lacking a milieu hospitable to the preservation of cultural midden, local chronologies have relied upon temporally diagnostic artifacts, such as projectile points, or upon the presence/absence of other temporal indicators, such as groundstone. Such methods are instructive, but can be limited by prehistoric occupants' concurrent use of different artifact styles, or by artifact re-use or re-sharpening, as well as researchers' mistaken diagnosis, and other factors (see Flenniken 1985; Flenniken and Raymond 1986; Flenniken and Wilke 1989). Recognizing the shortcomings of comparative temporal indicators, this study recommends review of Warren and Crabtree (1986), who have drawn upon this method to produce a commonly cited and relatively comprehensive chronology.

Ethnography

Serrano. The Uto-Aztecan "Serrano" people occupied the western Mojave Desert. Kroeber (1925) applied the term "Serrano" to four groups, each with distinct territories: the Kitanemuk, Tataviam, Vanyume, and Serrano. Only one group, in the San Bernardino Mountains and West-Central Mojave Desert, claims the term Serrano. "The Serrano resided in an area that extended east of the Cajon Pass, located in the San Bernardino Mountains, to Twenty-nine Palms, the north foothills of the San Bernardino Mountains and south to include portions of the Yucaipa Valley" (Bean and Smith 1978:570). Both the Serrano and Cahuilla utilized the western Mojave region seasonally. Evidence for permanent Serrano settlement in the western Mojave most notably includes the Serrano-named village of Guapiabit in Summit Valley. Access to water determined where the Serrano built their settlements/villages (ibid.). Most villages were within the Sonoran life zone (Scrub Oak [*Quercus* sp.] and sagebrush [*Salvia* sp.]), or forest transition zone, (Ponderosa pine [*Pinus ponderosa*]) (Bean and Smith 1978; Kroeber 1925). Like many neighboring tribes, the Serrano and Cahuilla were Takic (Uto-Aztecan language family) speakers (Lightfoot and Parrish 2009:341). Serrano traded with their neighbors and actively participated in a shell bead exchange economy with the Cahuilla, Luiseno, and Gabrielino (McCawley 1996). Occasionally, villages were located in the desert, adjacent to permanent water sources. Structures for families were usually circular domes, constructed of willow frames and tule thatching. Individual family homes were used primarily for sleeping and storage. Families conducted many of their daily routines outside of their

house or under a ramada. A ramada consisted of a thatched roof supported by vertical poles in the ground, which provided a shaded work area (Lightfoot and Parrish 2009:344). Other village structures included a ceremonial house, granaries and sweathouses. Subsistence strategies focused on hunting and gathering, occasionally supplemented by fishing. Food preparation varied and included a variety of cooking techniques. These ranged from baking in earth ovens to parching. Food processing utilities included scrapers, bowls, baskets, mortars, and metates (Bean and Smith 1978). A lineage leader, or kika, administered laws and ceremonies from a large ceremonial house centrally located in most villages. The size of lineages is a matter of some dispute, but most probably numbered between 70 and 120 individuals (Lightfoot and Parrish 2009). Serrano people were organized into clans affiliated with one of two exogamous moieties. Clans were led by a hereditary chief who occupied the village "big house" where ceremonies took place and shamans were initiated (Bean and Smith 1978:572; Strong 1929).

History

Historic-era California is generally divided into three periods: the Spanish or Mission Period (1769 to 1821), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

Spanish Period. The first European to pass through the area is thought to be a Spaniard called Father Francisco Garces. Having become familiar with the area, Garces acted as a guide to Juan Bautista de Anza, who had been commissioned to lead a group across the desert from a Spanish outpost in Arizona to set up quarters at the Mission San Gabriel in 1771 near what today is Pasadena (Beck and Haase 1974). Garces was followed by Alta California Governor Pedro Fages, who briefly explored the region in 1772. Searching for San Diego Presidio deserters, Fages had traveled through Riverside to San Bernardino, crossed over the mountains into the Mojave Desert, and then journeyed westward to the San Joaquin Valley (Beck and Haase 1974).

Mexican Period. In 1821, Mexico overthrew Spanish rule and the missions began to decline. By 1833, the Mexican government passed the Secularization Act, and the missions, reorganized as parish churches, lost their vast land holdings, and released their neophytes (Beattie and Beattie 1974).

American Period. The American Period, 1848–Present, began with the Treaty of Guadalupe Hidalgo. In 1850, California was accepted into the Union of the United States primarily due to the population increase created by the Gold Rush of 1849. The cattle industry reached its greatest prosperity during the first years of the American Period. Mexican Period land grants had created large pastoral estates in California, and demand for beef during the Gold Rush led to a cattle boom that lasted from 1849–1855. However, beginning about 1855, the demand for beef began to decline due to imports of sheep from New Mexico and cattle from the Mississippi and Missouri Valleys. When the beef market collapsed, many California ranchers lost their ranchos through foreclosure. A series of disastrous floods in 1861–1862, followed by a significant drought further diminished the economic impact of local ranching. This decline combined with ubiquitous agricultural and real estate developments of the late 19th century, set the stage for diversified economic pursuits that have continued to proliferate (Beattie and Beattie 1974; Cleland 1941).

Yucca Valley. Yucca Valley is located in the western part of the Mojave Desert in Southern California, within San Bernardino County. The region is commonly associated with the Yucca Valley town, but its history is tied to several surrounding communities and the broader desert region, including Joshua Tree, Twentynine Palms, and Landers. The first documented exploration and survey of the area was completed by Colonel Henry Washington for the U.S. Government in 1855 (Wilson and Grubb 1984:5-6). The area was largely uninhabited due to a lack of natural water but in 1862, the Homestead Act was passed and allowed Americans to claim 160-acres of land in the high desert and Mojave Desert to incentivize American expansion of southern California (National Park Service 2023). The Yucca Valley area, which was initially sparsely populated, relied heavily on groundwater to support its growing population. In 1884, Mark “Chuck” Warren, leased land on the outskirts of Yucca Valley and established the area's first significant water well. The well would become a crucial source of water and stage-stop for others traveling through the San Bernardino Mountains and Coachella Valley. As the area grew during the early 1900s, water became more critical for settlement and minor agriculture (Wilson and Grubb 1984:8-9; County Assessor-Recorder-County Clerk 2025). The region's desert climate meant that natural sources of water were limited, so settlers turned to drilling wells and tapping into the underground aquifers of Warren’s well on their own land. The development of water infrastructure and private wells was not uncommon and supported the growth of small communities (Lewis 1972:33; Wilson and Grubb 1984:108-110).

In the 1930s and 1940s, the availability of water was still a limiting factor for the region's development. While small farming communities relied on well water for crops and domestic use, the growing population in Southern California, especially after World War II, put additional strain on water resources. Recharge in Yucca Valley comes almost exclusively from precipitation of the San Bernardino Mountains and Little San Bernardino Mountains, putting strain on the basin in seasons of drought (Lewis 1972). The U.S. government began to look for ways to manage and distribute water more effectively. The construction of water infrastructure, including canals, reservoirs, and the establishment of regional water agencies, became more common throughout Southern California. However, Yucca Valley remained reliant on local wells and groundwater supplies, which limited large-scale growth.

After World War II, the region saw an increase in residential development, partly driven by veterans seeking affordable housing in the desert. As the population of Yucca Valley and surrounding areas grew, so did the demand for water. The development of public water systems was also another driving factor to the increase in population size and began to address these growing needs. By the 1960s and 1970s, local water agencies were established, including the Hi-Desert Water District and Mojave Water Agency, which helped manage water resources for the communities in the Yucca Valley area and high desert. These companies focused on providing residents with water from local wells and aquifers, as well as overseeing the development of infrastructure for water distribution. In the 1980s and 1990s, water conservation became an increasing concern as water tables dropped and droughts in the region became more frequent. Efforts were made to improve water conservation practices and manage resources more efficiently (Hi-Desert Water District 2024, Mojave Water Agency 2025). Today, Yucca Valley continues to rely heavily

on groundwater, although the region is also part of the broader California State Water Project and Colorado River system for supplemental water resources. The area is subject to the challenges of living in a desert climate, with recurring droughts and rising water demand placing pressure on available supplies. The Hi-Desert Water District and Mojave Water Agency now provide water to most residents in the region. There have been efforts to educate the public on water conservation techniques, as residents are encouraged to use water-saving devices and minimize waste. Yucca Valley and the surrounding region face ongoing challenges related to water scarcity, especially considering climate change, growing populations, and limited natural water sources (Hi-Desert Water District 2024, Mojave Water Agency 2025).

PERSONNEL

David Brunzell, M.A., RPA acted as the Principal Investigator for the current study. Joseph Orozco, M.A., RPA acted as the Project Manager and compiled the technical report with contributions from BCR Consulting Staff Archaeologists Doug Kazmier, B.A. and Eduardo Gutierrez B.S. BCR Consulting Archaeological Crew Chief Timothy Blood, M.S. completed the cultural resources records search at the South Central Coastal Information Center (SCCIC). BCR Consulting Staff Historian George Bretner, B.A., authored the Department of Park and Recreation (DPR) 523 forms. Mr. Blood and Staff Archaeologist John Defachelle completed the field survey.

METHODS

This work was completed pursuant to Section 106 of the NHPA and to CEQA, the Public Resources Code (PRC) Chapter 2.6, Section 21083.2, and California Code of Regulations (CCR) Title 14, Chapter 3, Article 5, Section 15064.5. The pedestrian cultural resources survey was intended to document previously recorded or new cultural resources, including archaeological sites, features, isolates, and historic-period buildings, that exceed 45 years in age within defined project boundaries. The project site was examined using 15-meter transect intervals within block portions and along the alignment frontage.

This study is intended to determine whether cultural resources are located within the project boundaries, whether any cultural resources are significant pursuant to the above referenced regulations and standards, and to develop specific mitigation measures that will address potential impacts to existing or potential resources. Tasks include:

- Cultural resources records search to review any studies conducted and the resulting cultural resources recorded within a one-mile radius of the project
- Additional research through various local and regional resources
- Systematic pedestrian survey of the entire project site
- Evaluation of National and California Register of Historical Resources (California Register) eligibility for any cultural resources discovered
- Development of recommendations for cultural resources documented within the project boundaries, following Section 106 of the NHPA, and CEQA guidelines
- Completion of DPR 523 forms for any cultural resources identified

Research

Records Search. An archaeological records search was conducted at the SCCIC on January 29, 2025. This included a review of all recorded historic and prehistoric cultural resources, as well as a review of known cultural resources, and survey and excavation reports generated from projects located within one of the APE. In addition, a review was conducted of the National Register of Historic Places (National Register), the California Register, and documents and inventories from the California Office of Historic Preservation including the lists of California Historical Landmarks, California Points of Historical Interest, Listing of National Register Properties, and the Built Environment Resources Directory (BERD).

Additional Research. BCR Consulting performed additional research through the San Bernardino County Assessor and Recorder, General Land Office records of the Bureau of Land Management, and various internet resources such as historicaerials.com, Newspapers.com, Ancestry.com, and the Built Environment Resource Directory hosted by the Office of Historic Preservation provided supplemental information.

Field Survey

An intensive-level cultural resources field survey of the project site was conducted on January 30, 2025. The survey was conducted by walking parallel transects spaced approximately 15 meters apart within 100 percent of the accessible APE. Digital photographs were taken at various points within the project site. These included overviews and detailed photographs of all cultural resources. Cultural resources were recorded per the California OHP *Instructions for Recording Historical Resources* in the field using:

- Detailed note taking for entry on DPR 523 Forms (see Appendix C)
- Hand-held Garmin Global Positioning systems for mapping purposes
- Digital photography of all cultural resources (see Appendix C and E).

RESULTS

Research

Records Search. Data from the SCCIC revealed that seven cultural resource studies have taken place resulting in three cultural resources identified within a one-mile radius of the APE. Of the seven previous studies, one has assessed a portion of the APE and no resources were previously identified within its boundaries. The records search results are summarized in Table A. Bibliographic details are provided in Appendix B.

Table A. Cultural Resources and Reports Located Within One Mile of the APE

USGS 7.5 Min Quad	Cultural Resources Within One Mile of APE	Studies Within One Mile of APE
Yucca Valley North, California (1979)	P-36-034534: Unspecified Historic Period Isolate (0.30 Miles E) P-36-034535: Unspecified Historic Period Isolate (0.60 Miles E) P-36-034545: Historic Period Road Rainbow Drive (0.65 Miles E)	SB-366, 635, 1809, 2158, 2515, 6388, 6704*

*Previously Assessed Project Site for Cultural Resources

Additional Research. BCR Consulting performed additional research through records of the General Land Office Maintained by the Bureau of Land Management and the San Bernardino County Assessor's office. Various internet resources such as historicaerials.com, Newspapers.com, Ancestry.com, and the Built Environment Resource Directory hosted by the Office of Historic Preservation provided supplemental information.

Field Survey

During the field survey Mr. Blood and Mr. Defachelle carefully inspected the project site and identified four historic-period concrete foundations. These resources are described in detail below. No other cultural resources (including prehistoric or historic archaeological or historic architectural resources) were identified during the field survey. The project site has been subject to moderate disturbances such as OHV activity and modern refuse dumping. Sediments, where visible, consist of a light yellowish-brown silt loam with moderate level of gravel.

ARD2404-H-2. This historic-period resource consists of a concrete foundation that was once part of a residential complex constructed between 1953 and 1970. Historic aerials indicate the building on the foundation was likely abandoned by 1995, and demolished by 2005 (USDA 1970, 1983, 1989, 1995, 2005). The foundation measures approximately 24 feet by 25 feet, with 3/8-inch bolts that are visible in the footing in addition to concrete nails. A concrete step that measures 40 inches by 20 inches was identified on the northern elevation of the foundation.

ARD2404-H-3. This historic-period concrete foundation is part of a former residential complex. Research from the General Land Office records of the Bureau of Land Management indicates that the complex was constructed on the subject property between 1956 and 1970. Historic aerials indicate the building on the foundation was partially demolished by 2018 (USDA 1970, 1983, 1989, 1995, 2005, 2016, 2018). The foundation measures approximately 24 feet by 21 feet. A portion of an eight-foot high concrete masonry unit wall built with cinder blocks that measure approximately 16 inches by eight inches is located along the northern elevation. Plastic tiles partially cover the cement foundation. There is a wood frame for a door and window on the northern elevation. Disturbances include OHV activity and modern refuse dumping.

ARD2404-H-4. This historic-period concrete foundation is part of a former residential complex. Research from the General Land Office records of the Bureau of Land Management indicates that the complex was constructed on the subject property between 1956 and 1970. Historic aerials indicate the building on the foundation was demolished by 2005 (USDA 1970, 1983, 1989, 1995, 2005). The concrete foundation measures approximately 24 feet by 20 feet. Bolts measuring three-eighths of an inch were also identified throughout the perimeter of the foundation. Disturbances include OHV activity and modern refuse dumping that may be associated with the former building or structure.

ARD2404-H-5. This resource consists of a 16-foot by 20-foot concrete foundation. This historic-period concrete foundation is part of a former residential complex. Research from the General Land Office records of the Bureau of Land Management indicates that the complex was likely constructed on the subject property between 1956 and 1970. Historic

aerials indicate the building that stood on the foundation was partially demolished by 2005 (USDA 1970, 1983, 1989, 1995, 2005, 2016, 2018). Bolts measuring one-eighth in length are visible on the footings and approximately seven inches of the footing are visible. Disturbances include OHV activity and modern refuse dumping that may be associated with the structure that once existed on this foundation.

SIGNIFICANCE EVALUATIONS

During the field survey, four concrete foundations (designated ARD2404-H-2, ARD2404-H-3, ARD2404-H-4, ARD2404-H-5), were identified within the project alignment. Section 106 of the NHPA and CEQA call for the evaluation and recordation of historic and archaeological resources. The criteria for determining the significance of impacts to cultural resources are based on 36 CFR Part 800 as part of the Section 106 process, and on Section 15064.5 of the *CEQA Guidelines* and Guidelines for the Nomination of Properties to the California Register. Properties eligible for listing in the National and/or California Register and subject to review under CEQA are those meeting the criteria for listing in the National or California Register, or local designation.

Significance Criteria

National Register of Historic Places. Eligibility recommendations for each resource are made based on National Register eligibility criteria. In conjunction with the following National Register criteria, sites must be assessed for integrity of location, design, setting, materials, workmanship, feeling, and association. A resource may be considered eligible for the National Register, or significant on a federal level, if it retains sufficient integrity of the elements listed above and it:

(a) is associated with events that have made a significant contribution to the broad patterns of our history;

(b) is associated with the lives of persons significant in our past;

(c) embodies the distinctive characteristics of a type, period, or method of construction represents the work of a master, possesses high artistic values, or represents a significant or distinguishable entity which may lack individual distinction;

(d) yields, or may be likely to yield, information important to the prehistory or history of the area/region.

California Register of Historical Resources. The California Register criteria are based on National Register criteria. For a property to be eligible for inclusion on the California Register, one or more of the following criteria must be met:

1. It is associated with the events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
2. It is associated with the lives of persons important to local, California, or U.S. history;

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of a master, possesses high artistic values; and/or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, the California Register requires that sufficient time has passed since a resource's period of significance to "obtain a scholarly perspective on the events or individuals associated with the resources." (CCR 4852 [d][2]). The California Register also requires that a resource possesses integrity. This is defined as the ability for the resource to convey its significance through seven aspects: location, setting, design, materials, workmanship, feeling, and association.

National Register and California Register Evaluation

ARD2404-H-2. Criterion A/1: Extensive research has not connected the subject property with any important events at the local, state, or national levels. As a result, this resource is recommended not eligible for listing on the National Register or California Register under Criterion A/1. Criterion B/2: Research has failed to associate this resource with any person who contributed in a significant way to the development of Yucca Valley. Research has also failed to otherwise associate the resource with the lives on any persons important to local, California, or U.S. History. Therefore, the subject property is recommended not eligible for listing on the National Register or California Register under Criterion B/2. Criterion C/3: The resource consists only of the concrete foundation, which does not have or evoke a method of construction, use of a material or have artistic value that has shaped the historic identity of Yucca Valley. It is therefore not recommended eligible for listing on the National Register or California Register under Criterion C/3. Criterion D/4: These types of resources do not have data potential and, as a consequence, the subject property is not recommended eligible for listing to the National Register or California Register under Criterion D/4.

ARD2404-H-3. Criterion A/1: Extensive research has not connected the subject property with any important events at the local, state, or national levels. As a result, this resource is recommended not eligible for listing on the National Register or California Register under Criterion A/1. Criterion B/2: Research has failed to associate this resource with any person who contributed in a significant way to the development of Yucca Valley. Research has also failed to otherwise associate the resource with the lives on any persons important to local, California, or U.S. History. Therefore, the subject property is recommended not eligible for listing on the National Register or California Register under Criterion B/2. Criterion C/3: The resource consists only of the concrete foundation, which does not have or evoke a method of construction, use of a material or have artistic value that has shaped the historic identity of Yucca Valley. It is therefore not recommended eligible for listing on the National Register or California Register under Criterion C/3. Criterion D/4: These types of resources do not have data potential and, as a consequence, the subject property is not recommended eligible for listing to the National Register or California Register under Criterion D/4.

ARD2404-H-4. Criterion A/1: Extensive research has not connected the subject property with any important events at the local, state, or national levels. As a result, this resource is recommended not eligible for listing on the National Register or California Register under Criterion A/1. Criterion B/2: Research has failed to associate this resource with any person who contributed in a significant way to the development of Yucca Valley. Research has also failed to otherwise associate the resource with the lives on any persons important to local, California, or U.S. History. Therefore, the subject property is recommended not eligible for listing on the National Register or California Register under Criterion B/2. Criterion C/3: The resource consists only of the concrete foundation, which does not have or evoke a method of construction, use of a material or have artistic value that has shaped the historic identity of Yucca Valley. It is therefore not recommended eligible for listing on the National Register or California Register under Criterion C/3. Criterion D/4: These types of resources do not have data potential and, as a consequence, the subject property is not recommended eligible for listing to the National Register or California Register under Criterion D/4.

ARD2404-H-5. Criterion A/1: Extensive research has not connected the subject property with any important events at the local, state, or national levels. As a result, this resource is recommended not eligible for listing on the National Register or California Register under Criterion A/1. Criterion B/2: Research has failed to associate this resource with any person who contributed in a significant way to the development of Yucca Valley. Research has also failed to otherwise associate the resource with the lives on any persons important to local, California, or U.S. History. Therefore, the subject property is recommended not eligible for listing on the National Register or California Register under Criterion B/2. Criterion C/3: The resource consists only of the concrete foundation, which does not have or evoke a method of construction, use of a material or have artistic value that has shaped the historic identity of Yucca Valley. It is therefore not recommended eligible for listing on the National Register or California Register under Criterion C/3. Criterion D/4: These types of resources do not have data potential and, as a consequence, the subject property is not recommended eligible for listing to the National Register or California Register under Criterion D/4.

RECOMMENDATIONS

During the research and field survey, BCR Consulting archaeologists identified four historic-period concrete foundations (designated ARD2404-H-2, ARD2404-H-3, ARD2404-H-4, ARD2404-H-5) that occupy the project site. BCR Consulting recommends that the resources that occupy the project site do not meet eligibility criteria for the National Register or for the California Register, and as such they are not recommended historic properties under Section 106 of the NHPA and are not recommended historical resources under CEQA. Therefore, the project will not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 and will not cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5. Furthermore, there is no evidence that the project contains or is sensitive for human remains, including those interred outside of dedicated cemeteries. As such, the project is not likely to disturb any human remains. Based on these results no further cultural resource mitigations are recommended for the current undertaking.

Disturbances associated with the construction and maintenance of housing and utilities at the project have been identified which has disrupted soil. As a result, the potential to encounter in-situ remains associated with significant archaeological materials during project-related excavation is low.

While the current study has not indicated sensitivity for unknown cultural resources within the project boundaries, ground disturbing activities always have the potential to reveal buried deposits not observed on the surface. Prior to the initiation of ground-disturbing activities, the applicant (in consultation with a U.S. Secretary of the Interior Qualified Archaeologist and any participating Native American entities) should alert field personnel to the possibility of buried prehistoric or historic cultural deposits. If field personnel encounter buried cultural materials, work in the immediate vicinity of the find should cease and a qualified archaeologist should be retained to assess the significance of the find. The qualified archaeologist shall have the authority to stop or divert construction excavation as necessary. If the qualified archaeologist finds that any cultural resources present meet eligibility requirements for listing on the California Register or the National Register, plans for the treatment, evaluation, and mitigation of impacts to the find will need to be developed. Prehistoric or historic cultural materials that may be encountered during ground-disturbing activities include:

- historic artifacts such as glass bottles and fragments, cans, nails, ceramic and pottery fragments, and other metal objects;
- historic structural or building foundations, walkways, cisterns, pipes, privies, and other structural elements;
- prehistoric flaked-stone artifacts and debitage (waste material), consisting of obsidian, basalt, and or cryptocrystalline silicates;
- groundstone artifacts, including mortars, pestles, and grinding slabs;
- dark, greasy soil that may be associated with charcoal, ash, bone, shell, flaked stone, groundstone, and fire affected rocks.

Findings were negative during the Sacred Lands File search with the Native American Heritage Commission (NAHC). Since the lead agency or agencies will initiate and carry out required Native American Consultation, results of consultation are not provided in this report. However, this report may be used during the consultation process, and BCR Consulting staff are available to answer questions and address concerns as necessary.

According to CEQA Guidelines, projects subject to CEQA must determine whether the project would “directly or indirectly destroy a unique paleontological resource”. The paleontological overview has been completed by the Western Science Center in Hemet California. Results are summarized below (see also Appendix F).

> The Geologic units underlying the project are composed of gravel and sand deposits from the Pleistocene epoch (Dibblee and Minch 2008). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have any localities within the project area or within a 1 mile radius, but does have localities within similarly mapped deposits across Southern California.

> Any fossil specimen from the Proposed Ames-Reche Recharge Basin Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If human remains are encountered during the undertaking, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. The applicant should notify the County Coroner of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC within 24 hours. The NAHC must then immediately identify the Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 48 hours of notification by the NAHC.

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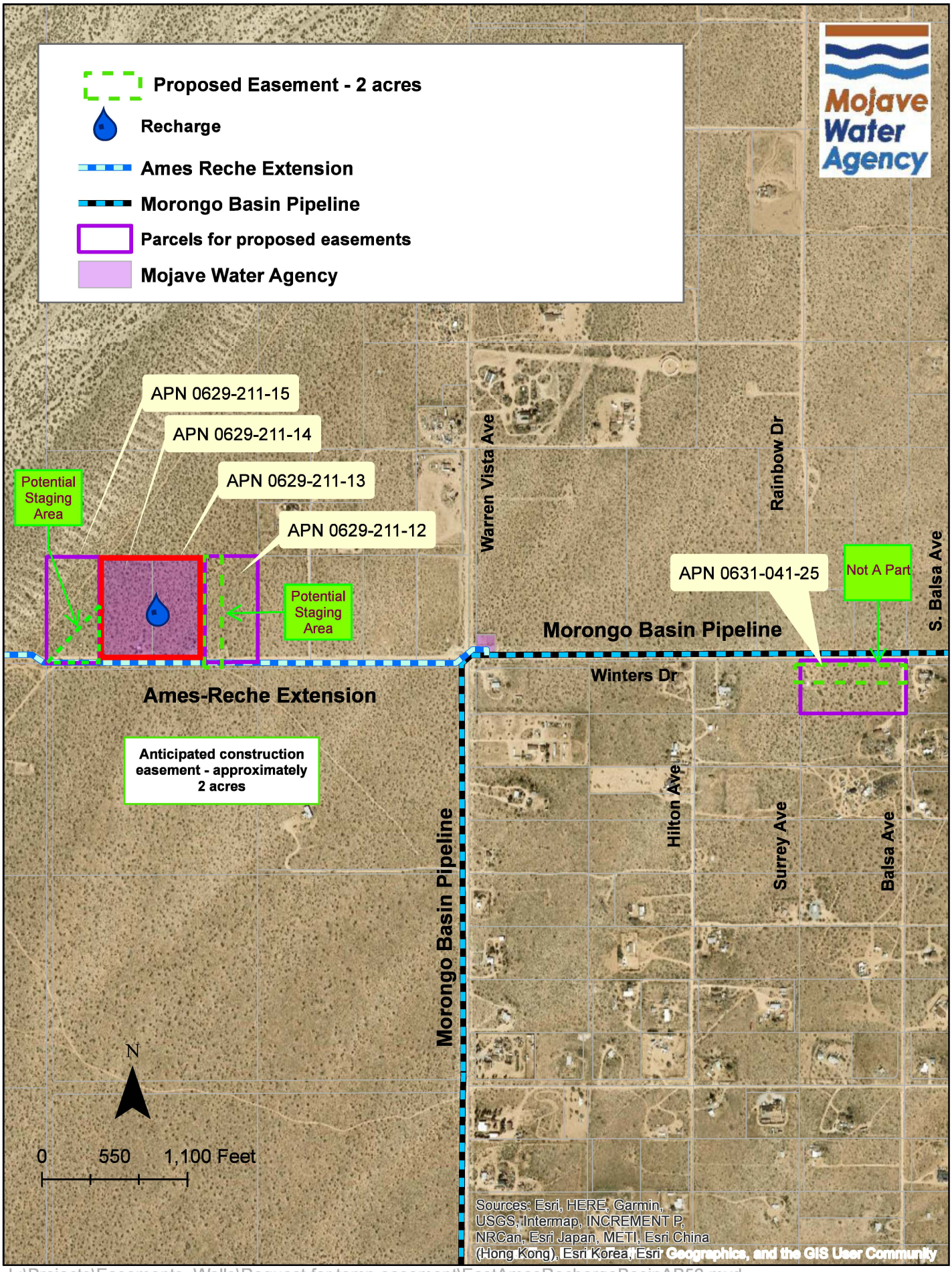
APPENDIX A

DETAILED PROJECT EXHIBIT



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APPENDIX B

RECORDS SEARCH BIBLIOGRAPHY

Report List

ARD2404

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SB-00366	NADB-R - 1060366; Voided - 76-7.5	1976	HARRIS, RUTH D.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF SEC. 23, T2N R5E, YUCCA VALLEY AREA	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-00635	NADB-R - 1060635; Voided - 78-4.10	1978	HEARN, JOSEPH E.	ARCHAEOLOGICAL - HISTORICAL RESOURCES ASSESSMENT OF THE PROPOSED IMPROVEMENTS OF THE DESERT VIEW COUNTY WATER DISTRICT SYSTEM	SAN BERNARDINO COUNTY MUSEUM ASSOCIATION	
SB-01809	NADB-R - 1061809; Voided - 88-6.6	1988	MACKO, MICHAEL E.	CULTURAL RESOURCE SURVEY RESULTS FOR THE HDWD PIPELINE SURVEY NEAR LANDERS, CALIFORNIA	MACKO ARCHAEOLOGICAL CONSULTING	
SB-02158	NADB-R - 1062158; Voided - 74-6.1	1974	MORTLAND, CAROL A.	ARCHAEOLOGICAL IMPACT EVALUATION: SOUTHERN CALIFORNIA EDISON PROPOSED GENERATING STATION IN UPPER JOHNSON VALLEY AND ASSOCIATED TRANSMISSION, GAS AND FUEL ROUTES	ARCHAEOLOGICAL RESEARCH UNIT, UCR	36-000181, 36-001922, 36-002208, 36-002592, 36-003433, 36-003434, 36-003435, 36-003697, 36-003698, 36-003780, 36-003781, 36-003782, 36-003783, 36-003784, 36-003785, 36-003843, 36-003844, 36-003845, 36-003849, 36-003850, 36-003851, 36-006190
SB-02515	NADB-R - 1062515; Voided - 92-2.16	1992	Lerch, Michael K.	CLASS III CULTURAL RESOURCES INVENTORY OF THE MORONGO BASIN PIPELINE PROJECT, HESPERIA TO LANDERS, SAN BERNARDINO COUNTY, CALIFORNIA	MICHAEL K. LERCH & ASSOCIATES	36-003849, 36-007070, 36-007071, 36-007072, 36-060840, 36-060886, 36-060887, 36-060888, 36-060889
SB-06388	NADB-R - 1066388	2008	McKenna, Jeanette A.	A Phase I Cultural Resources Investigation of Two Pipeline Alignments for the San Bernardino County Special Districts Department, CSA 70, Zone W-4, Pioneertown and Landers, San Bernardino Co.. California.	McKenna et al	36-006137, 36-020759
SB-06704						

Resource List

ARD2404

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-36-034534		Resource Name - GC-ISO-001	Other	Historic	AH16		
P-36-034535		Resource Name - GC-ISO-002	Other	Historic	AH16		
P-36-034545	CA-SBR-034545H	Resource Name - Rainbow Drive	Site	Historic	AH07		

APPENDIX C

DEPARTMENT OF PARK AND RECREATION 523 FORMS

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

P1. Other Identifier: N/A

***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:** *Yucca Valley North California* **Date:** 1979 **T** 2 N; **R** 5 E; Section 24**;** SBBM
c. Address: N/A City: Yucca Valley Zip: 92284
d. UTM: Zone: 11S 554365 mE/ 3788603 mN (G.P.S.; NAD83) Elevation: 3321' Feet AMSL
e. Other Locational Data: This resource is located at the northwest intersection of Winters Road and Lucky Lane.

***P3a. Description:** (Describe resource and its major elements: design, materials, condition, alterations, size, setting, boundaries)
This historic-period resource consists of a concrete foundation that was once part of a residential complex constructed between 1953 and 1970. Historic aerials indicate the building on the foundation was likely abandoned by 1995, and demolished by 2005 (USDA 1970, 1983, 1989, 1995, 2005). The foundation measures approximately 24 feet by 25 feet, with 3/8-inch bolts that are visible in the footing in addition to concrete nails. A concrete step that measures 40 inches by 20 inches was identified on the northern elevation of the foundation. Vegetation consisted of desert creosote, cholla cactus and Joshua trees. Ground visibility was 60-80 percent. Soil is a light yellowish-brown silt loam with moderate levels of gravel.

***P3b. Resource Attributes:** AH2. Foundations/Structure Pads

P5a. Photo or Drawing



P5b. Description of Photo: (View, date, accession) January 30, 2025

***P6. Date Built:**
☑Historic ☐Prehistoric ☐Both
Aerial photos indicate 1953-1970.

***P7. Owner and Address:**
Alan & Terry Goodwin Trust

***P8. Recorded by:**
G. Brentner
BCR Consulting LLC
Claremont, CA 91711

***P9. Date:** 02/10/25

***P10. Survey Type:**
Intensive.

***P11. Report Citation** *Cultural Resources Assessment of the Proposed Ames-Reche Recharge Basin Project, Unincorporated San Bernardino County, California.*

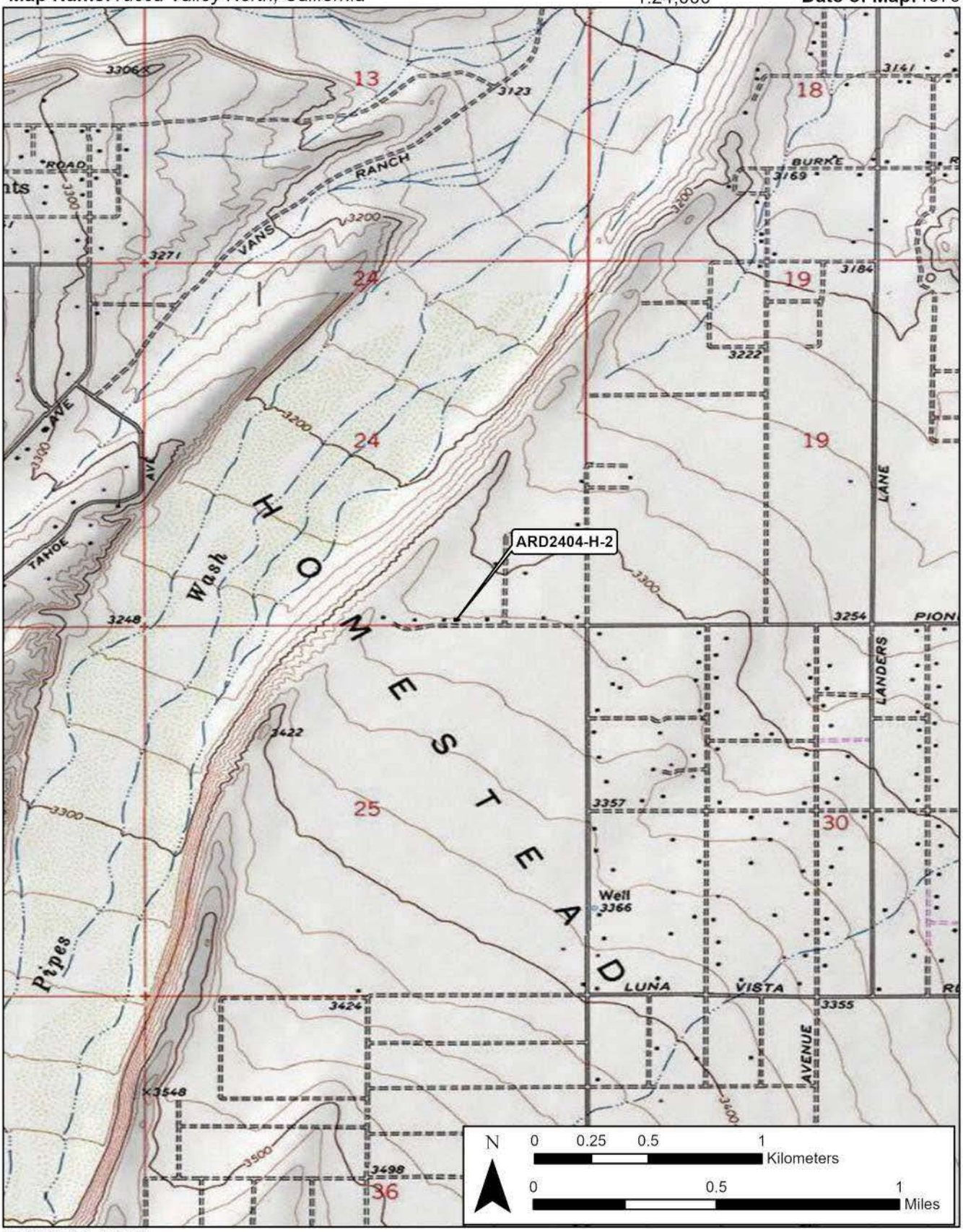
***Attachments:** ☐NONE ☑ Location Map ☐ Sketch Map ☑ Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #:
HRI #:
Trinomial:

***Resource Name or #:** ARD2404-H-2

***Map Name:** *Yucca Valley North, California* 1:24,000 ***Date of Map:** 1979



***Required Information**

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P1. Other Identifier: N/A

***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:** *Yucca Valley North California* **Date:** 1979 **T** 2 N; **R** 5 E; Section 24**;** SBBM
c. Address: N/A City: Yucca Valley Zip: 92284
d. UTM: Zone: 11S 554304 mE/ 3788600 mN (G.P.S.; NAD83) Elevation: 3321' Feet AMSL
e. Other Locational Data: This resource is located at the northwest intersection of Winters Road and Lucky Lane.

***P3a. Description:** (Describe resource and its major elements: design, materials, condition, alterations, size, setting, boundaries)
This historic-period concrete foundation is part of a former residential complex. Research from the General Land Office records of the Bureau of Land Management indicates that the complex was constructed on the subject property between 1956 and 1970. Historic aerials indicate the building on the foundation was partially demolished by 2018 (USDA 1970, 1983, 1989, 1995, 2005, 2016, 2018). The foundation measures approximately 24 feet by 21 feet. A portion of an eight-foot high concrete masonry unit wall built with cinder blocks that measure approximately 16 inches by eight inches is located along the northern elevation. Plastic tiles partially cover the cement foundation. There is a wood frame for a door and window on the northern elevation. Disturbances include OHV activity and modern refuse dumping that may be associated with the structures that once existed on this foundation. Vegetation is desert creosote some cholla cactus and Joshua trees. Ground visibility is 60-80 percent. Soil is a light yellowish-brown silt loam with moderate levels of gravel.

***P3b. Resource Attributes:** AH2. Foundations/Structure Pads

P5a. Photo or Drawing



P5b. Description of Photo: (View, date, accession) January 30, 2025

***P6. Date Built:**
☑Historic ☐Prehistoric ☐Both
General Land Office records of the Bureau of Land Management/ Aerial photos indicate 1956-1970.

***P7. Owner and Address:**
Mojave Water Agency

***P8. Recorded by:**
G. Brentner
BCR Consulting LLC
Claremont, CA 91711

***P9. Date:** 02/11/25

***P10. Survey Type:** Intensive.

***P11. Report Citation** *Cultural Resources Assessment of the Proposed Ames-Reche Recharge Basin Project, Unincorporated San Bernardino County, California.*

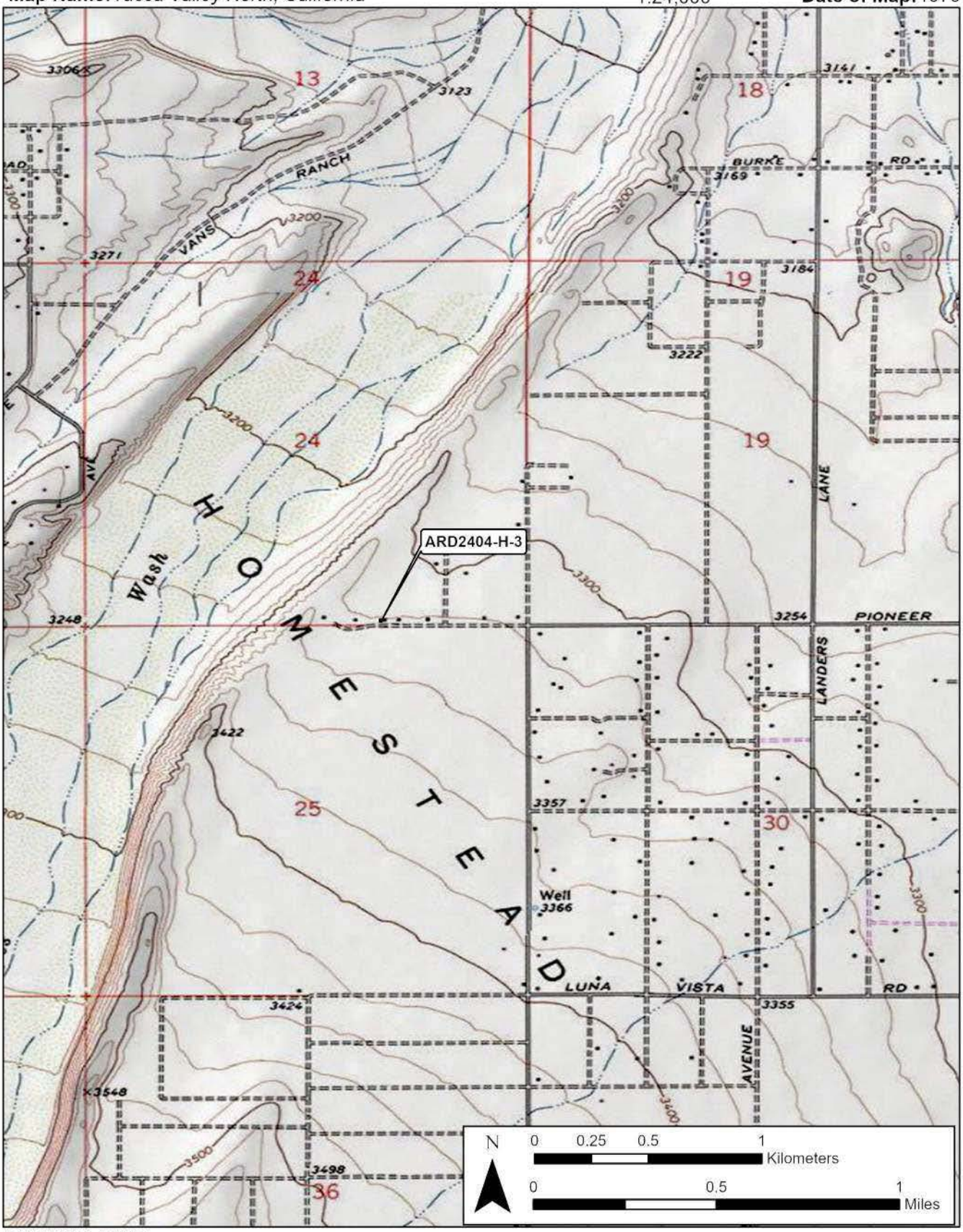
***Attachments:** ☐NONE ☑ Location Map ☐ Sketch Map ☑ Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #:
HRI #:
Trinomial:

*Resource Name or #: ARD2404-H-3

*Map Name: *Yucca Valley North, California* 1:24,000 *Date of Map: 1979



*Required Information

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State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # HRI # Trinomial NRHP Status Code	
Other Listings Review Code	Reviewer	Date

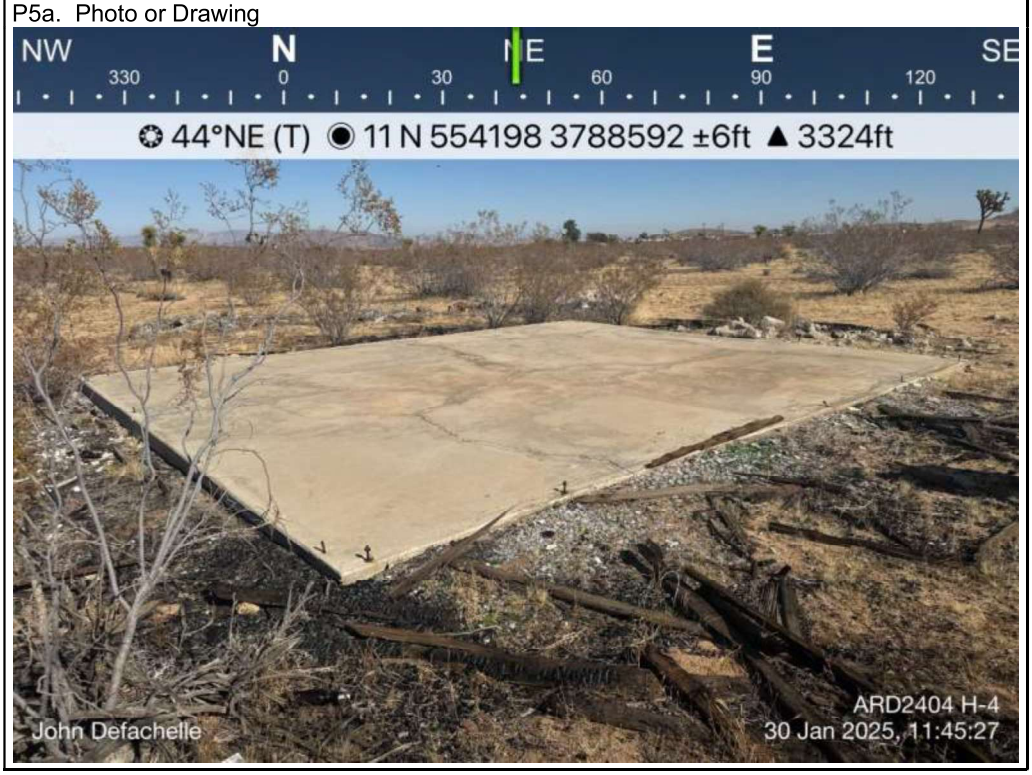
P1. Other Identifier: N/A

***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:** *Yucca Valley North California* **Date:** 1979 **T** 2 N; **R** 5 E; Section 24**;** SBBM
c. Address: City: Zip: 92284
d. UTM: Zone: 11S 554204 mE/ 3788600 mN (G.P.S.; NAD83) Elevation: 3324' Feet AMSL
e. Other Locational Data: This resource is located approximately 1050 feet west of the Winters Road and Lucky Lane intersection.

***P3a. Description:** (Describe resource and its major elements: design, materials, condition, alterations, size, setting, boundaries)
This historic-period concrete foundation is part of a former residential complex. Research from the General Land Office records of the Bureau of Land Management indicates that the complex was constructed on the subject property between 1956 and 1970. Historic aerials indicate the building on the foundation was demolished by 2005 (USDA 1970, 1983, 1989, 1995, 2005). The concrete foundation measures approximately 24 feet by 20 feet. Bolts measuring three-eighths of an inch were also identified throughout the perimeter of the foundation. Disturbances include OHV activity and modern refuse dumping that may be associated with the structure that once existed on this foundation. Vegetation is desert creosote some cholla cactus and Joshua trees. Ground visibility is 60-80 percent. Soil is a light yellowish-brown silt loam with moderate levels of gravel.

***P3b. Resource Attributes:** AH2. Foundations/Structure Pads

P5a. Photo or Drawing



P5b. Description of Photo: (View, date, accession), View NE, January 30, 2025

***P6. Date Built:**
☑Historic ☐Prehistoric ☐Both
Aerial photos General Land Office records of the Bureau of Land Management/ Aerial photos indicate 1956-1970.

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***P11. Report Citation** *Cultural Resources Assessment of the Proposed Ames-Reche Recharge Basin Project, Unincorporated San Bernardino County, California.*

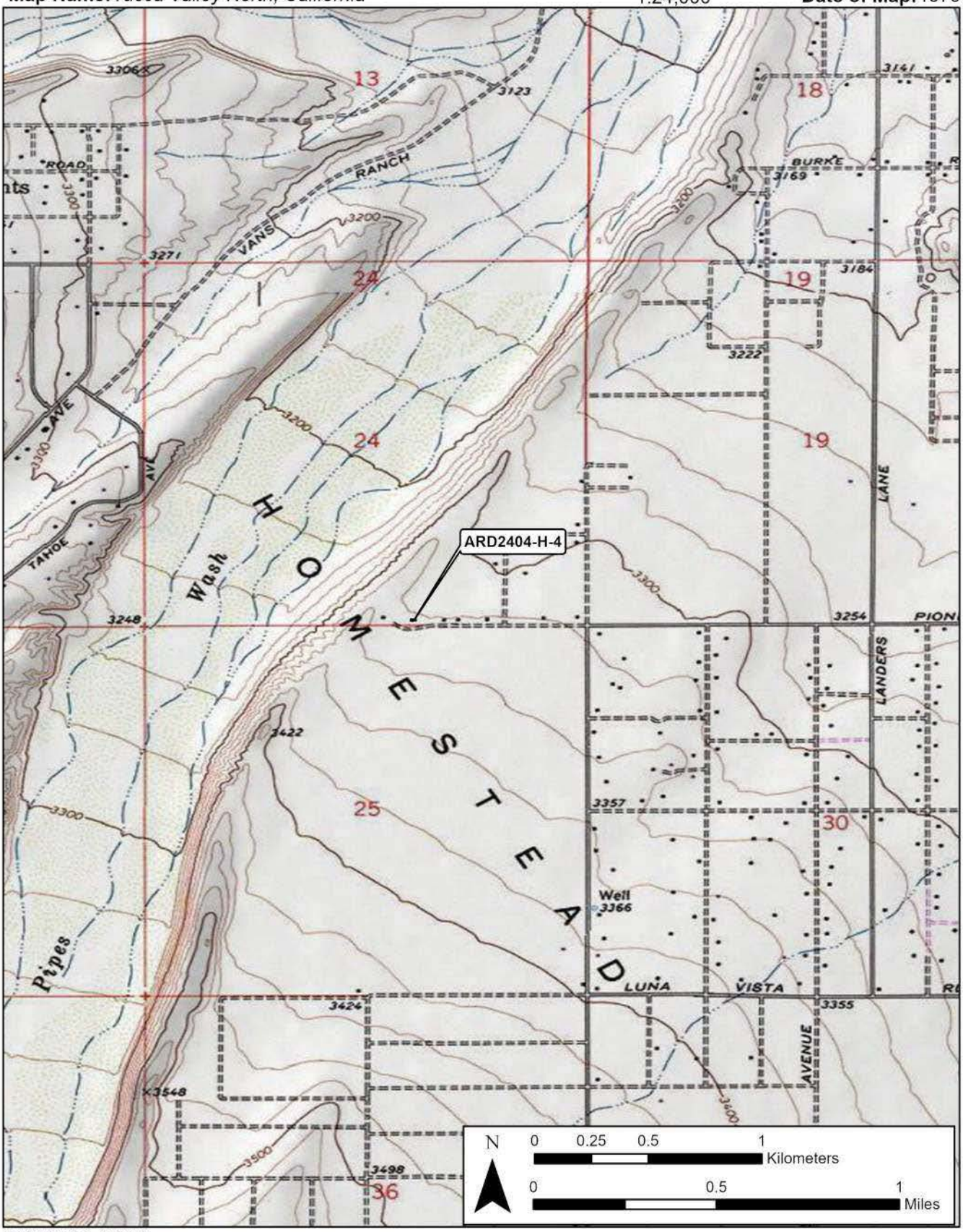
***Attachments:** ☐NONE ☑ Location Map ☐ Sketch Map ☑ Continuation Sheet ☐Building, Structure, and Object Record ☑Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #:
HRI #:
Trinomial:

***Resource Name or #:** ARD2404-H-4

***Map Name:** *Yucca Valley North, California* 1:24,000 ***Date of Map:** 1979



***Required Information**

References:

Buereau of Land Management. 2025. General Land Office Records. U.S. Department of the Interior. https://glorecords.blm.gov. Accessed multiple dates.

San Bernardino County History. 2025 San Bernardino County History – Yucca Valley, Electronic document, https://main.sbcounty.gov/2025/01/08/san-bernardino-county-history-42/, accessed February 20, 2025.

Homesteaders. 2023 Homesteaders, National Parks Service, U.S. Department of the Interior, Electronic document, https://www.nps.gov/jotr/learn/historyculture/homesteaders.htm, accessed February 20, 2025.

Wilson, Joan and Grubb Charleen 1984 The Heritage of Yucca Valley, California – Including Giant Rock, Vol. I.

Oroville Mercury Register. January 16, 1958. "Film Cowboy in Suicide Try." Oroville, California.

San Bernardino County Assessor. 2025. Property Information For APN 0629211120000 On File with the San Bernardino Coiunty Assessor, County Clerk Recorder

United States Department of Agriculture. 1970, 1983, 1989, 1995. 2005 Aerial Photos of San Bernardino County (historicaerials.com)

United States Geological Survey 1979. Yucca Valley North N. 7.5 Minute Topo Quadrangle.

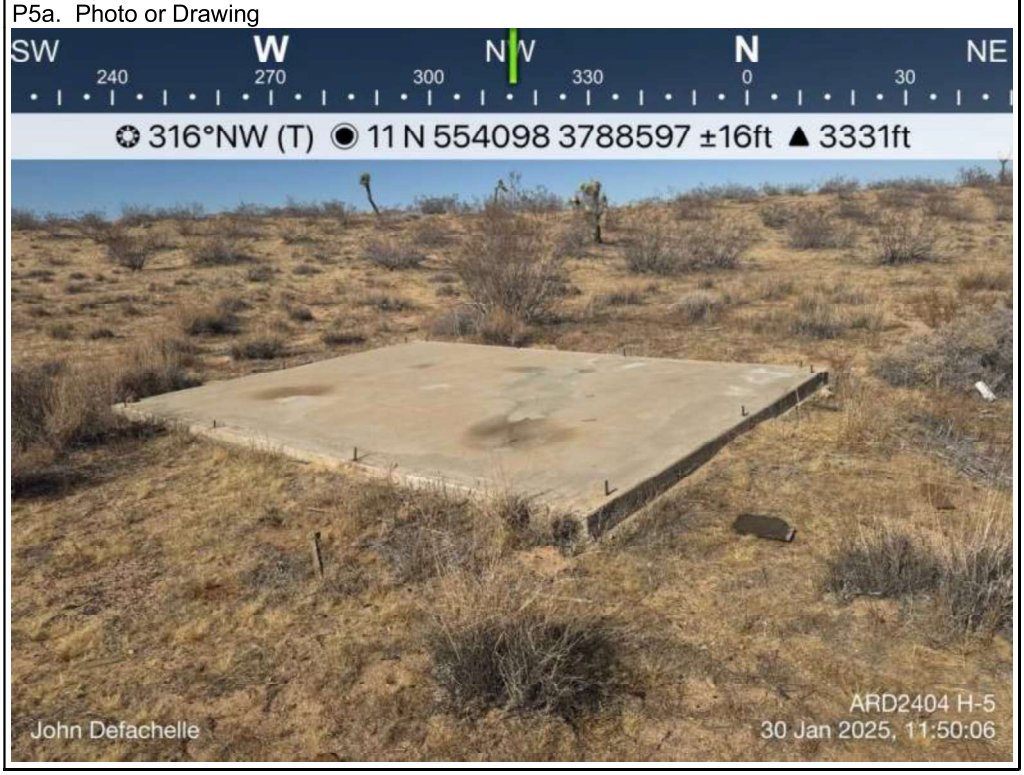
P1. Other Identifier: N/A

***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:** *Yucca Valley North California* **Date:** 1979 **T** 2 N; **R** 5 E; Section 24**;** SBBM
c. Address: N/A City: Yucca Valley Zip: 92284
d. UTM: Zone: 11S 554094 mE/ 3788602 mN (G.P.S.; NAD83) Elevation: 3328' Feet AMSL
e. Other Locational Data: This resource is located approximately 1425 feet west of the Winters Road and Lucky Lane intersection.

***P3a. Description:** (Describe resource and its major elements: design, materials, condition, alterations, size, setting, boundaries)
This resource consists of a 16-foot by 20-foot concrete foundation. This historic-period concrete foundation is part of a former residential complex. Research from the General Land Office records of the Bureau of Land Management indicates that the complex was likely constructed on the subject property between 1956 and 1970. Historic aerials indicate the building that stood on the foundation was partially demolished by 2005 (USDA 1970, 1983, 1989, 1995, 2005, 2016, 2018). Bolts measuring one-eighth in length are visible on the footings and approximately seven inches of the footing are visible. Disturbances include OHV activity and modern refuse dumping that may be associated with the structure that once existed on this foundation. Vegetation is desert creosote some cholla cactus and Joshua trees. Ground visibility is 60-80 percent. Soil is a light yellowish-brown silt loam with moderate levels of gravel.

***P3b. Resource Attributes:** AH2. Foundations/Structure Pads

P5a. Photo or Drawing



P5b. Description of Photo: (View, date, accession), View NW, January 30, 2025

***P6. Date Built:**
☑Historic ☐Prehistoric ☐Both
General Land Office records of the Bureau of Land Management/ Aerial photos indicate 1956-1970.

***P7. Owner and Address:**
Capri Lynn Wheaton & Madeline Elizabeth Griswold

***P8. Recorded by:**
G.Brentner
BCR Consulting LLC
Claremont, CA 91711

***P9. Date:** 02/11/25

***P10. Survey Type:** Intensive.

***P11. Report Citation** *Cultural Resources Assessment of the Proposed Ames-Reche Recharge Basin Project, Unincorporated San Bernardino County, California.*

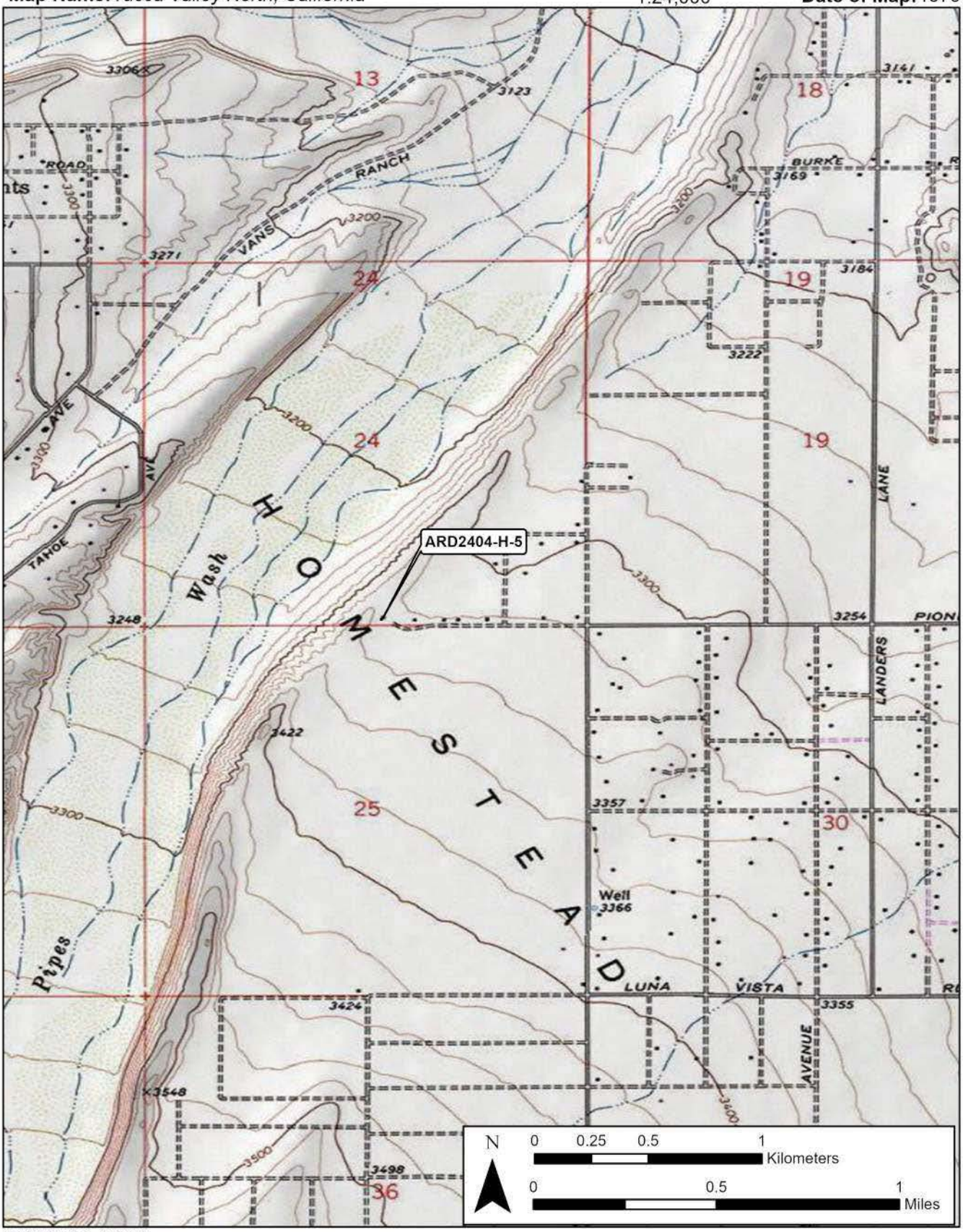
***Attachments:** ☐NONE ☑ Location Map ☐ Sketch Map ☑Continuation Sheet ☐Building, Structure, and Object Record ☑Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #:
HRI #:
Trinomial:

***Resource Name or #:** ARD2404-H-5

***Map Name:** *Yucca Valley North, California* 1:24,000 ***Date of Map:** 1979



***Required Information**

References:

Buereau of Land Management. 2025. General Land Office Records. U.S. Department of the Interior. https://glorecords.blm.gov. Accessed multiple dates.

Homesteaders. 2023 Homesteaders, National Parks Service, U.S. Department of the Interior, Electronic document, https://www.nps.gov/jotr/learn/historyculture/homesteaders.htm, accessed February 20, 2025.

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United States Department of Agriculture. 1970, 1983, 1989, 1995. 2005 Aerial Photos of San Bernardino County (historicaerials.com)

United States Geological Survey 1979. Yucca Valley North N. 7.5 Minute Topo Quadrangle.

Wilson, Joan and Grubb Charleen 1984 The Heritage of Yucca Valley, California – Including Giant Rock, Vol. I.

APPENDIX D

NATIVE AMERICAN HERITAGE COMMISSION SACRED LANDS FILE SEARCH

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Reginald Pagaling
Chumash

VICE-CHAIRPERSON
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

SECRETARY
Sara Dutschke
Miwok

PARLIAMENTARIAN
Wayne Nelson
Luiseño

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Stanley Rodriguez
Kumeyaay

COMMISSIONER
Laurena Bolden
Serrano

COMMISSIONER
Reid Milanovich
Cahuilla

COMMISSIONER
Bennae Calac
Pauma-Yuima Band of Luiseño Indians

ACTING EXECUTIVE SECRETARY
STEVEN QUINN

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

February 5, 2025

David Brunzell
BCR Consulting, LLC

Via Email to: bcrllc2008@gmail.com

Re: Proposed Ames-Reche Recharge Basin (ARD2404) Project, San Bernardino County

To Whom It May Concern:

As requested, a record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on information submitted for the above referenced project. The results were negative. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, a SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area.

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. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. If within two weeks of notification, a response has not been received, the Commission requests that you follow-up with a telephone call or email to ensure that the project information was received.

If you receive notification of a change of address or phone number from a tribe, please notify the NAHC so that we can assure that our lists contain current information.

In addition to engaging in tribal consultation, you should consult the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center to determine whether it has information regarding the presence of recorded archaeological sites within the project area.

If you have any questions or need additional information, please contact me at melina.carlos@nahc.ca.gov.

Sincerely,

Melina Carlos

Melina Carlos
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
2/5/2025

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Contact Address	Phone #	Email Address	Cultural Affiliation	Last Updated
Agua Caliente Band of Cahuilla Indians	F	Lacy Padilla, Director of Historic Preservation/THPO	5401 Dinah Shore Drive Palm Springs, CA, 92264	(760) 333-5222	ACBCI-THPO@aguacaliente.net	Cahuilla	1/11/2024
Morongo Band of Mission Indians	F	Ann Brierty, THPO	12700 Pumarra Road Banning, CA, 92220	(951) 755-5259	abrierty@morongo-nsn.gov	Cahuilla Serrano	
Morongo Band of Mission Indians	F	Robert Martin, Chairperson	12700 Pumarra Road Banning, CA, 92220	(951) 755-5110	abrierty@morongo-nsn.gov	Cahuilla Serrano	
Quechan Indian Tribe of the Fort Yuma Reservation	F	Jordan Joaquin, President, Quechan Tribal Council	P.O.Box 1899 Yuma, AZ, 85366-1899	(760) 919-3600	executivesecretary@quechantribe.com	Quechan	1/31/2025
Quechan Indian Tribe of the Fort Yuma Reservation	F	Jill McCormick, Historic Preservation Officer	P.O. Box 1899 Yuma, AZ, 85366-1899	(928) 261-0254	historicpreservation@quechantribe.com	Quechan	1/31/2025
San Manuel Band of Mission Indians	F	Alexandra McCleary, Senior Manager of Cultural Resources Management	26569 Community Center Drive Highland, CA, 92346	(909) 633-0054	alexandra.mccleary@sanmanuel-nsn.gov	Serrano	1/16/2024
Serrano Nation of Mission Indians	N	Wayne Walker, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(253) 370-0167	serranonation1@gmail.com	Serrano	10/10/2023
Serrano Nation of Mission Indians	N	Mark Cochrane, Co-Chairperson	P. O. Box 343 Patton, CA, 92369	(909) 578-2598	serranonation1@gmail.com	Serrano	10/10/2023
Twenty-Nine Palms Band of Mission Indians	F	Christopher Nicosia, Cultural Resources Manager/THPO Manager	46-200 Harrison Place Coachella, CA, 92236	(760) 863-3972	christopher.nicosia@29palmsbomi-nsn.gov	Chemehuevi	11/15/2023

Native American Heritage Commission
Native American Contact List
San Bernardino County
2/5/2025

Twenty-Nine Palms Band of Mission Indians	F	Nicolas Garza, Cultural Resources Specialist	46-200 Harrison Place Coachella, CA, 92236	(760) 863-2486	nicolas.garza@29palmsbomi-nsn.gov	Chemehuevi	11/15/2023
Twenty-Nine Palms Band of Mission Indians	F	Sarah O'Brien, Tribal Archivist	46-200 Harrison Place Coachella, CA, 92236	(760) 863-2460	sobrien@29palmsbomi-nsn.gov	Chemehuevi	11/15/2023

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 Resources Code and 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 Ames-Reche Recharge Basin (ARD2404) Project, San Bernardino County.

APPENDIX E

PROJECT PHOTOGRAPHS



Photo 1: Southern Overview of Project Area.



Photo 2: Northeast Overview of Resource ARD2404-H-2.



Photo 3: North Overview of Resource ARD2404-H-3.



Photo 4: North Overview of Resource ARD2404-H-4.



Photo 5: NE Overview of Resource ARD2404-H-5.

APPENDIX F

PALEONTOLOGICAL OVERVIEW

WESTERN SCIENCE CENTER

February 15th, 2025

BCR Consulting, LLC
Nick Shepetuk
505 W. 8th St.
Claremont, CA 91711

Dear Mr. Shepetuk,

This letter presents the results of a record search conducted for the Proposed Ames-Reche Recharge Basin Project located in unincorporated San Bernardino County, CA. The project site is on either side of Pioneer Road on Township 2 North, Range 5 & 6 East, Sections 24 and 30 on the *Yucca Valley North, CA* and the *Landers, CA* USGS 7.5" minute quadrangles.

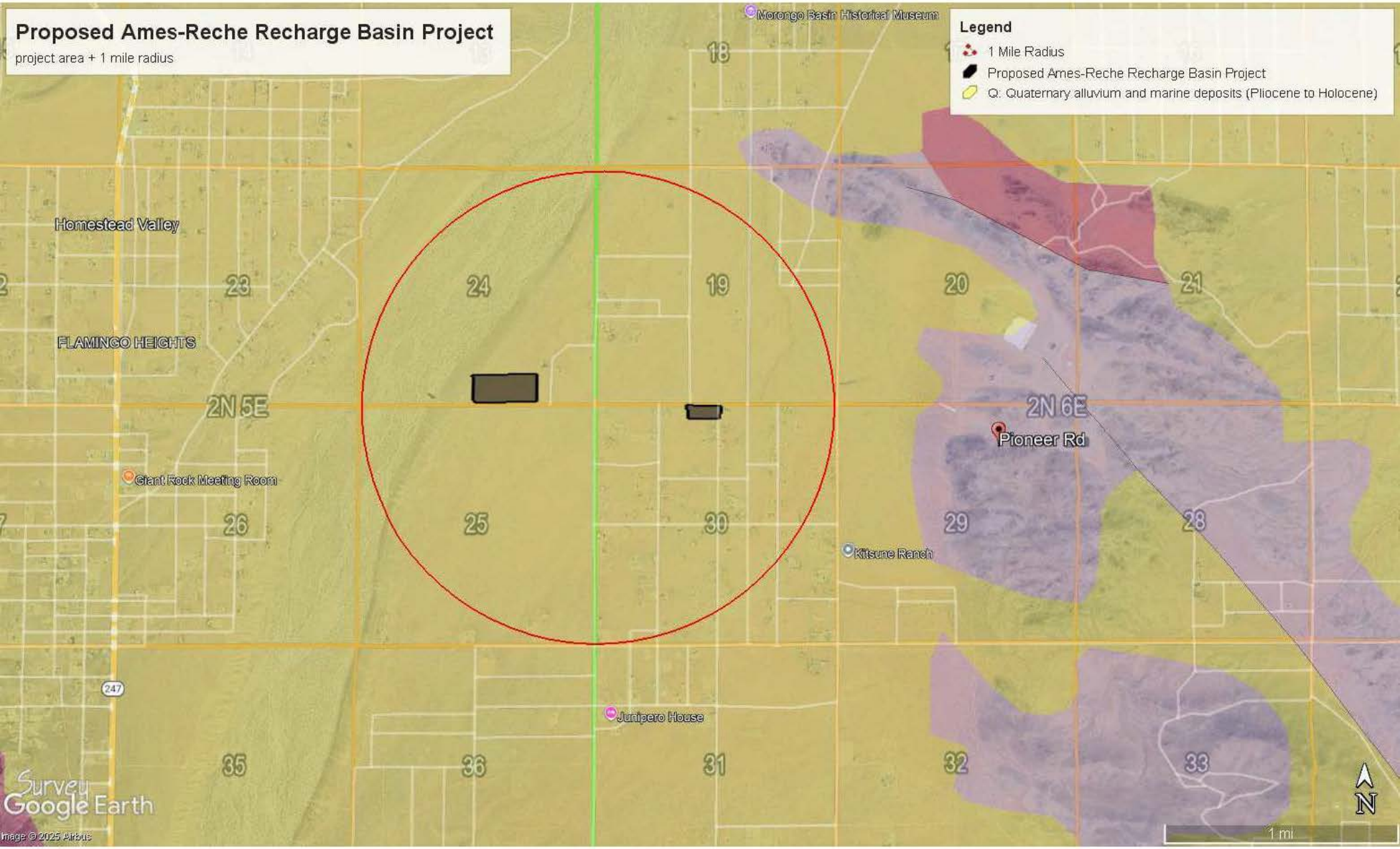
The geologic units underlying the project are composed of gravel and sand deposits from the Pleistocene epoch (Dibblee and Minch 2008). Pleistocene alluvial units are considered to be highly paleontologically sensitive. The Western Science Center does not have any localities within the project area or within a 1 mile radius, but does have localities within similarly mapped deposits across Southern California.

Any fossil specimen from the Proposed Ames-Reche Recharge Basin Project would be scientifically significant. Excavation activity associated with the development of the project area would impact the paleontologically sensitive Pleistocene alluvial units, and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the study area.

If you have any questions, or would like further information, please feel free to contact me at bstoneburg@westerncentermuseum.org.

Sincerely,

Brittney Elizabeth Stoneburg, MSc
Collections Manager


Proposed Ames-Reche Recharge Basin Project
project area + 1 mile radius
Legend
1 Mile Radius
Proposed Ames-Reche Recharge Basin Project
Q: Quaternary alluvium and marine deposits (Pliocene to Holocene)
Morongo Basin Historical Museum
Homestead Valley
FLAMINGO HEIGHTS
2N 5E
2N 6E
Pioneer Rd
Giant Rock Meeting Room
Kitsune Ranch
Junipero House
247
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Survey Google Earth
Image © 2025 Airbus
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APPENDIX D

Soils and Geotechnical (Converse Consultants 2024)

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

GEOTECHNICAL INVESTIGATION REPORT

AMES-RECHE RECHARGE BASIN

Along Winters Road
City of Landers, San Bernardino County, California

CONVERSE PROJECT NO. 23-81-275-01



Prepared For:

ARDURRA
43410 Business Park Drive
Temecula, CA 92590

Presented By:

CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

April 19, 2024

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

April 19, 2024

Mr. Ryan Huston, PE
Client Service Manager
Ardurra
43410 Business Park Drive
Temecula, CA 92590

Subject: **GEOTECHNICAL INVESTIGATION REPORT**
Ames-Reche Recharge Basin
Along Winters Road
City of Landers, San Bernardino County, California
Converse Project No. 23-81-275-01

Dear Mr. Huston:

Converse Consultants (Converse) is pleased to submit this geotechnical investigation report to assist with the design of the Mojave Water Agency (MWA) new Ames-Reche Recharge Basin Project, located within the City of Landers, San Bernardino County, California. This report was prepared in accordance with our proposal dated October 4, 2023, revised on October 9, 2023, and your Professional Subconsultant Agreement dated January 25, 2024..

Based upon our field investigation, laboratory data, and analyses, the proposed project is considered feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and construction of the project.

We appreciate the opportunity to be of continued service to Ardurra and MWA. Should you have any questions, please do not hesitate to contact me at 909-474-2847.

CONVERSE CONSULTANTS



Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

Dist.: 1/Addressee
EH/RLG/HSQ/kvg

PROFESSIONAL CERTIFICATION

This report has been prepared by the following professionals whose seals and signatures appear hereon.

The findings, recommendations, specifications and professional opinions contained in this report were prepared in accordance with the generally accepted professional engineering and engineering geologic principle and practice in this area of Southern California. We make no other warranty, either expressed or implied.



Robert Gregorek, PG, CEG
Senior Geologist



Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

EXECUTIVE SUMMARY

The following is a summary of our geotechnical investigation, conclusions and recommendations, as presented in the body of this report. Please refer to the appropriate sections of the report for complete conclusions and recommendations. In the event of a conflict between this summary and the report, or an omission in the summary, the report shall prevail.

- The purpose of this project is to construct a new recharge basin and monitoring well on the proposed MWA-owned site. The proposed 10-acre site is located along Winters Road, approximately 0.3 miles east of the existing recharge facility and adjacent to a 12-inch diameter HDPE pipeline, in Landers, California. The project will include installing a new tee connection to the existing 12-inch diameter HDPE pipeline, 2 isolation valves, pipeline, and outlet with energy dissipater to the proposed recharge basin. The recharge basin will be designed for a maximum flow rate of 5 cfs and an anticipated annual recharge capacity of 1,500 AFY or better. The recharge basin will include a perimeter access road, fencing, and signage. Geochemical modeling may be required if the Synthetic Precipitation Leaching Procedure (SPLP) test results warrant. The new basin dimensions have not been determined during the preparation of this report.
- The project site is located on parcel nos. 062921113 and 062921114 on vacant unsecured land covered in sand with scattered Joshua trees throughout the parcels. The site is bounded by Pipes Wash to the north, Winters Road to the south, Lucky Lane to the east, and the exiting recharge basin to the west. The Ames-Reche recharge site is developed with an existing recharge basin with associated berms, access roads, and piping.
- Our scope of work included project setup, subsurface exploration, laboratory testing, engineering analysis, and preparation of this report.
- Three exploratory borings were drilled on March 4 and 5, 2024, at locations selected by Ardurra. The proposed depths of the borings were 15.0 feet and 100 feet below ground surface (bgs). The borings were drilled to depths ranging from 31.5 to 101.5 feet bgs.
- Based on the exploratory borings and laboratory test results, the project site is underlain to a depth of at least 101.5 feet by alluvial sediments consisting primarily of sand and silty sand with occasional gravel which is generally fine to coarse-grained, with few to little gravel up to 2.5 inches maximum dimension, trace of caliche, medium dense to very dense, dry to moist and various shades of brown and red. The soil conditions encountered are relatively uniform across the site.
- Groundwater was not encountered in our exploratory borings to a maximum explored depth of 101.5 feet bgs. The current depth to groundwater at the site is estimated to be deeper than 222 feet bgs. The historical high groundwater level at the site is not known with certainty but is approximated to be 222 feet bgs. Groundwater is not anticipated to be encountered during construction of the proposed basin and associated pipeline.

- The project site is not located within a currently designated State of California or San Bernardino County Fault Zone. There are no known active faults projecting toward or extending across the project site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.
- The project site has the potential for up to 3.6 inches of dry seismic settlement and 1 inch of static settlement. The anticipated differential dynamic settlement is expected to be 1.2 inches over 450 horizontal feet. The anticipated differential static settlement is expected to be less than 0.5 inch over 40 horizontal feet.
- The potential for earthquake-induced liquefaction lateral spreading, land sliding, or flooding at the site from offsite sources is considered low.
- The site soil does not contain elevated concentrations of soluble sulfates or chlorides but are mildly corrosive to ferrous metals. A corrosion engineer should be consulted for corrosion mitigation measures for ferrous metals in contact with soil.
- Based on the laboratory test results performed at boring locations (BH-02 and BH-03) used to investigate the upper five feet of soils the collapse potential values were 3.6 and 4.2 percent. Recharging of the basin will result in substantial collapse of the bottom over time. Collapse potential distress is typically considered a concern when collapse potential is over 2% (LA County, 2013).
- Based on the laboratory test results, the expansion index of the upper 10 feet soils was 0, corresponding to very low expansion potential.
- Prior to the start of any earthwork, the site should be cleared of all vegetation, existing fill, and debris. The materials resulting from the clearing and grubbing operations should be removed from the site.
- The site soils are anticipated to be readily excavatable with conventional heavy duty earthworking and trenching equipment.
- Excavated on-site soils are generally considered 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 basin berms.
- All surfaces to receive additional fill should be scarified to a depth of 6 inches. The scarified soil should be moisture conditioned to within ± 3 percent of optimum moisture for granular soils or 0 to 2 percent above optimum for fine soils. The scarified soil should be recompacted to at least 90 percent of the laboratory maximum dry density prior to the placement of any fill.
- Fill soils should be evenly spread in horizontal, 8-inch-maximum, loose lifts. The fill materials should be thoroughly mixed and moisture conditioned to within 3 percent of optimum moisture content for granular soils and up to 2 percent above optimum moisture content for fine-grained soils.
- All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry density. The upper 12 inches of soil below asphalt and concrete pavement, should be compacted to at least 95 percent of laboratory maximum dry density.

- The recharge basin bottoms should be scarified to a depth of 24 inches below finish grade. The bottoms should be left uncompacted, if practical. If the recharge basin bottoms are recompacted, the compaction should not exceed 85 percent of the laboratory maximum dry density.
- Any proposed cut slopes higher than 5 feet should be overexcavated and constructed as compacted fill slopes. Slope overexcavations should extend at least 2 feet horizontally behind the top of slope and 2 feet vertically below the toe of slope.
- Slope stability and seepage analyses for the basin slope under dry, steady state and rapid drawdown are presented in the text of this report.
- Rapid drawdown conditions, different water levels in adjacent basins, and surface drainage over the slopes should be avoided. These conditions may result in reduced slope stability, seepage between basins, or surficial erosion.
- Settlement will likely occur in the vicinity of the basins due to collapse of the underlying soils when saturated by percolating water. Such settlement is expected to diminish with time. Re-grading may be required to maintain the intended surface drainage and to repair any settlement-induced soil cracking.
- Lateral earth pressures, foundation design parameters, pipeline design parameters and flexible pavement section recommendation are presented in the text of this report.
- Recommendations for temporary sloped excavations and temporary shoring are provided in the text of this report.

Based on our investigation, it is our professional opinion that the project sites are suitable for construction of the proposed project, provided the findings and conclusions presented in this geotechnical investigation report are considered in the planning, design and construction of the project.

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1.0 INTRODUCTION

This report contains the findings of our geotechnical investigation for the design of the proposed Mojave Water Agency (MWA) new Ames-Reche recharge basin in the City of Landers, San Bernardino County, California. The approximate location of the project site is shown in Figure No. 1, *Approximate Project Location Map.*

The purposes of this investigation were to evaluate the nature and pertinent engineering properties of the subsurface materials at the site and to provide recommendations regarding slope stability evaluation and design.

This report is prepared for the project site described herein and is intended for use solely by Ardurra and their designated project team. If provided to other parties, this report be used for information on factual data only. Other parties should be responsible for making their own interpretations of the data contained in this report.

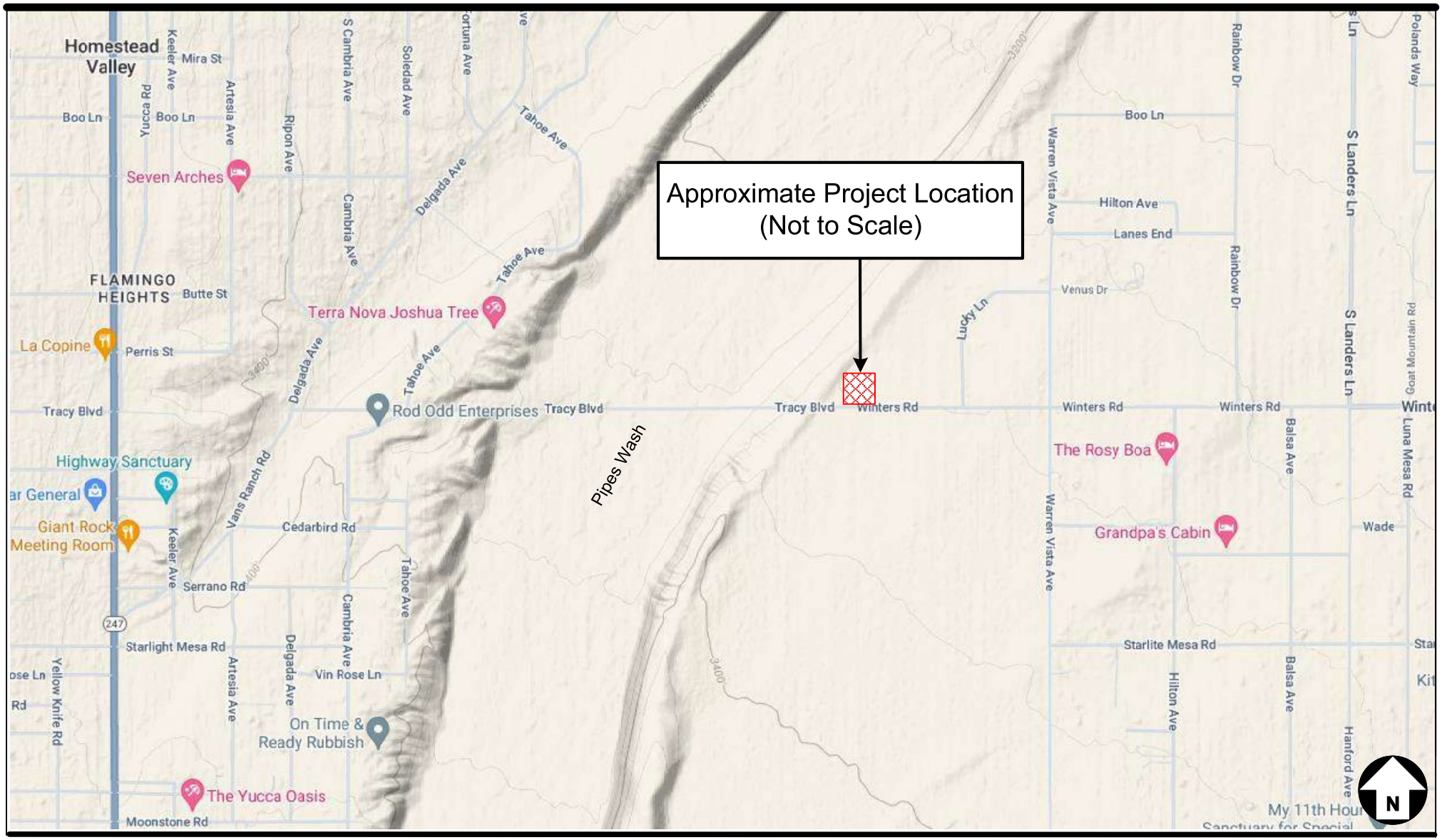
2.0 PROJECT DESCRIPTION

The purpose of this project is to construct a new recharge basin and monitoring well on the proposed MWA-owned site. The proposed 10-acre site is located along Winters Road, approximately 0.3 miles east of the existing recharge facility and adjacent to a 12-inch diameter HDPE pipeline, in Landers, California. The project will include installing a new tee connection to the existing 12-inch diameter HDPE pipeline, 2 isolation valves, pipeline, and outlet with energy dissipater to the proposed recharge basin. The recharge basin will be designed for a maximum flow rate of 5 cfs and an anticipated annual recharge capacity of 1,500 AFY or better. The recharge basin will include a perimeter access road, fencing, and signage. Geochemical modeling may be required if the Synthetic Precipitation Leaching Procedure (SPLP) test results warrant. The new basin dimensions have not been determined during the preparation of this report.

3.0 SITE DESCRIPTION

The project site is located on Parcel Nos. 062921113 and 062921114 on vacant unsecured land covered in sand with scattered Joshua trees throughout the parcels. The site is bounded by Pipes Wash to the north, Winters Road to the south, Lucky Lane to the east, and the exiting recharge basin to the west. The Ames-Reche recharge site is developed with an existing recharge basin with associated berms, access roads, and piping.

The project site gently slopes from approximately 3,320 feet above mean sea level (amsl) in the southeastern corner, but peaks abruptly to 3,324 feet amsl between borings, BH-02 to BH-01, and then slopes down to 3,311 feet amsl in the northwestern corner.



Project: Ames-Reche Recharge Basin Relocation
Location: Along Winters Road
City of Landers, San Bernardino County, CA
For: Ardurra

Approximate Project Location Map

Project No.
23-81-275-01

Converse Consultants

Figure No.
1

4.0 SCOPE OF WORK

The scope of this investigation included set-up, subsurface exploration, laboratory testing, engineering analysis, and preparation of this report, as described in the following sections.

4.1 Project Set-up

The project set-up consisted of the following tasks.

- Reviewed existing documents and submitted boring locations for review and approval.
- Conducted site reconnaissance and staked the boring locations selected by Ardurra.
- Notified Underground Service Alert (USA) at least 48 hours prior to investigation to clear the locations of any conflict with existing underground utilities.

4.2 Subsurface Exploration

Three exploratory borings were drilled on March 4 and 5, 2024, at locations selected by Ardurra. The proposed depths of the borings were 15.0 feet and 100.0 feet below ground surface (bgs). The borings were drilled to depths of 31.5 to 101.5 feet bgs.

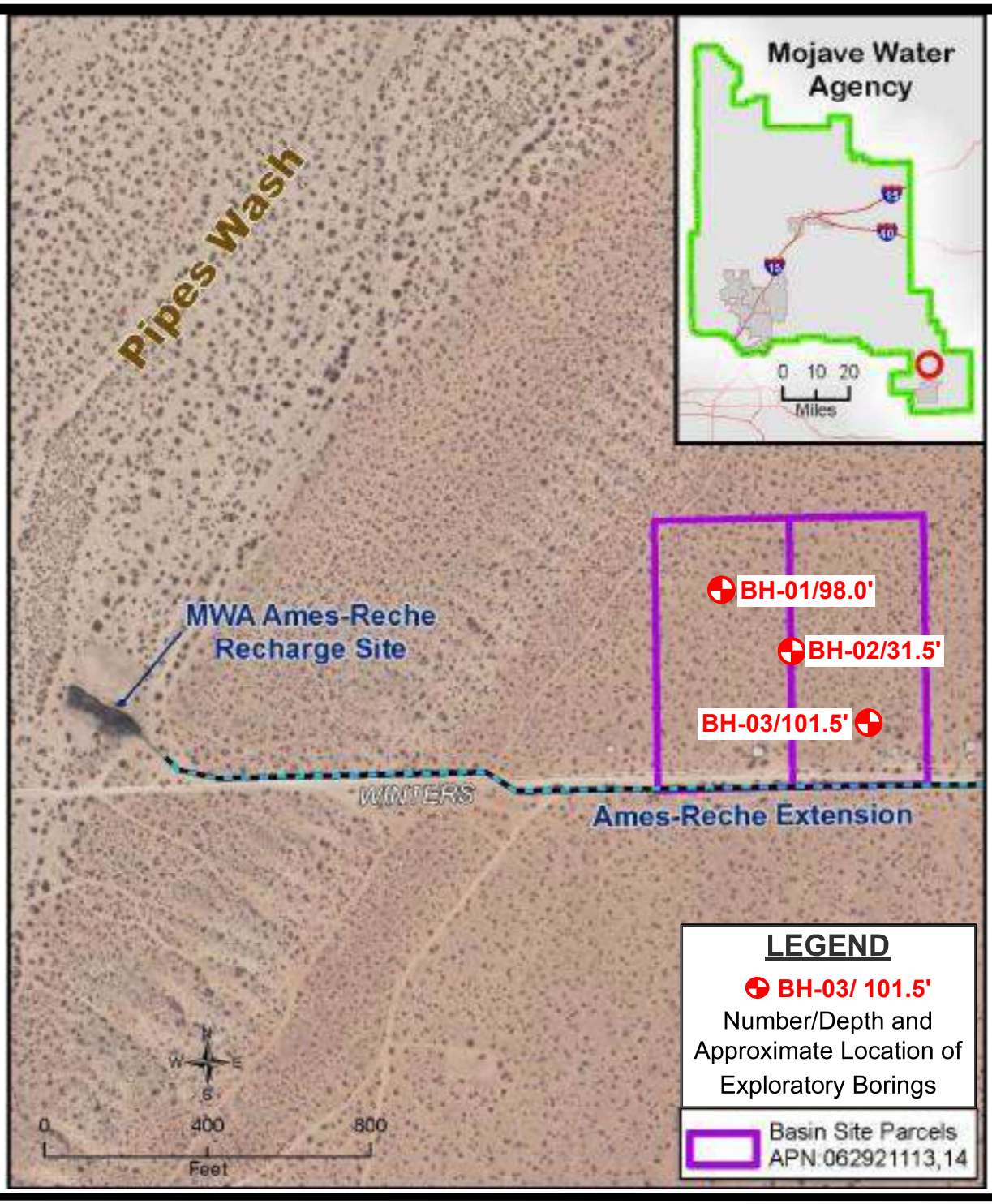
The approximate location of the exploratory borings is shown in Figure No. 2, *Approximate Boring Locations Map.* A detailed discussion of subsurface exploration is presented in Appendix A, *Field Exploration*.

4.3 Laboratory Testing

Due to the primarily granular dry soils, representative undisturbed samples were difficult to collect. Representative samples of the site soils were tested in the laboratory to aid in the soil classification, and to evaluate relevant engineering properties of the site soils. These tests included the following.

- *In-situ* moisture contents and dry densities (ASTM D2216-19 and 2937-17e2)
- Expansion index (ASTM D4829-21)
- R-value (California Test 301)
- Soil corrosivity (California Tests 643, 422, 417)
- Collapse potential (ASTM Standard D4546)
- Sand equivalent (ASTM 2419-22)
- Percent finer than sieve No. 200 (ASTM D1140-17)
- Grain size distribution (ASTM D6913/D6913M-17)
- Maximum dry density and optimum-moisture content (ASTM D1557-12(2021)).
- Direct shear strength (ASTM D3080/D3080M-23)

*Note: most samples were relatively disturbed.



Project: Ames-Reche Recharge Basin Relocation
Location: Along Winters Road
City of Landers, San Bernardino County, CA

For: Ardurra

Approximate Boring Locations Map

Project No.
23-81-275-01

Converse Consultants

Figure No.
2

For *in-situ* moisture and dry density data, see the Logs of Borings in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program.*

4.4 Analysis and Report Preparation

Data obtained from the field exploration and laboratory testing program were compiled and evaluated. Geotechnical analyses of the compiled data were performed, and this report was prepared to present our findings, conclusions and recommendations for the proposed recharge basin.

5.0 SUBSURFACE CONDITIONS

A general description of the subsurface conditions, various materials and groundwater conditions encountered at the site during our field exploration is discussed below.

5.1 Subsurface Profile

Based on the exploratory borings and laboratory test results, the project site is underlain to a depth of at least 101.5 feet by alluvial sediments consisting primarily of sand and silty sand which is generally fine to coarse-grained, with few to little gravel up to 2.5 inches maximum dimension, trace of caliche, medium dense to very dense, dry to moist and various shades of brown and red. The soil conditions encountered are relatively uniform across the site.

For a detailed description of the subsurface materials encountered in the exploratory borings, see Drawing Nos. A-2a through A-4c, *Logs of Borings,* in Appendix A, *Field Exploration.*

5.2 Groundwater

Groundwater was not encountered during the field investigation to a maximum explored depth of 101.5 feet bgs.

For comparison, regional groundwater data from the GeoTracker database (SWRCB, 2024) was reviewed to evaluate current and historical groundwater levels. No site with groundwater data was identified within a 1.0-mile radius of the project site using the coordinates 34.237866° latitude and 116.411050° longitude.

The National Water Information System (USGS, 2024) was reviewed for current and historical groundwater data from sites within an approximately 1.0-mile radius of the proposed development and the results of that search are included below.

Table No. 1, Summary of USGS Groundwater Depth Data

Site Number	Location	Groundwater Depth Range (ft. bgs)	Date Range
341420116245601	Northeast of existing recharge basin; approximately 1,426 feet northwest of project site	222 – 236	2014 - 2023
341445116242301	Vacant Lot W of Warren Vista Ave; approximately 2,3,166 feet northeast of project site	282 - 300	2014 - 2023
341432116252501	Vacant Lot NW of Tahoe Ave; approximately 4,336 feet northwest of project site	225	1958
341335116241901	Vacant Lot W of Warren Vista Ave; approximately 4,468 feet southeast of project site	361 - 373	1958 - 1966
341332116241301	E of Warren Vista Ave; approximately 4,870 feet southeast of project site	349 - 363	1994 - 2023

Based on the data reviewed, the current depth to groundwater at the site is estimated to be deeper than 222 feet bgs. The historical high groundwater level at the site is not known with certainty but is approximated to be 222 feet bgs. Groundwater is not anticipated to be encountered during construction of the proposed basin. 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 or irrigation events.

5.3 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. Depending on the extent and location below finish subgrade, expansive soils can have a detrimental effect on structures.

Based on the laboratory test results, the expansion index of the upper 10 feet soils was 0, corresponding to very low expansion potential.

5.4 Collapse Potential

Soil deposits subjected to collapse/hydro-consolidation generally exist in regions of moisture deficiency. Collapsible soils are generally defined as soils that have potential to suddenly decrease in volume upon increase in moisture content even without an increase in external loads. Moreover, some soils may have a different degree of collapse/hydro-consolidation based on the amount of proposed fill or structure loads. Soils susceptible to collapse/ hydro-consolidation include wind-blown silt, weakly cemented sand, and silt where the cementing agent is soluble (e.g., soluble gypsum, halite), alluvial or colluvial deposits within semi-arid to arid climate, and certain weathered bedrock above the groundwater table.

Granular soils may have a potential to collapse upon wetting in arid climate regions. Collapse/hydro-consolidation may occur when the soluble cements (carbonates) in the soil matrix dissolve, causing the soil to densify from its loose/low density configuration from deposition.

The degree of collapse of a soil can be defined by the collapse potential value, which is expressed as a percentage of collapse of the total sample using the Collapse Potential Test (ASTM D4546). According to the ASTM guideline, the severity of collapse potential is commonly evaluated by the following Table No. 2, *Collapse Potential Values*.

Table No. 2, Collapse Potential Values

Collapse Potential Value (%)	Severity of Problem
0	None
0.1 to 2	Slight
2.1 to 6.0	Moderate
6.0 to 10.0	Moderately Severe
>10	Severe

Based on the laboratory test results performed at boring locations (BH-02 and BH-03) used to investigate the upper five feet of soils the collapse potential ranged between 3.6 and 4.2 percent. Recharging of the basin will result in substantial collapse of the bottom over time. Collapse potential distress is typically considered a concern when collapse potential is over 2% (LA County, 2013).

5.5 Excavatability

Based on our field observations, the surface and subsurface materials at the site are anticipated to be excavatable by conventional heavy-duty earth moving equipment. However, excavation may be difficult if concentrations of gravel are encountered.

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. The selection of appropriate excavation equipment models should be done by an experienced earthwork contractor.

5.6 Subsurface Variations

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface conditions within the project site should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

6.0 LABORATORY TEST RESULTS

Laboratory testing was performed to determine the physical characteristics and engineering properties of the subsurface soils. Discussions of the various test results are presented below:

6.1 Physical Testing

Results of the various laboratory tests are presented in Appendix B, *Laboratory Testing Program*, except for the results of in-situ moisture and dry density tests which are presented on the Logs of Borings in Appendix A, *Field Exploration*. The results are also discussed below.

- *In-situ* Moisture and Dry Density – *In-situ* dry densities and moisture contents of the upper 15 feet of soil ranged between 106 and 131 pounds per cubic feet (pcf) and between 1 and 2 percent respectively.
- Expansion Index (EI) – Three representative soil samples were tested to evaluate the expansion potentials in accordance with ASTM Standard D4829-21. The test results showed EI of 0, corresponding to very low expansion potential.
- R-Value (R) – Two representative bulk samples were tested in accordance with Caltrans Test Method 301. The results showed R-values of 70 and 71.
- Collapse Potential (CL) – Two relatively undisturbed representative samples collected from the upper 5.0 feet soil were tested in accordance with the ASTM Standard D4546 test method. The collapse potential was measured under a vertical stress of 2.0 kips per square foot (ksf). The test result showed collapse potentials of 3.6 and 4.2 percent, indicating moderate collapse potential.
- Sand Equivalent (SE) – Three representative soil samples were tested to evaluate Sand Equivalent (SE) in accordance with the ASTM Standard D2419-22 test method. The sand equivalents of the soil samples ranged from 27.0 to 29.0.

- Percent Finer than Sieve No. 200 (WA) – Nine tests were performed on selected soil samples to aid in the classification of the on-site soils and to estimate other engineering parameters. The tests were performed in general accordance with the ASTM Standard D1140-17 test method. The test results are presented in the boring log and in Appendix B Laboratory Testing Program.
- Grain Size Analysis (PA) – Ten representative samples were tested to determine their relative grain size distributions in accordance with the ASTM Standard D6913/D6913-M-17. Test results are graphically presented in Drawings No. B-1a and 1b, *Grain Size Distribution Results.*
- Maximum Dry Density and Optimum Moisture Content (CP) – Three moisture-density relationships of representative soil samples were tested, in accordance with ASTM Standard D1557-12(2021), with the results presented in Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program.* The laboratory maximum dry densities were 130.0, 133.0, and 132.5 (134.2, rock corrected) pounds per cubic foot (pcf) and the optimum moisture content were 7.3, 7.5, and 7.5 (7.0, rock corrected) percent, respectively, including a rock correction of 5.84%.
- Direct Shear (DS) – One direct shear test was performed in accordance with ASTM Standard D3080/D3080M-23 on relatively undisturbed ring samples. The results of the direct shear tests are presented in Drawings No. B-3, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.
- Direct Shear (remolded) – One direct shear test was performed on a sample remolded to 90% of the laboratory maximum dry density under soaked moisture conditions in accordance with ASTM Standard D3080/D3080M-23. The results are presented in Drawing No. B-4, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.

6.2 Chemical Testing - Corrosivity Evaluation

Two representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common construction materials. These tests were performed by Keegan Labs LLC (Pomona, CA) in accordance with California Test Methods 643, 422, and 417. The test results are summarized below and are presented in Appendix B, Laboratory Testing Program. See Section 11.6, *Soil Corrosivity* for design recommendations relating to soil corrosivity.

- The pH measurements of the sample are 8.4 and 8.9.
- The sulfate content of the samples tested is 32 ppm and 41 ppm.
- The chloride concentration of the samples tested is 29 ppm and 41 ppm.
- The minimum electrical resistivities when saturated is 10,600 ohm-cm and 10,500 ohm-cm.

7.0 ENGINEERING GEOLOGY

The regional and local geology within the proposed project area is discussed below.

7.1 Regional Geology

The project site is located in the southwestern margin of the Mojave Desert Geomorphic Province of 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 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 to older Pleistocene-age sedimentary basins, and eruptions of volcanic units.

7.2 Local Geology

The project site is situated on a gently southeast-northwest sloping surface in Landers near Pipes Wash. Regional mapping (Dibblee, 2008; Wesoloski and Marquis, 2022) indicates that the site is generally underlain by late Holocene to middle Pleistocene-age alluvial and eolian deposits. The alluvial deposits generally consist of older fan deposits and older valley fill deposits from the mountains to the east and south. The alluvium is primarily composed of slightly to moderately consolidated silty sand with gravel and poorly bedded to non-bedded granitic cobble-pebble gravel and sand. The eolian deposits consist of unconsolidated, loose, fine windblown sand deposited by prevailing westerly winds.

8.0 FAULTING AND SEISMICITY

The approximate distance and seismic characteristics of nearby faults as well as seismic design coefficients are discussed in the following subsections.

8.1 Faulting

The project site is not located within a currently designated State of California or San Bernardino County Fault Zone (CGS, 2007; San Bernardino County, 2007b). There are no known active faults projecting toward or extending across the project site. The potential

for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

The proposed site is situated in a seismically active region. As is the case for most areas of Southern California, ground shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site.

The project site is not located within a currently mapped State of California Earthquake Fault Zone for surface fault rupture. The table below summarizes selected data of known faults capable of seismic activity within 100 kilometers of the site. The data presented below was calculated using the National Seismic Hazard Maps Database (USGS, 2008) and other published geologic data.

Table No. 3, Summary of Regional Faults

Fault Name and Section	Closest Distance (km)	Slip Sense	Length (km)	Slip Rate (mm/year)	Maximum Magnitude
Landers	2.66	strike slip	95	0.6	7.40
Johnson Valley (No)	9.46	strike slip	35	0.6	6.90
So Emerson-Copper Mtn	11.63	strike slip	54	0.6	7.10
Pinto Mtn	11.76	strike slip	74	2.5	7.30
Burnt Mtn	12.84	strike slip	21	0.6	6.80
Eureka Peak	12.88	strike slip	19	0.6	6.70
North Frontal (East)	13.3	thrust	27	0.5	7.00
Calico-Hidalgo	18.01	strike slip	117	1.8	7.40
Lenwood-Lockhart-Old Woman Springs	24.78	strike slip	145	0.9	7.50
Pisgah-Bullion Mtn-Mesquite Lk	26.6	strike slip	88	0.8	7.30
Helendale-So Lockhart	38.5	strike slip	114	0.6	7.40
S. San Andreas	40.04	strike slip	548	n/a	8.18
North Frontal (West)	43.09	reverse	50	1	7.20
San Jacinto	71.61	strike slip	241	n/a	7.88
Cleghorn	73.28	strike slip	25	3	6.80
Gravel Hills-Harper Lk	84.46	strike slip	65	0.7	7.10
Cucamonga	95.25	thrust	28	5	6.70

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

8.2 CBC Seismic Design Parameters

Seismic parameters based on the 2022 California Building Code (CBSC, 2022) and

ASCE 7-16 are provided in the following table. These parameters were determined using the generalized coordinates for the location and the ASCE Hazard Tool.

Table No. 4, CBC Seismic Parameters

Seismic Parameters	
Site Coordinates	33.237866N, 116.41105W
Site Class	D
Risk Category	II
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_s	1.932g
Mapped 1-second Spectral Response Acceleration, S_1	0.659g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.0
Site Coefficient (from ASCE 7-16, Section 21.3), F_v	2.5
MCE 0.2-sec period Spectral Response Acceleration, S_{MS}	1.932g
MCE 1-second period Spectral Response Acceleration, S_{M1}	1.647g
Design Spectral Response Acceleration for short period S_{DS}	1.288g
Design Spectral Response Acceleration for 1-second period, S_{D1}	1.098g
Peak Ground Acceleration, PGA_M	0.896g

8.3 Secondary Effects of Seismic Activity

In general, secondary effects of seismic activity include surface fault rupture, soil liquefaction, and settlement due to seismic shaking, landslides, lateral spreading, tsunamis, seiches, and earthquake-induced flooding. The site-specific potential for each of these seismic hazards is discussed in the following sections.

Surface Fault Rupture: The site is not located within a currently designated State of California or San Bernardino County Earthquake Fault Zone (CGS, 2007; San Bernardino County, 2007b). There are no known active faults projecting toward or extending across the project site. The nearest fault zone is the Johnson Valley Fault Zone located approximately 1.4 miles east of the site. The potential for surface rupture resulting from the movement of nearby major faults is not known with certainty but is considered low.

Liquefaction: Liquefaction is defined as the phenomenon in which a cohesionless soil mass within the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due to 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 generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur. They are as follows.

- Soils must be submerged.
- Soils must be primarily granular.
- 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.

The site is not located in an area designated by San Bernardino County with susceptibility to liquefaction (San Bernardino County, 2007b). The current groundwater depth is greater than 101.5 feet bgs and historically highest groundwater depth was approximately at 222 feet bgs. Based on a site-specific liquefaction analysis performed on BH-01 and BH-03, presented in Appendix C, *Liquefaction and Settlement Analyses*, the potential for liquefaction of the site is expected to be negligible.

Dry Seismic Settlement: Seismically induced settlement occurs in unsaturated, unconsolidated, granular sediments during ground shaking associated with earthquakes. Based on Dynamic Settlement analyses performed on BH-01 and BH-03, presented in Appendix C*, Liquefaction and Settlement Analyses,* we estimate that the site will have the potential for up to 3.6 and 2.4 inches of dry seismic settlement, respectively.

Landslides: Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The site is not located in an area designated by San Bernardino County with susceptibility for landslides (San Bernardino County, 2007b). A lack of significant slopes surrounding the site makes the potential for seismically induced landslides affecting the project site considered to be very low.

Lateral Spreading: Seismically induced lateral spreading involves primarily lateral movement of earth materials over underlying materials which are liquefied due to ground shaking. It differs from slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Lateral spreading is possible in basins during shallow groundwater conditions which may occur during infiltration or high surface flow of the adjacent Pipes Wash.

Tsunamis: Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the site, tsunamis are not considered to be a risk.

Seiches: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Due to the absence of large bodies of water in the site vicinity, the risk from off-site seiching is considered to be low. There is a potential for seiching in the proposed basin in the event of a major seismic event.

Earthquake-Induced Flooding: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site is not located within a designated dam inundation zone (San Bernardino County, 2007a; DSOD, 2024). Due to the distance from any large dams or other water-retaining structures, the risk for earthquake-induced flooding at the project site is considered low.

9.0 SLOPE STABILITY AND SEEPAGE ANALYSIS

A preliminary evaluation of slope stability and seepage were performed on conceptual recharge basin dimensions as follows.

- Basin depth: 10 ft.
- Basin bed width: 50 ft.
- Basin slope ratio: 3(H): 1(V).

The preliminary evaluation of slope stability and seepage are discussed in the following sections. For a detailed description of the input parameters, analysis methods, and figures, see Appendix D, *Slope Stability and Seepage Analysis*.

9.1 Minimum Recommended Factors of Safety

Permanent graded slopes are generally required to have minimum factors of safety against slope failure of 1.5 under static conditions and 1.1 under seismic conditions in order to protect human safety and nearby structures. We anticipate the recharge basins will be within a secure facility not designated for human habitation. Slope failure may result in operational difficulties and would require repair; however, such failure is not anticipated to create a risk to human safety or existing structures. Less conservative factors of safety may be considered.

The US Army Corps of Engineers provides minimum factors of safety for levee slope stability under static conditions (USACE, 2000). Although the basin slopes are not levees, they will be subject to similar conditions of changing water levels. The USACE does not provide minimum factors of safety for seismic conditions.

Based on review of the USACE guidelines and commonly accepted standards, we recommend the following factors of safety for the recharge basins.

Table No. 5, Minimum Recommended Factors of Safety

Condition	Minimum Static Factor of Safety[1]	Minimum Seismic Factor of Safety
Dry	1.3	1.1
Filled (steady-state)	1.4	1.1
Rapid Drawdown (long-term seepage)	1.2	1.1

[1] Minimum factors of safety – levee slope stability (USACE, 2000).

The USACE recommends a factor of safety of 1.0 for rapid drawdown conditions when the filled conditions are unlikely to persist for long periods preceding drawdown, or a factor of safety of 1.2 when the water level is likely to persist for long periods. Because the basins may stay filled for extended periods, the long-term condition is considered to be appropriate for this evaluation.

9.2 Stability of Proposed Slopes

The stability of the conceptual recharge basin slopes under static conditions (dry, steady seepage, and rapid drawdown) were evaluated using the Slide 9.008 software (RocScience, 2020). Pseudostatic analyses using a seismic coeffiecient of 0.29 were performed in order to evaluate the stability of the slopes during a large earthquake.

The anticipated seepage of retained water and anticipated slope stability were analyzed for conceptual slope height of approximately 10 feet, width, and an assumed slope ratio of 3:1 horizontal:vertical (H:V). Analyses were completed for both sides of a berm between a filled basin and an empty basin to model the worst-case scenario. Soil parameters were conservatively selected from laboratory test results based on the worst-case soils encountered. Where the modeled factor of safety exceeded 3.0, a conservative value of 3.0 was assumed.

A detailed description of the input parameters and analytical methods is presented in Appendix D, *Slope Stability and Seepage Analysis*. The resulting factors of safety are summarized in the following table.

Table No. 6, Factors of Safety Against Slope Failure

Condition	Conceptual Slope Configuration	Static FOS		Pseudo-Static FOS	
		Filled Side	Dry Side	Filled Side	Dry Side
Dry	3H:1V 30' Width 10' Height	2.82	N/A	1.39	N/A
Steady State		3.0	1.97	1.16	0.88*
Rapid Drawdown		2.87	N/A	1.43	N/A

*Note: Does not meet the recommended Factor of Safety

The analyzed worst-case proposed slope meets or exceeds the recommended minimum factors of safety under all analyzed conditions, except during the Steady State condition of the dry side of the berm under seismic event.

The recharge basin configuration was not provided during the preparation of this report. The configuration used for the analyses is conceptual or assumed and calculations will need to be revised once final plans are provided.

9.3 Seepage

Based on the seepage analysis performed for the proposed slope configuration, seepage between basins may occur if adjoining basins are kept at filled and empty conditions for long periods of time. The hydraulic conductivity of the compacted basin berms is expected to be lower than the native soil below the basins. We anticipate that seepage, if it occurs, would result in moisture at the toe of the adjacent berm slope. The slope stability analysis indicates that seepage does not result in a significant change in the factor of safety of the slopes of adjoining basins.

10.0 EARTHWORK RECOMMENDATIONS

Earthwork recommendations for the project are presented in the following sections.

10.1 General

This section contains our general recommendations regarding earthwork and grading for the proposed recharge basins. These recommendations are based on the results of our field exploration, laboratory tests, our experience with similar projects, and data evaluation as presented in the preceding sections. These recommendations may require modification by the geotechnical consultant based on observation of the actual field conditions during grading.

The earthwork will include basin excavation, pipe trench excavation and subgrade preparation, and trench backfilling. Per Ardurra, no other structures will be constructed as part of this project.

Prior to the start of construction, all underground existing utilities and appurtenances should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing structures or utilities.

All debris, surface vegetation, deleterious material, existing fill, and surficial soils containing roots and perishable materials should be stripped and removed from the site.

Deleterious material, including organics, concrete, and debris generated during excavation, should not be placed as fill.

The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill. Based on these observations, localized areas may require remedial grading deeper than indicated herein. Therefore, some variations in the depth and lateral extent of excavation recommended in this report should be anticipated.

10.2. Over-Excavation and Grading

Over-excavation and grading for the proposed improvements are discussed in the following sections.

10.2.1 Over-Excavation/Removal

Footing and pavement should be uniformly supported on compacted fill. In order to provide uniform support, structural areas should be over-excavated, scarified, and recompacted. The general over-excavation minimum depths are as follows.

Table No. 7, Over-Excavation Depths

Structure/Pavement	Minimum Excavation Depth*
Footings (Fencing, Signage)	18 inches below footings bottom or 3 feet below existing ground surface, whichever is deeper
Pavement	12 inches below finish grade or 2 feet below existing ground surface, whichever is deeper

The over-excavation below the footings should be uniform. The over-excavation should extend to at least 2 feet beyond the proposed footing edges, and 1 foot beyond the edges of the proposed pavement. The over-excavation bottom should be scarified and compacted as described in Section 10.4, *Compacted Fill Placement*. If isolated pockets of very soft, loose, eroded, or pumping soil are encountered, the unstable soil should be excavated as needed to expose undisturbed, firm, and unyielding soils.

The contractor should determine the best manner to conduct the excavations, such that there are no losses of bearing and/or lateral support to the existing structures or utilities.

Areas to receive fill and/or other surface improvements should be scarified to a minimum depth of 6 inches, brought to a near-optimum moisture condition, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557).

10.2.2 Remedial Grading for Basins

The basin berms should be supported on uniform compacted fill. In order to provide uniform support, slope over-excavations should extend at least 2 feet horizontally behind the top of slope and 2 feet vertically below the toe of slope. Berm over-excavations should be widened as necessary to allow fill to be placed and compacted in horizontal lifts.

Variations in the depths and lateral extent of over-excavation should be anticipated, based on observations by the geotechnical consultant during grading. The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill or structures. If isolated pockets of very soft, loose, or pumping subgrade are encountered, the over-excavation should be locally deepened, as needed, to expose undisturbed, firm, and unyielding soils.

10.3 Fill Materials

Excavated on-site soils are generally considered 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 basin berms.

Imported soils, 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.
- Sand Equivalent greater than greater than 30 for pipe bedding.
- Corrosivity is not greater than onsite soil.

Based on field investigation and laboratory testing results, on-site soils may be suitable as fill materials. However, onsite soils might not be suitable as pipe bedding as the sand equivalent of the onsite soils ranges from 27 to 29.3.

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by a geotechnical representative prior to delivery to the site.

10.4 Compacted Fill Placement

All surfaces to receive additional fill should be scarified to a depth of 6 inches. The scarified soil should be moisture conditioned to within ± 3 percent of optimum moisture for granular soils or 0 to 2 percent above optimum for fine soils. The scarified soil should be recompacted to at least 90 percent of the laboratory maximum dry density prior to the placement of any fill.

Fill soils should be evenly spread in horizontal, 8-inch-maximum, loose lifts. The fill materials should be thoroughly mixed, and moisture conditioned to within 3 percent of optimum moisture content for granular soils and up to 2 percent above optimum moisture content for fine-grained soils. The *in-situ* moisture contents of the upper 5 feet of soils at the time of our investigation was generally in the range of 1 to 7 percent. The optimum moisture content for the site soils is approximately 7 to 7.5 percent. Moisture conditioning will be required during site grading, due to the relatively drier conditions.

All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557 test method. The upper 12 inches of soil below asphalt and concrete pavement, should be compacted to at least 95 percent of laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

To reduce differential settlement, variations in the soil type, degree of compaction and thickness of the compacted fill placed underneath the foundations should be kept to a minimum.

The project geotechnical consultant should observe the placement of fill and conduct in-place field density tests to check for adequate moisture content and relative compaction as required by the project specifications. Where less than the required relative compaction is indicated, additional compactive efforts should be applied and the soil moisture conditioned as necessary, until the required relative compaction is attained.

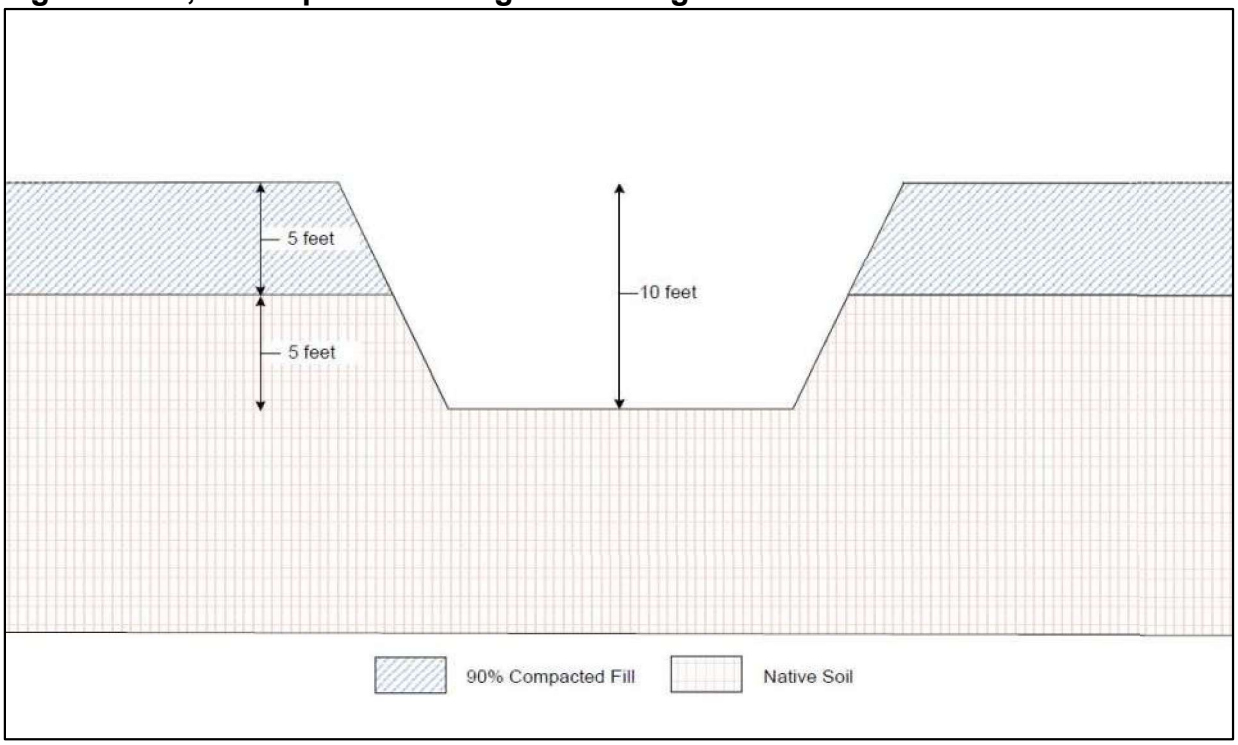
10.5 Recharge Basin Bottoms

The bottom surfaces of the recharge basins should be scarified to a depth of 24 inches below finish grade. The surfaces may be left uncompacted, if practical. If the bottom surfaces are recompacted, the compaction should not exceed 85 percent of the laboratory maximum dry density. Overcompaction of the recharge basin bottoms will result in reduced infiltration rates and poor basin performance.

10.6 Construction of Recharge Basin

Construction of the recharge basin should entail the overexcavation of soil up to 5.0 feet bgs. The excavated material can be used to build the slope up to 5-feet in height to create the 10-foot-deep basin. The final berm slope of the basin should be composed of 5 feet of compacted fill atop 5-feet of native soil for a total height of 10-feet. A conceptual drawing of the basin is shown below.

Figure No. 3, Conceptual Drawing of Recharge Basin



10.7 Slope Grading

We anticipate that the recharge basins will have slope heights of approximately 10 feet. Cut slopes higher than approximately 5 feet to 10 feet are not recommended due to the poorly consolidated near-surface and/or cohesionless soil at the site. Any proposed cut slopes higher than 5 feet should be overexcavated and constructed as compacted fill slopes.

Fill for slopes should be placed and compacted as described in Section 10.4, *Compacted Fill Placement*. Fill slopes should be properly compacted out to the slope face. This may be achieved by overbuilding and cutting back to the compacted core or by utilizing other methods that meet the intent of the project specifications.

10.8 Underground Utilities

Earthwork associated with construction of underground utilities will include pipeline sub-grade preparation, pipe bedding placement, and trench backfill. Recommendations for these activities are provided in the following sections. Recommendations related to temporary utility trench excavations are provided in Section 12.2, *Shoring Design* and Section 12.3, *Temporary Sloped Excavations*.

10.8.1 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, and free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than 2 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe subgrade should be removed and replaced with an adequate bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

10.8.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 12 inches above the pipe. Specifications for bedding materials including required backfill requirements surrounding the pipe should be specified by the design engineer in accordance with the pipe manufacturer's guideline.

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. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The sand equivalent of the onsite soils ranges from 27 to 29.3. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the springline of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding

material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable.

Migration of fines from the surrounding native and/or fill soils must be considered in selecting the gradation of any imported bedding material. We recommend that the pipe bedding material should satisfy the following criteria to protect migration of fine materials.

i. $\frac{D15(F)}{D85(B)} \leq 5$

ii. $\frac{D50(F)}{D50(B)} < 25$

iii. Bedding Materials must have less than 5% passing No. 200 sieve (0.0074 mm) to avoid internal movement of fines.

Where,
F = Bedding Material
B = Surrounding Native and/or Fill Soils
*D*15(F) = Particle size through which 15% of bedding material will pass
*D*85(B) = Particle size through which 85% of surrounding soil will pass
*D*50(F) = Particle size through which 50% of bedding material will pass
*D*50(B) = Particle size through which 50% of surrounding soil will pass

If the above criteria do not satisfy, commercially available geofabric used for filtration purposes (such as Mirafi 140N or equivalent) may be wrapped around the bedding material encasing the pipe to separate the bedding material from the surrounding native or fill soils.

10.8.3 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated site soils free of oversize particles and deleterious matter may be used to backfill the trench zone. Detailed trench backfill recommendations are provided below.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557 test method. At least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95 percent of the laboratory maximum dry density as per ASTM D1557 test method.
- Particles larger than 1 inch should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks

larger than 3 inches in the largest dimension should not be placed as trench backfill.

- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.
- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.
- It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

11.0 DESIGN RECOMMENDATIONS

Recommendations for the design and construction of the proposed recharge basins and associated piping and improvements are presented in the following sections. The recommendations provided are based on the assumption that, in preparing the site, the above earthwork recommendations will be implemented.

11.1 Shallow Foundation Design Parameters

The proposed fencing wall and signage may be supported on footings. The design of the shallow foundations should be based on the recommended parameters presented in the table below.

Table No. 8, Recommended Foundation Parameters

Parameter	Value
Minimum continuous footing width	18 inches
Minimum isolated footing width	18 inches
Minimum continuous or isolated footing depth of embedment below lowest adjacent grade to the top of footing	18 inches
Allowable net bearing capacity	2,500 psf

The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 pounds per square foot (psf) with each foot of additional embedment and 100 psf with each foot of additional width up to a maximum of 3,500 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loadings, which will include loadings induced by wind or seismic forces.

11.2 Pipe Design

The proposed recharge project will include installing a new tee connection to the existing 12-inch diameter HDPE pipeline, 2 isolation valves, pipeline, and outlet with energy dissipater to the proposed recharge basin.

Where pipelines are connecting to rigid structures near, or at its lower levels, and then are subjected to significant loads as the backfill is placed to finish grade, we recommend that provisions be incorporated in the design to provide support of these pipelines where they exit the structure. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying and supporting the pipes with a few inches of compressible material, (i.e. Styrofoam, or other materials), or other techniques. Automatic shut-offs should be installed to limit the potential leakage in the event of damage in a seismic event.

11.2.1 Soil Parameters for Pipe Design

Structural design of pipelines requires proper evaluation of all possible loads acting on pipes. The stresses and strains induced on buried pipes depend on many factors, including the type of soil, density, bearing pressure, angle of internal friction, coefficient of passive earth pressure, and coefficient of friction at the interface between the backfill and native soils.

The recommended values of the various soil parameters for the pipe design are provided in the following table.

Table No. 9, Soil Parameters for Pipe Design

Soil Parameters	Parameters
Total unit weight of compacted backfill (assuming 92% average relative compaction), γ	131 pcf
Angle of internal friction of soils, ϕ	28º
Soil cohesion, c	170 pcf
Coefficient of friction between concrete and native soils, fs	0.35
Coefficient of friction between pipe and native soils, fs	0.25 for HDPE pipe
Bearing pressure against compacted soils	2,500 psf
Coefficient of passive earth pressure, K_p	2.77
Coefficient of active earth pressure, K_a	0.36
*Modulus of Soil Reaction, E'	1,500 psi

11.3 Lateral Earth Pressures and Resistance to Lateral Loads

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

11.3.1 Active Earth Pressures

The active earth pressure behind any buried wall or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The lateral earth pressures for the project site are presented in the following table.

Table No. 10, Active and At-Rest Earth Pressures

Loading Conditions	Lateral Earth Pressure[1] (psf)
Active earth conditions (wall is free to deflect at least 0.001 radian)	47
At-rest (wall is restrained)	69

These pressures assume a level ground surface around the structure for a distance greater than the structure height, no surcharge, and no hydrostatic pressure.

If water pressure is allowed to build up behind the structure, the active pressures should

be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the structure.

11.3.2 Passive Earth Pressure

Resistance to lateral loads can be assumed to be provided by a combination of friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.4 between formed concrete and soil may be used with the dead load forces. An allowable passive earth pressure of 240 psf per foot of depth may be used for the sides of footings poured against compacted soils. A factor of safety of 1.5 was applied in calculating passive earth pressure. The maximum value of the passive earth pressure should be limited to 2,500 psf for compacted fill.

Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

Due to the low overburden stress of the soil at shallow depth, the upper 1 foot of passive resistance should be neglected unless the soil is confined by pavement or slab.

11.3.3 Seismic Earth Pressure

The seismic force applied to the wall is based on a horizontal seismic acceleration coefficient equal to one-third of the peak ground. An equivalent fluid seismic pressure of 32H pcf for native soil may be assumed under active loading conditions (regular triangular pressure distribution) where H is the height of the backfill behind the wall.

11.4 Settlement

A static and dynamic settlements discussion are presented below.

11.4.1 Static Settlement

Most of the settlements at the project site are expected to occur immediately after the application of the load. Based on the maximum allowable net bearing pressures presented above, static settlement is anticipated to be approximately 1 inch or less. Differential settlement is expected to be up to one-half of the total settlement over a 40-foot span.

11.4.2 Dynamic Settlement

Our analysis of the potential dynamic settlement is presented in Appendix C, *Liquefaction and Seismic Settlement Analyses*. The current groundwater depth is greater than 101.5

feet bgs and historically highest groundwater depth was approximately at 222 feet bgs. Based on the analysis performed on BH-01 and BH-03, we estimate that the project site has the potential for up to 3.6 and 2.4 inches of dry seismic settlement, respectively, with negligible liquefaction induced settlement under current groundwater conditions. The dynamic differential settlement of the site is 1.2 inches over a lateral distance of 450 feet.

Generally, static and dynamic settlement does not occur at the same time. For design purposes, the structural engineer should decide whether static and dynamic settlement will be combined or not.

11.5 Basin Berm Design

Basin final design was not provided during the preparation of this report. We assumed that the basin berms will be up to approximately 10 feet high, 30 feet wide at the top, and 50 feet in width at the base. The basins will be constructed of on-site soils and will not be lined. Based on the analysis presented in Appendix D, the basin slopes are considered stable in the proposed configurations.

The basin berm slopes should be designed with the proposed slope ratios of 3H:1V or flatter. Fill slopes steeper than recommended will have reduced stability.

The lowest stability of water-retaining fill slopes generally occurs under rapid drawdown conditions, where the soil is saturated, and the retained water is emptied over a period of days or hours. In order to reduce the potential for instability, the basins should not be emptied rapidly. We understand that the basins will only be emptied by infiltration. Lowering the water levels by pumping or other means should be avoided. Flattened slope ratios may also be considered to reduce the potential for slope instability.

The site soils are generally granular and will be susceptible to erosion. Surface drainage should be controlled to prevent water from flowing over the berm slopes. If water from one basin will be allowed to overflow into an adjacent basin, a lined spillway and energy dissipation area should be provided. Uncontrolled overflow between basins is likely to result in berm failure.

The basin berm slopes will require maintenance through time to perform in a satisfactory manner. Any minor erosion channels should be repaired in order to prevent concentration of water flow over the slope face.

Based on laboratory test results presented in Appendix B, *Laboratory Testing Program*, the site soils have a potential for 3.6 to 4.2 percent collapse when saturated. The measured collapse potentials of the site are moderate. Infiltration of water in the basins will likely result in collapse of the underlying soils, potentially resulting in settlement in the basin bottoms, slopes, berms, and surrounding areas. Any settlement resulting from soil collapse is expected to occur as the underlying soils are wetted, and will diminish with

time. Re-grading may be required to maintain the intended surface drainage and to repair any settlement-induced soil cracking.

11.6 Soil Corrosivity

The results of chemical testing of representative samples of site soils were evaluated for corrosivity with respect to common construction materials such as concrete and steel. The test results are presented in Appendix B, *Laboratory Testing Program* design recommendations pertaining to soil corrosivity are presented on the following page.

The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations (ACI 318-14, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-14, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that concrete structures such as footings, slab, and concrete pads will be exposed to moisture from precipitation and irrigation. Based on the site locations and the results of chloride testing of the site's soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-14, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-14, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

According to Romanoff, 1957, the following table provides general guidelines of soil corrosion based on electrical resistivity.

Table No. 11, Correlation Between Resistivity and Corrosion

Soil Resistivity (Ohm-CM) per Caltrans CT 643	Corrosivity Category
Over 10,000	Mildly corrosive
2,000 – 10,000	Moderately corrosive
1,000 – 2,000	corrosive
Less than 1,000	Severe corrosive

The measured value of the minimum electrical resistivity of the sample when saturated were 10,500 and 10,600 ohm-cm for the site. This indicates that the soils tested are mildly corrosive to ferrous metals in contact with the soil. Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site soils.

11.7 Site Drainage

Adequate positive drainage should be provided away from any future structures to prevent ponding and to reduce percolation of water into structural backfill. A desirable slope for surface drainage is 2 percent in landscaped areas and 1 percent in paved areas.

11.8 Asphalt Concrete Pavement

Two soil samples were tested to evaluate the R-value of the site soil. Based on the laboratory test results, the on-site R-value were 70 and 71. For pavement design, we have utilized an R-value of 50 and design Traffic Indices (TIs) ranging from 5 to 8.

Based on the above information, asphalt concrete and aggregate base thickness results are presented using the Caltrans Highway Design Manual (Caltrans, 2022), Chapter 630 with a safety factor of 0.2 for asphalt concrete/aggregate base section and 0.1 for full depth asphalt concrete section. Preliminary asphalt concrete pavement sections are presented in the following table below.

Table No. 12, Recommended Preliminary Flexible Pavement Sections

R-value	Traffic Index (TI)	Pavement Section		
		Option 1		Option 2
		Asphalt Concrete (inches)	Aggregate Base (inches)	Full AC Section (inches)
50	5	3.0	3.0	4.5
	6	3.5	3.5	5.5
	7	4.0	4.5	7.0
	8	5.0	5.0	8.0

At or near the completion of grading, subsurface samples should be tested to evaluate the actual subgrade R-value for final pavement design.

Prior to placement of aggregate base, at least 12 inches below finish grade should be overexcavated, processed and replaced as compacted fill (recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557 test method).

Base materials should conform with Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2021) and should be placed in accordance with Section 301.2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC and should be placed in accordance with Section 302.5 of the SSPWC.

12.0 CONSTRUCTION RECOMMENDATIONS

Recommendations pertaining to construction, temporary excavations, and temporary shoring are provided in the following sections.

12.1 General

Prior to the start of construction, all existing underground utilities (if any) should be located at the project sites. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

Vertical braced excavations can be considered for the foundations. Sloped excavations may not be feasible in locations adjacent to existing utilities, pavement, or structures. Recommendations pertaining to temporary excavations are presented in this section.

Excavations near existing structures may require vertical side wall excavation. Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the geotechnical consultant and the competent person designated by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

12.2 Shoring Design

Temporary shoring will be required for vertical excavations. Temporary shoring may consist of conventional soldier piles and lagging or sheet piles. The shoring for the pipe excavations may be laterally supported by walers and cross bracing or may be cantilevered. Drilled excavations for soldier piles will require the use of drilling fluids to prevent caving and to maintain an opened hole for pile installation.

The active earth pressure behind any shoring depends primarily on the allowable movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressures.

The lateral earth pressures to be used in the design of shoring is presented in the following table.

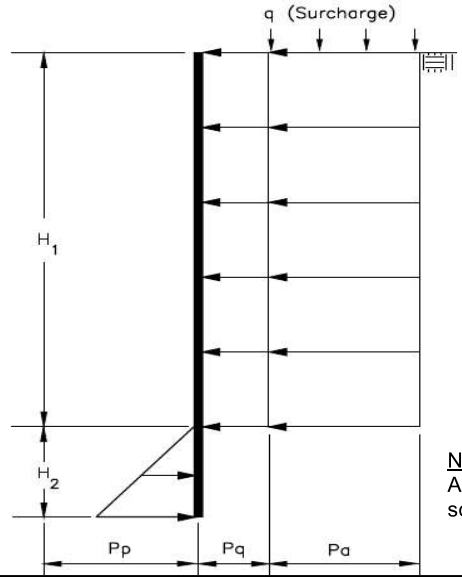
Table No. 13, Lateral Earth Pressures for Temporary Shoring

Lateral Resistance Soil Parameters*	Values
Active Earth Pressure (Braced Shoring) (psf) (A)	30
Active Earth Pressure (Cantilever Shoring) (psf) (B)	47
At-Rest Earth Pressure (Cantilever Shoring) (psf) (C)	69
Passive earth pressure (psf per foot of depth) (D)	240
Maximum allowable bearing pressure against native soils (psf) (E)	2,500
Coefficient of friction between sheet pile and native soils, fs (degree) (F)	0.30

* Parameters A through F are used in Figures No. 3 and 4 below.

Restrained (braced) shoring systems should be designed based on Figure No. 4, *Lateral Earth Pressures for Temporary Braced Excavation* to support a uniform rectangular lateral earth pressure.

Figure No. 4, Lateral Earth Pressures for Temporary Braced Excavation



Total Earth Pressure, P

P = Pq + Pa

Pq = 0.5q - incremental surcharge pressure

Pa = (A)H₁ - active earth pressure (Braced walls)

Lateral Pressure Resistance

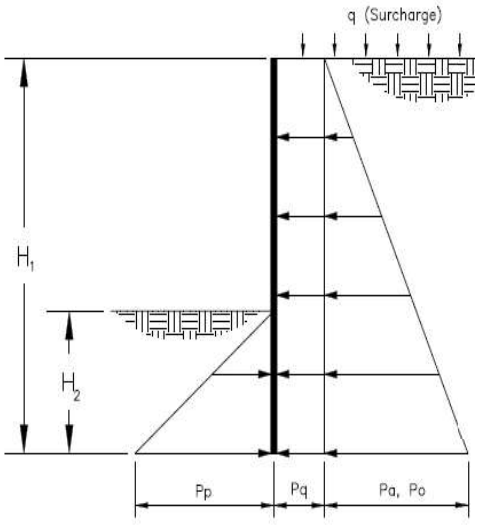
Pp = (D) H₂ ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel sheet piles and soil

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

Unrestrained (cantilever) design of cantilever shoring consisting of soldier piles spaced at least two diameters on-center or sheet piles, can be based on Figure No. 4, *Lateral Earth Pressures on Temporary Cantilever Wall*.

Figure No. 5, Lateral Earth Pressures on Temporary Cantilever Wall



Total Earth Pressure, P

P = Pq + Pa, Po

Pq = 0.5q - incremental surcharge pressure

Pa = (B)H_1 - active earth pressure (Un-restrained)

Po = (C)H_1 - at rest earth pressure (Restrained)

Lateral Pressure Resistance

Pp = (D) H_2 ≤ (E) psf - passive earth pressure (on native soils)

μ = (F) - ultimate friction coefficient between steel

Note:
All values of height (H) in feet, pressure (P) and surcharge (q) in pounds per square foot (psf).

The provided pressures assume no hydrostatic pressures. If hydrostatic pressures are allowed to build up, the incremental earth pressures below the ground-water level should be reduced by 50 percent and added to hydrostatic pressure for total lateral pressure.

Passive resistance includes a safety factor of 1.5. The upper 1 foot for passive resistance should be ignored unless the surface is confined by a pavement or slab.

In addition to the lateral earth pressure, surcharge pressures due to miscellaneous loads, such as soil stockpiles, vehicular traffic or construction equipment located adjacent to the shoring, should be included in the design of the shoring. A uniform lateral pressure of 100 psf should be included in the upper 10 feet of the shoring to account for normal vehicular and construction traffic within 10 feet of the trench excavation. As previously mentioned, all shoring should be designed and installed in accordance with state and federal safety regulations.

The contractor should have provisions for soldier pile and sheet pile removal. All voids resulting from removal of shoring should be filled. The method for filling voids should be selected by the contractor, depending on construction conditions, void dimensions and available materials. The acceptable materials, in general, should be non-deleterious, and able to flow into the voids created by shoring removal (e.g., concrete slurry, “pea” gravel, etc.).

Excavations should not extend below a 1:1 horizontal:vertical (H:V) plane extending from the bottom of any existing structures, utility lines or streets. Any proposed excavation should not cause loss of bearing and/or lateral supports of the existing utilities or streets. If the excavation extends below a 1:1 (H:V) plane extending from the bottom of the existing structures, utility lines or streets, a maximum of 10 feet of slope face parallel to

the existing improvement should be exposed at a time to reduce the potential for instability. Backfill should be accomplished in the shortest period of time and in alternating sections.

12.3 Temporary Sloped Excavations

Temporary open-cut trenches may be constructed with side slopes as recommended in the following table. Temporary cuts encountering soft and wet fine-grained soils; dry loose, cohesionless soils or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below. The final determination of temporary slope gradients should be based on review of the encountered soils by a competent person employed by the contractor, in accordance with Section 1541 of the OSHA Construction Safety Orders.

Table No. 14, Slope Ratios for Temporary Excavations

Soil Type	OSHA Soil Type	Depth of Cut (feet)	Recommended Maximum Slope (Horizontal:Vertical)[1]
Silty Sand (SM), Gravelly Sand with Silt (SP-SM) and Gravelly Sand with Silt (SP-SM)	C	0-6	1.5:1
		6-20	2:1

[1] Slope ratio assumed to be uniform from top to toe of slope.

For shallow excavations up to 4 feet bgs, excavation can be vertical. For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor to protect the workers in the excavation.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

13.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Geotechnical observation and testing should be performed as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

14.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Ardurra, Mojave Water Agency, and their authorized agents, to assist in the design and construction of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed, and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

15.0 REFERENCES

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Appendix A

Field Exploration

APPENDIX A

FIELD EXPLORATION

Our field investigation included reconnaissance of the project site and drilling exploratory soil borings. During the site reconnaissance, the surface conditions were noted, and the drill rig access routes were determined. The proposed borings were staked at the locations approved by Ardurra using visual reference to site boundaries as guides.

The number of borings and their proposed depths was amended after discussions with Ardurra from four to three borings for a total of 230 feet. Three soil borings (BH-01 through BH-03) were drilled on March 4th and 5th, 2024, to investigate the subsurface conditions at the site. The proposed boring depths were 15.0 feet and 100.0 feet below ground surface (bgs) for a total of 4 borings. The actual drilled depths were 31.5 feet, 98.0 feet, and 101.5 feet bgs without refusal. Boring, BH-02, was terminated at 98 feet bgs due to driller using a spare 2-foot-auger instead of a 5-foot-auger for the last 5 feet.

The soil borings were advanced using a rubber tracks mounted rig equipped with 8-inch outside diameter hollow-stem augers and a drive sampling system for soil sampling. Initially, the continuous coring method was used in boring, BH-03, but was discontinued after 10 feet due to the inability to collect continuous core samples, at which point the boring was relocated within 5 feet of the original location and sampled using the drive sampling system. Soils encountered in the borings were logged by a Converse geologist and classified in the field by visual examination in accordance with the Unified Soil Classification System (ASTM Standard 2488). The field descriptions presented on the boring logs have been modified where appropriate to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Bulk samples of typical soil types were also obtained.

Standard Penetration Testing (SPT) was also performed in accordance with the ASTM Standard D1586 test method in each boring using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, falling 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings.

It should be noted that the exact depths at which material changes occur cannot always be established accurately. Unless a more precise depth can be established by other

means, changes in material conditions that occur between drive samples are indicated in the logs at the top of the next drive sample.

Following the completion of logging and sampling, all borings were backfilled with soil cuttings and compacted by pushing down with augers using the drill rig weight. If construction is delayed, the surface may settle over time. We recommend the owner monitor the boring locations and backfill any depressions that might occur or provide protection around the boring locations to prevent trip and fall injuries from occurring near the area of any potential settlement.

For a key to soil symbols and terminology used in the boring logs, refer to Drawing Nos. A-1a and 1b, *Unified Soil Classification and Key to Boring Log Symbols*. For logs of borings, see Drawings No. A-2a through A-4c, *Logs of Borings.*

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

FIELD AND LABORATORY TESTS

C	Consolidation (ASTM D 2435)
CL	Collapse Potential (ASTM D 4546)
CP	Compaction Curve (ASTM D 1557)
CR	Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422)
CU	Consolidated Undrained Triaxial (ASTM D 4767)
DS	Direct Shear (ASTM D 3080)
EI	Expansion Index (ASTM D 4829)
M	Moisture Content (ASTM D 2216)
OC	Organic Content (ASTM D 2974)
P	Permeablility (ASTM D 2434)
PA	Particle Size Analysis (ASTM D 6913 [2002])
PI	Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318)
PL	Point Load Index (ASTM D 5731)
PM	Pressure Meter
PP	Pocket Penetrometer
R	R-Value (CTM 301)
SE	Sand Equivalent (ASTM D 2419)
SG	Specific Gravity (ASTM D 854)
SW	Swell Potential (ASTM D 4546)
TV	Pocket Torvane
UC	Unconfined Compression - Soil (ASTM D 2166)
	Unconfined Compression - Rock (ASTM D 7012)
UU	Unconsolidated Undrained Triaxial (ASTM D 2850) Unit
UW	Weight (ASTM D 2937)

BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE — 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE — No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING
- Dist. — Disturbed

DRILLING METHOD SYMBOLS

Auger Drilling | Mud Rotary Drilling | Dynamic Cone or Hand Driven | Diamond Core

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-1a

CONSISTENCY OF COHESIVE SOILS

Descriptor	Unconfined Compressive Strength (tsf)	SPT Blow Counts	Pocket Penetrometer (tsf)	CA Sampler	Torvane (tsf)	Field Approximation
Very Soft	<0.25	< 2	<0.25	<3	<0.12	Easily penetrated several inches by fist
Soft	0.25 - 0.50	2 - 4	0.25 - 0.50	3 - 6	0.12 - 0.25	Easily penetrated several inches by thumb
Medium Stiff	0.50 - 1.0	5 - 8	0.50 - 1.0	7 - 12	0.25 - 0.50	Can be penetrated several inches by thumb with moderate effort
Stiff	1.0 - 2.0	9 - 15	1.0 - 2.0	13 - 25	0.50 - 1.0	Readily indented by thumb but penetrated only with great effort
Very Stiff	2.0 - 4.0	16 - 30	2.0 - 4.0	26 - 50	1.0 - 2.0	Readily indented by thumbnail
Hard	>4.0	>30	>4.0	>50	>2.0	Indented by thumbnail with difficulty

APPARENT DENSITY OF COHESIONLESS SOILS

Descriptor	SPT N_{60} Value (blows / foot)	CA Sampler
Very Loose	<4	<5
Loose	4- 10	5 - 12
Medium Dense	11 - 30	13 - 35
Dense	31 - 50	36 - 60
Very Dense	>50	>60

MOISTURE

Descriptor	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OF PROPORTION OF SOILS

Descriptor	Criteria
Trace (fine)/ Scattered (coarse)	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

SOIL PARTICLE SIZE

Descriptor		Size
Boulder		> 12 inches
Cobble		3 to 12 inches
Gravel	Coarse	3/4 inch to 3 inches
	Fine	No. 4 Sieve to 3/4 inch
Sand	Coarse	No. 10 Sieve to No. 4 Sieve
	Medium	No. 40 Sieve to No. 10 Sieve
	Fine	No. 200 Sieve to No. No. 40 Sieve
Silt and Clay		Passing No. 200 Sieve

PLASTICITY OF FINE-GRAINED SOILS

Descriptor	Criteria
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

CEMENTATION/ Induration

Descriptor	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

NOTE: This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-1b

Log of Boring No. BH-01

Dates Drilled: 3/4/2024 Logged by: Javier Calzada Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3318 Depth to Water (ft, bgs): NOT ENCOUNTERED

SUMMARY OF SUBSURFACE CONDITIONS

This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.

Depth (ft)	Graphic Log	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
	ALLUVIUM						
	SILTY SAND (SM): fine to coarse-grained, dense, dry to moist, brown.						EI, PA, R
		■		12/18/20	1	117.3	
5		■		15/15/20	1		*disturbed
							CP, CR, PA, SE
	-@7.5': few gravel up to 2.5 inches maximum dimension.	■		12/15/20	1		*disturbed
10							
	SAND WITH SILT (SP-SM): fine to coarse-grained, few silt, dense, dry to moist, light brown.			10/15/20			*no recovery PA
15		■		18/20/34	1		*disturbed PA
20		⊠		10/14/20	1		WA = 7.9%
25	-@25.0': very dense.	■		15/50-6"	1		*disturbed
30	-@30.0': medium dense.	⊠		10/12/17	1		WA = 9.3%

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-2a

Log of Boring No. BH-01

Dates Drilled: 3/4/2024 Logged by: Javier Calzada Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3318 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SAND WITH SILT (SP-SM):** fine to coarse-grained, few gravel up to 2.5 inches maximum dimension, few silt, very dense, dry to moist, light brown.	■		50-6"	2		*disturbed
40		**SAND (SP):** fine to coarse-grained, dense, moist, whitish brown.	☒		10/18/19	1		WA = 4.5%
45		-@45.0': fine to medium-grained, very dense, light brown.	■		50-6"	1		*disturbed
50		-@50.0': fine to coarse-grained, dense, few gravel up to 1.0 inch maximum dimension.	☒		12/18/23	1		WA = 4.7%
55		-@55.0': slightly indurated, very dense.	■		50-5"	1		*disturbed
60		-@60.0': slightly to moderately indurated, dense. **SAND WITH SILT (SP-SM):** fine to coarse-grained, few gravel up to 2.5 inches maximum dimension, few silt, very dense, dry to moist, light brown.	☒		12/20/25	1		WA = 5.3%
65		-@65.0': dense.	▭		27/50-6"			*no recovery

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-2b

Log of Boring No. BH-01

Dates Drilled: 3/4/2024 Logged by: Javier Calzada Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3318 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SAND WITH SILT (SP-SM):** fine to coarse-grained, few gravel up to 2.5 inches maximum dimension, some silt, very dense, dry to moist, light brown.	X		21/32/32	1		WA = 8.2%
75		-@75.0': fine to medium-grained, few silt.	■		50-6"	1		*disturbed
80		-@80.0': fine to coarse-grained, few gravel up to 1.0 inch imaximum dimension.	X		20/25/26	2		WA = 8.1%
85					50-6"			*no recovery
90			X		50-5"	1		WA = 8.5%
95		-@95.0': few gravel up to 0.5 inches maximum dimension.	■		50-6"	1		*disturbed
			X		25/50-6"			WA = 7.1%
		End of Boring at 98.0 feet bgs. No groundwater encountered. Borehole backfilled with cuttings and compacted using augers and the drill rig weight on 3/4/2024.						

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-2c

Log of Boring No. BH-02

Dates Drilled: 3/4/2024 Logged by: Javier Calzada Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3318 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND (SM):** fine to coarse-grained, few gravel up to 0.5 inches maximum dimension, medium dense, dry to moist, brown.						DS CP, EI, PA, SE
			■		12/18/20	2	106	CL
5		**SAND WITH SILT (SP-SM):** fine to coarse-grained, few gravel up to 1.5 inches maximum dimension, few silt, medium dense, dry to moist, brown.	■		10/15/20	7	117	PA
			■		7/12/17	1		*disturbed DS
10		-@10.0': dense, brown.	■		10/15/24	1		*disturbed
15		-@15.0': medium to coarse-grained,	■		10/21/30	1		*disturbed DS
20		-@20.0': fine to coarse-grained, medium dense.	☒		7/9/9	1		
25		-@25.0': very dense.	■		42/50-6"	1		*disturbed
30		-@30.0': slightly indurated, dense.	☒		15/15/25	1		
		End of Boring at 31.5 feet bgs. No groundwater encountered. Borehole backfilled with cuttings and compacted using augers and the drill rig weight on 3/4/2024.						

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-3

Log of Boring No. BH-03

Dates Drilled: 3/5/2024 Logged by: Stephen Mcpherson Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3321 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SILTY SAND WITH GRAVEL (SM) (SM):** fine to coarse-grained, few gravel up to 0.5 inches maximum dimension, medium dense, dry to moist, brown.						CR, PA, R
		-@2.5': caliche.	■		10/22/26	2	116	
5		-@5.0': no caliche.	■		10/21/20	2	131	CL EI, SE
			■		12/22/24	1	113	
10					10/18/20			*no recovery CP
15		**SAND WITH SILT (SP-SM):** fine to coarse-grained, dense, moist, reddish brown.	■		9/25/28	1	112	DS
20		-@20.0': medium dense.	⊠		6/10/12	1		
25		-@25.0': very dense.	■		22/25/41	1		*disturbed
30		-@30.0': dense.	⊠		10/14/18	1		

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-4a

Log of Boring No. BH-03

Dates Drilled: 3/5/2024 Logged by: Stephen Mcpherson Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3321 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SAND WITH SILT (SP-SM):** fine to coarse-grained, very dense, moist, reddish brown.	■		22/50-6"	1		*disturbed
40		-@40.0': dense.	☒		12/15/19	1		
45		-@45': very dense.	■		20/50-4"	1		*disturbed
50		-@50.0 dense.	☒		12/20/30	1		
55		-@55.0': very dense.	▬		50-6"			*no recovery
60			☒		22/30/24	1		
65			▬		50-2"	1		*disturbed

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-4b

Log of Boring No. BH-03

Dates Drilled: 3/5/2024 Logged by: Stephen Mcpherson Checked By: Robert Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 3321 Depth to Water (ft, bgs): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the Test Pit and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM **SAND WITH SILT (SP-SM):** fine to coarse-grained, very dense, moist, reddish brown.	X		15/23/32	1		PA
75			■		50-5"	1		*disturbed
80			X		15/23/32	1		PA
85			■		50-6"	2		
90			X		20/30/36	2		PA
95			■		30/50-3"	1		
100			X		33/43/46	1		
		End of Boring at 101.5 feet bgs. No groundwater encountered. Borehole backfilled with cuttings and compacted using augers and the drill rig weight on 3/5/2024.						

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. A-4c

Appendix B

Laboratory Testing Program

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

Moisture Content and Dry Density

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples, in accordance with ASTM Standard D2216-19 and D2937-17e2 to aid soils classification and to provide qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Boring in Appendix A, *Field Exploration.*

Expansion Index (EI)

Three representative bulk samples were tested to evaluate the expansion potential in accordance with ASTM Standard D4829-21. The test results are presented in the following table.

Table No. B-1, Expansion Index Test Results

Boring No.	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-01	0-5	Silty Sand (SM)	0	Very Low
BH-02	0-5	Silty Sand (SM)	0	Very Low
BH-03	5-10	Silty Sand with Gravel (SM)	0	Very Low

R-value (R)

Two representative bulk soil samples were tested in accordance with California Test Method CT301 for resistance value (R-value). The test provides a relative measure of soil strength for use in pavement design. The test results are presented in the following table.

Table No. B-2, R-Value Test Result

Boring No.	Depth (feet)	Soil Classification	Measured R-value
BH-01	0-5	Silty Sand (SM)	70
BH-03	0-5	Silty Sand with Gravel (SM)	71

Soil Corrosivity Tests (CR)

Two representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common construction materials. These tests were performed by Keegan Labs LLC (Pomona, CA) in accordance with California Tests 643, 422 and 417. Test results are presented in the following table.

Table No. B-3, Summary of Soil Corrosivity Test Results

Boring No.	Depth (feet)	pH	Soluble Sulfates (CA 417) (ppm)	Soluble Chlorides (CA 422) (ppm)	Min. Resistivity (CA 643) (Ohm-cm)
BH-01	5-10	8.4	32	29	10,600
BH-03	0-5	8.9	41	41	10,500

Collapse (CL)

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, two collapse tests were performed in accordance with the ASTM Standard D4546 laboratory procedure. The samples were loaded to approximately 2 kips per square foot (ksf), allowed to stabilize under load, and then submerged. The tests are presented in the following table.

Table No. B-4, Collapse Test Results

Boring No.	Depth (feet)	Soil Classification	Percent Swell (+) Percent Collapse (-)	Collapse Potential
BH-02	2.5-4.0	Silty Sand (SM)	-3.6	Moderate
BH-03	5.0-6.5	Silty Sand with Gravel (SM)	-4.2	Moderate

Sand Equivalent (SE)

Three representative soil samples were tested in accordance with the ASTM Standard D2419-22 test method to determine the sand equivalent. The test results are presented in the following table.

Table No. B-5, Sand Equivalent Test Results

Boring No.	Depth (feet)	Soil Description	Sand Equivalent
BH-01	5-10	Silty Sand (SM)	29.0
BH-02	0-5	Silty Sand (SM)	29.0
BH-03	5-10	Silty Sand with Gravel (SM)	27.0

Percent Passing No. 200 Sieve (WA)

Nine percent passing (No. 200 sieve) tests were performed on select samples in accordance with ASTM Standard D1140-17. The test results of the percent passing #200 sieves are presented in the following table.

Table No. B-6, Percentage Passing No. 200 Sieve Results

Boring No.	Depth (feet)	Description	Passing #200 Sieve (%)
BH-01	20.0-21.5	Sand with Silt (SP-SM)	7.9
BH-01	30.0-31.5	Sand with Silt (SP-SM)	9.3
BH-01	40.0-41.5	Sand (SP)	4.5
BH-01	50.0-51.5	Sand (SP)	4.7
BH-01	60.0-61.5	Sand with Silt (SP-SM)	5.3
BH-01	70.0-71.5	Sand with Silt (SP-SM)	8.2
BH-01	80.0-81.5	Sand with Silt (SP-SM)	8.1
BH-01	90.0-90.4	Sand with Silt (SP-SM)	8.5
BH-01	97.0-98.0	Sand with Silt (SP-SM)	7.1

Grain-Size Analysis (PA)

To aid in classification of the soils, mechanical grain-size analyses were performed on ten representative soil samples at various depths. Testing was performed in accordance with the ASTM Standard D6913/D6913M-17 test method. Grain-size curves are shown in Drawing No. B-1a and 1b, *Grain Size Distribution Results,* and in the following table.

Table No. B-7, Grain Size Distribution Test Results

Boring No.	Depth (ft)	Soil Classification	% Gravel	% Sand	%Silt	%Clay
BH-01	0-5	Silty Sand (SM)	0.0	76.1	23.9	
BH-01	5-10	Silty Sand (SM)	2.0	83.1	14.9	
BH-01	10-15	Sand with Silt (SP-SM)	4.0	86.6	9.4	
BH-01	15-20	Sand with Silt (SP-SM)	4.0	89.8	6.2	
BH-02	0-5	Silty Sand (SM)	0.0	82.7	17.3	
BH-02	5-10	Sand with Silt (SP-SM)	5.0	86.8	8.2	
BH-03	0-5	Silty Sand with Gravel (SM)	26.0	60.2	13.8	
BH-03	70.0-71.5	Sand with Silt (SP-SM)	9.0	84.3	6.7	
BH-03	80.0-81.5	Sand with Silt (SP-SM)	0.0	93.6	6.4	
BH-03	90.0-91.5	Sand with Silt (SP-SM)	7.0	84.5	8.5	

Maximum Density and Optimum Moisture Content (CP)

Laboratory maximum dry density-optimum moisture content relationship tests were performed on three representative bulk samples. The tests were conducted in accordance with the ASTM Standard D1557-12(2021) test method. The test results are presented on Drawing No. B-2, *Moisture-Density Relationship Results,* and in the following table.

Table No B-8, Summary of Moisture-Density Relationship Results

Boring No.	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Density (pcf)
BH-01	5-10	Silty Sand (SM), Light Brown	7.5	133.0
BH-02	0-5	Silty Sand (SM), Brown	7.3	130.0
BH-03	10-15	Silty Sand with Gravel (SM), Brown	7.5 (7.0) *	132.5 (134.2) *
*Rock correction = 5.84%				

Direct Shear Tests (DS)

Direct shear tests were performed on two representative samples remolded to 90% of the laboratory maximum dry density in soaked moisture conditions. For each test, 3 samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.01 and 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawing Nos. B-3 and B-4, *Direct Shear Test Results,* and summarized in the following table.

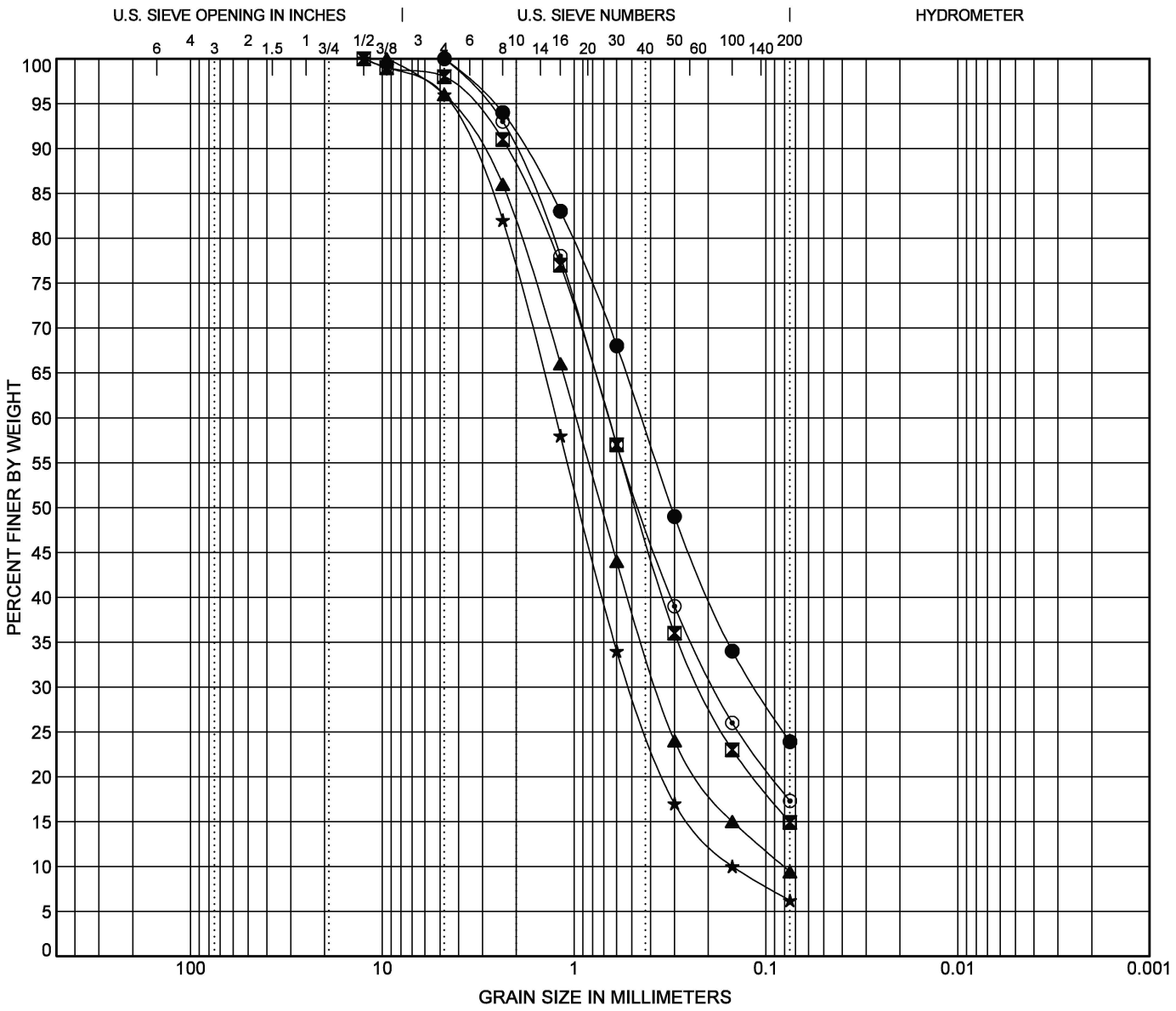
Table No. B-9, Summary of Direct Shear Test Results

Boring No.	Depth (feet)	Soil Description	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-02	0-5	Silty Sand (SM)*	28	170
BH-03	15.0-16.5	Sand with Silt (SP-SM)	33	10

*Sample remolded to 90 percent of laboratory maximum dry density.

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	BH-01	0.0 - 5.0	SILTY SAND (SM)					
⊠	BH-01	5.0 - 10.0	SILTY SAND (SM)					
▲	BH-01	10.0 - 15.0	SAND WITH SILT (SP-SM)				1.72	12.15
★	BH-01	15.0 - 20.0	SAND WITH SILT (SP-SM)				1.39	8.33
⊙	BH-02	0.0 - 5.0	SILTY SAND (SM)					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-01	0.0 - 5.0	4.75	0.448	0.114		0.0	76.1	23.9	
⊠	BH-01	5.0 - 10.0	12.5	0.664	0.218		2.0	83.1	14.9	
▲	BH-01	10.0 - 15.0	9.5	0.981	0.369	0.081	4.0	86.6	9.4	
★	BH-01	15.0 - 20.0	12.5	1.25	0.51	0.15	4.0	89.8	6.2	
⊙	BH-02	0.0 - 5.0	4.75	0.661	0.186		0.0	82.7	17.3	

GRAIN SIZE DISTRIBUTION RESULTS

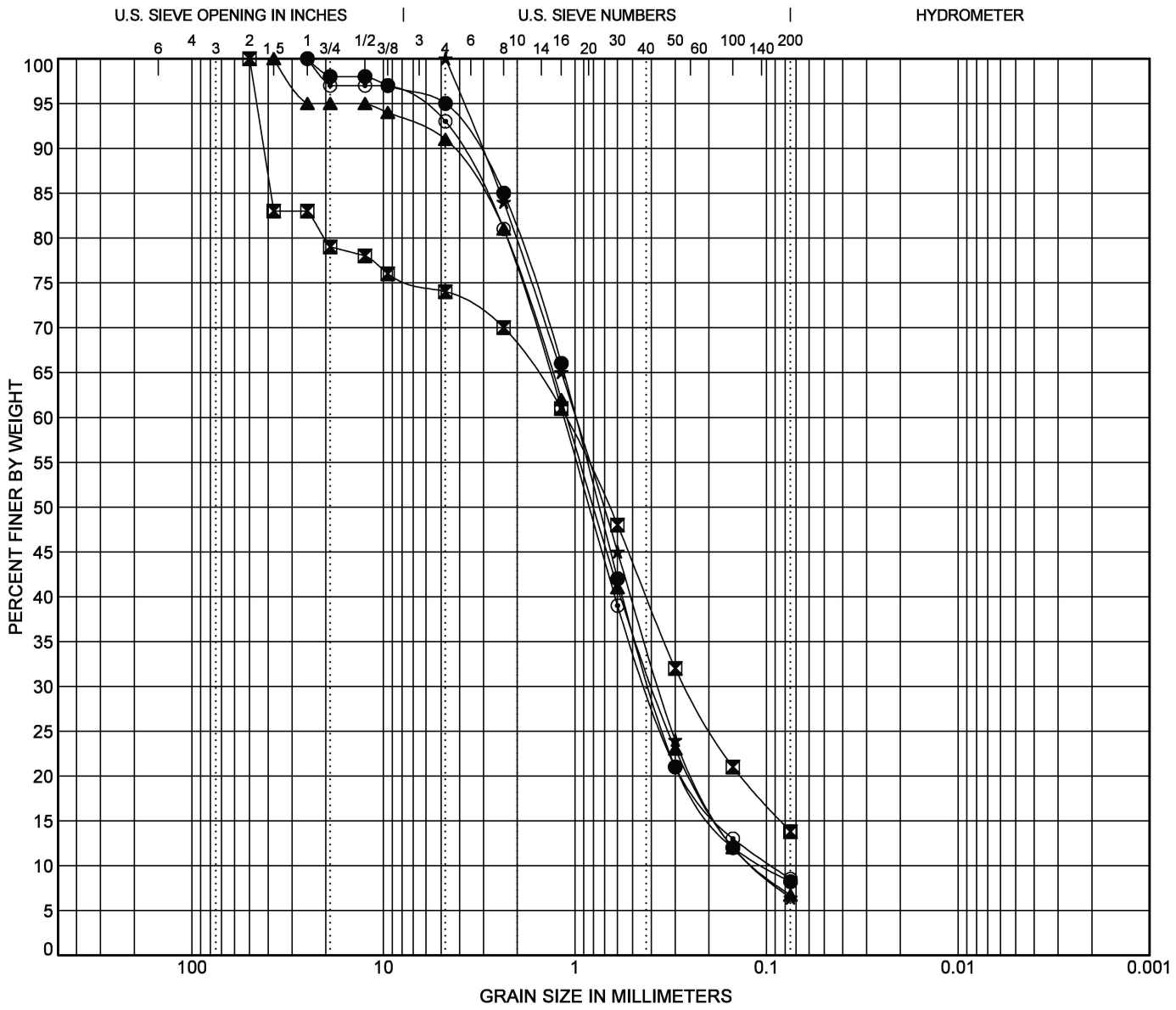
Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. B-1a



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	BH-02	5.0 - 10.0	SAND WITH SILT (SP-SM)				1.57	9.57
⊠	BH-03	0.0 - 5.0	SILTY SAND with GRAVEL (SM)					
▲	BH-03	70.0 - 71.5	SAND WITH SILT (SP-SM)				1.21	9.58
★	BH-03	80.0 - 81.5	SAND WITH SILT (SP-SM)				1.15	8.51
⊙	BH-03	90.0 - 91.5	SAND WITH SILT (SP-SM)				1.66	12.11

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH-02	5.0 - 10.0	25	0.996	0.404	0.104	5.0	86.8	8.2	
⊠	BH-03	0.0 - 5.0	50	1.12	0.264		26.0	60.2	13.8	
▲	BH-03	70.0 - 71.5	37.5	1.106	0.393	0.115	9.0	84.3	6.7	
★	BH-03	80.0 - 81.5	4.75	0.996	0.366	0.117	0.0	93.6	6.4	
⊙	BH-03	90.0 - 91.5	25	1.144	0.424	0.094	7.0	84.5	8.5	

GRAIN SIZE DISTRIBUTION RESULTS

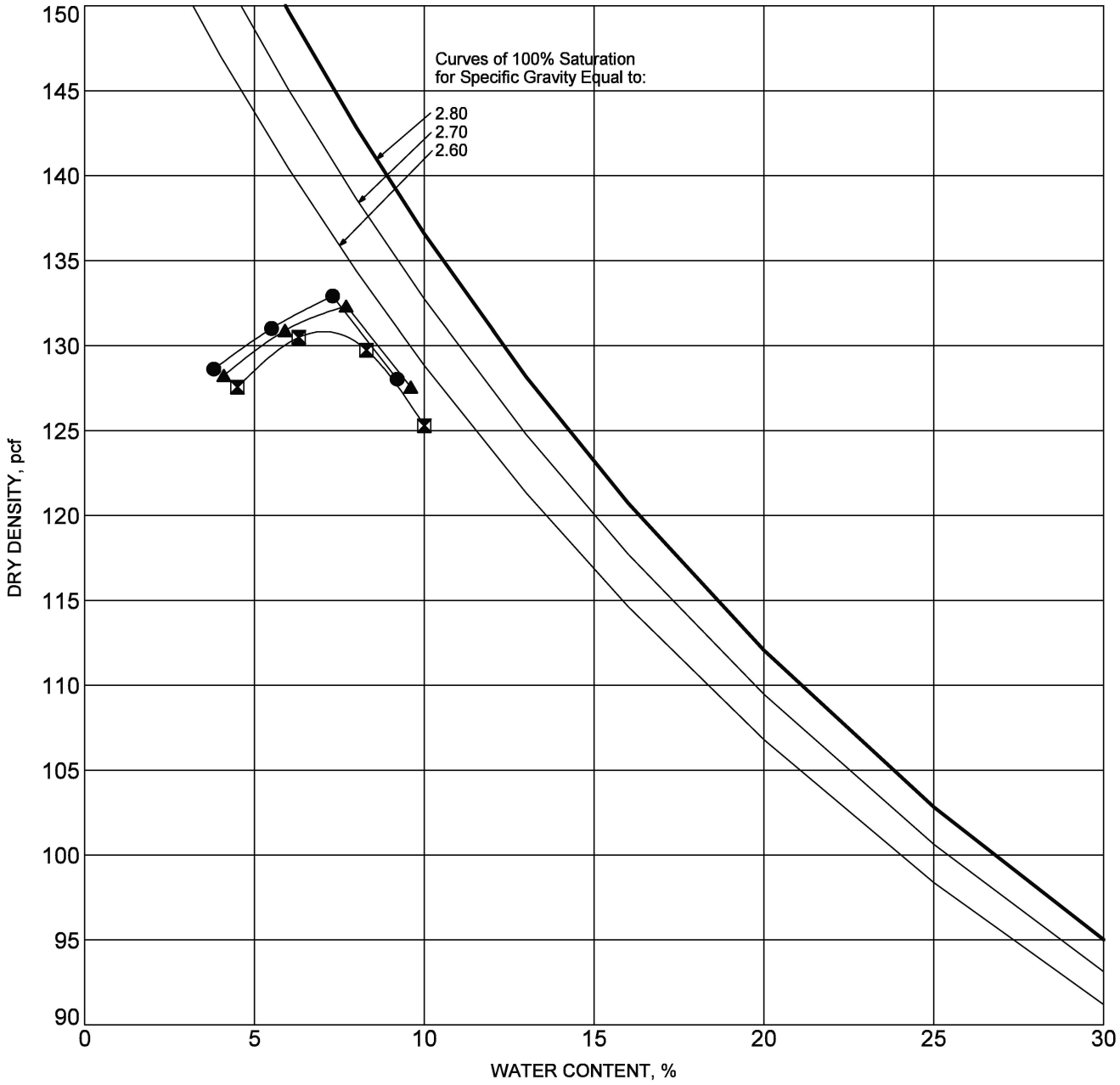
Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

For: Ardurra

Project No. 23-81-275-01

Drawing No. B-1b



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	**BH-01**	**5.0 - 10.0**	**SILTY SAND (SM), light brown.**	**Method A**	**7.5**	**133**
⊠	**BH-02**	**0.0 - 5.0**	**SILTY SAND (SM), brown.**	**Method A**	**7.3**	**130**
▲	**BH-03**	**10.0 - 15.0**	**SILTY SAND with GRAVEL (SM), brown.**	**Method A**	**7.5 (7.0*)**	**132.5 (134.2*)**

(*Rock Correction = 5.84%)

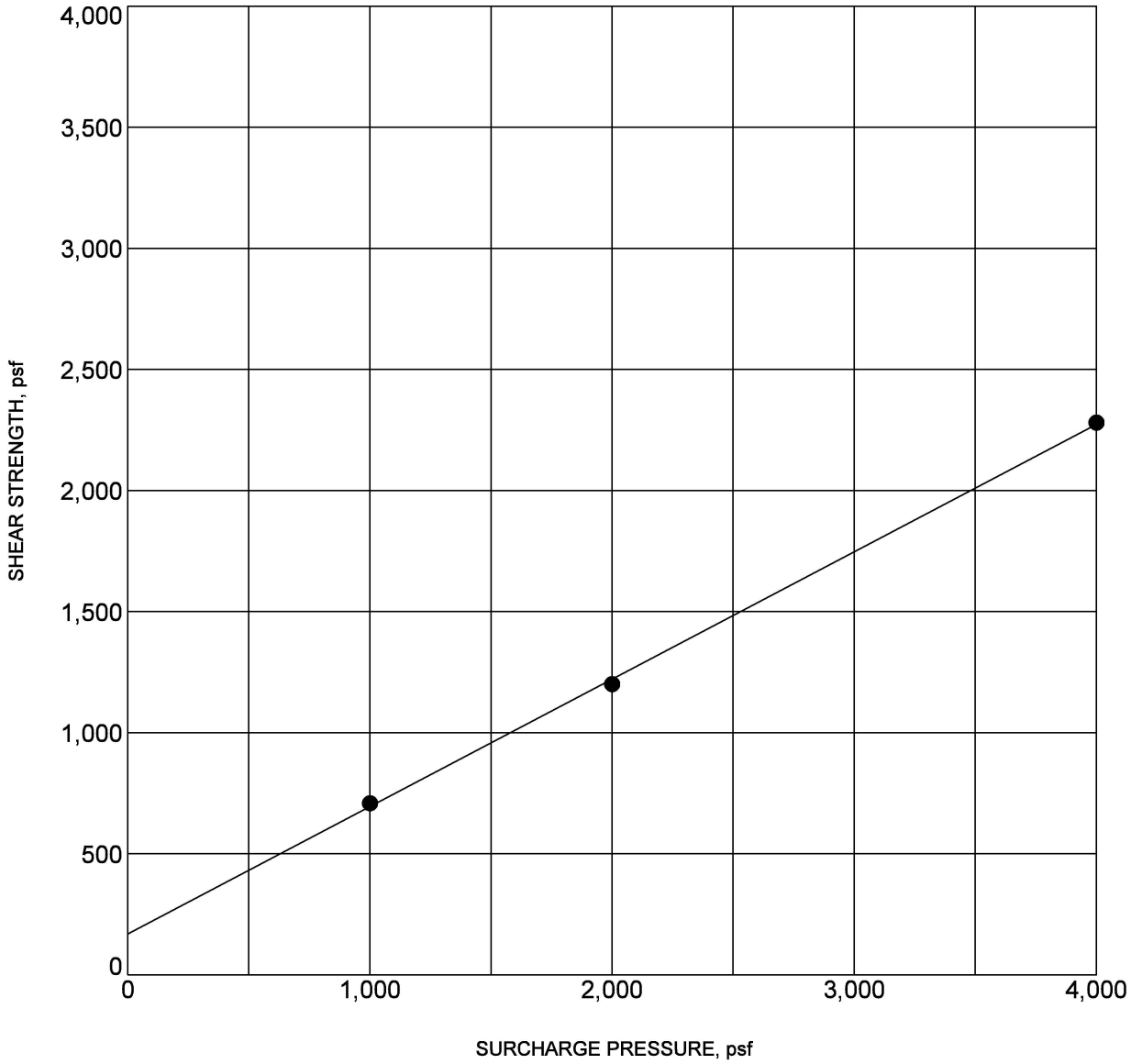
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

Project No. **23-81-275-01**

Drawing No. **B-2**



BORING NO.	:	**BH-02**	DEPTH (ft)	:	**0.0 - 5.0**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**170**	FRICTION ANGLE (degrees):		**28**
MOISTURE CONTENT (%)	:	**7.3**	DRY DENSITY (pcf)	:	**117.0**

(*Remolded to 90% max dry density)

NOTE: Ultimate Strength.

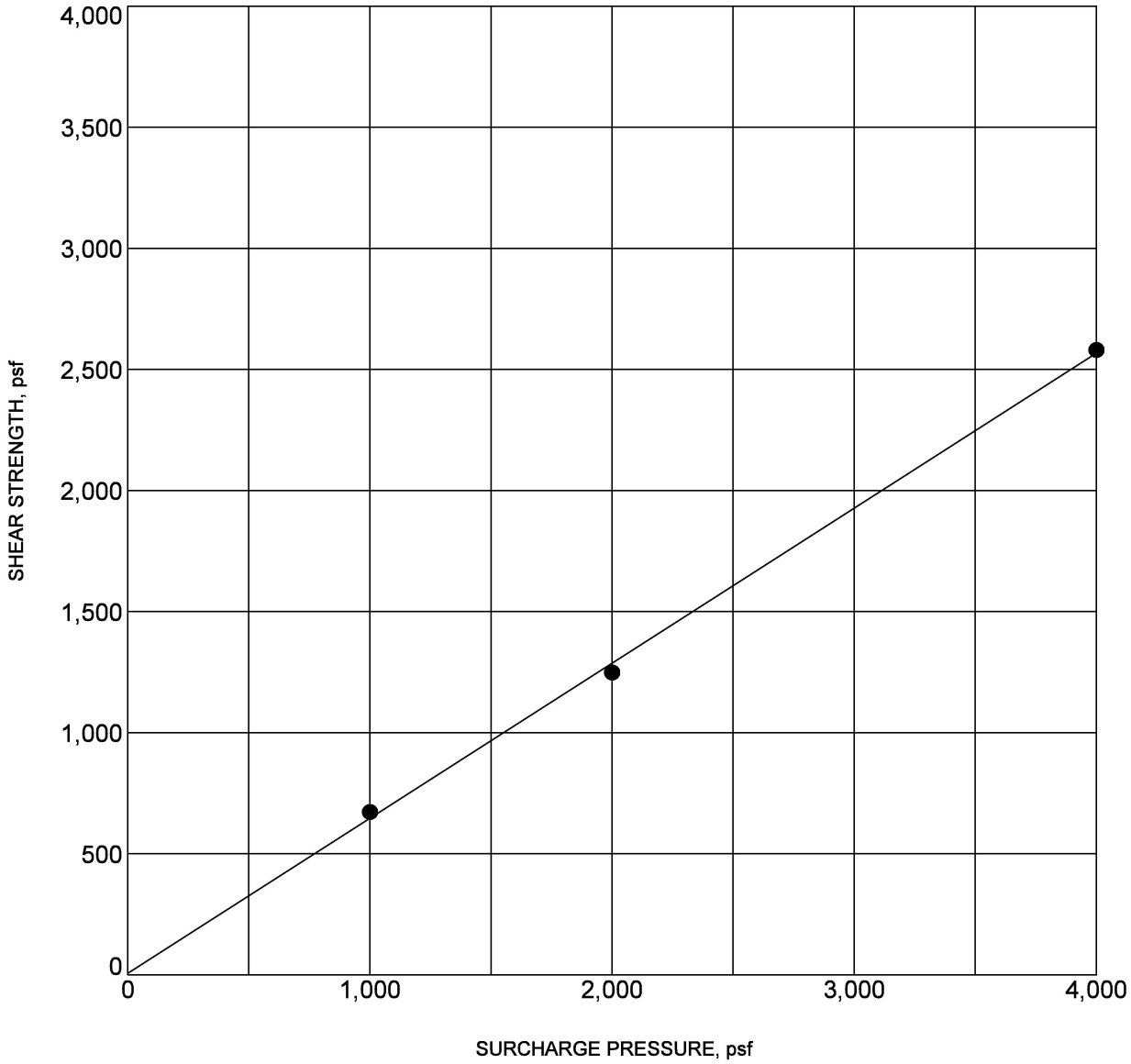
DIRECT SHEAR TEST RESULTS

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

Project No. **23-81-275-01**

Drawing No. **B-3**



BORING NO.	:	**BH-03**	DEPTH (ft)	:	**15.0 - 16.5**
DESCRIPTION	:	**SAND WITH SILT (SP-SM)**			
COHESION (psf)	:	**10**	FRICTION ANGLE (degrees):		**33**
MOISTURE CONTENT (%)	:	**1.2**	DRY DENSITY (pcf)	:	**112.0**

NOTE: Ultimate Strength.

DIRECT SHEAR TEST RESULTS

Converse Consultants

Ames-Reche Recharge Basin
Winters Road
City of Landers, San Bernardino County, California.

Project No. **23-81-275-01**

Drawing No. **B-4**

Appendix C

Liquefaction and Settlement Analyses

APPENDIX C

LIQUEFACTION AND SEISMIC SETTLEMENT ANALYSIS

The subsurface data obtained from boring BH-01 and BH-03 were used to evaluate the liquefaction potential and associated dry seismic settlement when subjected to ground shaking during earthquakes.

A simplified liquefaction hazard analysis was performed using the program SPTLIQ (InfraGEO Software, 2021) using the liquefaction triggering analysis method by Boulanger and Idriss (2014). A modal earthquake magnitude of M 8.1 was selected based on the results of seismic deaggregation analysis using the USGS interactive online tool (https://earthquake.usgs.gov/hazards/interactive/).

A peak ground acceleration (PGA_M) of 0.896 for the MCE design event, where g is the acceleration due to gravity, was selected for this analysis. The PGA was based on the 2022 CBSC seismic design parameters presented in Section 8.2, *CBC Seismic Design Parameters.*

The result of our analysis is presented on Plates Nos. C-1 through C-6 and summarized in the following table.

Table C-1, Estimated Dynamic Settlements

Location	Groundwater Conditions	Groundwater Depth (feet bgs)	Dry Seismic Settlement (inches)	Liquefaction Induced Settlement (inches)
BH-01	Current	> 98	3.59	negligible
	Historical	222		
BH-03	Current	> 98	2.35	negligible
	Historical	222		

Based on the analysis, liquefaction-induced settlement is negligible and dry seismic settlement is up to 3.6 inches. The dynamic differential settlement of the site is 1.2 inches over a lateral distance of 450 feet.

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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PROJECT INFORMATION

Project Name	Ames-Reche Recharge Basin
Project No.	23-81-275-01
Project Location	Winters Road, City of Landers, San Bernardino County, California
Analyzed By	Mahmoud Suliman
Reviewed By	Hashmi S. Quazi

SELECTED METHODS OF ANALYSIS

Analysis Description	Dynamic Settlement Analyses
Triggering of Liquefaction	Boulanger-Idriss (2014)
Severity of Liquefaction	LPI: Liquefaction Potential Index based on Iwasaki et al. (1978)
Seismic Compression Settlement (Dry/Unsaturated Soil)	Pradel (1998)
Liquefaction-Induced Settlement (Saturated Soil)	Ishihara and Yoshimine (1992)
Liquefaction-Induced Lateral Spreading	Zhang et al. (2004)
Residual Shear Strength of Liquefied Soil	Idriss and Boulanger (2008)

SEISMIC DESIGN PARAMETERS

Earthquake Moment Magnitude, M_w	8.11
Peak Ground Acceleration, A_{max}	0.90 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS

Boring No.	BH-01
Ground Surface Elevation	3,318.00 feet
Proposed Grade Elevation	3,318.00 feet
GWL Depth Measured During Test	98.00 feet
GWL Depth Used in Design	222.00 feet
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Energy Efficiency Ratio, ER (%)	80.00 %
Hammer Distance to Ground Surface	5.00 feet
Topographic Site Condition:	TSC1 (Level Ground with No Nearby Free Face)
- Ground Slope, S (%)	<<= Leave this blank
- Free Face Distance to Slope Height Ratio, (L/H)	5.00 <<= Leave this blank Set H to zero ==>> 15.00 feet

INPUT SOIL PROFILE DATA

Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Screening *Susceptible Soil? (Y, N)*	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field Blow Count N_{field} (blows/ft)	Fines Content FC (%)
0.00	5.00	SM	Y	118.5	MCal	24.70	23.90
5.00	10.00	SM	Y	118.5	MCal	22.75	14.90
10.00	15.00	SP-SM	Y	118.5	MCal	22.75	9.40
15.00	20.00	SP-SM	Y	118.5	MCal	35.10	6.20
20.00	25.00	SP-SM	Y	118.5	SPT1	34.00	7.90
25.00	30.00	SP-SM	Y	124.0	MCal	42.25	7.90
30.00	35.00	SP-SM	Y	118.5	SPT1	29.00	9.30
35.00	40.00	SP-SM	Y	118.5	MCal	32.50	9.30
40.00	45.00	SP	Y	118.5	SPT1	37.00	4.50
45.00	50.00	SP	Y	118.5	MCal	32.50	4.50

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

(Copyright © 2015, 2021, SPTLIQ, All Rights Reserved; By: InfraGEO Software)

PROJECT INFORMATION	
Project Name	Ames-Reche Recharge Basin
Project No.	23-81-275-01
Project Location	Winters Road, City of Landers, San Bernardino County, California
Analyzed By	Mahmoud Suliman
Reviewed By	Hashmi S. Quazi

SEISMIC DESIGN PARAMETERS	
Earthquake Moment Magnitude, M_w	8.11
Peak Ground Acceleration, A_{max}	0.90 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS		
Boring No.	BH-01	
Ground Surface Elevation	3,318.00 feet	
Proposed Grade Elevation	3,318.00 feet	
GWL Depth Measured During Test	102.00 feet	
GWL Depth Used in Design	222.00 feet	
Borehole Diameter	8.00 inches	
Hammer Weight	140.00 pounds	
Hammer Drop	30.00 inches	
Hammer Energy Efficiency Ratio, ER	80.00 %	
Hammer Distance to Ground Surface	5.00 feet	
Topographic Site Condition:	TSC1 (Level Ground with No Nearby Free Face)	
- Ground Slope, S	0.00 %	
- Free Face (L/H) Ratio	5.00	H = 15 feet

SUMMARY OF RESULTS

Severity of Liquefaction:

Total Thickness of Liquefiable Soils: 0.00 feet (cumulative total thickness in the upper 65 feet)

Liquefaction Potential Index (LPI): 0.00 *** (Very low risk, with no surface manifestation of liquefaction)

Seismic Ground Settlements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Seismic Compression Settlement:	Pradel (1998)	2.02 inches	3.59 inches	3.59 inches	(Dry/Unsaturated Soils)
Liquefaction-Induced Settlement:	Ishihara and Yoshimine (1992)	0.00 inches	0.00 inches	0.00 inches	(Saturated Soils)
Total Seismic Settlement:		2.02 inches	3.59 inches	3.59 inches	

Seismic Lateral Displacements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Cyclic Lateral Displacement:	Tokimatsu and Asaka (1998)	1.31 inches	2.23 inches	2.23 inches	(During Ground Shaking)
Lateral Spreading Displacement:	Zhang et al. (2004)	0.00 inches	0.00 inches	0.00 inches	(After Ground Shaking)

NOTES AND REFERENCES

\+ This method of analysis is based on observed seismic performance of level ground sites using correlation with normalized and fines-corrected SPT blow count, $(N_1)_{60cs} = f\{(N_1)_{60}, FC\}$ where $(N_1)_{60} = N_{field}\, C_N\, C_E\, C_B\, C_R\, C_S$

++ Liquefaction susceptibility screening is performed to identify soil layers assessed to be non-liquefiable based on laboratory test results using the criteria proposed by Cetin and Seed (2003), Bray and Sancio (2006), or Idriss and Boulanger (2008).

* FS_{liq} = Factor of Safety against liquefaction = (CRR/CSR), where $CRR = CRR_{7.5}\, MSF\, K_\sigma\, K_\alpha$, MSF = Magnitude Scaling Factor, $K_\sigma = f[(N_1)_{60}, \sigma'_{vo}]$, $K_\alpha = 1.0$, (level ground), CSR = Cyclic Stress Ratio = $0.65\, A_{max}\, (\sigma_{vo}/\sigma'_{vo})\, r_d$, and $CRR_{7.5}$ = Cyclic Resistance Ratio is a function of $(N_1)_{60cs}$ and corrected for an earthquake magnitude M_w of 7.5.

** Residual strength values of liquefied soils are based on correlation with post-earthquake, normalized and fines-corrected SPT blow count derived by Idriss and Boulanger (2008).

*** Based on Iwasaki et al. (1978) and Toprak and Holzer (2003)

+ Reference: Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.

INPUT SOIL PROFILE DATA								LIQUEFACTION TRIGGERING ANALYSIS BASED ON R.W. BOULANGER AND I.M. IDRISS (2014) METHOD +																					
Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Susceptibility Screening ++ Susceptible Soil? (Y/N)	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field SPT Blow Count N_{field} (blows/ft)	Fines Content FC (%)	Total Vert. Stress (Design) σ_{vo} (psf)	Effective Vert. Stress (Design) σ'_{vo} (psf)	SPT Corr. for Vert. Stress C_N	SPT Corr. for Hammer Energy C_E	SPT Corr. for Borehole Size C_B	SPT Corr. for Rod Length C_R	SPT Corr. for Sampling Method C_S	Corrected SPT Blow Count N_{60}	Normalized SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coefficient r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio CSR	Cyclic Resistance Ratio CRR	Factor of Safety * FS_{liq}	Liquefaction Analysis Results	Residual Shear Strength ** S_r (psf)	Seismic Porewater Pressure Ratio r_u (%)	Cumulative Seismic Settlement (inches)	Cumulative Cyclic Lateral Displacement (inches)	Cumulative Lateral Spreading Displacement (inches)
0.00	5.00	SM	Y	118.50	MCal	24.70	23.90	296.25	296.25	1.700	1.333	1.150	0.750	0.650	18.5	31.4	36.4	1.000	1.100	0.582							3.59	2.23	0.00
5.00	10.00	SM	Y	118.50	MCal	22.75	14.90	888.75	888.75	1.383	1.333	1.150	0.800	0.650	18.1	25.1	28.3	0.995	1.100	0.580							3.36	2.04	0.00
10.00	15.00	SP-SM	Y	118.50	MCal	22.75	9.40	1,481.25	1,481.25	1.136	1.333	1.150	0.850	0.650	19.3	21.9	22.8	0.986	1.043	0.574							2.91	1.76	0.00
15.00	20.00	SP-SM	Y	118.50	MCal	35.10	6.20	2,073.75	2,073.75	0.988	1.333	1.150	0.950	0.650	33.2	32.8	32.9	0.976	0.992	0.569							2.11	1.36	0.00
20.00	25.00	SP-SM	Y	118.50	SPT1	34.00	7.90	2,666.25	2,666.25	0.927	1.333	1.150	0.950	1.000	49.5	45.9	46.2	0.965	0.914	0.562							1.82	1.13	0.00
25.00	30.00	SP-SM	Y	124.00	MCal	42.25	7.90	3,272.50	3,272.50	0.847	1.333	1.150	0.950	0.650	40.0	33.9	34.2	0.953	0.879	0.555							1.82	1.13	0.00
30.00	35.00	SP-SM	Y	118.50	SPT1	29.00	9.30	3,878.75	3,878.75	0.807	1.333	1.150	1.000	1.000	44.5	35.9	36.7	0.940	0.801	0.547							1.57	0.92	0.00
35.00	40.00	SP-SM	Y	118.50	MCal	32.50	9.30	4,471.25	4,471.25	0.717	1.333	1.150	1.000	0.650	32.4	23.2	24.1	0.925	0.878	0.539							1.35	0.72	0.00
40.00	45.00	SP	Y	118.50	SPT1	37.00	4.50	5,063.75	5,063.75	0.775	1.333	1.150	1.000	1.000	56.7	43.9	43.9	0.910	0.721	0.530							0.75	0.38	0.00
45.00	50.00	SP	Y	118.50	MCal	32.50	4.50	5,656.25	5,656.25	0.636	1.333	1.150	1.000	0.650	32.4	20.6	20.6	0.895	0.858	0.521							0.75	0.38	0.00

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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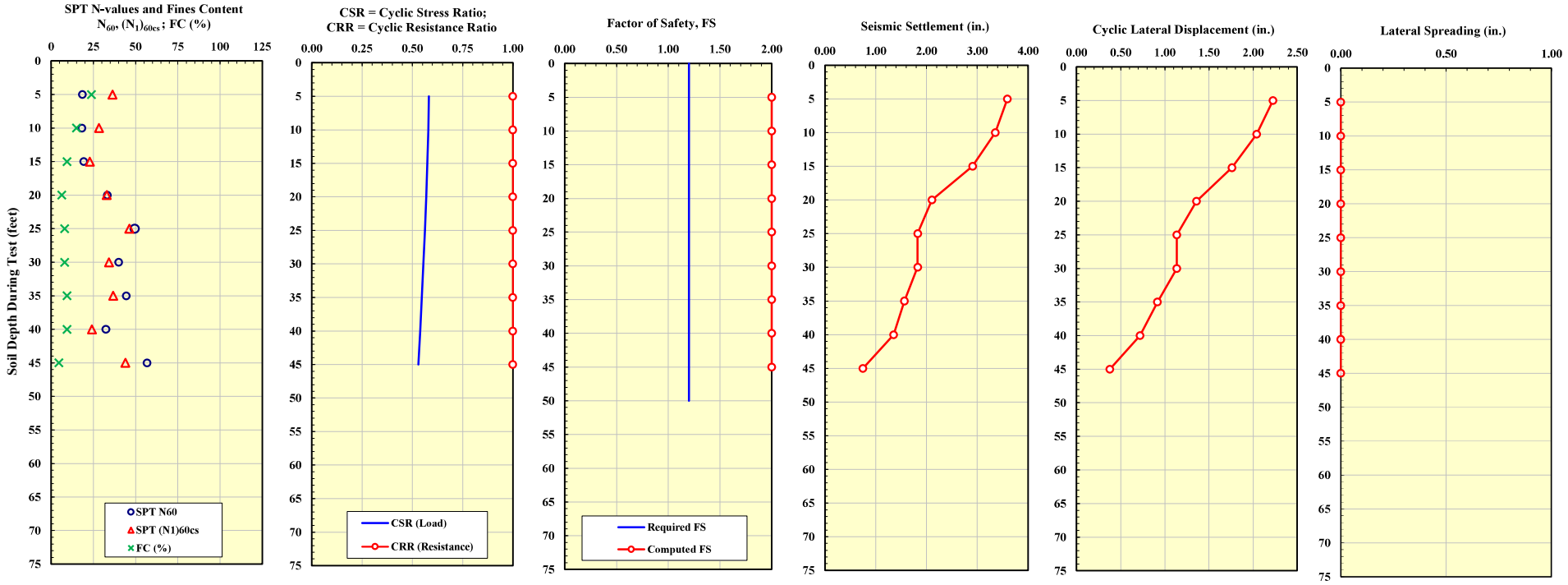
PROJECT INFORMATION	
Project Name	Ames-Reche Recharge Basin
Project No.	23-81-275-01
Project Location	Winters Road, City of Landers, San Bernardino County, California
Analyzed By	Mahmoud Suliman
Reviewed By	Hashmi S. Quazi



Analysis Methods Used ==>>	Liquefaction Triggering:		Seismic Settlements:	Cyclic Lateral Displacements:	Lateral Spreading:
	Boulanger-Idriss (2014)	Above GWL:	Pradel (1998)	Pradel (1998)	Zhang et al. (2004)
		Below GWL:	Ishihara and Yoshimine (1992)	Tokimatsu and Asaka (1998)	

REFERENCES:

1. Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.
2. Bray, J.D., and Sancio, R.B. (2006). "Assessment of the liquefaction susceptibility of fine-grained soils," Journal of Geotech. and Geoenv. Engineering, ASCE 132 (9), 1165-1177.
3. Cetin, K.O. and Seed, R.B., et al. (2004), "Standard penetration test-based probabilistic and deterministic assessment of seismic soil liquefaction potential," Journal of Geotech. and Geoenv. Engineering, ASCE 130 (12), 1314-1340.
4. Idriss, I.M. and Boulanger, R.W. (2008), "Soil Liquefaction During Earthquakes", Earthquake Engineering Research Institute (EERI), Monograph MNO-12.
5. Ishihara, K. and Yoshimine, M. (1992), "Evaluation of settlements in sand deposits following liquefaction during earthquakes," Soils and Foundations, Japanese Geotechnical Society, 32 (1), 173-188.
6. Iwasaki, T., et al. (1978), "A practical method for assessing soil liquefaction potential based on case studies at various sites in Japan," Proceedings Of 3rd International Conference of Microzonation, San Francisco, 885-896.
7. Olson, S.M. and Johnson, C.I. (2008), "Analyzing Liquefaction-Induced Lateral Spreads Using Strength Ratios," Journal of Geotech. and Geoenv. Engineering, ASCE 134 (8), 1035-1049.
8. Pradel, D. (1998), "Procedure to Evaluate Earthquake-Induced Settlements in Dry Sandy Soils," Journal of Geotechnical Engineering, ASCE 124 (4), pp. 364-368.
9. Seed, R.B. and Harder, L.F. (1990), "SPT-based analysis of cyclic pore pressure generation and undrained residual strength, Proceedings Of Seed Memorial Symposium, Vancouver, B.C., 351-376.
10. Tokimatsu, K. and Seed, H.B. (1987), "Evaluation of settlements in sands due to earthquake shaking," Journal of Geotechnical Engineering, ASCE 113 (GT8), 861-878.
11. Tokimatsu, K. and Asaka, Y. (1998), "Effects of liquefaction-induced ground displacementson pile performance in the 1995 Hyogoken-Nambu Earthquake," Soils and Foundations, Special Issue, Japan Geotechnical Society, 163-177.
12. Toprak, S. and Holzer, T.L. (2003), "Liquefaction Potential Index: Field Assessment," Journal of Geotechnical and Geoenviromental Engineering, ASCE 129 (4), 315-322.
13. Youd, T.L, Idriss, I.M., et al. (2001), "Liquefaction resistance of soils: summary report from the 1996 NCEER and 1998 NCEER/NSF Workshops", Journal of Geotech. and Geoenv. Engineering, ASCE 127 (10), 817-833.
14. Zhang, G, Robertson, P.K. and Brachman, R.W.I. (2004), "Estimating liquefaction-induced lateral displacement using the standard penetration test or cone penetration test," Journal of Geotech. and Geoenv. Engineering, ASCE 130 (8), 861-871.

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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PROJECT INFORMATION

Project Name	Ames-Reche Recharge Basin
Project No.	23-81-275-01
Project Location	Winters Road, City of Landers, San Bernardino County, California
Analyzed By	Mahmoud Suliman
Reviewed By	Hashmi S. Quazi

SELECTED METHODS OF ANALYSIS

Analysis Description	Dynamic Settlement Analyses
Triggering of Liquefaction	Boulanger-Idriss (2014)
Severity of Liquefaction	LPI: Liquefaction Potential Index based on Iwasaki et al. (1978)
Seismic Compression Settlement (Dry/Unsaturated Soil)	Pradel (1998)
Liquefaction-Induced Settlement (Saturated Soil)	Ishihara and Yoshimine (1992)
Liquefaction-Induced Lateral Spreading	Zhang et al. (2004)
Residual Shear Strength of Liquefied Soil	Idriss and Boulanger (2008)

SEISMIC DESIGN PARAMETERS

Earthquake Moment Magnitude, M_w	8.11
Peak Ground Acceleration, A_{max}	0.90 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS

Boring No.	BH-03
Ground Surface Elevation	3,321.00 feet
Proposed Grade Elevation	3,321.00 feet
GWL Depth Measured During Test	102.00 feet
GWL Depth Used in Design	222.00 feet
Borehole Diameter	8.00 inches
Hammer Weight	140.00 pounds
Hammer Drop	30.00 inches
Hammer Energy Efficiency Ratio, ER (%)	80.00 %
Hammer Distance to Ground Surface	5.00 feet
Topographic Site Condition:	TSC1 (Level Ground with No Nearby Free Face)
- Ground Slope, S (%)	<<= Leave this blank
- Free Face Distance to Slope Height Ratio, (L/H)	5.00 <<= Leave this blank Set H to zero ==> 15.00 feet

INPUT SOIL PROFILE DATA

Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Screening *Susceptible Soil? (Y, N)*	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field Blow Count N_{field} (blows/ft)	Fines Content FC (%)
0.00	5.00	SM	Y	118.3	MCal	31.20	13.80
5.00	10.00	SM	Y	126.0	MCal	28.27	13.80
10.00	15.00	SM	Y	126.0	MCal	24.70	13.80
15.00	20.00	SP-SM	Y	113.1	MCal	34.45	6.70
20.00	25.00	SP-SM	Y	113.1	SPT1	22.00	6.70
25.00	30.00	SP-SM	Y	113.1	MCal	42.90	6.70
30.00	35.00	SP-SM	Y	113.1	SPT1	32.00	6.70
35.00	40.00	SP-SM	Y	113.1	MCal	46.80	6.70
40.00	45.00	SP-SM	Y	113.1	SPT1	34.00	6.70
45.00	50.00	SP-SM	Y	113.1	MCal	45.50	6.70

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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PROJECT INFORMATION	
Project Name	Ames-Reche Recharge Basin
Project No.	23-81-275-01
Project Location	Winters Road, City of Landers, San Bernardino County, California
Analyzed By	Mahmoud Suliman
Reviewed By	Hashmi S. Quazi

SEISMIC DESIGN PARAMETERS	
Earthquake Moment Magnitude, M_w	8.11
Peak Ground Acceleration, A_{max}	0.90 g
Factor of Safety Against Liquefaction, FS	1.20

BORING DATA AND SITE CONDITIONS		
Boring No.	BH-03	
Ground Surface Elevation	3,321.00 feet	
Proposed Grade Elevation	3,321.00 feet	
GWL Depth Measured During Test	102.00 feet	
GWL Depth Used in Design	222.00 feet	
Borehole Diameter	8.00 inches	
Hammer Weight	140.00 pounds	
Hammer Drop	30.00 inches	
Hammer Energy Efficiency Ratio, ER	80.00 %	
Hammer Distance to Ground Surface	5.00 feet	
Topographic Site Condition:	TSC1 (Level Ground with No Nearby Free Face)	
- Ground Slope, S	0.00 %	
- Free Face (L/H) Ratio	5.00	H = 15 feet

SUMMARY OF RESULTS

Severity of Liquefaction:

Total Thickness of Liquefiable Soils: 0.00 feet (cumulative total thickness in the upper 65 feet)

Liquefaction Potential Index (LPI): 0.00 *** (Very low risk, with no surface manifestation of liquefaction)

Seismic Ground Settlements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Seismic Compression Settlement:	Pradel (1998)	1.89 inches	2.35 inches	2.35 inches	(Dry/Unsaturated Soils)
Liquefaction-Induced Settlement:	Ishihara and Yoshimine (1992)	0.00 inches	0.00 inches	0.00 inches	(Saturated Soils)
Total Seismic Settlement:		1.89 inches	2.35 inches	2.35 inches	

Seismic Lateral Displacements:	Analysis Method	Upper 30 feet	Upper 50 feet	Upper 65 feet	
Cyclic Lateral Displacement:	Tokimatsu and Asaka (1998)	1.29 inches	1.70 inches	1.70 inches	(During Ground Shaking)
Lateral Spreading Displacement:	Zhang et al. (2004)	0.00 inches	0.00 inches	0.00 inches	(After Ground Shaking)

NOTES AND REFERENCES

\+ This method of analysis is based on observed seismic performance of level ground sites using correlation with normalized and fines-corrected SPT blow count, $(N_1)_{60cs} = f\{(N_1)_{60}, FC\}$ where $(N_1)_{60} = N_{field}\, C_N\, C_E\, C_B\, C_R\, C_S$

++ Liquefaction susceptibility screening is performed to identify soil layers assessed to be non-liquefiable based on laboratory test results using the criteria proposed by Cetin and Seed (2003), Bray and Sancio (2006), or Idriss and Boulanger (2008).

* FS_{liq} = Factor of Safety against liquefaction = (CRR/CSR), where $CRR = CRR_{7.5}\, MSF\, K_\sigma\, K_\alpha$, MSF = Magnitude Scaling Factor, $K_\sigma = f[(N_1)_{60}, \sigma'_{vo}]$, K_α =1.0, (level ground), CSR = Cyclic Stress Ratio = $0.65\, A_{max}\, (\sigma_{vo}/\sigma'_{vo})\, r_d$, and $CRR_{7.5}$ = Cyclic Resistance Ratio is a function of $(N_1)_{60cs}$ and corrected for an earthquake magnitude M_w of 7.5.

** Residual strength values of liquefied soils are based on correlation with post-earthquake, normalized and fines-corrected SPT blow count derived by Idriss and Boulanger (2008).

*** Based on Iwasaki et al. (1978) and Toprak and Holzer (2003)

+ Reference: Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.

INPUT SOIL PROFILE DATA								LIQUEFACTION TRIGGERING ANALYSIS BASED ON R.W. BOULANGER AND I.M. IDRISS (2014) METHOD +																					
Depth to Top of Soil Layer (feet)	Depth to Bottom of Soil Layer (feet)	Material Type USCS Group Symbol (ASTM D2487)	Liquefaction Susceptibility Screening ++ Susceptible Soil? (Y/N)	Total Soil Unit Weight γ_t (pcf)	Type of Soil Sampler	Field SPT Blow Count N_{field} (blows/ft)	Fines Content FC (%)	Total Vert. Stress (Design) σ_{vo} (psf)	Effective Vert. Stress (Design) σ'_{vo} (psf)	SPT Corr. for Vert. Stress C_N	SPT Corr. for Hammer Energy C_E	SPT Corr. for Borehole Size C_B	SPT Corr. for Rod Length C_R	SPT Corr. for Sampling Method C_S	Corrected SPT Blow Count N_{60}	Normalized SPT Blow Count $(N_1)_{60}$	Fines Corrected SPT Blow Count $(N_1)_{60cs}$	Shear Stress Reduction Coefficient r_d	Correction for High Overburden Stress K_σ	Cyclic Stress Ratio CSR	Cyclic Resistance Ratio CRR	Factor of Safety * FS_{liq}	Liquefaction Analysis Results	Residual Shear Strength ** S_r (psf)	Seismic Porewater Pressure Ratio r_u (%)	Cumulative Seismic Settlement (inches)	Cumulative Cyclic Lateral Displacement (inches)	Cumulative Lateral Spreading Displacement (inches)
0.00	5.00	SM	Y	118.32	MCal	31.20	13.80	295.80	295.80	1.700	1.333	1.150	0.750	0.650	23.3	39.6	42.5	1.000	1.100	0.582							2.35	1.70	0.00
5.00	10.00	SM	Y	126.00	MCal	28.27	13.80	906.60	906.60	1.333	1.333	1.150	0.800	0.650	22.5	30.0	32.9	0.995	1.100	0.580							2.35	1.70	0.00
10.00	15.00	SM	Y	126.00	MCal	24.70	13.80	1,536.60	1,536.60	1.115	1.333	1.150	0.850	0.650	20.9	23.3	26.2	0.986	1.040	0.574							2.07	1.49	0.00
15.00	20.00	SP-SM	Y	113.12	MCal	34.45	6.70	2,134.40	2,134.40	0.977	1.333	1.150	0.950	0.650	32.6	31.9	32.0	0.976	0.986	0.569							1.42	1.13	0.00
20.00	25.00	SP-SM	Y	113.10	SPT1	22.00	6.70	2,699.95	2,699.95	0.894	1.333	1.150	0.950	1.000	32.0	28.7	28.7	0.965	0.943	0.562							1.11	0.89	0.00
25.00	30.00	SP-SM	Y	113.10	MCal	42.90	6.70	3,265.45	3,265.45	0.849	1.333	1.150	0.950	0.650	40.6	34.5	34.6	0.953	0.875	0.555							0.71	0.62	0.00
30.00	35.00	SP-SM	Y	113.10	SPT1	32.00	6.70	3,830.95	3,830.95	0.825	1.333	1.150	1.000	1.000	49.1	40.5	40.6	0.940	0.805	0.547							0.46	0.41	0.00
35.00	40.00	SP-SM	Y	113.10	MCal	46.80	6.70	4,396.45	4,396.45	0.776	1.333	1.150	1.000	0.650	46.6	36.2	36.3	0.925	0.764	0.539							0.46	0.41	0.00
40.00	45.00	SP-SM	Y	113.10	SPT1	34.00	6.70	4,961.95	4,961.95	0.761	1.333	1.150	1.000	1.000	52.1	39.7	39.8	0.910	0.727	0.530							0.25	0.21	0.00
45.00	50.00	SP-SM	Y	113.10	MCal	45.50	6.70	5,527.45	5,527.45	0.700	1.333	1.150	1.000	0.650	45.3	31.7	31.8	0.895	0.776	0.521							0.25	0.21	0.00

SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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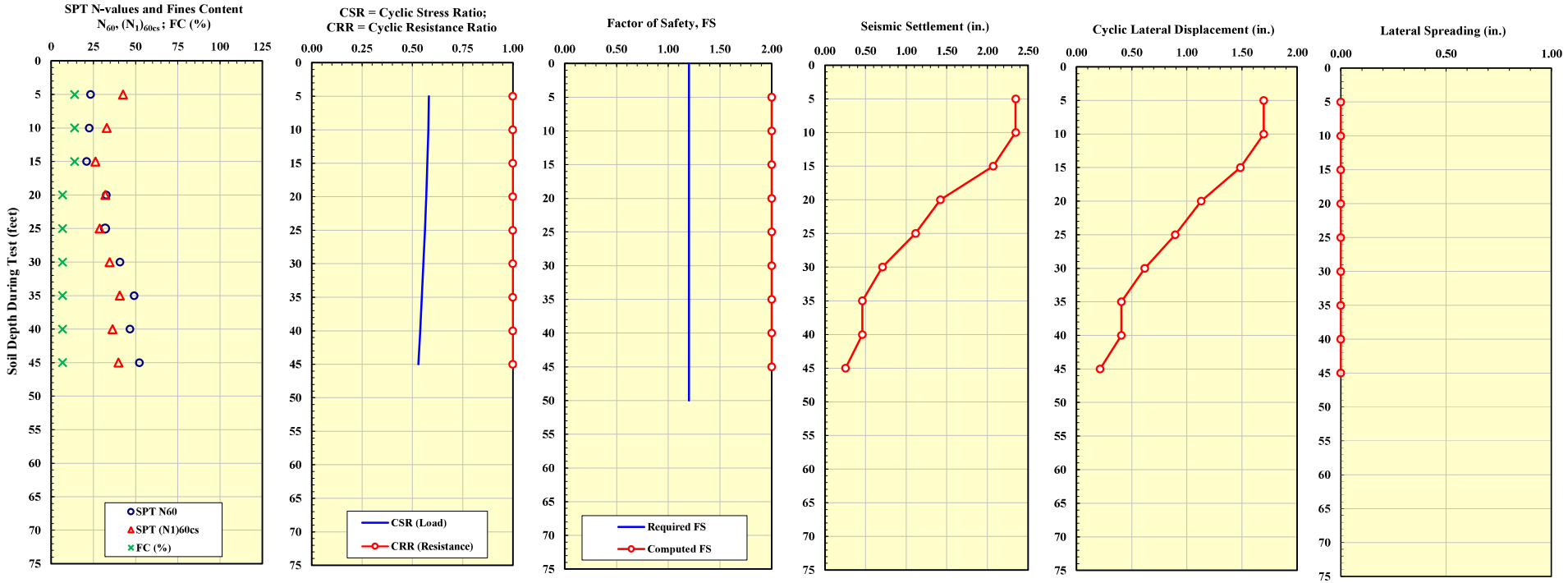
Project Name	Ames-Reche Recharge Basin
Project No.	23-81-275-01
Project Location	Winters Road, City of Landers, San Bernardino County, California
Analyzed By	Mahmoud Suliman
Reviewed By	Hashmi S. Quazi



Analysis Methods Used ==>>

Liquefaction Triggering:		Seismic Settlements:	Cyclic Lateral Displacements:	Lateral Spreading:
Boulanger-Idriss (2014)	Above GWL:	Pradel (1998)	Pradel (1998)	Zhang et al. (2004)
	Below GWL:	Ishihara and Yoshimine (1992)	Tokimatsu and Asaka (1998)	

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1. Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.
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3. Cetin, K.O. and Seed, R.B., et al. (2004), "Standard penetration test-based probabilistic and deterministic assessment of seismic soil liquefaction potential," Journal of Geotech. and Geoenv. Engineering, ASCE 130 (12), 1314-1340.
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5. Ishihara, K. and Yoshimine, M. (1992), "Evaluation of settlements in sand deposits following liquefaction during earthquakes," Soils and Foundations, Japanese Geotechnical Society, 32 (1), 173-188.
6. Iwasaki, T., et al. (1978), "A practical method for assessing soil liquefaction potential based on case studies at various sites in Japan," Proceedings Of 3rd International Conference of Microzonation, San Francisco, 885-896.
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8. Pradel, D. (1998), "Procedure to Evaluate Earthquake-Induced Settlements in Dry Sandy Soils," Journal of Geotechnical Engineering, ASCE 124 (4), pp. 364-368.
9. Seed, R.B. and Harder, L.F. (1990), "SPT-based analysis of cyclic pore pressure generation and undrained residual strength, Proceedings Of Seed Memorial Symposium, Vancouver, B.C., 351-376.
10. Tokimatsu, K. and Seed, H.B. (1987), "Evaluation of settlements in sands due to earthquake shaking," Journal of Geotechnical Engineering, ASCE 113 (GT8), 861-878.
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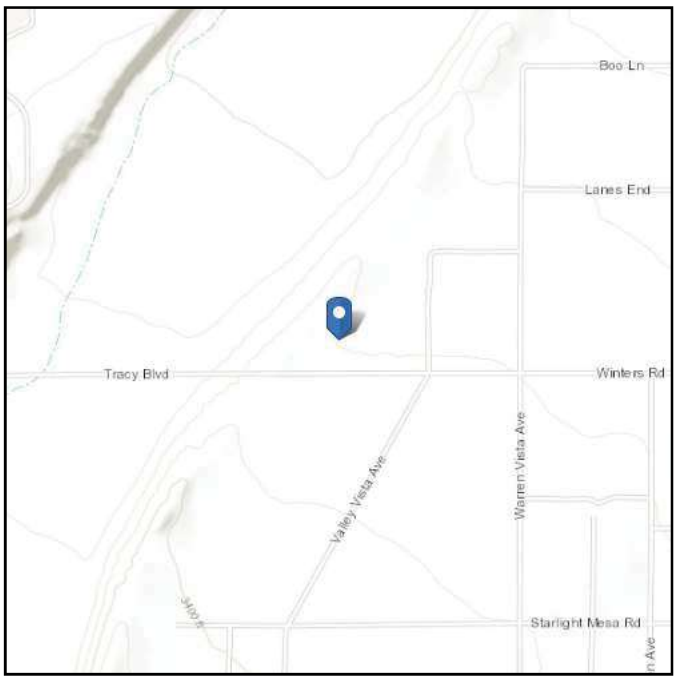
12. Toprak, S. and Holzer, T.L. (2003), "Liquefaction Potential Index: Field Assessment," Journal of Geotechnical and Geoenviromental Engineering, ASCE 129 (4), 315-322.
13. Youd, T.L, Idriss, I.M., et al. (2001), "Liquefaction resistance of soils: summary report from the 1996 NCEER and 1998 NCEER/NSF Workshops", Journal of Geotech. and Geoenv. Engineering, ASCE 127 (10), 817-833.
14. Zhang, G, Robertson, P.K. and Brachman, R.W.I. (2004), "Estimating liquefaction-induced lateral displacement using the standard penetration test or cone penetration test," Journal of Geotech. and Geoenv. Engineering, ASCE 130 (8), 861-871.

ASCE Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	34.237866
Risk Category:	II	**Longitude:**	-116.41105
Soil Class:	D - Stiff Soil	**Elevation:**	3315.2685950944974 ft (NAVD 88)





Seismic

Site Soil Class: D - Stiff Soil

Results:

S_S :	1.932	S_{D1} :	N/A
S_1 :	0.659	T_L :	8
F_a :	1	PGA :	0.815
F_v :	N/A	PGA_M :	0.896
S_{MS} :	1.932	F_{PGA} :	1.1
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.288	C_v :	1.486

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Fri Apr 12 2024

Date Source: USGS Seismic Design Maps

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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U.S. Geological Survey - Earthquake Hazards Program

Unified Hazard Tool

Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the U.S. Seismic Design Maps web tools (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

Please also see the new USGS Earthquake Hazard Toolbox for access to the most recent NSHMs for the conterminous U.S. and Hawaii.

Input

Edition

Dynamic: Conterminous U.S. 2014 (u…

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

33.4237866

Time Horizon

Return period in years

2475

Longitude

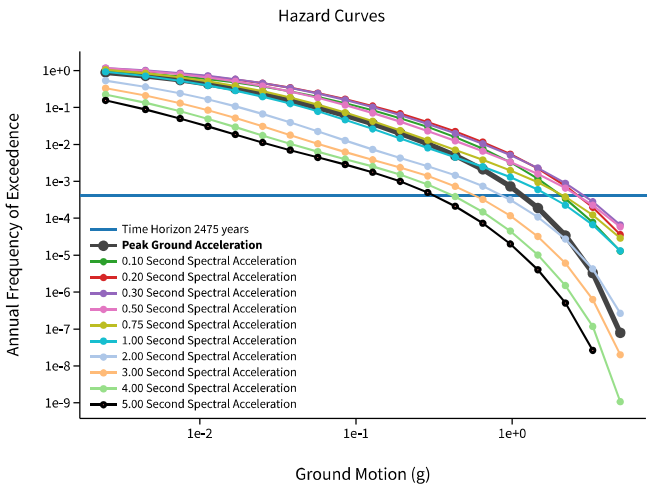
Decimal degrees, negative values for western longitudes

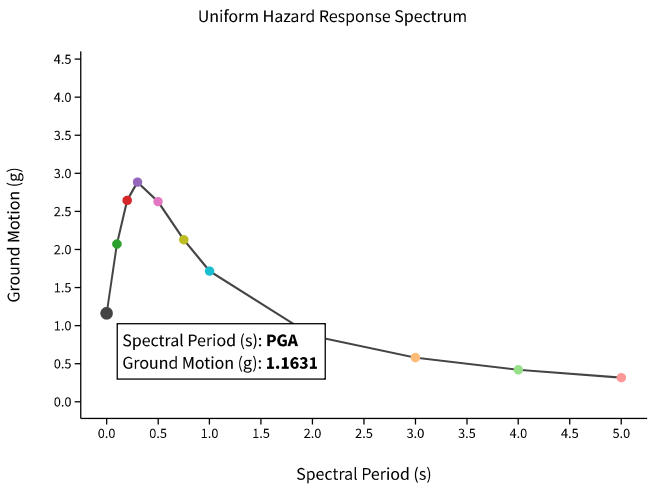
-116.41105

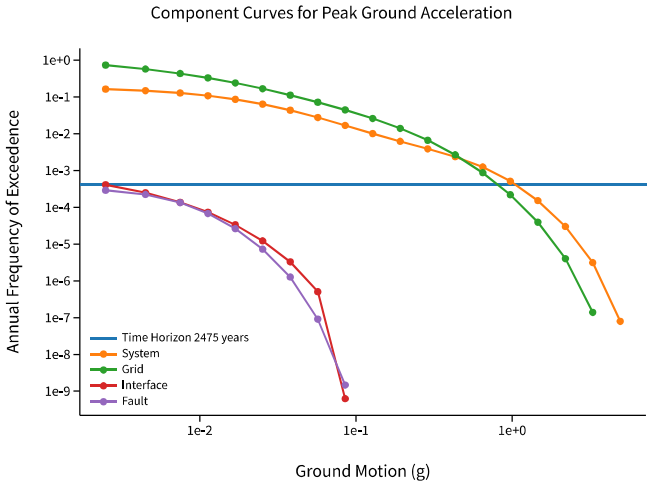
Site Class

360 m/s (C/D boundary)

Hazard Curve





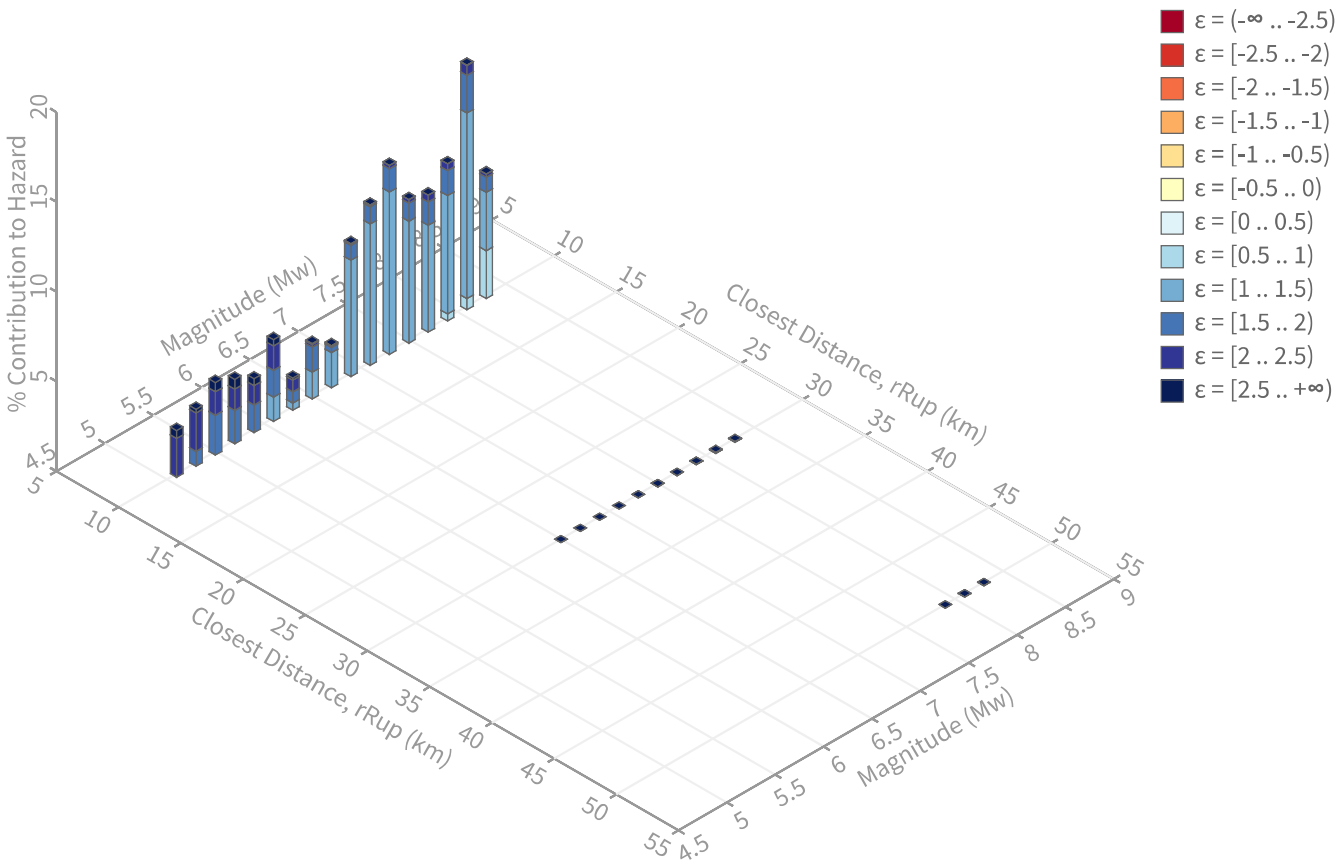


View Raw Data

Deaggregation

Component

Total



Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 1.1630745 g

Recovered targets

Return period: 2987.2583 yrs
Exceedance rate: 0.00033475512 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.03 %

Mean (over all sources)

m: 7.13
r: 3.57 km
ε_0: 1.48 σ

Mode (largest m-r bin)

m: 8.11
r: 3.25 km
ε_0: 1.27 σ
Contribution: 13.6 %

Mode (largest m-r-ε_0 bin)

m: 8.1
r: 3.13 km
ε_0: 1.18 σ
Contribution: 10.34 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

Deaggregation Contributors

Source Set ↳ Source	Type	r	m	ε_0	lon	lat	az	%
UC33brAvg_FM31	System							38.81
San Jacinto (Clark) rev [1]		1.73	7.39	1.25	116.411°W	33.428°N	358.11	25.75
San Jacinto (Coyote Creek) [1]		4.15	7.91	1.40	116.441°W	33.396°N	221.45	12.19
UC33brAvg_FM32	System							38.14
San Jacinto (Clark) rev [1]		1.73	7.40	1.24	116.411°W	33.428°N	358.11	24.68
San Jacinto (Coyote Creek) [1]		4.15	7.89	1.40	116.441°W	33.396°N	221.45	12.66
UC33brAvg_FM31 (opt)	Grid							11.53
PointSourceFinite: -116.411, 33.446		5.78	5.62	1.94	116.411°W	33.446°N	0.00	4.38
PointSourceFinite: -116.411, 33.446		5.78	5.62	1.94	116.411°W	33.446°N	0.00	4.32
PointSourceFinite: -116.411, 33.500		9.02	5.92	2.35	116.411°W	33.500°N	0.00	1.00
UC33brAvg_FM32 (opt)	Grid							11.53
PointSourceFinite: -116.411, 33.446		5.78	5.62	1.94	116.411°W	33.446°N	0.00	4.38
PointSourceFinite: -116.411, 33.446		5.78	5.62	1.94	116.411°W	33.446°N	0.00	4.32
PointSourceFinite: -116.411, 33.500		9.02	5.92	2.35	116.411°W	33.500°N	0.00	1.00

Appendix D

Slope Stability and Seepage Analysis

APPENDIX D

SLOPE STABILITY AND SEEPAGE ANALYSIS

The stability of the conceptual recharge basin slopes under static conditions (dry, steady seepage, and rapid drawdown) were evaluated using the Slide 9.008 software (RocScience, 2020). Pseudostatic analyses using a seismic coeffiecient of 0.29 were performed in order to evaluate the stability of the slopes during a large earthquake.

The anticipated seepage of retained water and anticipated slope stability were analyzed for conceptual slope height, width, and ratio. Analyses were completed for both sides of a berm between a filled basin and an empty basin to model the worst-case scenario.

For all slope conditions, a Mohr-Coulomb soil strength model was assumed, and Factors of Safety (FOS) for slope stability were evaluated using different methods solution procedures: Bishop Simplified, Janbu Simplified, and Spencer.

The relevant soil parameters for the proposed slope including unit weight, friction angle, cohesion was derived from field and laboratory test data, are presented in the table below. The average values of the parameters shown in the table were used in slope stability analysis.

Table No. D-1, Soil Parameters Used for Slope Stability Analysis

Depth, from Top of the Slope (ft)	Layer	Unit Weight (pcf)	Internal Friction Angle (Degree)	Cohesion (psf)
0-10	Silty Sand (SM)	117	28	170
10-60	Sand with Silt (SP-SM)	112	33	10

Auto Refine searches within predefined areas were utilized to determine the critical slip surface in each case. Slip surface limits (entrance and exit zones) were implemented to avoid modeling surficial slope failures which have a marginally lower overall factor of safety compared to deeper seated slip surfaces, but which are less relevant to the slope design.

Limit equilibrium methods for evaluating slope stability consider the static equilibrium of a soil mass above a potential failure surface. For conventional, two-dimensional methods of analysis; the slide mass above an assumed failure surface is first divided into vertical slices, then stresses are evaluated along the sides and base of each slice. The factor of safety against a slope failure (FS_{slope}) is defined as:

$$FS_{slope} = \frac{\text{shear strength of soil}}{\text{shear stress required for equilibrium}}$$

The strengths and stresses are computed along a defined failure surface located at the base of the vertical slices. The shearing resistance along the potential slip surface is computed, with appropriate Mohr-Coulomb strength parameters, as a function of the effective normal stress.

The results of the analyses are discussed in Section 9.0, *Slope Stability and Seepage Analysis*. The following table and pages include figures presenting the results of the analyses.

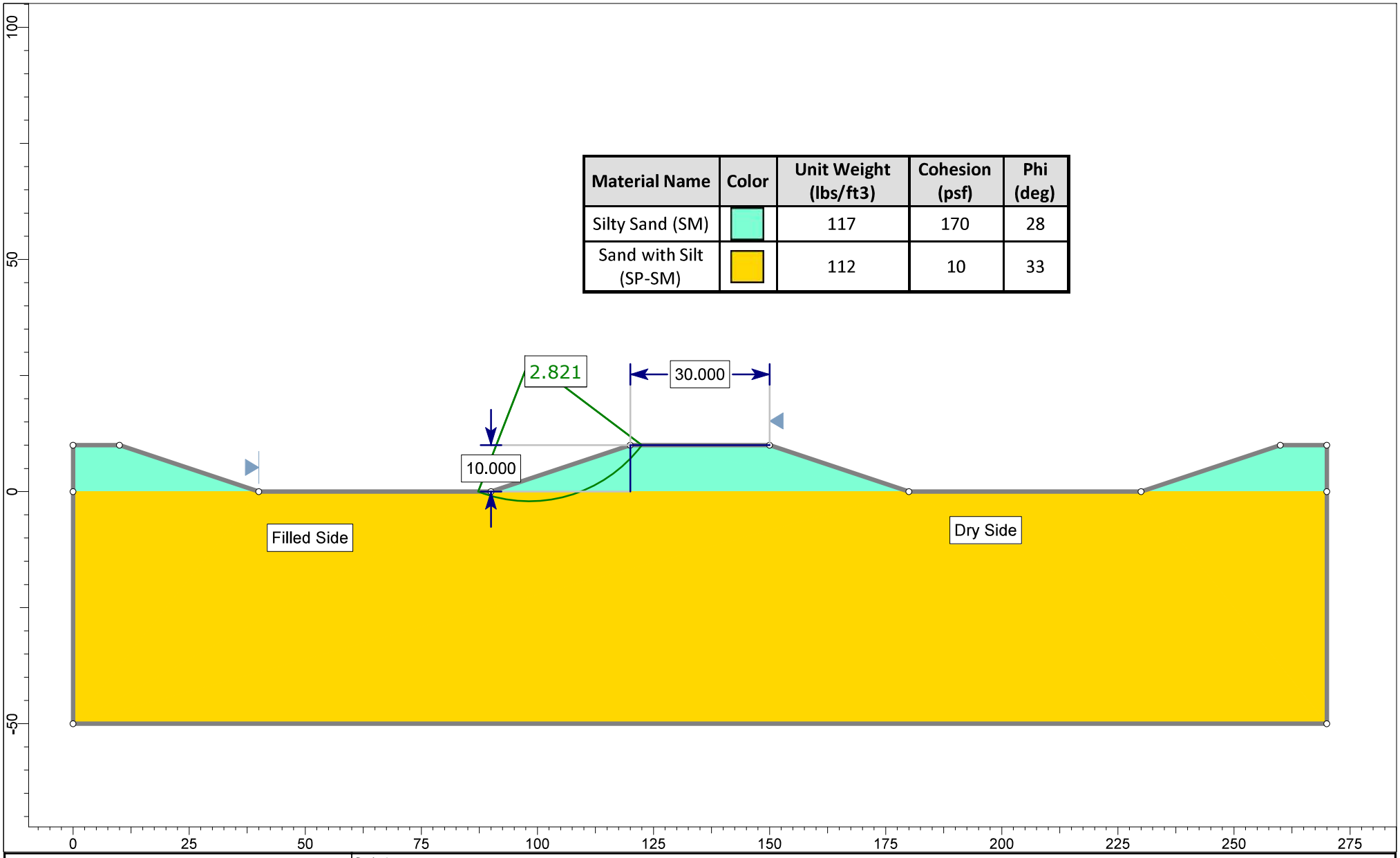
Table No. D-2, Factors of Safety Against Slope Failure

Condition	Conceptual Slope Configuration	Static FOS		Pesudo-Static FOS	
		Filled Side	Dry Side	Filled Side	Dry Side
Dry	3H:1V 30' Width 10' Height	2.82	N/A	1.39	N/A
Steady State		3.0	1.97	1.16	0.88*
Rapid Drawdown		2.87	N/A	1.43	N/A

*Note: Does not meet the recommended Factor of Safety

- Figures D-1, Dry Condition, *Static Analysis, Filled Basin Side*
- Figures D-2, Dry Condition, *Pesudo-Static Analysis, Filled Basin Side*
- Figures D-3, Steady State Condition, *Static Analysis, Filled Basin Side*
- Figures D-4, Steady State Condition, *Static Analysis, Dry Basin Side*
- Figures D-5, Steady State Condition, *Pesudo-Static Analysis, Filled Basin Side*
- Figures D-6, Steady State Condition, *Pesudo-Static Analysis, Dry Basin Side*
- Figures D-7, Rapid Drowdawn Condition, *Static Analysis, Filled Basin Side*
- Figures D-8, Rapid Drowdawn Condition, *Pesudo-Static Analysis, Filled Basin Side*

Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Silty Sand (SM)		117	170	28
Sand with Silt (SP-SM)		112	10	33

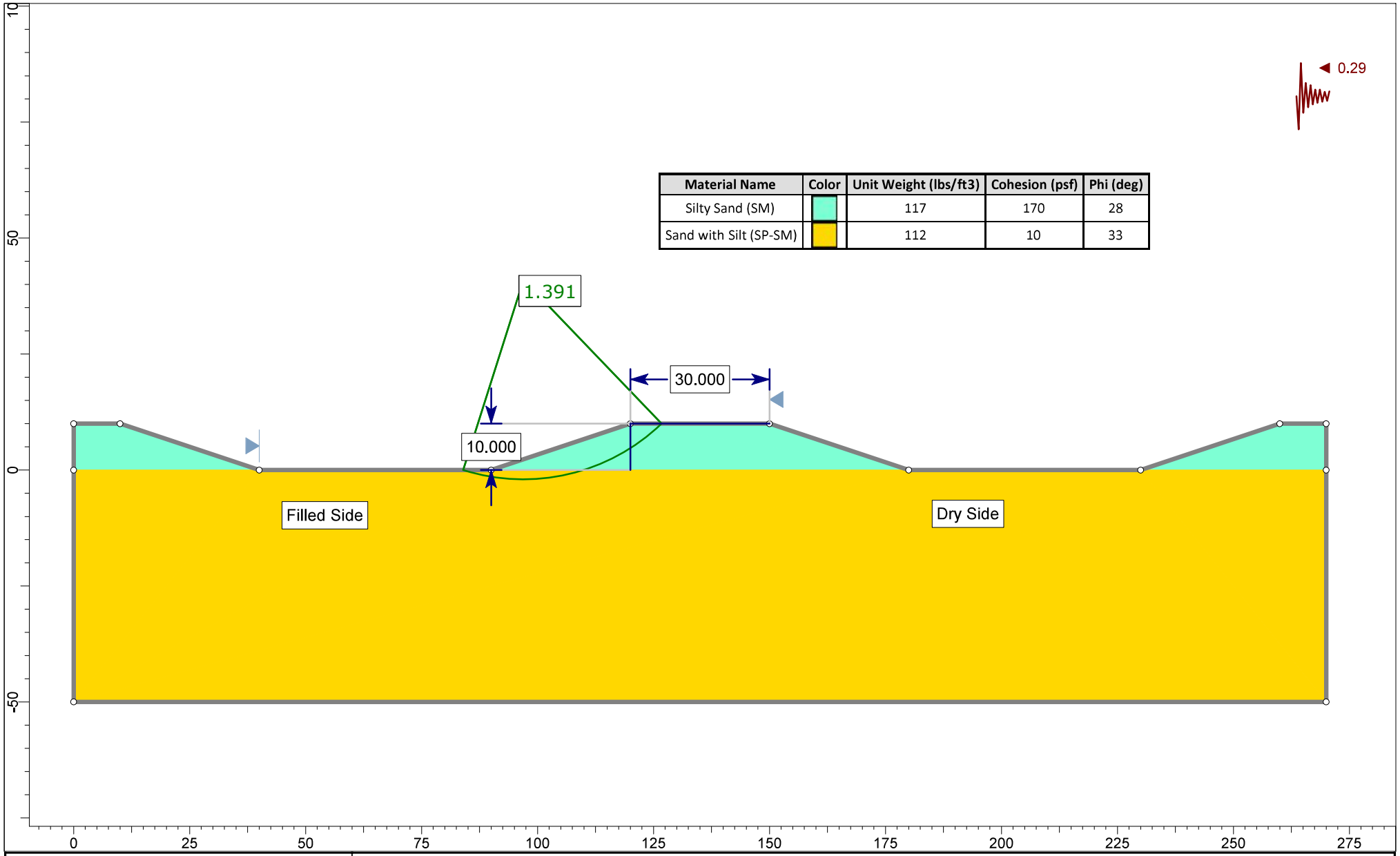


rocscience

SLIDEINTERPRET 9.008

Project	Ames-Reche Recharge Basin Relocation		
Group	Dry	Analysis	Static Analysis (Filled Side)
Drawn By	M. Suliman	Company	Converse Consultants
Date	4/15/2026	File Name	Ames-Reche Recharge Basin Relocation.slmd

Figure D-1

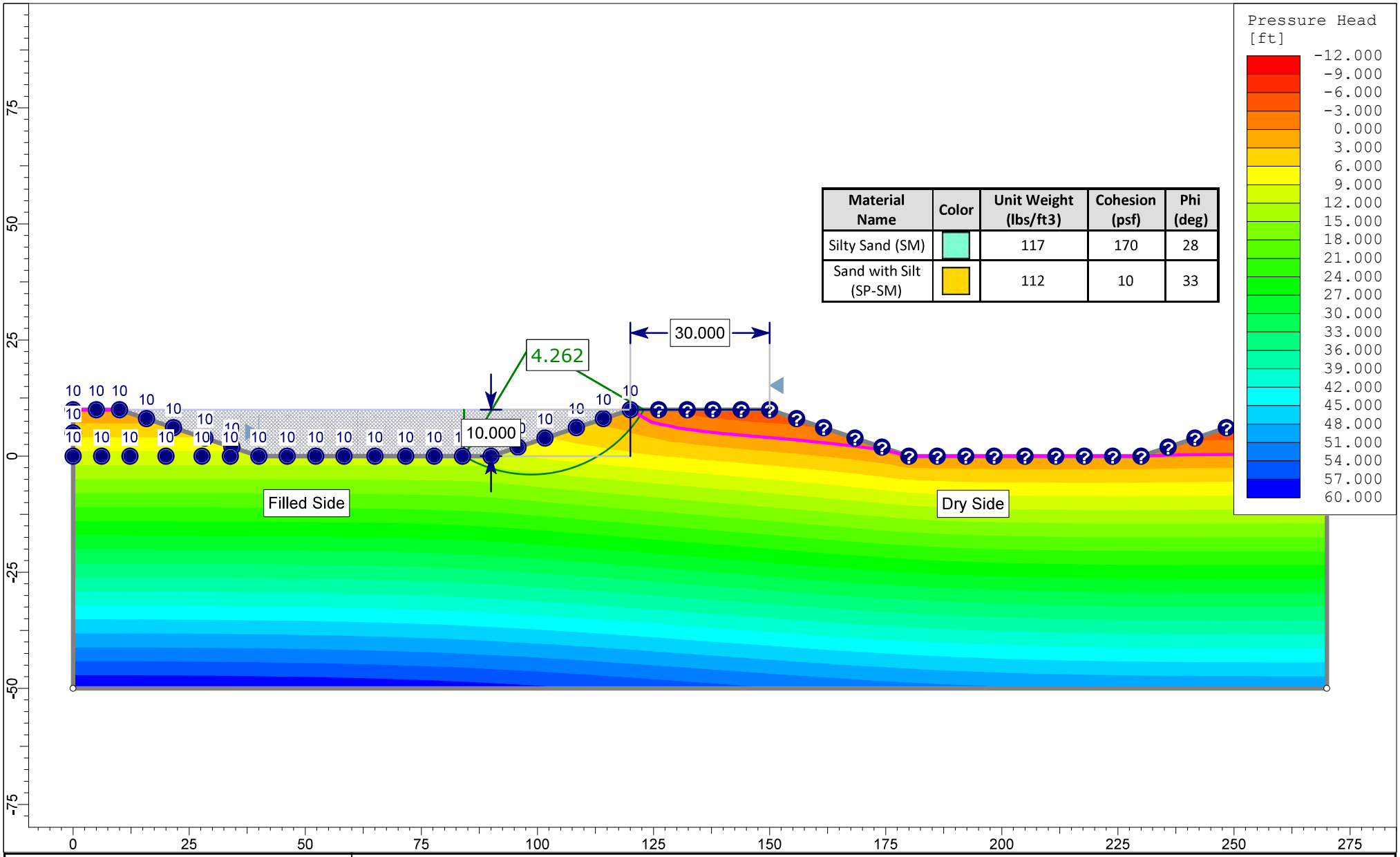


Material Name	Color	Unit Weight (lbs/ft3)	Cohesion (psf)	Phi (deg)
Silty Sand (SM)		117	170	28
Sand with Silt (SP-SM)		112	10	33

rocscience	*Project*	Ames-Reche Recharge Basin Relocation	
	Group Dry	*Analysis*	Pesudo-Static Analysis (Filled Side)
	Drawn By M. Suliman	*Company*	Converse Consultants
	Date 4/15/2026	*File Name*	Ames-Reche Recharge Basin Relocation.slmd

SLIDEINTERPRET 9.008

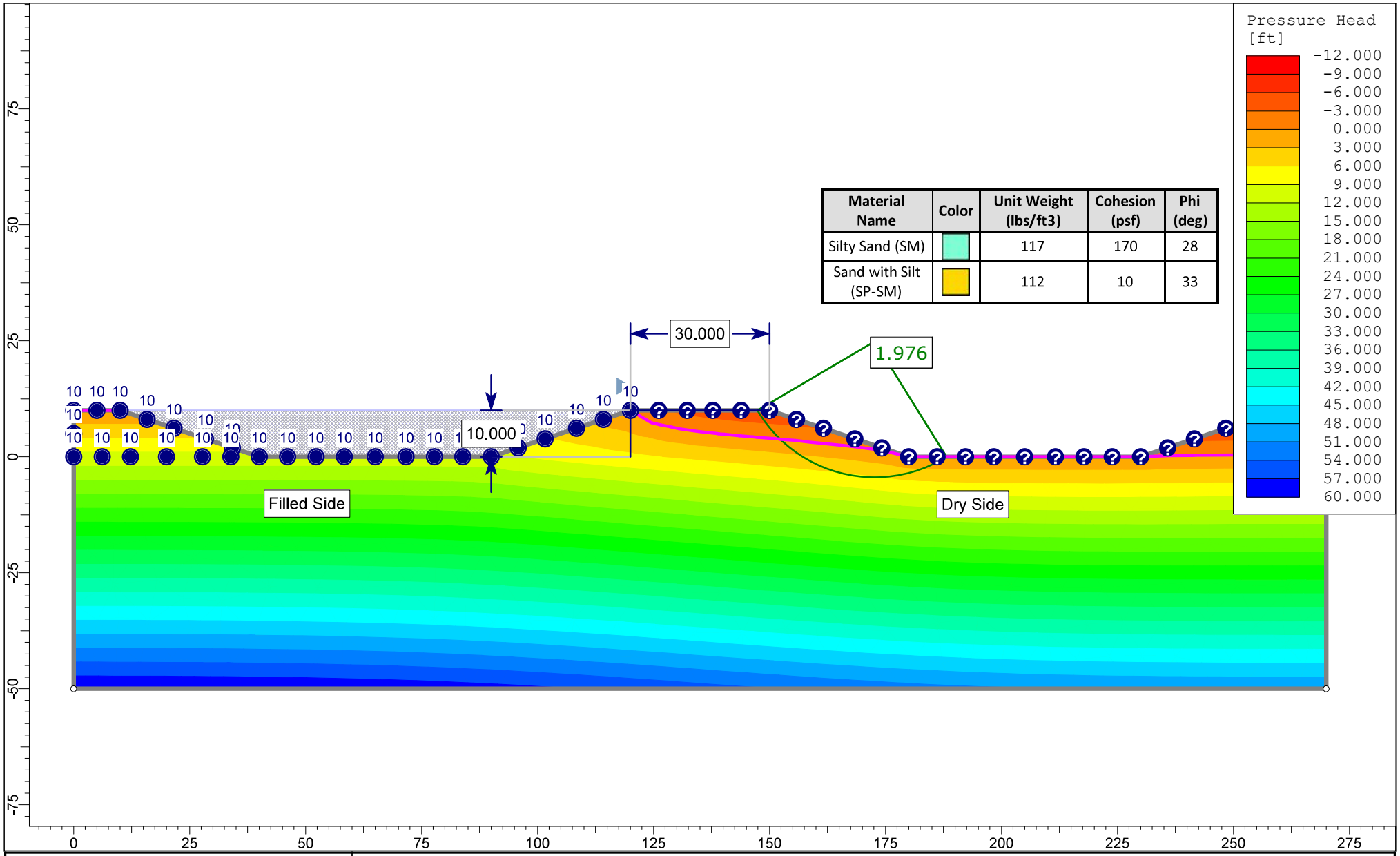
Figure D-2



rocscience	Project	Ames-Reche Recharge Basin Relocation	
	Group	Steady State	Analysis: Static Analysis (Filled Side)
	Drawn By	M. Suliman	Company: Converse Consultants
	Date	4/15/2026	File Name: Ames-Reche Recharge Basin Relocation.slmd

SLIDEINTERPRET 9.008

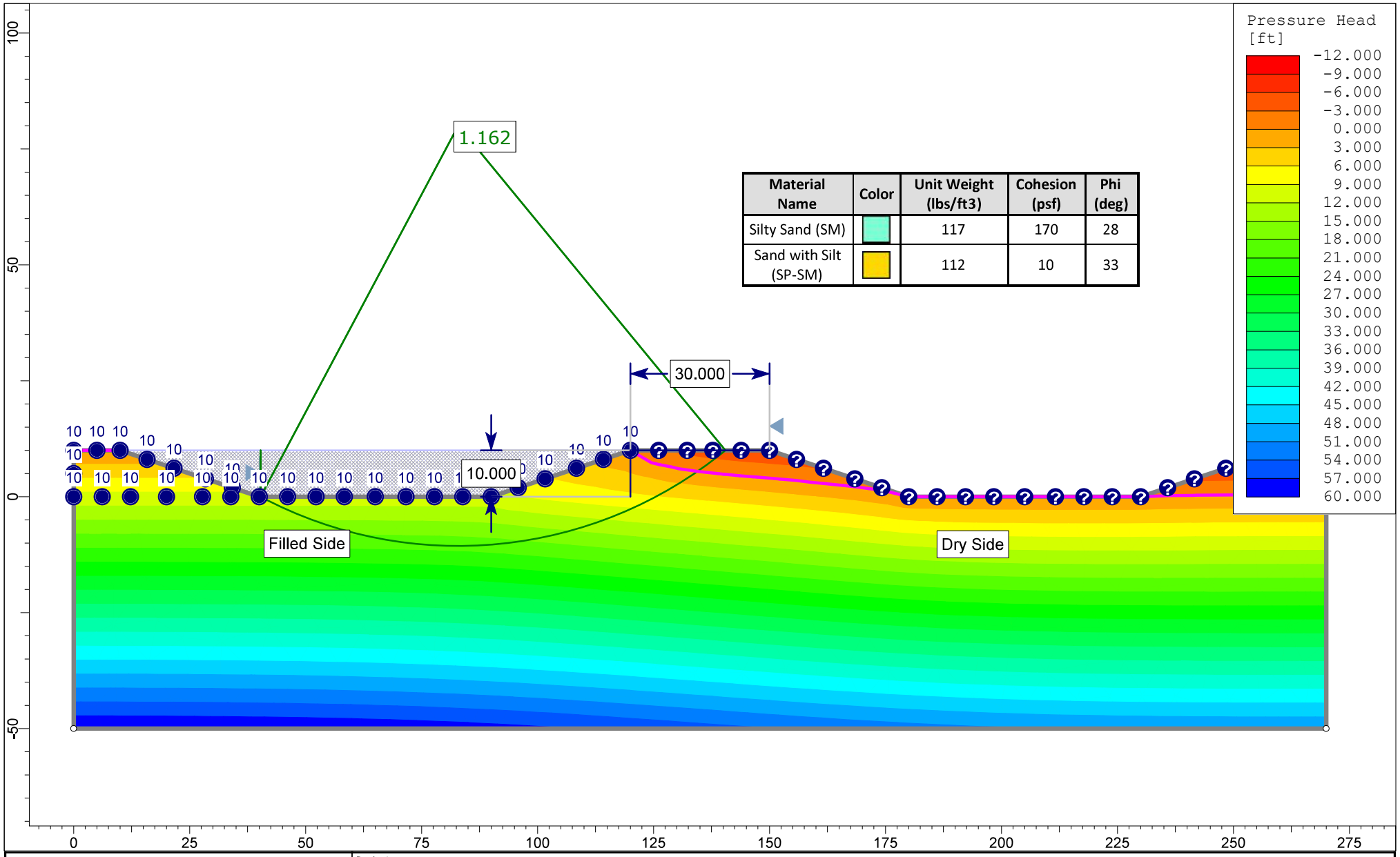
Figure D-3



rocscience	Project: Ames-Reche Recharge Basin Relocation		
	Group: Steady State	Analysis: Static Analysis (Dry Side)	
	Drawn By: M. Suliman	Company: Converse Consultants	
	Date: 4/15/2026	File Name: Ames-Reche Recharge Basin Relocation.slmd	

SLIDEINTERPRET 9.008

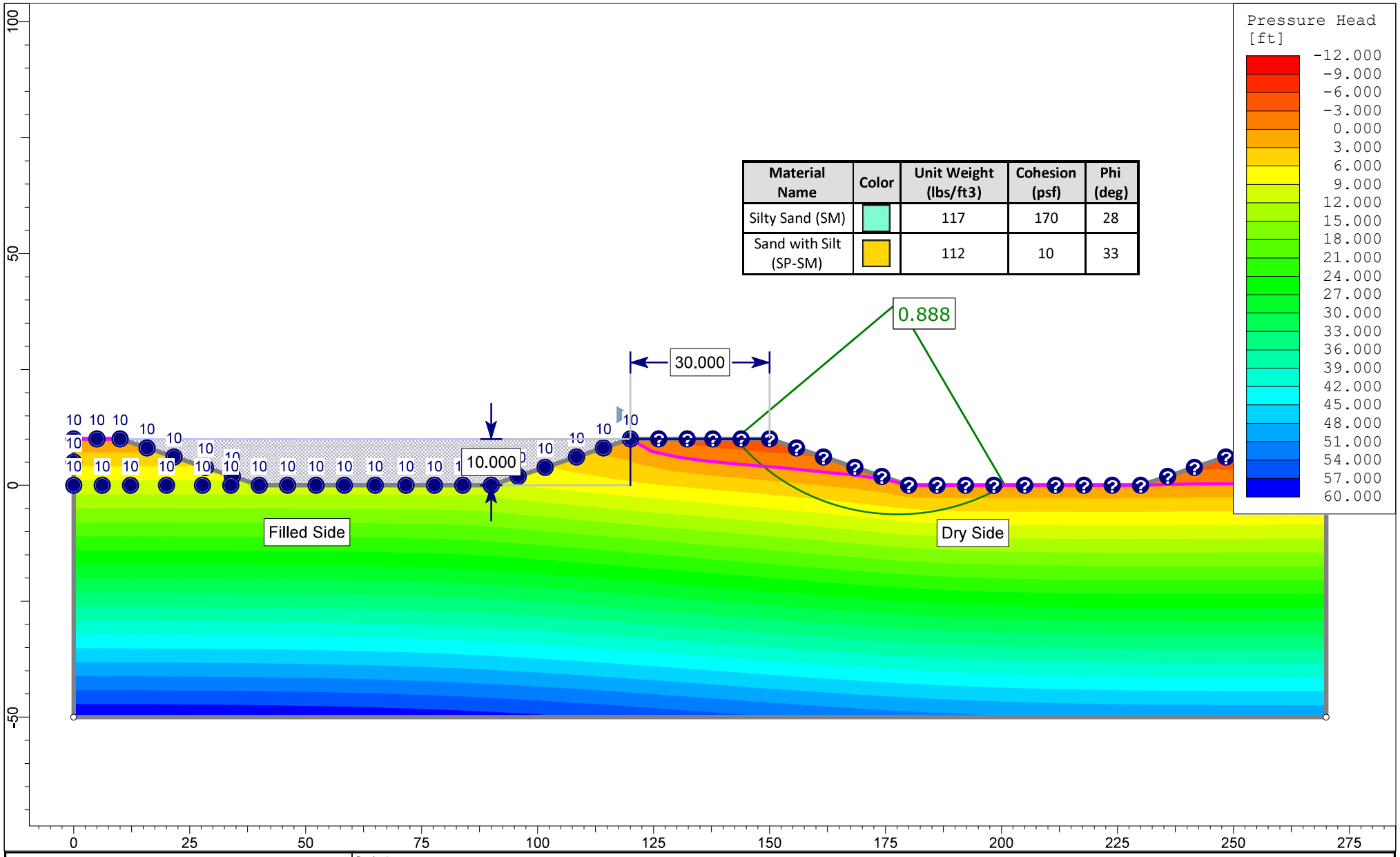
Figure D-4



rocscience	Project	Ames-Reche Recharge Basin Relocation	
	Group	Steady State	Analysis: Pesudo-Static Analysis (Filled Side)
	Drawn By	M. Suliman	Company: Converse Consultants
	Date	4/15/2026	File Name: Ames-Reche Recharge Basin Relocation.slmd

SLIDEINTERPRET 9.008

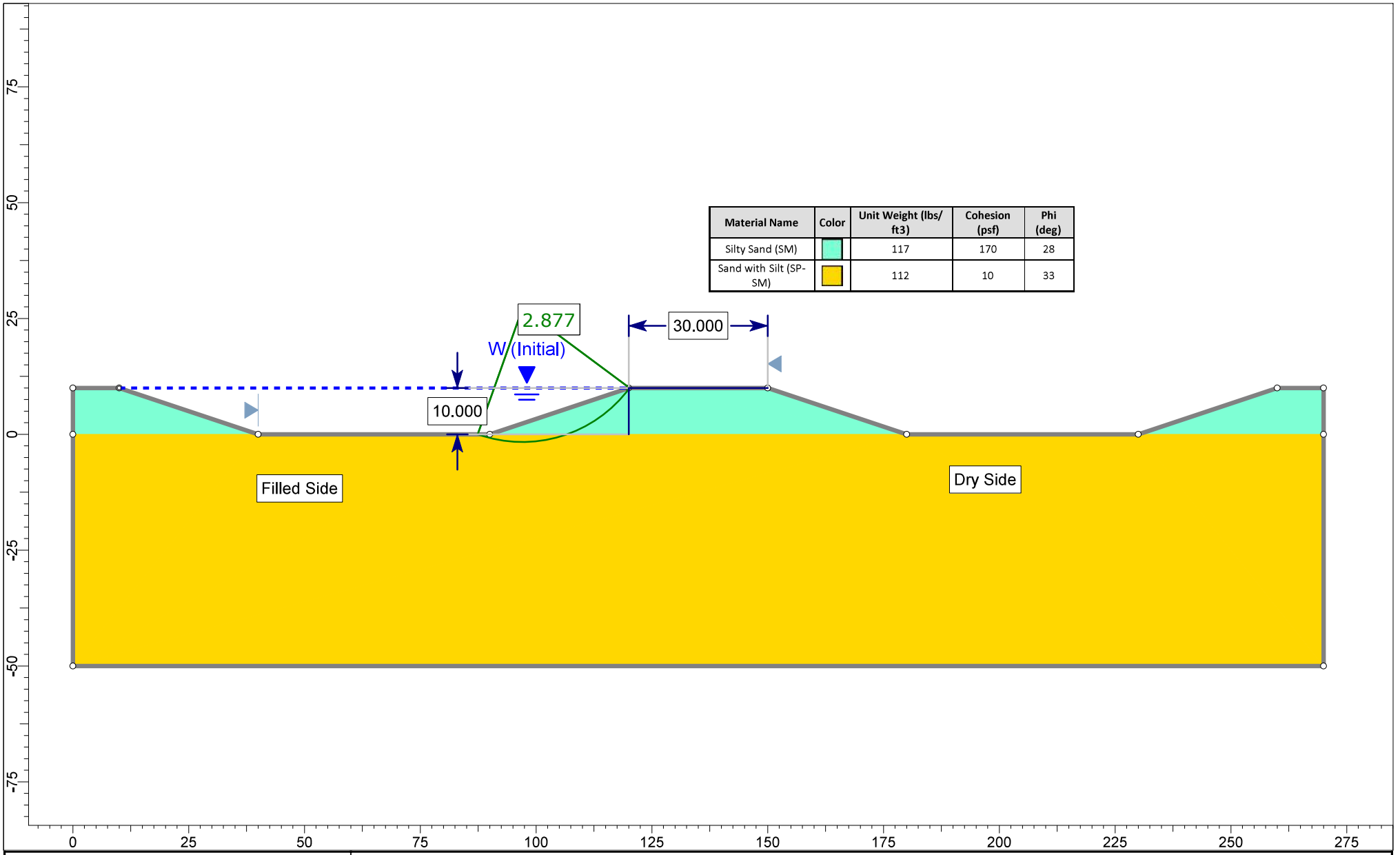
Figure D-5



rocscience	Project	Ames-Reche Recharge Basin Relocation	
	Group	Steady State	Analysis: Pesudo-Static Analysis (Dry Side)
	Drawn By	M. Suliman	Company: Converse Consultants
	Date	4/15/2026	File Name: Ames-Reche Recharge Basin Relocation.slmd

SLIDEINTERPRET 9.008

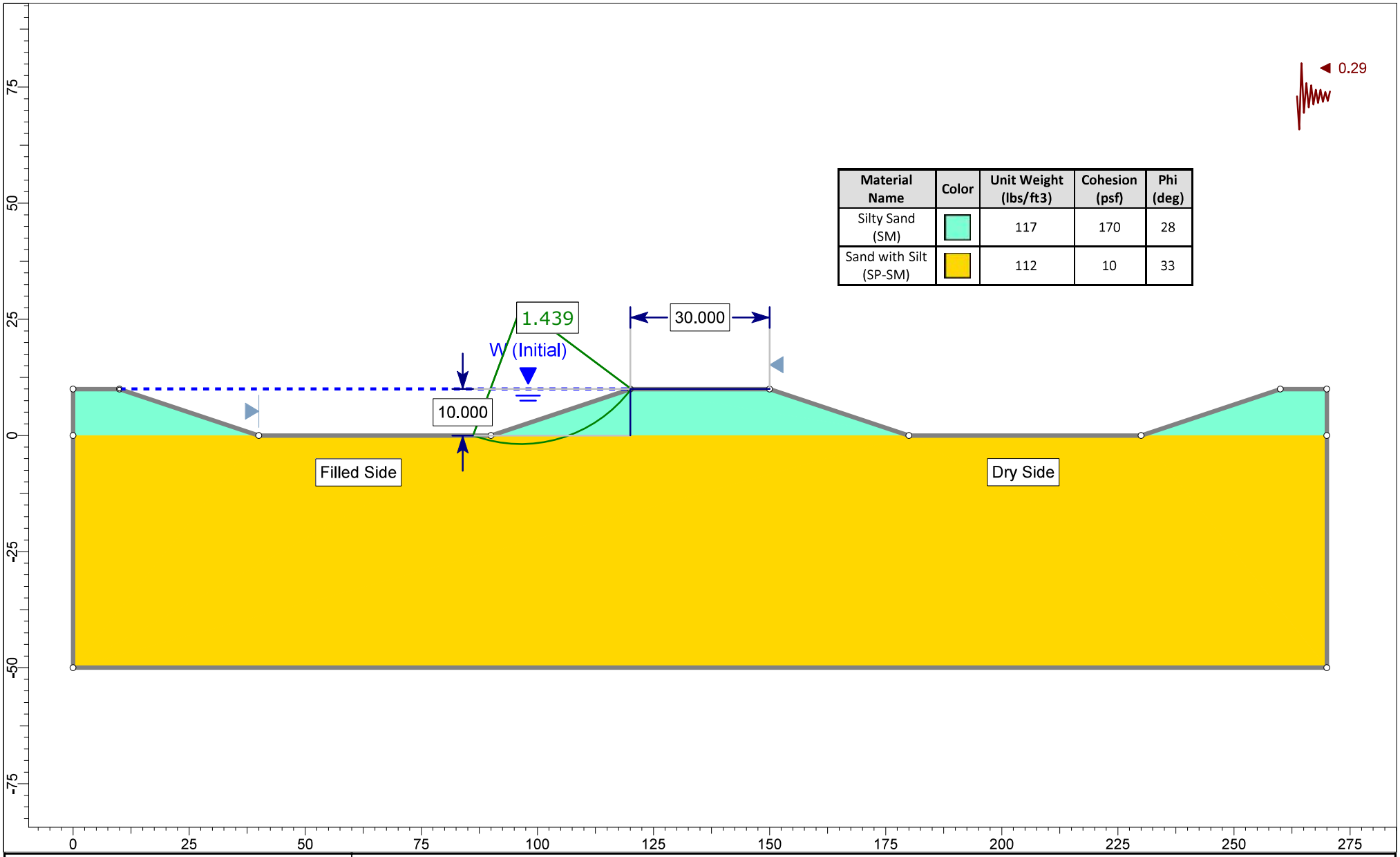
Figure D-6



rocscience	*Project*	Ames-Reche Recharge Basin Relocation	
	Group	Rapid Drowdawn	*Analysis* Static Analysis (Filled Side)
	Drawn By	M. Suliman	*Company* Converse Consultants
	Date	4/15/2026	*File Name* Ames-Reche Recharge Basin Relocation.slmd

SLIDEINTERPRET 9.008

Figure D-7



rocscience	Project	Ames-Reche Recharge Basin Relocation	
	Group	Rapid Drowdawn	Analysis: Pesudo-Static Analysis (Filled Side)
	Drawn By	M. Suliman	Company: Converse Consultants
	Date	4/15/2026	File Name: Ames-Reche Recharge Basin Relocation.slmd

SLIDEINTERPRET 9.008

Figure D-8

APPENDIX E

Noise Study (Ganddini Group Inc 2025)

AMES-RECHE RECHARGE BASIN NOISE IMPACT ANALYSIS

County of San Bernardino

May 2, 2025

Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

AMES-RECHE RECHARGE BASIN NOISE IMPACT ANALYSIS

County of San Bernardino

May 2, 2025

prepared by
Roma Stromberg, INCE, MS
Catherine Howe, MS

GANDDINI GROUP INC.
555 Parkcenter Drive, Suite 225
Santa Ana, California 92705
(714) 795-3100 | ganddini.com

Project No. 19712

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EXECUTIVE SUMMARY

The Project consists of the development of two (2) new recharge basins (north and south basin) on 10 acres surrounded by 12-ft tall berms. The berms are sloped at 3:1 from the edge of the proposed 16-ft to 24-ft wide access road, which surrounds the perimeter of each basin, to the bottom of each basin. The north basin bottom is approximately 2.3 acres at 3,304 ft AMSL, and the south basin bottom is 2.5 acres at 3,311.5 ft AMSL. The development of the recharge basin will result in a maximum flow rate of 5 cubic feet per second (cfs) with an anticipated annual recharge capacity of 1,500 AFY. In addition to the installation of the recharge basins, the Project proposes to install 6-foot perimeter fencing with barbered wire; a new tee connection within the Winters Road right-of-way; approximately 500 linear feet of 12-inch non-potable water pipeline from Winters Road to the eastern perimeter of each basin (north and south); two (2) headwalls located along the eastern perimeter of each basin connecting to the new 12-inch non-potable water pipeline; outlet with energy dissipator to the proposed recharge basin; and a nested or multi-completion monitoring well located within the proposed site to monitor infiltration rates, groundwater levels, and water quality. The proposed improvements will allow MWA to increase its groundwater recharge capacity of annual State Water Project Table A allocations.[1] The recharge basin will include a perimeter access road, fencing, and signage. Electrical and SCADA are not required at the site. The existing pipeline and recharge basin will remain but shall be isolated with a valve. To determine the site for the monitoring well, a Synthetic Precipitation Leaching Procedure (SPLP) leach test will be conducted, and geochemical modeling performed if the SPLP test results warrant.

Existing Noise Environment

Sensitive receptors that may be affected by project generated noise include the nearest sensitive receptor to the project site are the existing single-family residential uses with property lines located approximately 275 feet southeast and 290 feet northeast of the project site.

Measured short-term ambient noise levels in the project vicinity ranged between 31.6 and 34 dBA L_{eq} and long-term noise ambient noise levels ranged between 20.4 to 43.6 dBA L_{eq}. The dominant noise source in the project vicinity was vehicle traffic associated with Tracy Boulevard/Winters Road as well as bird song, residential activity, and dogs barking.

Project Construction Impacts – Onsite Equipment

Based on the modeled construction noise levels, construction noise levels are estimated to reach up to 69.2 dBA L_{eq} at the nearest existing residential property line and will not exceed the FTA residential construction noise standard of 80 dBA L_{eq} (daytime) and 70 dBA L_{eq} (nighttime). Therefore, the project would not exceed established standards relating to construction noise. The project impact is less than significant; no mitigation is required.

Notwithstanding the above, best management practices (BMPs) are provided in the Project Description and can be added to project plans and in contract specifications to minimize construction noise emanating from the proposed project.

Project Construction Impacts – Offsite Vehicle Trips

Project vehicle traffic generated during project construction would result in an existing plus project noise level of 51.6 dBA CNEL, which is below the County's mobile source residential noise level standard of 60 dBA CNEL. Off-site project generated construction vehicle trips would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

[1] According to the 2023 State Water Project Table A Allocations, Mojave Water Agency requested 89,800 total Acre-Feet per year and was allowed only 26,940 Acre-Feet per year, which is 30 percent of their initial request (DWR CA State Water Project, 2023).

Operational Noise Impacts

The project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. There are no stationary noise sources associated with the project. However, to conduct routine inspections and ensure proper long-term maintenance, the long-term operation of the project will require a minimal number of monthly worker trips. Additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated. Therefore, the addition of project vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

Groundborne Vibration Impacts

Construction Groundborne Vibration

Groundborne vibration generated by project construction would not exceed the levels necessary to cause architectural damage or annoyance; therefore, the project impact would be less than significant.

Operational Groundborne Vibration

The most substantial sources of groundborne vibration during post-construction project operations will include the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction. This impact would not be significant. No mitigation is required.

Air Traffic Impacts

There are no airports within two miles of the project site. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels. There is no impact, and no mitigation is required.

1. INTRODUCTION

This section describes the purpose of this study and introduces the proposed project.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise impacts resulting from development of the proposed project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state and local policies, including those of the County of San Bernardino, in the context of the California Environmental Quality Act (CEQA).

Although this is a technical report, effort has been made to write the report clearly and concisely. A list of acronyms and glossary are provided in Appendix A and Appendix B of this report to assist the reader with technical terms.

PROJECT LOCATION

Regionally, the Project Site is located within the East Desert within Unincorporated San Bernadino County within the Ames-Reche groundwater basin. As of 2020, a total of 192,948 acre-feet (AF) of groundwater was reported to be stored throughout MWA's local groundwater basins (Mojave Basin; Ames-Reche, Joshua Basin); and approximately 373 AF is stored within the Ames-Reche basin.[2] This basin covers approximately 110,000 acres and is surrounded by the San Bernardino Mountains in the west Iron Ridge to the north, the Hidalgo Mountain on the northeast, and various fault lines on the east and northern boundaries.

The closest City to the Project Site is Yucca Valley, approximately 12 miles south of the Project Site accessible via the regional transportation route State Route 247 (SR-247). Surrounding unincorporated areas include Homestead Valley and Flamingo Heights, approximately 2.4 miles northwest and west of the Project Site. The unincorporated areas are well connected to the Project Site via local roadways (Tracy Blvd, Landers Lane, Reche Road, etc.), which lead to SR-247. In addition, the Project Site is located approximately 30 miles east from the foothills of the San Bernardino Mountains; and approximately 41 miles west from the Cleghorn Lakes Wilderness Area. A project location map is provided on Figure 1.

The Project Site is a 10-acre site comprised of two parcels (APN 062-921-113, -114) located on federal property, along Winters Road, approximately 0.3 miles east of the existing recharge facility and adjacent to the 12-inch diameter HDPE pipeline along Winters Road within the Ames Valley Groundwater Basin.[3] The Project Site is heavily disturbed at the southern perimeter with two (2) existing concrete pads, one (1) containing walls littered with debris from the abandoned structure and illegal dumping. Debris is composed of a hot tub, glass, drywall, clothes, car parts, etc., which will require removal upon Project implementation. The parcels are naturally vegetated with 68 Western Joshua Trees, and a plant community known as the creosote bush scrub. The Project Site is surrounded by vacant open spaces and rural residential developments. The surrounding land uses are shown in Table 1. The closest residential development to the Project Site is approximately 500 feet northeast, located along Lucky Lane.

Other notable facilities close to the Project Site include the existing Ames-Reche recharge facility, approximately 0.3 miles east of the Project Site; and the flow control facility, located near the intersection of Winters Road and Landers Lane, approximately 0.3 miles west of the Project Site. The existing Ames-Reche recharge facility was completed in 2014 and delivers water from the State Water Project directly to the Pipes Wash in Landers, California, located north of Yucca Valley. The facility consists of a flow control facility and pipeline extending west from MWA's Morongo Basin Pipeline at Winters Road to an outlet in Pipes Wash.

[2] UWMP, 2020; Table 3-9: MWA Total Stored Groundwater, September 2020.

[3] MWA Stormwater Resources Plan, 2020.

The turnout has a maximum capacity of 5 cfs, recharging a maximum of approximately 1,500 acre-feet per year (AFY). While the existing facility remains operational, permitting and operational requirements have severely reduced its functional capacity. A local vicinity map showing the project location is provided on Figure 2.

PROJECT DESCRIPTION

The Project consists of the development of two (2) new recharge basins (north and south basin) on 10 acres surrounded by 12-ft tall berms. The berms are sloped at 3:1 from the edge of the proposed 16-ft to 24-ft wide access road, which surrounds the perimeter of each basin, to the bottom of each basin. The north basin bottom is approximately 2.3 acres at 3,304 ft AMSL, and the south basin bottom is 2.5 acres at 3,311.5 ft AMSL. The development of the recharge basin will result in a maximum flow rate of 5 cubic feet per second (cfs) with an anticipated annual recharge capacity of 1,500 AFY. In addition to the installation of the recharge basins, the Project proposes to install 6-foot perimeter fencing with barbered wire; a new tee connection within the Winters Road right-of-way; approximately 500 linear feet of 12-inch non-potable water pipeline from Winters Road to the eastern perimeter of each basin (north and south); two (2) headwalls located along the eastern perimeter of each basin connecting to the new 12-inch non-potable water pipeline; outlet with energy dissipator to the proposed recharge basin; and a nested or multi-completion monitoring well located within the proposed site to monitor infiltration rates, groundwater levels, and water quality. The proposed improvements will allow MWA to increase its groundwater recharge capacity of annual State Water Project Table A allocations.[4] The recharge basin will include a perimeter access road, fencing, and signage. Electrical and SCADA are not required at the site. The existing pipeline and recharge basin will remain but shall be isolated with a valve. To determine the site for the monitoring well, a Synthetic Precipitation Leaching Procedure (SPLP) leach test will be conducted, and geochemical modeling performed if the SPLP test results warrant.

Project Objectives

The major goals of the Project are as follows:

1. Address population increases over time which can lead to decreases in potential groundwater recharge;
2. Increase resilience to drought;
3. Provide reliable groundwater recharge; and
4. Ensure safe yield is achieved and maintained

Project Characteristics – Construction

Project construction is anticipated to begin in January 2026 and conclude in November 2026, lasting for approximately 11 months. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days). Construction activities will occur between 7:30 AM and 4:30 PM, Monday through Friday; weekend work will be avoided when feasible, however, weekend or night work might occur to avoid peak traffic.

Construction activities for Phase 1 will involve up to 3 crew members daily. Construction activities for Phase 2 will involve approximately 8 to 10 crew members daily at any one time during active construction. Crew members will get to the construction site utilizing personal vehicles, approximately 10 vehicles at any one time, accessing the construction site via local roadways (Tracy Blvd, Winters Road, Landers Lane, Reche Road, etc.) or regional transportation routes (State Route (SR) 247). Personal vehicles will be parked along the public right-of-way, adjacent to the Project Site within the roadway, shoulder, or at the street curbs. Temporary

[4] According to the 2023 State Water Project Table A Allocations, Mojave Water Agency requested 89,800 total Acre-Feet per year and was allowed only 26,940 Acre-Feet per year, which is 30 percent of their initial request (DWR CA State Water Project, 2023).

fencing will be placed around the perimeter of each work area to secure construction sites after each work date and prevent theft/vandalism that has the potential to occur overnight. In addition to fencing, active construction will either be backfilled or covered with trench plates at the end of each day. Water for construction and potable water during construction activities will be supplied by the local water purveyor and conveyed to the site by the contractor via water trucks. Earthworks during construction involved 68,411 CY of cut and 1,594 CY of fill (66,817 CY of net cut).

Construction will include the implementation of relevant Mojave Water Agency standards and guidelines. The analysis in this document supports findings of less than significant impacts under CEQA.

Construction Equipment

Construction activities will involve the utilization of a variety of diesel-powered equipment along the Project Alignment throughout construction. Potential equipment on-site during construction includes:

Phase 1 – Monitoring Well Drilling

- one (1) drilling rig
- one (1) loader
- one (1) crane
- 2-3 work trucks

Phase 2 – Recharge Basins

- two (2) scrapers
- one (1) tractor / loader / backhoe
- two (2) off-highway trucks
- two (2) plate compactors
- two (2) excavators
- two (2) other material handling equipment
- two (2) other construction equipment
- four (4) pumps
- two (2) skid steer loaders
- two (2) surfacing equipment
- two (2) rubber tiered dozers
- one (1) crane
- one (1) water truck

During Project construction, equipment will be kept at a designated laydown yard (see Staging below) or the Project contractor's facilities.

Staging

Staging areas will be located inside the existing public right-of-way along Winters Road and on-site within APNs 062-921-113, -114, and/or adjacent parcels. These staging locations will depend on the portion of the project under construction.

Schedule and Phasing

Project construction is anticipated to begin in January 2026 and conclude in November 2026, lasting for approximately 11 months. Phase 1 consists of monitoring well installation (approximately 75 days), and Phase 2 consists of recharge basin construction (approximately 172 days).

Project Characteristics –Operation

The Project is anticipated to be operational for a minimum of 50 years from completion of initial construction. The Agency will operate and manage the Project similarly to existing conditions since the Project will install a new 10-acre recharge basin approximately 0.3 miles east of the existing Ames-Reche Recharge Basin. Therefore, Mojave Water Agency does not anticipate additional staffing needs for long-term operation and maintenance of the proposed Project. Monthly worker trips over the lifetime of the Proposed Project will be required to conduct routine inspections and ensure proper long-term maintenance.

Figure 3 illustrates the project site plan.

Although project construction noise impacts would not exceed applicable thresholds, the following best management practices (BMPs) can be provided on project plans and in contract specifications to minimize construction noise emanating from the proposed project:

1. All equipment, whether fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.
2. All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the project site.
3. As applicable, all equipment shall be shut off and not left to idle when not in use.
4. To the degree possible, equipment staging will be located in areas that create the greatest distance between construction-related noise and vibration sources and existing sensitive receptors.
5. Jackhammers, pneumatic equipment, and all other portable stationary noise sources will be directed away and shielded from existing residences in the vicinity of the project site. Either one-inch plywood or sound blankets can be utilized for this purpose. They should reach up from the ground and block the line of sight between equipment and existing residences. The shielding should be without holes and cracks.
6. No amplified music and/or voice will be allowed on the project site during construction.
7. Haul truck deliveries will not occur outside of the hours presented as exempt for construction per County of San Bernardino Development Code within Section 83.01.080(g)(3).

Table 1
Surrounding Land Uses

Location	Land Use	General Plan	Zoning
Project Site	Vacant (Portions of Abandoned Structures)	Rural Living (RL)	Homestead Valley/Rural Living (HV/RL)
North	Vacant	Rural Living (RL)	HV/RL
South	Vacant	Rural Living (RL)	HV/RL
East	Vacant (Existing Ames-Reche Flow Control Facility)	Rural Living (RL)	HV/RL
West	Vacant (Existing Ames-Reche Flow Control Facility)	Rural Living (RL)	HV/RL

Source: San Bernardino County Land Use Map, 2020.

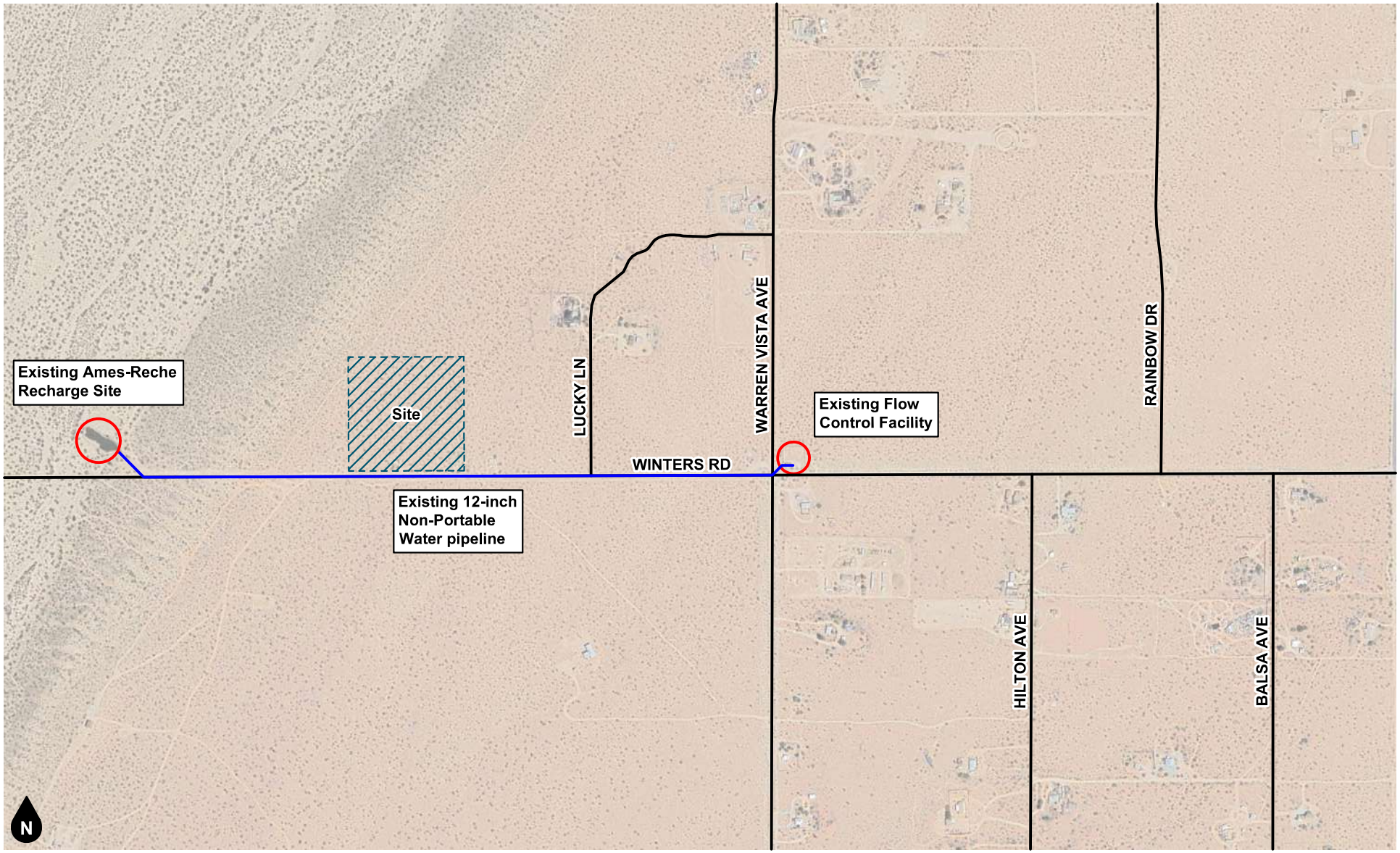

Figure 1
Project Location Map

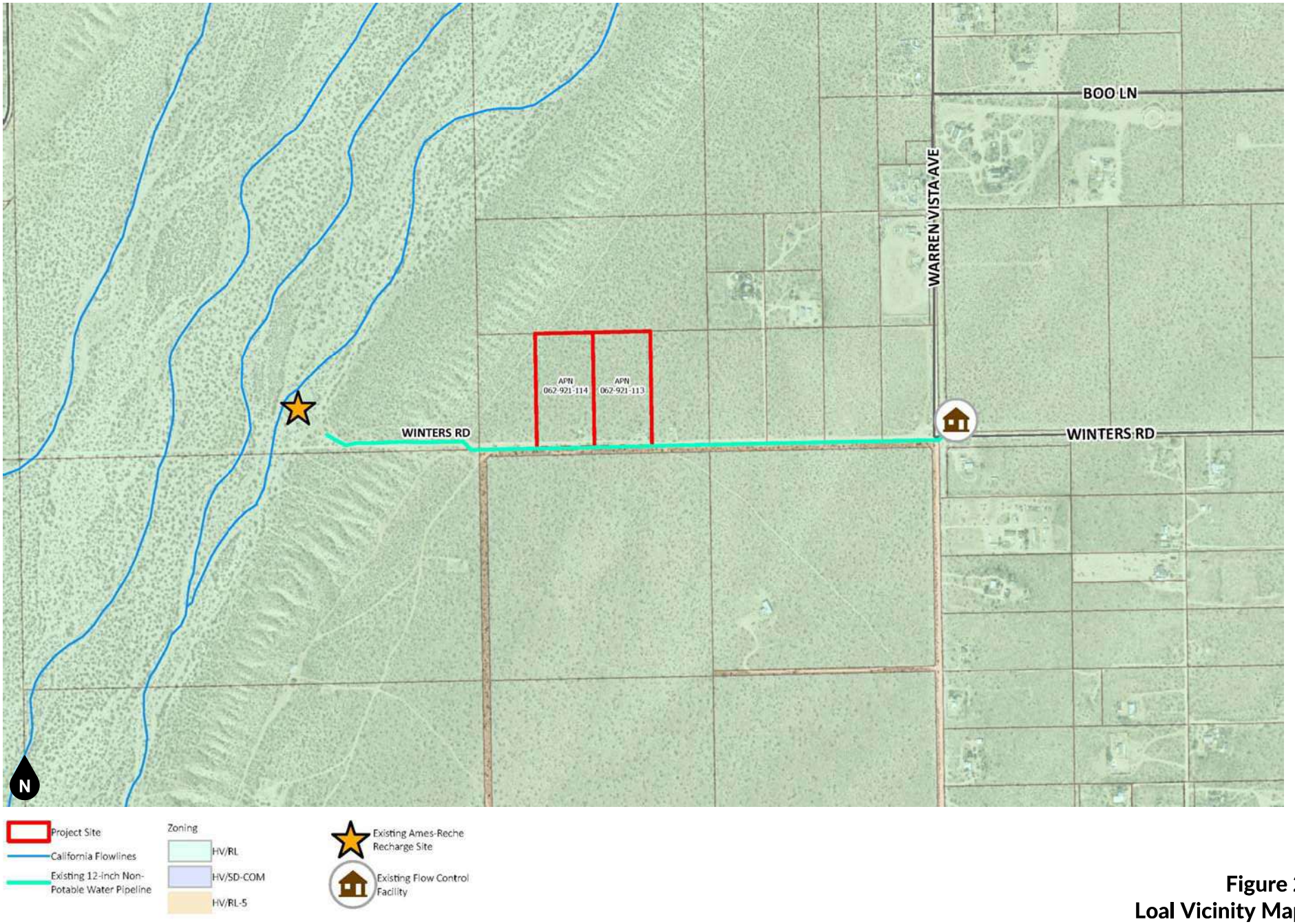

Figure 2
Loal Vicinity Map

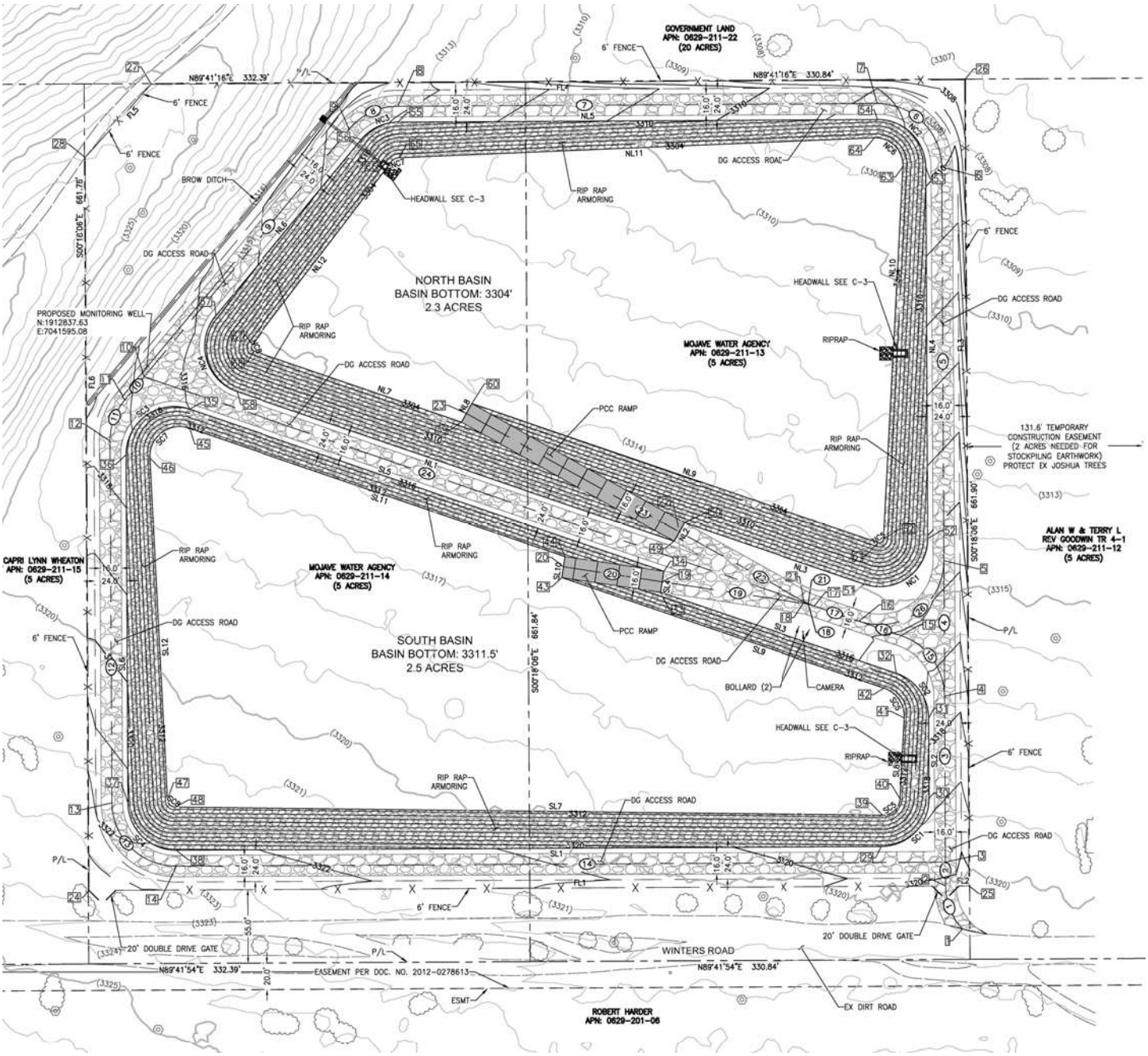

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Figure 3
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

This section provides an overview of key noise and vibration concepts.

NOISE FUNDAMENTALS

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

Commonly used noise terms are presented in Appendix B. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dB(A) or dBA.

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiates uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease. Figure 4 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, or the equivalent noise level for that period of time. For example, $L_{eq(3\text{-}hr)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (DNL). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours. DNL is a very similar 24-hour average measure that weighs only the nighttime hours.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation's Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013).

VIBRATION FUNDAMENTALS

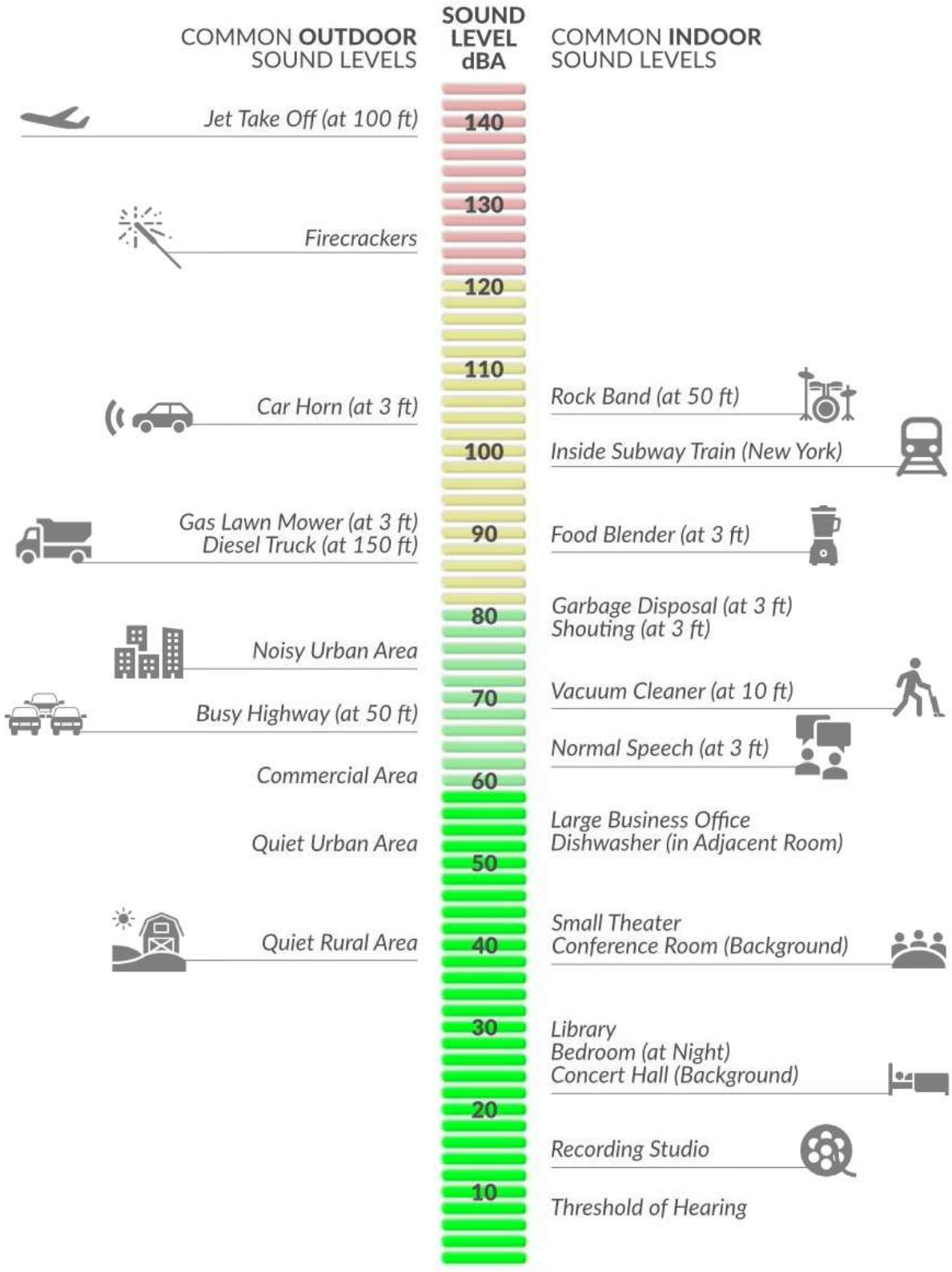
The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. There are three main types of vibration propagation: surface, compression, and shear waves.

Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. Compression waves, or P-waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. Shear waves, or S-waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation".

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal in inches per second. The RMS of a signal is the average of the squared amplitude of the signal in vibration decibels (VdB), ref one micro-inch per second. The Federal Railroad Administration uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel.

PPV is appropriate for evaluating the potential of building damage and VdB is commonly used to evaluate human response. Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval. Figure 5 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in the figure, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually substantial unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.



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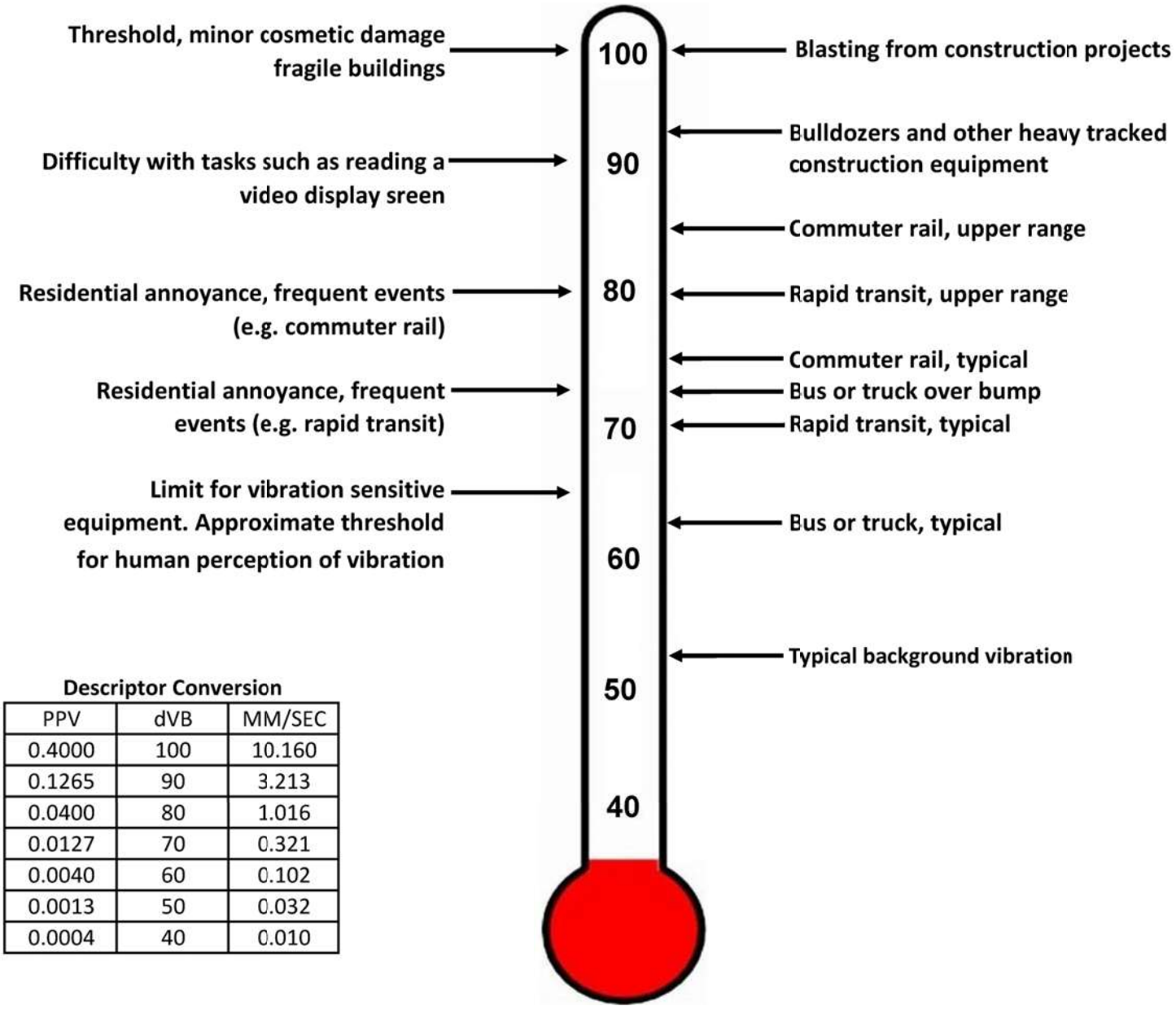
Based on Policy & Guidance from Federal Aviation Administration

Figure 4
A-Weighted Comparative Sound Levels



Descriptor Conversion

PPV	dVB	MM/SEC
0.4000	100	10.160
0.1265	90	3.213
0.0400	80	1.016
0.0127	70	0.321
0.0040	60	0.102
0.0013	50	0.032
0.0004	40	0.010

Source: FRA, 2012. Federal Railroad Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment. Office of Railroad Policy Development, Washington, D.C. DOT/FRA/ORD-12/15. September.

Figure 5
Typical Levels of Groundborne Vibration

3. EXISTING NOISE ENVIRONMENT

This section describes the existing noise setting in the project vicinity.

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered by vacant land to the north, east, and west and Winters Road to the south of the project site.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas.

Existing sensitive land uses that may be affected by project noise include the nearest sensitive receptor to the project site are the existing single-family residential uses with property lines located approximately 275 feet southeast and 290 feet northeast of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section SI.4 2014, Class 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. In order to document existing ambient noise levels in the project area, three (3) 15-minute daytime noise measurements were taken between 9:28 AM and 11:02 AM on April 21, 2025. In addition, one (1) long-term 24-hour noise measurement was also taken from April 21, 2025 to April 22, 2025. Figure 6 shows the noise measurement locations. Field worksheets and noise measurement output data are provided in Appendix C.

As shown on Figure 6, existing ambient noise measurements were taken at the following locations:

- STNM1: Noise measurement represents the residential uses located to the northwest of the project site along Lucky Lane (57522 Lucky Lane, Landers). The noise meter was placed near the southeastern property line of the residential use just west of Lucky Lane.

- STNM2: Noise measurement represents the residential uses located to the southeast of the project site near the intersection of Winters Road and Warren Vista Avenue (921 Warren Vista Avenue, Landers). The noise meter was placed just southeast intersection of Winters Road and Warren Vista Avenue near the northwestern property line of the residential use.

- STNM3: Noise measurement represents the residential uses located to the southeast of the project site along Winters Road near Hilton Avenue (57949 Winters Road, Landers). The noise meter was placed just south of Winters Road along the northern boundary of the residential use.

- LTNM1: Noise measurement represents the existing noise environment in the vicinity of the project site. The noise meter was placed jut east of the western property line of the project site and north of Winters Road.

Table 2 provides a summary of the short-term ambient noise data. Table 3 provides hourly interval ambient noise data from the long-term noise measurements. Measured short-term ambient noise levels ranged between 31.6 and 34 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 20.4 to 43.6 dBA L_{eq}. The dominant noise source in the project vicinity was vehicle traffic associated with Tracy Boulevard/Winters Road as well as bird song, residential activity, and dogs barking.

Table 2
Short-Term Noise Measurement Summary

Daytime Measurements (dBA)[1,2]								
Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
STNM1	10:47 AM	31.6	48.1	23.9	40.4	35.6	30.4	27.6
STNM2	10:03 AM	34.0	47.4	21.8	41.4	38.6	34.4	30.7
STNM3	9:28 AM	32.9	47.9	23.2	41.1	36.3	32.2	30.2

Notes:

(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.

(2) Noise measurements were performed on April 21, 2025.

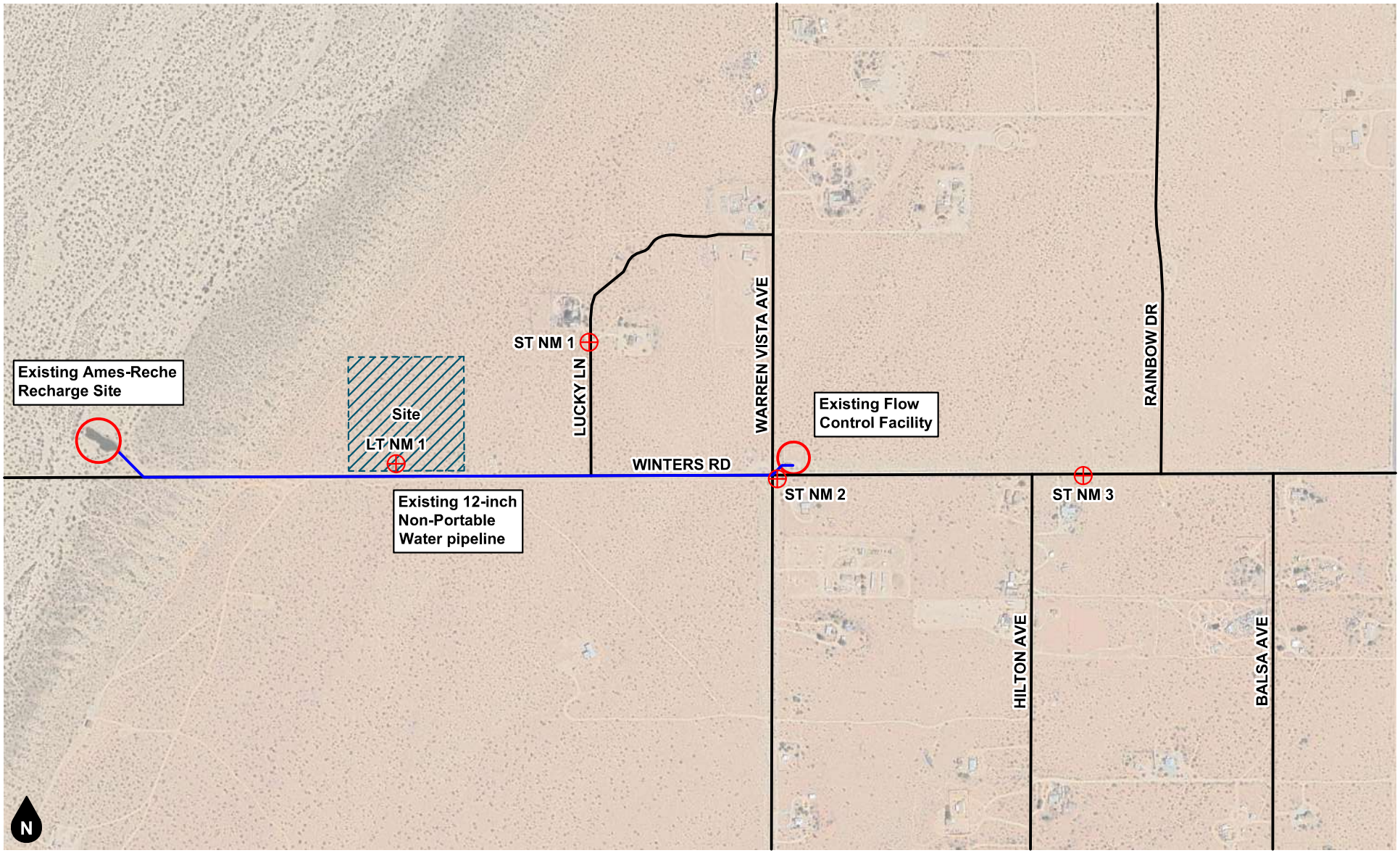
Table 3
Long-Term Noise Measurement Summary

24-Hour Ambient Noise (dBA)[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	1:00 PM	37.0	69.6	15.9	44.8	38.1	30.4	25.2
1	1:00 PM	36.2	55.3	20.5	44.9	39.6	34.3	29.1
2	2:00 PM	38.8	60.5	20.1	45.6	39.3	32.8	27.6
3	3:00 PM	41.5	66.4	21.7	48.9	44.3	39.0	34.7
4	4:00 PM	43.6	69.6	21.3	50.2	45.2	40.1	34.1
5	5:00 PM	36.9	53.1	23.0	44.3	41.1	37.3	33.6
6	6:00 PM	40.3	63.4	21.8	44.3	39.6	34.6	30.4
7	7:00 PM	40.7	67.8	21.2	46.1	38.4	32.7	28.8
8	8:00 PM	33.0	53.8	21.2	39.0	33.9	30.4	28.0
9	9:00 PM	31.4	52.5	17.5	41.9	33.8	27.3	24.2
10	10:00 PM	31.3	63.9	17.3	32.2	28.2	24.9	22.6
11	11:00 PM	23.7	47.4	16.1	30.8	26.3	21.3	18.9
12	12:00 AM	21.2	38.6	16.1	27.6	24.4	21.3	19.4
13	1:00 AM	20.4	37.7	16.0	26.1	22.9	20.7	18.7
14	2:00 AM	23.0	39.0	16.1	29.7	26.8	23.4	20.3
15	3:00 AM	21.1	36.0	15.9	27.8	24.8	21.3	18.9
16	4:00 AM	22.7	39.0	15.9	29.8	26.1	22.8	20.5
17	5:00 AM	25.9	49.6	16.7	32.5	28.4	25.4	22.4
18	6:00 AM	28.1	47.9	20.1	33.6	30.7	28.0	26.2
19	7:00 AM	30.3	49.6	18.1	38.0	33.0	29.2	26.7
20	8:00 AM	38.9	60.3	18.2	48.9	40.6	29.2	22.6
21	9:00 AM	42.8	63.1	18.3	52.2	48.9	25.3	21.4
22	10:00 AM	27.5	47.7	19.4	35.6	29.2	25.2	23.1
23	11:00 AM	36.0	56.2	19.5	45.8	39.6	34.3	28.0
24	12:00 PM	37.4	54.5	21.0	46.4	41.8	36.5	31.8
CNEL	38.8							

Notes:

(1) See Figure 5 for noise measurement locations. Noise measurement was performed over a 24-hour duration.

(2) Noise measurement performed from April 21, 2025 to April 22, 2025.



Legend

NM 1 Noise Measurement Location

ST NM Short-Term Noise Measurement

LT NM Long-Term Noise Measurement

Figure 6
Noise Measurement Location Map

4. REGULATORY SETTING

This section documents the regulatory framework and applicable noise standards.

FEDERAL REGULATION

Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

Federal Transit Administration

Transit and Construction Noise

FTA standards and criteria for assessing noise impacts related to transit projects are based on community reactions to noise. The criteria reflect changes in noise exposure using a sliding scale where the higher the level of existing noise, the smaller increase in total noise exposure is allowed. Some land use activities are more sensitive to noise than others, such as parks, churches and residences, as compared to industrial and commercial uses. FTA Noise Impact Criteria groups sensitive land uses into the three categories described below.

(1) Category 1 – High Sensitivity: Land where quiet is an essential element of its intended purpose. Example land uses include preserved land for serenity and quiet, outdoor amphitheaters and concert pavilions, and national historic landmarks with considerable outdoor use. Recording studios and concert halls are also included in this category.
(2) Category 2 – Residential: This category is applicable all residential land use and buildings where people normally sleep, such as hotels and hospitals.
(3) Category 3 – Institutional: This category is applicable to institutional land uses with primarily daytime and evening use. Example land uses include schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds, and recreational facilities are also included in this category.

Most commercial or industrial uses are not considered noise-sensitive because activities within these buildings are generally compatible with higher noise levels. Business can be considered noise-sensitive if low noise levels are an important part of operations, such as sound and motion picture recording studios. Most parks used primarily for active recreation such as sports complexes and bike or running paths are not considered noise-sensitive. However, some parks (even some in dense urban areas) are primarily used for passive recreation such as reading, conversation, or meditation. These places, which may be valued as havens from

the noise and rapid pace of everyday city life, are treated as noise-sensitive, and are included in land use Category 3. Non-sensitive uses do not require noise impact assessment.

Construction noise is assessed using guidance provided in the FTA Guidance Manual. The FTA provides reasonable criteria for assessing construction noise impacts based on the potential for adverse community reaction. For residential uses, the daytime noise threshold is 80 dBA L_{eq} averaged over an 8-hour period ($L_{eq\ (8\text{-}hr)}$; and the nighttime noise threshold is 70 dBA $L_{eq\ (8\text{-}hr)}$. For commercial uses, the daytime and nighttime noise threshold is 85 dBA $L_{eq\ (8\text{-}hr)}$ and for industrial uses the daytime and nighttime noise threshold is 90 dBA $L_{eq\ (8\text{-}hr)}$.

Federal Interagency Commission on Noise (FICON)

The Federal Interagency Commission on Noise (FICON) has published thresholds that can be used to assess whether a project may result in a substantial increase in noise levels where a lead agency has not adopted their own, as follows:

- If project generated vehicle traffic results in an increase of 5 dB or more where existing ambient noise levels are less than 60 dB CNEL at existing sensitive noise receptors; or
- If project generated vehicle traffic results in an increase of 3 dB or greater where existing ambient noise levels are 60 to 65 dBA CNEL at existing sensitive noise receptors; or
- If project generated vehicle traffic results in an increase of 1.5 dB or more where existing ambient noise levels are greater than 65 dBA CNEL at existing sensitive noise receptors.

STATE REGULATIONS

State of California General Plan Guidelines 2017

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project. The County of San Bernardino has adopted its own version of land use compatibility guidelines titled the County of San Bernardino Noise Standards for Mobile Noise Standards (discussed further in Local Regulations below).

Department of Transportation

The California Department of Transportation (Caltrans) has developed several publications on groundborne vibration. The *Transportation and Construction Vibration Guidance Manual* (Caltrans, 2020) provides informational content that supplements previous publications with improved knowledge and information relating to groundborne transportation- and construction-induced vibrations. Although the *Transportation and*

Construction Vibration Guidance Manual is not an official policy, standard, specification, or regulation, it serves as a useful guide for evaluating vibration impacts.

Table 4 and Table 5 show the guideline criteria for potential damage and annoyance resulting from groundborne vibration. As shown in Table 4, these guidelines specify that the threshold at which there is a risk of architectural damage is a peak particle velocity (PPV) of 0.25 inches/second (in/sec) for historic buildings, 0.3 in/sec at older residential structures, and 0.5 in/sec at new residential structures and modern commercial/industrial buildings. Table 5 shows that a PPV of 0.1 in/sec is the threshold at which groundborne vibration becomes strongly perceptible in regard to annoyance.

LOCAL REGULATIONS

County of San Bernardino General Plan

The County of San Bernardino Countywide Plan (Policy Plan) serves as the County's General Plan and was adopted in October 2020. The County's Policy Plan's Hazards Element provides goals and policies that are intended to protect life, property, and commerce from impacts associated with natural hazards, human-generated hazards, and increased risk due to climate change. The noise related goals and policies from the Hazards Element that are applicable to the proposed project are presented below:

Goal HZ-2 Human-generated Hazards. People and the natural environment are protected from exposure to hazardous materials, excessive noise, and other human-generated hazards.

Policies

Policy HZ-2.7 Truck delivery areas. We encourage truck delivery areas to be located away from residential properties and require associated noise impacts to be mitigated.

Policy HZ-2.8 Proximity to noise generating uses. We limit or restrict new noise sensitive land uses in proximity to existing conforming noise generating uses and planned industrial areas.

Policy HZ-2.9 Control sound at the source. We prioritize noise mitigation measures that control sound at the source before buffers, sound walls, and other perimeter measures.

County of San Bernardino Development Code

Section 83.01.080 of the County of San Bernardino Development Code establishes noise criteria not to be exceeded at the property line of adjacent land uses. These criteria would apply to on-site operational noise generated by the project. Nearby residential land uses may be affected by project-generated operational noise. Sections of the code applicable to the proposed project are presented below.

Noise Standards for Stationary Noise Sources

Stationary noise sources are regulated within the County of San Bernardino Development Code Section 83.01.080(c)(1). Table 6 shows the County-established noise standards for stationary noise sources.

For purposes of this analysis, project operational noise was evaluated in light of the L_{eq}(30-minute) and the maximum (Lmax) noise standards. It is highly unlikely that the other standards would be exceeded if the project is in compliance with these two standards. The 30-minute L_{eq} is referred to as "L_{eq}" throughout this document. The L_{eq} and L_{eq}(30-minute) are equivalent in this analysis.

The County's L_{eq} standards are presented in Table 6. Exterior noise level standards for residential land uses are 55 dBA L_{eq} during daytime hours and 45 dBA L_{eq} during nighttime hours; 55 dBA L_{eq} for daytime and nighttime hours at professional service land uses; 60 dBA L_{eq} for both daytime and nighttime at other commercial land uses; and 70 dBA L_{eq} for both daytime and nighttime at industrial land uses.

Per Development Code Section 83.01.080(e), the base standards may be adjusted such that the allowable noise exposure standard shall be increased to reflect the ambient noise level if the measured ambient level exceeds any of the first four noise limit categories. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

In addition, County of San Bernardino Development Code Section 83.01.080(c)(2) states that:

"No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.
(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.
(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.
(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.
(E) The noise standard plus 20 dB(A) for any period of time."

Noise Standards for Adjacent Mobile Noise Sources

Mobile noise sources are regulated within the County of San Bernardino Development Code Section 83.01.080(d). Table 7 shows the County-established interior and exterior standards for mobile noise sources. As shown in Table 7, the noise level criteria of 45 dBA CNEL for interior noise and the 65 dBA CNEL apply to residential land uses.

Noise Standards for Construction Noise

Temporary construction, maintenance, repair, and demolition activities between 7:00 AM and 7:00 PM, except Sundays and Federal holidays are exempt from Section 83.01.080(g)(3) the San Bernardino Development Code.

Groundborne Vibration

Section 83.01.090(a) of the County of San Bernardino Development Code prohibits the creation of ground vibration that can be felt without the aid of instruments at or beyond the lot-line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot-line. Per Section 83.01.090(c), construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays.

Table 4
Guideline Criteria for Vibration Damage Potential

Structure Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Notes:

PPV = Peak Particle Velocity

Source: *Transportation and Construction Vibration Guidance Manual* (California Department of Transportation, April 2020); Chapter 7, Table 19.

Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 5
Guideline Criteria for Vibration Annoyance Potential

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Notes:
PPV = Peak Particle Velocity
Source: *Transportation and Construction Vibration Guidance Manual* (California Department of Transportation, April 2020); Chapter 7, Table 20.
Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 6
County of San Bernardino Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7:00 AM to 10:00 PM dBA L_{eq}	10:00 PM to 7:00 AM dBA L_{eq}
Residential	55	45
Professional Services	55	55
Other Commercial	60	60
Industrial	70	70

Source: County of San Bernardino Development Code Section 83.01.080(c)(1), Table 83-2.

Notes:

(1) Per County of San Bernardino Development Code Section 83.01.080(e), if the measured ambient level exceeds any of the first four noise limit categories, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level. Considering that the proejct is an existing land use, this methodology was not applied.

(2) Noise Limit Categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

Table 7
County of San Bernardino Noise Standards for Mobile Noise Sources

Land Use		L_{dn} (or CNEL) dB(A)	
Category	Type	Interior[1]	Exterior[2]
Residential	Single and multi-family, duplex, mobile homes	45	60[3]
Commercial	Hotel, motel, transient housing	45	60[3]
	Commercial retail, bank, restaurant	50	n/a
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	n/a
Institutional/ Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	n/a	65

Notes:

Source: County of San Bernardino Development Code, Development Code Table 83-3.

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

Hospital/office building patios
Hotel and motel recreation areas
Mobile home parks
Multi-family private patios or balconies
Park picnic areas
Private yard of single-family dwellings
School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

This section discusses the analysis methodologies used to assess noise impacts.

CONSTRUCTION NOISE MODELING

Construction noise associated with the proposed project was calculated at the sensitive receptor locations, utilizing methodology presented in the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (2018) together with several key construction parameters, including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site. Distances to receptors were based on the acoustical center of the project site.

The equipment used to calculate the construction noise levels for each phase were based on the assumptions provided in the California Emissions Estimator Model (CalEEMod) modeling provided in the Air Quality, Global Climate Change, and Energy Impact Analysis prepared for the proposed project (Ganddini Group Inc., 2025). For analysis purposes, the distance measured from the project site to sensitive receptors was assumed to be the acoustical center of the project site to the property line of residential properties with existing residential buildings. Sound emission levels associated with typical construction equipment as well as typical usage factors provided in Table 8 were utilized for modeling purposes. Construction noise worksheets are provided in Appendix D.

MOBILE SOURCE NOISE MODELING

Noise from vehicular traffic was projected using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Key model parameters and REMEL adjustments are presented below:

- Roadway classification (e.g., freeway, major arterial, arterial, secondary, collector, etc.)
- Roadway Active Width (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic Volumes (ADT), Travel Speeds, Percentages of automobiles, medium trucks, and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period.

The traffic noise calculation worksheets are included in Appendix E.

GROUNDBORNE VIBRATION MODELING

Groundborne vibration modeling was performed using vibration propagation equations and construction equipment source levels obtained from the FTA *Transit Noise and Vibration Impact Assessment Manual* (2018). Table 9 shows typical vibration levels associated with commonly used construction equipment based on data from the FTA.

There are several types of construction equipment that can cause vibration levels high enough to annoy persons in the vicinity and/or result in architectural or structural damage to nearby structures and improvements. For example, as shown in Table 9, a vibratory roller could generate up to 0.21 PPV at a distance of 25 feet; and operation of a large bulldozer (0.089 PPV) at a distance of 25 feet (two of the most vibratory pieces of construction equipment). Groundborne vibration at sensitive receptors associated with this equipment would drop off as the equipment moves away. For example, as the vibratory roller moves further

than 100 feet from the sensitive receptors, the vibration associated with it would drop below 0.0026 PPV. It should be noted that these vibration levels are reference levels and may vary slightly depending upon soil type and specific usage of each piece of equipment. Groundborne vibration calculations are provided in Appendix F.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{equipment} = PPV_{ref} (25/D_{rec})^{n}$$

Where: PPV_{ref} = *reference PPV at 25ft.*
D_{rec} = *distance from equipment to receiver in ft.*
n = 1.1 (*the value related to the attenuation rate through ground*)

Table 8 (1 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-N/A-	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-N/A-	0
Blasting	Yes	-N/A-	94	-N/A-	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-N/A-	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Forklift[2,3]	No	50	n/a	61	n/a
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-N/A-	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-N/A-	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	50	85	77	9
Paving Equipment	No	50	85	77	9
Pneumatic Tools	No	50	85	85	90

Table 8 (2 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-N/A-	0
Tractor	No	40	84	-N/A-	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

Notes:

(1) Source: FHWA Roadway Construction Noise Model User's Guide January 2006.

(2) Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014 http://www.noisetesting.info/blog/carl-strautins/page-3/

(3) Data provided Leq as measured at the operator. Sound Level at 50 feet is calculated using Inverse Square Law.

Table 9
Construction Equipment Vibration Source Levels

Equipment		PPV at 25 ft, in/sec	Approximate Lv* at 25 ft
Pile Driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	typical	0.170	93
clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Loaded Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment Manual, 2018.
*RMS velocity in decibels, VdB re 1 micro-in/sec

6. NOISE AND VIBRATION IMPACT ANALYSIS

This section analyzes the significance of project-related noise and groundborne vibration impacts relative to standards established by the County of San Bernardino and other applicable agencies in the context of CEQA. Appendix G of the California Environmental Quality Act Guidelines (Title 14, Division 6, Chapter 3 of the California Code of Regulations) includes an environmental checklist that identifies issues upon which findings of significance should be made. The CEQA Environmental Checklist Appendix G, XIII. Noise, requires determination if the project would result in:

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

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

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

NOISE IMPACTS

Would the project result in:

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

Finding: Less Than Significant

In relation to the Environmental Checklist noise issue "a", applicable standards established by the County of San Bernardino can be categorized into the following areas:

- Construction Noise
- Operational Noise

Project Construction

On-Site Equipment

Construction noise is regulated within Section 83.01.080(g)(3) of the County of San Bernardino's Development Code (see Regulatory Setting section of this report). Accordingly, the project would result in a significant impact if:

- Construction activities take place outside of the hours of 7:00 AM and 7:00 PM, except Sundays and Federal holidays.

As the County of San Bernardino does not establish a numeric maximum acceptable construction source noise level at potentially affected receivers during the daytime, which would allow for a quantified determination of what CEQA consists as a *substantial temporary or periodic noise increase*. Therefore, a numerical construction noise threshold based on the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction daytime noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime (7:00 AM to 10:00 PM) exterior construction noise level of 80 dBA L_{eq} and nighttime (10:00 PM to 7:00 AM) exterior construction noise level of 70 dBA L_{eq} for noise sensitive residential land uses and 85 dBA L_{eq} (daytime and nighttime) for commercial uses.

Accordingly, the project would result in a significant impact if:

- Project construction occurs outside the hours of 7:00 AM and 7:00 PM or at any time on a Sunday and Federal holiday; or,
- Project construction noise exceeds 80 dBA L_{eq} during the daytime (7:00 AM to 10:00 PM) or 70 dBA L_{eq} during the nighttime (10:00 PM to 7:00 AM) at residential uses; or,
- Project construction noise exceeds 85 dBA L_{eq} at commercial uses.

As stated previously, project construction noise levels at nearby sensitive receptors were calculated using the FTA methodology. Construction noise modeling worksheets for each phase are provided in Appendix D. Anticipated noise levels during each construction phase are presented in Table 10.

As shown in Table 10, modeled construction noise levels will range between 63.3 and 69.2 dBA L_{eq} at the nearest property line of the existing residential land uses surrounding the project site. Construction noise will not exceed the FTA daytime construction noise threshold for impacts to residential land uses (80 dBA L_{eq} daytime and 70 dBA L_{eq} nighttime) or commercial land uses (85 dBA L_{eq}). Construction activities will occur between 7:30 AM and 4:30 PM, Monday through Friday; weekend work will be avoided when feasible, however, weekend or night work might occur to avoid peak traffic.

Furthermore, BMPs provided in the Project Description, which can be added to project plans and in contract specifications, will minimize construction noise.

Off-Site Vehicle Trips

The County of San Bernardino's Development Code establishes mobile source noise standards. As shown in Table 7, the exterior mobile source noise standard for a residential use is 60 dBA CNEL.

Construction truck trips would occur throughout the construction period. The existing average daily traffic (ADT) along Winters Road is estimated to be 4 vehicles per day.[5] Given the project site's location, it is anticipated that vendor and/or haul truck traffic would take the most direct route to State Route 247 or State Route 62. As shown in the CalEEMod output files provided in the Air Quality, Greenhouse Gas, and Energy Impact Analysis prepared for the proposed project (Ganddini, 2025), the greatest number of construction-related vehicle trips per day would be up to 70 vehicle trips per day during Phase 2 Recharge Basins (20 for worker trips and 49.7 for hauling trips). The modeled existing plus project noise level is 51.6 dBA CNEL, which is below the residential noise level standard of 60 dBA CNEL (see Appendix E). Off-site project generated construction vehicle trips would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

[5] Existing average daily traffic was estimated using measured ambient noise levels. As shown in Table 2, daytime existing ambient noise levels along Winters Road ranged between 32.9 and 34 dBA L_{eq}.

Project Operational Noise

The project is the development of two new recharge basins, approximately 500 linear feet of water pipeline, and a monitoring well. There are no stationary noise sources associated with the project. However, to conduct routine inspections and ensure proper long-term maintenance, the long-term operation of the project will require a minimal number of monthly worker trips. Additional staffing needs for long-term operation and maintenance of the proposed project are not anticipated. Therefore, the addition of project vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

GROUNDBORNE VIBRATION IMPACTS

Would the project result in:

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

Finding: Less Than Significant

In relation to the Environmental Checklist noise issue "b", Section 83.01.090(a) of the County of San Bernardino Development Code prohibits the creation of ground vibration that can be felt without the aid of instruments at or beyond the lot-line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second (in/sec) measured at or beyond the lot-line. Per Section 83.01.090(c), construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays. Additionally, the Caltrans *Transportation and Construction Vibration Guidance Manual* provides guidance criteria at which there is a potential for architectural damage (see Regulatory Section, Table 4). Accordingly, the project would result in a significant impact if:

- Groundborne vibration levels generated by the project during construction or operation have the potential to cause architectural damage at nearby buildings by exceeding the following PPV:
  - 0.08 in/sec at extremely fragile historic buildings, ruins, ancient monuments;
  - 0.10 in/sec at fragile buildings;
  - 0.25 in/sec at historic and some old buildings;
  - 0.30 in/sec at older residential structures;
  - 0.50 in/sec at new residential structures and modern industrial/commercial buildings; or
- Groundborne vibration levels generated by project construction produce a PPV greater than 0.2 inches per second at or beyond the property line outside the hours of 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays.
- Groundborne vibration levels generated by the project have the potential to cause strongly perceptible annoyance to people living or working in nearby buildings by exceeding a PPV of 0.1 in/sec.

Groundborne vibration modeling was performed based on the FTA methodology; worksheets are provided in Appendix F.

The closest existing structures include residential structures located as close as approximately 536 feet northeast and 1,105 feet southeast of the project site boundaries.

Table 11 summarizes the modeled groundborne vibration levels at the nearest sensitive receptors. As shown in Table 11, at the nearest residential receptor, the use of a vibratory roller would be expected to generate a PPV of 0.002 in/sec and a bulldozer would be expected to generate a PPV of 0.001 in/sec. The project would not exceed either the County of San Bernardino Development Code Section 83.01.090(c) threshold of a PPV

of 0.2 in/sec nor the Caltrans architectural damage threshold for older residential uses of a PPV of 0.3 in/sec. Furthermore, as shown in Table 11, the project would also not cause strongly perceptible annoyance to people living or working in nearby buildings. The project impact is less than significant; no mitigation is required.

The most substantial sources of groundborne vibration during post-construction project operations will include the movement of passenger vehicles and trucks on paved and generally smooth surfaces. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020), which is a substantially lower PPV than that of a vibratory roller (0.210 in/sec PPV at 25 feet). Therefore, groundborne vibration levels generated by project operation would not exceed those modeled for project construction.

AIR TRAFFIC IMPACTS

Would the project result in:

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 area to excessive noise levels?*

Finding: No Impact

There are no airports within two miles of the project site. Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels. There is no impact, and no mitigation is required.

Table 10
Construction Noise Levels

Phase	Receptor Location	Construction Noise Levels (dBA Leq)[1]	Applicable Daytime FTA Threshold (dBA Leq)2	Applicable Nighttime FTA Threshold (dBA Leq)[2]	FTA Threshold Exceeded (Day/Night)?
Phase 1: Monitoring Well Drilling	Residential to Northeast (57522 Lucky Ln)	63.7	80	70	No/No
	Residential to Southeast (57635 Winters Rd)	63.3	80	70	No/No
Phase 2: Retention Basins	Residential to Northeast (57522 Lucky Ln)	69.2	80	70	No/No
	Residential to Southeast (57635 Winters Rd)	68.8	80	70	No/No

Notes:

1. Construction noise worksheets are provided in Appendix D.
2. The FTA considers a daytime (7:00 AM to 10:00 PM) exterior construction noise level of 80 dBA Leq and nighttime (10:00 PM to 7:00 AM) exterior construction noise level of 70 dBA Leq for noise sensitive residential land uses and 85 dBA Leq (daytime and nighttime) for commercial uses.

Table 11
Construction Vibration Levels at the Nearest Receptors

Receptor Location	Distance from Property Line to Nearest Structure (feet)	Equipment	Vibration Level (PPV)[1]	Caltrans Architectural Damage Threshold (PPV)[2]	County of San Bernardino Threshold (PPV)[2]	Threshold Exceeded?
Residential to Northeast (57522 Lucky Ln, Landers)	536	Vibratory Roller	0.002	0.3	0.2	No/No
	536	Large Bulldozer	0.001	0.3	0.2	No/No
Residential to Southeast (57635 Winters Rd, Landers)	1,105	Vibratory Roller	0.001	0.3	0.2	No/No
	1,105	Large Bulldozer	0.000	0.3	0.2	No/No

Notes:

(1) PPV = Peak Particle Velocity in inches per second.

(2) Caltrans guidance identifies the threshold at which there is a risk of architectural damage as 0.3 in/sec PPV at older residential structures and 0.5 in/sec PPV at modern industrial/commercial buildings (see Table 3). In addition, Section 83.01.090(c) of the County's Development Code includes a threshold of 0.2 in/sec PPV; however, construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays.

7. REFERENCES

California, State of, Department of Transportation
2020 Transportation and Construction Vibration Guidance Manual. April.

California, State of, Building Code
2019 Chapter 12, Section 1206.4 Allowable Interior Noise Levels

Environmental Protection Agency
1974 "Information on Levels of Environmental Noise Requisite to Protect Public Health And Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March 1974.

Federal Transit Administration
2018 Transit Noise and Vibration Impact Assessment Manual. Typical Construction Equipment Vibration Emissions.

Office of Planning and Research
2017 State of California General Plan Guidelines

San Bernardino, County of
2007 County of San Bernardino 2007 Development Code. March 13 (as amended December 14, 2021).

2020 County of San Bernardino Policy Plan. October.

U.S. Department of Transportation
2006 FHWA Roadway Construction Noise Model User's Guide. January.

APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheets
Appendix D Construction Noise Model Worksheets
Appendix E FHWA Worksheets
Appendix F Groundborne Vibration Worksheets

APPENDIX A

LIST OF ACRONYMS

Term	Definition
ADT	Average Daily Traffic
ANSI	American National Standard Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
D/E/N	Day / Evening / Night
dB	Decibel
dBA or dB(A)	Decibel "A-Weighted"
dBA/DD	Decibel per Double Distance
dBA L_{eq}	Average Noise Level over a Period of Time
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
L_{02},L_{08},L_{50},L_{90}	A-weighted Noise Levels at 2 percent, 8 percent, 50 percent, and 90 percent, respectively, of the time period
DNL	Day-Night Average Noise Level
$L_{eq(x)}$	Equivalent Noise Level for '"x" period of time
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Level of Noise (measured using a sound level meter)
L_{min}	Minimum Level of Noise (measured using a sound level meter)
Lp	Sound Pressure Level
LOS C	Level of Service C
Lw	Sound Power Level
OPR	California Governor's Office of Planning and Research
PPV	Peak Particle Velocities
RCNM	Road Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root Mean Square

APPENDIX B

GLOSSARY

Term	Definition
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
CNEL	Community Noise Equivalent Level. CNEL is a weighted 24-hour noise level that is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours.
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
DNL, Ldn	Day Night Level. The DNL, or Ldn is a weighted 24-hour noise level that is obtained by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the nighttime hours.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
L_{02}, L_{08}, L_{50}, L_{90}	The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
L_{max}, L_{min}	Lmax is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. Lmin is the minimum level.
Offensive/ Offending/Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.

APPENDIX C

NOISE MEASUREMENT FIELD WORKSHEETS

Noise Measurement
Field Data

Project Name: Ames-Reche Recharge Basin, Yucca Valley **Date:** April 21, 2025

Project #: 19712

Noise Measurement #: STNM1 Run Time 15 minutes **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 57522 Lucky Lane, Landers, CA 92285

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: Just W of Lucky Lane & S of residence 57522 Lucky Lane, Landers.

Adjacent: Lucky Lane (traveling N-S) just E of STNM1. Residence to the N and E. Winters Rd (traveling E-W) ~680' S of STNM1 microphone.

Weather: >10% cloud, sunny. Sunset: 7:22PM **Settings:** SLOW FAST

Temperature: 63 deg F **Wind:** 2 mph **Humidity:** 20% **Terrain:** Flat

Start Time: 10:47 AM **End Time:** 11:02 AM **Run Time:**

Leq: 31.6 dB **Primary Noise Source:** Bird song.

Lmax 48.1 dB

L2 40.4 dB **Secondary Noise Sources:** No vehicles passed microphone during measurement. 2 mph breeze blowing

L8 35.6 dB through desert vegetation.

L25 30.4 dB

L50 27.6 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	7/31/2024	**FACTORY CALIBRATION DATE:**	7/10/2024
FIELD CALIBRATION DATE:	4/21/2025		

Noise Measurement
Field Data

PHOTOS:



STNM1 looking E across Lucky Lane towards residence 777 Lucky Lane, Yucca Valley.



STNM1 looking N up Lucky Lane towards residence 57522 Lucky Lane, Landers.

Summary	
File Name on Meter	LxT_Data.566.s
File Name on PC	LxT_0003099-20250421 104703-LxT_Data.566.ldbin
Serial Number	3099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM1 34°14'19.45"N 116°24'28.59"W
Job Description	15 minute noise measurement
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley

Measurement	
Start	2025-04-21 10:47:03
Stop	2025-04-21 11:02:03
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2025-04-21 10:45:31
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.2 dB

Results			
L_{Aeq}	31.6		
LAE	61.2		
EA	0.1453104	µPa²h	
EA8	4.649933	µPa²h	
EA40	23.24967	µPa²h	
$L_{Apeak\ (max)}$	2025-04-21 10:48:10	77.8	dB
L_{ASmax}	2025-04-21 10:52:16	48.1	dB
L_{ASmin}	2025-04-21 10:54:04	23.9	dB

			Statistics		
L_{Ceq}	51.0	dB	**LA2.00**	40.4	dB
L_{Aeq}	31.6	dB	**LA8.00**	35.6	dB
L_{Ceq} - L_{Aeq}	19.4	dB	**LA25.00**	30.4	dB
L_{AIeq}	39.3	dB	**LA50.00**	27.6	dB
L_{Aeq}	31.6	dB	**LA66.60**	26.7	dB
L_{AIeq} - L_{Aeq}	7.7	dB	**LA90.00**	25.4	dB
Overload Count	0				
Overload Duration	0.0	s			

Measurement Report

Report Summary

Meter's File Name	LxT_Data.566.s	Computer's File Name	LxT_0003099-20250421 104703-LxT_Data.566.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM1 34°14'19.45"N 116°24'28.59"W
Job Description	15 minute noise measurement		
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley		
Start Time	2025-04-21 10:47:03	Duration	0:15:00.0
End Time	2025-04-21 11:02:03	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	31.6 dB		
LAE	61.2 dB	SEA	--- dB
EA	0.1 µPa²h	LAFTM5	40.6 dB
EA8	4.6 µPa²h		
EA40	23.2 µPa²h		
LA_{peak}	77.8 dB	2025-04-21 10:48:10	
LAS_{max}	48.1 dB	2025-04-21 10:52:16	
LAS_{min}	23.9 dB	2025-04-21 10:54:04	
LA_{eq}	31.6 dB		
LC_{eq}	51.0 dB	LC_{eq} - LA_{eq}	19.4 dB
LAI_{eq}	39.3 dB	LAI_{eq} - LA_{eq}	7.7 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	31.6 dB		51.0 dB		--- dB	
$Ls_{(max)}$	48.1 dB	2025-04-21 10:52:16	--- dB		--- dB	
$LS_{(min)}$	23.9 dB	2025-04-21 10:54:04	--- dB		--- dB	
$L_{Peak(max)}$	77.8 dB	2025-04-21 10:48:10	--- dB		--- dB	

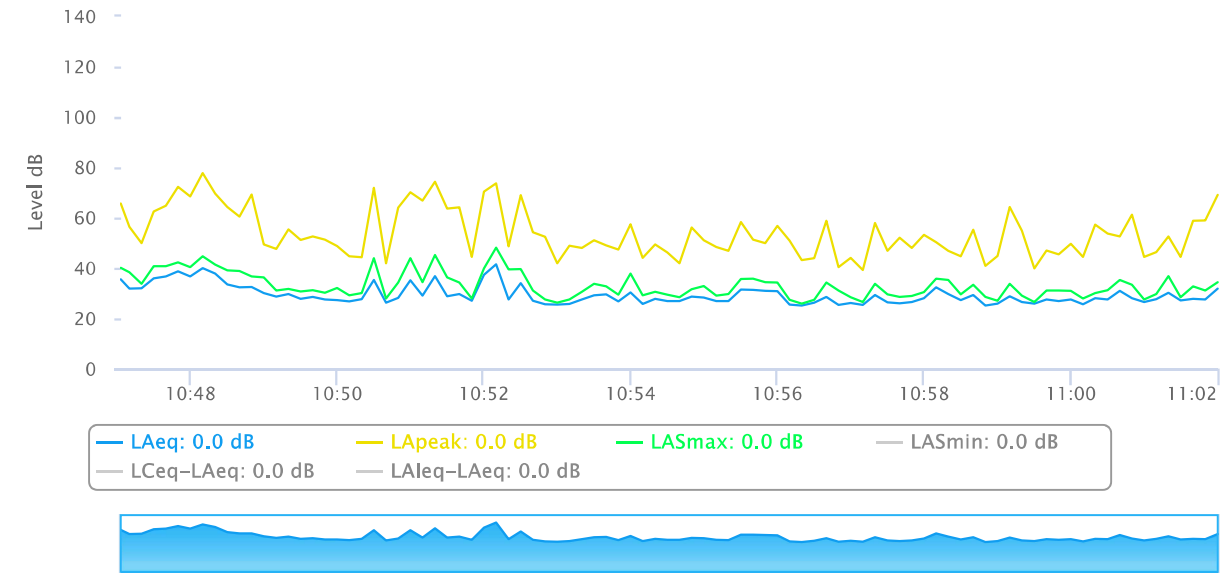
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 2.0	40.4 dB
LAS 8.0	35.6 dB
LAS 25.0	30.4 dB
LAS 50.0	27.6 dB
LAS 66.6	26.7 dB
LAS 90.0	25.4 dB

Time History



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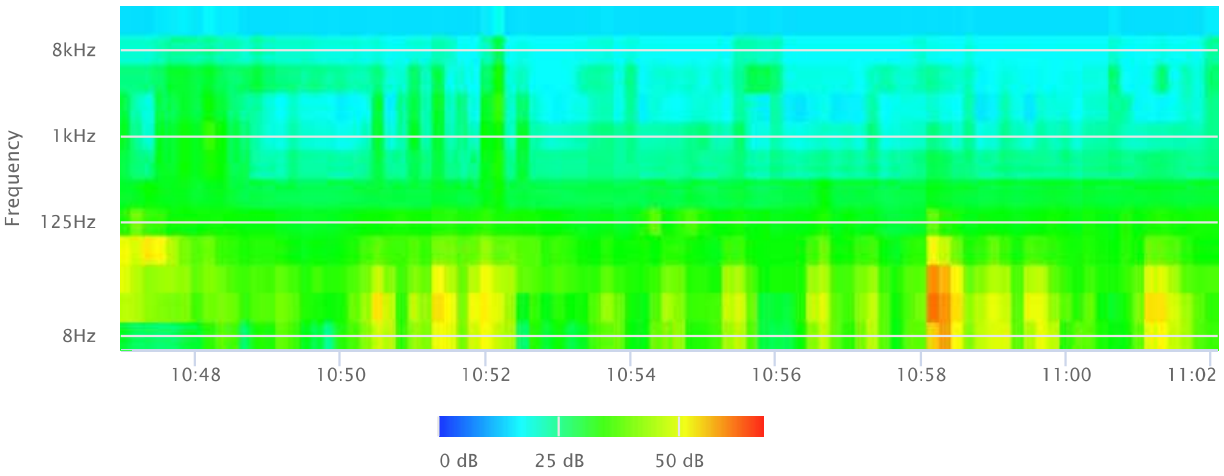
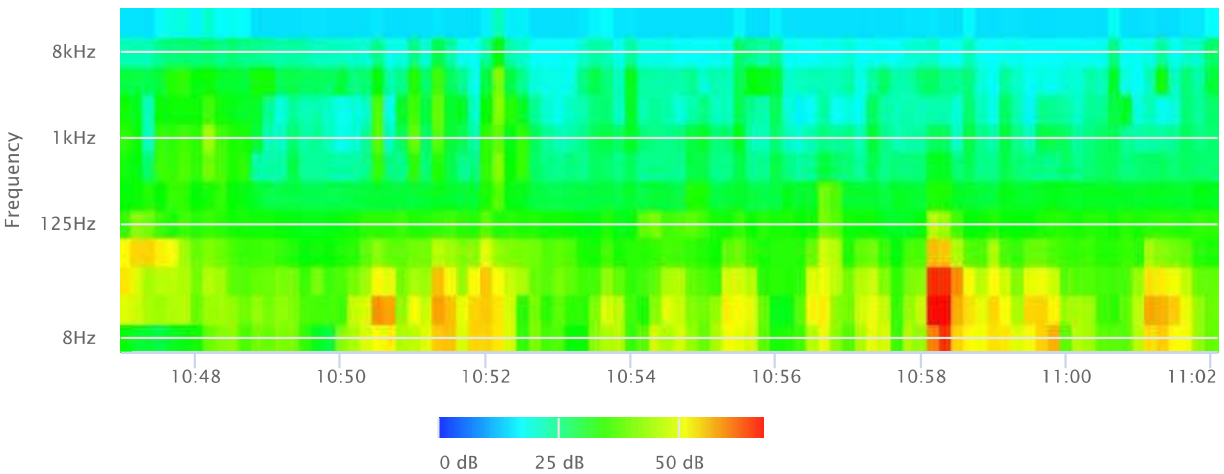
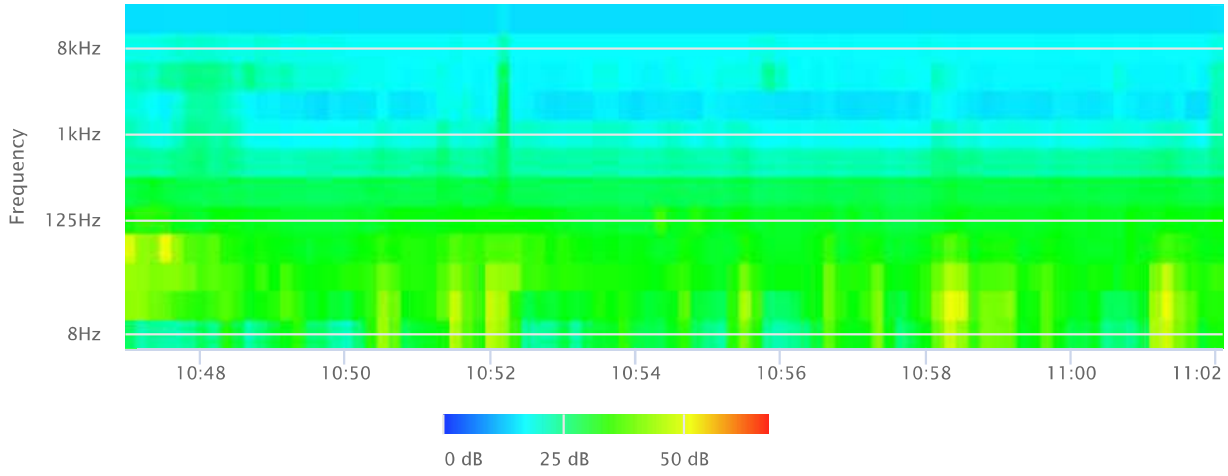


OBA 1/1 Lmax



OBA 1/1 Lmin



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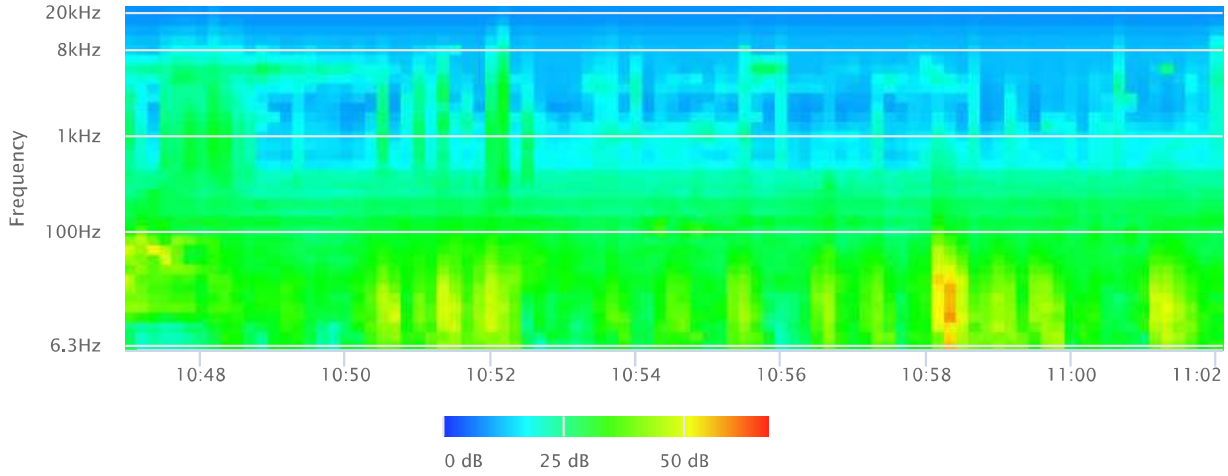
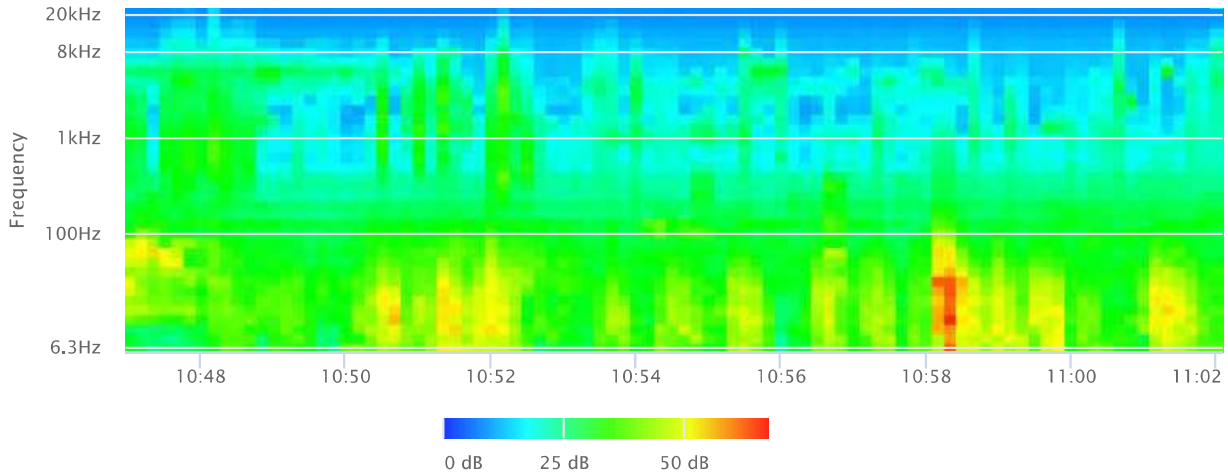


OBA 1/3 Lmax



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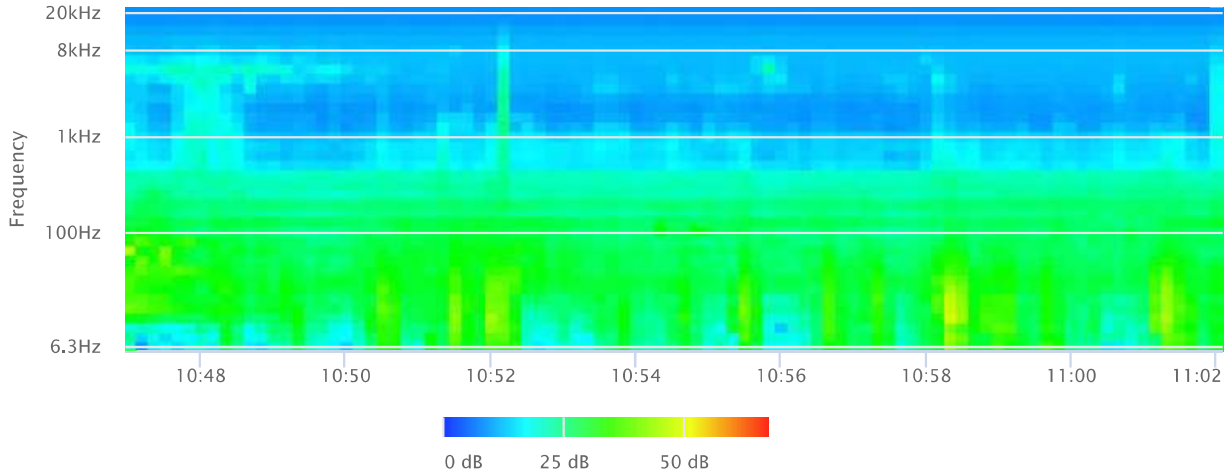

20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
10:48
10:50
10:52
10:54
10:56
10:58
11:00
11:02
0 dB
25 dB
50 dB

Noise Measurement
Field Data

Project Name: Ames-Reche Recharge Basin, Yucca Valley **Date:** April 21, 2025

Project #: 19712

Noise Measurement #: STNM2 Run Time 15 minutes **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 921 Warren Vista Avenue, Yucca Valley, CA 92284

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: SE corner of Warren Vista Ave & Winters Rd intersection. Adjacent: Warren Vista Ave (running N-S) just W of STNM2 & Winters Rd (running E-W) just N of STNM2, both are dirt roads. Mostly vacant desert. One residence SE & one building NE of STNM2.

Weather: >10% cloud, sunny. Sunset: 7:22PM **Settings:** SLOW FAST

Temperature: 63 deg F **Wind:** 2 mph **Humidity:** 20% **Terrain:** Flat

Start Time: 10:03 AM **End Time:** 10:18 AM **Run Time:**

Leq:	34	dB
Lmax	47.4	dB
L2	41.4	dB
L8	38.6	dB
L25	34.4	dB
L50	30.7	dB

Primary Noise Source: Some residential ambiance, distant dogs barking.

Secondary Noise Sources: Bird song, slight noise from 2 mph breeze through desert vegetation.

No vehicles passed STNM2 microphone during measurement.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	7/31/2024	**FACTORY CALIBRATION DATE:**	7/10/2024
FIELD CALIBRATION DATE:	4/21/2025		

Noise Measurement
Field Data

PHOTOS:



STNM2 looking W across intersection of Warren Vista Ave (N-S) & Winters Rd (E-W).



STNM2 looking SE from SE corner of intersection Warren Vista Ave (N-S) & Winters Road (E-W) towards residence 921 Warren Vista Ave, Yucca Valley.

Summary					
File Name on Meter	LxT_Data.565.s				
File Name on PC	LxT_0003099-20250421 100346-LxT_Data.565.ldbin				
Serial Number	3099				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM2 34°14'12.45"N 116°24'15.87"W				
Job Description	15 minute noise measurement				
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley				
Measurement					
Start	2025-04-21 10:03:46				
Stop	2025-04-21 10:18:46				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre-Calibration	2025-04-21 10:03:19				
Post-Calibration	None				
Overall Settings					
RMS Weight	A Weighting				
Peak Weight	A Weighting				
Detector	Slow				
Preamplifier	PRMLxT1L				
Microphone Correction	Off				
Integration Method	Linear				
OBA Range	Normal				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	C Weighting				
OBA Max Spectrum	At LMax				
Overload	122.1 dB				
Results					
LAeq	34.0				
LAE	63.5				
EA	0.2499866 µPa²h				
EA8	7.999573 µPa²h				
EA40	39.99786 µPa²h				
LApeak (max)	2025-04-21 10:06:01	72.4 dB			
LASmax	2025-04-21 10:09:08	47.4 dB			
LASmin	2025-04-21 10:18:01	21.8 dB			
			Statistics		
LCeq	46.1 dB		**LA2.00**	41.4 dB	
LAeq	34.0 dB		**LA8.00**	38.6 dB	
LCeq - LAeq	12.2 dB		**LA25.00**	34.4 dB	
LAleq	43.1 dB		**LA50.00**	30.7 dB	
LAeq	34.0 dB		**LA66.60**	28.8 dB	
LAleq - LAeq	9.1 dB		**LA90.00**	25.5 dB	
Overload Count	0				
Overload Duration	0.0 s				

Measurement Report

Report Summary

Meter's File Name	LxT_Data.565.s	Computer's File Name	LxT_0003099-20250421 100346-LxT_Data.565.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM2 34°14'12.45"N 116°24'15.87"W
Job Description	15 minute noise measurement		
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley		
Start Time	2025-04-21 10:03:46	Duration	0:15:00.0
End Time	2025-04-21 10:18:46	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	34.0 dB		
LAE	63.5 dB	SEA	--- dB
EA	0.2 µPa²h	LAFTM5	43.7 dB
EA8	8.0 µPa²h		
EA40	40.0 µPa²h		
LA_{peak}	72.4 dB	2025-04-21 10:06:01	
LAS_{max}	47.4 dB	2025-04-21 10:09:08	
LAS_{min}	21.8 dB	2025-04-21 10:18:01	
LA_{eq}	34.0 dB		
LC_{eq}	46.1 dB	LC_{eq} - LA_{eq}	12.2 dB
LAI_{eq}	43.1 dB	LAI_{eq} - LA_{eq}	9.1 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	34.0 dB		46.1 dB		--- dB	
$Ls_{(max)}$	47.4 dB	2025-04-21 10:09:08	--- dB		--- dB	
$LS_{(min)}$	21.8 dB	2025-04-21 10:18:01	--- dB		--- dB	
$L_{Peak(max)}$	72.4 dB	2025-04-21 10:06:01	--- dB		--- dB	

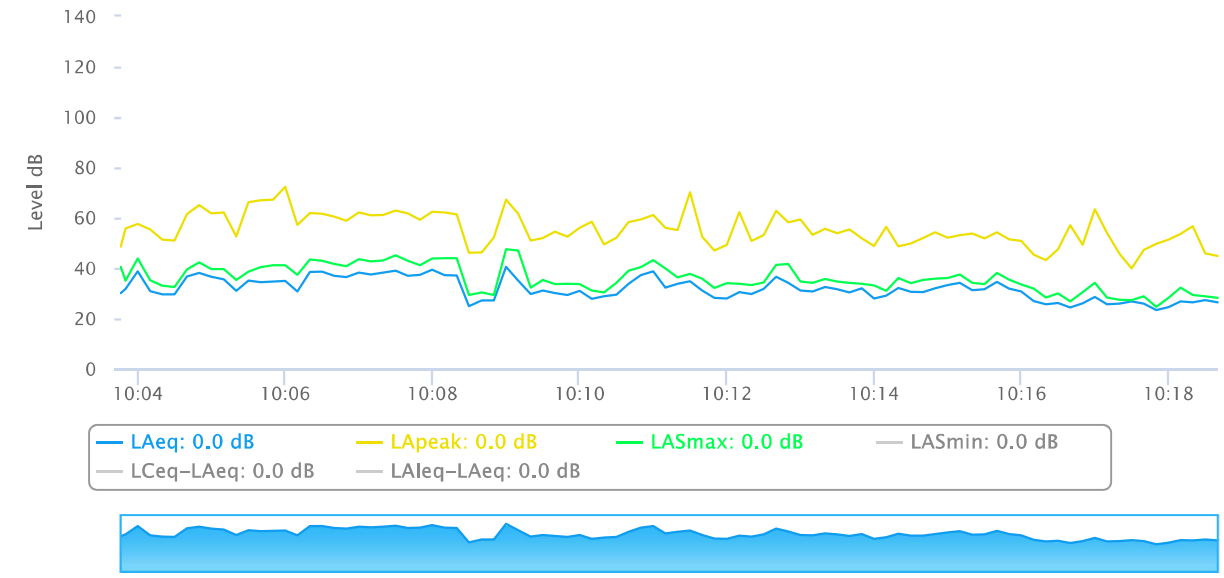
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 2.0	41.4 dB
LAS 8.0	38.6 dB
LAS 25.0	34.4 dB
LAS 50.0	30.7 dB
LAS 66.6	28.8 dB
LAS 90.0	25.5 dB

Time History



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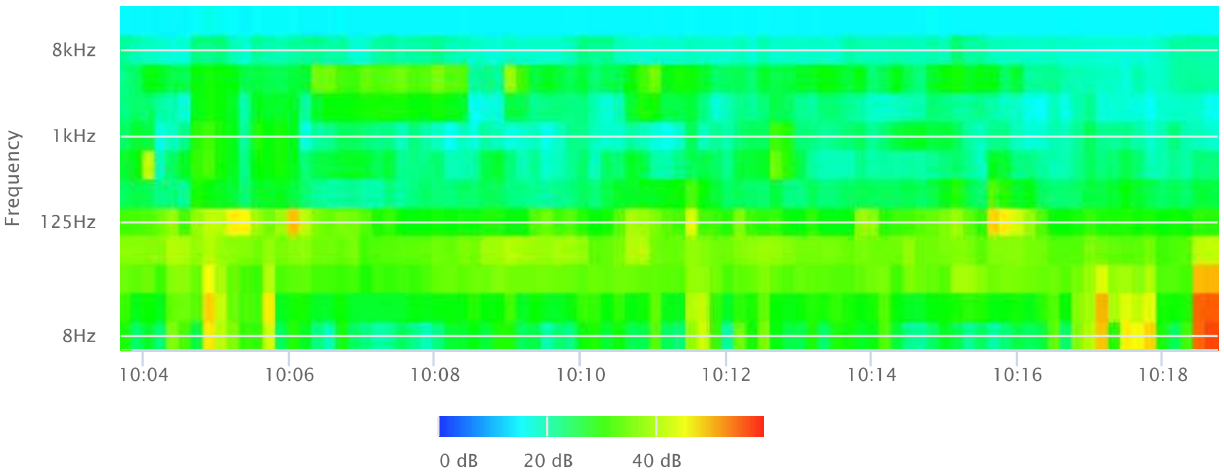
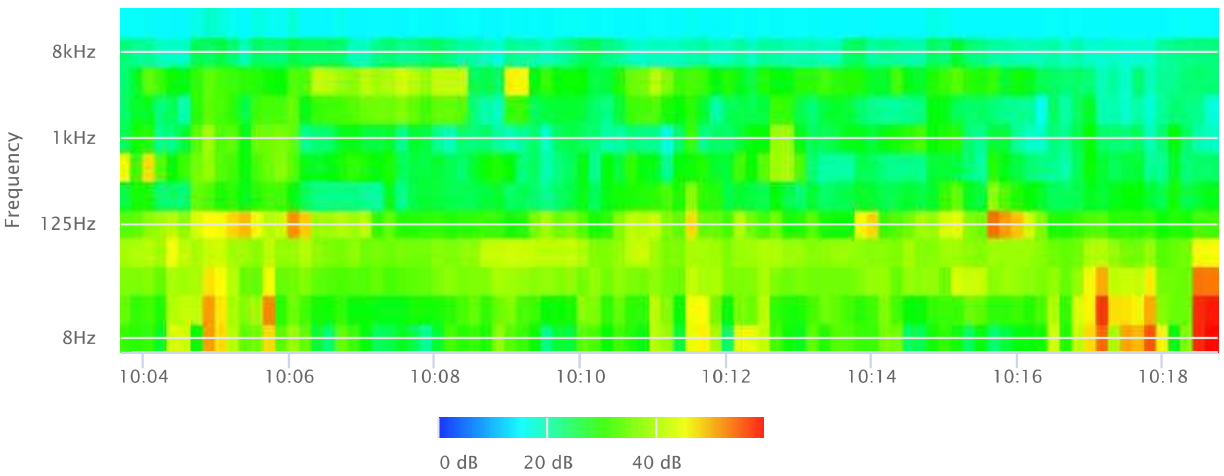
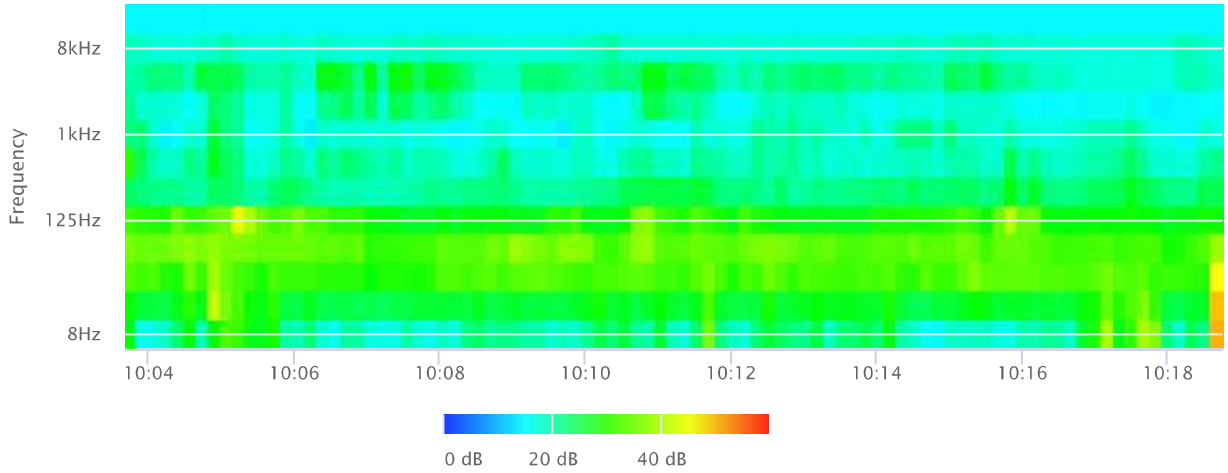


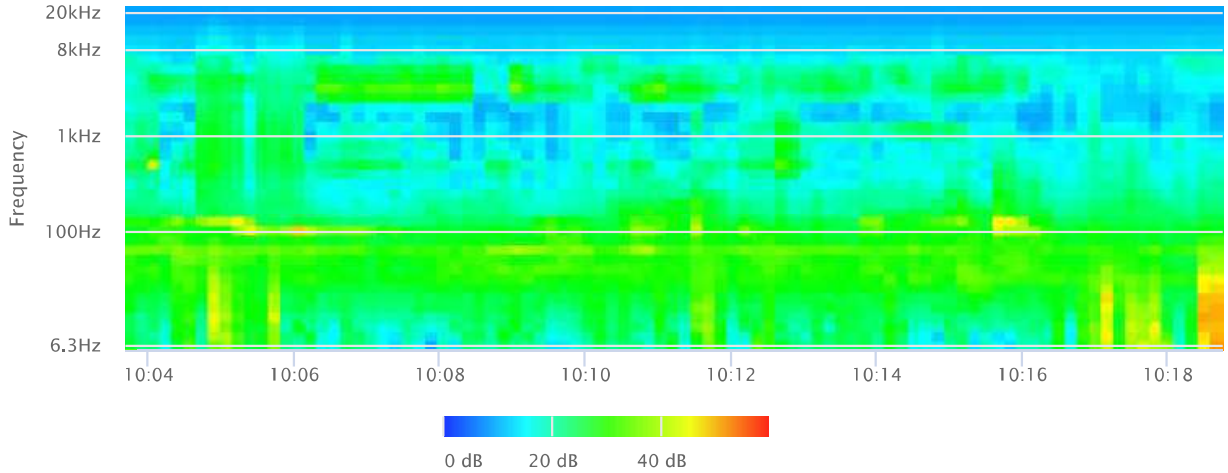
OBA 1/1 Lmax



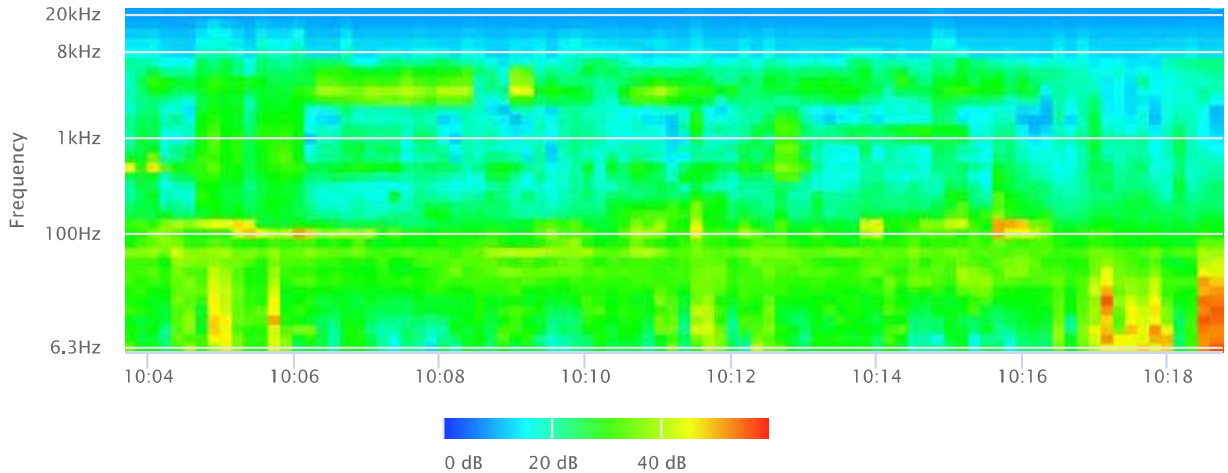
OBA 1/1 Lmin



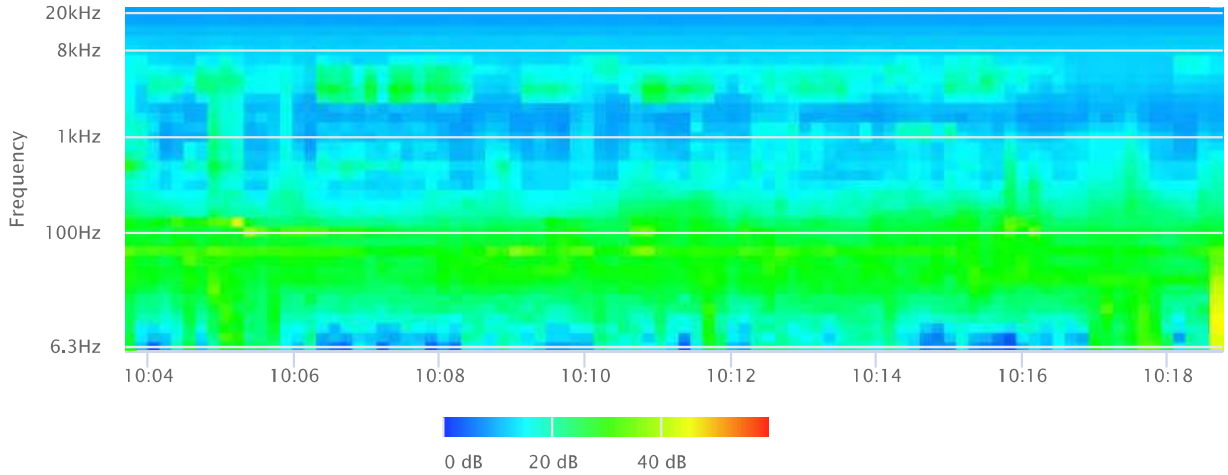
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
10:04
10:06
10:08
10:10
10:12
10:14
10:16
10:18
0 dB
20 dB
40 dB

Noise Measurement
Field Data

Project Name: Ames-Reche Recharge Basin, Yucca Valley **Date:** April 21, 2025

Project #: 19712

Noise Measurement #: STNM3 Run Time 15 minutes **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 57949 Winters Road, Yucca Valley, CA 92284

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: South side of Winters Rd near residence 57949 Winters Rd.

Adjacent: Winters Rd (running E-W) just N of STNM3 & Hilton Ave (running N-S) terminating on Winters Rd ~290' W of STNM3. Both are dirt roads.

Weather: >10% cloud, sunny. Sunset: 7:22PM **Settings:** SLOW FAST

Temperature: 63 deg F **Wind:** 2 mph **Humidity:** 20% **Terrain:** Flat

Start Time: 9:28 AM **End Time:** 9:43 AM **Run Time:**

Leq:	32.9	dB
Lmax	47.9	dB
L2	41.1	dB
L8	36.3	dB
L25	32.2	dB
L50	30.2	dB

Primary Noise Source: Slight residential ambiance. Distant conversing between neighbors. Distant barking dogs.

Secondary Noise Sources: Bird song. 2mph breeze blowing through desert vegetation.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	7/31/2024	**FACTORY CALIBRATION DATE:**	7/10/2024
FIELD CALIBRATION DATE:	4/21/2025		

Noise Measurement
Field Data

PHOTOS:



STNM3 looking SW towards closest residence 57949 winters Road, Yucca Valley.



STNM3 looking W down Winters Road towards Hilton Avenue intersection (~290' W) & residence 938 Hilton Avenue, Yucca Valley (~345' W).

Summary	
File Name on Meter	LxT_Data.564.s
File Name on PC	LxT_0003099-20250421 092800-LxT_Data.564.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM3 34°14'12.50"N 116°23'56.22"W
Job Description	15 minute noise measurement
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley

Measurement	
Description	
Start	2025-04-21 09:28:00
Stop	2025-04-21 09:43:00
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2025-04-21 09:26:39
Post-Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	C Weighting
OBA Max Spectrum	At LMax
Overload	122.1 dB

Results				
LA_{eq}	32.9			
LAE	62.4			
EA	0.195	µPa²h		
EA8	6.247	µPa²h		
EA40	31.235	µPa²h		
$LA_{peak\ (max)}$	2025-04-21 09:31:03	82.7	dB	
LAS_{max}	2025-04-21 09:31:26	47.9	dB	
LAS_{min}	2025-04-21 09:32:15	23.2	dB	

		Statistics	
LC_{eq}	48.9 dB	**LA2.00**	41.1 dB
LA_{eq}	32.9 dB	**LA8.00**	36.3 dB
LC_{eq} - LA_{eq}	16.0 dB	**LA25.00**	32.2 dB
LAI_{eq}	41.7 dB	**LA50.00**	30.2 dB
LA_{eq}	32.9 dB	**LA66.60**	28.9 dB
LAI_{eq} - LA_{eq}	8.8 dB	**LA90.00**	25.9 dB
Overload Count	0		
Overload Duration	0.0 s		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.564.s	Computer's File Name	LxT_0003099-20250421 092800-LxT_Data.564.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM3 34°14'12.50"N 116°23'56.22"W
Job Description	15 minute noise measurement		
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley		
Start Time	2025-04-21 09:28:00	Duration	0:15:00.0
End Time	2025-04-21 09:43:00	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	32.9 dB		
LAE	62.4 dB	SEA	--- dB
EA	0.2 µPa²h	LAFTM5	42.3 dB
EA8	6.2 µPa²h		
EA40	31.2 µPa²h		
LA_{peak}	82.7 dB	2025-04-21 09:31:03	
LAS_{max}	47.9 dB	2025-04-21 09:31:26	
LAS_{min}	23.2 dB	2025-04-21 09:32:15	
LA_{eq}	32.9 dB		
LC_{eq}	48.9 dB	LC_{eq} - LA_{eq}	16.0 dB
LAI_{eq}	41.7 dB	LAI_{eq} - LA_{eq}	8.8 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	32.9 dB		48.9 dB		--- dB	
$Ls_{(max)}$	47.9 dB	2025-04-21 09:31:26	--- dB		--- dB	
$LS_{(min)}$	23.2 dB	2025-04-21 09:32:15	--- dB		--- dB	
$L_{Peak(max)}$	82.7 dB	2025-04-21 09:31:03	--- dB		--- dB	

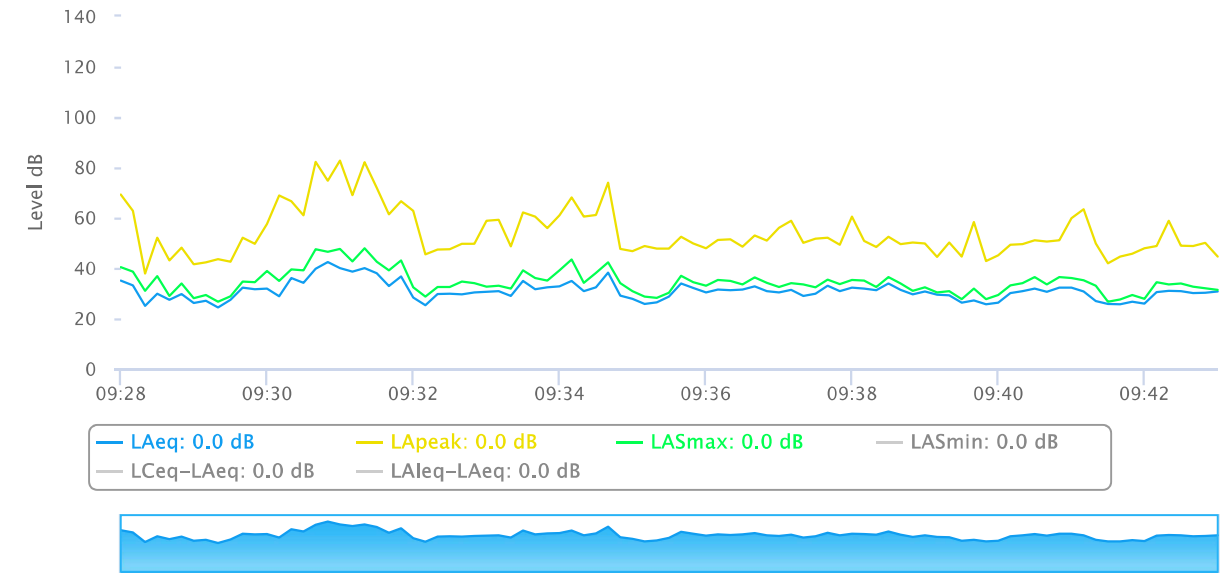
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

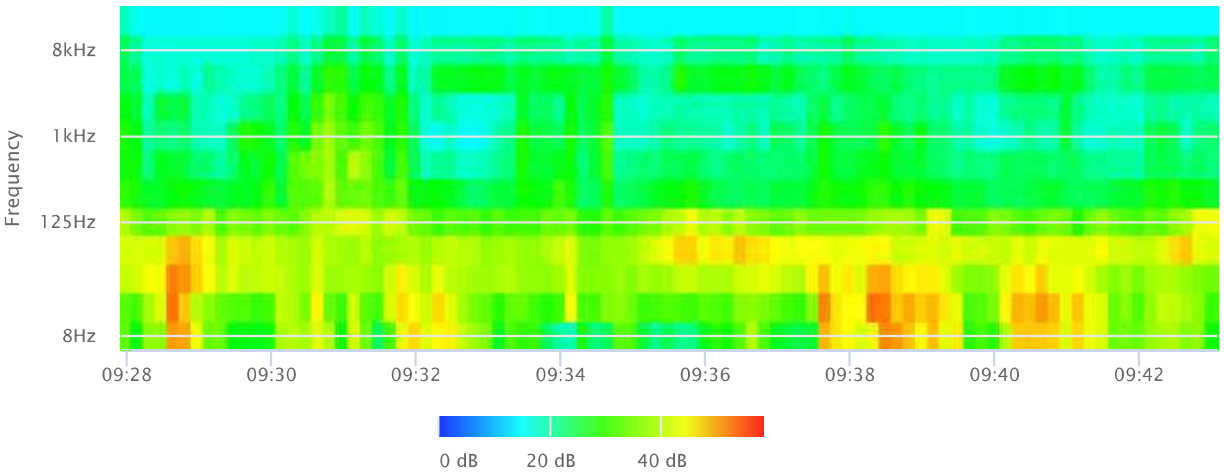
Statistics

LAS 2.0	41.1 dB
LAS 8.0	36.3 dB
LAS 25.0	32.2 dB
LAS 50.0	30.2 dB
LAS 66.6	28.9 dB
LAS 90.0	25.9 dB

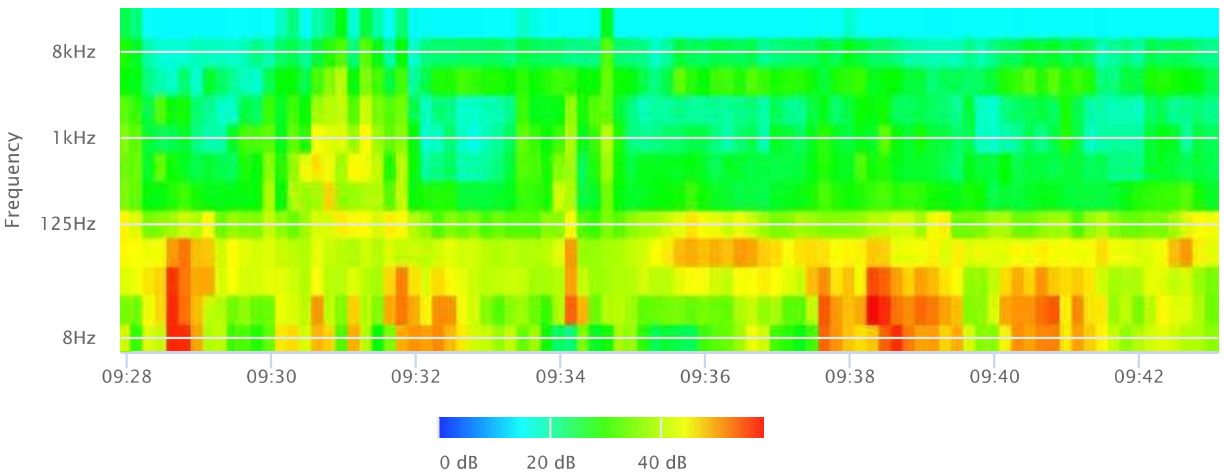
Time History



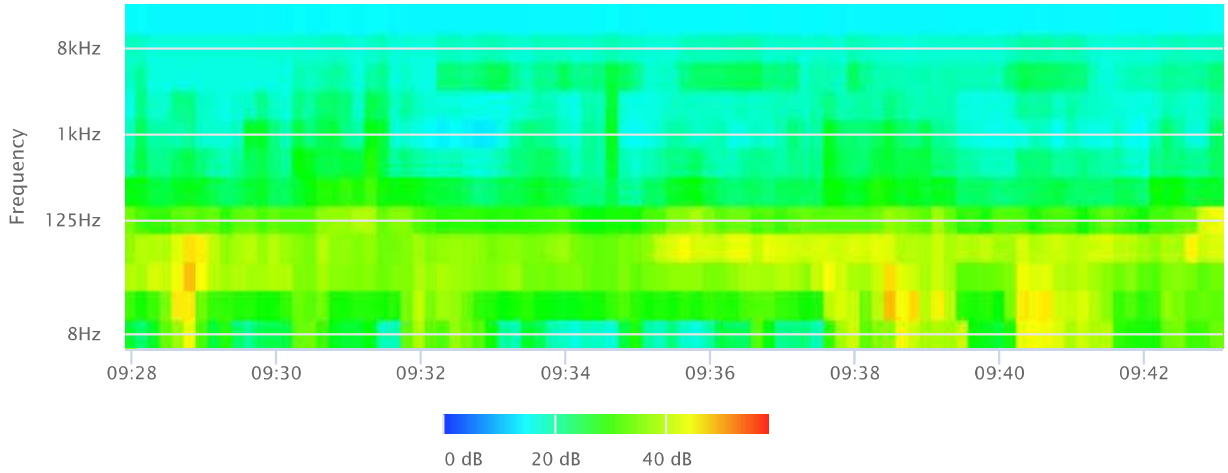
OBA 1/1 Leq



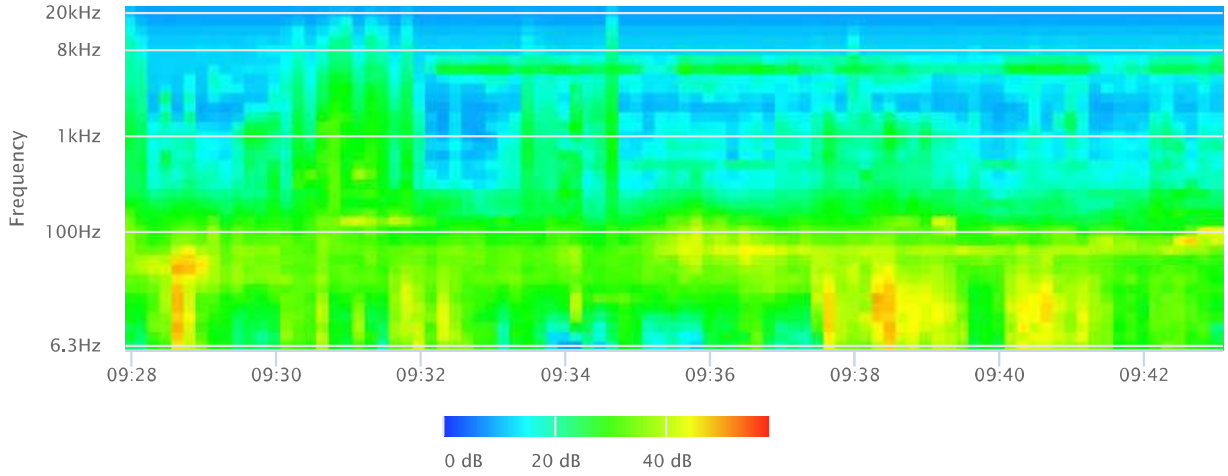
OBA 1/1 Lmax



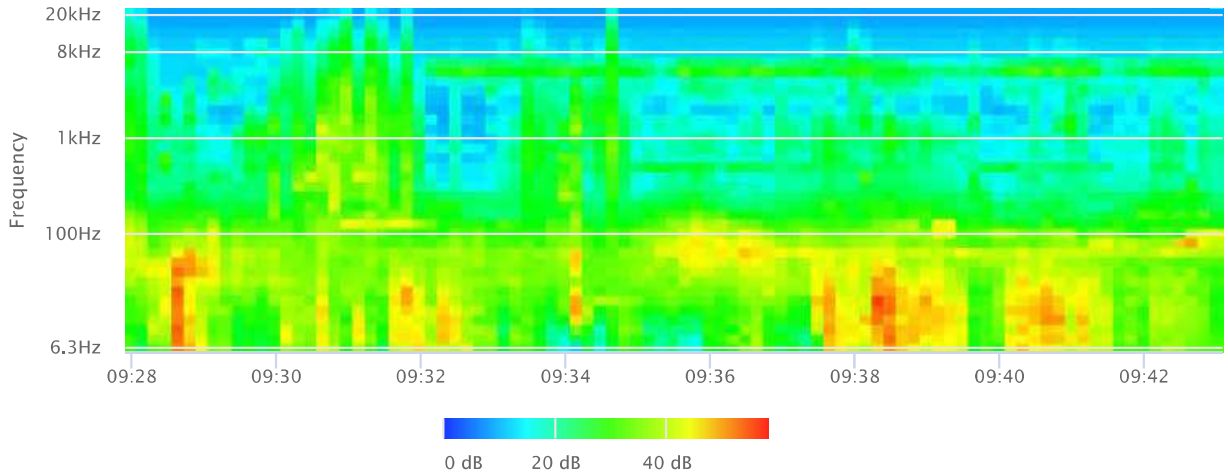
OBA 1/1 Lmin



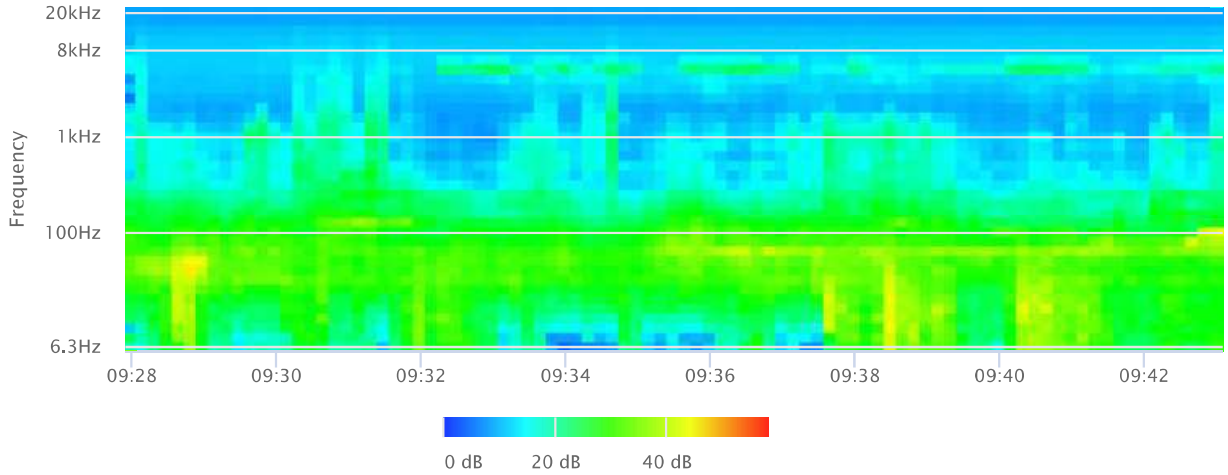
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
09:28
09:30
09:32
09:34
09:36
09:38
09:40
09:42
0 dB
20 dB
40 dB

Noise Measurement
Field Data

Project Name: Ames-Reche Recharge Basin, Yucca Valley **Date:** April 21-22, 2025

Project #: 19712

Noise Measurement #: LTNM1 Run Time 24 hours (24 x 1 hours) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: Intersection Tracy Blvd & Winters Rd. LTNM1 mic location 34°14'14.02"N 116°24'45.74"W

Site Description (Type of Existing Land Use and any other notable features): Measurement Site: Just west of project site and north of Tracy Blvd/Winter Rd.

Adjacent: Winters Road/Tracy Boulevard (E-W), dirt roads, ~120' S of LTNM1. Residences to the NE/SE and natural drainage valley to the W.

Weather: >10% cloud, sunny by day. Sunset/rise: 7:22PM/6:07AM **Settings:** SLOW FAST

Temperature: 56-76 deg F **Wind:** 2-12 mph **Humidity:** 20-35% **Terrain:** Flat

Start Time: 1:00 PM **End Time:** 1:00 PM **Run Time:**

Leq:	37	dB
Lmax	69.6	dB
L2	44.8	dB
L8	38.1	dB
L25	30.4	dB
L50	25.2	dB

Primary Noise Source: Occasional vehicle/ recreational vehicle (quad) traveling along Tracy Blvd/ Winters Rd.

Secondary Noise Sources: Bird song by day, crickets at night, various wild life. Wind blowing through desert vegetation. Not a lot of noise sources, pretty quiet.

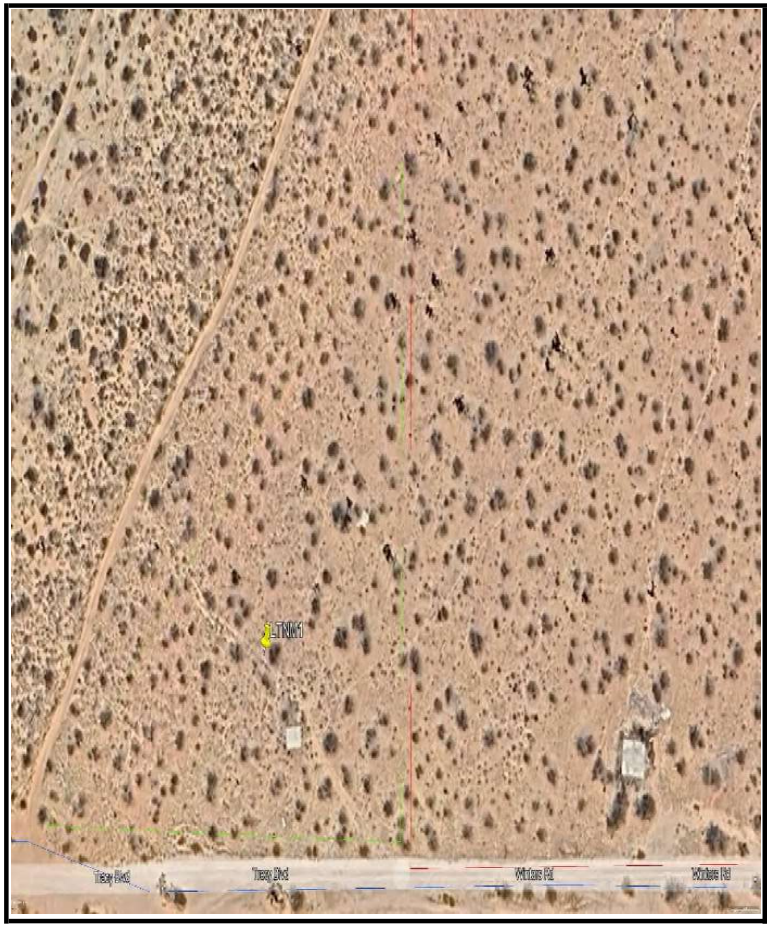
NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	7/31/2024	**FACTORY CALIBRATION DATE:**	7/10/2024
FIELD CALIBRATION DATE:	4/21/2025		

Noise Measurement
Field Data

PHOTOS:



LTNM1 looking SE passed concrete footprint of long demolished building towards Winters Road (E-W) / Tracy Boulevard (E-W), all dirt road.



Aerial view of LTNM1 (microphone shown as yellow pin) showing relative location to surrounding area. Tracy Blvd (E-W) & Winters Rd (E-W) along bottom of photo. Two, rebar enforced concrete rectangle footprints are all that remains of buildings.

Record #	Date	Time	Run Duration	Run Time	Pause	LAeq	LASmin	LASmin Time	LASmax	LASmax Time	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS99.00
1	2025-04-21	13:00:00	01:00:00.0	01:00:00.0	00:00:00.0	36.2	20.5	13:03:40	55.3	13:24:47	44.9	39.6	34.3	29.1	23.4	21.4
2	2025-04-21	14:00:00	01:00:00.0	01:00:00.0	00:00:00.0	38.8	20.1	14:16:49	60.5	14:40:21	45.6	39.3	32.8	27.6	22.7	20.7
3	2025-04-21	15:00:00	01:00:00.0	01:00:00.0	00:00:00.0	41.5	21.7	15:00:09	66.4	15:11:27	48.9	44.3	39.0	34.7	27.2	23.0
4	2025-04-21	16:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.6	21.3	16:07:43	69.6	16:55:28	50.2	45.2	40.1	34.1	25.5	22.9
5	2025-04-21	17:00:00	01:00:00.0	01:00:00.0	00:00:00.0	36.9	23.0	17:24:44	53.1	17:06:03	44.3	41.1	37.3	33.6	27.2	24.5
6	2025-04-21	18:00:00	01:00:00.0	01:00:00.0	00:00:00.0	40.3	21.8	18:42:14	63.4	18:18:31	44.3	39.6	34.6	30.4	25.2	23.1
7	2025-04-21	19:00:00	01:00:00.0	01:00:00.0	00:00:00.0	40.7	21.2	19:12:12	67.8	19:42:54	46.1	38.4	32.7	28.8	24.3	22.3
8	2025-04-21	20:00:00	01:00:00.0	01:00:00.0	00:00:00.0	33.0	21.2	20:51:23	53.8	20:47:36	39.0	33.9	30.4	28.0	24.6	22.6
9	2025-04-21	21:00:00	01:00:00.0	01:00:00.0	00:00:00.0	31.4	17.5	21:54:56	52.5	21:36:29	41.9	33.8	27.3	24.2	20.0	18.2
10	2025-04-21	22:00:00	01:00:00.0	01:00:00.0	00:00:00.0	31.3	17.3	22:18:00	63.9	22:08:30	32.2	28.2	24.9	22.6	19.3	18.0
11	2025-04-21	23:00:00	01:00:00.0	01:00:00.0	00:00:00.0	23.7	16.1	23:41:41	47.4	23:37:14	30.8	26.3	21.3	18.9	17.2	16.5
12	2025-04-22	00:00:00	01:00:00.0	01:00:00.0	00:00:00.0	21.2	16.1	00:04:45	38.6	00:58:57	27.6	24.4	21.3	19.4	17.1	16.4
13	2025-04-22	01:00:00	01:00:00.0	01:00:00.0	00:00:00.0	20.4	16.0	01:05:37	37.7	01:01:35	26.1	22.9	20.7	18.7	16.5	16.1
14	2025-04-22	02:00:00	01:00:00.0	01:00:00.0	00:00:00.0	23.0	16.1	02:27:27	39.0	02:46:05	29.7	26.8	23.4	20.3	17.0	16.3
15	2025-04-22	03:00:00	01:00:00.0	01:00:00.0	00:00:00.0	21.1	15.9	03:17:03	36.0	03:10:12	27.8	24.8	21.3	18.9	16.6	16.1
16	2025-04-22	04:00:00	01:00:00.0	01:00:00.0	00:00:00.0	22.7	15.9	04:03:34	39.0	04:45:42	29.8	26.1	22.8	20.5	16.6	16.1
17	2025-04-22	05:00:00	01:00:00.0	01:00:00.0	00:00:00.0	25.9	16.7	05:18:46	49.6	05:59:49	32.5	28.4	25.4	22.4	18.3	17.1
18	2025-04-22	06:00:00	01:00:00.0	01:00:00.0	00:00:00.0	28.1	20.1	06:11:05	47.9	06:00:25	33.6	30.7	28.0	26.2	23.8	21.9
19	2025-04-22	07:00:00	01:00:00.0	01:00:00.0	00:00:00.0	30.3	18.1	07:52:49	49.6	07:21:56	38.0	33.0	29.2	26.7	21.9	19.8
20	2025-04-22	08:00:00	01:00:00.0	01:00:00.0	00:00:00.0	38.9	18.2	08:13:41	60.3	08:32:52	48.9	40.6	29.2	22.6	19.5	18.6
21	2025-04-22	09:00:00	01:00:00.0	01:00:00.0	00:00:00.0	42.8	18.3	09:39:48	63.1	09:21:49	52.2	48.9	25.3	21.4	19.6	18.7
22	2025-04-22	10:00:00	01:00:00.0	01:00:00.0	00:00:00.0	27.5	19.4	10:03:39	47.7	10:18:41	35.6	29.2	25.2	23.1	20.8	19.9
23	2025-04-22	11:00:00	01:00:00.0	01:00:00.0	00:00:00.0	36.0	19.5	11:00:03	56.2	11:30:56	45.8	39.6	34.3	28.0	22.8	21.1
24	2025-04-22	12:00:00	01:00:00.0	01:00:00.0	00:00:00.0	37.4	21.0	12:32:09	54.5	12:53:08	46.4	41.8	36.5	31.8	24.4	21.6

Measurement Report

Report Summary

Meter's File Name	LxT_Data.567.s	Computer's File Name	LxT_0003099-20250421 130000-LxT_Data.567.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	LTNM1 34°14'14.02"N 116°24'45.74"W
Job Description	24 hour noise measurement (24x 1 hours)		
Note	Ganddini Project# 19712 Ames-Reche Recharge Basin, Yucca Valley		
Start Time	2025-04-21 13:00:00	Duration	24:00:00.0
End Time	2025-04-22 13:00:00	Run Time	24:00:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	37.0 dB		
LAE	86.4 dB	SEA	--- dB
EA	48.2 µPa²h	LAFTM5	41.8 dB
EA8	16.1 µPa²h		
EA40	80.4 µPa²h		
LA_{peak}	85.6 dB	2025-04-21 16:55:28	
LAS_{max}	69.6 dB	2025-04-21 16:55:28	
LAS_{min}	15.9 dB	2025-04-22 03:17:03	
LA_{eq}	37.0 dB		
LC_{eq}	54.9 dB	LC_{eq} - LA_{eq}	17.9 dB
LAI_{eq}	39.7 dB	LAI_{eq} - LA_{eq}	2.7 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	3	0:00:10.2
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	37.0 dB		54.9 dB		--- dB	
$Ls_{(max)}$	69.6 dB	2025-04-21 16:55:28	--- dB		--- dB	
$LS_{(min)}$	15.9 dB	2025-04-22 03:17:03	--- dB		--- dB	
$L_{Peak(max)}$	85.6 dB	2025-04-21 16:55:28	--- dB		--- dB	

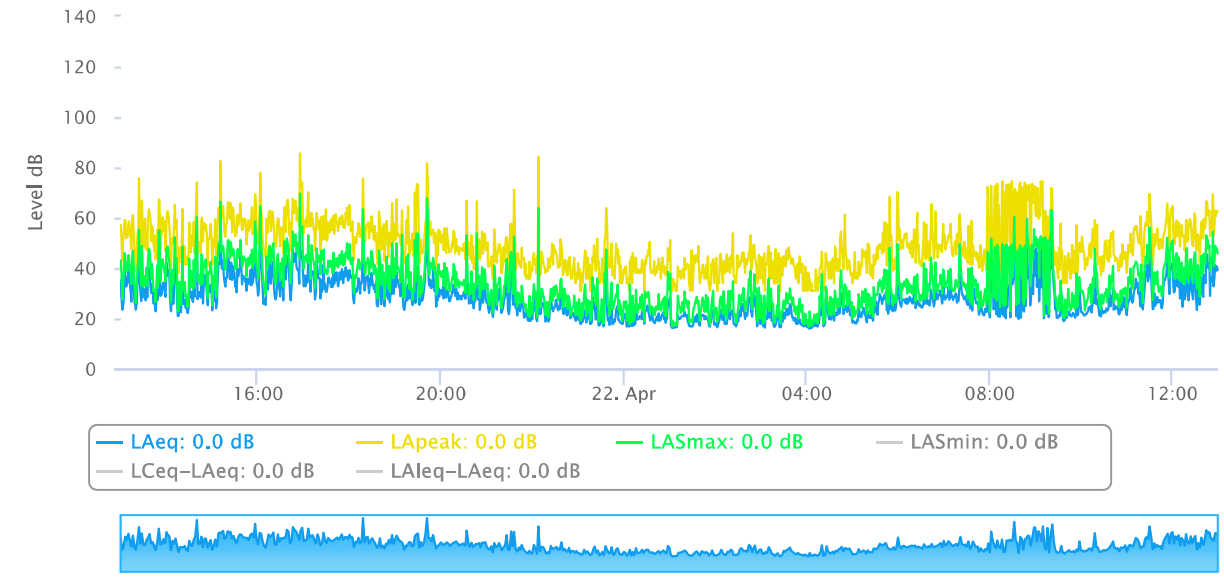
Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

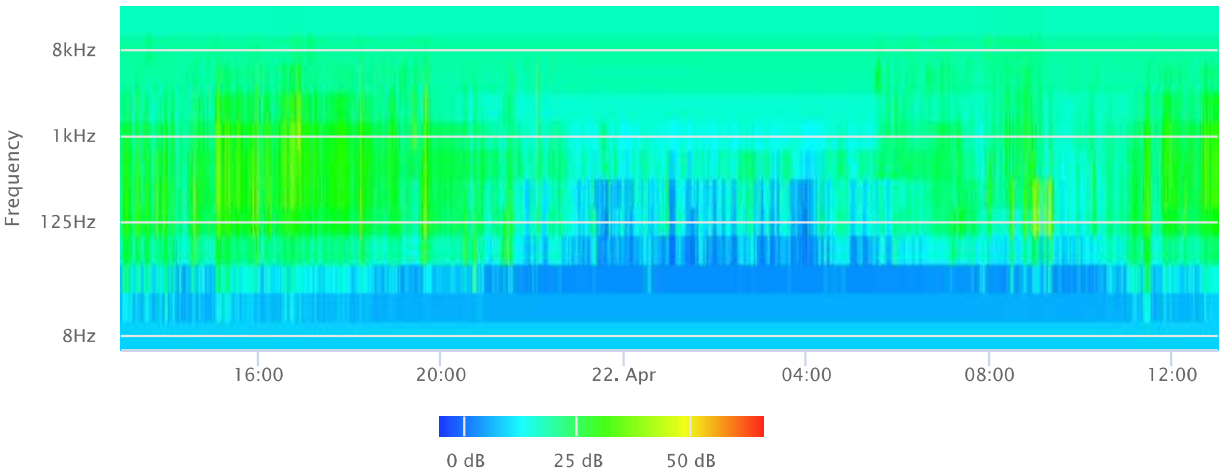
Statistics

LAS 2.0	44.8 dB
LAS 8.0	38.1 dB
LAS 25.0	30.4 dB
LAS 50.0	25.2 dB
LAS 90.0	18.4 dB
LAS 99.0	16.4 dB

Time History



OBA 1/1 Leq



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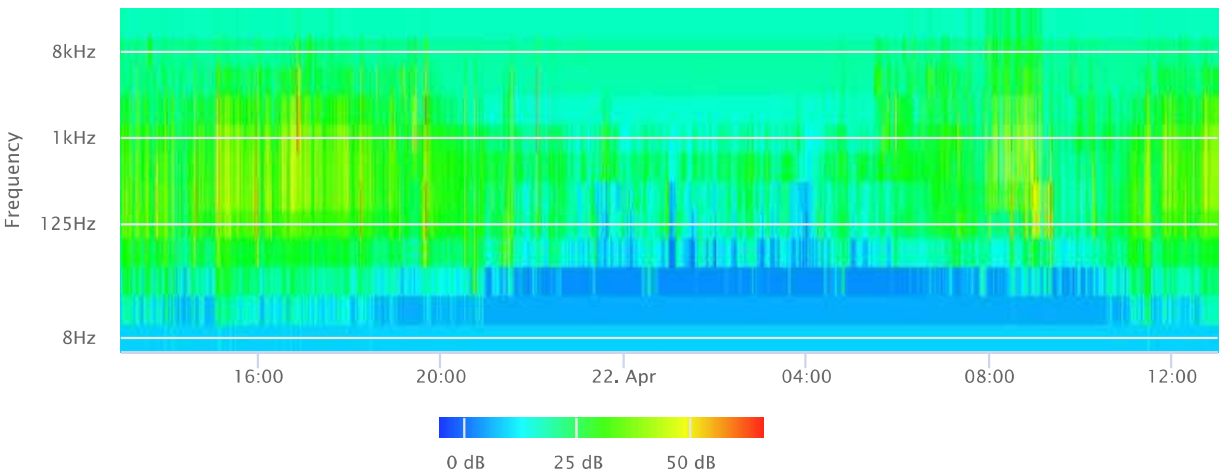
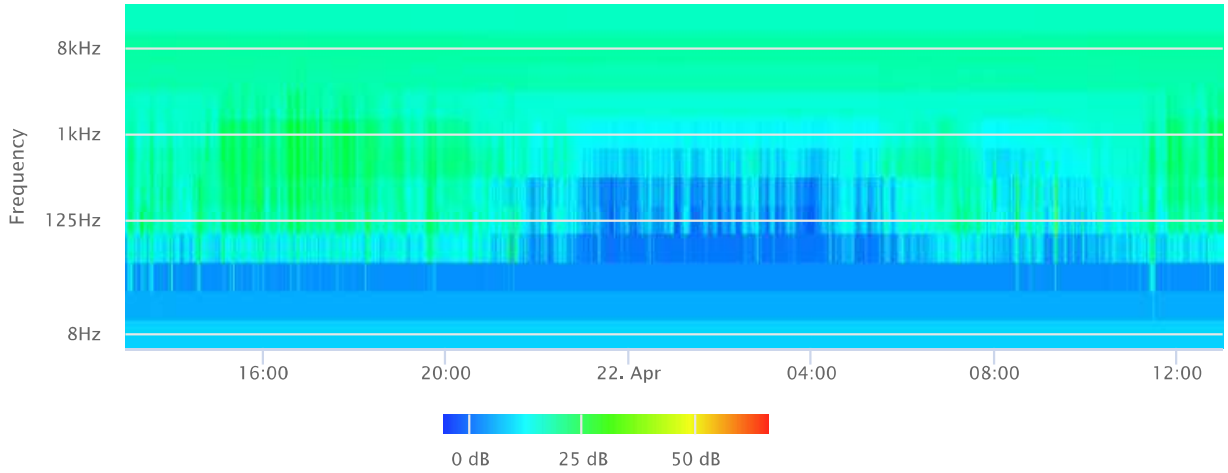
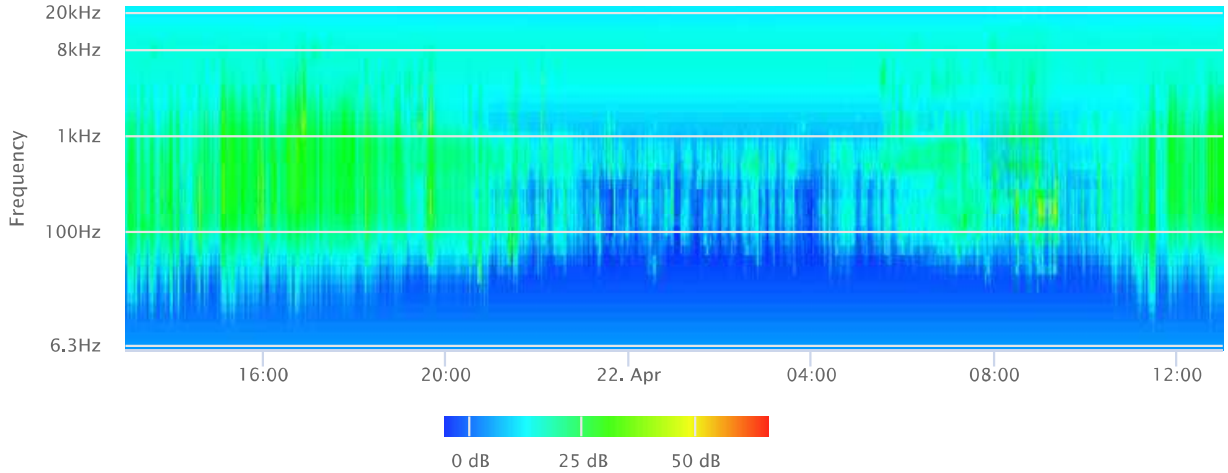


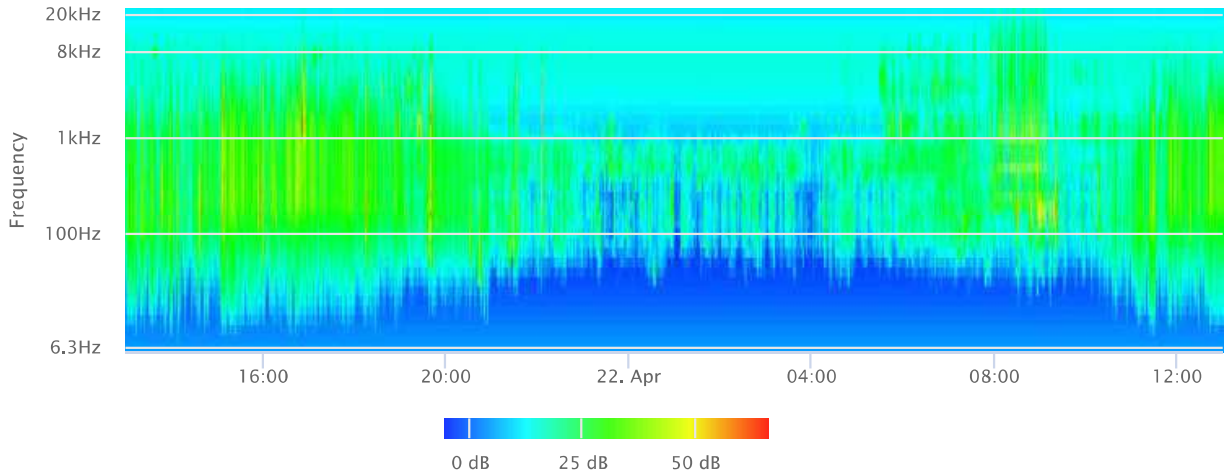
OBA 1/1 Lmin



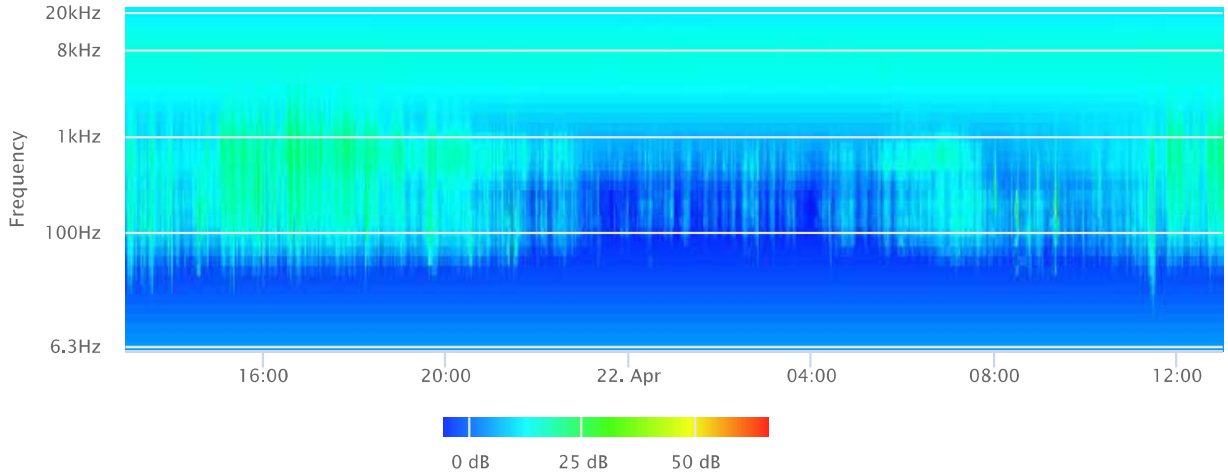
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
16:00
20:00
22. Apr
04:00
08:00
12:00

0 dB
25 dB
50 dB

APPENDIX D

CONSTRUCTION NOISE MODEL WORKSHEETS

Receptor - Residential to Northeast (57522 Lucky Lane, Landers)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[2]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Phase 1: Monitoring Well Drilling									
At Property Line									
Drilling Rig	1	84	689	100	1.00	-22.8	0.0	61.2	61.2
Tractors/Loaders/Backhoes/Skid Steer	1	84	689	40	0.40	-22.8	-4.0	61.2	57.2
Off Highway Truck[3]	3	81	689	20	0.60	-22.8	-2.2	58.2	56.0
Crane	1	81	689	16	0.16	-22.8	-8.0	58.2	50.3
								Log Sum	63.7

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006).

(2) Distance to receptor calculated from center of the project site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

(3) To be conservative and consistent with the Air Quality Analysis, the work truck was modeled as an off-highway truck. Noise specifications for this are based on a concrete pump truck.

Receptor - Residential to Northeast (57522 Lucky Lane, Landers)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[2]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Phase 2: Retention Basins									
At Property Line									
Scrapers	2	84	689	40	0.80	-22.8	-1.0	61.2	60.2
Tractors/Loaders/Backhoes/Skid Steer	3	84	689	40	1.20	-22.8	0.8	61.2	62.0
Off-Highway Trucks[3]	3	81	689	20	0.60	-22.8	-2.2	58.2	56.0
Plate Compactors	2	83	689	20	0.40	-22.8	-4.0	60.2	56.2
Excavators	2	81	689	40	0.80	-22.8	-1.0	58.2	57.2
Other Material Handling Equipment[4]	2	80	689	20	0.40	-22.8	-4.0	57.2	53.2
Other Construction Equipment[5]	2	50	689	80	1.60	-22.8	2.0	27.2	29.3
Pumps	4	81	689	50	2.00	-22.8	3.0	58.2	61.2
Surfacing Equipment[6]	2	90	689	20	0.40	-22.8	-4.0	67.2	63.2
Rubber Tired Dozers	2	82	689	40	0.80	-22.8	-1.0	59.2	58.2
Crane	1	81	689	16	0.16	-22.8	-8.0	58.2	50.3
								Log Sum	69.2

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006).

(2) Distance to receptor calculated from center of the project site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

(3) To be conservative and consistent with the Air Quality Analysis, the water truck was modeled as an off-highway truck. Noise specifications for off-highway trucks utilized the noise specifications for a concrete pump truck.

(4) Other material handling equipment utilized the noise specifications for a vibratory concrete mixer.

(5) Other Construction Equipment utilized the noise specifications for a slurry trenching machine.

(6) Other surfacing equipment utilized the noise specifications for a pavement scarifier.

Receptor - Residential to Southeast (57635 Winters Road, Landers)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[2]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Phase 1: Monitoring Well Drilling									
At Property Line									
Drilling Rig	1	84	725	100	1.00	-23.2	0.0	60.8	60.8
Tractors/Loaders/Backhoes/Skid Steer	1	84	725	40	0.40	-23.2	-4.0	60.8	56.8
Off Highway Truck[3]	3	81	725	20	0.60	-23.2	-2.2	57.8	55.6
Crane	1	81	725	16	0.16	-23.2	-8.0	57.8	49.8
								Log Sum	63.3

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006).

(2) Distance to receptor calculated from center of the project site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

(3) To be conservative and consistent with the Air Quality Analysis, the work truck was modeled as an off-highway truck. Noise specifications for this are based on a concrete pump truck.

Receptor - Residential to Southeast (57635 Winters Road, Landers)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[2]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Phase 2: Retention Basins									
At Property Line									
Scrapers	2	84	725	40	0.80	-23.2	-1.0	60.8	59.8
Tractors/Loaders/Backhoes/Skid Steer	3	84	725	40	1.20	-23.2	0.8	60.8	61.6
Off-Highway Trucks[3]	3	81	725	20	0.60	-23.2	-2.2	57.8	55.6
Plate Compactors	2	83	725	20	0.40	-23.2	-4.0	59.8	55.8
Excavators	2	81	725	40	0.80	-23.2	-1.0	57.8	56.8
Other Material Handling Equipment[4]	2	80	725	20	0.40	-23.2	-4.0	56.8	52.8
Other Construction Equipment[5]	2	50	725	80	1.60	-23.2	2.0	26.8	28.8
Pumps	4	81	725	50	2.00	-23.2	3.0	57.8	60.8
Surfacing Equipment[6]	2	90	725	20	0.40	-23.2	-4.0	66.8	62.8
Rubber Tired Dozers	2	82	725	40	0.80	-23.2	-1.0	58.8	57.8
Crane	1	81	725	16	0.16	-23.2	-8.0	57.8	49.8
								Log Sum	68.8

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construction Noise Model User's Guide (January 2006).

(2) Distance to receptor calculated from center of the project site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

(3) To be conservative and consistent with the Air Quality Analysis, the water truck was modeled as an off-highway truck. Noise specifications for off-highway trucks utilized the noise specifications for a concrete pump truck.

(4) Other material handling equipment utilized the noise specifications for a vibratory concrete mixer.

(5) Other Construction Equipment utilized the noise specifications for a slurry trenching machine.

(6) Other surfacing equipment utilized the noise specifications for a pavement scarifier.

APPENDIX E

FHWA WORKSHEETS

Existing Traffic Noise

1	:Id
Winters Road	:Road
In the Vicinity of the Project Site	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	4
Speed	45
Distance	50
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	0.23	0.00	0.01	0.17	0.00	0.00	0.04	0.01	0.01
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	-13.19	-30.03	-27.81	-14.48	-37.81	-35.59	-20.54	-28.60	-26.38
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	31.09	22.53	29.26	29.79	14.75	21.48	23.74	23.95	30.69
	DAY LEQ	33.63		EVENING LEQ	30.51		NIGHT LEQ	32.19	

F	CNEL	38.93	Day hour 89.00
	DAY LEQ	33.63	Absorptive? no
			Use hour? no
			GRADE dB 0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

Existing Plus Project Traffic Noise

1	:Id
Winters Road	:Road
In the Vicinity of the Project Site	:Segment

Vehicle Distribution (Heavy Truck Mix)				
Motor-Vehicle Type	Daytime % (7 AM - 7 PM)	Evening % (7 PM - 10 PM)	Night % (10 PM - 7 AM)	Total % of Traffic Flow
Automobiles	75.54	14.02	10.43	92.00
Medium Trucks	48.00	2.00	50.00	3.00
Heavy Trucks	48.00	2.00	50.00	5.00

ADT	74
Speed	45
Distance	50
Left Angle	-90
Right Angle	90

	Daytime			Evening			Night		
Noise Parameters	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks	Autos	Medium Trucks	Heavy Trucks
INPUT PARAMETERS									
Vehicles per hour	4.29	0.09	0.15	3.18	0.01	0.02	0.79	0.12	0.21
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS									
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14
ADJUSTMENTS									
Flow	-0.52	-17.35	-15.14	-1.81	-25.14	-22.92	-7.87	-15.93	-13.71
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	43.76	35.20	41.94	42.46	27.42	34.15	36.41	36.63	43.36
	DAY LEQ	46.30		EVENING LEQ	43.18		NIGHT LEQ	44.87	

CNEL	51.60
DAY LEQ	46.30

Day hour	89.00
Absorptive?	no
Use hour?	no
GRADE dB	0.00

Notes:

(1) FHWA Traffic Noise Prediction Model FHWA-RD-77-108

(2) Vehicle percentages based on County of Riverside heavy truck mix.

APPENDIX F

GROUNDBORNE VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS

Project:	19712 Ames-Reche Recharge Basin	Date:	4/18/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to Northeast		
Address:	57522 Lucky Ln, Landers		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	536.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.002	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19712 Ames-Reche Recharge Basin	Date:	4/18/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to Northeast		
Address:	57522 Lucky Ln, Landers		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	536.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.001	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19712 Ames-Reche Recharge Basin	Date:	4/18/25
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to Southeast		
Address:	57635 Winters Rd, Landers		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	1,105.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.001	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS

Project:	19712 Ames-Reche Recharge Basin	Date:	4/18/25
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to Southeast		
Address:	57635 Winters Rd, Landers		

PPV = PPVref(25/D)^n (in/sec)

INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	1,105.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

RESULTS

PPV =	0.000	IN/SEC	OUTPUT IN BLUE



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APPENDIX F

Mitigation Monitoring and Reporting Program

Mojave Water Agency

Mitigation Monitoring and Reporting Program
East Ames-Recharge Recharge Facility Project

CEQA Guidelines Section 21081.6 requires that a mitigation monitoring and reporting program (MMRP) be adopted upon certification of a Mitigated Negative Declaration to ensure that the mitigation measures are implemented. The mitigation monitoring and reporting program identifies the mitigation and when in the process it should be implemented. The Mojave Water Agency (MWA) is the implementing responsible party for all measures. A record of the MMRP will be maintained at the Mojave Water Agency, 13846 Conference Center Drive, Apple Valley, CA 92307.

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
AESTHETICS						
Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	**MM BIO-05: Tree & Plant Removal Permit** (see below).	See below	See below			
AGRICULTURE & FORESTRY						
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))?	**MM BIO-04: Cover Species Inventory** and **MM BIO-05: Incidental Take Permit** (see below).	See below	See below			
AIR QUALITY						
Conflict with or obstruct implementation of the applicable air quality plan?	**MM-AQ-1, MDAQMD Compliance**. The project applicant shall ensure that all applicable MDAQMD Rules and Regulations are complied with during construction.	Prior to issuance Notice to Proceed with Construction Contractor, then weekly thereafter	Confirmation of compliance with MDAQMD Rules and Regulations.			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
BIOLOGICAL RESOURCES						
Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	**MM BIO-01: Pre-construction Nesting Bird Clearance Survey.** If construction occurs between February 1st and August 31st, MWA shall ensure a pre-construction clearance survey for nesting birds be conducted within three (3) days of the start of any vegetation removal or ground disturbing activities to ensure that no nesting birds will be disturbed during construction. The biologist conducting the clearance survey should document a negative survey with a brief letter report indicating that no impacts to active avian nests will occur. If an active avian nest is discovered during the pre-construction clearance survey, construction activities should stay outside of a no-disturbance buffer. The size of the no-disturbance buffer will be determined by the wildlife biologist and will depend on the level of noise and/or surrounding anthropogenic disturbances, line of sight between the nest and the construction activity, type and duration of construction activity, ambient noise, species habituation, and topographical barriers. These factors will be evaluated on a case-by-case basis when developing buffer distances. Limits of construction to avoid an active nest will be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel will be instructed on the sensitivity of nest areas. A biological monitor should be present to delineate the boundaries of the buffer area and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.	Within 3 days of the start of vegetation removal or ground disturbing activities	Brief letter report from biologist submitted to MWA			
	MM BIO-02: Pre-construction Burrowing Owl Clearance Survey. Due to the potential of occurrence, MWA shall ensure a pre-construction burrowing owl clearance survey shall be conducted by a qualified biologist concurrently with the pre-construction nesting bird clearance survey to ensure that burrowing owl remains absent from the Project Site. Depending on the results from the pre-construction Burrowing Owl Survey, the District shall perform the following: - **Not Detected**: If burrowing owl are not detected during the pre-construction survey, no further	Prior to start of construction	Survey memo or Burrowing Owl Plan from biologist submitted to MWA and CDFW, as applicable			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
	mitigation is required. If burrowing owl are detected, CDFW shall be sent written notification within 3 days of detection of burrowing owls. - **Discovery of Burrowing Owl**: If active burrowing owl burrows are detected, the District shall not commence activities until no sign is present that the burrows are being used by adult or juvenile owls or following CDFW approval of a Burrowing Owl Plan as described below. If owl presence is difficult to determine, a qualified biologist shall monitor the burrows with motion-activated trail cameras for at least 24 hours to evaluate burrow occupancy. The onsite qualified biologist will verify the nesting effort has finished according to methods identified in the Burrowing Owl Plan. - **Burrowing Owl Plan**: The Burrowing Owl Plan shall be prepared in accordance with guidelines in the CDFW Staff Report on Burrowing Owl (March 2012). The qualified biologist and MWA shall coordinate with the Agency and CDFW to develop a Burrowing Owl Plan to be approved by the District and CDFW prior to commencing Project activities. The Burrowing Owl Plan shall describe proposed avoidance, relocation, monitoring, minimization, and/or mitigation actions. The Burrowing Owl Plan shall include the number and location of occupied burrow sites and details on proposed buffers if avoiding the burrowing owls or information on the adjacent or nearby suitable habitat available to owls for relocation. If no suitable habitat is available nearby for relocation, details regarding the creation and funding of artificial burrows (numbers, location, and type of burrows) and management activities for relocated owls shall also be included in the Burrowing Owl Plan. The District shall implement the Burrowing Owl Plan following CDFW review and approval.					
	MM BIO-03: Pre-construction Desert Tortoise Clearance Survey: Thirty (30) days prior to ground disturbing areas, MWA shall ensure a preconstruction Desert Tortoise Clearance survey shall be conducted in undeveloped areas to confirm	Within 30 days prior to ground disturbing activities	Survey memo from biologist submitted to MWA			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
	the absence of desert tortoise within the boundaries of the survey area. All burrows, if present, will be thoroughly inspected for the presence of desert tortoise or evidence of recent use using non-intrusive methods (i.e., mirror, digital camera). Burrow characteristics including class, shape, orientation, size, and evidence of deterioration will be recorded on field data sheets. Although not anticipated, if desert tortoise are found onsite during the pre-construction clearance survey, coordination will need to occur with the USFWS and CDFW to determine if avoidance and minimization measures can be implemented to avoid any direct or indirect impacts to desert tortoise, or if "Take" permits will need to be obtained prepared and approved by the USFWS and CDFW.		Avoidance and minimization measures documented with USFWS and CDFW, as applicable Incidental Task Permit application(s) from MWA submitted and issued by USFWS and CDFW, as applicable Copy of permit provided to construction contractor			
Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	**MM BIO-05: Incidental Take Permit:** Prior to the start of construction, the permittee shall obtain a western Joshua tree incidental take permit and pay in-lieu fees for the removal of 68 western Joshua trees within the Project Site. The permittee must adhere to the conditions of the WJTCA Incidental Take Permit.	Prior to start of construction	Incidental Take Permit application(s) submitted and issued by USFWS and CDFW Memo documenting delegated authority Copy of permit provided to construction contractor			
Conflict with any local policies or ordinances protecting biological	**MM BIO-04: Cover Species Inventory**: MWA shall obtain a qualified biologist to conduct a comprehensive inventory of all covered species within the Project Site and Project	Between 3 and 30 days prior to	Survey memo from biologist submitted to MWA			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
resources, such as a tree preservation policy or ordinance?	Footprint, no more than 30-days and 3-days prior to Project construction. The inventory shall include identification and documentation of all special status species present on-site; mapping of species location using GPS coordinates; and photographic documentation of species and their habitats. Any changes in species presence shall be recorded and provided to MWA and the Project contractor.	project construction	and construction contractor			
	MM BIO-05: Incidental Take Permit (see above).	See above	See above			
CULTURAL RESOURCES						
Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	**MM-CUL-01: Cultural Resources Monitoring.** In the event that 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 Yuhaaviatam of San Manuel Nation Cultural Resources Department (YSMN) shall be contacted, as detailed within TCR-1, regarding any pre-contact finds 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.	During ground disturbing activities	Report by qualified archaeologist Documented contact with YSMN			
	MM-CUL-02: Cultural Resources Monitoring and Treatment Plan. If significant pre-contact 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 YSMN for review and comment, as detailed within TCR-1. The archaeologist shall monitor the remainder of the project and implement the Plan accordingly.	During ground disturbing activities	Monitoring and Treatment Plan from archaeologist submitted to YSMN			
Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	**MM-CUL-01: Cultural Resources Monitoring** (see above).	See above	See above			
	MM-CUL-02: Cultural Resources Monitoring and Treatment plan (see above).	See above	See above			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
Disturb any human remains, including those interred outside of dedicated cemeteries?	**MM-CUL-03: Discovery of Human Remains.** 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 that code enforced for the duration of the project.	During ground disturbing activities	Confirmation of coroner contact and submittal of Report of Findings, if applicable			
GEOLOGY AND SOILS						
Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	**MM-GEO-1: Paleontological Resources Monitoring.** A paleontological resources mitigation program shall be put in place to monitor, salvage, and curate recovered fossils associated within the Project Area. A qualified paleontological resources specialist will spot check construction excavations that would impact Pleistocene alluvial units. The frequency will be determined with the paleontological resources specialist and the construction contractor based on the work schedule and anticipated depth of soil excavation. If evidence of subsurface paleontological resources is found during construction, excavation and other construction activity in that area shall cease and the construction contractor shall contact the County of San Bernardino Planning Department. With direction from the County, a paleontologist certified by the County of San Bernardino shall evaluate the find prior to resuming ground disturbing activities in the immediate vicinity. If warranted, the paleontologist shall prepare and complete a standard Paleontological Resources Mitigation Program for the salvage and curation of identified resources.	Prior to start of construction	Paleontological Resources Mitigation Program from paleontologist submitted to MWA Memo documenting contact with County of San Bernardino Planning Department, as applicable			
HYDROLOGY AND WATER QUALITY						
Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	**BMP HYDRO-01: Construction BMPs.** In accordance with the Construction General Permit and San Bernadino County General Plan EIR, the Project Contractor shall implement a Project-specific SWPPP, which will deploy construction BMPs from the California Stormwater Quality Association (CASQA). The following construction BMPs shall be implemented throughout construction activities: 1. ***Erosion Controls***: will consist of using project scheduling and planning to reduce soil or vegetation disturbance (particularly during the rainy season),	SWPPP prepared prior to project construction BMPs in place during project construction	List of required BMPs provided to construction contractor BMPs visibly in place throughout project construction, as applicable.			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
	preventing or reducing erosion potential by diverting or controlling drainage, as well as preparing and stabilizing disturbed soil areas. a. Examples of erosion controls include scheduling, preservation of existing vegetation, hydraulic mulch, hydroseeding, soil binders, straw mulch, geotextile and mats, wood mulching, earth dikes and drainage swales, velocity dissipation devices, slope drains, streambank stabilization, compost blankets, soil preparation/roughening, and nonvegetative stabilization. 2. ***Sediment Controls*** will filter out soil particles that have been detached and transported in water. a. Examples of sediment controls include silt fence, sediment basin, sediment riprap, check dam, fiber rolls, gravel bag berm, street sweeping and vacuuming, sandbag barrier, straw bale barrier, storm drain inlet protection, manufactured linear sediment controls, compost socks and berms, and biofilter bags. 3. ***Wind Erosion Controls*** will consist of applying water or other dust palliatives to prevent or minimize dust nuisance. a. Examples of wind erosion controls include dust control soil binders, chemical dust suppressants, covering stockpiles, permanent vegetation, mulching, watering, temporary gravel construction, synthetic covers, and minimization of disturbed area. 4. ***Tracking Dust Controls*** will minimize the tracking of soil offsite by vehicles a. Examples of tracking dust controls includes stabilized construction roadways and construction entrances/exits, and entrance/outlet tire wash. 5. ***Non-storm water management controls*** will prohibit discharge of materials other than stormwater, such as discharges from the cleaning, maintenance, and fueling of vehicles and equipment. Conduct various construction operations, including paving, grinding, and concrete curing and finishing, in ways that minimize non-					

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
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	stormwater discharges and contamination of any such discharges. a. Examples of non-stormwater management controls include water conservation practices, temporary stream crossings, clear water diversions, illicit connection/discharge, potable and irrigation water management, and the proper management of the following operations: paving and grinding, dewatering, vehicle and equipment cleaning, fueling and maintenance, pile driving, concrete curing, concrete finishing, demolition adjacent to water, material over water, and temporary batch plants. 6. ***Waste Management and Controls*** (i.e. good Housekeeping practices) will manage materials and wastes to avoid contamination of stormwater. a. Examples include stockpile management, spill prevention and control, solid waste management, hazardous waste management, contaminated soil management, concrete waste management, sanitary/septic waste management, liquid waste management, and management of material delivery storage and use.					
TRIBAL CULTURAL RESOURCES						
Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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:						
Listed or eligible for listing in the California Register of Historical Resources, or in a local register of	**MM-TCR-01: Tribal Cultural Resources Monitoring and Treatment Plan.** The Yuhaaviatam of San Manuel Nation Cultural Resources Management Department (YSMN) shall be	During ground disturbing activities	Monitoring and Treatment Plan from archaeologist			

Impact	Mitigation Measure	Monitoring/ Timing Frequency	Action Indicating Compliance	Verification		
				Initials	Date	Remarks
historical resources as defined in Public Resources Code section 5020.1(k), or	contacted, as detailed in CUL-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 YSMN, and all subsequent finds shall be subject to this Plan. This Plan shall allow for a monitor to be present that represents YSMN for the remainder of the project, should YSMN elect to place a monitor on-site.		submitted to YSMN			
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 § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	**MM-TCR-01: Tribal Cultural Resources Monitoring and Treatment Plan** (see above).	See above	See above			
	MM-TCR-02: Tribal Consultation. 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 YSMN. The Lead Agency and/or applicant shall, in good faith, consult with YSMN throughout the life of the project.	During ground disturbing activities	Documents from archaeologist submitted to MWA and YSMN			