Santa Ana River Watershed Weather Modification Project

Initial Study & Mitigated Negative Declaration

Prepared for: Santa Ana Watershed Project Authority

June 2022

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Table of Contents

Mitigated Negative Declaration **1**

SECTION 1 Introduction **1-1**

1.1 Overview of the Proposed Project 1-1

1.2 History of Weather Modification Activities in California 1-1

1.3 Project Objective 1-3

1.4 California Environmental Quality Act 1-3

1.5 Public Outreach 1-3

1.6 Organization of the Initial Study 1-4

SECTION 2 Project Description **2-1**

2.1 Project Description 2-1

2.2 Unit Installation and Operation 2-1

2.3 Project Personnel 2-3

2.4 Suspension Criteria 2-4

2.5 Lead Agency 2-5

2.6 Required Approval of Other Public Agencies 2-5

SECTION 3 Environmental Factors Potentially Affected **3-1**

3.1 Determination 3-1

SECTION 4 Evaluation of Potential Environmental Impacts **4-1**

4.1 Aesthetics 4-2

4.2 Agriculture and Forestry Resources 4-8

4.3 Air Quality 4-11

4.4 Biological Resources 4-20

4.5 Cultural Resources 4-34

4.6 Energy 4-36

4.7 Geology and Soils 4-39

4.8 Greenhouse Gas Emissions 4-44

4.9 Hazards and Hazardous Materials 4-52

4.10 Hydrology and Water Quality 4-56
4.11 Land Use and Planning 4-69
4.12 Mineral Resources 4-72
4.13 Noise 4-73
4.14 Population and Housing 4-78
4.15 Public Services 4-79
4.16 Recreation 4-81
4.17 Transportation 4-82
4.18 Tribal Cultural Resources 4-84
4.19 Utilities and Service Systems 4-86
4.20 Wildfire 4-88
4.21 Growth-Inducing Impacts 4-91
4.22 Mandatory Findings of Significance 4-92
SECTION 5 References 5-2
Appendix A Air Quality Modeling .....
Appendix B Special Status Species Occurrence .....

List of Tables

Table 1.5-1. Ongoing Weather Modification Programs in California 1-2
Table 2.1-1. Ground-based Cloud Seeding Equipment Installation Sites by Target Area 2-2
Table 2.1-2. Estimated Precipitation and Streamflow Increases 2-1
Table 4.1-1. Project Site Scenic Resources and Regulations 4-3
Table 4.2-1. Agricultural Zoning 4-9
Table 4.3-1. Federal and State Air Quality Standards and Project area Attainment Status 4-12
Table 4.3-2. Nearest Sensitive Receptors to Each Site 4-14
Table 4.3-3. SCAQMD Air Quality Mass Daily Significance Thresholds 4-16
Table 4.3-4. Emission Localized Significance Thresholds for Construction and Operation (1-Acre Project Site, 25 Meters from Sensitive Receptor) 4-16
Table 4.3-5. Construction Emissions Estimates (Daily) 4-17
Table 4.4-1. Habitat in the Vicinity of the CNG and AHOGS Installation Sites 4-21
Table 4.4-2. Special-status plant species mapped within two miles of installation sites and presumed to still exist in the area. 4-25
Table 4.6-1. Construction Fuel Consumption 4-37
Table 4.7-1. Geological Attributes of Project Sites 4-40
Table 4.8-1. Global Warming Potential for Selected Greenhouse Gases 4-44
Table 4.8-2. Proposed Project GHG Emissions 4-50
Table 4.10-1. Nearest waterbodies to ground-based cloud seeding locations 4-57
Table 4.10-2. Clean Water Act 303(d) Impaired Waterbodies in the Project area 4-62
Table 4.11-1. Zoning and Land Use Designations for the Proposed Ground-Based Cloud Seeding Sites. 4-69
Table 4.13-1. Presumed Ambient Noise Levels 4-74
Table 4.20-1. Project Site Fire Hazard Severity Zones 4-88

Acronyms

°F	Fahrenheit
AB	Assembly Bill
AHOGS	Automated High Output Ground Seeding
AQMP	Air Quality Management Plan
Basin	South Coast Air Basin
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
CAP	Climate Action Plan
CARB	California Air Resources Board
CBWCD	Chino Basin Water Conservation District
CCAA	California Clear Air Act
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CEQA	California Environmental Quality Act
cfs	Cubic Feet Per Second
CNEL	Community Noise Equivalent Level
CNDDB	California Natural Diversity Database
CNG	Cloud Nuclei Generator
CNPS	California Native Plant Society
CO	Carbon Monoxide
CRHR	California Register of Historical Resources
CWA	Clean Water Act
dBA	A-Weighted Decibels
db	Decibel
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EMWD	Eastern Municipal Water District
EVWD	East Valley Water District
GHG	Greenhouse Gas Emissions
H_2S	Hydrogen Sulfide
IS	Initial Study
L_{eq}	Equivalent Noise Level
LCFS	Low Carbon Fuel Standard
LRA	Local Responsibility Area
mg/L	Milligram Per Liter
MBTA	Migratory Bird Treaty Act
MGD	Million Gallons Per Day

MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NAWC	North American Weather Consultants
NHPA	National Historic Preservation Act
NO	Nitrogen Monoxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NOAA	National Ocean and Atmospheric Agency
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWS	National Weather Service
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
Pb	lead
PFCs	perfluorocarbons
PM	particulate matter
PM_{10}	Particulate Matter Less than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less than 2.5 Microns in Diameter
ppm	parts per million
PRC	California Public Resource Code
RPS	Renewables Portfolio Standard
RWQCB	Regional Water Quality Control Board
SAWC	San Antonio Water Company
SAWPA	Santa Ana Watershed Protection Authority
SB	Senate Bill
SBVMND	San Bernardino Valley Municipal Water District
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Community Strategy
SF_6	sulfur hexaflouride
SO_2	sulfur dioxide
SO_x	sulfur oxides
SRA	State Responsibility Area
SWRCB	California State Water Resources Control Board
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VHFHSZ	Very High Fire Hazard Severity Zone
VMT	Vehicle Miles Traveled

VOCs	volatile organic compounds
WMA	Weather Modification Associate
WOUS	Waters of the United States

Mitigated Negative Declaration

Project Name:
Santa Ana Watershed Project Authority (SAWPA) Pilot Weather Modification Project (Project)

Lead Agency Name and Address:
Santa Ana Watershed Project Authority
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Contact Person, Phone Number, and Email Address:
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Project Proponent Name and Address:
Santa Ana Watershed Project Authority
11615 Sterling Ave, Riverside, CA 92503

Project Description:
SAWPA proposes to install, and operate for a period of four years, 15 ground-based cloud seeding units to increase precipitation in target areas throughout the Santa Ana River watershed. The ground-based cloud seeding units would be installed on previously disturbed sites. During storm events, the units would emit silver iodide particles, which function as seeding agents for the formation of ice in clouds, leading to snowfall.

Project Location:
The proposed Project is located in incorporated and unincorporated areas of San Bernardino and Orange counties. The target areas for the Project include four mountainous regions in the Santa Ana River watershed (Northwest (Transverse Range, Northeast (Central Transverse Range), Southwest (Santa Ana Mountains), and Southeast (San Jacinto Mountains)).

Findings:
It is hereby determined that based on the information contained in the attached Initial Study, the Project, with implementation of the mitigation measures listed therein, would not have a significant effect on the environment. Mitigation measures necessary to avoid the potentially significant impacts on the environment are included in the Initial Study, which is hereby incorporated and fully made part of this Mitigated Negative Declaration. A Mitigation Monitoring and Reporting Plan containing each mitigation measure in this Initial Study has been prepared for adoption by the lead agency, and all mitigation measures will be incorporated as Conditions of Approval for the Project to ensure that mitigation measures are implemented, as required.

Pursuant to Section 21082.1 of the California Environmental Quality Act, SAWPA has independently reviewed and analyzed the Initial Study/Mitigated Negative Declaration for the proposed Project and finds that this document reflects the independent judgement of SAWPA. SAWPA, as lead agency, also

confirms that the Project mitigation measures detailed in this document are feasible and will be implemented as stated in the Initial Study/Mitigated Negative Declaration.

Mark R Nute

Signature

6/21/2022

Date

SECTION 1 Introduction

1.1 Overview of the Proposed Project

The Santa Ana Watershed Project Authority (SAWPA) proposes to implement a pilot weather modification project (Project). SAWPA is a joint power authority composed of five member agencies: Eastern Municipal Water District (EMWD), Inland Empire Utilities Agency, Orange County Water District, San Bernardino Valley Municipal Water District (SBVMWD), and Western Municipal Water District. SAWPA manages the water resources of the Santa Ana River to maximize beneficial uses in the watershed in an economically and environmentally responsible manner.

The Project would include the installation and operation of 15 ground-based weather modification units throughout the Santa Ana River watershed to increase precipitation in the region. Two types of ground-based cloud seeding methods would be used: North American Weather Consultants (NAWC) proprietary automated high output ground seeding (AHOGS) systems and ground-based cloud nuclei generators (CNGs). AHOGS are triggered by the Project meteorologist operating remotely; once triggered the units burn flares that rapidly release a concentrated amount of silver iodide (NAWC 2020). These generators are used for seeding convective bands with high concentrations of supercooled liquid water and strong vertical updrafts. CNGs are manually-operated systems that burn a solution of silver iodide and acetone to create a constant cloud of seeding material that provides broad coverage over mountainous terrain with strong orographic effects (NAWC 2020).

1.2 History of Weather Modification Activities in California

Clouds form in the atmosphere when the saturation point of water is reached (i.e., relative humidity is 100%). Water vapor condenses, forming a cloud droplet around a nucleus, such as a salt crystal (NAWC 2020). In cold areas of a cloud (less than 0°C), these droplets may not freeze even if the temperature is at or below freezing due to the purity of the water droplets: pure water droplets can remain unfrozen at temperatures as cold as -39°C (NAWC 2020). However, natural impurities in a cloud droplet, such as soil particles or bacteria, aid in freezing the droplet at temperatures greater than -39°C. Once frozen (nucleated), each ice crystal has the potential to accumulate additional mass within the cloud and, if it reaches sufficient size, fall to the surface as either rain or snow, depending on the surrounding air temperature near ground level.

In the late 1940s, it was discovered that microscopic particles of silver iodide are an effective nucleating agent for the formation of ice crystals likely because its crystalline structure closely resembles that of ice. Silver iodide is an effective nucleating agent at cloud temperatures colder than -5°C and works even better than naturally-occurring freezing agents at temperatures between -5 and -15°C (NAWC 2020). Based on these findings, weather modification using silver iodide has been conducted via both ground-based seeding units and aerial deposition (i.e., airplanes) in California since the 1950s, and there are numerous active programs throughout the state (Table 1.2-1). In southern California, the Los Angeles County Department of Public Works, Flood Control Department has been conducting cloud seeding activities within various cities and unincorporated county territories along the southern slopes of the

San Gabriel Mountains to target watersheds within the Angeles National Forest (LACDPW 2015). Weather modification activities were initiated in Los Angeles County between 2009 and are ongoing. The Santa Barbara County Department Water Agency (SBCWA) has also been conducting weather modification activities to bolster their reservoirs since 1981 and conducted extensive research on the subject from 1957-1974 (SBCWA 2021). For the 2020-2021 winter season, cloud seeding operations were conducted to enhance precipitation in the Huasna-Alamo drainage in northern Santa Barbara and southern San Luis Obispo counties. A winter cloud seeding program is also currently underway over portions of San Luis Obispo County targeting the Lake Lopez drainage (SLO County 2021).

An early research program was conducted in Santa Barbara County from 1957-1960 (Santa Barbara I) and was sponsored by various organizations, including the State of California, the University of California, Santa Barbara and Ventura counties, the National Science Foundation, the U.S. Weather Bureau, and the U.S. Forest Service. This program employed randomized seeding of storm periods using ground-based silver iodide solution generators. A second research program was conducted in the county during the winter seasons from 1967 to 1973 (Santa Barbara II). Phase I of Santa Barbara II consisted of the release of silver iodide from a ground site at 2,600 feet in elevation in the Santa Ynez Mountains. Phase II of the experiment used an aircraft to release silver iodide into convection bands along the Santa Barbara coastline. These studies demonstrated the advantage of ground-based cloud seeding in coastal regions with convection bands. These experiments resulted in a statistically significant increase in precipitation from seeded convection bands compared to non-seeded bands (Griffith et al. 2005). In summary, the Santa Barbara research indicated that convective bands are a common feature of winter storms and that those bands contribute a significant proportion of the rainy season precipitation. The supercooled liquid droplets contained in the bands can be targeted by cloud seeding activities from either the ground or air to increase the amount of precipitation received at the ground (NAWC 2021).

Table 1.5-1. Ongoing Weather Modification Programs in California

Location	Program Name	Sponsor	Active Years
Santa Barbara County	Santa Barbara County Water Agency (SBCWA) Cloud Seeding[1]	SBCWA	1981 - Present
San Luis Obispo County	Winter Cloud Seeding Program for Lopez Lake and Salinas Reservoir[2]	The County of San Luis Obispo Flood Control and Water Conservation District	2020 – 2023 (anticipated)
Placer and El Dorado Counties	El Dorado Cloud Seeding [Expansion] Project[3]	Sacramento Municipal Utility District	1968 - Present
Los Angeles County	County of Los Angeles Weather Modification Project[4]	County of Los Angeles Department of Public Works	2009 - Present
Plumas County	PG&E Seeding Program in Lake Almanor Watershed[5]	PG&E	1953 - Present

Sources: [1]Santa Barbara County Water Agency (2021); [2]County of San Luis Obispo Flood Control and Water Conservation District (2021); [3]Sacramento Municipal Utility District (2017); [4]Los Angeles County Department of Public Works (2015); [5]PG&E (2011)

1.3 Project Objective

The objective of the pilot Project is to increase water supply in the region through implementation of a weather modification project and evaluate the realized benefits of cloud seeding in the Santa Ana River watershed to inform long-term decision-making and investments related to water supply. The Santa Ana River watershed is within one of the most densely populated areas in the State, with a growing and urbanizing population that is increasing demands on water supply. Due to population growth and climate change, historic hydrologic patterns can no longer be relied on and the system of imported water that provides significant supply to the region has become less reliable. The watershed gets about 50% of its water from local precipitation in the form of surface water and stored as groundwater, 35% using imports from the State Water Project and the Colorado River Aqueduct, and 15% from recycled water. Southern California, as with much of the state, has experienced drought conditions since 2014 (Drought Monitor 2022). The Project seeks to benefit the region by increasing the productivity of storm events and increasing local water supply.

1.4 California Environmental Quality Act

The California Environmental Quality Act (CEQA) applies to projects initiated by, funded by, or requiring discretionary approvals from California state or local government agencies. The proposed Project constitutes a project as defined by CEQA (California Public Resources Code [PRC] Section 21000 et seq.). CEQA Guidelines Section 15367 states that a Lead Agency is "the public agency which has the principal responsibility for carrying out or approving a project." SAWPA, as a Joint Powers Agency, would implement and operate the proposed Project and therefore serves as the lead agency responsible for compliance with CEQA. As lead agency for the proposed Project, SAWPA must complete an environmental review to determine if implementation of the Project would result in significant adverse environmental impacts.

1.5 Public Outreach

SAWPA has conducted outreach with local water districts, agencies, tribes, and communities to explain the objectives of the Project, describe the weather modification processes under consideration, and to identify candidate sites and requirements for ground-seeding systems.

This Initial Study/Mitigated Negative Declaration (IS/MND) was published for a 30-day comment period from April 6, 2022 to May 7, 2022, during which the public and agencies were able provide comment on the document. A public meeting was held on April 19, 2022 to inform stakeholders of the project and CEQA analysis. The public meeting was attended by one member of the public. One public comment was received during the public review period from the San Manuel Band of Mission Indians regarding treatment of tribal cultural resources and inadvertent discovery of human remains and cultural resources. This comment was considered by SAWPA and is addressed in Section 4.5, Cultural Resources and Section 4.18, Tribal Cultural Resources of this IS/MND. These revisions provide additional details to MM CUL-1 and MM TCR-1 to specify that the San Manuel Band of Mission Indians will be contacted in the event of any unanticipated discoveries and are not substantial revisions to the IS/MND.

1.6 Organization of the Initial Study

The remainder of the Initial Study is organized as follows:

Section 2 (Project Description) provides a detailed description of the Project. Information on Project characteristics, facilities, and construction phase is provided. This chapter also includes a description of the intended uses of the Initial Study and public agency actions.

Section 3 (Environmental Factors Potentially Affected) lists those resource sections that could have potential effects and provides SAWPA's determination regarding the level of environmental review which will be conducted.

Section 4 (Evaluation of Environmental Impacts) describes the baseline conditions and regulatory setting in the Project area. The environmental setting establishes the baseline conditions by which the determination of specific Project-related impacts is made. This section describes for each environmental resource area the impacts that would result from Project implementation following Appendix G, CEQA IS Checklist of the CEQA Guidelines; and the applicable mitigation measures that would eliminate or reduce any identified significant impacts. The following topics are addressed in the IS.

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

Section 5 (References) lists the references used in preparation of the IS/MND.

SECTION 2 Project Description

2.1 Project Description

SAWPA proposes to implement a pilot weather modification project (Project) to increase precipitation over the Santa Ana River Watershed and provide additional local water supply resources. As described in Section 1, the Project would install and operate 15 ground-based weather modification units throughout the Santa Ana River watershed. The target areas for the Project include four mountainous regions in the Santa Ana River watershed that exhibit relatively distinct geographical and climatological attributes as shown in Figure 1 and described below:

- The northwest target area, bordering Los Angeles and San Bernardino Counties encompasses a portion of the Central Transverse Ranges, to the west of the Interstate (I)-15 freeway. Estimated average seasonal runoff: 25,000 acre-feet (AF).
- The northeast target area in San Bernardino County encompasses the area of the Central Transverse Ranges east of I-15, extending down to I-10 north of Palm Springs. Estimated average seasonal runoff: 65,000 AF.
- The southeast target area includes the mountains in Riverside County centered just to the west and southwest of Palm Springs. Estimated average seasonal runoff: 10,000 AF.
- The southwest target area includes the mountain range that lies on the border of Orange and Riverside counties. Estimated average seasonal runoff: 5,000 AF.

The Project would be operated for four years. Prior to Project installation and operation, an operations plan would be prepared to detail the implementation, management, and ultimately the removal of the weather modification facilities and program. The plan would be customized for each specific intended target area and provide more detail on operational period, personnel needs, equipment requirements, maintenance, operations center procedures, modeling, seeding decision processes, suspension criteria, communications, and reporting.

2.1.1 Project Location

The proposed Project would span portions of incorporated and unincorporated areas of San Bernardino, Orange, and Riverside counties. The proposed location for each of the 15 proposed ground-based weather modification generators is shown in Figure 2. These proposed locations have been chosen based on their upwind proximity to high precipitation mountainous target areas (Table 2.1-1). The CNGs and AHOGS would be positioned such that they can be activated when upwind of the target areas during storm events (generally southerly to westerly flow situations). Due to the orientation of the mountain barriers, a westerly to southwesterly flow is the most favorable direction for precipitation and provides the best orographic uplift. Coordinated use of the array of ground-based cloud seeding sites would ensure that adequately high concentrations of nuclei are present in the seeding plumes and that there is horizontal plume overlap over the higher terrain.

The locations are based on effective and available sites known at the time of this Initial Study. However, exact coordinates may change prior to Project implementation if a nearby site is identified that provides better plume overlap over the higher terrain. In this case, SAWPA would ensure that any relocated sites would not have new or more severe environmental impacts than those described herein through the following steps. Prior to using a new location, SAWPA would compare the impacts of the proposed activity at the new location to the impacts disclosed in this Initial Study. Using the CEQA Environmenal Checklist as a guide, SAWPA must affirmatively answer, based on the substantial data, whether the new location would have any new significant environmental effects not addressed in the Initial Study, or activities that would substantially increase the severity of previously identified significant effects. These answers must be provided impact-by-impact, as well as in a final integrated response. The two possible outcomes of this comparison are:

- If there are no new significant environmental effects not addressed in the Initial Study, and no new activities that would substantially increase the severity of previously identified significant effects, then the location may be used relying on the Initial Study for CEQA compliance.
- If, however, the location would have any new significant environmental effects not addressed in the Initial Study, or activities that would substantially increase the severity of previously identified significant effects, then a subsequent environmental document would have to be prepared to address these changed conditions. If there are new impacts or a substantial increase in the severity of previously identified impacts, but only minor additions or changes would be required to this Initial Study to adequately apply to the Project in the changed situation, then a supplement to this Initial Study would need to be prepared (pursuant to CEQA Guidelines Section 15163 and 15164, either an Addendum, Initial Study, or EIR).

Table 2.1-1. Ground-based Cloud Seeding Equipment Installation Sites by Target Area

Target Area	CNG Installation Sites	AHOGS Installation Sites
Northwest		
Transverse Ranges on the Angeles National Forest	San Antonio Water Company 1 (SAWC-1)	-
Transverse Ranges on the Angeles National Forest	San Antonio Water Company 2 (SAWC-2)	-
Transverse Ranges on the Angeles National Forest	Upland - Chino Basin Water Conservation District (Upland - CBWCD)	-
Transverse Ranges on the Angeles National Forest	Waterwise Community Center - Chino Basin Water Conservation District (Waterwise - CBWCD)	-
Northeast		
The Central Transverse Ranges on the San Bernardino National Forest	East Valley Water District (EVWD)	-
The Central Transverse Ranges on the San Bernardino National Forest	Thousand Pines Christian Camp	-
The Central Transverse Ranges on the San Bernardino National Forest	Sycamore Water Plant	-

Target Area	CNG Installation Sites	AHOGS Installation Sites
The Central Transverse Ranges on the San Bernardino National Forest	San Bernardino Valley Water Conservation District 1 (SBVWCD-1)	-
The Central Transverse Ranges on the San Bernardino National Forest	San Bernardino Valley Water Conservation District 2 (SBVWCD-2)	-
The Central Transverse Ranges on the San Bernardino National Forest	San Gorgonio Pass Water Agency	-
Southeast		
The San Jacinto Mountains	Eastern Municipal Water District North (EMWD - N)	-
The San Jacinto Mountains	Eastern Municipal Water District South (EMWD - S)	-
The San Jacinto Mountains	Mary Lea Gardiner	-
Southwest		
The Santa Ana Mountains	-	Irvine Ranch Water District (IRWD)
The Santa Ana Mountains	-	El Toro Reservoir

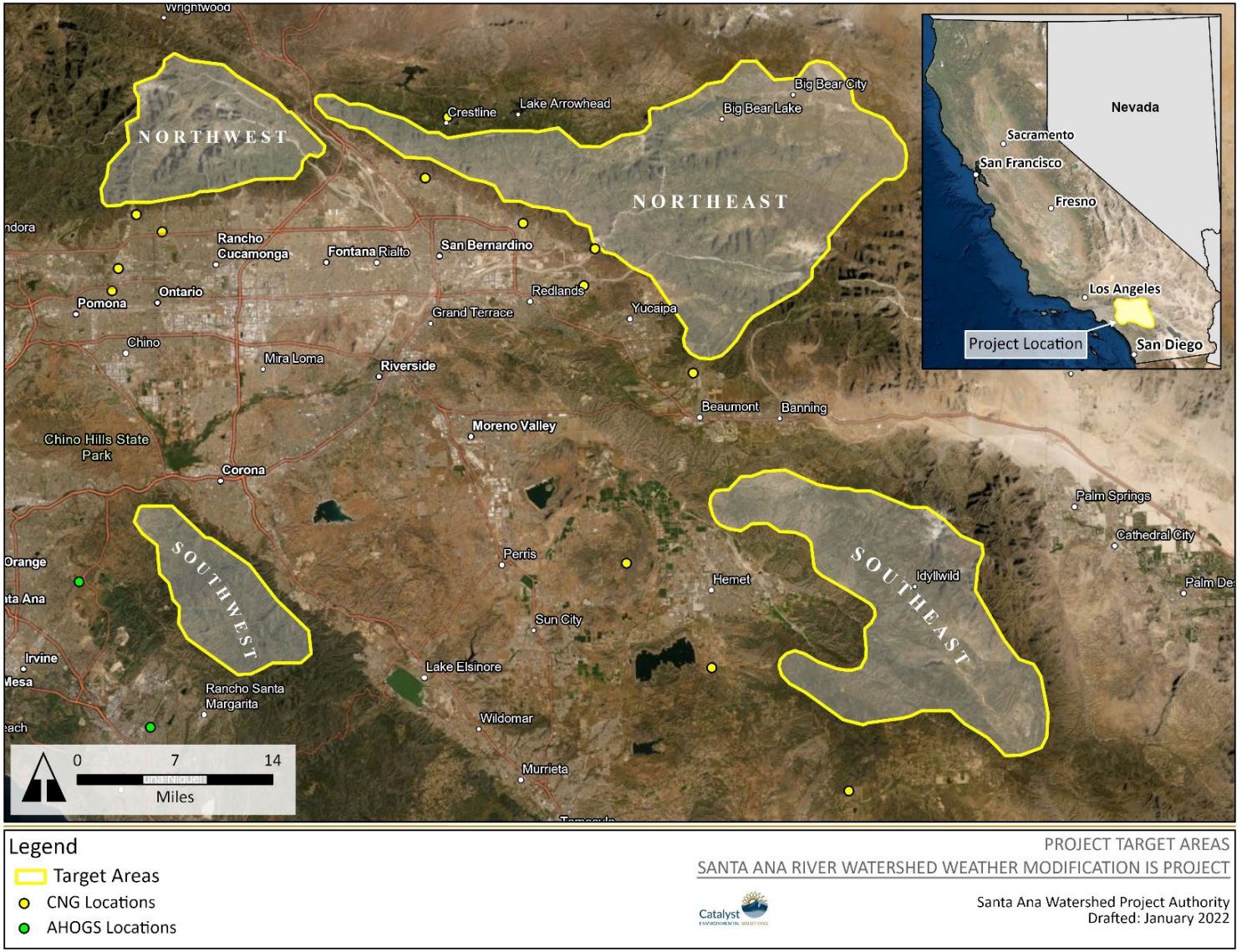

Figure 1. Project Target Areas

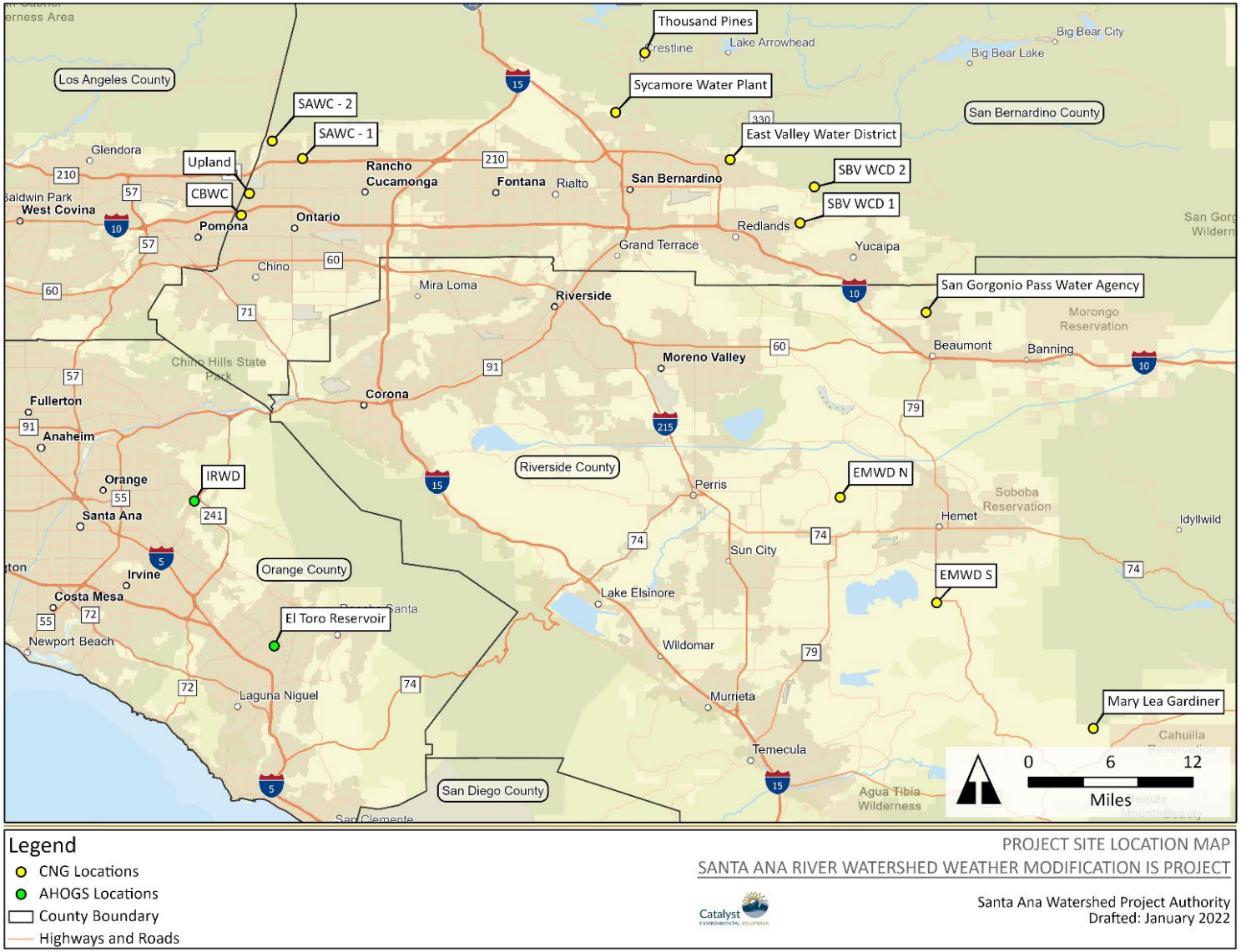

Figure 2. Ground-based Seeding Locations

2.1.2 Estimates of Precipitation and Stormwater Runoff Increase

The four target areas have different precipitation patterns and therefore different estimated precipitation increases under the Project. Estimated seasonal (November–April) precipitation and runoff increases for the four target areas are shown in Table 2.1-2.

Table 2.1-2. Estimated Precipitation and Streamflow Increases

Target Area	Seasonal Precipitation Increase (inches)	Percent Increase	Avg. Natural Streamflow (AF)	Streamflow Increase (AF)	Percent Increase
Northwest	0.41	3.5%	25,000	2,043	8.2%
Northeast	0.49	4.1%	65,000	4,330	6.7%
Southwest	0.59	3.7%	5,000	447	9.0%
Southeast	0.49	4.5%	10,000	1,373	13.7%

2.1.3 Project Termination

The proposed weather modification program would take place over a four-year period. At the conclusion of the four years, the program would either be renewed or the AHOGS and CNGs would be removed from the sites. If removal of the facilities requires the removal of vegetation, the site will be seeded with a native vegetation seed mix.

2.2 Unit Installation and Operation

SAWPA would install 13 ground-based CNGs and 2 ground-based AHOGS. If deemed appropriate during further Project planning, one or more identified CNG sites could be appropriate for AHOGS installation. Installation and operation of each of the unit types is described below.

2.2.1 Cloud Nuclei Generators

One CNG would be installed at each site, where indicated in Table 2.1-1. Installation at each site would take approximately one hour by one or two crew members. Many of the CNG sites are located on properties already fenced or with otherwise restricted access. However, if needed, a locked chain link fence at least six feet tall topped with barbed wire would be installed to enclose the CNG and prevent access to the unit by unauthorized personnel. The CNGs include a tank holding the seeding solution and a burn chamber where the solution would be burned in a propane flame (Figure 3-A). The units are approximately four feet tall. Units would be brought to the sites via a half-ton passenger pickup truck (e.g., Ford F-150, F-250). Each CNG unit would require a 125- or 250-gallon propane tank. A 250-gallon propane tank has a footprint of approximately 2.5 feet by 8 feet and is approximately 2.5 feet tall. Propane tanks would be transported by medium duty trucks (e.g., Ford F-550, Ford F-750) by a licensed third-party propane company. Propane companies sometimes use truck-mounted cranes to move the tanks from the trucks to the ground. The tanks would be filled to approximately 80 percent capacity at the beginning of the season and refilled mid-season as needed. The propane tanks would be serviced by

licensed propane suppliers. One technician would be required to operate and maintain the CNGs. Servicing generally would occur two to four times per year.

No significant grading would be needed prior to installation due to the selection of appropriate sites in previously disturbed areas. Most CNGs do not require a concrete pad; however, if one is required by a supporting agency or landowner, the maximum size of the pad would be 10 feet by 10 feet. Most CNGs do not require anchoring. Rebar may be used to support the units depending on site conditions. Three pieces of rebar would be hammered approximately six to eight inches into the ground.

Once installed, CNGs are only operated during storm events and require manual operation by the property owner at each site, following instruction from the Project meteorologist. During a storm event, the Program meteorologist would call or e-mail the resident or business contact of the CNG location to inform them to activate or deactivate the unit. When activated, CNGs burn a solution of silver iodide and acetone. Approximately 20-25 grams of silver iodide would be released for each hour of operations from one of these units. These generators create a continuous plume of seeding material that provides broad coverage over primarily mountainous terrain with the need for strong orographic lift (movement of air over mountain barriers). The CNG units would be operated for up to approximately eight hours per storm event. A total of 600 hours is expected for all sites over the duration of the season. In a very productive season this could extend to 800 hours total for all sites.

2.2.2 Automated High Output Ground Seeding System

AHOGS, or equal devices, are ideal for seeding convective bands with high concentrations of supercooled liquid water and strong vertical updrafts. These units are most effective for storms with convective attributes (i.e., turbulence). Installation of each AHOGS would take two days by two crew members. Most AHOGS do not require a concrete pad; however, if one is required by a supporting agency or landowner, it would be 30 feet long by 5 feet wide. In this case, a concrete drill attached to a skid steer would be used to drill three holes in the concrete. AHOGS would be enclosed by locked fencing to prevent access by unauthorized personnel. Installation of fencing would be as described above for CNGs.

AHOGS consist of three aluminum pillars and one smaller pole cemented in the ground. The pillars are six inches by six inches and would require holes between 8 and 12 inches in diameter to install. Pillars would be cemented two to three feet into the ground. Holes would be dug using gas powered post hole diggers. Cement would be mixed manually. The units would be solar powered. Additional holes would be dug to support security and a monitoring camera. Vertical AHOGS contain numerous flares oriented around the central upright pole (e.g., “flare trees”). Porous metal cylinders called spark arrestors cover the flares (Figure 3-B). In addition to the flare trees, an environmentally sealed control box containing a cellular phone communications system, digital firing sequence relays/controller, data logger and system battery would be installed. One technician would maintain the equipment four to five times per year. Following installation, weed abatement would be routinely performed to prevent vegetation that could serve as fuel from encroaching on the towers.

The AHOGS are remotely operated units that use burn-in-place flares that release a high concentration of silver iodide very rapidly. The devices are triggered by a Project Meteorologist operating remotely. The use of the monitoring camera allows the operator to evaluate the conditions prior to triggering, and

after the triggering to ensure operations are as expected. The cloud seeding flares consist of the silver iodide cloud seeding mixture and igniter. The cloud seeding mixture is glued into a paper tube, and the igniter is stored at the end of the flare and sealed with a plastic cap. The electronic igniter is activated using the voltage supplied from the ground remotely-controlled flare unit to the firing box. The flares produce a plume that may be visible to nearby receptors. SAWPA would notify the local fire department(s) when the devices are installed so that the department is aware of the AHOGS locations and the potential for smoke from the devices.

The flares would be ignited by the Project meteorologist. The units are also equipped with high-resolution cameras that would be used by the Project meteorologist to monitor the unit prior to igniting the flares and during the illuminating of flares to ensure proper ignition and burning of the flares. Flares would only be ignited when a convection band is passing over one of the sites when rain is imminent or present to further reduce any concerns about small sparks hitting the ground and igniting. The flares burn similarly to an emergency road flare, emitting a small continuous flame for up to four minutes. The flares are housed within aluminum spark arrestors (Figure 3-B). These ventilated cylinders allow the seeding agents to escape while preventing sparks from reaching the ground. Each flare burns for approximately 3-4 minutes, and flares are ignited consecutively during a storm event, with a maximum of 15 flares ignited in a 24-hour period. The Project meteorologist would monitor the number of spent flares, and a field technician would replace the flares as necessary following storm events.

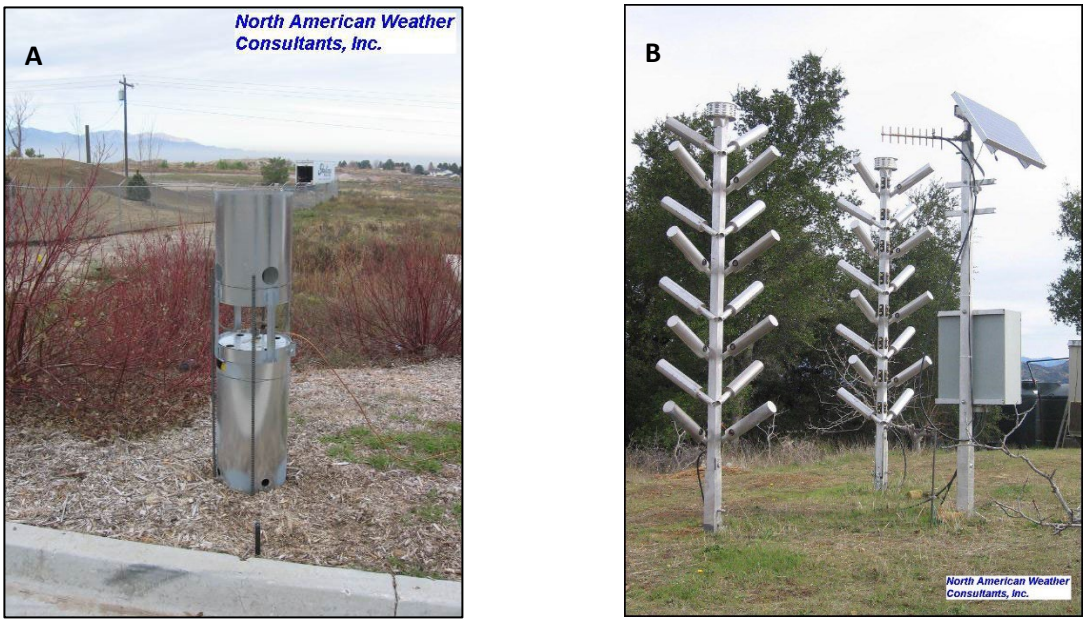

Figure 3. Images Showing (A) fully installed Cloud Nucleating Generator and (B) Automated High-Output Ground Seeding System with flare tree configuration.

2.3 Project Personnel

The Project manager would be a Weather Modification Association (WMA) Certified Manager or American Meteorological Society Certified Meteorologist. A WMA Certified Operator would serve as the Project meteorologist. If qualified, the Project meteorologist could serve as the Project manager. The Project manager would be responsible for the supervision, operation, and overall direction of the

Project. The Project meteorologist would manage the day-to-day operations of the weather modification program, including tracking meteorological conditions, recordkeeping (e.g., meteorological data, seeding times), ensuring that each unit is maintained at full operational readiness, remotely operating the AHOGS, and communicating with CNG operators.

A field technician working under the direction of the Project manager would be responsible for the installation and maintenance of the ground seeding units, including refilling CNGs with seeding solution, CNG maintenance, replacing expended flares in the AHOGS, and general AHOGS maintenance.

Each of the CNG sites would be overseen by the Project meteorologist and directly operated by someone who lives and/or works at the location. The CNG operator would be in frequent contact with the Project meteorologist and would transmit information regarding the function of the CNGs.

2.4 Suspension Criteria

The Project would use established suspension criteria to be developed by SAWPA and NAWC to determine when weather modification activities should occur. Suspension criteria and restrictions are developed to minimize or avoid the potential for the cloud seeding activities to create or contribute to significant flood hazards. Seeding operations may need to be suspended whenever the National Weather Service (NWS) issues a Winter Storm Warning, a Flood/Flash Flood Warning, or a Severe Thunderstorm Warning for the target area or any areas adjacent to the target areas. Suspension is not always necessary when Winter Storm Warnings are issued, unless there are special, extenuating considerations, such as heavy snowfall to low elevations or holiday periods.

An excessive amount of rain can result in increased flooding hazards. When a significant rain on snow event is expected in the area, the weather forecast would be monitored closely to signal the potential for heavy rain. The types of storms associated with a Flash Flood Warning that may cause hazards during cloud seeding are those that have the potential of producing two to three inches (or greater) of rainfall in an approximately 24-hour period. Seeding operations would also potentially need to be suspended during the warning period in the affected areas when the 24-hour rainfall is forecast to be greater than six inches. Coordination between the Project manager and water managers would be necessary in situations where the freezing level is detected at elevations greater than 7,000 feet and the Quantitative Precipitation Forecast is greater than three inches in 24 hours (NAWC 2020).

A weather phenomenon known as “Atmospheric River” storms can also impact the proposed target areas during the winter season. These are “deep cloud systems fueled by tropical, or subtropical connections that can feed large amounts of atmospheric moisture into the west coast including southern California”. These storms naturally produce a large amount of precipitation and cloud seeding would not occur.

According to the Riverside County Flood Control and Water Conservation District, areas to the north and east of the southwest target area contain underdeveloped infrastructure, leaving it particularly susceptible to flooding, which can inhibit transportation in and out of the area, leaving individuals unable to attend work or school. To prevent the Project from contributing to flooding in this area, additional suspension criteria would be implemented for the southwestern target area (IRWD and El Toro Reservoir). Suspension criteria would be based on flood advisories and precipitation forecasts. Operations would be suspended in this target area when 0.5-0.7 inch (or greater) of precipitation in a

one-hour period or two to three inches (or greater) of precipitation in a 24-hr period is forecasted. The southeast target area, is also susceptible to flash flooding and heavy runoff. If rainfall forecasts exceed these 0.5-0.7 and two to three-inch thresholds, the Project meteorologist would coordinate with the flood district to determine if weather modification activities should be temporarily suspended.

Earthquake damage to the soil structure may occur in target areas depending on the intensity and distance from the epicenter of an earthquake. During the storm season, if a 5.0 (Richter Scale) earthquake occurs within 50 miles, or a 4.0 (Richter Scale) earthquake occurs within 25 miles of any Project site or target area, the suspension criteria will be activated. Damage to the soil structure may increase the potential for damaging landslides and mud flows during periods of moderate to heavy rainfall. After an earthquake, cloud seeding in the affected area may be suspended for the remainder of the storm season. Geology, geo-technical, and sedimentation personnel will analyze the impact to the soil structure and sediment transport potential to decide when cloud seeding may resume in the affected area.

Following wildfires, many flood districts monitor the possibility of debris flow and runoff. Depending on the location and extent of a wildfire event, cloud seeding operations may be paused for entire seasons or even years. The Santa Ana Watershed is unique in that it comprises four target areas, sufficiently divided and relatively easy to target individually. The program would be able to target unburned areas of the watershed while avoiding burn scarred areas. In the event of a fire, SAWPA, the flood control district, and the Project manager would work together to determine the best course of action to prevent erosion and sediment transport downstream.

2.5 Lead Agency

The lead agency for the CEQA review is SAWPA. SAWPA is a joint powers authority composed of five member agencies: Eastern Municipal Water District, Inland Empire Utilities Agency, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District. SAWPA manages the water resources of the Santa Ana River to maximize beneficial uses in the watershed in an economically and environmentally responsible manner.

2.6 Required Approval of Other Public Agencies

The proposed Project does not require any federal, state, or local permits or discretionary approvals. The National Oceanic and Atmospheric Administration (NOAA) requires the operators of weather modification activities to file an “Initial Report on Weather Modification Activities” and subsequent interim and annual completion reports, which provides the number of days and hours of operation and the amounts of seeding material used. Public Law 92-205 requires the operators of cloud seeding programs conducted in the United States to file an initial, interim (if the project spans two calendar years) and final report to NOAA for each seeded season.

The California Department of Water Resources (DWR) requires sponsors of weather modification projects to file a Notice of Intent at the beginning of a project and every five years thereafter. The Notice of Intent must be published in local newspapers in the affected counties at least 21 days before the start of the Project, and proof of publication must be filed with DWR.

SECTION 3 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project as indicated by the checklist on the following pages.

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

3.1 Determination

On the basis of this initial evaluation:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR 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 Thad R Nott Date 4/1/2022

SECTION 4 Evaluation of Potential Environmental Impacts

This section describes the resources found in the Project area and the potential impacts to those resources from implementing the Project. Impacts to resources may result from the construction/installation of the Project or operation and maintenance associated with the Project. For each resource area, the potential impacts resulting from implementation of the Project are evaluated for their level of significance. The categories used to designate impact significance are described below:

- *No Impact*: A project is considered to have no impact if there is no potential for impacts, or if the environmental resource does not exist within the Project area or the area of potential effect. For example, there would be no impacts related to wastewater disposal if the project would not involve the production of wastewater.
- *Less than Significant*: This determination applies if there is some impact, but not one that qualifies under the significance criteria as a significant impact.
- *Less than Significant with Mitigation*: This determination applies to impacts that exceed significance criteria, but for which feasible mitigation is available to reduce the impacts to a less than significant level.
- *Potentially Significant:* This determination applies to impacts that are significant but for which: 1) no feasible mitigation has been identified to reduce the impact to a less than significant level, or 2) feasible mitigation has been identified, but the residual impact remains significant after mitigation is applied. Therefore, the impact is considered significant and unavoidable.

The level of significance for an impact is determined by the application of significance criteria. These are the thresholds for assigning significance to an impact, per the list of significance levels above. Significance criteria are determined through evaluation of the regulatory setting of the area from a federal, state, and local standpoint. When no regulatory guidelines are available, generalized criteria based on the CEQA Checklist ensures that significance is comprehensively addressed.

In cases where impacts are expected, but which can be reduced with adequate mitigation, those mitigation measures are described. A revised level of significance may result from mitigation. In some cases, less than significant determinations are made, but application of mitigation may still be warranted to further reduce potential impacts (CEQA Section 15021).

Impact assessment takes into consideration construction and operational impacts. Construction impacts are those that may occur during implementation of construction actions and are compared to baseline conditions under which no project would occur. Operational impacts are those that may occur after the project has been completed.

The analysis of potential impacts and mitigation measures is based on pre-determined significance criteria. The significance criteria used in this Initial Study are taken from Appendix G: Environmental Checklist Form included in the CEQA Guidelines (CA OPR 2018).

4.1 Aesthetics

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
I. 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?	☐	☐	☐	☒

4.1.1 Environmental Setting

Eight of the proposed seeding sites are in non-urban/rural areas and seven are located in urban area. All proposed sites are subject to the scenic resource requirements of the cities and counties in which they are located as shown in Table 4.1-1.

Table 4.1-1. Project Site Scenic Resources and Regulations

Location Name	Is the Site in an Urban or Nonurban Area?	Is there a designated scenic highway or vista near the Site?	Local Scenic Resource Requirements
Waterwise Community Center - CBWCD	Urban	No scenic highways or vistas in vicinity	No aesthetic requirements in Montclair city code.
Upland – CBWCD	Urban	No scenic highways or vistas in vicinity	Building setback distances from street/property line in Upland city code.
SAWC - 1	Urban	No scenic highways or vistas in vicinity	Building setback distances from street/property line in Upland city code.
SAWC - 2	Urban	County-designated scenic route: N Mountain Ave 0.14-mile northeast of site. No scenic vistas in vicinity	San Bernardino County General Plan Policy NR-4.1 Preservation of scenic resources: Consider the location and scale of development to preserve regionally significant scenic vistas and natural features, including prominent hillsides, ridgelines, dominant landforms, and reservoirs. Policy LU-4.7 Dark skies: Minimize light pollution and glare to preserve views of the night sky, particularly in the Mountain and Desert regions where dark skies are fundamentally connected to community identities and local economies. We also promote the preservation of dark skies to assist the military in testing, training, and operations.
EVWD	Nonurban	County-designated scenic highway SR 330 0.5-mile northwest of site. No scenic vistas in vicinity	San Bernardino Municipal Code 19.10.020 Any structure located in a Special Purpose zone (except the Open Space zone, wherein all structures are prohibited) shall be subject to an Administrative or Development Permit and shall be: 2. Sited in a manner sensitive to the existing natural resources and constraints of the land; 5. Subject to demonstrating the need for exterior lighting, and if justified shall be appropriately located, directed, and shielded from surrounding properties and public rights-of-way; 6. Subject to a visual analysis relating building proportions, massing, height, and setbacks to preserve and enhance the scenic character of the area; and 7. Compatible and in harmony with surrounding development and land use designations

Location Name	Is the Site in an Urban or Nonurban Area?	Is there a designated scenic highway or vista near the Site?	Local Scenic Resource Requirements
Thousand Pines Christian Camp	Nonurban	County-designated scenic route: Lake Dr. 0.44-mile S/SE of site; County-designated scenic vista: Lake Gregory Dr 0.45 mile south of site; site is surrounded by San Bernardino National Forest	Same as for Site SAWC-2
Sycamore Water Plant	Nonurban	No scenic highways or vistas in vicinity	No aesthetic requirements in San Bernardino city code.
SBVWCD-1	Urban	Site is located on Eligible state scenic highway: State highway 38. No scenic vistas in vicinity	Same as for Site SAWC-2
SBVWCD-2	Nonurban	No scenic highways or vistas in vicinity	Highland Municipal Code 16.40.440 Scenic resources. C. Development Standards. 1. When a land use is proposed within scenic area, the following criteria shall be used to evaluate the project compliance with the intent of the district: a. Building and Structure Placement. The building and structure placement shall be compatible with and shall not detract from the visual setting or obstruct significant views. d. Landscaping. The removal of native vegetation, especially timber, shall be minimized and replacement vegetation and landscaping shall be compatible with the local environment and, where practicable, capable of surviving with a minimum of maintenance and supplemental water. Landscaping and plantings shall not obstruct significant views, either when installed or when they reach mature growth. g. Grading. The alteration of the natural topography of the site shall be minimized and shall, to the extent feasible and practical, avoid detrimental effects to the visual setting of the designated area and the existing natural drainage system. Alterations of the natural topography

Location Name	Is the Site in an Urban or Nonurban Area?	Is there a designated scenic highway or vista near the Site?	Local Scenic Resource Requirements
			shall be screened from view from either the scenic highway or the adjacent scenic or recreational resource by landscaping and plantings pursuant to subsection (C)(1)(d) of this section.
San Gorgonio Pass Water Agency	Urban	County eligible scenic route Oak Glen Rd 0.24 mile east of site. No scenic vistas in vicinity	Riverside County General Plan LU 14.1 Preserve and protect outstanding scenic vistas and visual features for the enjoyment of the traveling public. LU 14.3 Ensure that the design and appearance of new landscaping, structures, equipment, signs, or grading within Designated and Eligible State and County scenic highway corridors are compatible with the surrounding scenic setting or environment. LU 14.4 Maintain an appropriate setback from the edge of the right-of-way for new development adjacent to Designated and Eligible State and County Scenic Highways based on local surrounding development, topography, and other conditions.
EMWD - N	Nonurbanized	No scenic highways or vistas in vicinity	Same as for Site San Gorgonio Pass Water Agency
EMWD - S	Nonurbanized	No scenic highways or vistas in vicinity	Same as for Site San Gorgonio Pass Water Agency
Mary Lea Gardiner	Nonurbanized	No scenic highways or vistas in vicinity	Same as for Site San Gorgonio Pass Water Agency
IRWD	Nonurbanized	No scenic highways or vistas in vicinity	Orange County General Plan Resources Element Policy 5. Landforms: To protect the unique variety of significant landforms in Orange County through environmental review procedures and community and corridor planning activities.
El Toro Reservoir	Urbanized	No scenic highways or vistas in vicinity	City of Mission Viejo General Plan Policy 3.8: Preserve views of significant value along streets and highways that adjoin such areas as a lake, hillside, ridgeline, creek, open space, or recreational area

Sources: Riverside County 2021a; Orange County 2015; San Bernardino County 2020; City of Mission Viejo 2021

4.1.2 Environmental Impacts

AES (a). Have a substantial adverse effect on a scenic vista?

No Impact. The proposed facilities are not located near or in the viewshed of any designated scenic vistas, as provided in Table 4.1-1 above. The CNGs and AHOGS would be installed in areas of previously disturbed land and existing structures and would not alter the quality of any scenic vistas. Only one of the proposed sites, Thousand Pines Christian Camp, is close to a scenic vista and also surrounded by the San Bernardino National Forest, which while not officially-designated, does provide scenic views. However, the proposed unit would be installed near the developed area of the camp site and would not impede or adversely affect the views of camp-goers or recreationalists at the San Bernardino National Forest. Therefore, the Project would have no impact on scenic vistas.

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

Less than Significant. As shown in Table 4.1-1, a number of the Project sites are near designated or eligible scenic routes and highways. Site SBVWCD-1 is located along an eligible state scenic highway Highway 38, and the CNG would be installed approximately 80 feet from the highway. Therefore, Site SBVWCD-1 would be visible from Highway 38, and the potential exists that sites SAWC-2, East Valley Water District (EVWD), Thousand Pines Christian Camp, and San Gorgonio Pass Water Agency may also be visible from designated or eligible scenic routes. However, all of the CNG and AHOG would be installed on previously disturbed land and would require minimal ground disturbance during installation. Therefore, the Project would not result in substantial damage to any scenic resources within any designated scenic routes and impacts would be less than significant.

AES (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?

Less than Significant. As described in Table 4.1-1, eight units would be installed in nonurban areas and seven units would be installed in urban areas. As such, this response evaluates if the units installed in the nonurban areas would substantially degrade existing visual character or quality of public views from the site and for those sites in urban areas evaluates if the project would conflict with the applicable zoning and other regulations that govern scenic quality in the specific local jurisdictions governing each of the subject units.

Structures are present at all the nonurban sites selected for unit installation. For example, lodging, dining and meeting facilities are present at the Thousand Pines Christian Camp site and there is a residence at the Mary Lea Gardiner site. The units would be installed on existing disturbed areas. While the units would be visible and distinct from the existing buildings and introduce new visual features to these rural areas, they would be relatively small in footprint and would not substantially detract from the overall visual character of these nonurban areas. Therefore, impacts would be less than significant.

In urban areas, the units would be installed in accordance with local aesthetic regulations shown in Table 4.1-1. Further, the installation and operation of ground-based cloud seeding units is not prohibited

by any city and county zoning ordinances (Table 4.11-1). Therefore, the Project would not degrade the existing visual character of a site, and less than significant impacts would occur.

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

No Impact. There would be no lighting installed at any of the units. The CNGs use a small flame and the AHOGS use a flare enclosed in a spark arrestor. The flame and flare would only be lit during storm events and would not be visible to the public. Therefore, the Project would not create a new source of light or glare of light, and no impacts would occur.

4.2 Agriculture and Forestry Resources

Issue	Potentially Significant Impact	Less Than Significant 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?	☐	☐	☐	☒

4.2.1 Environmental Setting

The proposed locations for cloud seeding units are scattered throughout San Bernardino, Orange, and Riverside counties (Figure 2). Table 4.2-1 indicates the agricultural zoning of each of the proposed locations. As shown in the table, six of the proposed locations are in areas zoned as "Other Land", three locations are on land zoned as "Grazing Land", and three locations are zoned as "Urban and Built-Up Land". Only the San Gorgonio Pass Water Agency location is in an area designated as "Farmland of local importance", which is farmland of importance to the local economy, as determined by each county's Board of Supervisors, but does not meet the criteria of Prime, Statewide or Unique Farmland. The last two locations are in unincorporated areas that do not have a zoning designation.

None of the proposed locations contain timber resources or agricultural crops (CDOC 2021a). None of the proposed locations are within active Williamson Act Contract parcels or Agricultural Preserves (CDOC 2016).

Table 4.2-1. Agricultural Zoning

Location Name	Agriculture Zoning
Waterwise Community Center - CBWCD	Urban and Built-Up Land
Upland - CBWCD	Other land
SAWC - 1	Other land
SAWC - 2	Urban and Built-Up Land
EVWD	Grazing land
Thousand Pines Christian Camp	Area not mapped
Sycamore Water Plant	Grazing land
SBVWCD-1	Grazing land
SBVWCD-2	Area not mapped
San Gorgonio Pass Water Agency	Farmland of local importance
EMWD - N	Other land
EMWD - S	Other land
Mary Lea Gardiner	Other land
IRWD	Other land
El Toro Reservoir	Urban and Built-Up Land

Source: CDOC 2021a

4.2.2 Environmental Impacts

AG (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?

Less than Significant. The CNGs and AHOGS would be installed on private land with the permission of landowners. None of the sites is located on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The San Gorgonio Pass Water Agency site is in an area designated as Farmland of Local Importance; however, the CNG unit would only occupy up to 100 square feet of land and would not significantly change the existing land use (the site is currently vacant, previously disturbed land) or the land use of the surrounding area. Therefore, impacts would be less than significant.

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

No Impact. None of the Project sites are Williamson Act contract lands. For the sites that are zoned as agricultural, none of the city or county zoning ordinances (see Table 4.11-1) prohibit the installation and operation of ground-based cloud seeding units. Furthermore, installation and operation of the units would not alter the existing or potential future land use of the of the sites. Therefore, the Project would have no impacts.

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

No Impact. None of the Project sites are zoned forest land, timberland, or timberland zoned Timberland Production. The Project would not involve any changes in land use or zoning. Therefore, the Project would have no impacts.

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

No Impact. The Project would not involve any tree removal and would not convert any forest land to non-forest use. Therefore, the Project would have no impacts.

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

No Impact. As described in (AG) a-d above, the Project would not result in any physical changes to the Project sites that would directly or indirectly convert land uses. Therefore, no impacts would occur.

4.3 Air Quality

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. 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?	☐	☐	☒	☐

4.3.1 Environmental Setting

The proposed sites are all located within the South Coast Air Basin ("the Basin"). The Basin is designated as a state nonattainment area for ozone (O_3), fine particulate matter (PM) less than 2.5 microns in diameter ($PM_{2.5}$), and PM 10 microns of less in diameter (PM_{10}) and are attainment or maintenance areas for carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2), and lead (Pb).

The South Coast Air Quality Management District (SCAQMD) is the air pollution agency responsible for monitoring air quality conditions and regulating stationary sources of air pollution in the Basin. A review of the monitoring data from 2018-2020 for the Basin indicates that concentrations of ozone exceeded the state 8-hour standard for 141 days in 2018, 126 days in 2019, and 157 days in 2020 (SCAQMD 2021a).

4.3.1.1 Criteria Air Pollutants

Air quality is defined by ambient air concentrations of seven specific pollutants identified by the United States Environmental Protection Agency (USEPA) to be of concern with respect to health and welfare of the general public. These specific pollutants, known as "criteria air pollutants," are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. Criteria air pollutants include CO, O_3, nitrogen oxides (NO_X), sulfur oxides (SO_X), $PM_{2.5}$, PM_{10}, and lead (Pb). Table 4.3-1 summarizes the federal and state air quality standards for each criteria pollutant along with the attainment status for the Project area.

Table 4.3-1. Federal and State Air Quality Standards and Project area Attainment Status

Pollutant	Averaging Period	California		Federal	
		Standards	Attainment Status	Standards	Attainment Status
Ozone (O_3)	1-hour	0.09 ppm (180 µg/m³)	Nonattainment	--	--
	8-hour	0.070 ppm (137 µg/m³)	n/a	0.070 ppm	Nonattainment
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m³	Nonattainment	150 µg/m³	Maintenance
	Annual Arithmetic Mean	20 µg/m³	Nonattainment	--	--
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	--	35 µg/m³	Nonattainment
	Annual Arithmetic Mean	12 µg/m³	Nonattainment	12.0 µg/m³	Nonattainment
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m³)	Attainment	9 ppm (10 mg/m³)	Maintenance
	1-hour	20 ppm (23 mg/m³)	Attainment	35 ppm (40 mg/m³)	Maintenance
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	30 ppb (57 µg/m³)	Attainment	53 ppb (100 µg/m³)	Attainment
	1-hour	0.18 ppm (338 µg/m³)	Attainment	100 ppb (188 µg/m³)	Maintenance
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	--	--	0.030 ppm (80 µg/m³)	Attainment
	24-hour	0.04 ppm (105 µg/m³)	Attainment	0.14 ppm (365 µg/m³)	Attainment
	3-hour	--	--	75 ppb (196 µg/m³)	--
	1-hour	0.25 ppm (655 µg/m³)	Attainment	--	--
Lead (Pb)	30-day average	1.5 µg/m³	Attainment	--	--
	Calendar Quarter	--	--	1.5 µg/m³	Nonattainment (Los Angeles County)
Visibility Reducing Particles	8-hour	Extinction of 0.07 per kilometer	n/a	No Federal Standards	
Sulfates	24-hour	25 µg/m³	Attainment		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m³)	Unclassified		
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m³)	n/a		

n/a = not available

Source: CARB 2021

4.3.1.2 Local Climate

The climate of Southern California is classified as Mediterranean and is characterized by warm, dry summers and mild winters with moderate rainfall. Prevailing daily winds in the region are westerly, with a nighttime return flow. Within the proposed Project area, wind predominately blows from the east-southeast (SCAQMD 2021b).

The annual average temperatures in the coastal area of the Basin vary from the lows in the mid-50s to highs in the mid-70s, with annual precipitation ranging from 12 to 15 inches. Further inland in low elevation areas, temperatures increase, and precipitation decreases. Average highs during the summertime can reach mid- to high-90s, with maximum daily temperatures over 100 degrees Fahrenheit (°F). Rainfall in some inland areas average less than 10 inches per year. Total precipitation on the proposed Project site and vicinity averages approximately 17.7 inches annually. Precipitation occurs mostly during the winter and relatively infrequently during the summer. In the surrounding inland mountains where elevations reach more than 10,000 feet, temperatures can drop to below freezing in the winter with precipitation in the form of snow.

The topography and climate of Southern California combine to make the Basin an area of high air pollution potential. A warm upper layer of air mass descends over the cool, moist marine layer and forms a cap over the cooler surface layer, which inhibits the pollutants from dispersing upward during the summer months. Light winds during the summer further limit ventilation and abundant sunlight triggers photochemical reactions that produce O_3 and the majority of PM.

4.3.1.3 Sensitive Receptors

The California Air Resource Board (CARB) has identified the following groups who are most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to the SCAQMD, sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

The Project areas include primarily urbanized areas (i.e., Cities of Montclair, Upland, Crestline, San Bernardino, and Highland) with several sites in more rural areas of unincorporated Orange County, Riverside County, and San Bernardino County where residences, schools, hospitals, and daycare centers could be in close proximity to project activities (within 1,000 feet). Table 4.3-2 provides a breakdown of the closest sensitive receptors to the sites. As observed all the closest sensitive receptors were identified as residences. The site with the closest sensitive receptor is the Mary Lea Gardiner site with a residence less than 100 feet from the site.

Table 4.3-2. Nearest Sensitive Receptors to Each Site

Site	Cloud Seeding Unit Type	Type of Sensitive Receptor	Distance to Nearest Sensitive Receptor (Ft)
Waterwise Community Center - CBWCD	CNG	Residential Property	196
Upland - CBWCD	CNG	Residential Property	805
SAWC-1	CNG	Residential Property	1,292
SAWC-2	CNG	Residential Property	186
EVWD	CNG	Residential Property	590
Thousand Pines	CNG	Residential Property	452
Sycamore Water Plant	CNG	Residential Property	1,372
SBVWCD-1	CNG	Residential Property	145
SBVWCD-2	CNG	Residential Property	3,271
San Gorgonio Pass Water Agency	CNG	Residential Property	137
EMWD – N	CNG	Residential Property	820
EMWD – S	CNG	Residential Property	882
Mary Lea Gardiner	CNG	Residential Property	59
IRWD	AHOGS	Residential Property	2,593
El Toro Reservoir	AHOGS	Residential Property	209

4.3.1.4 Federal Clean Air Act

The Clean Air Act (CAA) provides the regulatory framework that governs air quality in the United States and is enforced by the USEPA. Pursuant to the CAA, USEPA determines the National Ambient Air Quality Standards (NAAQS) which establish thresholds for the seven major air pollutants: CO, NO_2, O_3, $PM_{2.5}$, PM_{10}, SO_2, and Pb. Primary standards set limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung disease (such as asthmatics), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. The CAA requires the USEPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for primary standards based on whether the NAAQS have been achieved.

In addition to the criteria pollutants, the air toxics provisions of the CAA require the USEPA to develop and enforce regulations to protect the public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Section 112 of the CAA, the USEPA establishes National Emission Standards for Hazardous Air Pollutants. The list of Hazardous Air Pollutants or air toxics includes specific compounds that are known or suspected to cause cancer or other serious health effects.

4.3.1.5 California Clean Air Act

In addition to being subject to the requirements of the CAA, air quality in California is also regulated by the California Clean Air Act (CCAA). In California, the CCAA is administered by CARB at the State level and by the air quality management districts and air pollution control districts at the regional and local levels.

The California Ambient Air Quality Standards (CAAQS) are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The CCAA requires CARB to designate areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years. Exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard and are not used as a basis for designating areas as nonattainment. Under the CCAA, the Los Angeles County, Orange County, San Bernadino County, and Riverside County portions of the Basin is designated as a nonattainment area for O_3, $PM_{2.5}$, and PM_{10}.

4.3.1.6 SCAQMD Rules 402 and 403

The SCAQMD has established various rules to manage air quality in the Basin, including Rules 402 and 403. Rule 402 (Nuisance) states that a person should not emit 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 (Fugitive Dust) controls fugitive dust through various requirements including, but not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the proposed Project site, and maintaining effective cover over exposed areas.

In its role as the local air quality regulatory agency, the SCAQMD recommended thresholds of significance for evaluating air quality impacts. To determine whether air quality impacts from the proposed Project or Alternatives may be significant, impacts are evaluated and compared to the criteria in Table 4.3-3. If impacts equal or exceed any of the criteria in Table 4.3-3, they are considered significant. SCAQMD is currently in the process of developing an "Air Quality Analysis Guidance Handbook" (Handbook) to replace the SCAQMD CEQA Handbook. Until the Air Quality Analysis Guidance Handbook becomes available, the SCAQMD provides supplemental information to assist in air quality analysis. Specifically, the SCAQMD provides Localized Significance Thresholds for projects that are five acres or less. To provide a conservative assessment, each Project site is considered a 1-acre construction site for the purpose of comparing to the relevant Localized Significance Thresholds. Since the Project sites span several Source Receptor Areas, the most conservative emissions thresholds for all Source Receptor Areas located 25 feet from the Project sites as summarized in Table 4.3-4, are used to determine whether air quality impacts from the proposed Project may be significant.

Table 4.3-3. SCAQMD Air Quality Mass Daily Significance Thresholds

Pollutant	Mass Daily Thresholds (Construction)	Mass Daily Thresholds (Operation)
NO_X	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_X	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

Source: SCAQMD 2019; lbs/day = pounds per day

Table 4.3-4. Emission Localized Significance Thresholds for Construction and Operation (1-Acre Project Site, 25 Meters from Sensitive Receptor)

Pollutant	Localized Significance Thresholds for Construction (pounds per day)	Localized Significance Thresholds for Operation (pounds per day)
NO_x	46	46
CO	231	231
PM_{10}	4	1
$PM_{2.5}$	3	1

Source: SCAQMD 2008a

4.3.2 Environmental Impacts

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

Less than Significant. The most recent Air Quality Management Plan (AQMP) was adopted by the Governing Board of the SCAQMD on March 3, 2016 (SCAQMD 2016). An inventory of existing emissions from industrial facilities is included in the baseline inventory in the 2016 AQMP, as well as projections of the future emissions which are based on source category growth factors provided by the Southern California Association of Government. The 2016 AQMP also identifies emission reductions from existing sources and air pollution control measures that are necessary to comply with applicable state and federal ambient air quality standards. Two criteria are used to determine whether the proposed Project would conflict with or obstruct implementation of the AQMP. The first criterion is whether the proposed Project is consistent with projections for population and vehicle miles traveled that were used as the basis of the AQMP projections. The proposed Project would not result in an increase in population in the Project area and would not add a substantial enough number of vehicle miles traveled to exceed the projections used by the SCAQMD. The second criterion is whether the proposed Project would increase

the frequency or severity of existing air quality violations, contribute to new violations, or delay the timely attainment of air quality standards.

Construction activities associated with installation the Project equipment at each site would temporarily generate emissions of criteria pollutants, which are primarily associated with mobile equipment exhaust. Installation of the Project equipment would also generate fugitive dust emissions from vehicles and shallow excavation/auger drilling activities. Operation of the CNG and AHOGS units would emit microscopic silver iodide particles during cloud seeding events. However, as set forth in air impact criteria (b) below, the total emissions associated with the proposed Project would be well below the SCAQMD thresholds and would not lead to an exceedance of any applicable air quality standards or conflict with the applicable attainment plans.

The proposed Project would not conflict with or obstruct implementation of the AQMP or the other applicable plans. Therefore, impacts would be less than significant.

AIR (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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Less than Significant. Construction-related emissions were estimated using SCAQMD's CalEEMod 2016.3.2 model (refer to Appendix A) based on assumptions for the proposed Project, including the proposed Project's construction equipment and duration at each site as detailed in Section 2.3. The analysis assumed that no more than one site installation would be completed in one day. Appendix A provides detailed assumptions regarding the installation schedule, numbers of construction equipment, and truck trips per day required to install the 13 CNGs and 2 AHOGS.

Table 4.3-5 below provides a summary of estimate daily construction emissions, based on construction equipment estimates provided in the Project Description throughout the construction period. Note that construction would not be continuous throughout this entire duration. Initial analysis of criteria emissions from equipment operations indicates that incremental emissions would be below SCAQMD significance thresholds and Localized Significance Thresholds for the most conservative source receptor areas.

Table 4.3-5. Construction Emissions Estimates (Daily)

Pollutant	Emissions (pounds per day)	SCAQMD Construction Significance Thresholds (pounds per day)	SCAQMD Construction Localized Significance Thresholds (1 acre site, Mass Daily Thresholds)	Significant?
NO_X	0.93	100	46	No
VOC	0.09	75	--	No
PM_{10}	0.09	150	4	No
$PM_{2.5}$	0.05	55	3	No
SO_X	0.003	150	--	No
CO	1.57	550	231	No

As shown in Table 4.3-5, the construction of the proposed Project would not result in emissions that would exceed the SCAQMD's regional thresholds. As a result, construction of the proposed Project would not significantly contribute to an existing violation of air quality standards for regional pollutants (e.g., ozone). In terms of local air quality, the proposed Project would not produce significant emissions exceeding SCAQMD's Localized Significance Thresholds for NOx, CO, PM_{10}, or $PM_{2.5}$ during the construction phase. Compliance with existing SCAQMD regulations, including Rule 403, which is designed to reduce fugitive dust emissions, would ensure PM_{10} and $PM_{2.5}$ emissions during site preparation and construction do not exceed localized thresholds recommended by SCAQMD.

During operations, approximately 20-25 grams of silver iodide would be released for each hour of operations from one of CNG units and approximately 15 grams per flare at the AHOGS units. For a conservative estimate of emissions of particulate matter during operations, this analysis assumes that all silver iodide emissions were immediately converted to $PM_{2.5}$. Assuming the CNG units operate up to eight hours over a 24-hour period for each storm event, this would correspond to up to 200 grams (0.44 lbs) of $PM_{2.5}$ per day. For the AHOGS units, it is assumed that a maximum of 15 flares would be ignited per 24-hour period for each storm event, corresponding to up to 225 grams (0.49 lbs) of $PM_{2.5}$ per day. Therefore, operations would result in a maximum of 0.49 lbs/day of $PM_{2.5}$ at any given site, which is below the SCAQMD operational mass daily threshold of 55 lbs/day (Table 4.3-3) and the SCAQMD Localized Significance Thresholds of 1 lb/day (Table 4.3-4). The Localized Significance Thresholds represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standards. Accordingly, the operation of the proposed Project is not expected to contribute to a net increase of any criteria pollutant for which the Project region is non-attainment. As such, the proposed Project impacts related to regional and local emissions during construction and operation would be less than significant.

AIR (c). Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant. Land uses that are generally considered more sensitive to air pollution than others are as follows: hospitals, schools, residences, playgrounds, child-care centers, athletic facilities, and retirement/convalescent homes. The proposed Project sites are located across several land use types including residential, industrial/commercial, agricultural, mining, and open space. As noted in Table 4.3-2 above, several Project sites are located near (within 1,000 feet) to sensitive receptors, with residences being the nearest receptors to all sites.

As discussed above, SCAQMD has developed Localized Significance Thresholds look-up tables for Project sites that are one, two, and five acres in size to simplify evaluation of localized emissions at small sites. Localized Significance Thresholds are provided for each Source Receptor Area and various distances from the source of emissions and represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standards in the affected area. In the case of this conservative analysis, the proposed Project sites are assumed to be located within 25 meters (82 feet) from the nearest sensitive uses using the most conservative values for all Source Receptor Areas (also see Table 4.3-2 above for a breakdown of the closest sensitive receptors for each site). Therefore, the Localized Significance Thresholds for a 1-acre site and receptors located within 25 meters are used to address the potential localized NO_X, CO, PM_{10}, and $PM_{2.5}$ impacts to the area surrounding each proposed Project site. As discussed for AIR (b) above, emissions generated during construction were calculated with the SCAQMD's CalEEMod model.

The predicted emissions associated with construction are presented in Table 4.3-4 above. As shown in Table 4.3-5, construction of the proposed Project would not exceed the SCAQMD's Localized Significance Thresholds for the specified pollutants. Due to the uncertainty in assessing cancer risk from very short-term exposures, the Office of Environmental Health Hazard Assessment (OEHHA) does not recommend assessing cancer risk for projects lasting less than two months at the Maximum Exposed Individual Residential receptor (OEHHA 2015). Accordingly, since the Project proposes a maximum of one day of construction at each site, a Health Risk Assessment is not warranted for the Project. Therefore, impacts related to localized pollutant concentrations during construction would be less than significant.

Further, neither the cloud seeding units nor any Project vehicles would operate in the immediate vicinity of any sensitive receptor for an extended period, and neither equipment installation nor operational emissions would exceed emissions thresholds. Furthermore, as discussed in Section 1.5.1, concentrations of silver measured in the environment before (background) and after cloud seeding event are not toxic to humans and are over 1,000 times lower than the USEPA's secondary drinking water standard. Comprehensive reviews of cloud seeding programs have shown that there is no evidence of harm to humans or the environment from the use of silver iodide (Cardno ENTRIX 2011, Fisher et al. 2015). Therefore, operation activities for the proposed Project would not expose sensitive receptors to substantial pollutant concentrations. As such, impacts associated with operations would be less than significant.

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

Less than Significant. During construction, diesel emissions from construction equipment may be sources of odor. These emissions would be temporary and minimal based on the limited equipment required for construction of the proposed Project. Operations of the CNG units would use propane to combust the seeding solution comprised of approximately 96 percent acetone (C_3H_6O). During combustion each molecule of this solvent decomposes into $3H_2O$ molecules (i.e., water) and $3CO_2$ molecules (i.e., carbon dioxide) which are both odorless. Similarly, the primary fuel source, propane (C_3H_8), decomposes into carbon dioxide and water ($3CO_2$ molecules and $4H_2O$ molecules per molecule of propane). As such, operation of the CNGs is not expected to result in odors or other objectionable emissions.

The cloud seeding flares to be used at the AHOGS units consist of the ignitable silver iodide seeding solution mixture glued into a paper tube, with the igniter held into the end and sealed with a plastic cap. When activated, the flare burns for 3½ to 4 minutes. Smoke emitted during the brief 4-minute burn time would occur over a very short duration and would disperse rapidly with distance from the source. Therefore, exposure to odors and/or smoke associated with Project activities would not have the potential to affect a substantial number of people and impacts would be less than significant.

4.4 Biological Resources

Issue	Potentially Significant Impact	Less Than Significant 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 Wildlife 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 Wildlife 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?	☐	☐	☐	☒

4.4.1 Environmental Setting

The biological resources setting is based on a desktop review of the ground-based seeding sites via Google Earth satellite imagery to determine the site condition and potential to provide habitat for wildlife. In addition, a review of the California Natural Diversity Database (CNDDB) was conducted to identify if special-status species have been mapped within two miles of the installation sites in the past 25 years. Descriptions of the general habitat and potential for occurrence of special status at installation sites are provided in Table 4.4-1 and described in detail in Appendix B-2.

Plant, wildlife, and potential habitat in the target areas is described more generally due to the large geographic area; however, a CNDDB records search was also conducted for the target areas. This was conducted by querying the database for records <25 years old inside polygons representing the target areas.

In addition to evaluating the specific setting for biological resources at each of the proposed sites, this section describes the biological resources present within the four target areas. The impact analysis relies in part on the discussion of the fate, transport, and toxicity of silver iodide in the environment presented in Water Quality and Hydrology, Section 4.10.2.

Table 4.4-1. Habitat in the Vicinity of the CNG and AHOGS Installation Sites

Ground Based Seeding Site	Environmental Setting/Constraints	Potential Habitat for Sensitive Species?[A]
Waterwise – CBWCD	Landscaped foliage and some artificial ponds are present in the vicinity. Highly urbanized.	**No**. No suitable habitat appears to be present.
Upland – CBWCD	High level of soil disturbance, very little vegetation. Surrounding areas industrial or residential in nature	**No.** No suitable habitat appears to be present.
SAWC-1	Active mining area.	**No**. No suitable habitat appears to be present.
SAWC-2	Abuts residential neighborhood and open space disturbed area around the San Antonio Canyon Wastewater treatment plant.	**No.** Sensitive species mapped within 2 miles, but no suitable habitat appears to be present at the installation site or immediately adjacent.
EVWD	Mixed scrub and open space. Adjacent to mapped Riversidian Alluvial Fan Sage Scrub and Southern Mixed Riparian Forest	**Yes**. Suitable habitat for numerous special status species in the vicinity. Moderate potential for occurrence of California satintail, San Bernardino kangaroo rat, Santa Ana River woollystar, and western yellow bat. High potential for occurrence of least Bell's vireo and rubber boa.
Thousand Pines Christian Camp	Adjacent to parking lot for the camp and mowed grassy area. Located within the San Bernardino Mountains, pine forested area with light residential in the vicinity.	**Yes.** Location within forested area could provide habitat for southern rubber boa, San Bernardino flying squirrel, and bald eagle.
Sycamore Water Plant	Foothills of the San Bernardino Mountains, scrub habitat with chamise, chaparral, sage. Numerous washes in vicinity.	**Yes.** Potentially suitable habitat exists for coastal California gnatcatcher, orange-throated whiptail, and southern California legless lizard.
SBVWCD-1	Highly disturbed, ruderal, and undeveloped property bordered by residences and CA-38.	**No.** No suitable habitat appears to be present.
SBVWCD-2	Foothills of San Bernardino Mountains, scrub habitat with chamise, chaparral, sage. Adjacent to mapped Southern Sycamore Alder Riparian Woodland.	**Yes.** Although suitable habitat may not occur at the precise installation site, numerous special status species mapped in the vicinity. Moderate potential for occurrence of California glossy snake, coastal whiptail, and two-striped garter snake.

Ground Based Seeding Site	Environmental Setting/Constraints	Potential Habitat for Sensitive Species?[A]
San Gorgonio Pass Water Agency	Highly disturbed, ruderal, and undeveloped property. Adjacent areas developed for residential and commercial/industrial.	**No**. No special status species records w/in 1 mile and no suitable habitat appears to be present.
EMWD – N	Mix of ruderal and scrub habitat with chamise, chaparral, sage. A wash/drainage runs immediately south of the site.	**Yes**. High potential for occurrence of burrowing owls, records <0.5 miles from site. Scrub habitat could also support Bell's sage sparrow, California glossy snake, Parry's spineflower, and red-diamond rattlesnake.
EMWD – S	Scrub habitat with chamise, chapparal, sage, and hills. Adjacent to open space and residential areas.	**Yes**. Moderate potential for occurrence of species mapped within 0.5 miles, including coastal California gnatcatcher, coastal whiptail, red-diamond rattlesnake, and southern California rufous-crowned sparrow. Suitable habitat may also be present for burrowing owl, orange-throated whiptail, and Parry's spineflower.
Mary Lea Gardiner	Scrub habitat with chamise, chapparal, sage, and hills. Adjacent to open space and residential areas.	**No**. Although open space scrub habitat is abundant in vicinity; there are very few species records from within 2 miles and most historic (>25 years). Site does not provide suitable habitat for the species mapped that have been mapped within 2 miles.
IRWD	Hilly area with mixed grass and scrub habitat. Bounded on three sides by highways. The site features a vegetated wash, open grassland, and scrub habitat is present immediately to the south. A wetland with open water habitat associated with Peters Canyon Regional Park is present less than half a mile to the northwest of the site.	**Yes.** Coast California gnatcatcher mapped on the west side of SR-26. Coastal California gnatcatcher mapped immediately adjacent to the site to the north and south. Intermediate mariposa-lily mapped less than 0.5 miles from site in 2020.
El Toro Reservoir	Ruderal open space adjacent to roads associated with the El Toro Reservoir. Dense residential development surrounding.	**No.** No suitable habitat appears to be present.

A see Appendix B-2 for rationale and habitat descriptions for mapped species.

4.4.1.1 Clean Water Act

The Clean Water Act (CWA) has provisions for protecting biological resources within the aquatic environment through identification of beneficial uses and prohibitions on fill of wetlands or other waters of the United States (WOUS). The primary function of the CWA is in protecting biological resources in this instance are to ensure that any impacts to wetlands or WOUS are compensated for and provide a framework for ensuring that water quality is maintained or improved.

4.4.1.2 Endangered Species Act

The federal Endangered Species Act protects threatened and endangered species by prohibiting federal actions that would jeopardize the continued existence of such species or result in destruction or adverse modification of any critical habitat of such species. If effects to listed species are anticipated, Section 7 of the Act requires consultation regarding protection of such species be conducted with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service prior to project implementation. (16 USC 1531, 1536).

4.4.1.3 Migratory Bird Treaty Act

Congress passed the Migratory Bird Treaty Act (MBTA) in 1918 to prohibit the kill or transport of native migratory birds, or any part, nest, or egg of any such bird unless allowed by another regulation adopted in accordance with the MBTA. The prohibition applies to birds included in the respective international conventions between the United States and Great Britain, the United States and Mexico, the United States and Japan, and the United States and Russia.

Migratory bird species receive federal protection under the MBTA and state protection under the CEQA §15380(d). In the case of bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*), additional protection is offered under the federal Bald and Golden Eagle Protection Act. All birds, except European starlings, English house sparrows, rock doves (pigeons), and non-migratory game birds such as quail, pheasant, and grouse, are protected under the MBTA. No permit is issued under the MBTA; however, a project would need to employ measures that would avoid or minimize impacts to protected migratory birds.

4.4.1.4 California Endangered Species Act

The California Endangered Species Act focuses on protecting all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation.

4.4.1.5 California Fish and Wildlife Code, Sections 1600-1607

Sections 1600 through 1607 regulate work that would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; that would substantially change the bed, channel, or bank of a river, stream, or lake; or that would use material from a streambed.

4.4.1.6 San Bernardino County Countywide Policy Plan

The San Bernardino County Countywide Policy Plan includes a Natural Resources Element chapter with a subchapter dedicated to Biological Resources. Policies NR-5.1 through NR-5.8 describe the prioritization of natural resources as it pertains to development. The County participates in landscape-scale habit conservation planning and coordinates with existing or proposed habitat conservation and natural resource management plans for private and public lands (NR-5.1).

Policy NR-5.3 (Multiple-resource benefits) is applicable to the Proposed Project in that the Project would provide multiple benefits supporting the County's goals. NR-5.3 indicates the County's prioritization of

conservation actions that demonstrate multiple resource preservation benefits, such as biology, climate change adaptation and resiliency, hydrology, cultural, scenic, and community character.

4.4.1.7 Riverside County General Plan

Riverside County has numerous policies that are meant to protect biological resources. The 2021 General Plan provides policies directly related to preserving and enhancing open space through land use related methods. It includes restrictions on development of open space, focusing urban growth, providing recreational and open space opportunities within the built environment, and achieving a balance between urban uses and open space/habitat. Open Space policies include guidelines for wetlands, floodways, and floodplains. Open space policies are also available for protection of native vegetation, including OS 9.3 (Maintain and conserve superior examples of native trees, natural vegetation, stands of established trees, and other features for ecosystem, aesthetic, and water conservation purposes), OS 9.4 (Conserve the oak tree resources in the county), and OS 9.6 (Conserve important traditional Native American plant gathering resource areas).

4.4.1.8 Orange County General Plan

The Resource Element chapter of the Orange County General Plan covers Natural Resources. The County's policy pertaining to wildlife and vegetation states "preserve the significant wildlife and vegetation habitats of the County". Open space, conservation, and scenic corridor policies and goals also support the conservation of critical wildlife and vegetation habitat.

4.4.1.9 Botanical Resources

Vegetation generally reflects the topographic and precipitation patterns of the target areas. Uplands in the San Gabriel and San Bernardino Mountains are characterized by drought-tolerant chaparral and sage scrub vegetation, particularly on the south-facing slopes (Strong 2000) that typify the sites proposed for installation of CNGs and AHOGS and the portions of the target areas immediately upslope from them. Dominant species depend on elevation and include chamise (*Adenostoma fasciculatum*), manzanita (*Arctostaphylos spp.*), buckthorn (*Ceanothus spp.*), yucca (*Yucca whipplei*), black sage (*Salvia mellifera*), California buckwheat (*Erigonum fasciculatum*), California sagebrush (*A. californica*), laurel sumac (*Malosma laurina*), and white sage (*S. apiana*) (Sawyer et al. 2009).

The north-facing slopes of the target areas are characterized by coniferous forests with species composition varying by elevation. At lower elevations, bigcone Douglas-fir (*Pseudotsuga macrocarpa*) and canyon live oaks (*Quercus chrysolepsis*) dominate (Strong 2000). As elevation increases, Jeffrey pine (*Pinus jeffreyi*), Coulter pine (*Pinus coulteri*), and incense cedar (*Calocedrus decurrens*) are commonly found with a grassy understory. At the highest elevations, Jeffrey pine, sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), and lodgepole pine (*Pinus contorta*) communities dominate (Strong 2000; Sawyer et al. 2009).

Riparian vegetation (woodlands and scrublands) is present where canyons, washes, and streams provide suitable substrate throughout the target areas. Dominant species include white alder (*Alnus rhombiflora*), California sycamore (*Platanus racemose*), bigleaf maple (*Acer macrophyllum*), Fremont cottonwood (*Populus fremontii*), and numerous species of willows (*Salix spp.*) (Strong 2000; Sawyer et al. 2009).

Special-Status Plants

There are many special-status plant species that have been previously documented in the target areas (CDFW 2022), including species ranked as seriously or moderately threatened in California by the California Native Plant Society (California Rare Plant Rank of 1 or 2), federally listed threatened or endangered species, and CDFW species of special concern (Appendix B-1). In the Northeast and Southeast target areas, more than 40 species have a Rare Plant Rank of 1 (seriously threatened).

Twenty-one species of rare plants have also been mapped within two miles of the proposed installation sites and are presumed to still exist in the general vicinity (records less than 25 years old; CDFW 2022). These are presented in Table 4.4-1. A full list of the mapped special-status plants is included in Appendix B-1 (target areas) and Appendix B-2 (installation areas) as well as evaluation of their potential to occur.

Table 4.4-2. Special-status plant species mapped within two miles of installation sites and presumed to still exist in the area.

Common Name	Scientific Name	Federal Status	State Status	Rare Plant Rank[A]	Found within 2 miles of Installation Site[B]
Braunton's milkvetch	*Astragalus brauntonii*	Endangered	NA	1B.1	Irvine Ranch Water District
California satintail	*Imperata brevifolia*	NA	NA	2B.1	EVWD
Chapparal nolina	*Nolina cismontane*	NA	NA	1B.2	El Toro Reservoir
Intermediate mariposa-lily	*Calochortus weedii var. intermedius*	NA	NA	1B.2	Irvine Ranch Water District SAWC-2
Many-stemmed dudleya	*Dudleya multicaulis*	NA	NA	1B.2	Irvine Ranch Water District
Mesa horkelia	*Horkelia cuneata var. puberula*	NA	NA	1B.1	Waterwise Upland - CBWCD
Mojave tarplant	*Deinandra mohavensis*	NA	Endangered	1B.3	Mary Lea Gardiner
Nevin's barberry	*Berberis nevinii*	Endangered	Endangered	1B.1	Waterwise - CBWCD Upland - CBWCD SAWC-2
Palmer's mariposa-lily	*Calochortus palmeri var. palmeri*	NA	NA	1B.2	Sycamore Water Plant
Parish's alumroot	*Heuchera parishii*	NA	NA	1B.3	Sycamore Water Plant
Parish's daisy	*Erigeron parishii*	Threatened	NA	1B.1	Sycamore Water Plant

Common Name	Scientific Name	Federal Status	State Status	Rare Plant Rank[A]	Found within 2 miles of Installation Site[B]
Parry's spineflower	*Chorizanthe parryi var. parryi*	NA	NA	1B.1	Sycamore Water Plant SBVWCD-1 SBVWCD-2 EMWD - N EMWD - S San Gorgonio
Salt spring checkerbloom	*Sidalcea neomexicana*	NA	NA	2B.2	SBV WCD-1
San Bernardino Mountains owl's-clover	*Dudleya abramsii ssp. affinis*	NA	NA	1B.2	Thousand Pines
Santa Ana River woollystar	*Eriastrum densifolium ssp. sanctorum*	Endangered	Endangered	1B.1	Sycamore Water Plant SBVWCD-1 SBVWCD-2
Short-joint beavertail	*Opuntia basilaris var. brachyclada*	NA	NA	1B.2	Sycamore Water Plant
Slender mariposa-lily	*Calochortus clavatus var. gracilis*	NA	NA	1B.2	SAWC-2
Slender-horned spineflower	*Dodecahema leptoceras*	Endangered	Endangered	1B.1	Sycamore Water Plant
Smooth tarplant	*Centromadia pungens ssp. laevis*	NA	NA	1B.1	EMWD - S
Southern jewelflower	*Streptanthus campestris*	NA	NA	1B.3	Thousand Pines
Yucaipa onion	*Allium marvinii*	NA	NA	1B.2	San Gorgonio

Notes: NA = Not Applicable

A California Rare Plant Rank (CNPS 2019)

1A and 2A – presumed extirpated in California

1B – rare, threatened, or endangered in California or elsewhere

2B – rare, threatened, or endangered in California but more common elsewhere

Threat Ranks

0.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)

0.2 – Moderately threatened in California (20-80% of occurrences threatened/moderate degree and immediacy of threat)

0.3 – Not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

B see Appendix B-2 for determination of likelihood to occur and habitat descriptions for mapped species.

4.4.1.10 Wildlife

The target areas primarily include mountainous regions with lakes, meadows, coniferous forests, oak woodlands, riparian woodlands, chaparral scrub, desert scrub, grasslands, streams, and reservoirs that provide foraging, resting, and breeding habitat for hundreds of species of birds. Examples of common resident birds include many species of waterfowl, red-tailed hawk (*Buteo jamaicensis*), California quail (Callipepla californica), mountain quail (*Oreortyx pictus*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), hummingbirds (*Calypte spp*., *Selasphorus spp.*), woodpeckers (*Picoides spp.*), sapsuckers (*Sphyrapicus spp.*), northern flicker (*Colaptes auratus*), Stellar's jay (*Cyanocitta stelleri*). California scrub jay (*Aphelocoma californica*), mountain chickadee (*Poecile gambeli*), bushtit (*Psalttriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), wrens (*Troglodytes spp.*), American robin (*Turdus migratorius*), California thrasher (*Toxostoma redivivum*), yellow-rumped warbler (*Dendroica coronata*), towhees (*Pipilo spp*.), sparrows (*Spizella spp., Amphispiza spp., Melospiza spp.*), dark-eyed junco (*Junco hyemalis*), brown-headed cowbird (*Molothrus ater*), and purple finch (*Carpodacus purpureus*) (USFS 2014).

The target areas support a diverse assemblage of terrestrial mammals, including bighorn sheep (*Ovis canadensis*), black bear (*Ursus americanus*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), coyote (*Canis latrans*), gray fox (*Urocyon cineroargenteus*), mule deer (*Odocileus hemionus*), racoon (*Procyon lotor*), and ground squirrels (*Spermophilus spp*.). Common bat species include western pipistrelle (*Pipistrellus herperus*), big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), and California myotis (*Myotis californicus*). Bats can be found in all vegetation types and elevation zones in the target areas.

Common amphibian and reptile species found in the target areas include Pacific treefrog (*Hyla regilla*), ensatina (*Ensatina eschscholtzii eschscholtzii*), western toad (*Bufo boreus*), California legless lizard (*aniella pulchra*), western fence lizard (*Sceloporus occidentalis*), western whiptail (*Cnemidophorus tigris*), common kingsnake (*Lampropeltis getula*), gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus viridis*).

Fisheries Resources

The target areas occur over three watersheds: the San Gabriel River, Santa Ana, and San Jacinto. Special-status fish species are known to occur in the target areas (CNDDB search conducted January 4, 2022). Santa Ana sucker (*Catostmus santaanae*) and unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*) are presumed to exist in the Northeast and Southeast target areas. Santa Ana speckled dace (*Rhinichthys osculus spp. 8*) is presumed to exist in the Northwest target area.

The Northwest target area overlaps the San Gabriel River and its creeks flow through the San Gabriel Mountains in Angeles National Forest. Tributaries to the San Gabriel River provide habitat for various species of fish, including a naturally reproducing rainbow trout (*Oncorhynchus mykiss*), Santa Ana speckled dace, Santa Ana sucker, and arroyo chub (*Gila orcutti*). Nonnative species such as largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and black bullhead (*Ameiurus melus*) occur in the Upper San Gabriel River Watershed (O'Brien et al. 2011).

The Northeast target area overlaps the Santa Ana River and its upper tributaries in the San Bernardino Mountains and San Bernardino National Forest. Large waterbodies in the region include Big Bear Lake,

Lake Arrowhead, and Silverwood Lake. Endemic native fish species in the target area include Santa Ana sucker, arroyo chub, Santa Ana speckled dace, partially armored three-spine stickleback (*Gasterosteus aculeatus*), and unarmored three-spined stickleback. Rainbow trout are also present (RCRCD 2022). Big Bear Lake is stocked with rainbow trout. Other sport fish are also present, including largemouth bass, smallmouth bass (*M. dolomieu*), bluegill sunfish (*L. macrochirus*), blue catfish (*Ictalurus furcatus*), carp (*Cyprinus carpio*), and black crappie (*Pomoxis nigromaculatus*) (California's Greatest Lakes 2022).

The Southeast target area overlaps the San Jacinto River and its tributaries in San Bernardino National Forest. Fish species present include Santa Ana speckled dace and numerous nonnative species, including black bullhead, brown bullhead (*A. nebulosus*), brown trout (*Salmo trutta*), largemouth bass, and redear sunfish (*L. microlophus*) (UC 2022).

Special-Status Wildlife

The target areas provide suitable habitat for numerous special-status wildlife species (Appendix B-2). Suitable habitat for special-status amphibians, including arroyo toad (*Anaxyrus californicus*), southern mountain yellow-legged frog (*Rana mucosa*), and Coast Range newt (*Taricha torosa*) exists and the species have been documented both within two miles of some of the installation sites as well as within the target areas (Appendix B-1). Reptiles include southern rubber boa (*Charina umbratica*), coast horned lizard (*Phrynosoma coronatum*), and two-striped gartersnake (*Thamnophis hammondii*).

Potential special-status birds in the target areas include bald eagle (*Haliaeetus leucocephalus*), southwestern willow flycatcher (*Empidonax traillii extimus*), coastal California gnatcatcher and (*Polioptila californica californica*). Installation areas may provide suitable habitat for California coastal gnatcatcher, least Bell's vireo (*Vireo bellii pusillus*), American peregrine falcon (*Falco peregrinus*), coastal cactus wren (*Campylorhynchus brunneicapillus*), tricolored blackbird (*Agelaius tricolor*), and white-tailed kite (*Elanus leucurus*) (CDFW 2022). Special-status birds in the installation areas include Bell's sage sparrow (*Artemisiospiza belli*), burrowing owl (*Athene cunicularia*), California black rail (*Laterallus jamaicensis*), California horned lark (*Eremophila alpestris*), southern California rufous-crowned sparrow (*Aimophila ruficeps*).

Special-status bats in the target areas include western mastiff bat (*Eumops perotis californicus*). Special-status bats in the installation areas include western mastiff bat, western yellow bat (*Lasiurus xanthinus*), and pallid bat (*Antrozous pallidus*). Other special-status mammals that are known to occur or could occur in the target area include American badger (*Taxidea taxus*), San Bernardino flying squirrel (*Glaucomys oregonensis californicus*), and desert bighorn sheep (*Ovis canadensis nelsoni*). Mammals observed within two miles of the installation sites include San Bernardino flying squirrel, San Bernardino kangaroo rat (*Dipodomys merriami parvus*), Los Angeles pocket mouse (*Perognathus longimembris brevinasis*), northwestern San Diego pocket mouse (*Chaetodipus fallax*), and pallid San Diego pocket mouse (*Perognathus fallax pallidus*).

4.4.1.11 Wetlands

Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. In the target areas, wetlands occur along shorelines and lakeshore-basin meadows (e.g., Big Bear Lake, Lake Hemet) or larger creek and river systems (e.g., fringes of the San

Gabriel, Santa Ana, and San Jacinto River tributaries). Species composition varies greatly depending on the hydrology of the wetland (e.g., wetland type), associated primary waterbody, elevation, and location. Some wetland species have limited distribution and are endemic to certain waterbodies. Wet meadows occur in areas with shallow water tables and/or groundwater seeps. Freshwater emergent wetlands develop in topographic depressions with little or no outflow (e.g., reservoirs) and vegetation is dominated by perennial emergent monocots such as sedges, bulrushes, and cattails. Wet meadows are often dominated by grasses, sedges, and rushes. Seasonal wetlands develop in areas where runoff accumulates in topographic depressions with no outflow and usually consist of small stature and short-lived annuals.

None of the proposed installation sites occur in a National Wetlands Inventory (NWI) mapped wetland (USFWS 2022). One site, Eastern Municipal Water District - North, is within 100 feet of a mapped feature (riverine, R4SBC). The feature appears to be a vegetated wash.

4.4.2 Environmental Impacts

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

Less than Significant with Mitigation. The CNGs and AHOGS would be installed on flat, previously disturbed areas. As shown in tables 4.4-1 and 4.4-2 above, numerous special-status wildlife and rare plants have been mapped within two miles of installation sites within the last 25 years. Some of these species could occur in the vicinity of installation sites (see Appendix B-2). Therefore, SAWPA would implement **MM BIO-1** to identify sensitive wildlife and rare plants and ensure that impacts are less than significant.

As described in Section 2 (Project Description), the cloud seeding program would disperse small quantities of silver iodide particles over four large, mountainous, and primarily forested target areas. The following discussion addresses the potential for cloud seeding activities to harm special-status fish and wildlife species that occur in the target area and the potential for increased rainfall and snowmelt affecting the growing season for special-status plants.

Silver iodide has a very low solubility and would not result in the presence of silver ions in the environment at sufficient quantities to harm sensitive ecological receptors. Numerous studies have shown that cloud seeding does not result in concentrations of silver in the environment that would be toxic to humans or wildlife. For example, the Payette River Basin, north of Boise, Idaho, has been the site of cloud seeding activities since 2003. Over 4,000 samples taken from the target areas have shown that average silver concentrations range from 0.0005 to 0.0025 ppb, and the highest concentration was 0.080 ppb (Fisher et al. 2015). Further, in its annual reviews of Snowy Hydro cloud seeding program in Australia since 2004, the New South Wales EPA has found no significant difference in silver concentrations in aquatic, soil, sediments, and aquatic species in the area cloud seeding target areas compared with non-target areas (NSW EPA 2020). Extensive environmental sampling and chemical analyses for that project have shown that environmental concentrations of silver in seeded areas are all well below 0.005 ppb (Williams and Denham 2009). Analyses of water and soil samples from three mountain ranges (Medicine Bow, Sierra Madre, and Wind River Ranges) in which the Wyoming Weather

Modification Pilot Program conducted cloud seeding from 2009-2014 showed that silver concentrations in the water were in the parts per trillion range (1,000 times lower than the ppb concentrations that cause adverse effects in aquatic species) (Wyoming Water Development Commission 2014). In California, measurements taken in the Salt Spring Reservoir, within the target area of PG&E's Mokelumne water cloud seeding project showed that silver concentrations were less than 0.0005 ppb, a level within natural background concentrations (Stone 2006).

Silver iodide has low toxicity and does not accumulate in soils at levels above natural background.[1] Other chemicals used in cloud seeding, such as propane, are used in such low quantities as to have a negligible effect on plant or animal life. Silver bioavailability in freshwater is significantly diminished by the presence of dissolved minerals (e.g., chlorine, carbonate, sulfide ions) and dissolved carbon and particulates. A literature review completed by PG&E (Cardno ENTRIX 2011) provides additional support for the conclusion that the insolubility of silver iodide makes it useful for cloud seeding while also limiting its bioavailability and effects on the environment. Based on the chemical properties of silver iodide, the proposed Project would have less than significant impacts on special-status species.

While the proposed Project may result in up to 0.5 inches of increased precipitation per year in the target areas (Table 2.3-1), the amount of precipitation would still be within the range of natural variability to which native species are adapted. Given frequent drought conditions throughout the target areas, exacerbated by climate change (NOAA and NIDIS 2021), the proposed Project may have a beneficial effect on special-status plants and wildlife by providing additional precipitation to facilitate growth and prevent or decrease the occurrence of drought-related fire.

Neither the installation of CNGS and AHOGS, nor the effects of cloud seeding in general (e.g., increased precipitation) would directly or indirectly affect special-status plant and wildlife species. The impacts of the Project on special-status species and habitats would be less than significant.

Mitigation Measure BIO-1. A qualified biologist familiar with the flora and fauna in the Project area shall conduct pre-construction clearance surveys within 10 days prior to the start of construction. Pre-construction clearance surveys for special-status plants and wildlife shall be conducted in suitable habitats within 100 feet of Project disturbance areas. The purpose of the surveys will be to identify the presence of any special-state plants and the extent of their population and the presence of special status wildlife for the purpose of avoidance to the extent feasible. Surveyors will record the locations using GPS and mark populations if present with stakes or flags. SAWPA will avoid special-status plants by placing the CNGs and AHOGS away from established populations of rare plants whenever feasible. Installation would be paused in the event that a special status wildlife species is encountered, and the appropriate state or federal agency would be notified. A buffer zone will be recommended by the biologist that will prevent direct or indirect disturbance to the identified plants or populations of special status wildlife from installation activities and dust.

[1] In contrast, the free, ionic form of silver (Ag+), which is not used in cloud seeding and should not be confused with silver iodide, is used as a fungicide, algaecide, and bactericide, including water disinfectant (WHO 2018). This form of silver (Ag+) is highly toxic to fish and aquatic invertebrates: studies conducted using different fish species have shown that silver is toxic to fish at concentrations ranging from 1.2 to 70 ppb (Eisler 1996; Hogstrand and Wood 1998). Silver ion has been shown to be 300 times more toxic than silver chloride and 15,000 times more toxic than silver sulfide in fathead minnow (LeBlanc et al. 1984).

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

Less than Significant. The CNGs and AHOGS would be installed in flat, previously disturbed areas, and riparian habitat and natural communities would not be affected.

Riparian vegetation and sensitive natural communities in the target areas occur along the fringes of streams, washes, lakes, and reservoirs. Under natural hydrologic conditions, high spring flows provide the inundation required to maintain these communities. Cloud seeding would lead to up to 0.5 inches in increased precipitation in the target areas (Table 2.3-1) and occasional increases in stream and river flows over current natural conditions. These increases would occur in different locations at different times, and, depending on naturally occurring snowmelt, may result in an overall increase in long-term average annual flows of area streams and rivers. This may result in incremental soil erosion, streambank alteration, or localized flooding; however, these small changes would not fundamentally alter riparian habitat and may even provide beneficial relief from drought conditions. These areas typically experience naturally occurring annual episodic flood events that result in sediment transport in rivers and streams. These events occur at times of year when the cloud seeding program would not be in use. Furthermore, SAWPA's suspension criteria prohibit cloud seeding that could contribute to high stream flows (e.g., when winter storm warnings or flash flood warnings are in effect).

The incremental effects of cloud seeding precipitation on riparian habitat or other sensitive natural communities would be localized and short-term and would generally be less intense than occurs in years with heavy storms or major snow accumulation. Overall, the addition of cloud seeding precipitation to the target areas would likely increase the period of time that soil moisture is available to support riparian and sensitive plant growth. Therefore, a less than significant impact on riparian habitat or other sensitive natural communities would occur and may be beneficial to some communities. The effects of cloud seeding on streams and rivers is also discussed in Section 4.10 (Hydrology and Water Quality).

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

Less than Significant. The CNGs and AHOGS would be installed in flat, previously disturbed areas. None of the proposed installation sites occur in a NWI mapped wetland (USFWS 2022). No impacts to wetlands from installation of the CNGs and AHOGS would occur.

Cloud seeding activities could increase the water levels in the lakes and reservoirs that support wetlands in the target areas. However, as described previously, the target areas are subjected to episodic rainfall, snowfall, and flood events that vary year-to-year. Wetland communities in the target areas are adapted to these events and variations. The proposed Project would result in less than 0.5 inches in increased precipitation in the target areas in the form of rain or snow (Table 2.3-1). Overall, any incremental increase in moisture or water levels in the target areas would not be detrimental to wetlands and may provide beneficial additional moisture to support hydrology and vegetation. Therefore, impacts to wetlands from cloud seeding of the target areas would be less than significant.

BIO (d). Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant with Mitigation. The CNGs and AHOGS would be installed in flat, previously disturbed areas, and would have no impact on the movement of wildlife, including birds. No trees or shrubs would be removed to install the CNGs and AHOGS. There is potential that nesting birds may be present in trees near each of the proposed sites. Therefore, SAWPA would implement **MM BIO-2** to ensure that impacts to nesting birds (particularly ground-nesting species) from installation are less than significant.

Increased precipitation in the target areas would have minimal impact on the movement of resident migratory fish or wildlife species, which are adapted to variable snow or rain conditions in the mountainous areas targeted by the cloud seeding project. Estimates of increase in stream flow are shown in Table 2.3-1 and would not be substantial enough to alter habitat conditions within streams such that their existing use by native fish and wildlife would change. The proposed Project would result in less than 0.5 inches in increased precipitation in the target areas in the form of rain or snow and the overall impact on movement and habitat use by fish and wildlife would be less than significant.

Mitigation Measure BIO-2. The nesting season generally occurs from February 1 to September 15. Pre-construction nesting bird surveys shall be conducted by a qualified biologist no more than 14 days before initiation of any construction activities. The surveys shall include the installation disturbance area plus a 100-foot buffer. If active nests are located, the qualified biologist shall recommend avoidance buffers (minimum 25 feet) based on the species, nest location, and observed behavior. A qualified biologist shall confirm that young have fledged the nest prior to removal of the avoidance buffer.

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

No Impact. The CNGs and AHOGS would be installed in flat, previously disturbed areas, and no trees would be removed. The proposed Project would not conflict with the goals or policies of the County General Plans. In addition, the installation of the units is an acceptable land use per the zoning ordinances as described in Table 4.11-1. Therefore, no impact would occur.

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

No Impact. The Upper Santa Ana River Wash Habitat Conservation Plan covers species known to occur in the general vicinity of the East Valley Water District, San Bernardino Valley WCD-1 and San Bernardino Valley WCD-2 installation areas. The installation sites are not inside of the HCP area. No other proposed installation sites are near the HCP area. Covered species are Coastal California gnatcatcher, cactus wren, San Bernardino kangaroo rat, slender-horned spineflower, and Santa Ana River woolly-star. The Habitat Conservation Plan covers the area of the Santa Ana River in San Bernardino County from approximately one mile downstream of Seven Oaks Dam to Redlands, which is outside of the target areas. The Habitat Conservation Plan's goal is to balance the ground-disturbing activities of water conservation, aggregate mining, recreational activities, and other public services in the Plan Area with the conservation of natural communities and special-status plants and wildlife (ICF 2020). The installation of the CNGs and AHOGS is in the vicinity of the Habitat Conservation Plan

coverage area, but not within it and would not conflict with the goals or provisions of the Habitat Conservation Plan. Therefore, the proposed Project would have no impact on the established HCP.

4.5 Cultural Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the project:				
g) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☐	☐	☒
h) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
i) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

4.5.1 Environmental Setting

Cultural resources include the locations of human activity, occupation, or usage that contain materials, structures, or landscapes that were used, built, or modified by people. Cultural resources consist of a variety of prehistoric and historic archaeological resources including sites, objects, buildings, structures, districts, and properties of religious and cultural significance including traditional cultural properties. Historic properties, as defined in 36 CFR 800, the implementing regulations of the National Historic Preservation Act (NHPA), are cultural resources that meet the criteria to be included in or eligible for inclusion in the National Register of Historic Places (NRHP).

All of the proposed sites have experienced prior disturbance, and the probability of cultural resources present in the shallow subsurface is very low. While there are structures located on the properties where the units are proposed for installation, none of the units would be located on top of any structures. All units would be located on disturbed ground.

4.5.1.1 California Health and Safety Code Sections 7050.5 and 7052

In accordance with the California Health and Safety Code Sections 7050.5 and 7052, if human remains are uncovered during ground-disturbing activities, all such activities in the vicinity of the find shall be halted immediately, and SAWPA's designated representative would be notified. SAWPA's representative would immediately notify the county coroner and a qualified professional archaeologist. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or State lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]).

4.5.1.2 California Public Resources Code Section 5097.9

SAWPA's responsibilities for acting upon notification of a discovery of Native American human remains are identified in detail in the California Public Resources Code Section 5097.9. SAWPA or its appointed representative and the professional archaeologist shall contact the Most Likely Descendent (MLD), as determined by the NAHC, regarding the remains. The MLD, in cooperation with SAWPA, would determine the ultimate disposition of the remains.

4.5.2 Environmental Impacts

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

No Impact. The CNGs and AHOGS would be installed at previously disturbed sites and would not disturb any historical structures, sites, or buildings; therefore, there would be no impacts to historical resources.

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

Less than Significant with Mitigation. The CNGs and AHOGS would be installed at previously disturbed sites and would require minimal ground disturbance, with holes dug to a depth of 8 inches for CNGs and 3 feet for AHOGS. While impacts to an archaeological resource are unlikely due to the prior disturbance activities, SAWPA would implement **MM CUL-1** to ensure that impacts are less than significant.

Mitigation Measure CUL-1. In the event that any archaeological features are discovered during installation, all work shall stop within a 60-foot buffer of the find, and a qualified archaeologist meeting the Secretary of Interior standards shall be notified. Additionally, per request, the San Manuel Band of Mission Indians Cultural Resources Department shall be contacted and provided information after the archaeologist makes the initial assessment. The archaeologist shall record the site and work with SAWPA to identify an alternate installation location on the property that will avoid impacting cultural resources. The archaeologist shall prepare a report according to current professional standards.

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

Less than Significant. Due to the previously disturbed nature of the sites and minimal ground disturbance necessary for CNG and AHOGS installation, encountering and disturbing human remains is unlikely. However, if human remains were discovered during installation activities, SAWPA would implement the protocols discussed in Section 4.5.1 above to ensure impacts would be less than significant.

4.6 Energy

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

4.6.1 Environmental Setting

Energy capacity, or electrical power, is generally measured in watts while energy use is measured in watt-hours. For example, if a light bulb has a capacity rating of 100 watts, the energy required to keep the bulb on for 1 hour would be 100 watt-hours. If ten 100-watt bulbs were on for 1 hour, the energy required would be 1,000 watt-hours or 1 kilowatt-hour (kWh). On a utility scale, a generator's capacity is typically rated in megawatts, which is one million watts, while energy usage is measured in megawatt-hours (MWh) or gigawatt-hours, which is one billion watt-hours.

The Project area is primarily served by Southern California Edison with some sites in the service area of local utility providers. Southern California Edison delivered a total of approximately 81.2 million MWh of electricity to its customers in 2021 (Southern California Edison 2021).

4.6.1.1 CARB Heavy-Duty On-Road and Off-Road Vehicle Regulations

In 2004, CARB adopted an Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling in order to reduce public exposure to diesel particulate matter (DPM) emissions (Title 13 California Code of Regulations 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 does not allow diesel-fueled commercial vehicles to idle for more than five minutes at any given location. While the goal of this measure is primarily to reduce public health impacts from diesel emissions, compliance with the regulation also results in energy savings in the form of reduced fuel consumption from unnecessary idling.

In addition to limiting exhaust from idling trucks, CARB also promulgated emissions standards for off-road diesel construction equipment greater than 25 horsepower (hp) such as loaders, backhoes, and forklifts, as well as many other self-propelled off-road diesel vehicles. The In-Use Off-road Diesel-Fueled Fleets regulation adopted by CARB on July 26, 2007, encourages the retirement, replacement, or repower of older engines with newer emissions-controlled models (13 CCR Section 2449). The compliance schedule requires full implementation by 2023 in all equipment for large and medium fleets and by 2028 for small fleets. While the goal of this measure is primarily to reduce public health impacts

from diesel emissions, compliance with the regulation has shown an increase in energy savings in the form of reduced fuel consumption from more fuel-efficient engines.

4.6.2 Environmental Impacts

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

Less than Significant. Construction activities associated with the proposed Project are estimated to take one day per site for a total of 15 days. Construction of the proposed Project would require the use of fuels (primarily gasoline and diesel) for the operation of construction equipment and vehicles to perform a variety of activities, including shallow auger drilling, installation of proposed Project components, and vehicle travel. Table 4.6-1 provides an estimate of construction fuel consumption for the proposed Project based on information provided by the CalEEMod air quality computer model.

Table 4.6-1. Construction Fuel Consumption

Phase Name	Equipment Type	Horsepower	Duration[1] (total hours)	Number of Equipment Units	Load Factor	Fuel Consumption Rate[2] (gallons per hour)	Total Fuel Consumption[3,4] (gallons)
Construction at 15 Project Sites (15 days)	Skid Steer	5	60	1	0.37	1.25	75
	Power Auger	65	15	1	0.37	0.07	1
	Pickup Truck	150	60	1	0.38	2.28	274
						TOTAL	***350***

Notes:

1. Total hours of duration derived from hours per day x total duration (days).
2. Derived using the following equation:
   Fuel Consumption Rate = Horsepower x Load Factor x Fuel Consumption Factor.
   Where: Fuel Consumption Factor for diesel engines is 0.04 gallons per horsepower per hour (gal/hp/hr).
3. Total Fuel Consumption calculated using the following equation: *Total Fuel Consumption = Duration in Hours x Fuel Consumption Rate*.

Source: Refer to Appendix A, CalEEMod 2016.4.0 Emissions Data, for CalEEMod assumptions used in this analysis.

As shown in Table 4.6-1, assuming that all sites will require all powered equipment, the construction of the proposed Project would result in total consumption of approximately 350 gallons of fuel. Compliance with the CARB anti-idling and emissions regulations would result in less fuel combustion and energy consumption and thus minimize the proposed Project's construction-related energy use. Therefore, construction of the proposed Project would not result in the wasteful, inefficient, or unnecessary consumption of energy.

Following construction, the Project would not require any additional electricity resources to operate beyond the power provided by the solar panels installed at each AHOGS site. Operation of the CNG units would require use of propane during each cloud seeding event. These units burn approximately 0.75 gallons of propane per hour during active operation. Assuming eight hours of operation per storm event and eight storm events per year, an estimated 48 gallons of propane would be consumed at each CNG

site per year. As detailed in Section 2.1, 13 sites have been selected to house CNG units. Assuming that all 13 CNG units operate for the same number of hours per year, up to 624 gallons of propane would be consumed per year. However, the combustion of propane during operations would not result in wasteful or inefficient use of energy. Operation and maintenance activities would require an estimated 15 trips per year to each site. Fewer trips will be required for remotely operated sites. These negligible number of trips would result in minor fuel consumption. Overall, the proposed Project would result in energy conservation by expanding the SAWPA goals of reducing water-sector greenhouse gas (GHG) emissions by increasing local water supplies in the Santa Ana River Watershed. These goals are consistent with California's Renewable Energy Resources Act of 2011. Therefore, the proposed Project would not adversely affect energy resources or energy conservation and would not result in an unnecessary or wasteful use of energy. Therefore, impacts due to construction and operation activities associated with the proposed Project would be less than significant.

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

No impact. The proposed Project would not involve any effect on energy supplies or the demand for energy. As such, construction and operation of the proposed Project would not have the potential to conflict with any applicable plans, policies, or regulations related to renewable energy or energy efficiency plans. Therefore, no impact would occur.

4.7 Geology and Soils

Issue	Potentially Significant Impact	Less Than Significant 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 waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

4.7.1 Environmental Setting

The Project area is located within a seismically active area of southern California. Much of the southern area of the Project area is classified as a liquefaction zone, and areas in San Bernadino County are within landslide zones (CGS 2021). None of the specific sites selected for installation of the units are located in a liquefaction zone, and two sites (Irvine Ranch Water District and El Toro Reservoir) are located within a landslide zone (Table 4.7-1). Three sites are located within an Alquist-Priolo Earthquake Fault Zone (East Valley Water District, Sycamore Water Plant, and SBVWCD-2).

Table 4.7-1. Geological Attributes of Project Sites

Location Name	Fault Zones	Liquefaction/ Landslide Zone	Soil Type
Waterwise - CBWCD	No	No/No	GP Quarries and Pits soils SpC Soboba stony loamy sand, 2 to 9 percent slopes
Upland - CBWCD	No	No/No	Soboba gravelly loamy sand, 0 to 9 percent slopes
SAWC-1	Cucamonga Fault and Sierra Madre Fault Zone located approximately 1.2 miles to the north	No/No	SpC Soboba stony loamy sand, 2 to 9 percent slopes
SAWC-2	Cucamonga Fault and Sierra Madre Fault Zone located approximately 0.5 mile south	No/No	HaC Hanford coarse sandy loam, 2 to 9 percent slopes SoC Soboba gravelly loamy sand, 0 to 9 percent slopes
EVWD	Lies within San Andreas Fault Zone	No/No	Ps Psamments, Fluvents and Frequently flooded soils TvC Tujunga gravelly loamy sand, 0 to 9 percent slopes
Thousand Pines Christian Camp	No	No/No	Heapspeak-Cedarpines complex, 10 to 25 percent slopes
Sycamore Water Plant	Lies within San Andreas Fault Zone	No/No	SpC Soboba stony loamy sand, 2 to 9 percent slopes
SBVWCD-1	No	No/No	Soboba stony loamy sand, 2 to 9 percent slopes
SBVWCD-2	Lies within San Andreas Fault Zone	No/No	Rw, riverwash
San Gorgonio Pass Water Agency	San Gorgonio Pass Fault Zone located approximately 1.2 miles NE	No/No	HcC, Hanford coarse sandy loam, 2 to 8 percent slopes
San Gorgonio Pass Water Agency	No	No/No	CkF2 Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded GyD2 Greenfield sandy loam, 8 to 15 percent slopes, eroded VsD2 Vista coarse sandy loam, 8 to 15 percent slopes, eroded
EMWD - N	No	No/No	FyF2, Friant rocky fine sandy loam, 25 to 50 percent slopes, eroded

Location Name	Fault Zones	Liquefaction/ Landslide Zone	Soil Type
EMWD - S	No	No/No	MsD Mottsville sandy loam, 8 to 15 percent slopes TfF2 Tollhouse rocky coarse sandy loam, 8 to 50 percent slopes, eroded
Irvine Ranch Water District	No	No/Yes	101 Alo clay, 15 to 30 percent slopes, dry 127 Bosanko clay, 15 to 30 percent slopes
El Toro Reservoir	No	No/Yes	101 Alo clay, 15 to 30 percent slopes, dry

Source: CDOC 2021b; NRCS 2022

None of the sites located in San Bernardino County are within a Paleontological Resource overlay district, where palaeontologic resources are known to occur or are likely to be present (San Bernardino County 2021). Of the sites located in Riverside County, the EMWD-S site is located in an area with high paleontological sensitivity (Riverside County 2015). A paleontological report conducted for the West Valley Connector Project indicates that the general area around the Waterwise CBWCD, Upland, and SAWC-1 sites is of low paleontological sensitivity (SB CTA 2018). The IRWD and El Toro Reservoir sites are areas of general paleontological sensitivity (Orange County 2015).

4.7.2 Environmental Impacts

GEO (a). Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault; Strong seismic ground shaking; Seismic-related ground failure, including liquefaction; or, Landslides?

Less than Significant. Three CNG sites are located within an Alquist-Priolo Earthquake Fault Zone (East Valley Water District, Sycamore Water Plant, and SBVWCD-2). Projects that involve the building of habitable structures in these zones require geotechnical investigations prior to construction. The Project involves the installation of cloud seeding units and no housing; therefore, a geotechnical investigation is not required.

The weather modification units do not require excavation and would not induce fault rupture, seismic ground shaking, liquefaction, or landslides. However, the Project area is located in the vicinity of various faults and liquefaction and landslide zones (Table 4.7-1) and could be impacted by these events. In the event of an earthquake, SAWPA would implement suspension criteria discussed in Section 2.3.4. If strong ground shaking, soil liquefaction, or landslides were to occur, the weather modification units could topple over. However, this would not be expected to result in the exposure of people or structures to the risk of loss, injury, or death because the units would be unoccupied and located a minimum of 50 feet away from occupied residences/buildings. The propane and CNG seeding canisters are kept in a

sealed tank and AHOGS flares are housed within spark arrestor canisters and would not be expected to impact the surrounding environment. Therefore, this impact would be less than significant.

The proposed Project would enhance snowfall rather than rainfall, and operations would cease during heavy precipitation events, consistent with the suspension criteria presented in Section 2.3.4. These criteria would also preclude cloud seeding in burn areas that are more susceptible to landslides. Therefore, the increase in snowfall in the target areas would not contribute to landslides and would not expose people or structures to the risk of loss, injury, or death associated with landslides. Therefore, this impact would be less than significant.

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

Less than Significant. The weather modification units would be installed on previously disturbed and graded land and the construction of the units would not contribute to an increase in soil erosion or loss of topsoil.

The precipitation increased from the Project and increases in flows would occur in different areas at different times with each storm event, resulting in an overall increase in the long-term average annual flows of area streams and rivers as shown in Table 2.3-1. Although a minor increase in erosion and topsoil loss is expected due to Project-induced higher streamflow (see Table 2.1-1) in any given year, the overall change is anticipated to be within the range of natural variation in erosion. This finding is due to several factors, including the intermittent nature of cloud seeding efforts (i.e., not all storms would be seeded), incremental increases in snowfall on the order of 10 percent, and cloud seeding suspension during the risk of flood events, which causes erosion in rivers and streams. Taken together, these factors lead to the conclusion that the increases are expected to be within the range of values observed naturally. Therefore, impacts on erosion and topsoil loss during weather modification activities would be less than significant.

GEO (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?

Less than Significant. The CNGs and AHOGS would be installed on flat, previously disturbed land with rebar dug to a depth of 8 inches for the CNGS and up to 3 feet for the AHOGS. Therefore, installation of the units would have no impact on the stability of the geologic unit or soil. The potential impacts of increased precipitation caused by the Project would be less than significant as discussed in GEO (a) above.

GEO (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?

Less than Significant. The Project sites are underlain by mostly sand and loam soils, which drain well and are not considered expansive soils. Increased snowfall caused by the Project would occur during winter and spring when soils within the target areas are saturated. Therefore, impacts to the units, and accordingly the properties where the units would be located due to expansive soils would be less than significant.

GEO (e). Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The Project does not require the use of septic tanks or alternative wastewater disposal systems and would not impact any existing septic tanks or alternative wastewater disposal systems. Therefore, the Project would have no impacts.

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

No Impact. While some of the project sites are in areas of paleontological sensitivity, the sites are on previously disturbed areas and are not likely to contain any known paleontological resources or unique geologic resources. Further, digging for the rebar for the units would be limited to a depth of 8 inches for the CNGs and 3 feet for the AHOGS, which is above the strata in which paleontological resources or unique geological features are found. Therefore, the Project would have no impact on paleontological or unique geologic resources.

4.8 Greenhouse Gas Emissions

Issue	Potentially Significant Impact	Less Than Significant 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?	☐	☐	☒	☐

4.8.1 Environmental Setting

Recent significant changes in global climate patterns have been associated with global warming, an average increase in the temperature of the atmosphere near Earth's surface. Global warming has been attributed to the accumulation of GHG emissions in the atmosphere. GHGs trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities. The emission of GHGs through the combustion of fossil fuels (i.e., fuels containing carbon) in conjunction with other human activities appears to be closely associated with global warming.

The standard state definition of GHG includes six substances: carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulfur hexafluoride (SF_6) (CARB 2014). Tropospheric O_3 (a short-lived, not-well-mixed gas) and black carbon are also important climate pollutants. CO_2 is the most abundant GHG, and collectively CO_2, CH_4, and N_2O amount to 80 percent of GHG effects.

For each GHG, a global warming potential (GWP) has been calculated to reflect how long emissions remain in the atmosphere and how strongly energy is absorbed on a per-kilogram basis relative to CO_2. GWP is a metric that indicates the relative climate forcing of a kilogram of emissions when averaged over the period of interest (both 20-year and 100-year horizons are used for the GWPs shown in Table 4.8-1). To account for this higher potential, emissions of other GHGs are frequently expressed in the equivalent of CO_2, denoted as CO_2e. CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect.

Table 4.8-1. Global Warming Potential for Selected Greenhouse Gases

Pollutant	Lifetime (Years)	Global Warming Potential (20 Year)	Global Warming Potential (100 Year)
Carbon Dioxide	100	1	1
Nitrous Oxide	121	264	265

Pollutant	Lifetime (Years)	Global Warming Potential (20 Year)	Global Warming Potential (100 Year)
Nitrogen Triflouride	500	12,800	16,100
Sulfur Hexafluoride	3,200	17,500	23,500
Perfluorocarbons	3,000-50,000	5,000-8,000	7,000-11,000
Black Carbon	days to weeks	270-6,200	100-1,700
Methane	12	84	28
Hydrofluorocarbons	Uncertain	100-11,000	100-12,000

Source: CARB 2014

The primary effect of rising global concentrations of atmospheric GHG is a rise in the average global temperature of approximately 0.2 degrees Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using emission rates shows that further warming is likely to occur given the expected rise in global atmospheric GHG concentrations from innumerable sources of GHG emissions worldwide, which would induce further changes in the global climate system during the current century.

Scientific understanding of the fundamental processes responsible for global climate change has improved over the past decade. However, there remain significant scientific uncertainties. For example, uncertainties exist in predictions of local effects of climate change, occurrence of extreme weather events, and effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the climate system, the uncertainty surrounding the implications of climate change may never be eliminated. Because of these uncertainties, there continues to be significant debate as to the extent to which increased concentrations of GHGs have caused or would cause climate change, and with respect to the appropriate actions to limit and/or respond to climate change. In addition, it may not be possible to link specific development projects to future specific climate change impacts, though estimating project-specific impacts is possible.

4.8.1.1 Executive Order S-3-05

On June 1, 2005, Executive Order S-3-05 set the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. It calls for the Secretary of CalEPA (California Environmental Protection Agency) to be responsible for coordination of State agencies and progress reporting.

4.8.1.2 Executive Order B-30-15

In April 2015, Governor Edmund Brown issued an Executive Order establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and Governor Brown's Executive Order S-03-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In

addition, the Executive Order aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

4.8.1.3 Assembly Bill 32 (AB 32)

In September 2006, the California Global Warming Solutions Act of 2006, also known as AB 32, was signed into law. AB 32 focuses on reducing GHG emissions in California and requires CARB to adopt rules and regulations that would achieve GHG emissions equivalent to Statewide levels in 1990 by 2020. CARB initially determined that the total Statewide aggregated GHG 1990 emissions level and 2020 emissions limit was 427 million metric tons of CO_2e. The 2020 target reduction was estimated to be 174 million metric tons of CO_2e.

To achieve the goal, AB 32 mandates that CARB establish a quantified emissions cap, institute a schedule to meet the cap, implement regulations to reduce Statewide GHG emissions from stationary sources, and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved.

4.8.1.4 Senate Bill 32 (SB 32)

Senate Bill (SB) 32, signed September 8, 2016, updates AB 32 to include an emissions reductions goal for the year 2030. Specifically, SB 32 requires the state board to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030. The new plan, outlined in SB 32, involves increasing renewable energy use, imposing tighter limits on the carbon content of gasoline and diesel fuel, putting more electric cars on the road, improving energy efficiency, and curbing emissions from key industries.

4.8.1.5 Senate Bill 375 (SB 375)

Acknowledging the relationship between land use planning and transportation sector GHG emissions, Senate Bill (SB) 375 was passed by the State Assembly on August 25, 2008 and signed by the Governor on September 30, 2008. This legislation links regional planning for housing and transportation with the GHG reduction goals outlined in AB 32. Reductions in GHG emissions would be achieved by, for example, locating employment opportunities close to transit.

Under SB 375, each Metropolitan Planning Organization (MPO) would be required to adopt a Sustainable Community Strategy (SCS) to encourage compact development that reduce passenger vehicle miles traveled (VMT) and trips so that the region will meet a target, created by CARB, for reducing GHG emissions. If the SCS is unable to achieve the regional GHG emissions reduction targets, then the MPO is required to prepare an alternative planning strategy that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measure.

4.8.1.6 Southern California Association of Governments

To implement SB 375 and reduce GHG emissions by correlating land use and transportation planning, SCAG adopted the 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy (2020–2045 RTP/SCS) on September 3 ,2020. The 2020–2045 RTP/SCS reaffirms the land use policies that were incorporated into the 2016–2040 RTP/SCS. The 2020-2045 RTP/SCS describes how the region can attain the GHG emission-reduction targets set by CARB by achieving a 19 percent reduction by 2035 compared

to the 2005 level on a per capita basis. Compliance with and implementation of 2020 RTP/SCS policies and strategies would have co-benefits of reducing per capita criteria air pollutant emissions associated with reduced per capita VMT.

4.8.1.7 Climate Change Scoping Plan

In 2008, CARB approved the original *Climate Change Scoping Plan* as required by AB 32. Subsequently, CARB approved updates to the *Climate Change Scoping Plan* in 2014 (First Update) and 2017 (2017 Update), with the *2017 Update* considering SB 32 (adopted in 2016) in addition to AB 32. The original *Climate Change Scoping Plan* proposed a "comprehensive set of actions designed to reduce overall carbon GHG emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health. The original *Climate Change Scoping Plan* identified a range of GHG reduction actions that included direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms, such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

The original *Climate Change Scoping Plan* called for a "coordinated set of solutions" to address all major categories of GHG emissions. Transportation emissions were addressed through a combination of higher standards for vehicle fuel economy, implementation of the Low Carbon Fuel Standard (LCFS), and greater consideration to reducing trip length and generation through land use planning and transit-oriented development. Buildings, land use, and industrial operations were encouraged and, sometimes, required to use energy more efficiently. Utility energy providers were required change to include more renewable energy sources through implementation of the Renewables Portfolio Standard (RPS). Additionally, the original Climate Change Scoping Plan emphasized opportunities for households and businesses to save energy and money through increasing energy efficiency. It indicated that substantial savings of electricity and natural gas would be accomplished through "improving energy efficiency by 25 percent."

On December 2017, CARB adopted California's *2017 Climate Change Scoping Plan Update: The Strategy for Achieving California's 2030 Greenhouse Gas Target (2017 Scoping Plan Update)*. The *2017 Scoping Plan Update* builds upon the framework established by the original *Climate Change Scoping Plan* and the First Update while identifying new, technologically feasible, and cost-effective strategies to ensure that California meets its GHG reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health. The *2017 Scoping Plan Update* includes policies to require direct GHG emissions reductions at some of the state's largest stationary sources and mobile sources. These policies include the use of lower GHG fuels, efficiency regulations, and the Cap-and-Trade program, which constrains and reduces emissions at covered sources.

4.8.1.8 California Green Building Standards (CALGreen Code)

The 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, 2017. CALGreen standards require new residential and commercial buildings to comply with mandatory measures under five topical areas: planning and design, energy efficiency, water efficiency and conservation, material

conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The 2019 CalGreen code updates were published July 1, 2019 with an effective date of January 1, 2020.

The California Energy Code (California Code of Regulations, Title 24, Section 6) was created as part of the California Building Standards Code (Title 24 of the California Code of Regulations) by the California Building Standards Commission in 1978 to establish statewide building energy efficiency standards to reduce California's energy consumption. These standards include provisions applicable to all buildings, residential and nonresidential, which describe requirements for documentation and certificates that the building meets the standards. Compliance with Title 24 is enforced through the building permit process.

4.8.1.9 CEQA Guidelines Amendments

SB 97 required the Governor's Office of Planning and Research to develop CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." The CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. Noteworthy revisions to the CEQA Guidelines include the following:

- Lead agencies should quantify all relevant GHG emissions and consider the full range of project features that may increase or decrease GHG emissions as compared to the existing setting;
- Consistency with the CARB Scoping Plan is not a sufficient basis to determine that a project's GHG emissions would not be cumulatively considerable;
- A lead agency may appropriately look to thresholds developed by other public agencies, including the CARB's recommended CEQA thresholds;
- 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;
- The effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impact analysis; and
- Given that impacts resulting from GHG emissions are cumulative, significant advantages may result from analyzing such impacts on a programmatic level. If analyzed properly, later projects may tier, incorporate by reference, or otherwise rely on the programmatic analysis.

4.8.1.10 SCAQMD Interim CEQA GHG Thresholds

SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds in October 2008. The SCAQMD proposed the use of a percent emission reduction target (e.g., 30 percent) to determine significance for commercial/residential projects that emit greater than 3,000 metric tons per year. On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold of 10,000 metric tons per year of CO_2e for stationary source/industrial projects where the SCAQMD is the lead agency. However, SCAQMD has yet to adopt a GHG significance threshold for land use development projects (e.g., residential/commercial projects) and has formed a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds

and provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents. Guidance documents have not yet been published. The proposed Project does not include the construction or operation of any stationary sources, as SCAQMD classifies the cloud seeding units as combustion equipment; therefore, the interim significance threshold is not applicable to the proposed Project.

Riverside County has adopted the Climate Action Plan (CAP) for unincorporated areas in the County with an update provided in 2019 (Riverside County Planning Department 2019). The CAP allows Riverside County to meet the requirements of AB 32, SB-32 (along with Executive Order B-30-15), and Executive Order S-3-05 for reducing GHG emissions by 40 percent from 1990 levels by 2030 and 80 percent by 2050. The screening threshold set in the CAP is 3,000 metric tons of CO_2e per year for any project. If the project is below the screening threshold, GHG impacts would be less than significant. Since a CEQA analysis was completed for the CAP, it is a CEQA-qualified document as defined by Sections 15183.5(b) and 15064.4 of the State CEQA Guidelines. As such, tiering from the CAP is considered an appropriate threshold for the Project's GHG impact analysis for sites within unincorporated Riverside County. Similarly, San Bernardino County has adopted the Greenhouse Gas Reduction Plan for unincorporated areas in San Bernardino County with an update provided in 2021 (San Bernardino County 2021). The screening threshold set in the Greenhouse Gas Reduction Plan is also 3,000 metric tons of CO_2e per year for any project, with projects that do not exceed this threshold to be considered consistent with the Greenhouse Gas Reduction Plan and determined to have a less than significant individual and cumulative impact for GHG emissions. In the absence of adopted thresholds for Project sites not within the jurisdiction of Riverside and San Bernardino Counties (i.e., no GHG thresholds or CAPs have been adopted for the unincorporated areas of Los Angeles and Orange Counties, or for the Cities of Montclair, Upland, or Mission Viejo), the following analysis also applies the Riverside County CAP and San Bernardino County Greenhouse Gas Reduction Plan screening threshold of 3,000 metric tons CO_2e per year. The CAP and Greenhouse Gas Reduction Plan screening thresholds represent a level that would result in sufficiently low GHG emission to be less than cumulatively considerable without mitigation. The Riverside County CAP screening threshold is appropriate to use for the proposed Project as both San Bernardino County and Riverside County are located within the South Coast Air Basin as are all other proposed Project Sites.

4.8.2 Environmental Impacts

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

Less than Significant. The proposed Project would generate GHG emissions from worker vehicles and construction equipment used during installation at each site as well as vehicle trips associated with operations and maintenance. In addition, the combustion of both propane and acetone utilized in the CNG units will result in CO_2 emissions.

Construction-related GHG emissions were estimated using SCAQMD's CalEEMod 2016.4.0 model (refer to Appendix A) based on the Project's construction schedule detailed in Section 2.3. All construction emissions (e.g., off-road equipment and worker vehicle trips) associated with the proposed Project were evaluated. Based on the results of this modeling, construction emissions would result in 0.11 CO_2e metric tons GHG emissions per year. As stated in Section 4.3, emissions assumptions are conservative

since emissions were calculated assuming the maximum use of equipment at all Project sites. SCAQMD guidance recognizes that GHG emission reduction options for construction are extremely limited, and they recommend amortizing construction emissions over a 30-year period and address them as part of operational GHG reduction strategies (SCAQMD 2008b). In accordance with this guidance, GHG emissions from construction were amortized (i.e., averaged annually) over a 30-year timeframe, with a resulting annual emission of 0.004 metric tons CO_2e per year.

During operations, cloud seeding generators burn the cloud seeding agents in a solution of acetone using propane as the fuel source. The primary fuel source, propane (C_3H_8), decomposes into carbon dioxide and water during combustion (i.e., $C_3H_8 + (5)O_2 \rightarrow (3)CO_2 + (4)H_2O$). Similarly, the combustion of acetone also produces carbon dioxide and water (i.e., $C_3H_6O(l) + 4O_2(g) \rightarrow 3CO_2(g) + 3H_2O(g)$). The CNG units burn approximately 0.75 gallons of propane per hour during active operation for each cloud seeding event. Assuming eight hours of operation per storm event and eight storm events per year, an estimated 48 gallons of propane would be consumed at each CNG site per year. As detailed in Section 2.1, 13 sites have been selected to house CNG units. This analysis conservatively assumes that all 13 CNG units operate for the same number of hours per year; therefore, up to 624 gallons of propane would be consumed per year. Propane combustion CO_2 emissions per gallon are approximately 5.72 kilograms (kg) (United States Energy Information Administration 2021). Accordingly, combustion of 624 gallons of propane would result in an estimated 3,569 kg (equivalent to 3.569 metric tons) of CO_2 emitted per year. The seeding solution burns at a rate of approximately 0.24 gallons per hour, which corresponds to approximately 15.36 gallons of seeding solution consumed per year (assuming eight hours of operation per storm event and eight storm events per year). As a further conservative assumption, it is assumed that combustion CO_2 emission per gallon of acetone seeding solution is equal to that of combustion of propane (i.e., 5.72 kg/gallon). Accordingly, combustion of 15.36 gallons per year of seeding solution would result in an estimated 87.86 kg (equivalent to 0.088 metric tons) of CO_2 emitted per year, resulting in a total of 3.69 metric tons of CO_2 emitted per year as a result of combustion of the propane and seeding solution. Operation and maintenance activities would require an estimated 15 trips per year to each site which would contribute an additional 6e-4 metric tons CO_2e per year. Table 4.8-2 summarizes the Project's total estimated GHG emissions for construction and operation.

Table 4.8-2. Proposed Project GHG Emissions

Phase	GHG Emissions (metric tons CO_2e/year)
Construction Activities (amortized over 30-year useful life)	0.01
Operational Activities	3.69
TOTAL	3.7
CEQA Significance Threshold	3,000
Significant? (Yes/No)	No

As shown in Table 4.8-2, total annual Project GHG emissions would be much less than the 3,000 metric tons CO_2e per year threshold. Therefore, the impact of the Project's GHG emissions on the environment would be less than significant.

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

Less than Significant. The purpose of the proposed Project is to increase water supply in the region through implementation of the cloud seeding program. Since water delivery is one of the most energy-intensive activities in the State, implementing programs that support enhancement of local water sources would result in a reduction in energy required for water conveyance and thereby result in a net reduction in GHG emissions. Therefore, the State has adopted goals for development of alternative water sources, such as recycled water and stormwater. The proposed Project would increase water supply, and therefore, would be consistent with goals of AB 32 and the CARB Scoping Plan update to reduce GHG emissions and the effects of climate change. Additionally, the Project would utilize solar panels at Project sites to provide electricity to Project components which is consistent with AB 32 Scoping Plan-related measures, such as the Renewable Portfolio Standard and investments in renewable energy. Further, Project GHG emissions are far below the screening threshold of the Riverside County CAP and San Bernardino County Greenhouse Gas Reduction Plan. As such the Project would be considered consistent with both plans.

Although not directly applicable to the proposed Project, the proposed Project would not conflict with population growth projections of the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, or its goals associated with GHG reductions since the Project would be consistent with the current land use designation for the Project site and would not create housing or otherwise lead to substantial unplanned population growth in the vicinity.

As detailed above, local water sources use less energy than purchasing imported water. Accordingly, Project construction emissions would be offset by GHG emission reductions from enhancing local surface water supplies and reduction in energy required by imported water supplies. In addition, construction would be conducted in accordance with applicable BMPs of the California Green Building Standards Code for efficiency and sustainability. Because the Project is consistent and does not conflict with the applicable plans, policies, and regulations, the Project's incremental increase in GHG emissions of 3.7 metric tons CO_2e per year would be less than significant.

4.9 Hazards and Hazardous Materials

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
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?	☐	☐	☒	☐

4.9.1 Environmental Setting

The ground-based cloud seeding locations are located on private and municipal property. None of the sites is located on a hazardous materials site (DTSC 2021, SWRCB 2021).

There are numerous airports in the vicinity of the Project area. Big Bear City Airport is within the NE target area boundaries. The following are the closest airports around the target areas:

- Cable Airport
- Chino Airport
- Brackett Field Airport
- Redlands Municipal Airport
- Ontario International Airport
- San Bernardino International Airport

- Corona Municipal Airport
- Banning Municipal Airport
- Palm Springs Municipal Airport
- Hemet Ryan Airport Ryan Airport
- John Wayne Airport

The individual Project sites and general Project area are located in and near very high fire hazard zones (see Table 4.20-1).

4.9.2 Environmental Impacts

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

Less Than Significant. The installation and operation of ground-based units would include the transport, use, and disposal of hazardous materials (e.g., fuel, lubricants). The CNGs would use propane, which would be stored in 125 or 250-gallon tanks onsite and delivered by a licensed propane contractor. The transport, storage, and use of propane would comply with all applicable federal, state, and local ordinances and design standards.

In addition to silver iodide, the CNG seeding solution comprises approximately 96 percent acetone, which is considered a hazardous material under the California Hazardous Waste Control Law, CCR Title 22, Chapter 11, Appendix X. Approximately 8 gallons of seeding solution are stored within a sealed, locked tank inside each CNG.

The CNGs and AHOGS would both release silver iodide into the environment during storm events. Unlike other metals (e.g., lead and mercury), silver, in any form, is not toxic to humans at levels found in the environment. Section 4.10.2, Water Quality and Hydrology, presents data supporting this finding. Comprehensive reviews of cloud seeding programs have shown that there is no evidence of harm to humans or the environment from the use of silver iodide (Cardno ENTRIX 2011, Fisher et al. 2015).

The flares used to ignite the AHOGS are similar to road flares; the safety data sheet for the flares indicate that when stored in large quantities they can pose an explosion hazard and contain small amounts of toxic compounds. The cloud seeding solution is separated from the igniter by a sealed plastic cap to ensure that combustion does not occur unless the igniter is triggered by the Project meteorologist. The flares are housed inside aluminum, ventilated cylinders that allow the seeding agents to escape, while preventing sparks from reaching the ground. They burn for approximately 3-4 minutes. Flares are ignited by the Project Meteorologist, from a remote location. The camera mounted at the AHOGS location will be used to assess the state of the equipment and to monitor the ignition and contained combustion. Therefore, a very low concentration of these compounds is released into the environment.

SAWPA and its contractors would comply with CalEPA's Unified Program (e.g., hazardous materials release response plans and inventories, California Uniform Fire Code hazardous materials management plans and inventories), Caltrans regulations related to the transport of hazardous materials (CFR Title

49), and Department of Toxic Substances Control (DTSC) regulations pertaining to the use of hazardous materials (CCR Title 22).

Thus, while the Project would use hazardous materials, they would be used in small amounts and in compliance with all applicable hazardous material regulations. Flares and igniters would be enclosed and monitored remotely during use to ensure the integrity of the containers. Therefore, Project would result in a less than significant impact due to the routine transport, use, or disposal of hazardous materials.

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

Less Than Significant. The CNGs would be installed on private property or spaces such as vacant lots or open fields. The propane and cloud seeding tanks associated with each CNG would be locked to prevent tampering. Locked fencing and security cameras would be installed around the AHOGS to restrict access by the public. Therefore, the hazard to the public or environment through reasonably foreseeable upset or accident conditions would be less than significant.

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

Less Than Significant. One Project site, the El Toro Reservoir AHOGS site, is located within one-quarter mile of a preschool. All other sites are located greater than one-quarter mile from a school. As discussed above, all hazardous materials would be handled in accordance with applicable requirements and would not be released into the environment at concentrations that would cause harm. Therefore, impacts would be less than significant.

HAZ (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?

No Impact. The Project sites are not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, and therefore would have no impact on the public or environment (DTSC 2021, SWRCB 2021).

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

No Impact. The Upland site is located just over one mile away from the Cable Airport. The Cable Airport, Redlands Airport, Chino Airport, Ontario International, and Big Bear Airport have land use plans. The CNGs and AHOGS would not create an aerial hazard for nearby airplanes, and as discussed in Section 4.13 (Noise), would not generate noise in excess of levels allowed by the airport land use plans or that would cause a hazard to people residing in the Project area. Therefore, no impact would occur.

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

Less Than Significant. The Project would not result in any changes in ingress or egress to the Project sites or increase traffic. The proposed Project would result in higher amounts of precipitation across the target areas. Increased precipitation could potentially include increased snowfall that could slow or

delay emergency vehicle access and evacuations. However, residents of the target areas are accustomed to rain and snow in the mountains. The Project's incremental contribution to time needed to clear snow from roadways would be less than occurs in years with heavy storms and major snow accumulation. In heavy snow years, SAWPA would implement suspension criteria and would reduce or stop cloud seeding that may result in high snowfall and problematic road conditions. Therefore, impacts of the Project on emergency response plans or emergency evacuation plans would be less than significant.

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

Less Than Significant. As discussed in (a) above, the CNGs require the use of propane as an ignition source. The propane would be transported and handled by a licensed third-party contractor and would not create an unusual wildland fire risk.

The AHOGS require the use of flares as an ignition source. The flares are housed inside aluminum spark arrestors that prevent sparks from reaching the ground. In addition, vegetation around the units would be maintained to ensure that it does not pose a fire risk. Therefore, impacts would be less than significant.

4.10 Hydrology and Water Quality

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. 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?	☐	☐	☐	☒

4.10.1 Environmental Setting

4.10.1.1 Surface Water Hydrology

The target areas encompass 759 square miles of varied terrain, including streams, river, and reservoirs. The target areas drain to the Santa Ana River. The predominant hydrologic soil group in the San Bernardino Valley is Type A, typified by low overland flow rates and high infiltration rates. In the mountainous regions that are the target areas for cloud seeding, the most common hydrologic soil type is Type D, which has high potential for overland flow and stormwater runoff into canyons and valleys (SBC 2018).

The highest flows and water levels in these waterways occur during spring snowmelt. The Santa Ana River Watershed is the largest river basin in southern California. Its primary waterway is the Santa Ana River. The Santa Ana River headwaters are high in the San Bernardino mountains. Bear Creek is the

uppermost tributary of the Santa Ana River. The Santa Ana River is dammed at Seven Oaks Dam. The river travels through San Bernardino and Riverside counties. The river is dammed again near the city of Corona, where the Prado Dam releases water to the lower watershed. This area contains the largest wetlands in southern California. Below Prado Dam, the river flows through the Santa Ana Mountains and down onto the Orange County coastal plain, where the river widens, and sediments settle to create a smooth, open valley floor. The Santa Ana River is then diverted into spreading grounds where it recharges groundwater and provides water for over 1 million Orange County residents. Downstream of the spreading grounds, the river is channeled through cement channels and eventually enters the Pacific Ocean south of Huntington Beach. Because the target areas are in steep terrain and the Santa Ana River is regulated with the use of dams, the potential for flooding is limited. The waterbodies identified in the vicinity of the installation sites are shown in Table 4.10-1 (USFWS 2022).

Table 4.10-1. Nearest waterbodies to ground-based cloud seeding locations

Site Name	Nearby Waterbodies
Waterwise - CBWCD	40.89-acre Riverine habitat, San Antonio Creek Channel (R4SBAx) and 0.23-acre Riverine habitat (R4SBAx) are approx. 0.08-mile W of site
Upland - CBWCD	40.89-acre Riverine habitat, San Antonio Creek Channel (R4SBCx) is approx. 0.04-mile W of site
SAWC-1	1.24-acre Riverine habitat (R4SBCx) approx. 0.16-mile W of site; 6.49-acre Freshwater Pond habitat (PUBFh) approx. 0.12-mile N of site
SAWC-2	7.95-acre Freshwater Forested/Shrub Wetland habitat (PSSCh) 0.14-mile N of site; 0.24-acre Freshwater Forested/Shrub Wetland habitat (PSSA) 0.17-mile NE of site
EVWD	15.11-acre Riverine habitat (R4SBC) 0.06-mile W and 0.04-mile S of site
Thousand Pines Christian Camp	3.96-acre Riverine habitat (R4SBC) 0.19-mile NE of site
Sycamore Water Plant	2.39-acre Riverine habitat (R4SBC) is 0.06-mile E of site
SBVWCD-1	8.34-acre Riverine habitat (R4SB) 0.57-mile SE of site
SBVWCD-2	145.41-acre Riverine habitat, Santa Ana River (R5UBF) W of site
San Gorgonio Pass Water Agency	2.84-acre Riverine habitat (R4SBAx) 0.03-mile E of site
EMWD - N	7.47-acre Riverine habitat (R4SBC) 0.02-mile S of site
EMWD - S	6.25-acre Riverine habitat (R4SBA) 0.27-mile E of site
Mary Lea Gardiner	2.29-acre Riverine habitat (R4SBC) 0.27-mile W of site; 1.64-acre Riverine habitat (R4SBC) 0.28-mile E of site
Irvine Ranch Water District	0.86-acre Riverine habitat is classified as a R4SBA 0.01-mile NW and 0.02-mile NE of site; 0.34-acre Riverine habitat (R4SBA) 0.08 mile SW of site; 0.46 acre Riverine habitat (R4SBA) 0.1 mile SE of site
El Toro Reservoir	21.06 acre El Toro Reservoir 0.1-mile E of site

Source: USFWS 2022

4.10.1.2 Precipitation

Southern California has a Mediterranean-type climate with warm, dry summer, and cool, somewhat moist winters. Winter precipitation is somewhat sporadic and variable. Average annual precipitation ranges from between 20 to 40 inches annually in the mountains (above 2,000 feet elevation), between 10 and 20 inches in lower elevation coastal areas, less than 10 inches in desert areas, and under 5 inches in the drier inland deserts. Mountain snowfall is most common in mid to late winter above 5,000 feet elevation. The four primary target areas of the Santa Ana River Watershed are distinct in terms of their geography and topographic features, contributing to the hydrology of the areas. Precipitation trends for the four target areas are briefly described below and additional detail is presented in the Final Feasibility Report (NAWC 2020).

Southwestern Target Area

The southwestern target area (Santa Ana Range), bordering Orange and Riverside counties, is the lowest in elevation (up to 4,000 feet), with a few peaks (such as Modjeska and Santiago) exceeding 5,000 feet. This area generates primarily winter runoff directly pertaining to rainfall events, with little to no accumulating snowpack under normal circumstances. Annual precipitation in this range is believed to be generally between 15 and 25 inches, although there is a lack of precipitation stations in higher elevation portions.

Northwestern Target Area

The northwestern target area, bordering primarily San Bernardino County and some of Los Angeles County, encompasses a portion of the Central Transverse Ranges to the west of the I-15 freeway. This target area contains multiple peaks above 8,000 feet elevation and receives about 25 to 35 inches of annual precipitation, in addition to some significant snow accumulation in higher elevations. Maximum runoff from this area typically occurs from about December to April.

Northeastern Target Area

The northeastern target area in San Bernardino County encompasses the area of the Central Transverse Ranges east of I-15, extending down to I-10 north of Palm Springs. This area ranges extends southward from Big Bear Lake and includes some very high terrain with some peaks over 11,000 feet in elevation (e.g., San Gorgonia Mountain). This portion of the Santa Ana River Watershed generally receives between 20 and 40 inches of annual precipitation, including significant snowpack. Runoff peaks between late March and early April due to combined rainfall and melting snowpack. This portion of the watershed contributes the largest amount of runoff of the four target areas, with runoff 2 to 5 times greater than that of the other three areas in the watershed.

Southeastern Target Area

The southeastern target area of the watershed, in Riverside County just to the west and southwest of Palm Springs, is significantly drier than more northern areas despite an area of high elevation terrain. On the eastern side, there are portions above 8,000 feet in elevation with Mt. San Jacinto (on the eastern boundary) exceeding 10,700 feet. This area generally receives about 15 to 25 inches of annual

precipitation, with a limited amount of high elevation area (>7,000 feet elevation) on the eastern side as the only location that is likely to have any significant snow accumulation.

4.10.1.3 Clean Water Act

The USEPA regulates water quality under the CWA. The CWA, enacted by the federal government in 1972, was designed to restore and maintain the chemical, physical, and biological integrity of waters in the United States. The CWA provides the legal framework for several water quality regulations including National Pollutant Discharge Elimination System (NPDES) permits, effluent limitations, water quality standards, pretreatment standards, Antidegradation

Policy, nonpoint source discharge regulation, and wetlands protection. The Clean Water Act requires that states adopt water quality standards, including standards for toxic substances. The USEPA has delegated the responsibility for administration of portions of the CWA to state and regional agencies.

CWA Section 303(d) requires that states develop a list of water quality limited segments that do not meet water quality standards. A total maximum daily load (TMDL) is then established for water quality limited segments in order to improve water quality. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

4.10.1.4 Porter-Cologne Water Quality Control Act

The Porter-Cologne Act is California's comprehensive water quality control law. This Act, promulgated in the California Code of Regulations Title 22, regulates both surface water and groundwater. It requires the adoption of water quality control plans (basin plans) by the Regional Water Quality Control Board (RWQCBs) for watersheds within their regions. The basin plans are reviewed triennially and amended as necessary by the RWQCB, subject to the approval of the California Office of Administrative Law, the California State Water Resources Control Board (SWRCB), and ultimately the USEPA.

Water quality standards for the proposed Project area are contained in the Water Quality Control Plan for the Santa Ana River Basin, which was adopted in 1995 and most recently updated in 2019. This plan sets numeric and/or narrative water quality criteria to protect the beneficial uses of water in the basin. There are no water quality objectives for silver for surface water in the basin. The basin plan specifies a limit of 50 ppb silver in groundwater designated for municipal use (Santa Ana RWQCB 2019).

4.10.1.5 Surface Water Quality

Water quality of surface waterbodies in the target areas is good and generally unaffected by urban runoff because the target areas focus on higher elevation areas upstream of population centers. The small municipalities in these areas follow existing water management guidelines issued by the county. For example, Big Bear Lake in the northeastern target area falls under San Bernardino County's Municipal Separate Storm Sewer System (MS4) permit fir regulating discharges.

The San Bernardino County Department of Public Works has developed a Stormwater Resource Plan for the San Bernardino County portion of the Santa Ana River Watershed. Existing TMDLs and CWA 303(d) listed impairments have been identified for receiving waters within the San Bernardino County portion of the Santa Ana River Watershed along with applicable Water Quality Objectives. Waterbodies in the San Bernardino County portion of the Santa Ana Watershed support beneficial uses such as municipal

and domestic water supply, agricultural supply, groundwater recharge, hydropower generation, recreation, warm and cold freshwater habitat, and wildlife habitat.

Various waterbodies in the target areas are included in the CWA 303(d) list as shown in Figure 4 and listed in Table 4.10-2. None of the waterbodies in the Project area are listed for silver.

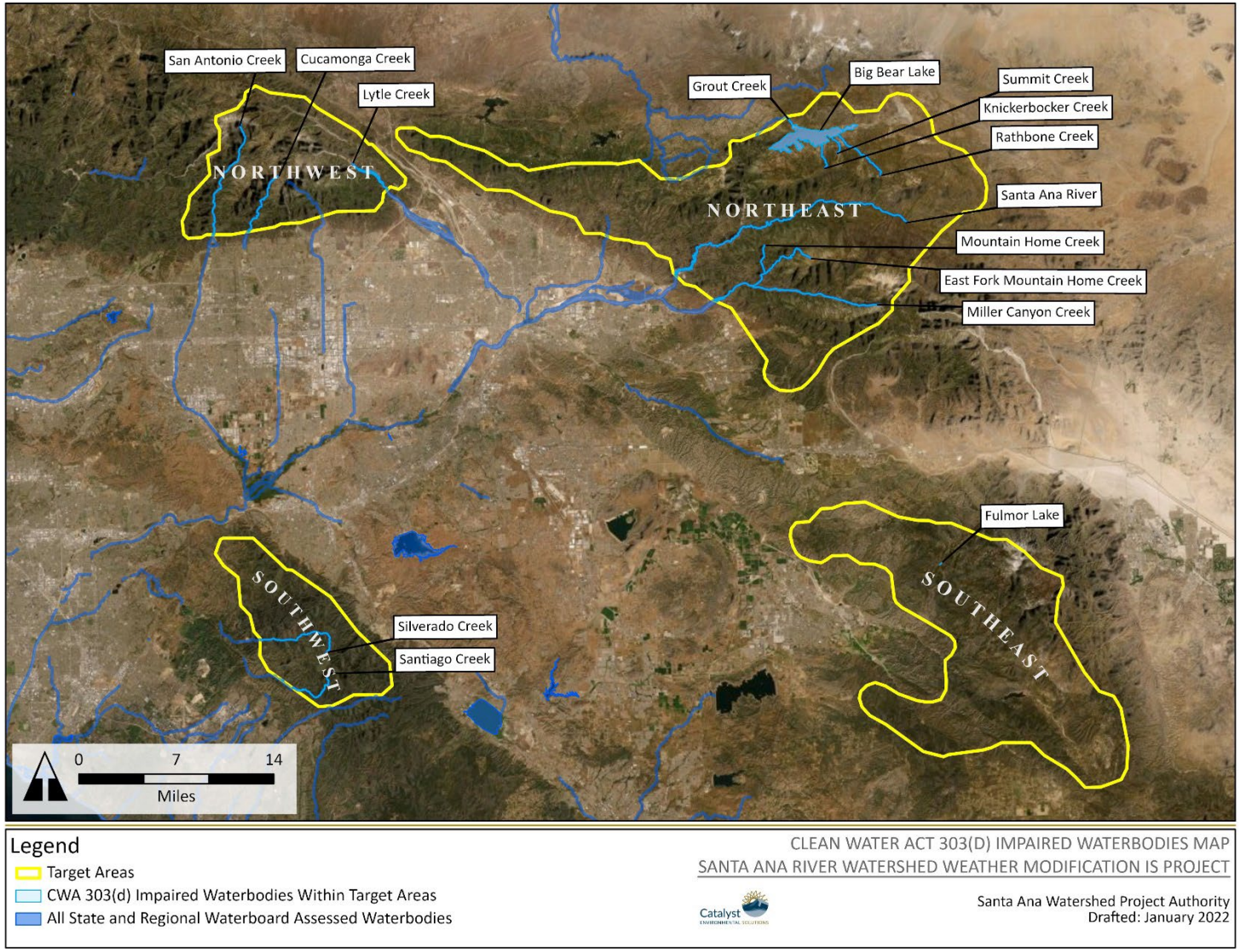

Figure 4. Clean Water Act 303(d) Impaired Waterbodies in the Project area

Table 4.10-2. Clean Water Act 303(d) Impaired Waterbodies in the Project area

Target Area	Site Name	Impairment	TMDL
Northeast	Big Bear Lake	Nutrients, Noxious Aquatic Plants, DDT, Chlordane, Copper[1], Metals[1], Sedimentation/Siltation[1]	Nutrient (phosphorus) and nuisance aquatic plant Phosphorus: Annual average no greater than 35 µg/L. For dry hydrological conditions the total phosphorus load allocation is 26,012 lbs/yr. Macrophyte Coverage: 30-40% on a total lake area basis. Percentage of Nuisance Aquatic Vascular Plant Species: 95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species. Chlorophyll *a* concentration: Growing season average no greater than 14 µg/L. Sedimentation/siltation TMDLs
Northeast	Summit Creek	Nutrients	Phosphorus: Annual average no greater than 35 µg/L. For dry hydrological conditions the total phosphorus load allocation is 26,012 lbs/yr. Macrophyte Coverage: 30-40% on a total lake area basis. Percentage of Nuisance Aquatic Vascular Plant Species: 95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species. Chlorophyll *a* concentration: Growing season average no greater than 14 µg/L.
Northeast	Knickerbocker Creek	Indicator Bacteria, Metals[1]	Phosphorus: Annual average no greater than 35 µg/L. For dry hydrological conditions the total phosphorus load allocation is 26,012 lbs/yr. Macrophyte Coverage: 30-40% on a total lake area basis. Percentage of Nuisance Aquatic Vascular Plant Species: 95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species. Chlorophyll *a* concentration: Growing season average no greater than 14 µg/L.
Northeast	Middle Santa Ana River	Indicator Bacteria	None
Northeast	Santa Ana River	Cadmium, Lead, Copper	None
Northeast	Grout Creek	Nutrients, Metals[1]	Phosphorus: Annual average no greater than 35 µg/L. For dry hydrological conditions the total phosphorus load allocation is 26,012 lbs/yr. Macrophyte Coverage: 30-40% on a total lake area basis. Percentage of Nuisance Aquatic Vascular Plant Species: 95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species. Chlorophyll *a* concentration: Growing season average no greater than 14 µg/L.

Target Area	Site Name	Impairment	TMDL
Northeast	Mill Canyon Creek	Indicator Bacteria[1]	None
Northeast	East Fork Mountain Home Creek	Indicator Bacteria	None
Northeast	Rathbone (Rathbun) Creek	Nutrients, Sedimentation/Siltation, Cadmium, Copper	Phosphorus: Annual average no greater than 35 µg/L. For dry hydrological conditions the total phosphorus load allocation is 26,012 lbs/yr. Macrophyte Coverage: 30-40% on a total lake area basis. Percentage of Nuisance Aquatic Vascular Plant Species: 95% eradication on a total area basis of Eurasian Watermilfoil and any other invasive aquatic plant species. Chlorophyll *a* concentration: Growing season average no greater than 14 µg/L.
Northwest	Lytle Creek	Indicator Bacteria[1]	None
Northwest	San Antonio Creek	pH	None
Northwest	Cucamonga Creek	pH	None
Southeast	Fulmor Lake	Indicator Bacteria[1]	None
Southwest	Silverado Creek	Salinity, TDS, Chlorides, Toxicity, Indicator Bacteria[1]	None
Southwest	Santiago Creek	Salinity, TDS, Chlorides, Toxicity	None

[1] Impairments that have been approved to be delisted by the USEPA in 2018. Sources: Santa Ana RWQCB 2008, Santa Ana RWQCB 2019, SWRCB 2021.

4.10.1.6 Groundwater Hydrology

The Santa Ana Basin is divided into three subbasins: the Coastal Basin, the Inland Basin, and the San Jacinto Basin (U.S. Geological Survey (USGS) 2002). The Coastal Basin includes a relatively small unconfined recharge area and a relatively large, confined area where groundwater pumping is the primary source of discharge, and the land use is almost entirely urban. The target areas overlap the Inland and San Jacinto Basins, while the Coastal Basin is located downstream of the proposed cloud seeding Project.

The Inland Basin is predominantly unconfined and land use is urban and agricultural. The San Jacinto Basin is largely unconfined and land use is mostly agricultural. The basins are primarily underlain with alluvium with water-bearing deposits (USGS 2002). The Inland Basin is filled with alluvial deposits eroded from the surrounding mountains. Recharge to the basin varies seasonally and is largely from infiltration of runoff from the San Gabriel and San Bernardino Mountains. Depth to water ranges from hundreds of feet near the flanks of mountains to near land surface along rivers and in wetland areas. Ground-water discharge occurs primarily by ground-water withdrawal for public supply. The Inland

Basin is affected greatly by the presence of the San Andreas Fault which lies along the base of the San Bernardino Mountains, and other faults, which lie along the base of the San Gabriel Mountains and Chino Hills. The San Jacinto Fault divides the basin and restricts groundwater flow and discharge (USGS 2002).

The San Jacinto Basin aquifer system consists of a series of interconnected alluvium-filled valleys bounded by steep-sided bedrock mountains and hills. Prior to human development, recharge to the flow was from infiltration of mountain streams, primarily the San Jacinto River. Groundwater recharge is currently dominated by irrigation return flows and from percolation ponds and reclaimed water. Ground water discharge is primarily by groundwater pumping (USGS 2002).

4.10.1.7 Groundwater Quality

Groundwater quality varies among the region's groundwater basins and is influenced by the surrounding rock formations and land use. These variances are reflected as inorganic constituents such as minerals, naturally occurring radioactive constituents, and metals. Trace elements may include manganese, silver, iron, arsenic, boron, fluoride, and molybdenum, with arsenic occurring in volcanic aquifers. Groundwater in the Inland and San Jacinto Basins is typically produced from deep aquifer zones. Major dissolved components are predominantly calcium-bicarbonate type, reflecting the quality of recharge originating in pristine, high-altitude areas adjacent to the San Gabriel and San Bernardino Mountains. Other factors that influence groundwater quality include recharge from the Santa Ana River, discharge of recycled wastewater to the river, and use of imported water in the basin (from the Colorado River) (USGS 2002).

Nutrients in groundwater, primarily nitrate and phosphorus, can originate from a variety of sources, including atmospheric deposition and dissolution of natural deposits. Elevated concentrations are commonly the result of human activity (including leaching from animal/agricultural wastes and fertilizers). Elevated nitrate concentrations in groundwater in the Inland and San Jacinto Basins may be from past and present agricultural activities.

Past analyses for trace elements in the Santa Ana Basin include aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, molybdenum, nickel, selenium, silver, strontium, thallium, vanadium, and zinc (USGS 2002). Pesticides have been measured in groundwater samples from the Santa Ana Watershed; however, all detected pesticides were below the MCLs established by the EPA (USGS 2002). Atrazine, deethylatrazine, simazine, tebuthiuron, and prometon were the five most commonly detected pesticides in the USGS studies (USGS 2002). Volatile organic compounds were measured in groundwater samples from the Santa Ana basins as part of the USGS studies. Ten VOCs were detected in at least five percent of the wells sampled: chloroform, trichloroethlyene (TCE); 1,1,1-trichloroethane (TCA); trichlorofluoromethane (CFC 11); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC 113); tetrachloroethylene (PCE); bromodichloromethane; methyl tert-butyl ether (MTBE); 1,2- dichloroethene (1,2-DCE); and 1,1-dichloroethene (1-1-DCE) (USGS 2002).

4.10.2 Environmental Impacts

4.10.2.1 Fate, Transport, and Toxicity of Silver Iodide

The fate, transport, and potential toxicity of silver iodide it the environment is the basis for much of the water quality impact analysis, and analysis of impacts to biological resources. The findings of numerous studies of the use and safety of this cloud seeding agent is described in this subsection.

The basis for cloud seeding being an effective method to enhance precipitation from wintertime orographic cloud systems[2] is that a cloud's natural precipitation efficiency can be augmented with silver iodide "seeds" to assist in converting supercooled water to ice upstream and over a mountain range in such a manner that newly created ice particles can grow and fall to the ground as additional snow on a specified target area.

Silver is a naturally-occurring element that can exist in various forms in the environment. Silver can form salts with other elements such as chloride (AgCl), bromide (AgBr), iodide (AgI), and nitrate (silver nitrate; $AgNO_3$). Silver salts are insoluble in water, meaning they do not dissolve, with the exception of silver nitrate, which readily dissolves in water, releasing ionic silver.

Silver iodide is a salt formed by one atom of silver and one atom of iodine. In addition to being insoluble, it does not readily dissociate (i.e., break into the silver anion (Ag+) and iodide) in water. These characteristics make it an effective cloud seeding agent. A small amount of dissociation may occur in water, but the silver anion would form complexes with other ions present in the water, such as chloride, rather than remain the free silver anion. Because only a small fraction of silver iodide would dissolve or dissociate, the maximum amount of free silver that could occur in water in which silver iodide is present is 0.984 parts per billion (ppb). This value assumes that the silver iodide would not adsorb, or bind, to any other compounds such as organic matter, clays, iron compounds, or manganese compounds. In fact, when deposited in soils or water, silver iodide remains an insoluble salt or adsorbs to surfaces such as organic matter and oxides, remaining within the soil or sediment. Studies have shown that up to 75% of silver complexes or ions adsorb, meaning only 25% would be free silver. Using these values, if the total amount of silver ion due to silver iodide is 0.984 ppb, approximately 0.246 ppb would remain as the silver anion once adsorption is taken into account. Once silver adsorbs to other compounds or particulates it is not bioavailable, meaning that it cannot be absorbed by organisms and cannot cause toxic effects.

Numerous studies have validated these findings in the field and have shown that cloud seeding does not result in concentrations of silver in the environment that would be toxic to humans or wildlife. For example, the Payette River Basin, north of Boise Idaho, has been the site of cloud seeding activities since 2003. Over 4,000 samples taken from the target areas showed that average silver concentrations ranged from 0.0005 to 0.0025 ppb and the highest concentration was 0.080 ppb (Fisher et al. 2015). Further, in its annual reviews of Snowy Hydro cloud seeding program since 2004, the New South Wales EPA has found no significant difference in silver concentrations in aquatic, soil, sediments, and aquatic species in the area cloud seeding target areas compared with non-target areas (NSW EPA 2020). Analyses of water and soil samples from three mountain ranges (Medicine Bow, Sierra Madre, and Wind River Ranges) in

[2] Orographic clouds, in this context, refers to cloud systems over mountain ranges, whether isolated or components of frontal systems within extratropical cyclones.

which the Wyoming Weather Modification Pilot Program conducted cloud seeding from 2009-2014 showed that silver concentrations in the water were in the parts per trillion range (1,000 times lower than the ppb concentrations that cause adverse effects in aquatic species) (Wyoming Water Development Commission 2014). In California, measurements taken in the Salt Spring Reservoir, within the target area of PG&E's Mokelumne water cloud seeding project showed that silver concentrations were less than 0.0005 ppb, a level with natural background concentrations. The numerous ongoing projects in California are tabulated and referenced in Section 1.2.

Silver bioavailability and toxicity is dependent upon its form in the environment; the environment in which it is present (air, soil, sediment, water); the characteristics of the environment (e.g., dissolved organic carbon content, chloride content, hardness, and pH of water); and the organism that is exposed to the silver. Because the silver iodide used in cloud seeding is insoluble in water and is not bioavailable, it is not toxic to wildlife or humans at environmental concentrations (as reviewed in Cardno ENTRIX 2011, Fisher et al. 2015).

It is important not to confuse silver iodide with other forms of silver. Ionic silver (Ag+) is highly toxic to fish and aquatic invertebrates: studies conducted using different fish species have shown that silver is toxic to fish at concentrations ranging from 5 to 70 ppb (Hogstrand and Wood 1998). Ionic silver is also used a fungicide, algaecide, and bactericide, including water disinfectant (WHO 2018). Therefore silver nitrate and ionic silver can be toxic to aquatic organisms.

High concentrations of silver nitrate used for film development may cause discoloration of the skin. Occupational exposure in factory workers exposed to silver nitrate has been shown to cause breathing problems, lung and throat irritation, and stomach pain (ATSDR 1990). Silver is not known to cause cancer, reproductive neurological or other adverse effects in humans. The USEPA has set a National Secondary Drinking Water standard of 0.10 mg/L (100 ppb) for silver. Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. Silver nitrate also dissociates in water releasing ionic silver. However, silver nitrate and ionic silver are not used in cloud seeding, and the silver compound that is used (silver iodide) does not dissociate. Concentrations of silver measured in the environment before (background) and after cloud seeding events are not toxic to humans and are over 1,000 times lower than the USEPA's secondary drinking water standard.

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

Less than Significant. Installation of the ground-based cloud seeding units would require minimal excavation and would not result in erosion, sedimentation, or pollutant discharge into any waterbodies. As discussed above, concentrations of silver measured in water during cloud seeding projects has been shown to be similar to background concentrations and not harmful to human health or wildlife. The USEPA has published a non-enforceable secondary drinking water standard of 100 ppb for silver and the Santa Ana RWQCB Water Quality Plan specifies a limit of 50 ppb silver in groundwater designated for municipal use (Santa Ana RWQCB 2019). These values are over 500-1,000 times greater than concentrations of silver measured in surface water during other cloud seeding projects. Further, there are no waterbodies in the target area that are impaired for silver. Therefore, the Project would not violate any water quality standards or degrade water quality and impacts would be less than significant.

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

Less than Impact (beneficial). The cloud seeding units do not require groundwater and will not interfere with groundwater recharge. Rather, the Project would increase precipitation in the target areas, leading to increased overland runoff and water reaching downstream waterbodies. Therefore, the Project would have no adverse impact on groundwater supplies and, would instead result in a *beneficial* impact on groundwater recharge due to increased precipitation and streamflow.

HYD (c). Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: result in a substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; 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 impede or redirect flood flows?

Less than Significant. The ground-based seeding units would be installed on disturbed land and would not require the creation of any impervious surfaces or grading or excavation that would result in on- or off-site erosion or siltation. As shown in Table 2.1-2, it is estimated that the Project would result in precipitation increases of 3.5 to 4.5% and streamflow increases of 6.7% to 13.7% in the four target areas. The Project area is naturally subject to highly variable precipitation and streamflow between wet and dry years. The estimated increases in streamflow would fall within the natural variation of the area and would not increase the likelihood of flooding. Further, SAWPA would suspend Project operations when the suspension criteria described in Section 2.4 for flooding are met. Therefore, impacts would be less than significant.

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

Less than Significant. The Project is not located in areas subject to seiche or tsunami. The Project would result in increased snowfall and snowmelt in the target area. The Project would occur in an area subject to major winter storms including rain, snow, and rain-on-snow events. To minimize flood hazards, SAWPA would implement suspension criteria (Section 1.5.1), which include measures to curtail cloud seeding when there is a risk of rainfall or a rain-on-snow event that could result in flooding. Further, the propane and cloud seeding solutions would be stored in sealed and locked containers. Therefore, the proposed Project would have a less than significant impact related to pollution release due to flooding, tsunami or seiche.

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

No Impact. The southern portion of the Project area (in Orange County) contains the Coastal Plain of Orange County Groundwater Basin, which DWR has designated as a medium-priority basin. The basin covers an area of approximately 350 square miles, bordered by the Puente Hills and Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest. The Orange County Water District, City of La Habra, and Irvine Ranch Water District manage this basin's groundwater in accordance with their Basin 8-1 Alternative (2017). The plan does not include any water quality objectives for silver. Therefore, the Project would not conflict with the plan.

The San Jacinto Groundwater Basin, encompassing areas around Moreno Valley, Hemet, Perris, and Sun City, is designated as a high priority basin by DWR. The EMWD is the Groundwater Sustainability Agency for the western part of the basin and is required to develop a groundwater sustainability plan by 2022 (EMWD 2022).

As described in HYD (b) above, the Project would not use groundwater. Rather, the Project would increase precipitation in the target areas, leading to increased overland runoff and water reaching downstream waterbodies, which could have a *beneficial* impact on groundwater management. The Project would also have no impacts on a water quality control plan as it would not impair any beneficial uses or degrade water quality.

4.11 Land Use and Planning

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. 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?	☐	☐	☐	☒

4.11.1 Environmental Setting

The proposed Project sites are located throughout the Santa Ana River Watershed in various jurisdictions and have different zoning classifications as noted in Table 4.11-1.

Table 4.11-1. Zoning and Land Use Designations for the Proposed Ground-Based Cloud Seeding Sites

Site Name	Elevation (ft)	Coordinates (Lat., long.)	Local Jurisdiction	Zoning	Ordinance/Code Regulating Land Use	Current Land Use
Waterwise - CBWCD	1044	34.078103, -117.704509	City of Montclair, San Bernadino County	R1 Single-Family Residential	City of Montclair Zoning Ordinance 11.18.010	Community center/park
Upland - CBWCD	1318	34.101183, -117.695932	City of Upland, San Bernardino County	PB-FC/R Public Flood Control/ Recharge	Upland Municipal Code 17.08.020 Land Use Regulations for Special Purpose Zones	Flood control
SAWC-1	1720	34.137955, -117.639953	City of Upland, San Bernardino County	M Mining	Upland Municipal Code 17.08.020 Land Use Regulations for Special Purpose Zones	Mining
SAWC-2	2120	34.156470, -117.671847	San Bernardino County	RS-10M Single Residential - 10,000 square feet Minimum	San Bernardino County Code of Ordinances 82.04.040	Water treatment/ flood control

Site Name	Elevation (ft)	Coordinates (Lat., long.)	Local Jurisdiction	Zoning	Ordinance/Code Regulating Land Use	Current Land Use
EVWD	1498	34.136848, -117.188404	City of San Bernardino	Publicly Owned Flood Control	City of San Bernardino Development Code Chapter 19.10	Sparsely vegetated vacant land
Thousand Pines Christian Camp	4903	34.249539, -117.278552	San Bernardino County	CF/RL-5 Crest Forest/Rural Living-5 Acre Minimum	San Bernardino County Code of Ordinances 82.04.040	Camp and conference center
Sycamore Water Plant	1649	34.186745, -117.309273	City of San Bernardino, San Bernardino County	University Hills Specific Plan District	City of San Bernardino Development Code Chapter 19.10	Sparsely vegetated vacant land
SBVWCD-1	1841	34.070031, -117.114747	San Bernardino County	RM Residential Multiple	San Bernardino County Code of Ordinances 82.04.040	Vacant lot
SBVWCD-2	2120	34.107975, -117.099455	San Bernardino County	Resource Conservation	San Bernardino County Code of Ordinances 82.03.030	Dam powerhouse and ancillary facilities
San Gorgonio Pass Water Agency	2881	33.975799, -116.981613	Riverside County	R-A-1, Residential Agricultural	Riverside County Ordinance 348.4966 Section 6.50	Vacant lot
EMWD - N	2182	33.780236, -117.072465	Riverside County	R-A-10, CZ No. 5696, Residential Agricultural	Riverside County Ordinance 348.4966 Section 6.50	Open space
EMWD - S	1854	33.668970, -116.970352	Riverside County	A-2-10, Heavy Agriculture	Riverside County Ordinance 348.4966 Section 14.1	Water storage
Mary Lea Gardiner	3663	33.536251, -116.805057	Riverside County	R-1-2 1/2 One and multiple family dwellings	Riverside County Ordinance 348.4966 Section 6.1 and 7.1	Private residence
Irvine Ranch Water District	810	33.776528, -117.754128	Orange County	A1 (SR) General agricultural/ rural residential (sign restriction)	Orange County Municipal Code Section 7-9-32	Municipal buildings

Site Name	Elevation (ft)	Coordinates (Lat., long.)	Local Jurisdiction	Zoning	Ordinance/Code Regulating Land Use	Current Land Use
El Toro Reservoir	579	33.6234824, -117.6697852	City of Mission Viejo	Community Facility	Mission Viejo Code of Ordinances Chapter 9.14	Water reservoir

Sources: City of Montclair 2018; City of Upland 2015; City of San Bernardino 2021; San Bernardino County 2022; Orange County 2016; Riverside County 2021b; City of Mission Viejo 2018

4.11.2 Environmental Impacts

LUP (a). Physically divide an established community?

No Impact. The Project sites are located on private property and would not involve the construction of any structures that would physically divide a community. Therefore, there would be no impacts.

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

No Impact. The installation and operation of cloud seeding units is not prohibited by any of the city and county ordinances listed in Table 4.11-1 governing land use of the Project sites nor general plans. Therefore, the Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental effects, and there would be no impacts.

4.12 Mineral Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. 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?	☐	☐	☐	☒

4.12.1 Environmental Setting

The San Antonio Water Company – 1 (SAWC-1) site is the only proposed site that is zoned for mining (M) (Table 4.11-1). All other sites are zoned residential, agricultural, or other zoning in which mining is not a permitted land use.

4.12.2 Environmental Impacts

MIN (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?

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

No Impact. The Project would only require minimal ground excavation and would occupy only 10 ft by 10 ft sized area at each site. At the SAWC-1 site, the CNG would be sited in a location that does not impact access to mineral resources. Therefore, the Project would have no impact on mineral resources.

4.13 Noise

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. Noise. Would the project:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
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?	☐	☐	☐	☒

4.13.1 Environmental Setting

The extent and duration of Project activities may vary across a variety of land uses including urban, residential, industrial/commercial, agricultural, mining, and open space. Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels, and because of the potential for nighttime noise to result in sleep disruption. Additional land uses such as schools, transient lodging, historic sites, cemeteries, and places of worship are also generally considered sensitive to increases in noise levels. These land use types are also considered vibration-sensitive land uses, as are commercial and industrial buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance.

The Project sites are located adjacent to developed areas, including residential communities, schools, commercial and industrial parks, roadways, and freeways and highways as well as in undeveloped and rural areas. As such, noise-sensitive receptors are in close proximity to several of the Project sites. As noted in Table 4.3-2 above, several Project sites are located near (within 1,000 feet) to sensitive receptors, with residences being the nearest receptors to all sites. Existing ambient noise sources in the vicinity of the Project sites are primarily vehicular traffic on local roads. For the purpose of this conservative analysis, the ambient noise levels at each site are assumed to be equal to the applicable noise standard for the respective land use in each jurisdiction as summarized in Table 4.13-1 below.

Table 4.13-1. Presumed Ambient Noise Levels

Site (Jurisdiction)	Land Use/Zoning	Presumed Ambient Noise Levels (dBA L_{eq}) 7:00 a.m. 10:00 p.m.	Presumed Ambient Noise Levels (dBA L_{eq}) 10:00 p.m. 7:00 a.m.	Notes
Waterwise - CBWCD (City of Montclair)	Single-Family Residential	55	45	a
Upland - CBWCD (City of Upland)	Public Flood Control/Recharge	65	65	b
SAWC-1 (City of Upland)	Mining	75	75	c
SAWC-2 (San Bernardino County)	Single Residential	55	45	d
EVWD (City of San Bernardino)	Publicly Owned Flood Control	65 (CNEL)	65 (CNEL)	e
Thousand Pines Christian Camp (San Bernardino County)	Crest Forest/Rural Living	55	45	d
Sycamore Water Plant (City of San Bernardino)	University Hills Specific Plan District	65 (CNEL)	65 (CNEL)	e
SBVWCD-1 (San Bernardino County)	Residential Multiple	55	45	d
SBVWCD-2 (City of Highland)	Open Space	75 (CNEL)	75 (CNEL)	f
San Gorgonio Pass Water Agency (Riverside County)	Residential Agricultural	45	45	g
EMWD - N (Riverside County)	Residential Agricultural	45	45	g
EMWD - S (Riverside County)	Heavy Agriculture	45	45	g
Mary Lea Gardiner (Riverside County)	One and multiple family dwellings	55	45	g
Irvine Ranch Water District (Orange County)	General agricultural/rural residential	55	50	h
El Toro Reservoir (City of Mission Viejo)	Water Reservoir	55	50	j

Notes:

a. Base Ambient Noise Level for Residential Land Uses per City of Montclair Municipal Code, Section 6.12 Noise Control

b. Base Ambient Noise Level for "Uses not Specified" Land Uses per City of Upland Municipal Code, Section 9.40 Unnecessary Noise

c. Base Ambient Noise Level for Industrial/Commercial Land Uses per City of Upland Municipal Code, Section 9.40 Unnecessary Noise

d. Noise Standards for Stationary Noise Sources at Residential Land Uses per San Bernardino County Development Code, Section 83.0.080 Noise

e. Noise Standards for Residential Land Eses per City of San Bernardino Municipal Code, Section 19.20.030 General Standards

f. Noise Standards for Open Space Land Uses per City of Highland Noise Municipal Code, Section 8.50 Noise Control

g. General Sound Level Standards for Rural Residential/Agricultural Land Uses per Riverside County Code of Ordinances, Section 9.52.040 General Sound Level Standards

h. Noise Standards for Residential Land Uses per Orange County Code of Ordinances, Section 4-6-5 Exterior Noise Standards

i. Noise Standards for Residential Land Uses per City of Newport Beach Municipal Code, Section 10.26.025 Exterior Noise Standards

j. Noise Standards for Residential Land Uses per City of Mission Viejo Municipal Code, Section 6.35.040 Exterior Noise Standards

Leq = Equivalent continuous sound level, CNEL = Community Noise Equivalent Level defined as the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly Leq for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours)

4.13.1.1 Federal Transit Administration Guidance

The Federal Transit Administration has published guidance for assessing building damage impacts from vibration. Table 4.13-2 shows the Federal Transit Administration building damage criteria for vibration. Federal Transit Administration has also established criteria related to vibration annoyance, which are shown in Table 4.13-3.

Table 4.13-2. Construction Vibration Damage Criteria

Building Category	PPV (inches per second)
I. Reinforced-concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12

Source: FTA 2006

Table 4.13-3. Construction Vibration Annoyance Criteria

Land Use Category	Vibration Impact Level Frequent Events[a]	Vibration Impact Level Occasional Events[b]	Vibration Impact Level Infrequent Events[c]
1. Buildings where vibration would interfere with interior operations.	65[d]	65[d]	65[d]
2. Residences and buildings where people normally sleep.	72	75	80
3. Institutional land uses with primarily daytime use.	75	78	83

[a] Frequent Events are defined as more than 70 vibration events of the same source per day.

[b] Occasional Events" are defined as between 30 and 70 vibration events of the same source per day.

[c] Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day.

[d] This criterion limit is based on levels that are acceptable for most moderately-sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

Vibration impact level - VdB re micro-inch per second

Source: FTA 2006

4.13.2 Environmental Impacts

NOI (a). Generate 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?

Less than Significant. Construction activities for the installation of the CNGs and AHOGS could slightly increase noise levels temporarily in the immediate vicinity of the Project sites. Specifically, installation may require use of a gas-powered auger for 30-60 minutes if the ground is particularly hard. Some sites may necessitate using a concrete pad. In this case, a concrete drill attached to a skid steer would be used to drill three holes in the concrete. These drilling units generate sound up to 85 dBA at the source, similar to the noise levels generated by a gas-powered lawn mower. All construction activities would take place between the hours of 7:00 a.m. and 7:00 p.m. and use of the powered equipment would be minimal. Based on the very limited duration for CNG and AHOGS installation and the small equipment involved, any noise increase would be short-term (30-60 minutes) and minor. Furthermore, since installation is expected to last a maximum of one day per site, noise increase would be limited to that period.

Operation of the CNG and AHOGS units is not anticipated to increase the ambient noise levels above the levels existing without the Project. The Project will remain within established noise limits at each site and will not contribute to significant increases in traffic volumes at any time; therefore, the Project will not lead to significant levels of traffic-generated noise. Therefore, the Project would not result in an increase in noise levels in excess of established standards and impacts would be less than significant.

NOI (b). Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Less than Significant. Based on the methods proposed for installation of the CNG and AHOGS units as described in Section 2.2, and the small equipment involved, installation of the CNGs and AHOGS will not generate perceptible ground-borne vibrations. Operation of the units is limited to ignition of the flares in the AHOGS units and/or burning of the solution of silver iodide and acetone at the CNG units which would not generate ground-borne vibrations. As such, implementation of the proposed Project would not result in exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels and impacts would be less than significant.

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

No Impact. As discussed in Section 4.9, the Upland site is located less than one mile away from the Cable Airport. The Cable Airport, Redlands Airport, Chino Airport, Ontario International, and Big Bear Airport have land use plans. The Upland - CBWCD site is located within the planning area boundaries of the Cable Airport Land Use Plan and the Waterwise – CBWCD site is located within the airport influence area of the Ontario International Airport. All other proposed Project sites are not located within any airport land use plan areas. For the proposed Project sites located within two miles of a public airport or private airstrip, the proposed Project will not involve construction or expansion of the airport. In addition, the Project will not result in the addition of sensitive receivers inside of the 65 dBA CNEL noise

contour. As such, the proposed Project would not have the potential to expose people residing or working in the proposed Project area to excessive noise levels associated with airstrip operations or aircraft; therefore, no impact would occur.

4.14 Population and Housing

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. 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?	☐	☐	☐	☒

4.14.1 Environmental Setting

The cloud seeding units would be installed on properties already developed or adjacent to heavily urbanized/developed land. The Project is located in the Inland Empire metropolitan area and region, generally described as containing the federally-defined Riverside-San Bernardino-Ontario metropolitan area, which covers more than 27,000 square miles and is part of the Greater Los Angeles area (Inland Action 2022). The Inland Empire has a population of over 4 million people. The Inland Empire is considered part of the Greater Los Angeles Area, which had a population of over 18 million people in 2019 (U.S. Census Bureau 2019).

The target areas are primarily mountainous, low population areas dominated by national forests and wilderness areas. Census-designated places are present in the target areas, including towns and cities that provide access to popular skiing and hiking areas or lakes, such as Crestline, Lake Arrowhead, and Big Bear Lake.

4.14.2 Environmental Impacts

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

No Impact. The Project does not include the construction of new homes or businesses and does not extend roads or another infrastructure. Therefore, the Project would not induce substantial unplanned population growth, and there would be no impacts.

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

No Impact. The Project sites are located on private property and would not displace any existing housing. Therefore, there would be no impacts.

4.15 Public Services

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. 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?	☐	☐	☐	☒

4.15.1 Environmental Setting

The proposed installation sites are in urban areas serviced by city and county fire departments. Sites in San Bernardino County are serviced by the San Bernardino County Fire Protection District, which serves more than 60 communities and cities as well as unincorporated areas in the county (San Bernardino County Fire Protection District 2022). Sites in Riverside County are serviced by the Riverside County Fire Department which cooperates with California Department of Forestry and Fire Protection (CAL FIRE) to provide fire and emergency services to residents of unincorporated areas of Riverside County as well as 21 cities in the county (Riverside County Fire 2022). Some installation sites are in areas served by local fire departments, including the Montclair Fire Department and the Highland Fire Department. Police services in the Project area are provided by the Montclair Police Department, Upland Police Department, San Bernardino Police Department, and San Bernardino County Sheriff's Department, which also serves the City of Highland by contract (San Bernardino County Sheriff's Department 2022). None of the installation sites occur on school properties or within parks.

4.15.2 Environmental Impacts

PUB (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?

No Impact. The proposed Project would not generate population or result in development that would increase the demand on fire protection services and facilities such that constructing new or expanding existing fire protection services and facilities would be required to maintain response times and service ratios. In addition, the use of CNGs and AHOGS would be delayed until sufficient rainfall has occurred to reduce concerns over fire safety. No impact would occur. Fire risk is discussed in additional detail in Section 4.20.

ii. Police protection?

No Impact. The proposed Project would not increase the population in the Project area by creating new housing or employment opportunities that would increase demand for police protection. Therefore, the project would not require constructing new or expanding existing police protection services and facilities to maintain response times or service ratios. No impact would occur.

iii. Schools?

No Impact. The proposed Project would not increase the population in the Project area by creating new housing or employment opportunities. Therefore, the Project would not result in the need for new schools. No impact would occur.

iv. Parks?

No Impact. The proposed Project would not increase the population in the Project area by creating new housing or employment opportunities. Therefore, the Project would not result in the need for new parks. No impact would occur.

v. Other public facilities?

No Impact. No other public facilities exist in the Project area that would be affected by the proposed Project. No impact would occur.

4.16 Recreation

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. RECREATION. Would the project:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
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?	☐	☐	☐	☒

4.16.1 Environmental Setting

The cloud seeding units would be installed in densely populated and urban or urban-adjacent areas with no public recreation opportunities at the specific sites. The target areas overlay forested and mountainous areas with low population and numerous recreation areas, including national forests (e.g., Angeles National Forest, San Bernardino National Forest), city and county parks, and state and regional parks (e.g., Mt. San Jacinto State Park; Limestone Canyon Regional Park). Recreational opportunities are many and varied. Popular activities include camping, picnicking, hiking, fishing, bird watching, hunting, OHV riding, swimming, and skiing.

4.16.2 Environmental Impacts

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

No Impact. The Project does not include any new housing or businesses that would increase population and use of recreational facilities. The CNGs would be operated by residents/occupants of the private property homes and businesses and AHOGS would be operated remotely and would not require additional personnel that may use recreational facilities. Therefore, the Project would have no impacts on recreational facilities.

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

No Impact. The Project does not include the construction or expansion of any recreational facilities, and therefore there would be no impacts.

4.17 Transportation

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. 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?	☐	☐	☒	☐

4.17.1 Environmental Setting

The proposed Project sites would occur within San Bernardino, Riverside, and Orange Counties on both private and public lands. Within the overall Project area are both state and locally managed roadways that would provide access to Project sites. Specifically, the area is served by major interstate transportation corridors including I-5, I-10, and I-15, and I-405, many state routes including SR-57, SR-60, SR-71, SR-74, SR-79, SR-91, SR-210, and SR-241, and local roadways. Roadways are generally classified according to Federal Highway Administration Functional Classification Guidelines and the designed level of mobility and land access. Local roadways provide the greatest access to adjacent land via driveways and other roadways and are consequently generally smaller than interstate highways and state routes. Other roadway types include arterials and collectors. Arterials emphasize a high level of mobility for through movement and consequently have higher capacity and speed with relatively little accessibility to adjacent land. Collectors offer a combination of both functions. Each Project site would be served directly and/or indirectly by one or more of these existing public roadways. The Project area is served by several public transit services including those managed by the San Bernardino County Transit Authority, Riverside County Transit Commission, Orange County Transit Authority, Amtrak, and Metrolink. Numerous bike lanes and paths are also present in the vicinity of the proposed Project sites. Pedestrian facilities serving the proposed Project sites include sidewalks and crosswalks adjacent to onsite and offsite Project components.

4.17.2 Environmental Impacts

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

Less than Significant. At each Project site, a single vehicle would be used for Project installation and operation purposes. Each installation would require one round trip, thus generating a negligible increase in vehicular traffic. In addition, operation at manual sites may require 15 trips per year. Fewer trips will

be required for remotely operated sites. The negligible increase in trips anticipated for construction or operation would not have the potential to result in any adverse effects on the traffic system and would not conflict with any transportation-related program, plan, ordinance, or policy. Therefore, impacts would be less than significant.

TRA (b). Conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?

Less than Significant. State CEQA Guidelines Section 15064.3(b) sets forth criteria for analyzing transportation impacts, with the applicable methodology based on project type, and specifying other criteria for conducting VMT analysis. As detailed for impact criteria (a), each installation would require one round trip, thus generating a negligible increase in vehicular traffic. In addition, operation at manual sites may require 15 trips per year. Fewer trips would be required for remotely operated sites. Therefore, Project activities would generate much fewer than 110 trips per day, which would result in less than significant transportation impacts as described in the *Technical Advisory on Evaluating Transportation Impacts* (OPR 2018). Accordingly, Project activities would not conflict or be inconsistent with CEQA Guidelines detailed in Section 15064.3, subdivision (b) and, therefore, impacts would be less than significant.

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

Less than Significant. The Project would not create a substantial safety risk or interfere with air traffic patterns because the roads to the project sites already exist, and the number of vehicle trips would be minimal. Further, Installation of the CNGs and AHOGS would not prevent or limit road access. As such, the Project would result in less than significant impacts related to hazards and incompatible uses on local roadways.

TRA (d). Result in inadequate emergency access?

Less than Significant. The proposed Project would not result in any physical development or other changes to the proposed Project sites or surrounding area such that emergency access would be reduced or otherwise adversely affected. In addition, Project suspension criteria developed by SAWPA and NAWC as detailed in Section 2.4.5, *Suspension Criteria*. These suspension criteria and restrictions were developed to avoid the potential for Project activities to contribute to significant flood hazards, which may have the indirect effect of hindering emergency access. With implementation of the suspension criteria, a less than significant impact to emergency access would occur as a result of the proposed Project.

4.18 Tribal Cultural Resources

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. TRIBAL CULTURAL RESOURCES.				
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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 (CRHR), 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.	☐	☐	☒	☐

4.18.1 Environmental Setting

This section evaluates potential impacts of the Project and alternatives on tribal cultural resources, which are defined in PRC Section 21074(a)(1-2) as:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    - Included or determined to be eligible for inclusion in the CRHR.
    - Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- 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 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.
- A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
- A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a “non-unique archaeological resource” as defined in

subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

All the proposed sites have experienced prior disturbance and the probability of tribal cultural resources present in the shallow subsurface is very low. To investigate the potential presence of tribal cultural resources, SAWPA queried the NAHC GIS database of tribes to provide contact information for Native American tribal organizations and individuals with traditional lands or cultural places located within the Program area (i.e., the entirety of the state of California). This review resulted in a list of 32 regional Native American tribes. Pursuant to AB 52, on March 3, 2022, the SAWPA sent letters to each of the tribal representatives provided by the NAHC inquiring if they wished to consult on the Project, if they had any knowledge of cultural resources or values in the area, if they had any concerns with the proposed Program, and asking for a response within 30 days, per PRC Section 21080.3.1(d) requirements. SAWPA received a response from the Viejas Band of Kumeyaay Indians indicating no intent to comment. SAWPA did not receive any requests for consultation from any of the other tribes. SAWPA did receive questions regarding the project from the San Manuel Band of Mission Indians during the public review period for the IS/MND. Following receipt of response to questions, the San Manuel Band of Mission Indians provided SAWPA language regarding mitigation measures and treatment of human remains.

4.18.2 Environmental Impacts

TCR (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: Listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or, 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.

Less Than Significant with Mitigation. No tribal cultural resources were identified during the AB 52 consultation process, as no tribes submitted any information regarding known tribal cultural resources on the sites. All the sites have experienced prior disturbance and the probability of a tribal cultural resource present in the subsurface is very low. While impacts to an archaeological resource are unlikely due to the prior disturbance activities, SAWPA would implement **MM TCR-1**, in addition to **MM CUL-1**, to ensure that impacts are less than significant.

Mitigation Measure TCR-1. SAWPA shall prepare and implement an Unanticipated Discoveries Plan prior to installing any of the cloud seeding units. Project construction personnel would monitor areas during surface disturbing activities and if any potential tribal cultural resources are encountered, all construction affecting the discovery site would be suspended in an area 60 feet around the resource immediately until a qualified archaeologist meeting Secretary of Interior standards, or relevant tribal representative, has reviewed the findings. Per request, the San Manuel Band of Mission Indians Cultural Resources Department shall be contacted in the event of any cultural resources discovered during project implementation and be provided information regarding the nature of the find.

4.19 Utilities and Service Systems

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
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?	☐	☐	☐	☒

4.19.1 Environmental Setting

Five water agencies participate in the Santa Ana Watershed Project Authority: Eastern Municipal Water District, Inland Empire Utilities Agency, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District. These agencies provide a variety of water resources-related services, including managing and maintaining water supply, water quality improvement, recycled water programs, wastewater treatment, groundwater management, brine disposal, and regional planning.

San Bernardino County's Solid Waste Management Division is responsible for the operation and management of the solid waste disposal system, which consists of five regional landfills and nine transfer stations. It also administers the County's Solid Waste Franchise Program with 20 Franchise Areas and the refuse collection permit program, which authorizes and regulates trash collection by private haulers in the unincorporated areas of the county (San Bernardino County Department of Public Works 2022). Riverside County Department of Waste Resources operated six landfills that serve Riverside County and five transfer stations (Riverside County Department of Waste Resources 2022).

4.19.2 Environmental Impacts

UT (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?

No Impact. The Project involves the use of standalone CNGs and AHOGS on private property. Each unit would be powered by its own individual solar pane. The Project would not require the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities. Therefore, there would be no impacts.

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

No Impact. The Project does not require any water during installation or operation. The purpose of the Project is to increase precipitation within the Project area. Therefore, the Project would have a beneficial impact on regional water supplies.

UT (c). Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact. The Project would not generate any wastewater, and there would be no impacts.

UT (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?

No Impact. Solid waste generated by the Project would consist of the bases of the spent flares on the AHOGS. This waste is non-hazardous and would be disposed of the local landfill. The amount of waste generated would be negligible (approximately 200 spent flares per year) and would not exceed local landfill capacity; therefore, no impacts would occur.

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

No Impact. As noted in d) above, the Project would create minimal solid waste, and would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. Therefore, there would be no impacts.

4.20 Wildfire

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☒	☒	☐
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?	☐	☐	☒	☐

4.20.1 Environmental Setting

Wildfire is an annual threat in the Transverse Ranges. As described in Section 2.4, Suspension Criteria, in the event of a wildfire, SAWPA and the Project manger would determine if cloud seeding operations need to be suspended in an area and for how long. The general Project area contains areas mapped by CAL FIRE as state and local responsibility area Very High Fire Hazard Severity Zones (VHFHSZs), and the individual Project sites are in mapped areas shown in Table 4.20-1.

Table 4.20-1. Project Site Fire Hazard Severity Zones

Location Name	Fire Hazard Severity Zone
Waterwise - CBWCD	LRA – Non VHFHSZ
Upland - CBWCD	LRA – Very High
SAWC-1	LRA – Very High
SAWC-2	SRA – Very High
EVWD	LRA – Very High
Thousand Pines Christian Camp	SRA – Very High
Sycamore Water Plant	LRA – Very High
SBVWCD-1	LRA – Non VHFHSZ
SBVWCD-2	LRA – Very High

Location Name	Fire Hazard Severity Zone
San Gorgonio Pass Water Agency	LRA – Non VHFHSZ; immediately S of SRA - High
EMWD - N	SRA – Very High
EMWD - S	SRA - High
Mary Lea Gardiner	SRA – Very High
Irvine Ranch Water District	SRA – Very High
El Toro Reservoir	LRA – Non VHFHSZ

Source: CAL FIRE 2007a,b,c, 2008, 2009, 2011, 2021

4.20.2 Environmental Impacts

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

Less Than Significant. The ground-based cloud seeding units would be placed on flat sites upwind of the target areas and would be enclosed behind fencing, as needed. Because these installations have a small footprint and would not be located along emergency access or evacuation routes, they would not be expected to interfere with the movement of people or vehicles, nor would they interfere with any adopted emergency response plans or evacuation plans.

The proposed Project would result in higher amounts of precipitation across the target areas. Increased precipitation could potentially include increased snowfall that could slow or delay emergency vehicle access and evacuations. However, residents of the target areas are accustomed to rain and snow in the mountains. The Project's incremental contribution to time needed to clear snow from roadways would be less than occurs in years with heavy storms and major snow accumulation. In heavy snow years, SAWPA would implement suspension criteria and would reduce or stop cloud seeding that may result in high snowfall and problematic road conditions. Therefore, impacts of the project on emergency response plans or emergency evacuation plans would be less than significant.

WFR (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?

Less Than Significant. The ground-based cloud seeding apparatuses would not begin operation until after sufficient rainfall has occurred to reduce the local risk of wildfire. AHOGS flares would only be ignited when a convection band passes over one of the sites when rain is present to further reduce any concerns about small sparks hitting the ground. Vegetation around the units would also be managed to further reduce the risk of wildfire. Because they would only be operated during wet weather conditions, they would not be expected to pose a wildfire risk. Also, because propane is widely used in a variety of applications for residential, commercial, and industrial uses, its use in the cloud seeding program would not result in an unusual fire risk. Therefore, the risk to people or structures from wildfire due to the Project would be less than significant.

WFR (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?

No Impact. The Project would not require the installation of new infrastructure beyond the small footprint to house and stabilize the CNGs and AHOGS. Therefore, there would be no impact from installation of new infrastructure or maintenance of existing infrastructure.

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

Less Than Significant. As described in Section 2.4, SAWPA would implement suspension criteria in areas that have extensive vegetation loss or post-fire instability that might create potential for downslope flooding or landslides.

4.21 Growth-Inducing Impacts

Issue	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
GROWTH-INDUCING IMPACTS				
Would the Project foster economic development or population growth? Would the project cause growth that exceeds planned growth from a new development that exceeds the assumptions included in master plans, land use plans, or population projections?	☐	☐	☐	☒

Section 15125.2(d) of the CEQA Guidelines requires a discussion of the ways in which a Project could induce growth. This includes ways in which a Project would foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.

Induced growth is any growth that exceeds planned growth and results from new development that would not have taken place without the implementation of the Proposed Project. Typically, the growth-inducing potential of a Project would be considered significant if it resulted in growth or population concentration that exceeds those assumptions included in pertinent master plans, land use plans, or projections made by regional planning authorities. However, the creation of growth-inducing potentials does not automatically lead to growth, whether it would be below or in exceedance of a projected level.

No Impact. The proposed cloud seeding facilities would not provide any housing or create any new jobs that would increase population. The weather modification program is expected to increase precipitation but not outside of historic precipitation amounts. The estimated increase in precipitation would not lead to population growth or exceed any assumptions present in local land use plans. Therefore, the Project would not create any growth inducing impacts.

4.22 Mandatory Findings of Significance

Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
(a). Would the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, 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). Would 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). Would the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

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

Less Than Significant with Mitigation. The Project does not threaten any species and would not substantially reduce available habitat for any species, including listed species. All the proposed sites have experienced prior development and are not identified as high-quality habitat for any species. Although the development footprint for the installation of the cloud seeding units is relatively nominal (up to 10 sf when placed on a cement pad; see Section 2.2.1) and would not significantly threaten any species, potential impacts to biological resources would be ensured to be less than significant with the application of the **MM BIO-1** (pre-construction clearance survey for sensitive plant and wildlife species) and **MM BIO-2** (pre-construction clearance survey for nesting birds) (Section 4.4.2).

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

Less Than Significant. Section 15355 of the State CEQA Guidelines defines cumulative impacts as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact consists of an impact which is created because of the combination of the project evaluated in this IS/MND together with other projects causing related impacts (Section 15130[a][1]). The cumulative impacts analysis "would examine reasonable,

feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects" (Section 15130[b][(3]).

Cumulative impacts are assessed for related projects within a similar geographic area. This geographic area may vary, depending upon the issue area discussed and the geographic extent of the potential impact. For example, the geographic area associated with construction noise impacts is limited to areas directly adjacent to construction sites, whereas the geographic area that is affected by construction-related air emissions may include the larger air basin. Construction impacts associated with increased noise, dust, erosion, and access limitations tend to be localized but could be exacerbated if other development or improvement projects are occurring within the same or adjacent locations as the proposed Project.

In addition to the geographic scope, cumulative impacts also take into consideration the timing of related projects relative to the proposed project. The implementation schedule is particularly important for construction-related impacts; for a group of projects to generate cumulative construction impacts, they must be temporally, as well as spatially proximate.

No other uses or projects are proposed for the sites; therefore, the only potential cumulative impacts would be limited to potential off-site effects, including for example air quality, transportation, and noise. As discussed in the sections above, the Project would not result in significant impacts to any resources and would not contribute to significant cumulative impacts in the Project area. The objective of the Project is to increase precipitation in the target areas, resulting in beneficial impacts to the region's water supply. While this impact is region wide, it is not anticipated to result in any significantly adverse impacts to hydrology and water quality as the estimated increase in precipitation would be within the historic and normal range of precipitation in the area (Section 4.10). Therefore, potential cumulative impacts as result of the cloud seeding Project would be less than significant.

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

Less Than Significant. As discussed in Section 4.9, the CNGs and AHOGS would both release silver iodide into the environment during storm events. Concentrations of silver measured in the environment before (background) and after cloud seeding event are not toxic to humans and are over 1,000 times lower than the USEPA's secondary drinking water standard (Section 1.5.1). Comprehensive reviews of cloud seeding programs have also shown that there is no evidence of harm to humans or the environment from the use of silver iodide (Cardno ENTRIX 2011, Fisher et al. 2015). Therefore, the Project would not cause substantial adverse effects on human beings.

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Appendix A Air Quality Modeling

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

SAWPA Santa Ana River Watershed Cloud Seeding

South Coast Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	0.03	Acre	0.03	1,481.04	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2023
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	453.21	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Assume equipment pad is 10 ft x 10 ft multiplied by 15 sites = 1500 ft^2

Construction Phase - No grading, paving, or architectural coating.
Assume equipment would be installed in 1 day per site

Off-road Equipment - Skid steer would not be required at all sites but is included for conservative estimate.
Generators used to accound for gas-powered auger drills (assume 5 Hp).

Trips and VMT - Trips and VMT - Only 2 workers needed.

On-road Fugitive Dust -

Vehicle Trips - Operational worker trips are assumed to be approximately 15 times per year to each site (15x15 = 225 round trips per year => equivalent to roughly 0.025 trips per weekday total. Assume no weekend trips.

Consumer Products -

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

Energy Use - Assume units are solar-powered and/or use neglibible electricity.

Water And Wastewater - No water use required for operations.

Solid Waste - Solid waste generation assumed to be nominal.

Operational Off-Road Equipment - No off-road equipment required for operations.

Stationary Sources - Emergency Generators and Fire Pumps - No stationary sources associated with operations.

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	HorsePower	84.00	5.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.74	0.37
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Generator Sets
tblVehicleTrips	ST_TR	1.96	0.00
tblVehicleTrips	SU_TR	2.19	0.00
tblVehicleTrips	WD_TR	0.78	0.03
tblWater	OutdoorWaterUseRate	35,744.44	0.00

2.0 Emissions Summary

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.0864	0.9369	1.5713	2.5700e-003	0.0559	0.0347	0.0906	0.0148	0.0319	0.0468	0.0000	250.9664	250.9664	0.0659	1.2200e-003	252.9767
Maximum	**0.0864**	**0.9369**	**1.5713**	**2.5700e-003**	**0.0559**	**0.0347**	**0.0906**	**0.0148**	**0.0319**	**0.0468**	**0.0000**	**250.9664**	**250.9664**	**0.0659**	**1.2200e-003**	**252.9767**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.0864	0.9369	1.5713	2.5700e-003	0.0559	0.0347	0.0906	0.0148	0.0319	0.0468	0.0000	250.9664	250.9664	0.0659	1.2200e-003	252.9767
Maximum	**0.0864**	**0.9369**	**1.5713**	**2.5700e-003**	**0.0559**	**0.0347**	**0.0906**	**0.0148**	**0.0319**	**0.0468**	**0.0000**	**250.9664**	**250.9664**	**0.0659**	**1.2200e-003**	**252.9767**

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

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		5.2000e-003	5.2000e-003	0.0000	0.0000	5.2800e-003
Total	**8.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**5.2100e-003**	**5.2100e-003**	**0.0000**	**0.0000**	**5.2900e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		5.2000e-003	5.2000e-003	0.0000	0.0000	5.2800e-003
Total	**8.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**5.2100e-003**	**5.2100e-003**	**0.0000**	**0.0000**	**5.2900e-003**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	8/1/2022	8/1/2022	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Skid Steer Loaders	1	8.00	65	0.37
Site Preparation	Generator Sets	1	8.00	5	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	5.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0693	0.9248	1.3816	2.0600e-003		0.0344	0.0344		0.0316	0.0316		199.5789	199.5789	0.0646		201.1926
Total	**0.0693**	**0.9248**	**1.3816**	**2.0600e-003**	**0.0000**	**0.0344**	**0.0344**	**0.0000**	**0.0316**	**0.0316**		**199.5789**	**199.5789**	**0.0646**		**201.1926**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0171	0.0121	0.1897	5.1000e-004	0.0559	3.4000e-004	0.0562	0.0148	3.1000e-004	0.0151		51.3875	51.3875	1.3400e-003	1.2200e-003	51.7842
Total	**0.0171**	**0.0121**	**0.1897**	**5.1000e-004**	**0.0559**	**3.4000e-004**	**0.0562**	**0.0148**	**3.1000e-004**	**0.0151**		**51.3875**	**51.3875**	**1.3400e-003**	**1.2200e-003**	**51.7842**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0693	0.9248	1.3816	2.0600e-003		0.0344	0.0344		0.0316	0.0316	0.0000	199.5789	199.5789	0.0646		201.1926
Total	**0.0693**	**0.9248**	**1.3816**	**2.0600e-003**	**0.0000**	**0.0344**	**0.0344**	**0.0000**	**0.0316**	**0.0316**	**0.0000**	**199.5789**	**199.5789**	**0.0646**		**201.1926**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0171	0.0121	0.1897	5.1000e-004	0.0559	3.4000e-004	0.0562	0.0148	3.1000e-004	0.0151		51.3875	51.3875	1.3400e-003	1.2200e-003	51.7842
Total	**0.0171**	**0.0121**	**0.1897**	**5.1000e-004**	**0.0559**	**3.4000e-004**	**0.0562**	**0.0148**	**3.1000e-004**	**0.0151**		**51.3875**	**51.3875**	**1.3400e-003**	**1.2200e-003**	**51.7842**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		5.2000e-003	5.2000e-003	0.0000	0.0000	5.2800e-003
Unmitigated	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		5.2000e-003	5.2000e-003	0.0000	0.0000	5.2800e-003

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00	2	2
Total	0.00	0.00	0.00	2	2

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.544109	0.060768	0.184625	0.129879	0.023845	0.006339	0.011719	0.008584	0.000815	0.000515	0.024285	0.000743	0.003774

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Unmitigated	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.0000e-005					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Total	**8.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0000e-005**	**1.0000e-005**	**0.0000**		**1.0000e-005**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.0000e-005					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Total	**8.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0000e-005**	**1.0000e-005**	**0.0000**		**1.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Summer

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

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

SAWPA Santa Ana River Watershed Cloud Seeding

South Coast Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	0.03	Acre	0.03	1,481.04	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2023
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	453.21	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Assume equipment pad is 10 ft x 10 ft multiplied by 15 sites = 1500 ft^2

Construction Phase - No grading, paving, or architectural coating.
Assume equipment would be installed in 1 day per site

Off-road Equipment - Skid steer would not be required at all sites but is included for conservative estimate.
Generators used to accound for gas-powered auger drills (assume 5 Hp).

Trips and VMT - Trips and VMT - Only 2 workers needed.

On-road Fugitive Dust -

Vehicle Trips - Operational worker trips are assumed to be approximately 15 times per year to each site (15x15 = 225 round trips per year => equivalent to roughly 0.025 trips per weekday total. Assume no weekend trips.

Consumer Products -

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

Energy Use - Assume units are solar-powered and/or use neglibible electricity.

Water And Wastewater - No water use required for operations.

Solid Waste - Solid waste generation assumed to be nominal.

Operational Off-Road Equipment - No off-road equipment required for operations.

Stationary Sources - Emergency Generators and Fire Pumps - No stationary sources associated with operations.

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	HorsePower	84.00	5.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.74	0.37
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Generator Sets
tblVehicleTrips	ST_TR	1.96	0.00
tblVehicleTrips	SU_TR	2.19	0.00
tblVehicleTrips	WD_TR	0.78	0.03
tblWater	OutdoorWaterUseRate	35,744.44	0.00

2.0 Emissions Summary

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.0874	0.9381	1.5543	2.5400e-003	0.0559	0.0347	0.0906	0.0148	0.0319	0.0468	0.0000	248.0962	248.0962	0.0659	1.3000e-003	250.1300
Maximum	**0.0874**	**0.9381**	**1.5543**	**2.5400e-003**	**0.0559**	**0.0347**	**0.0906**	**0.0148**	**0.0319**	**0.0468**	**0.0000**	**248.0962**	**248.0962**	**0.0659**	**1.3000e-003**	**250.1300**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2022	0.0874	0.9381	1.5543	2.5400e-003	0.0559	0.0347	0.0906	0.0148	0.0319	0.0468	0.0000	248.0962	248.0962	0.0659	1.3000e-003	250.1300
Maximum	**0.0874**	**0.9381**	**1.5543**	**2.5400e-003**	**0.0559**	**0.0347**	**0.0906**	**0.0148**	**0.0319**	**0.0468**	**0.0000**	**248.0962**	**248.0962**	**0.0659**	**1.3000e-003**	**250.1300**

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

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		4.9700e-003	4.9700e-003	0.0000	0.0000	5.0500e-003
Total	**8.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**0.0000**	**5.0600e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		4.9700e-003	4.9700e-003	0.0000	0.0000	5.0500e-003
Total	**8.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**4.9800e-003**	**4.9800e-003**	**0.0000**	**0.0000**	**5.0600e-003**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	8/1/2022	8/1/2022	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Skid Steer Loaders	1	8.00	65	0.37
Site Preparation	Generator Sets	1	8.00	5	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	5.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0693	0.9248	1.3816	2.0600e-003		0.0344	0.0344		0.0316	0.0316		199.5789	199.5789	0.0646		201.1926
Total	**0.0693**	**0.9248**	**1.3816**	**2.0600e-003**	**0.0000**	**0.0344**	**0.0344**	**0.0000**	**0.0316**	**0.0316**		**199.5789**	**199.5789**	**0.0646**		**201.1926**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0181	0.0132	0.1727	4.8000e-004	0.0559	3.4000e-004	0.0562	0.0148	3.1000e-004	0.0151		48.5174	48.5174	1.3500e-003	1.3000e-003	48.9374
Total	**0.0181**	**0.0132**	**0.1727**	**4.8000e-004**	**0.0559**	**3.4000e-004**	**0.0562**	**0.0148**	**3.1000e-004**	**0.0151**		**48.5174**	**48.5174**	**1.3500e-003**	**1.3000e-003**	**48.9374**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.0693	0.9248	1.3816	2.0600e-003		0.0344	0.0344		0.0316	0.0316	0.0000	199.5789	199.5789	0.0646		201.1926
Total	**0.0693**	**0.9248**	**1.3816**	**2.0600e-003**	**0.0000**	**0.0344**	**0.0344**	**0.0000**	**0.0316**	**0.0316**	**0.0000**	**199.5789**	**199.5789**	**0.0646**		**201.1926**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0181	0.0132	0.1727	4.8000e-004	0.0559	3.4000e-004	0.0562	0.0148	3.1000e-004	0.0151		48.5174	48.5174	1.3500e-003	1.3000e-003	48.9374
Total	**0.0181**	**0.0132**	**0.1727**	**4.8000e-004**	**0.0559**	**3.4000e-004**	**0.0562**	**0.0148**	**3.1000e-004**	**0.0151**		**48.5174**	**48.5174**	**1.3500e-003**	**1.3000e-003**	**48.9374**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		4.9700e-003	4.9700e-003	0.0000	0.0000	5.0500e-003
Unmitigated	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000		4.9700e-003	4.9700e-003	0.0000	0.0000	5.0500e-003

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00	2	2
Total	0.00	0.00	0.00	2	2

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.544109	0.060768	0.184625	0.129879	0.023845	0.006339	0.011719	0.008584	0.000815	0.000515	0.024285	0.000743	0.003774

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

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

5.2 Energy by Land Use - NaturalGas

Mitigated

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

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Unmitigated	8.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.0000e-005					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Total	**8.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0000e-005**	**1.0000e-005**	**0.0000**		**1.0000e-005**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	8.0000e-005					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		1.0000e-005	1.0000e-005	0.0000		1.0000e-005
Total	**8.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**1.0000e-005**	**1.0000e-005**	**0.0000**		**1.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Winter

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

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

SAWPA Santa Ana River Watershed Cloud Seeding

South Coast Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	0.03	Acre	0.03	1,481.04	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2023
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	453.21	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Assume equipment pad is 10 ft x 10 ft multiplied by 15 sites = 1500 ft^2

Construction Phase - No grading, paving, or architectural coating.
Assume equipment would be installed in 1 day per site

Off-road Equipment - Skid steer would not be required at all sites but is included for conservative estimate.
Generators used to accound for gas-powered auger drills (assume 5 Hp).

Trips and VMT - Trips and VMT - Only 2 workers needed.

On-road Fugitive Dust -

Vehicle Trips - Operational worker trips are assumed to be approximately 15 times per year to each site (15x15 = 225 round trips per year => equivalent to roughly 0.025 trips per weekday total. Assume no weekend trips.

Consumer Products -

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

Energy Use - Assume units are solar-powered and/or use neglibible electricity.

Water And Wastewater - No water use required for operations.

Solid Waste - Solid waste generation assumed to be nominal.

Operational Off-Road Equipment - No off-road equipment required for operations.

Stationary Sources - Emergency Generators and Fire Pumps - No stationary sources associated with operations.

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	HorsePower	84.00	5.00
tblOffRoadEquipment	LoadFactor	0.37	0.37
tblOffRoadEquipment	LoadFactor	0.74	0.37
tblOffRoadEquipment	OffRoadEquipmentType	Graders	Skid Steer Loaders
tblOffRoadEquipment	OffRoadEquipmentType	Tractors/Loaders/Backhoes	Generator Sets
tblVehicleTrips	ST_TR	1.96	0.00
tblVehicleTrips	SU_TR	2.19	0.00
tblVehicleTrips	WD_TR	0.78	0.03
tblWater	OutdoorWaterUseRate	35,744.44	0.00

2.0 Emissions Summary

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	4.0000e-005	4.7000e-004	7.8000e-004	0.0000	3.0000e-005	2.0000e-005	4.0000e-005	1.0000e-005	2.0000e-005	2.0000e-005	0.0000	0.1129	0.1129	3.0000e-005	0.0000	0.1138
Maximum	**4.0000e-005**	**4.7000e-004**	**7.8000e-004**	**0.0000**	**3.0000e-005**	**2.0000e-005**	**4.0000e-005**	**1.0000e-005**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.1129**	**0.1129**	**3.0000e-005**	**0.0000**	**0.1138**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	4.0000e-005	4.7000e-004	7.8000e-004	0.0000	3.0000e-005	2.0000e-005	4.0000e-005	1.0000e-005	2.0000e-005	2.0000e-005	0.0000	0.1129	0.1129	3.0000e-005	0.0000	0.1138
Maximum	**4.0000e-005**	**4.7000e-004**	**7.8000e-004**	**0.0000**	**3.0000e-005**	**2.0000e-005**	**4.0000e-005**	**1.0000e-005**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.1129**	**0.1129**	**3.0000e-005**	**0.0000**	**0.1138**

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

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-1-2022	9-30-2022	0.0004	0.0004
		Highest	0.0004	0.0004

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.9000e-004	5.9000e-004	0.0000	0.0000	6.0000e-004
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.9000e-004**	**5.9000e-004**	**0.0000**	**0.0000**	**6.0000e-004**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.9000e-004	5.9000e-004	0.0000	0.0000	6.0000e-004
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.9000e-004**	**5.9000e-004**	**0.0000**	**0.0000**	**6.0000e-004**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	8/1/2022	8/1/2022	5	1	

Acres of Grading (Site Preparation Phase): 0

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

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

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Skid Steer Loaders	1	8.00	65	0.37
Site Preparation	Generator Sets	1	8.00	5	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	5.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-005	4.6000e-004	6.9000e-004	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0905	0.0905	3.0000e-005	0.0000	0.0913
Total	**3.0000e-005**	**4.6000e-004**	**6.9000e-004**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0905**	**0.0905**	**3.0000e-005**	**0.0000**	**0.0913**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0223	0.0223	0.0000	0.0000	0.0225
Total	**1.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0223**	**0.0223**	**0.0000**	**0.0000**	**0.0225**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

3.2 Site Preparation - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-005	4.6000e-004	6.9000e-004	0.0000		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	0.0905	0.0905	3.0000e-005	0.0000	0.0913
Total	**3.0000e-005**	**4.6000e-004**	**6.9000e-004**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0905**	**0.0905**	**3.0000e-005**	**0.0000**	**0.0913**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0223	0.0223	0.0000	0.0000	0.0225
Total	**1.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0223**	**0.0223**	**0.0000**	**0.0000**	**0.0225**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.9000e-004	5.9000e-004	0.0000	0.0000	6.0000e-004
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	5.9000e-004	5.9000e-004	0.0000	0.0000	6.0000e-004

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	0.00	0.00	0.00	2	2
Total	0.00	0.00	0.00	2	2

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.544109	0.060768	0.184625	0.129879	0.023845	0.006339	0.011719	0.008584	0.000815	0.000515	0.024285	0.000743	0.003774

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

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	1.0000e-005	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0000e-005					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

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

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

SAWPA Santa Ana River Watershed Cloud Seeding - South Coast Air Basin, Annual

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

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B Special Status Species Occurrence

B-1: Sensitive species occurrence within target areas

Target Area	Scientific Name	Common Name	Federal Status	State Status	Rare Plant Rank	CDFW Status	Taxon Group
Northeast	*Anaxyrus californicus*	arroyo toad	Endangered	None		SSC	Amphibians
Northeast	*Castilleja cinerea*	ash-gray paintbrush	Threatened	None	1B.2		Dicots
Northeast	*Navarretia peninsularis*	Baja navarretia	None	None	1B.2		Dicots
Northeast	*Haliaeetus leucocephalus*	bald eagle	Delisted	Endangered		FP	Birds
Northeast	*Linanthus killipii*	Baldwin Lake linanthus	None	None	1B.2		Dicots
Northeast	*Horkelia wilderae*	Barton Flats horkelia	None	None	1B.1		Dicots
Northeast	*Eriogonum microthecum var. lacus-ursi*	Bear Lake buckwheat	None	None	1B.1		Dicots
Northeast	*Sidalcea malviflora ssp. dolosa*	Bear Valley checkerbloom	None	None	1B.2		Dicots
Northeast	*Pyrrocoma uniflora var. gossypina*	Bear Valley pyrrocoma	None	None	1B.2		Dicots
Northeast	*Astragalus lentiginosus var. sierrae*	Big Bear Valley milk-vetch	None	None	1B.2		Dicots
Northeast	*Phlox dolichantha*	Big Bear Valley phlox	None	None	1B.2		Dicots
Northeast	*Eremogone ursina*	Big Bear Valley sandwort	Threatened	None	1B.2		Dicots
Northeast	*Astragalus leucolobus*	Big Bear Valley woollypod	None	None	1B.2		Dicots
Northeast	*Sidalcea pedata*	bird-foot checkerbloom	Endangered	Endangered	1B.1		Dicots
Northeast	*Taraxacum californicum*	California dandelion	Endangered	None	1B.1		Dicots
Northeast	*Diplectrona californica*	California diplectronan caddisfly	None	None			Insects
Northeast	*Rana draytonii*	California red-legged frog	Threatened	None		SSC	Amphibians
Northeast	*Acanthoscyphus parishii var. cienegensis*	Cienega Seca oxytheca	None	None	1B.3		Dicots
Northeast	*Phrynosoma blainvillii*	coast horned lizard	None	None		SSC	Reptiles
Northeast	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles
Northeast	*Bombus crotchii*	Crotch bumble bee	None	None			Insects
Northeast	*Eriogonum ovalifolium var. vineum*	Cushenbury buckwheat	Endangered	None	1B.1		Dicots
Northeast	*Palaeoxenus dohrni*	Dohrn's elegant eucnemid beetle	None	None			Insects
Northeast	*Gentiana fremontii*	Fremont's gentian	None	None	2B.3		Dicots
Northeast	*Myotis thysanodes*	fringed myotis	None	None			Mammals
Northeast	*Monardella macrantha ssp. hallii*	Hall's monardella	None	None	1B.3		Dicots
Northeast	*Streptanthus juneae*	June's jewelflower	None	None	1B.2		Dicots
Northeast	*Silene krantzii*	Krantz's catchfly	None	None	1B.2		Dicots
Northeast	*Lilium parryi*	lemon lily	None	None	1B.2		Monocots
Northeast	*Erythranthe purpurea*	little purple monkeyflower	None	None	1B.2		Dicots
Northeast	*Myotis evotis*	long-eared myotis	None	None			Mammals
Northeast	*Bombus morrisoni*	Morrison bumble bee	None	None			Insects
Northeast	*Pandion haliaetus*	osprey	None	None		WL	Birds
Northeast	*Calochortus palmeri var. palmeri*	Palmer's mariposa-lily	None	None	1B.2		Monocots
Northeast	*Heuchera parishii*	Parish's alumroot	None	None	1B.3		Dicots
Northeast	*Sidalcea hickmanii ssp. parishii*	Parish's checkerbloom	None	Rare	1B.2		Dicots
Northeast	*Boechera parishii*	Parish's rockcress	None	None	1B.2		Dicots
Northeast	*Perideridia parishii ssp. parishii*	Parish's yampah	None	None	2B.2		Dicots
Northeast	*Pebble Plains*	Pebble Plains	None	None			Herbaceous
Northeast	*Boechera dispar*	pinyon rockcress	None	None	2B.3		Dicots
Northeast	*Calochortus plummerae*	Plummer's mariposa-lily	None	None	4.2		Monocots
Northeast	*Hulsea vestita ssp. pygmaea*	pygmy hulsea	None	None	1B.3		Dicots
Northeast	*Arenaria lanuginosa var. saxosa*	rock sandwort	None	None	2B.3		Dicots
Northeast	*Oxytropis oreophila var. oreophila*	rock-loving oxytrope	None	None	2B.3		Dicots
Northeast	*Sidalcea neomexicana*	salt spring checkerbloom	None	None	2B.2		Dicots
Northeast	*Symphyotrichum defoliatum*	San Bernardino aster	None	None	1B.2		Dicots
Northeast	*Poa atropurpurea*	San Bernardino blue grass	Endangered	None	1B.2		Monocots
Northeast	*Glaucomys oregonensis californicus*	San Bernardino flying squirrel	None	None		SSC	Mammals
Northeast	*Gilia leptantha ssp. leptantha*	San Bernardino gilia	None	None	1B.3		Dicots
Northeast	*Physaria kingii ssp. bernardina*	San Bernardino Mountains bladderpod	Endangered	None	1B.1		Dicots
Northeast	*Dudleya abramsii ssp. affinis*	San Bernardino Mountains dudleya	None	None	1B.2		Dicots
Northeast	*Erythranthe exigua*	San Bernardino Mountains monkeyflower	None	None	1B.2		Dicots
Northeast	*Castilleja lasiorhyncha*	San Bernardino Mountains owl's-clover	None	None	1B.2		Dicots
Northeast	*Packera bernardina*	San Bernardino ragwort	None	None	1B.2		Dicots
Northeast	*Diadophis punctatus modestus*	San Bernardino ringneck snake	None	None			Reptiles

Northeast	*Boechera peirsonii*	San Bernardino rockcress	None	None	1B.2		Dicots
Northeast	*Claytonia peirsonii ssp. bernardinus*	San Bernardino spring beauty	None	None	1B.1		Dicots
Northeast	*Catostomus santaanae*	Santa Ana sucker	Threatened	None			Fish
Northeast	*Botrychium crenulatum*	scalloped moonwort	None	None	2B.2		Ferns
Northeast	*Boechera shockleyi*	Shockley's rockcress	None	None	2B.2		Dicots
Northeast	*Opuntia basilaris var. brachyclada*	short-joint beavertail	None	None	1B.2		Dicots
Northeast	*Lewisia brachycalyx*	short-sepaled lewisia	None	None	2B.2		Dicots
Northeast	*Ivesia argyrocoma var. argyrocoma*	silver-haired ivesia	None	None	1B.2		Dicots
Northeast	*Thelypodium stenopetalum*	slender-petaled thelypodium	Endangered	Endangered	1B.1		Dicots
Northeast	*Eriogonum kennedyi var. alpigenum*	southern alpine buckwheat	None	None	1B.3		Dicots
Northeast	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles
Northeast	*Aimophila ruficeps canescens*	southern California rufous-crowned sparrow	None	None		WL	Birds
Northeast	*Southern California Threespine Stickleback Stream*	Southern California Threespine Stickleback Stream	None	None			Inland Waters
Northeast	*Streptanthus campestris*	southern jewelflower	None	None	1B.3		Dicots
Northeast	*Eriogonum kennedyi var. austromontanum*	southern mountain buckwheat	Threatened	None	1B.2		Dicots
Northeast	*Rana muscosa*	southern mountain yellow-legged frog	Endangered	Endangered		WL	Amphibians
Northeast	*Charina umbratica*	southern rubber boa	None	Threatened			Reptiles
Northeast	*Empidonax traillii extimus*	southwestern willow flycatcher	Endangered	Endangered			Birds
Northeast	*Sisyrinchium longipes*	timberland blue-eyed grass	None	None	2B.2		Monocots
Northeast	*Thamnophis hammondii*	two-striped gartersnake	None	None		SSC	Reptiles
Northeast	*Eriogonum evanidum*	vanishing wild buckwheat	None	None	1B.1		Dicots
Northeast	*Drymocallis cuneifolia var. cuneifolia*	wedgeleaf woodbeauty	None	None	1B.1		Dicots
Northeast	*Malaxis monophyllos var. brachypoda*	white bog adder's-mouth	None	None	2B.1		Monocots
Northeast	*Antennaria marginata*	white-margined everlasting	None	None	2B.3		Dicots
Northeast	*Oreonana vestita*	woolly mountain-parsley	None	None	1B.3		Dicots
Northeast	*Allium marvinii*	Yucaipa onion	None	None	1B.2		Monocots
Northeast	*Myotis yumanensis*	Yuma myotis	None	None			Mammals
Northwest	*Anaxyrus californicus*	arroyo toad	Endangered	None		SSC	Amphibians
Northwest	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles
Northwest	*Ovis canadensis nelsoni*	desert bighorn sheep	None	None		FP	Mammals
Northwest	*Viola pinetorum ssp. grisea*	grey-leaved violet	None	None	1B.2		Dicots
Northwest	*Lasiurus cinereus*	hoary bat	None	None			Mammals
Northwest	*Calochortus weedii var. intermedius*	intermediate mariposa-lily	None	None	1B.2		Monocots
Northwest	*Eriogonum microthecum var. johnstonii*	Johnston's buckwheat	None	None	1B.3		Dicots
Northwest	*Monardella australis ssp. jokerstii*	Jokerst's monardella	None	None	1B.1		Dicots
Northwest	*Lilium parryi*	lemon lily	None	None	1B.2		Monocots
Northwest	*Neotamias speciosus speciosus*	lodgepole chipmunk	None	None			Mammals
Northwest	*Claytonia peirsonii ssp. peirsonii*	Peirson's spring beauty	None	None	1B.2		Dicots
Northwest	*Calochortus plummerae*	Plummer's mariposa-lily	None	None	4.2		Monocots
Northwest	*Riversidian Alluvial Fan Sage Scrub*	Riversidian Alluvial Fan Sage Scrub	None	None			Scrub
Northwest	*Orobanche valida ssp. valida*	Rock Creek broomrape	None	None	1B.2		Dicots
Northwest	*Astragalus lentiginosus var. antonius*	San Antonio milk-vetch	None	None	1B.3		Dicots
Northwest	*Linanthus concinnus*	San Gabriel linanthus	None	None	1B.2		Dicots
Northwest	*Batrachoseps gabrieli*	San Gabriel slender salamander	None	None			Amphibians
Northwest	*Rhinichthys osculus ssp. 8*	Santa Ana speckled dace	None	None		SSC	Fish
Northwest	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles
Northwest	*Rana muscosa*	southern mountain yellow-legged frog	Endangered	Endangered		WL	Amphibians
Northwest	*Southern Sycamore Alder Riparian Woodland*	Southern Sycamore Alder Riparian Woodland	None	None			Riparian
Northwest	*Thamnophis hammondii*	two-striped gartersnake	None	None		SSC	Reptiles
Northwest	*Carex occidentalis*	western sedge	None	None	2B.3		Monocots
Northwest	*Chorizanthe xanti var. leucotheca*	white-bracted spineflower	None	None	1B.2		Dicots
Northwest	*Oreonana vestita*	woolly mountain-parsley	None	None	1B.3		Dicots
Southeast	*Anaxyrus californicus*	arroyo toad	Endangered	None		SSC	Amphibians
Southeast	*Castilleja cinerea*	ash-gray paintbrush	Threatened	None	1B.2		Dicots
Southeast	*Navarretia peninsularis*	Baja navarretia	None	None	1B.2		Dicots
Southeast	*Haliaeetus leucocephalus*	bald eagle	Delisted	Endangered		FP	Birds

Southeast	*Linanthus killipii*	Baldwin Lake linanthus	None	None	1B.2		Dicots
Southeast	*Horkelia wilderae*	Barton Flats horkelia	None	None	1B.1		Dicots
Southeast	*Eriogonum microthecum var. lacus-ursi*	Bear Lake buckwheat	None	None	1B.1		Dicots
Southeast	*Sidalcea malviflora ssp. dolosa*	Bear Valley checkerbloom	None	None	1B.2		Dicots
Southeast	*Pyrrocoma uniflora var. gossypina*	Bear Valley pyrrocoma	None	None	1B.2		Dicots
Southeast	*Astragalus lentiginosus var. sierrae*	Big Bear Valley milk-vetch	None	None	1B.2		Dicots
Southeast	*Phlox dolichantha*	Big Bear Valley phlox	None	None	1B.2		Dicots
Southeast	*Eremogone ursina*	Big Bear Valley sandwort	Threatened	None	1B.2		Dicots
Southeast	*Astragalus leucolobus*	Big Bear Valley woollypod	None	None	1B.2		Dicots
Southeast	*Sidalcea pedata*	bird-foot checkerbloom	Endangered	Endangered	1B.1		Dicots
Southeast	*Taraxacum californicum*	California dandelion	Endangered	None	1B.1		Dicots
Southeast	*Diplectrona californica*	California diplectronan caddisfly	None	None			Insects
Southeast	*Acanthoscyphus parishii var. cienegensis*	Cienega Seca oxytheca	None	None	1B.3		Dicots
Southeast	*Phrynosoma blainvillii*	coast horned lizard	None	None		SSC	Reptiles
Southeast	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles
Southeast	*Bombus crotchii*	Crotch bumble bee	None	None			Insects
Southeast	*Eriogonum ovalifolium var. vineum*	Cushenbury buckwheat	Endangered	None	1B.1		Dicots
Southeast	*Palaeoxenus dohrni*	Dohrn's elegant eucnemid beetle	None	None			Insects
Southeast	*Gentiana fremontii*	Fremont's gentian	None	None	2B.3		Dicots
Southeast	*Myotis thysanodes*	fringed myotis	None	None			Mammals
Southeast	*Monardella macrantha ssp. hallii*	Hall's monardella	None	None	1B.3		Dicots
Southeast	*Streptanthus juneae*	June's jewelflower	None	None	1B.2		Dicots
Southeast	*Silene krantzii*	Krantz's catchfly	None	None	1B.2		Dicots
Southeast	*Lilium parryi*	lemon lily	None	None	1B.2		Monocots
Southeast	*Erythranthe purpurea*	little purple monkeyflower	None	None	1B.2		Dicots
Southeast	*Myotis evotis*	long-eared myotis	None	None			Mammals
Southeast	*Bombus morrisoni*	Morrison bumble bee	None	None			Insects
Southeast	*Pandion haliaetus*	osprey	None	None		WL	Birds
Southeast	*Calochortus palmeri var. palmeri*	Palmer's mariposa-lily	None	None	1B.2		Monocots
Southeast	*Heuchera parishii*	Parish's alumroot	None	None	1B.3		Dicots
Southeast	*Sidalcea hickmanii ssp. parishii*	Parish's checkerbloom	None	Rare	1B.2		Dicots
Southeast	*Sidalcea hickmanii ssp. parishii*	Parish's checkerbloom	None	Rare	1B.2		Dicots
Southeast	*Boechera parishii*	Parish's rockcress	None	None	1B.2		Dicots
Southeast	*Perideridia parishii ssp. parishii*	Parish's yampah	None	None	2B.2		Dicots
Southeast	*Boechera dispar*	pinyon rockcress	None	None	2B.3		Dicots
Southeast	*Calochortus plummerae*	Plummer's mariposa-lily	None	None	4.2		Monocots
Southeast	*Hulsea vestita ssp. pygmaea*	pygmy hulsea	None	None	1B.3		Dicots
Southeast	*Arenaria lanuginosa var. saxosa*	rock sandwort	None	None	2B.3		Dicots
Southeast	*Oxytropis oreophila var. oreophila*	rock-loving oxytrope	None	None	2B.3		Dicots
Southeast	*Sidalcea neomexicana*	salt spring checkerbloom	None	None	2B.2		Dicots
Southeast	*Symphyotrichum defoliatum*	San Bernardino aster	None	None	1B.2		Dicots
Southeast	*Poa atropurpurea*	San Bernardino blue grass	Endangered	None	1B.2		Monocots
Southeast	*Glaucomys oregonensis californicus*	San Bernardino flying squirrel	None	None		SSC	Mammals
Southeast	*Gilia leptantha ssp. leptantha*	San Bernardino gilia	None	None	1B.3		Dicots
Southeast	*Physaria kingii ssp. bernardina*	San Bernardino Mountains bladderpod	Endangered	None	1B.1		Dicots
Southeast	*Dudleya abramsii ssp. affinis*	San Bernardino Mountains dudleya	None	None	1B.2		Dicots
Southeast	*Erythranthe exigua*	San Bernardino Mountains monkeyflower	None	None	1B.2		Dicots
Southeast	*Castilleja lasiorhyncha*	San Bernardino Mountains owl's-clover	None	None	1B.2		Dicots
Southeast	*Packera bernardina*	San Bernardino ragwort	None	None	1B.2		Dicots
Southeast	*Diadophis punctatus modestus*	San Bernardino ringneck snake	None	None			Reptiles
Southeast	*Boechera peirsonii*	San Bernardino rockcress	None	None	1B.2		Dicots
Southeast	*Claytonia peirsonii ssp. bernardinus*	San Bernardino spring beauty	None	None	1B.1		Dicots
Southeast	*Botrychium crenulatum*	scalloped moonwort	None	None	2B.2		Ferns
Southeast	*Boechera shockleyi*	Shockley's rockcress	None	None	2B.2		Dicots
Southeast	*Opuntia basilaris var. brachyclada*	short-joint beavertail	None	None	1B.2		Dicots
Southeast	*Lewisia brachycalyx*	short-sepaled lewisia	None	None	2B.2		Dicots

Southeast	*Ivesia argyrocoma var. argyrocoma*	silver-haired ivesia	None	None	1B.2		Dicots
Southeast	*Thelypodium stenopetalum*	slender-petaled thelypodium	Endangered	Endangered	1B.1		Dicots
Southeast	*Eriogonum kennedyi var. alpigenum*	southern alpine buckwheat	None	None	1B.3		Dicots
Southeast	*Aimophila ruficeps canescens*	southern California rufous-crowned sparrow	None	None		WL	Birds
Southeast	*Streptanthus campestris*	southern jewelflower	None	None	1B.3		Dicots
Southeast	*Eriogonum kennedyi var. austromontanum*	southern mountain buckwheat	Threatened	None	1B.2		Dicots
Southeast	*Rana muscosa*	southern mountain yellow-legged frog	Endangered	Endangered		WL	Amphibians
Southeast	*Charina umbratica*	southern rubber boa	None	Threatened			Reptiles
Southeast	*Empidonax traillii extimus*	southwestern willow flycatcher	Endangered	Endangered			Birds
Southeast	*Oncorhynchus mykiss irideus pop. 10*	steelhead - southern California DPS	Endangered	None			Fish
Southeast	*Sisyrinchium longipes*	timberland blue-eyed grass	None	None	2B.2		Monocots
Southeast	*Thamnophis hammondii*	two-striped gartersnake	None	None		SSC	Reptiles
Southeast	*Eriogonum evanidum*	vanishing wild buckwheat	None	None	1B.1		Dicots
Southeast	*Drymocallis cuneifolia var. cuneifolia*	wedgeleaf woodbeauty	None	None	1B.1		Dicots
Southeast	*Malaxis monophyllos var. brachypoda*	white bog adder's-mouth	None	None	2B.1		Monocots
Southeast	*Antennaria marginata*	white-margined everlasting	None	None	2B.3		Dicots
Southeast	*Oreonana vestita*	woolly mountain-parsley	None	None	1B.3		Dicots
Southeast	*Allium marvinii*	Yucaipa onion	None	None	1B.2		Monocots
Southeast	*Myotis yumanensis*	Yuma myotis	None	None			Mammals
Southwest	*Taricha torosa*	Coast Range newt	None	None		SSC	Amphibians
Southwest	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None		SSC	Birds
Southwest	*Monardella macrantha ssp. hallii*	Hall's monardella	None	None	1B.3		Dicots
Southwest	*Lepechinia cardiophylla*	heart-leaved pitcher sage	None	None	1B.2		Dicots
Southwest	*Monardella hypoleuca ssp. intermedia*	intermediate monardella	None	None	1B.3		Dicots
Southwest	*Dudleya multicaulis*	many-stemmed dudleya	None	None	1B.2		Dicots
Southwest	*Phacelia keckii*	Santiago Peak phacelia	None	None	1B.3		Dicots
Southwest	*Oncorhynchus mykiss irideus pop. 10*	steelhead - southern California DPS	Endangered	None			Fish
Southwest	*Hesperocyparis forbesii*	Tecate cypress	None	None	1B.1		Gymnosperms
Southwest	*Calochortus weedii var. intermedius*	intermediate mariposa-lily	None	None	1B.2		Monocots
Southwest	*Calochortus plummerae*	Plummer's mariposa-lily	None	None	4.2		Monocots

B-2: Sensitive species occurrence near installation sites

Site	Scientific_Name	Common_Name	Federal_Status	State_Status	Rare_Plant_Rank	CDFW_Status	Taxon_Group	Habitat Requirements	Likelihood of Occurrence	Rationale
East Valley WD	*Vireo bellii pusillus*	least Bell's vireo	Endangered	Endangered			Birds	Dense shrubs and small trees along rivers and streams.	High Potential to Occur	Recent record <50 ft from site and numerous other records within 0.5 miles.
East Valley WD	*Chaetodipus fallax fallax*	northwestern San Diego pocket mouse	None	None		SSC	Mammals	Mainly in arid coastal and desert borders. Habitats tend to be stony soils above sandy desert fans and rocky areas within shrub communities such as coastal sage scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent scrub, pinyon-juniper, and annual grassland	Low Potential to Occur	Habitat potentially present, but species not recorded within 0.5 miles and record 20 years old.
East Valley WD	*Dipodomys merriami parvus*	San Bernardino kangaroo rat	Endangered	Candidate Endangered		SSC	Mammals	Occurs primarily in alluvial fan sage scrub which is a distinct habitat type of the coastal sage scrub community	Moderate Potential to Occur	Suitable habitat present and records within <0.5 miles
East Valley WD	*Rhinichthys osculus ssp. 8*	Santa Ana speckled dace	None	None		SSC	Fish	Small springs or streams to large rivers and deep lakes. Speckled Dace prefer habitat that includes clear, well oxygenated water, with movement due to a current or waves.	Not Expected	Suitable habitat not present.
East Valley WD	*Charina umbratica*	southern rubber boa	None	Threatened			Reptiles	Inhabits Oak-conifer and mixed-conifer forests at elevations between roughly 5,000 to 8,200 ft. where rocks and logs or other debris provide shelter.	High Potential to Occur	Numerous records <0.5 miles
East Valley WD	*Lasiurus xanthinus*	western yellow bat	None	None		SSC	Mammals	Feeds on flying insects. Forages over water and among trees. Roosts in trees. Palm oases and riparian.	Moderate Potential to Occur	Records <0.5 miles
East Valley WD	*Eriastrum densifolium ssp. sanctorum*	Santa Ana River woollystar	Endangered	Endangered	1B.1		Dicots	Coastal Sage Scrub, Chaparral, Riversidian Alluvial Fan Sage Scrub community	Moderate Potential to Occur	Suitable habitat may be present, but species mapped >0.5 miles away and record 25 years old.
East Valley WD	*Imperata brevifolia*	California satintail	None	None	2B.1		Monocots	Coastal Sage Scrub, Creosote Bush Scrub, Chaparral, wetland-riparian	Moderate Potential to Occur	Suitable habitat may be present. Species record from 2010, <0.25 miles from site.
El Toro	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None		SSC	Birds	Coastal sage scrub, desert scrub, and coastal dune scrub year-round. In California they occur along the coast in areas dominated by California sagebrush. They generally occur in areas less than 1,600 feet in elevation, but sometimes occur at higher elevation at inland scrub sites.	Not Expected	Site has no vegetation and is surrounded by residential and reservoir infrastructure.
El Toro	*Nolina cismontana*	chaparral nolina	None	None	1B.2		Monocots	Occurs in coastal mountain ranges in dry chaparral and coastal sage scrub habitat on rocky sandstone and gabbro substrates.	Not Expected	Extremely rare. Does not tolerate habitat fragmentation.
EMWD N	*Artemisiospiza belli belli*	Bell's sage sparrow	None	None		WL	Birds	Breed in coastal sagebrush, chaparral, and other open, scrubby habitats. During migration and winter, they use dry shrublands or grasslands, including creosote and saltbush-dominated desert scrub, yucca, honey mesquite, and greasewood.	Moderate Potential to Occur	Scrub habitat present and abundant nearby
EMWD N	*Athene cunicularia*	burrowing owl	None	None		SSC	Birds	Open, treeless areas with low, sparse vegetation, usually on gently sloping terrain. The owls can be found in grasslands, deserts, and steppe environments; on golf courses, pastures, agricultural fields, airport medians, and road embankments; in cemeteries and urban vacant lots.	High Potential to Occur	Records <0.5 miles
EMWD N	*Arizona elegans occidentalis*	California glossy snake	None	None		SSC	Reptiles	Inhabits arid scrub, rocky washes, grasslands, chaparral. Appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing.	Moderate Potential to Occur	Scrub habitat present and abundant nearby
EMWD N	*Crotalus ruber*	red-diamond rattlesnake	None	None		SSC	Reptiles	Inhabits arid scrub, coastal chaparral, oak and pine woodlands, rocky grassland, cultivated areas. On the desert slopes of the mountains, it ranges into rocky desert flats.	Moderate Potential to Occur	Scrub habitat present and abundant nearby
EMWD N	*Aimophila ruficeps canescens*	southern California rufous-crowned sparr	None	None		WL	Birds	Sage scrub, broken or burned chaparral, and grassland with scattered shrubs. Prefers open shrubby habitat on rocky, xeric slopes. Average habitat is fairly steep south-facing slopes . In California, breeds in sparsely vegetated scrubland on hillsides and canyons. Can also be found breeding in coastal bluff scrub, low-growing serpentine chaparral, and along the edges of tall chaparral habitats.	Low Potential to Occur	Scrub habitat present and abundant nearby, but species prefers steeper slopes.
EMWD N	*Chorizanthe parryi var. parryi*	Parry's spineflower	None	None	1B.1		Dicots	Endemic to Southern California, where it is found in the San Bernardino Mountains, San Gabriel Mountains and Western Transverse Ranges, the Colorado Desert, and along the southern coast. It is found mainly in chaparral scrub plant communities	Moderate Potential to Occur	Scrub habitat present and abundant nearby
EMWD S	*Artemisiospiza belli belli*	Bell's sage sparrow	None	None		WL	Birds	Breed in coastal sagebrush, chaparral, and other open, scrubby habitats. During migration and winter, they use dry shrublands or grasslands, including creosote and saltbush-dominated desert scrub, yucca, honey mesquite, and greasewood.	Moderate Potential to Occur	Suitable habitat likely present. Records <0.5 miles
EMWD S	*Athene cunicularia*	burrowing owl	None	None		SSC	Birds	Open, treeless areas with low, sparse vegetation, usually on gently sloping terrain. The owls can be found in grasslands, deserts, and steppe environments; on golf courses, pastures, agricultural fields, airport medians, and road embankments; in cemeteries and urban vacant lots.	Moderate Potential to Occur	Suitable habitat likely present.
EMWD S	*Phrynosoma blainvillii*	coast horned lizard	None	None		SSC	Reptiles	Inhabits open areas of sandy soil and low vegetation in valleys, foothills and semiarid mountains. Found in grasslands, coniferous forests, woodlands, and chaparral, with open areas and patches of loose soil. Often found in lowlands along sandy washes with scattered shrubs and along dirt roads. Often found near ant hills feeding on ants.	Moderate Potential to Occur	Suitable habitat likely present. Records <0.5 miles
EMWD S	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None		SSC	Birds	Coastal sage scrub, desert scrub, and coastal dune scrub year-round. In California they occur along the coast in areas dominated by California sagebrush. They generally occur in areas less than 1,600 feet in elevation, but sometimes occur at higher elevation at inland scrub sites.	Moderate Potential to Occur	Suitable habitat likely present. Records <0.5 miles
EMWD S	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	Moderate Potential to Occur	Suitable habitat likely present. Records <0.5 miles
EMWD S	*Aspidoscelis hyperythra*	orange-throated whiptail	None	None		WL	Reptiles	Semi-arid brushy areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, and coastal chaparral	Moderate Potential to Occur	Scrub habitat present and abundant nearby
EMWD S	*Crotalus ruber*	red-diamond rattlesnake	None	None		SSC	Reptiles	Inhabits arid scrub, coastal chaparral, oak and pine woodlands, rocky grassland, cultivated areas. On the desert slopes of the mountains, it ranges into rocky desert flats.	Moderate Potential to Occur	Suitable habitat likely present. Records <0.5 miles
EMWD S	*Aimophila ruficeps canescens*	southern California rufous-crowned sparr	None	None		WL	Birds	Sage scrub, broken or burned chaparral, and grassland with scattered shrubs. Prefers open shrubby habitat on rocky, xeric slopes. Average habitat is fairly steep south-facing slopes . In California, breeds in sparsely vegetated scrubland on hillsides and canyons. Can also be found breeding in coastal bluff scrub, low-growing serpentine chaparral, and along the edges of tall chaparral habitats.	Moderate Potential to Occur	Suitable habitat likely present. Records <0.5 miles

B-2: Sensitive species occurrence near installation sites

EMWD S	*Spea hammondii*	western spadefoot	None	None		SSC	Amphibians	Open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Not Expected	No suitable pool habitat nearby.
EMWD S	*Chorizanthe parryi var. parryi*	Parry's spineflower	None	None	1B.1		Dicots	Endemic to Southern California, where it is found in the San Bernardino Mountains, San Gabriel Mountains and Western Transverse Ranges, the Colorado Desert, and along the southern coast. It is found mainly in chaparral scrub plant communities	Moderate Potential to Occur	Scrub habitat present and abundant nearby
EMWD S	*Lepidium virginicum var. robinsonii*	Robinson's pepper-grass	None	None	4.3		Dicots	Coastal Sage Scrub, Chaparral. Roadsides, bottomlands, gravelly and sandy shores, waste grounds, stream banks, grassy meadows, dry flats and stream beds, abandoned fields, woods, cliffs, plains, pastures, sagebrush and other desert shrub communities, dry mountain slopes.	Moderate Potential to Occur	Potentially suitable roadside habitat present.
EMWD S	*Dodecahema leptoceras*	slender-horned spineflower	Endangered	Endangered	1B.1		Dicots	Coastal Sage Scrub, Chaparral. This plant grows in the silt-rich floodplains and washes of the foothills of the Transverse Ranges and the Peninsular Ranges of southern California	Not Expected	No suitable floodplain habitat present.
EMWD S	*Centromadia pungens ssp. laevis*	smooth tarplant	None	None	1B.1		Dicots	Riparian, meadows, playas. Shadscale Scrub, Alkali Sink, Valley Grassland	Not Expected	No suitable riparian habitat present.
Irvine	*Astragalus brauntonii*	Braunton's milk-vetch	Endangered	None	1B.1		Dicots	Coastal Sage Scrub, Closed-cone Pine Forest, Chaparral, Valley Grassland	Low Potential to Occur	Sage scrub habitat likely present, but habitat fragmented by highways.
Irvine	*Dudleya multicaulis*	many-stemmed dudleya	None	None	1B.2		Dicots	Primarily along coastal plain in heavy clay soils.	Moderate Potential to Occur	Mapped <0.5 miles southeast of site within last 10 years.
Irvine	*Falco peregrinus anatum*	American peregrine falcon	Delisted	Delisted		FP	Birds	Breed in open landscapes with cliffs (or skyscrapers) for nest sites. They can be found nesting at elevations up to about 12,000 feet, as well as along rivers and coastlines or in cities, where the local Rock Pigeon populations offer a reliable food supply.	Moderate Potential to Occur	May forage near site. No suitable nesting habitat.
Irvine	*Taricha torosa*	Coast Range newt	None	None		SSC	Amphibians	Found in wet forests, oak forests, chaparral, and rolling grasslands. In southern California, drier chaparral, oak woodland, and grasslands are used.	Not Expected	No suitable habitat present. Nearby records associated with Irvine Lake areas. Installation site is highly disturbed and fragmented.
Irvine	*Campylorhynchus brunneicapillus sandiegens*	coastal cactus wren	None	None		SSC	Birds	Coastal sage scrub	Low Potential to Occur	Suitable scrub habitat likely present, but habitat fragmented by highways. Records >1 mile from site.
Irvine	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None		SSC	Birds	Coastal sage scrub, desert scrub, and coastal dune scrub year-round. In California they occur along the coast in areas dominated by California sagebrush. They generally occur in areas less than 1,600 feet in elevation, but sometimes occur at higher elevation at inland scrub sites.	High Potential to Occur	Suitable habitat present. Mapped within 0.1 miles of site.
Irvine	*Vireo bellii pusillus*	least Bell's vireo	Endangered	Endangered			Birds	Dense shrubs and small trees along rivers and streams.	Low Potential to Occur	Suitable habitat not present at site, but present across the highway around wetlands. Mapped within 0.25 miles of site.
Irvine	*Aspidoscelis hyperythra*	orange-throated whiptail	None	None		WL	Reptiles	Semi-arid brushy areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, and coastal chaparral	Moderate Potential to Occur	Scrub habitat likely present, but habitat fragmented by highways.
Irvine	*Oncorhynchus mykiss irideus pop. 10*	steelhead - southern California DPS	Endangered	None			Fish	Small streams and tributaries where cool, well oxygenated water is available year-round.	Not Expected	No suitable habitat present.
Irvine	*Agelaius tricolor*	tricolored blackbird	None	Threatened		SSC	Birds	Wetlands with cattails, bulrushes, and willows, sometimes agricultural fields.	Low Potential to Occur	Suitable habitat not present at site, but present across the highway around wetlands. Mapped within 0.25 miles of site.
Irvine	*Spea hammondii*	western spadefoot	None	None		SSC	Amphibians	Open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Not Expected	No suitable habitat present. Project Area is highly disturbed and fragmented.
Irvine	*Elanus leucurus*	white-tailed kite	None	None		FP	Birds	Savannas, open woodlands, marshes, desert grasslands, partially cleared lands, and cultivated fields.	Not Expected	No suitable habitat present. Project Area is highly disturbed and fragmented.
Irvine	*Calochortus weedii var. intermedius*	intermediate mariposa-lily	None	None	1B.2		Monocots	Coastal Sage Scrub, Chaparral, Valley Grassland. Rocky soils.	High Potential to Occur	Mapped approximately 0.5 miles from site in 2020.
Mary Lea Gardiner	*Deinandra mohavensis*	Mojave tarplant	None	Endangered	1B.3		Dicots	Grows in moister areas in chaparral and riparian zone habitat.	Not Expected	No suitable riparian or moist habitat present
Mary Lea Gardiner	*Agelaius tricolor*	tricolored blackbird	None	Threatened		SSC	Birds	Wetlands with cattails, bulrushes, and willows, sometimes agricultural fields.	Not Expected	No suitable wetland habitat present
Mary Lea Gardiner	*Spea hammondii*	western spadefoot	None	None		SSC	Amphibians	Open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Not Expected	No suitable riparian or moist habitat present
San Gorgorino	*Chorizanthe parryi var. parryi*	Parry's spineflower	None	None	1B.1		Dicots	Endemic to Southern California, where it is found in the San Bernardino Mountains, San Gabriel Mountains and Western Transverse Ranges, the Colorado Desert, and along the southern coast. It is found mainly in chaparral scrub plant communities	Not Expected	Site ruderal with heavily developed and/or disturbed adjacent areas.
San Gorgorino	*Perognathus longimembris brevinasus*	Los Angeles pocket mouse	None	None		SSC	Mammals	Sandy areas of chaparral, coastal sage scrub, alluvial fan sage scrub, desert scrub, and washes	Not Expected	Site ruderal with heavily developed and/or disturbed adjacent areas.
San Gorgorino	*Chaetodipus fallax fallax*	northwestern San Diego pocket mouse	None	None		SSC	Mammals	Mainly in arid coastal and desert borders. Habitats tend to be stony soils above sandy desert fans and rocky areas within shrub communities such as coastal sage scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent scrub, pinyon-juniper, and annual grassland	Not Expected	Site ruderal with heavily developed and/or disturbed adjacent areas.
San Gorgorino	*Allium marvinii*	Yucaipa onion	None	None	1B.2		Monocots	Grows on the slopes of the hills and mountains, such as those of the Peninsular Ranges, Transverse Ranges, and southern California Coast Ranges.	Not Expected	Site ruderal with heavily developed and/or disturbed adjacent areas.
SAWC2	*Berberis nevinii*	Nevin's barberry	Endangered	Endangered	1B.1		Dicots	This plant is endemic to southern California, where it is known from very few occurrences in the chaparral of inland canyons and foothills	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SAWC2	*Anaxyrus californicus*	arroyo toad	Endangered	None		SSC	Amphibians	Inhabits washes, arroyos, sandy riverbanks, riparian areas with willows, sycamores, oaks, cottonwoods. Specialized habitat needs, which include exposed sandy streamsides with stable terraces for burrowing with scattered vegetation for shelter, and areas of quiet water or pools free of predatory fishes with sandy or gravel bottoms without silt for breeding.	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SAWC2	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	Not Expected	No suitable habitat present at site, but scrub habitat in vicinity may provide habitat.

B-2: Sensitive species occurrence near installation sites

SAWC2	*Rana boylii*	foothill yellow-legged frog	None	Endangered		SSC	Amphibians	Rocky streams and rivers with rocky substrate and open, sunny banks, in forests, chaparral, and woodlands. Sometimes found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools.	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SAWC2	*Neotoma lepida intermedia*	San Diego desert woodrat	None	None		SSC	Mammals	Desert scrub, coastal sage scrub, and chaparral habitats	Not Expected	No suitable habitat present at site, but scrub habitat in vicinity may provide habitat.
SAWC2	*Aimophila ruficeps canescens*	southern California rufous-crowned sparr	None	None		WL	Birds	Sage scrub, broken or burned chaparral, and grassland with scattered shrubs. Prefers open shrubby habitat on rocky, xeric slopes. Average habitat is fairly steep south-facing slopes . In California, breeds in sparsely vegetated scrubland on hillsides and canyons. Can also be found breeding in coastal bluff scrub, low-growing serpentine chaparral, and along the edges of tall chaparral habitats.	Low Potential to Occur	No suitable habitat present at site, but scrub habitat in vicinity may provide habitat.
SAWC2	*Rana muscosa*	southern mountain yellow-legged frog	Endangered	Endangered		WL	Amphibians	In the mountains of southern California, inhabits rocky streams in narrow canyons and in the chaparral belt.	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SAWC2	*Calochortus weedii var. intermedius*	intermediate mariposa-lily	None	None	1B.2		Monocots	Coastal Sage Scrub, Chaparral, Valley Grassland. Rocky soils.	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SAWC2	*Calochortus plummerae*	Plummer's mariposa-lily	None	None	4.2		Monocots	Coastal Sage Scrub, Yellow Pine Forest, Foothill Woodland, Chaparral, Valley Grassland	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SAWC2	*Calochortus clavatus var. gracilis*	slender mariposa-lily	None	None	1B.2		Monocots	Chaparral, tends to grow in rocky slopes and open areas, at elevations from 0-5900 feet.	Not Expected	No suitable habitat present. Site paved for flood control infrastructure.
SBV WCD1	*Chorizanthe parryi var. parryi*	Parry's spineflower	None	None	1B.1		Dicots	Endemic to Southern California, where it is found in the San Bernardino Mountains, San Gabriel Mountains and Western Transverse Ranges, the Colorado Desert, and along the southern coast. It is found mainly in chaparral scrub plant communities	Not Expected	Property is ruderal and no suitable shrub habitat is present.
SBV WCD1	*Sidalcea neomexicana*	salt spring checkerbloom	None	None	2B.2		Dicots	Rare native perennial herb that grows in southern and central California. Coastal Sage Scrub, Creosote Bush Scrub, Alkali Sink, Yellow Pine Forest, Chaparral, wetland-riparian. Usually in wetlands.	Not Expected	Property is ruderal and no suitable shrub habitat is present.
SBV WCD1	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None		SSC	Birds	Coastal sage scrub, desert scrub, and coastal dune scrub year-round. In California they occur along the coast in areas dominated by California sagebrush. They generally occur in areas less than 1,600 feet in elevation, but sometimes occur at higher elevation at inland scrub sites.	Not Expected	Property is ruderal and no suitable shrub habitat is present.
SBV WCD1	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	Not Expected	Property is ruderal and no suitable shrub habitat is present.
SBV WCD1	*Chaetodipus fallax fallax*	northwestern San Diego pocket mouse	None	None		SSC	Mammals	Mainly in arid coastal and desert borders. Habitats tend to be stony soils above sandy desert fans and rocky areas within shrub communities such as coastal sage scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent scrub, pinyon-juniper, and annual grassland	Not Expected	Property is ruderal and no suitable shrub habitat is present.
SBV WCD1	*Eriastrum densifolium ssp. sanctorum*	Santa Ana River woollystar	Endangered	Endangered	1B.1		Dicots	Coastal Sage Scrub, Chaparral, Riversidian Alluvial Fan Sage Scrub community	Not Expected	Property is ruderal and no suitable shrub or fan habitat is present.
SBV WCD1	*Dipodomys merriami parvus*	San Bernardino kangaroo rat	Endangered	Candidate Endangered		SSC	Mammals	Occurs primarily in alluvial fan sage scrub which is a distinct habitat type of the coastal sage scrub community	Not Expected	Property is ruderal and no suitable shrub or fan habitat is present.
SBV WCD1	*Neotoma lepida intermedia*	San Diego desert woodrat	None	None		SSC	Mammals	Desert scrub, coastal sage scrub, and chaparral habitats	Not Expected	Property is ruderal and no suitable shrub habitat is present.
SBV WCD1	*Rhinichthys osculus ssp. 8*	Santa Ana speckled dace	None	None		SSC	Fish	Small springs or streams to large rivers and deep lakes. Speckled Dace prefer habitat that includes clear, well oxygenated water, with movement due to a current or waves.	Not Expected	No stream habitat present
SBV WCD1	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles	Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans	Not Expected	Property is ruderal and no suitable shrub or fan habitat is present.
SBV WCD1	*Spea hammondii*	western spadefoot	None	None		SSC	Amphibians	Open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Not Expected	Property is ruderal and no suitable habitat is present.
SBV WCD2	*Chorizanthe parryi var. parryi*	Parry's spineflower	None	None	1B.1		Dicots	Endemic to Southern California, where it is found in the San Bernardino Mountains, San Gabriel Mountains and Western Transverse Ranges, the Colorado Desert, and along the southern coast. It is found mainly in chaparral scrub plant communities	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent.
SBV WCD2	*Eriastrum densifolium ssp. sanctorum*	Santa Ana River woollystar	Endangered	Endangered	1B.1		Dicots	Coastal Sage Scrub, Chaparral, Riversidian Alluvial Fan Sage Scrub community	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent. Records <0.5 miles
SBV WCD2	*Arizona elegans occidentalis*	California glossy snake	None	None		SSC	Reptiles	Inhabits arid scrub, rocky washes, grasslands, chaparral. Appears to prefer microhabitats of open areas and areas with soil loose enough for easy burrowing.	Moderate Potential to Occur	Suitable habitat may be present.
SBV WCD2	*Aspidoscelis tigris stejnegeri*	coastal whiptail	None	None		SSC	Reptiles	Found in a variety of ecosystems, primarily hot and dry open areas with sparse foliage - chaparral, woodland, and riparian areas.	Moderate Potential to Occur	Suitable habitat may be present.
SBV WCD2	*Vireo bellii pusillus*	least Bell's vireo	Endangered	Endangered			Birds	Dense shrubs and small trees along rivers and streams.	Low Potential to Occur	No suitable habitat likely at installation site, but species mapped 0.5 miles from site.
SBV WCD2	*Chaetodipus fallax fallax*	northwestern San Diego pocket mouse	None	None		SSC	Mammals	Mainly in arid coastal and desert borders. Habitats tend to be stony soils above sandy desert fans and rocky areas within shrub communities such as coastal sage scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent scrub, pinyon-juniper, and annual grassland	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent.
SBV WCD2	*Dipodomys merriami parvus*	San Bernardino kangaroo rat	Endangered	Candidate Endangered		SSC	Mammals	Occurs primarily in alluvial fan sage scrub which is a distinct habitat type of the coastal sage scrub community	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent.
SBV WCD2	*Neotoma lepida intermedia*	San Diego desert woodrat	None	None		SSC	Mammals	Desert scrub, coastal sage scrub, and chaparral habitats	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent. Records <0.5 miles
SBV WCD2	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles	Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent.
SBV WCD2	*Charina umbratica*	southern rubber boa	None	Threatened			Reptiles	Inhabits Oak-conifer and mixed-conifer forests at elevations between roughly 5,000 to 8,200 ft. where rocks and logs or other debris provide shelter.	Not Expected	No suitable habitat present.
SBV WCD2	*Oncorhynchus mykiss irideus pop. 10*	steelhead - southern California DPS	Endangered	None			Fish	Small streams and tributaries where cool, well oxygenated water is available year-round.	Not Expected	No suitable habitat present.

B-2: Sensitive species occurrence near installation sites

SBV WCD2	*Thamnophis hammondii*	two-striped gartersnake	None	None		SSC	Reptiles	Generally found near water sources - pools, creeks, cattle tanks, and others, often in rocky areas. Associated vegetation: oak woodland, willow, coastal sage scrub, scrub oak, sparse pine, chaparral, and brushland.	Moderate Potential to Occur	Suitable habitat may be present. Records <0.5 miles
SBV WCD2	*Spea hammondii*	western spadefoot	None	None		SSC	Amphibians	Open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Low Potential to Occur	No suitable habitat likely at installation site, but potentially suitable habitat adjacent. Records <0.5 miles
Sycamore WTP	*Chorizanthe parryi var. parryi*	Parry's spineflower	None	None	1B.1		Dicots	Endemic to Southern California, where it is found in the San Bernardino Mountains, San Gabriel Mountains and Western Transverse Ranges, the Colorado Desert, and along the southern coast. It is found mainly in chaparral scrub plant communities	Low Potential to Occur	Suitable scrub habitat likely present, but quality may be low due to disturbance.
Sycamore WTP	*Dodecahema leptoceras*	slender-horned spineflower	Endangered	Endangered	1B.1		Dicots	Coastal Sage Scrub, Chaparral. This plant grows in the silt-rich floodplains and washes of the foothills of the Transverse Ranges and the Peninsular Ranges of southern California	Not Expected	Suitable habitat not present.
Sycamore WTP	*Eremophila alpestris actia*	California horned lark	None	None		WL	Birds	Favor bare, dry ground and areas of short, sparse vegetation. Common habitats include prairies, deserts, tundra, beaches, dunes, and heavily grazed pastures.	Not Expected	No suitable flat habitat present.
Sycamore WTP	*Polioptila californica californica*	coastal California gnatcatcher	Threatened	None		SSC	Birds	Coastal sage scrub, desert scrub, and coastal dune scrub year-round. In California they occur along the coast in areas dominated by California sagebrush. They generally occur in areas less than 1,600 feet in elevation, but sometimes occur at higher elevation at inland scrub sites.	Moderate Potential to Occur	Sage scrub habitat likely present, but quality may be low due to disturbance.
Sycamore WTP	*Vireo bellii pusillus*	least Bell's vireo	Endangered	Endangered			Birds	Dense shrubs and small trees along rivers and streams.	Not Expected	No suitable habitat likely at installation site, but potentially suitable habitat adjacent. Records <0.5 miles
Sycamore WTP	*Falco columbarius*	merlin	None	None		WL	Birds	Nonbreeding in California. Grasslands, open forests, and coastal areas.	Not Expected	Suitable habitat not present.
Sycamore WTP	*Aspidoscelis hyperythra*	orange-throated whiptail	None	None		WL	Reptiles	Semi-arid brushy areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, and coastal chaparral	Moderate Potential to Occur	Suitable scrub habitat likely present, but quality may be low due to disturbance.
Sycamore WTP	*Dipodomys merriami parvus*	San Bernardino kangaroo rat	Endangered	Candidate Endangered		SSC	Mammals	Occurs primarily in alluvial fan sage scrub which is a distinct habitat type of the coastal sage scrub community	Not Expected	Suitable habitat not present.
Sycamore WTP	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles	Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans	Moderate Potential to Occur	Suitable sandy habitat likely present, but quality may be low due to disturbance.
Sycamore WTP	*Spea hammondii*	western spadefoot	None	None		SSC	Amphibians	Open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Rainpools which do not contain bullfrogs, fish, or crayfish are necessary for breeding.	Not Expected	No suitable habitat likely at installation site, but potentially suitable habitat adjacent. Records <0.5 miles
Sycamore WTP	*Calochortus plummerae*	Plummer's mariposa-lily	None	None	4.2		Monocots	Coastal Sage Scrub, Yellow Pine Forest, Foothill Woodland, Chaparral, Valley Grassland	Low Potential to Occur	Suitable scrub habitat likely present, but quality may be low due to disturbance.
Thousand Pines	*Lycium parishii*	Parish's desert-thorn	None	None	2B.3		Dicots	Coastal Sage Scrub, Creosote Bush Scrub	Not Expected	No suitable habitat present.
Thousand Pines	*Castilleja lasiorhyncha*	San Bernardino Mountains owl's-clover	None	None	1B.2		Dicots	Most of the plant's range is in the San Bernardino Mountains, where it grows in forests and meadows.	Not Expected	No meadow habitat present.
Thousand Pines	*Streptanthus campestris*	southern jewelflower	None	None	1B.3		Dicots	Yellow Pine Forest, Chaparral, Pinyon-Juniper Woodland	Not Expected	Extremely rare.
Thousand Pines	*Haliaeetus leucocephalus*	bald eagle	Delisted	Endangered		FP	Birds	Require access to open water for fishing. Nest in mature forests.	Not Expected	Nearest suitable habitat is Lake Gregory to the south.
Thousand Pines	*Palaeoxenus dohrni*	Dohrn's elegant eucnemid beetle	None	None			Insects	Typically found in remote mountainous forest lands consisting of incense cedar, ponderosa pine and sugar pine.	Low Potential to Occur	Site developed for camp, but heavily wooded in vicinity.
Thousand Pines	*Glaucomys oregonensis californicus*	San Bernardino flying squirrel	None	None		SSC	Mammals	High-elevation, mixed-conifer forests dominated by Jeffrey pine, white fir and black oak between 4,600 and 7,550 feet. Flying squirrels thrive in forests with big trees and closed-canopy cover, large snags that provide nesting cavities, downed logs that foster the growth of the truffles they eat and understory cover that provides protection from predators.	Moderate Potential to Occur	Suitable mature pine forest present.
Thousand Pines	*Diadophis punctatus modestus*	San Bernardino ringneck snake	None	None			Reptiles	Prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, woodlands.	Not Expected	No riparian or wet habitat present.
Thousand Pines	*Charina umbratica*	southern rubber boa	None	Threatened			Reptiles	Inhabits Oak-conifer and mixed-conifer forests at elevations between roughly 5,000 to 8,200 ft. where rocks and logs or other debris provide shelter.	Moderate Potential to Occur	Site developed for camp, but suitable habitat in vicinity.
Upland Chino	*Horkelia cuneata var. puberula*	mesa horkelia	None	None	1B.1		Dicots	Prefers chaparral, woodland, and coastal scrub habitats.	Not Expected	Site heavily disturbed.
Upland Chino	*Berberis nevinii*	Nevin's barberry	Endangered	Endangered	1B.1		Dicots	This plant is endemic to southern California, where it is known from very few occurrences in the chaparral of inland canyons and foothills	Not Expected	Site heavily disturbed.
Upland Chino	*Bombus crotchii*	Crotch bumble bee	None	None			Insects	Occurs primarily in California, including the Mediterranean region, Pacific Coast, Western Desert, Great Valley, and adjacent foothills through most of southwestern California. In California, *B. crotchii* inhabits open grassland and scrub habitats.	Not Expected	Site heavily disturbed.
Upland Chino	*Chaetodipus fallax fallax*	northwestern San Diego pocket mouse	None	None		SSC	Mammals	Mainly in arid coastal and desert borders. Habitats tend to be stony soils above sandy desert fans and rocky areas within shrub communities such as coastal sage scrub, chamise-redshank chaparral, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent scrub, pinyon-juniper, and annual grassland	Not Expected	Site heavily disturbed.
Upland Chino	*Neotoma lepida intermedia*	San Diego desert woodrat	None	None		SSC	Mammals	Desert scrub, coastal sage scrub, and chaparral habitats	Not Expected	Site heavily disturbed.
Upland Chino	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles	Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans	Not Expected	Site heavily disturbed.
Waterwise	*Horkelia cuneata var. puberula*	mesa horkelia	None	None	1B.1		Dicots	Prefers chaparral, woodland, and coastal scrub habitats.	Not Expected	Extremely urban area, heavily developed. No suitable habitat present.
Waterwise	*Berberis nevinii*	Nevin's barberry	Endangered	Endangered	1B.1		Dicots	This plant is endemic to southern California, where it is known from very few occurrences in the chaparral of inland canyons and foothills	Not Expected	Extremely urban area, heavily developed. No suitable habitat present.
Waterwise	*Anniella stebbinsi*	Southern California legless lizard	None	None		SSC	Reptiles	Often locally abundant, specimens are found in coastal sand dunes and a variety of interior habitats, including sandy washes and alluvial fans	Not Expected	Extremely urban area, heavily developed. No suitable habitat present.